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COST AND MANAGEMENT ACCOUNTING.

SEPT 2025 QUESTION BANK

THE ULTIMATE GUIDE

Updated for September 2025 exams

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Chapter 1

Introduction to Cost and Management Accounting

Topic 1 Introduction & Objectives

Question 1

Discuss the impact of Information Technology in Cost Accounting.

(MTP March '19 & April '23 & Sep '23, PYP Jan '21, RTP May '20, RTP May'22)

Answer 1

The impact of IT in cost accounting may include the followings:

(i) After the introduction of ERPs, different functional activities get integrated and as a consequence a single entry into the accounting system provides custom made reports for every purpose and saves an organization from preparing different sets of documents. Reconciliation process of results of both cost and financial accounting systems become simpler and less sophisticated.

(ii) A move towards paperless environment can be seen where documents like Bill of Material, Material Requisition Note, Goods Received Note, labour utilization report etc. are no longer required to be prepared in multiple copies, the related department can get e copy from the system.

(iii) Information Technology with the help of internet (including intranet and extranet) helps in resource procurement and mobilization. For example, production department can get materials from the stores without issuing material requisition note physically. Similarly, purchase orders can be initiated to the suppliers with the help of extranet. This enables an entity to shift towards Just-in-Time (JIT) approach of inventory management and production.

(iv) Cost information for a cost center or cost object is ascertained with accuracy in timely manner. Each cost center and cost object is codified and all related costs are assigned to the cost object or cost center. This process automates the cost accumulation and ascertainment process. The cost information can be customized as per the requirement. For example, when an entity manufacture or provide services, it can know information job -wise, batch-wise, process-wise, cost center wise etc.

(v) Uniformity in preparation of report, budgets and standards can be achieved with the help of IT. ERP software plays an important role in bringing uniformity irrespective of location, currency, language and regulations.

(vi) Cost and revenue variance reports are generated in real time basis which enables the management to take control measures immediately.

(vii) IT enables an entity to monitor and analyse each process of manufacturing or service activity closely to eliminate non value added activities.

The above are examples of few areas where Cost Accounting is done with the help of IT.

Question 2

DISCUSS the essential features of a good cost accounting system?

(Study material)

Answer 2

ESSENTIALS OF A GOOD COST ACCOUNTING SYSTEM

The essential features, which a good Cost Accounting System should possess, are as follows:

(a) Informative and simple: Cost accounting system should be tailor-made, practical, simple and capable of meeting the requirements of a business concern. The system of costing should not sacrifice the utility by introducing inaccurate and unnecessary details.

(b) Accurate and authentic: The data to be used by the cost accounting system should be accurate and authenticated; otherwise it may distort the output of the system and a wrong decision may be taken.

(c) Uniformity and consistency: There should be uniformity and consistency in classification, treatment and reporting of cost data and related information. This is required for benchmarking and comparability of the results of the system for both horizontal and vertical analysis.

(d) Integrated and inclusive: The cost accounting system should be integrated with other systems like financial accounting, taxation, statistics and operational research etc. to have a complete overview and clarity in results.

(e) Flexible and adaptive: The cost accounting system should be flexible enough to make necessary amendment and modifications in the system to incorporate changes in technological, reporting, regulatory and other requirements.

(f) Trust on the system: Management should have trust on the system and its output. For this, an active role of management is required for the development of such a system that reflects a strong conviction in using information for decision making.

Topic 2 Cost Control vs Cost Reduction

Question 3

Discuss the four different methods of costing along with their applicability to concerned industry?

(MTP March '18)

Answer 3

Four different methods of costing along with their applicability to concerned industry have been discussed as below:

(i) Job Costing: The objective under this method of costing is to ascertain the cost of each job order. A job card is prepared for each job to accumulate costs. The cost of the job is determined by adding all costs against the job it has incurred. This method of costing is used in printing press, foundries and general engineering workshops, advertising etc.

(ii) Batch Costing: This system of costing is used where small components/ parts of the same kind are required to be manufactured in large quantities. Here batch of similar products is treated as a job and cost of such a job is ascertained as discussed under (1), above. If in a cycle manufacturing unit, rims are produced in batches of 2,500 units each, then the cost will be determined in relation to a batch of 2,500 units.

(iii) Contract Costing: If a job is very big and takes a long time for its completion, then method used for costing is known as Contract Costing. Here the cost of each contract is ascertained separately. It is suitable for firms engaged in the construct ion of bridges, roads, buildings etc.

(iv) Operating Costing: The method of Costing used in service rendering undertakings is known as operating costing. This method of costing is used in undertakings like transport, supply of water, telephone services, hospitals, nursing homes etc.

Question 4

DISCUSS the steps to be followed to exercise control over cost.

(MTP Oct'20)

Answer 4

To exercise control over cost, following steps are followed:

(i) Determination of pre-determined standard or results: Standard cost or performance targets for a cost object or a cost centre is set before initiation of production or service activity. These are desired cost or result that need to be achieved.

(ii) Measurement of actual performance: Actual cost or result of the cost object or cost centre is measured. Performance should be measured in the same manner in which the targets are

set i.e. if the targets are set up operation-wise, and then the actual costs should also be collected and measured operation-wise to have a common basis for comparison.

(iii) Comparison of actual performance with set standard or target: The actual performance so measured is compared against the set standard and desired target. Any deviation (variance) between the two is noted and reported to the appropriate person or authority.

(iv) Analysis of variance and action: The variance in results so noted are further analysed to know the reasons for variance and appropriate action is taken to ensure compliance in future. If necessary, the standards are further amended to take developments into account.

Question 5

DISTINGUISH between cost control and cost reduction

(MTP Apr'21, Apr 19& Oct '23) (RTP (Nov '21, May 19, Nov '18 & Nov '22 & May '23)

Answer 5

Difference between Cost Control and Cost Reduction

Cost Control	Cost Reduction
1. Cost control aims at maintaining the costs in accordance with the established standards.	1. Cost reduction is concerned with reducing costs. It challenges all standards and endeavours to improvise them continuously
2. Cost control seeks to attain lowest possible cost under existing conditions.	2. Cost reduction recognises no condition as permanent, since a change will result in lower cost.
3. In case of cost control, emphasis is on past and present	3. In case of cost reduction, it is on present and future.

4. Cost control is a preventive function	4. Cost reduction is a corrective function. It operates even when an efficient cost control system exists.
5. Cost control ends when targets are achieved.	5. Cost reduction has no visible end and is a continuous process.

Important Note:-

a) In this theoretical question on 'Cost control and Cost reduction', below average performance of the examinees was observed.

b) The theory question required knowledge of the concepts of two terms Cost Control and Cost Reduction to identify differences between them. Most of the examinees answered partly correct. Performance of the examinees was below average.

Question 6

EXPLAIN the difference between Cost Accounting and Management Accounting.

(MTP Oct '21 & March '23) (RTP Nov'19, May '20 & Nov '22) (PYP Nov 20)

Answer 6

Difference between Cost Accounting and Management Accounting

	Basis	Cost Accounting	Management Accounting
(i)	Nature	It records the quantitative aspect only.	It records both qualitative and quantitative aspect.

(ii)	Objective	It records the cost of producing a product and providing a service.	It Provides information to management for planning and co-ordination.
(iii)	Area	It only deals with cost Ascertainment.	It is wider in scope as it includes financial accounting, budgeting, taxation, planning etc.
(iv)	Recording of data	It uses both past and present figures.	It is focused with the projection of figures for future.
(v)	Development	Its development is related to industrial revolution.	It develops in accordance to the need of modern business world.
(vi)	Rules and Regulation	It follows certain principles and procedures for recording costs of different products.	It does not follow any specific rules and regulations.

Question 7

Explain Direct Expenses and how these are measured and their treatment in cost accounting.

(PYP May '19)

Answer 7

Direct Expense: Expenses other than direct material cost and direct employee cost, which are incurred to manufacture a product or for provision of service and can be directly traced in an economically feasible manner to a cost object. The following costs are examples for direct expenses:

(i) Royalty paid/ payable for production or provision of service;

(ii) Hire charges paid for hiring specific equipment;

(iii) Cost for product/ service specific design or drawing;

(iv) Cost of product/ service specific software;

(v) Other expenses which are directly related with the production of goods or provision of service. The above list of expenses is not exhaustive; any other expenses which are directly attributable to the production or service are also included as direct expenses.

Measurement of Direct Expenses

The direct expenses are measured at invoice or agreed price net of rebate or discount but includes duties and taxes (for which input credit not available), commission and other directly attributable costs. In case of sub-contracting, where goods are get manufactured by job workers independent of the principal entity, are measured at agreed price. Where the principal supplies some materials to the job workers, the value of such materials and other incidental expenses are added with the job charges paid to the job workers.

Treatment of Direct Expenses

Direct Expenses forms part the prime cost for the product or service to which it can be directly traceable and attributable. In case of lump-sum payment or one-time payment, the cost is amortized over the estimated production volume or benefit derived. If the expenses incurred are of insignificant amount. i.e. not material, it can be treated as part of overheads.

Important Note:-

This theoretical question was related to 'Direct Expenses'. Poor performance of the examinees was observed.

Question 8

DISCUSS the different cost centres that on organization can have?

Answer 8

As the organization grows, its functions, organizational structure and other related functions also grow in terms of volume and complexity. To have a better control over the organization, management delegates its responsibility and authority to various departments or persons. These departments or persons are known as responsibility centres and are held responsible for performance in terms of expenditure, revenue, profitability and return on investment. Performance of these responsibility centres are measured against some set standards (input-output ratio, budgets etc.) and evaluated against organizational goal and performance targets.

(i) Cost Centres: The responsibility centre which is held accountable for incurrence of costs which are under its control. The performance of this responsibility centre is measured against pre-determined standards or budgets. The cost centres are of two types:

(a) Standard Cost Centre and

(b) Discretionary Cost Centre

(a) Standard Cost Centre: Cost Centre where output is measurable and input required for the output can be specified. Based on a well-established study, an estimate of standard units of input to produce a unit of output is set. The actual cost for inputs is compared with the standard cost. Any deviation (variance) in cost is measured and analyzed into controllable and uncontrollable cost. The manager of the cost centre is expected to comply with the standard and held responsible for adverse cost variances. The input-output ratio for a standard cost centre is clearly identifiable.

(b) Discretionary Cost Centre: The cost centre whose output cannot be measured in financial terms, thus input-output ratio cannot be defined. The cost of input is compared with allocated budget for the activity. Examples of discretionary cost centres are Research & Development department, Advertisement department where output of these department cannot be measured with certainty and co-related with cost incurred on inputs.

(ii) Revenue Centres: The responsibility centres which are accountable for generation of revenue for the entity. Sales Department for example, is responsible for achievement of sales target and revenue generation. Though, revenue centres do not have control on expenditures it incurs but sometimes expenditures related with selling activities like commission to sales person etc. are incurred by revenue centres.

(iii) Profit Centres: These are the responsibility centres which have both responsibility of generation of revenue and incurrence of expenditures. Since, managers of profit centres are accountable for both costs as well as revenue, profitability is the basis for measurement of performance of these responsibility centres. Examples of profit centres are decentralised branches of an organisation.

(iv) Investment Centres: These are the responsibility centres which are not only responsible for profitability but also have the authority to make capital investment decisions. The performance of these responsibility centres are measured on the basis of Return on Investment (ROI) besides profit. Examples of investment centres are Maharatna, Navratna and Miniratna companies of Public Sector Undertakings of Central Government.

MCQ

Question 9

Which of the following is true about Cost control:

(a) It is a corrective function

(b) It challenges the set standards

(c) It ends when targets achieved

(d) It is concerned with future

(Study material)

Ans: (c) It ends when targets achieved

Reason:

Cost control refers to the process of monitoring and regulating the expenses of a business to keep them within the predefined limits or set targets. It involves comparing actual costs with standard or budgeted costs and taking corrective actions to minimize deviations. Once the pre-set cost targets are achieved, the process of cost control is considered complete for that activity or period — it does not continue beyond the achievement of targets.

Question 10

Which of the following is Not true about the cost control and cost reduction:

(a) Cost control seeks to attain lowest possible cost under best conditions.

(b) Cost control emphasises on past and present.

(c) Cost reduction is a corrective function. It operates even when an efficient cost control system exists.

(d) Cost control ends when targets are achieved.

(Study material)

Ans: (a) Cost control seeks to attain lowest possible cost under best conditions.

Reason:

This statement is not true about cost control — it actually describes cost reduction.

Cost Control focuses on maintaining costs within set standards or budgets. It aims to adhere to predetermined cost limits and does not attempt to reduce costs beyond those set standards.

In contrast, Cost Reduction is a more aggressive and continuous process that seeks to bring down costs to the lowest possible level, even if the current costs are already within the standards — and does so without compromising quality or performance.

Topic 3 Cost Objects & Cost Units

Question 11

STATE Direct Expenses with examples.

(MTP April '19)

Answer 11

Expenses other than direct material cost and direct employee cost, which are incurred to manufacture a product or for provision of service and can be directly traced in an economically feasible manner to a cost object. The following costs are examples for direct expenses:

(a) Royalty paid/ payable for production or provision of service;

(b) Hire charges paid for hiring specific equipment;

(c) Cost for product/ service specific design or drawing;

(d) Cost of product/ service specific software;

(e) Other expenses which are directly related with the production of goods or provision of service.

Question 12

Narrate the objectives of cost accounting.

(Nov '23)

Answer 12

The main objectives of introduction of a Cost Accounting System in a manufacturing organization are as follows:

(i) Ascertainment of cost: The main objective of a Cost Accounting system is to ascertain cost for cost objects. Costing may be post completion or continuous but the aim is to arrive at a complete and accurate cost figure to assist the users to compare, control and make various decisions.

(ii) Determination of selling price: Cost Accounting System in a manufacturing organisation enables to determine desired selling price after adding expected profit margin with the cost of the goods manufactured.

(iii) Cost control and Cost reduction: Cost Accounting System equips the cost controller to adhere and control the cost estimate or cost budget and assist them to identify the areas of cost reduction.

(iv) Ascertainment of profit of each activity: Cost Accounting System helps to classify cost on the basis of activity to ascertain activity wise profitability.

(v) Assisting in managerial decision making: Cost Accounting System provides relevant cost information and assists managers to make various decisions.

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Question 13

State the method of costing that would be most suitable for:

(i) Oil Refinery

(ii) Interior Decoration

(iii) Airlines Company

(iv) Advertising

(v) Car Assembly.

(PYP Jan '21)

Answer 13

Method of Costing

S. No.	Industry	Method of Costing
(i)	Oil Refinery	Process Costing
(ii)	Interior Decoration	Job Costing
(iii)	Airlines Company	Operation/ Service Costing
(iv)	Advertising	Job Costing
(v)	Car Assembly	Multiple Costing

Question 14

LIST DOWN certain financial expenses and income included in Financial Accounts only.

(RTP Jan 2025)

Answer 14

Items included in Financial Accounts only-

(A) Purely Financial Expenses:

(i) Interest on loans or bank mortgages

(ii) Expenses and discounts on issue of shares, debentures etc.

(iii) Other capital losses i.e., loss by fire not covered by insurance etc.

(iv) Losses on the sales of fixed assets and investments

(v) Income tax, donations, subscriptions

(vi) Expenses of the company's share transfer office, if any.

(B) Purely Financial Income

(i) Interest received on bank deposits, loans and investments

(ii) Dividends received

(iii) Profits on the sale of fixed assets and investments

(iv) Transfer fee received

(v) Rent receivables.

Question 15

…….. is anything for which a separate measurement is required?

(a) Cost unit

(b) Cost object

(c) Cost driver

(d) Cost centre

(Study material)

Ans: (b) Cost object

Reason:

A Cost Object is anything for which separate cost measurement is desired. This could be a product, service, project, customer, activity, or department. It is the focus or target for accumulating and assigning costs.

Question 16

Cost units used in power sector is:

(a) Kilometer (K.M)

(b) Kilowatt-hour (kWh)

(c) Number of electric points

(d) Number of hours

(Study material)

Ans: (b) Kilowatt-hour (kWh)

Reason:

In the power sector, the standard cost unit used for measuring output and cost is the kilowatt-hour (kWh). It represents the amount of electrical energy consumed or produced over time and is used to compute cost per unit of electricity.

This unit helps in:

- Determining the cost of generating or distributing electricity,
- Billing consumers based on energy consumption,
- Comparing efficiency and cost performance.

Topic 4 Methods of Costing

Question 17

Discuss the prerequisite of installing cost accounting system.

(MTP Aug '18)

Answer 17

Before setting up a system of cost accounting the under mentioned factors should be studied:

(i) Objective: The objective of costing system, for example whether it is being introduced for fixing prices or for insisting a system of cost control.

(ii) Nature of Business or Industry: The Industry in which business is operating. Every business industry has its own peculiarity and objectives. According to its cost information requirement cost accounting methods are followed. For example, an oil refinery maintains process wise cost accounts to find out cost incurred on a particular process say in crude refinement process etc.

(iii) Organizational Hierarchy: Costing system should fulfil the information requirement s of different levels of management. Top management is concerned with the corporate strategy, strategic level management is concerned with marketing strategy, product diversification, product pricing etc.

Operational level management needs the information on standard quantity to be consumed, report on idle time etc.

(iv) Knowing the product: Nature of product determines the type of costing system to be implemented. The product which has by -products requires costing system which account for by-products as well. In case of perishable or short self - life, marginal costing method is required to know the contribution and minimum price at which it can be sold.

(v) Knowing the production process: A good costing system can never be established without the complete knowledge of the production process. Cost apportionment can be done on the most appropriate and scientific basis if a cost accountant can identify degree of effort or resources consumed in a particular process. This also includes some basic technical know - how and process peculiarity.

(vi) Information synchronization: Establishment of a department or a system requires substantial amount of organizational resources. While drafting a costing system, information needs of various other departments should be taken into account. For example, in a typical

business organization accounts department needs to submit monthly stock statement to its lender bank, quantity wise stock details at the time of filing returns to tax authorities etc.

(vii) Method of maintenance of cost records: The manner in which Cost and Financial accounts could be inter-locked into a single integral accounting system and how the results of separate sets of accounts i.e. cost and financial, could be reconciled by means of control accounts.

(viii) Statutory compliances and audit: Records are to be maintained to comply with statutory requirements and applicable cost accounting standards to be followed.

(ix) Information Attributes: Information generated from the Costing system should possess all the attributes of information i.e. complete, accurate, timeliness, relevant etc. to have an effective management information system (MIS).

Question 18

EXPLAIN the difference between product cost and period cost.

(April '19, Oct'22)

Answer 18

Product costs are those costs that are identified with the goods purchased or produced for resale. In a manufacturing organisation they are attached to the product and that are included in the inventory valuation for finished goods, or for incomplete goods. Product cost is also known as inventoriable cost. Under absorption costing method it includes direct material, direct labour, direct expenses, directly attributable costs (variable and non-variable) and other production (manufacturing) overheads. Under marginal costing method Product Costs includes all variable production costs and the all fixed costs are deducted from the contribution.

Periods costs are the costs, which are not assigned to the products but are charged as expense against revenue of the period in which they are incurred. General Administration, marketing, sales and distributor overheads are recognized as period costs.

Question 19

Identify the methods of costing from the following statements:

(i) Costs are directly charged to a group of products.

(ii) Nature of the product is complex and method cannot be ascertained.

(iii) Costs ascertained for a single product.

(iv) All costs are directly charged to a specific job.

(v) Costs are charged to operations and averaged over units produced.

(PYP May'22)

Answer 19

Method of costing followed:

Situation	Method of costing
(i) Costs are directly charged to a group of products.	Batch costing
(ii) Nature of the product is complex and method cannot be ascertained.	Multiple costing
(iii) Cost is ascertained for a single product.	Unit/ Single/Output costing
(iv) All costs are directly charged to a specific job.	Job costing
(v) Costs are charged to operations and averaged over units produced.	Process costing

Question 20

DISCUSS the four different methods of costing along with their applicability to concerned industry?

(Study material)

Answer 20

Different industries follow different methods of costing because of the differences in the nature of their work. The various methods of costing are as follows:

Methods	Description
Single or Output Costing	Under this method, the cost of a product is ascertained, the product being the only one produced like bricks, coals, etc.
Batch Costing	This method is the extension of job costing. A batch may represent a number of small orders passed through the factory in batch. Each batch here is treated as a unit of cost and thus separately costed. Here cost per unit is determined by dividing the cost of the batch by the number of units produced in the batch.
Job Costing	Under this method of costing, cost of each job is ascertained separately. It is suitable in all cases where work is undertaken on receiving a customer's order like a printing press, motor workshop, etc.

Contract Costing	Under this method, the cost of each contract is ascertained separately. It is suitable for firms engaged in the construction of bridges, roads, buildings etc.
Process Costing	Under this method, the cost of completing each stage of work is ascertained, like cost of making pulp and cost of making paper from pulp. In mechanical operations, the cost of each operation may be ascertained separately; the name given is operation costing.
Operating Costing	It is used in the case of concerns rendering services like transport, supply of water, retail trade etc.
Multiple Costing	It is a combination of two or more methods of costing outlined above. Suppose a firm manufactures bicycles including its components; the parts will be costed by the system of job or batch costing but the cost of assembling the bicycle will be computed by the single or output costing method. The whole system of costing is known as multiple costing.

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The following table summarises the various methods of costing applied in different industries:

Nature of Output	**Method**	**Cost**	**Examples of Industries**
A Series of Processes	Process costing or Operation Costing	For each process	Sugar

Construction of building	Contract Costing	For each contract	Real estate
Similar units of a Single Product, produced by Single Process	Unit or output or Single Costing	For the entire activity, but averaged for the output	Cold Drinks
Rendering of Services	Operating Costing	For all services	Hospitals
Customer Specifications: single Unit	Job Costing	For each order/ assignment/job	Advertising
Consisting of multiple varieties of activities and processes	Multiple Costing	Combination of any method	Car Assembly

Industries also follows Activity Based Costing which is an accounting methodology that assigns costs to activities rather than products or services. ABC is a technique which involves identification of cost with each cost driving activity and making it as the basis for apportionment of costs over different cost objects/ jobs/ products/customers or services.

Topic 5 Techniques of Costing

Question 21

Mention the cost units (physical measurements) for the following Industry/product:

(i) Automobile

(ii) Gas

(iii) Brick works

(iv) Power

(v) Steel

(vi) Transport (by road)

(vii) Chemical

(viii) Oil

(ix) Brewing

(x) Cement

(PYP Nov 22)

Answer 21

Industry or Product	Cost Units
Automobile	Number
Gas	Cubic feet
Brick works	1,000 bricks
Power	Kilo-watt hour (kWh)
Steel	Tonne
Transport (by road)	Passenger- kilometer or Tonne-kilometer
Chemical	Litre, gallon, kilogram, tonne etc.
Oil	Barrel, tonne, litre

Brewing	Barrel
Cement	Ton/ per bag etc.

Question 22

Cost and Management Accounting information is used by different stakeholders. The users of the information can be broadly categorised into internal and external to the entity.

GIVE two examples of internal users and three examples of external users and EXPLAIN how they are concerned with the Cost and Management Accounting information.

(MTP Jan 2025)

Answer 22

Internal Users

Internal users, who use the Cost and Management Accounting information may include the followings:

(a) Policy Makers- The policy makers are those who formulate strategies

(i) To achieve the goals (short & long term both) to fulfil the objectives of the organisation.

(ii) To position the organisation into the competitive market environment.

(iii) To design the organisational structure to get the policy and strategies implemented. Etc.

(b) Managers- The managers use the information

(i) To know the cost of a cost object and cost centre

(ii) To know the price for the product or service

(iii) To measure and evaluate performance of responsibility centres

(iv) To the know the profitability-product-wise, department-wise, customer-wise etc.

(v) To evaluate the strategic options and to make decisions

(c) Operational level staff- The operational level staff like supervisors, foreman, and team leaders require information

(i) To know the objectives and performance goals for them

(ii) To know product and service specifications like volume, quality and process etc.

(iii) To know the performance parameters against which their performance is measured and evaluated.

(iv) To know divisional (responsibility centre) profitability etc.

(d) Employees- Employees are concerned with the information related with time and attendance, incentives for work, performance standards etc.

External Users

External users, who use the Cost and Management Accounting information may include the followings:

(a) Regulatory Authorities- Regulatory Authorities are concerned with cost accounting data and information for different purpose which includes tariff determination, providing subsidies, rate fixation etc. To do this the regulatory bodies require information on the basis of some standards and format in this regard.

(b) Auditors- The auditors while conducting audit of financial accounts or for some other special purpose audit like cost audit etc. require information related with costing and reports reviewed by management etc.

(c) Shareholders- Shareholders are concerned with information that effect their investment in the entity. Management communicates to the shareholders through periodic communique, annual reports etc. regarding new orders received, product expansion, market share for products etc.

(d) Creditors and Lenders- Creditors and lenders are concerned with data and information which affects an entity's ability to serve lenders or creditors. For example, any financial institutions which provides loan to an entity against book debts and inventories are more concerned with regular reporting on net debt position and stock balances.

Topic 6 Cost Classification

Question 23

State the limitations of cost and management accounting.

(MTP Oct '18, RTP Nov'21)

Answer 23

Like other branches of accounting, cost and management accounting is also having certain limitations. The limitations of cost and management accounting are as follows:

1. Expensive: It is expensive because analysis, allocation and absorption of overheads require considerable amount of additional work, and hence additional money.

2. Requirement of Reconciliation: The results shown by cost accounts differ from those shown by financial accounts. Thus Preparation of reconciliation statements is necessary to verify their accuracy.

3. Duplication of Work: It involves duplication of work as organization has to maintain two sets of accounts i.e. Financial Account and Cost Account.

4. Inefficiency: Costing system itself does not control costs but its usage does.

Question 24

DISCUSS the Standard and Discretionary Cost Centres.

(MTP March'21 & Oct '23, Old & New SM)

Answer 24

(i) Standards Cost Centre: Cost Centre where output is measurable and input required for the output can be specified. Based on a well-established study, an estimate of standard units of input to produce a unit of output is set. The actual cost for inputs is compared with the standard cost. Any deviation (variance) in cost is measured and analysed into controllable and uncontrollable cost. The manager of the cost centre is supposed to comply with the standard and held responsible for adverse cost variances. The input-output ratio for a standard cost centre is clearly identifiable.

(ii) Discretionary Cost Centre: The cost center whose output cannot be measured in financial terms, thus input-output ratio cannot be defined. The cost of input is compared with allocated budget for the activity. Example of discretionary cost centers are Research & Development department, Advertisement department where output of these department cannot be measured with certainty and co-related with cost incurred on inputs.

Question 25

How do you deal with the following in cost accounts?

(i) Fringe benefits

(ii) Bad debts.

(MTP, Oct'21)

Answer 25

(i) Fringe benefits: These are the additional payments or facilities provided to the workers apart from their salary and direct cost-allowances like house rent, dearness and city compensatory allowances. These benefits are given in the form of overtime, extra shift duty allowance, holiday pay, pension facilities etc. These indirect benefits stand to improve the morale, loyalty and stability of employees towards the organization. If the amount of fringe benefit is considerably large, it may be recovered as direct charge by means of a

supplementary wage or labour rate; otherwise, these may be collected as part of production overheads.

(ii) Bad debts: There is no unanimity among different authors of Cost Accounting about the treatment of bad debts. One view is that 'bad debts' should be excluded from cost. According to this view bad debts are financial losses and therefore, they should not be included in the cost of a particular job or product. According to another view it should form part of selling and distribution overheads, especially when they arise in the normal course of trading. Therefore, bad debts should be treated in cost accounting in the same way as any other selling and distribution cost. However extra ordinarily large bad debts should not be included in cost accounts.

Question 26

DISCUSS cost classification based on variability and controllability.

(MTP Nov '21 & March '18) (RTP May '21 & May '19, Old & New SM)

Answer 26

Cost classification based on variability

(i) Fixed Costs – These are the costs which are incurred for a period, and which, within certain output and turnover limits, tend to be unaffected by fluctuations in the levels of activity (output or turnover). They do not tend to increase or decrease with the changes in output. For example, rent, insurance of factory building etc., remain the same for different levels of production.

(ii) Variable Costs – These costs tend to vary with the volume of activity. Any increase in the activity results in an increase in the variable cost and vice-versa. For example, cost of direct labour, etc.

(iii) Semi-variable Costs – These costs contain both fixed and variable components and are thus partly affected by fluctuations in the level of activity. Examples of semi variable costs are telephone bills, gas and electricity etc.

Cost classification based on controllability

(i) Controllable Costs - Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre. For example, direct costs comprising direct labour, direct material, direct expenses and some of the overheads are generally controllable by the shop level management.

(ii) Uncontrollable Costs - Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs. For example, expenditure incurred by, say, the tool room is controllable by the foreman in-charge of that section but the share of the tool-room expenditure which is apportioned to a machine shop is not to be controlled by the machine shop foreman.

Question 27

DESCRIBE Operation costing with two examples of industries where operation costing is applied.

(RTP Nov '20)

Answer 27

This product costing system is used when an entity produces more than one variant of final product using different materials but with similar conversion activities. This means conversion activity is similar for all the product variants but materials differ significantly. Operation Costing method is also known as Hybrid product costing system as materials costs are accumulated by job order or batch wise but conversion costs i.e. labour and overheads costs are accumulated by department, and process costing methods are used to assign these costs to products. Moreover, under operation costing, conversion costs are applied to products using a predetermined application rate. This predetermined rate is based on budgeted conversion costs. The two examples of industries are Ready made garments and Jeweler making.

Question 28

DEFINE Controllable Cost and Uncontrollable Cost.

(RTP Nov '18) (MTP March '19, April '23 & Sep '23)

Or

EXPLAIN the difference between controllable & uncontrollable costs?

(RTP May '22)

Answer 28

(i) Controllable Costs: - Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre. For example, direct costs comprising direct labour, direct material, direct expenses and some of the overheads are generally controllable by the shop level management.

(ii) Uncontrollable Costs - Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs. For example, expenditure incurred by, say, the tool room is controllable by the foreman in-charge of that section but the share of the tool-room expenditure which is apportioned to a machine shop is not to be controlled by the machine shop foreman.

Question 29

State the Method of Costing to be used in the following industries:

(i) Real Estate

(ii) Motor repairing workshop

(iii) Chemical Industry

(iv) Transport service

(v) Assembly of bicycles

(vi) Biscuits manufacturing Industry

(vii) Power supply Companies

(viii) Car manufacturing Industry

(ix) Cement Industry

(x) Printing Press

(PYP Nov '20)

Answer 29

Method of costing used in different industries:

S. No.	Industries	Method of Costing
(i)	Real Estate	Contract Costing
(ii)	Motor Repairing Workshop	Job Costing
(iii)	Chemical Industry	Process Costing
(iv)	Transport Service	Service/Operating Costing
(v)	Assembly of Bicycles	Unit/Single/Output/Multiple Costing
(vi)	Biscuits Manufacturing Industry	Batch Costing

(vii)	Power Supply Companies	Service/Operating Costing
(viii)	Car Manufacturing Industry	Multiple Costing
(ix)	Cement Industry	Unit/Single/Output Costing
(x)	Printing Press	Job Costing

Question 30

Briefly explain the 'techniques of costing'.

(PYP Dec '21)

Answer 30

Techniques	**Description**
Uniform Costing	When a number of firms in an industry agree among themselves to follow the same system of costing in detail, adopting common terminology for various items and processes they are said to follow a system of uniform costing. Advantages of such a system are: i. A comparison of the performance of each of the firms can be made with that of another, or with the average performance in the industry. ii. Under such a system, it is also possible to determine the cost of production of goods which is true for the industry as a whole. It is found useful when tax relief or protection is sought from the Government.

Marginal Costing	It is defined as the ascertainment of marginal cost by differentiating between fixed and variable costs. It is used to ascertain effect of changes in volume or type of output on profit.
Standard Costing and Variance Analysis	It is the name given to the technique whereby standard costs are pre-determined and subsequently compared with the recorded actual costs. It is thus a technique of cost ascertainment and cost control. This technique may be used in conjunction with any method of costing. However, it is especially suitable where the manufacturing method involves production of standardized goods of repetitive nature.
Historical Costing	It is the ascertainment of costs after they have been incurred. This type of costing has limited utility. Post Costing: It means ascertainment of cost after production is completed. Continuous costing: Cost is ascertained as soon as the job is completed or even when the job is in progress.
Absorption Costing	It is the practice of charging all costs, both variable and fixed to operations, processes or products. This differs from marginal costing where fixed costs are excluded.
Direct costing	Direct costing is a specialized form of cost analysis that only uses variable costs to make decisions. It does not consider fixed costs, which are assumed to be associated with the time periods in which they are incurred.

Important Note:-

This theory question on technique of costing was not answered well. Examinees answered different methods of costing instead of techniques. Performance of the examinees was poor.

Question 31

Define cost objects and give examples of any four cost objects.

(PYP May '23)

Answer 31

Definition of cost objects

Cost object is anything for which a separate measurement of cost is required. Cost object may be a product, a service, a project, a customer, a brand category, an activity, a department or a programme etc.

Examples of cost objects

Product	Smart phone, Tablet computer, SUV Car, Book etc.
Service	An airline flight from Delhi to Mumbai, Concurrent audit assignment, Utility bill payment facility etc.
Project	Metro Rail project, Road projects etc.
Activity	Quality inspection of materials, Placing of orders etc.
Process	Refinement of crudes in oil refineries, melting of billets or ingots in rolling mills etc.
Department	Production department, Finance & Accounts, Safety etc.

Question 32

DISCUSS cost classification based on variability and controllability?

(Study material)

Answer 32

It means the grouping of costs according to their common characteristics. The important ways of classification of costs are:

(i) By Nature or Element

(ii) By Functions

(iii) By Variability or Behaviour

(iv) By Controllability

(v) By Normality

(vi) By Costs for Managerial Decision Making

(i) By Nature or Element

Under this type of classification of cost, total cost of a cost object is classified on the basis of element of cost i.e., material, labour, other expenses and overheads.

(i)Material: Material cost means cost of raw material required to make a product into finished goods. The materials can be directly attributable to a cost object or allocable on some reasonable basis where direct attribution is not possible. Materials which are present in the finished product (cost object) or can be economically identified in the product are termed as direct materials. For example, cloth in dress making; materials purchased for a specific job etc. However, in some cases a material may be direct but it is treated as indirect; because it is used in small quantities, it is not economically feasible to identify that quantity. Those materials which are used for purposes ancillary to the business are also treated as Indirect Materials.

(ii) Labour: Wages paid to workers for converting the raw materials into finished goods, is called labour cost/ labour which can be economically identified or attributed wholly to a cost object is termed as direct labour. For example, employee engaged on the actual production of the product or in carrying out the necessary operations for converting the raw materials into finished product.

(iii) Other Expenses: All expenses other than material or labour which are incurred for a particular cost object are termed as other Expenses. For example, hire charges for some special machinery, cost of defective work etc.

(iv) Overheads: The aggregate of indirect material costs, indirect labour costs and indirect expenses is termed as Overheads. The main groups into which overheads may be subdivided are as follows:

- **Production or Works Overheads:** Indirect expenses which are incurred in the factory and for the running of the factory. E.g.: rent, power etc.

- **Administration Overheads:** Indirect expenses related to management and administration of business. E.g.: office rent, lighting, telephone etc.

- **Selling Overheads:** Indirect expenses incurred for marketing of a commodity. E.g.: Advertisement expenses, commission to sales persons etc.

- **Distribution Overheads:** Indirect expenses incurred for dispatch of the goods E.g.: warehouse charges, packing (secondary) and loading charges.

By Functions

Under this classification, costs are divided according to the function for which they have been incurred. It includes the following:

(i) Production/ Manufacturing Cost

(ii) Administration Cost

(iii) Selling Cost

(iv) Distribution Cost

(v) Research and Development cost etc.

By Variability or Behaviour

Based on this classification, costs are classified into three groups viz., fixed, variable and semi-variable.

(a) Fixed costs– These are the costs which are incurred for a period, and which, within certain output and turnover limits, tend to be unaffected by fluctuations in the levels of activity (output or turnover). They do not tend to increase or decrease with the changes in output. For example, rent, insurance of factory building etc., remain the same for different levels of production.

(b) Variable Costs– These costs tend to vary with the volume of activity. Any increase in the activity results in an increase in the variable cost and vice versa.

For example, cost of direct material, cost of direct labour, etc.

(c) Semi-variable costs– These costs contain both fixed and variable components and are thus partly affected by fluctuations in the level of activity. Examples of semi variable costs are telephone bills, gas and electricity etc.

Methods of segregating Semi-variable costs into fixed and variable costs

The segregation of semi-variable costs into fixed and variable costs can be carried

out by using the following methods:

(a) Graphical method

(b) High-Low method

(c) Analytical method

(d) Comparison by period or level of activity method

(e) Least squares method

(a) Graphical Method: Under this method, the following steps are followed:

(i) A large number of observations regarding the total costs at different levels of output are plotted on a graph.

(ii) The output is plotted on the X-axis and the total cost is plotted on the Y-axis.

(iii) Then, by judgment, a line of "best-fit", which passes through all or most of the points, is drawn.

(iv) The point at which this line cuts the Y-axis indicates the total fixed cost component in the total cost.

(v) If a line is drawn at this point parallel to the X-axis, this indicates the fixed cost.

(vi) The variable cost, at any level of output, is derived by deducting this fixed cost element from the total cost.

(b) High- Low Method: Under this method, difference between the total cost at highest and lowest volume is divided by the difference between the sales value at the highest and lowest volume. The quotient thus obtained gives us the rate of variable cost in relation to sales value.

(c) Analytical Method: Under this method an experienced cost accountant tries to judge empirically what proportion of the semi-variable cost would be variable and what would be fixed. The degree of variability is ascertained for each item of semi-variable expenses. For example, some semi-variable expenses may vary to the extent of 20% while others may vary to the extent of 80%. Although it is very difficult to estimate the extent of variability of an expense, the method is easy to apply.

(d) Comparison by period or level of activity method: Under this method, the variable overhead may be determined by comparing two levels of output with the amount of expenses at those levels.

(e) Least Square Method: This is the best method to segregate semi-variable costs into its fixed and variable components. This is a statistical method and is based on finding out a line of best fit for a number of observations.

The method uses the linear equation y = mx + c, where

'm' represents the variable element of cost per unit,

'c' represents the total fixed cost,

'y' represents the total cost,

'x' represents the volume of output.

The total cost is thus split into its fixed and variable elements by solving this equation.

By Controllability

Costs here may be classified into controllable and uncontrollable costs.

(a) Controllable Costs: - Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility canter can be influenced by the action of the manager heading that responsibility centre. For example, direct costs comprising direct labour, direct material, direct expenses and some of the overheads are generally controllable by the shop floor supervisor or the factory manager.

(b) Uncontrollable Costs - Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs. For example, expenditure incurred by say, the tool room is controllable by the foreman in-charge of that section but the share of the tool-room expenditure which is apportioned to a machine shop is not controlled by the machine shop foreman.

Distinction between Controllable Cost and Uncontrollable Cost: The distinction between controllable and uncontrollable costs is not very prominent and is sometimes left to individual judgment. In fact, no cost is uncontrollable; it is only in relation to a particular individual that we may specify a particular cost to be either controllable or uncontrollable.

Question 33

Cost control emphasis is on past and present, while cost reduction emphasis is on present and future. DISCUSS some more differences between Cost control and Cost reduction.

(MTP May 2025)

Answer 33

Cost Control	Cost Reduction
1. Cost control aims at maintaining the costs in accordance with the established standards.	1. Cost reduction is concerned with reducing costs. It challenges all standards and endeavours to improvise them continuously
2. Cost control seeks to attain lowest possible cost under existing conditions.	2. Cost reduction recognises no condition as permanent, since a change will result in lower cost.
3. Cost control is a preventive function.	3. Cost reduction is a corrective function. It operates even when an efficient cost control system exists.
4. Cost control ends when targets are achieved.	4. Cost reduction has no visible end and is a continuous process.

Question 34

Process Costing method is suitable for

(a) Transport sector

(b) Chemical industries

(c) Dam construction

(d) Furniture making

(Study material)

Ans: (b) Chemical industries

Reason:

Process Costing is a costing method used where production is continuous, and units are homogeneous — meaning all units are similar and go through the same processes.

Chemical industries are the best example of this, as they:

- Produce identical units (e.g., paint, petrol, acid),
- Use continuous and standardized processes,
- Accumulate costs by process or department, not by individual unit.

Question 35

A taxi provider charges minimum Rs.80 thereafter Rs.12 per kilometer of distance travelled, the behaviour of conveyance cost is:

(a) Fixed Cost

(b) Semi-variable Cost

(c) Variable Cost

(d) Administrative cost.

(Study material)

Ans: (b) Semi-variable Cost

Reason:

The taxi fare has two components:

1. Fixed Component: Rs.80 minimum charge — this remains constant regardless of how many kilometres are travelled (up to a point).

2. Variable Component: Rs.12 per kilometre — this increases with distance travelled.

Since the total cost includes both fixed and variable elements, it is classified as a semi-variable cost (also called mixed cost). These costs remain fixed up to a certain level and vary thereafter with the level of activity.

Topic 7 Responsibility Centres

Question 36

Mention and explain types of responsibility centers.

(PYP Nov '18)

Answer 36

There are four types of responsibility centres:

(i) Cost Centres: The responsibility centre which is held accountable for incurrence of costs which are under its control. The performance of this responsibility centre is measured against pre- determined standards or budgets. The cost centres are of two types:

(a) Standard Cost Centre and (b) Discretionary Cost Centre

(ii) Revenue Centres: The responsibility centres which are accountable for generation of revenue for the entity. Sales Department for example, is the responsible for achievement of sales target and revenue generation. Though, revenue centres does not have control on the

all expenditures it incurs but some time expenditures related with selling activities like commission to sales person etc. are incurred by revenue centres.

(iii) Profit Centres: These are the responsibility centres which have both responsibility of generation of revenue and incurrence of expenditures. Since, managers of profit centres are accountable for both costs as well as revenue, profitability is the basis for measurement of performance of these responsibility centres. Examples of profit centres are decentralised branches of an organisation.

(iv) Investment Centres: These are the responsibility centres which are not only responsible for profitability but also has the authority to make capital investment decisions. The performance of these responsibility centres is measured based on Return on Investment (ROI) besides profit.

Important Note:-

This was a theoretical question on responsibility centres. Below average performance was observed.

Topic 8 Management Accounting vs Cost Accounting

Question 37

DISCUSS short notes on (i) Discretionary Cost Centre and (ii) Investment Centre.

(RTP Nov 20 & May '18)

Answer 37

(i) Discretionary Cost Centre: The cost centre whose output cannot be measured in financial terms, thus input-output ratio cannot be defined. The cost of input is compared with allocated budget for the activity. Example of discretionary cost centres are Research & Development department, Advertisement department where output of these department cannot be measured with certainty and co-related with cost incurred on inputs.

(ii) Investment Centres: These are the responsibility centres which are not only responsible for profitability but also has the authority to make capital investment decisions. The performance of these responsibility centres are measured on the basis of Return on Investment (ROI) besides profit. Examples of investment centres are Maharatna, Navratna and Miniratna companies of Public Sector Undertakings of Central Government.

Question 38

DISCUSS the essential features of a good cost accounting system?

(Study material)

Answer 38

ESSENTIALS OF A GOOD COST ACCOUNTING SYSTEM

The essential features, which a good Cost Accounting System should possess, are as follows:

(a) Informative and simple: Cost accounting system should be tailor-made, practical, simple and capable of meeting the requirements of a business concern. The system of costing should not sacrifice the utility by introducing inaccurate and unnecessary details.

(b) Accurate and authentic: The data to be used by the cost accounting system should be accurate and authenticated; otherwise it may distort the output of the system and a wrong decision may be taken.

(c) Uniformity and consistency: There should be uniformity and consistency in classification, treatment and reporting of cost data and related information. This is required for benchmarking and comparability of the results of the system for both horizontal and vertical analysis.

(d) Integrated and inclusive: The cost accounting system should be integrated with other systems like financial accounting, taxation, statistics and operational research etc. to have a complete overview and clarity in results.

(e) Flexible and adaptive: The cost accounting system should be flexible enough to make necessary amendment and modifications in the system to incorporate changes in technological, reporting, regulatory and other requirements.

(f) Trust on the system: Management should have trust on the system and its output. For this, an active role of management is required for the development of such a system that reflects a strong conviction in using information for decision making.

Question 39

Though Cost Accounting and Management Accounting are used synonymously, but there are a few differences. ENUMERATE any five differences.

(RTP Sep. 2025)

Answer 39

Difference between Cost Accounting and Management Accounting

	Basis	**Cost Accounting**	**Management Accounting**
(i)	Nature	It records the quantitative aspect only.	It records both qualitative and quantitative aspect.
(ii)	Objective	It records the cost of producing a product and providing a service.	It provides information to management for planning and co-ordination.
(iii)	Area	It only deals with cost Ascertainment.	It is wider in scope as it includes financial accounting, budgeting, taxation, planning etc.

Achieving Excellence Together

(iv)	Recording of data	It uses both past and present figures.	It is focused with the projection of figures for future.
(v)	Development	Its development is related to industrial revolution.	Its development is related to the need of modern business world.
(vi)	Rules and Regulation	It follows certain principles and procedures for recording costs of different products.	It does not follow any specific rules and regulations.

Topic 9 Features of Good Cost Accounting System

Question 40

Discuss the essential features of a good cost accounting system.

(MTP Oct '19, Old & New SM)

Answer 40

The essential features, which a good cost accounting system should possess, are as follows:

(a) Informative and simple: Cost accounting system should be tailor-made, practical, simple and capable of meeting the requirements of a business concern. The system of costing should not sacrifice the utility by introducing inaccurate and unnecessary details.

(b) Accurate and authentic: The data to be used by the cost accounting system should be accurate and authenticated; otherwise it may distort the output of the system and a wrong decision may be taken.

(c) Uniformity and consistency: There should be uniformity and consistency in classification, treatment and reporting of cost data and related information. This is required for

benchmarking and comparability of the results of the system for both horizontal and vertical analysis.

(d) Integrated and inclusive: The cost accounting system should be integrated with other systems like financial accounting, taxation, statistics and operational research etc. to have a complete overview and clarity in results.

(e) Flexible and adaptive: The cost accounting system should be flexible enough to make necessary amendment and modifications in the system to incorporate changes in technological, reporting, regulatory and other requirements.

(f) Trust on the system: Management should have trust on the system and its output. For this, an active role of management is required for the development of such a system that reflects a strong conviction in using information for decision making.

Question 41

STATE the method of costing for the following industries:

(i) Sugar manufacturing

(ii) Bridge Construction

(iii) Advertising

(iv) Car Assembly

(MTP April '22)

Answer 41

S. No.	Industry	Method of costing
(i)	Sugar manufacturing	Process costing

(ii)	Bridge Construction	Contract Costing
(iii)	Advertising	Job costing

Question 42

Specify the types of Responsibility centres under the following situations:

(i) Purchase of bonds, stocks, or real estate property.

(ii) Ticket counter in a Railway station.

(iii) Decentralized branches of an organization.

(iv) Maharana, Navratna and Miniratna public sector undertaking (PSU) of Central Government.

(v) Sales Department of an organization.

(PYP July 21)

Answer 42

Particulars	**Types of Responsibility Centre**
(i) Purchase of bonds, stocks, or real estate property.	Investment Centre
(ii) Ticket counter in a Railway station.	Revenue Centre
(iii) Decentralized branches of an organization.	Profit Centre
(iv) Maharatna, Navratna and Miniratna public sector undertaking (PSU) of Central Government.	Investment Centre

(v) Sales Department of an organization.	Revenue Centre

Important Note:-

It was a theoretical question requiring examinees to specify the type of responsibility centre for the given five statements. Majority of the examinees failed to give clear responses to the statements. Performance of the examinees was below average.

Question 43

Explain: Opportunity cost

(PYP May '18)

Answer 43

Opportunity Cost - This cost refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action. For example, a firm financing its expansion plan by withdrawing money from its bank deposits. In such a case the loss of interest on the bank deposit is the opportunity cost for carrying out the expansion plan.

Question 44

DESCRIBE the factors which are to be considered before installing a system of cost accounting?

(Study material)

Answer 44

As in the case of every other form of activity, it should be considered whether it would be profitable to have a Cost Accounting System. Management of an organisation needs complete and accurate information to make decisions. A well-established costing system should provide

all relevant information as and when required by management as well as various stakeholders.

Before setting up a system of cost accounting the factors mentioned below should be studied:

(a) Objective: The objective of setting up the costing system, for example whether it is being introduced for fixing prices or for establishing a system of cost control.

(b) Nature of Business or Industry: The industry in which the business is operating. Every business or industry has its own uniqueness and objectives. According to its cost information requirement, cost accounting methods are followed. For example, an oil refinery maintains process wise cost accounts to find out the cost incurred on a particular process, say in crude refinement process etc.

(c) Organisational Hierarchy: Costing system should fulfil the information requirements of different levels of management. Top management is concerned with the corporate strategy, strategic level management is concerned with marketing strategy, product diversification, product pricing etc. Operational level management needs the information on standard quantity to be consumed, report on idle time etc.

(d) Knowing the product: Nature of the product determines the type of costing system to be implemented. The product which has by-products requires costing system which accounts for by-products as well. In case of perishable or short self- life products, marginal costing is appropriate to know the contribution and minimum price at which products could be sold.

(e) Knowing the production process: A good costing system can never be established without the complete knowledge of the production process. Cost apportionment can be done on the most appropriate and scientific basis if a cost accountant can identify degree of effort or resources consumed in a particular process. This also includes some basic technical know-how and process peculiarity.

(f) Information synchronisation: Establishment of a department or a system requires substantial amount of organisational resources. While drafting a costing system, information needs of various other departments should be taken into account. For example, in a typical

business organisation accounts department needs to submit monthly stock statement to its lender bank, quantity wise stock details at the time of filing returns to tax authorities etc.

(g) Method of maintenance of cost records: The organization must determine beforehand the manner in which Cost and Financial Accounts could be inter-locked into a single integral accounting system and how the results of separate sets of accounts i.e. cost and financial, could be reconciled by means of control accounts.

(h) Statutory compliances and audit: Records are to be maintained to comply with statutory requirements and applicable cost accounting standards should be followed.

(i) Information Attributes: Information generated from the Costing system should possess all the attributes of useful information i.e. it should be complete, accurate, timely, relevant. To have an effective management information system (MIS).

Topic 10 Advantages & Limitations of Cost Accounting

Question 45

DEFINE cost units? WRITE the cost unit basis against each of the following Industry/Product-

Automobile, Steel, Cement, Chemicals, Power and Transport.

(March ’23)(RTP Nov ’22)

Answer 45

Cost units are usually the units of physical measurement like number, weight, area, volume, length, time and value.

Industry or Product	Cost Unit Basis
Automobile	Number

Steel	Ton
Cement	Ton/ per bag etc.
Chemicals	Litre, gallon, kilogram, ton etc.
Power	Kilo-watt hour (kWh)
Transport	Passenger- kilometer

Topic 11 Integration of IT in Cost Accounting

MCQ

Question 46

The advantage of using IT in Cost Accounting does not include:

(a) Integration of various functions

(b) Stock needs to be reconciled with Goods Received Note

(c) Reduction in multicity of documents

(d) Customized reports can be prepared.

(Study material)

Ans: (b) Stock needs to be reconciled with Goods Received Note

Reason:

The question asks for what is not an advantage of using Information Technology (IT) in cost accounting.

(b) Stock needs to be reconciled with Goods Received Note –Not an advantage, but rather a manual or routine control activity that still needs to be done, even with IT systems. IT can assist in making it easier, but the need for reconciliation still exists and is not eliminated.

Topic 12 Types of Industries & Suitable Cost Units

Question 47

SUGGEST the unit of cost for following industries:

(a) Transport

(b) Power

(c) Hotel

(d) Hospital

(e) Steel

(f) Coal mining

(g) Professional Services

(h) Gas

(i) Engineering

(j) Oil

(RTP May 23)

Answer 47

Cost units are as follows:

Industry or Product	Cost Unit Basis
Transport	Passenger- kilometer
Power	Kilo-watt hour (kWh)
Hotel	Room
Hospitals	Patient day
Steel	Ton
Coal mining	Tonne/ton
Professional services	Chargeable hour, job, contract
Gas	Cubic feet
Engineering	Contract, job
Oil	Barrel, tonne, litre

Question 48

Mention the Cost Unit of the following Industries:

(i) Electricity

(ii) Automobile

(iii) Cement

(iv) Steel

(v) Gas

(vi) Brick Making

(vii) Coal Mining

(viii) Engineering

(ix) Professional Services

(PYP Nov'19)

Answer 48

Cost Unit of Industries:

S. No.	Industry	Cost Unit Basis
(i)	Electricity	Kilowatt-hour (kWh)
(ii)	Automobile	Number
(iii)	Cement	Ton/ per bag etc.
(iv)	Steel	Ton
(v)	Gas	Cubic feet
(vi)	Brick-making	1,000 bricks
(vii)	Coal mining	Tonne/ton
(viii)	Engineering	Contract, job

(ix)	Professional services	Chargeable hour, job, contract
(x)	Hospitals	Patient day

Important Note:-

This was a theoretical question based on cost unit in industries. Performance of the examinees was Average.

Chapter 2

Material Cost

Topic 1 Definition & Objectives of Inventory Control

Question 1

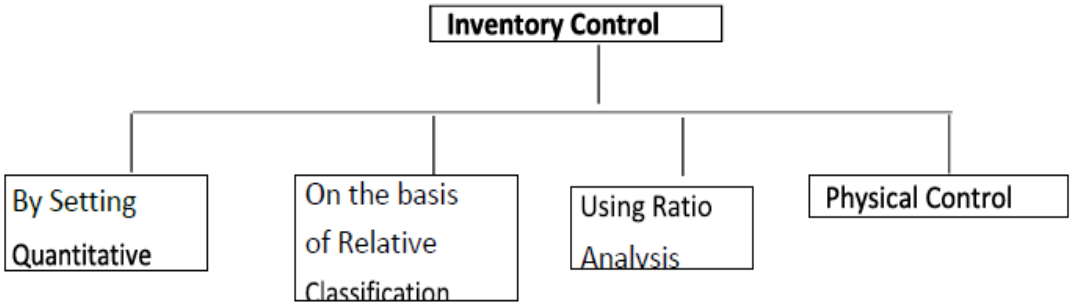
Define Inventory Control and give its objectives. List down the basis to be adopted for Inventory Control.

(PYP Nov'19)

Answer 1

Inventory Control: The Chartered Institute of Management Accountants (CIMA) defines Inventory Control as "The function of ensuring that sufficient goods are retained in stock to meet all requirements without carrying unnecessarily large stocks."

The objective of inventory control is to make a balance between sufficient stock and over - stock. The stock maintained should be sufficient to meet the production requirements so that uninterrupted production flow can be maintained. Insufficient stock not only pause the production but also cause a loss of revenue and goodwill. On the other hand, Inventory requires some funds for purchase, storage, maintenance of materials with a risk of obsolescence, pilferage etc. A trade-off between Stock-out and Over-stocking is required. The management may employ various methods of Inventory control to have a balance. Management may adopt the following basis for Inventory control:



Important Note:-

This was a numerical question relating to the topic 'Material cost' to calculate EOQ and Total Inventory cost. Performance of the examinees was good.

Topic 2 Bin Cards vs Stores Ledger

Question 2

DISTINGUISH clearly between Bin cards and Stores Ledger.

(MTP March '22 & March'23, Old & New SM)

Answer 2

Difference between Bin Card & Stores Ledger

Bin Card	Stores Ledger
It is maintained by the storekeeper in the store.	It is maintained in cost accounting department.

It contains only quantitative details of material received, issued and returned to stores.	It contains information both in quantity and value.
Entries are made when transaction takes place.	It is always posted after the transaction.
Each transaction is individually posted.	Transactions may be summarized and then posted.
Inter-department transfers do not appear in Bin Card.	Material tansfers from one job to another job are recorded for costing purposes.

Question 3 A manufacturing company maintains both a Bin Card and a Stores Ledger. In the event of a mismatch between the quantities shown in both, what are the possible reasons for such discrepancies, and how can they be rectified?

(Study material)

Answer 3

Bin Card	Stores Ledger
It is maintained by the storekeeper in the store.	It is maintained in cost accounting department.
It contains only quantitative details of material received, issued and returned to stores.	It contains information both in quantity and value.
Entries are made when transaction takes place.	It is always posted after the transaction.

Each transaction is individually posted.	Transactions may be summarized and then posted.
Inter-department transfers do not appear in Bin Card.	Material transfers from one job to another job are recorded for costing purposes.

Topic 3 Bill of Materials

Question 4

What is Bill of Material? Describe the uses of Bill of Material in following departments:

(i) Purchases Department

(ii) Production Department

(iii) Stores Department

(iv) Cost/Accounting Department

(PYP Dec '21)

Answer 4

Bill of Material: It is a detailed list specifying the standard quantities and qualities of materials and components required for producing a product or carrying out of any job.

Uses of Bill of Material in different department:

Purchase Department	Production Department	Stores Department	Cost/ Accounting Department
Materials are procured	Production is planned according to the nature,	It is used as a reference document	It is used to estimate cost and profit. Any

(purchased) on the basis of specifications mentioned in it.	volume of the materials required to be used. Accordingly, material requisition lists are prepared.	while issuing materials to the requisitioning department.	purchase, issue and usage are compared/ verified against this document.

Important Note:-

This theory question on Bill of Material was not answered in the correct line. Most of the students had written the concept of invoicing of material instead of bill of material. Performance of the examinees was poor.

Question 5

Distinguish between Bill of Materials and Material Requisition Note.

(MTP Oct. '19, Oct'20)

Answer 5

	Bills of Material	**Material Requisition Note**
1.	It is document or list of materials prepared by the engineering/ drawing department.	It is prepared by the foreman of the consuming department.
2.	It is a complete schedule of component parts and raw materials required for a particular job or work order.	It is a document authorizing Store-Keeper to issue material to the consuming department
3.	It often serves the purpose of a Store Requisition as it shows the complete schedule of materials required for a	It cannot replace a bill of material.

	particular job i.e. it can replace stores requisition.	
4.	It can be used for the purpose of quotation.	It is useful in arriving historical cost only.
5.	It helps in keeping a quantitative control on materials drawn through Stores Requisition.	It shows the material actually drawn from stores.

Topic 4 Material Requisition Note

Question 6

Distinguish between Bill of Materials and Material Requisition Note.

(MTP Oct. '19, Oct'20)

Answer 6

	Bills of Material	**Material Requisition Note**
1.	It is document or list of materials prepared by the engineering/ drawing department.	It is prepared by the foreman of the consuming department.
2.	It is a complete schedule of component parts and raw materials required for a particular job or work order.	It is a document authorizing Store-Keeper to issue material to the consuming department
3.	It often serves the purpose of a Store Requisition as it shows the complete schedule of materials required for a	It cannot replace a bill of material.

	particular job i.e. it can replace stores requisition.	
4.	It can be used for the purpose of quotation.	It is useful in arriving historical cost only.
5.	It helps in keeping a quantitative control on materials drawn through Stores Requisition.	It shows the material actually drawn from stores.

Topic 5 Uses of Bill of Materials in different departments

Question 7

What is Bill of Material? Describe the uses of Bill of Material in following departments:

(i) Purchases Department

(ii) Production Department

(iii) Stores Department

(iv) Cost/Accounting Department

(PYP Dec '21)

Answer 7

Bill of Material: It is a detailed list specifying the standard quantities and qualities of materials and components required for producing a product or carrying out of any job.

Uses of Bill of Material in different department:

Purchase Department	Production Department	Stores Department	Cost/ Accounting Department
Materials are procured (purchased) on the basis of specifications mentioned in it.	Production is planned according to the nature, volume of the materials required to be used. Accordingly, material requisition lists are prepared.	It is used as a reference document while issuing materials to the requisitioning department.	It is used to estimate cost and profit. Any purchase, issue and usage are compared/ verified against this document.

Important Note:-

This theory question on Bill of Material was not answered in the correct line. Most of the students had written the concept of invoicing of material instead of bill of material. Performance of the examinees was poor.

Topic 6 EOQ – Concept & Formula

(Theory part only – refer study material)

Topic 7 EOQ – Numerical Problems

Question 8

A store keeper has prepared the below list of items kept in the store of the factory.

Item	Units	Unit cost (Rs.)

A	12,000	30.00
B	18,000	3.00
C	6,000	35.00
D	750	220.00
E	3,800	75.00
F	400	105.00
G	600	300.00
H	300	350.00
I	3,000	250.00
J	20,000	7.50
K	11,500	27.50
L	2,100	75.00

The store keeper requires your help to classify the items for prioritization. You are required to APPLY ABC analysis to classify the store items as follows:

Store items which constitutes approx. 70%, 20% and 10% of total value as A, B and C respectively.

(MTP March '18)

Answer 8

Statement of Total Cost and Ranking

Item	Units	% of Total units	Unit cost (Rs.)	Total cost (Rs.)	% of Total cost	Ranking
A	12,000	15.30%	30.00	3,60,000	12.97%	2
B	18,000	22.94%	3.00	54,000	1.95%	11
C	6,000	7.65%	35.00	2,10,000	7.57%	5
D	750	0.96%	220.00	1,65,000	5.95%	7
E	3,800	4.84%	75.00	2,85,000	10.27%	4
F	400	0.51%	105.00	42,000	1.51%	12
G	600	0.76%	300.00	1,80,000	6.49%	6
H	300	0.38%	350.00	1,05,000	3.78%	10
I	3,000	3.82%	250.00	7,50,000	27.03%	1
J	20,000	25.49%	7.50	1,50,000	5.41%	9
K	11,500	14.66%	27.50	3,16,250	11.40%	3
L	2,100	2.68%	75.00	1,57,500	5.68%	8
	78,450	100.00%		27,74,750	100.00%	

Statement of classification of Inventory

Ranking	Item	% of Total units	Cost (Rs.)	% of Total Cost	Category
1	I	3.82%	7,50,000	27.03%	
2	A	15.30%	3,60,000	12.97%	
3	K	14.66%	3,16,250	11.40%	
4	E	4.84%	2,85,000	10.27%	
5	C	7.65%	2,10,000	7.57%	
Total		**46.27%**	**19,21,250**	**69.24%**	**A**
6	G	0.76%	1,80,000	6.49%	
7	D	0.96%	1,65,000	5.95%	
8	L	2.68%	1,57,500	5.68%	
9	J	25.49%	1,50,000	5.41%	
Total		**29.89%**	**6,52,500**	**23.53%**	**B**
10	H	0.38%	1,05,000	3.78%	
11	B	22.94%	54,000	1.95%	
12	F	0.51%	42,000	1.51%	
Total		**23.84%**	**2,01,000**	**7.24**	**C**

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	12	100%	27,74,750	100%	

Question 9

The annual demand for an item of raw material is 4,000 units and the purchase price is expected to be Rs. 90 per unit. The incremental cost of processing an order is Rs. 135 and the annual cost of storage is estimated to be Rs. 12 per unit. COMPUTE the optimal order quantity and total relevant cost of this order quantity? Suppose that Rs. 135 as estimated to be the incremental cost of processing an order is incorrect and should have been Rs. 80. All other estimates are correct.

ESTIMATE the difference in cost on account of this error? Assume at the commencement of the period that a supplier offers 4,000 units at a price of Rs. 86. The materials will be delivered immediately and placed in the stores. Assume that the incremental cost of placing the order is zero and original estimate of Rs. 135 for placing an order for the economic batch is correct. ANALYSE, should the order be accepted?

(MTP Aug '18)

Answer 9

(i) Optimal order quantity i.e. E.O.Q. = $\sqrt{\frac{2\times4,000\times135}{12}}$ $=\sqrt{90,000}$ =300 units

Relevant Cost of this order quantity	Rs.
Ordering Cost = $\frac{4,000}{300}$ =13.33 say 14 orders at Rs.135	1,890
Carrying Cost = $\frac{1}{2}$ × 300 × 12	1,800
Relevant cost	3,690

(ii) Revised EOQ = $\sqrt{\frac{2\times4,000\times80}{12}}$ = 231 units

Ordering Cost = $\frac{4,000}{231}$ =17.32 say 18 orders at Rs. 80	1,440
Carrying Cost = $\frac{1}{2}$ × 231 × 12	1,386

Different in cost on account of this error = 3,690 – 2,826 = Rs. 864

(iii) In case of discount in purchase price, the total cost of Purchase cost, ordering cost and carrying cost should be compared.

Original offer at Rs. 90 per unit	**Rs.**	**Supplier offered at Rs. 86 per unit**	**Rs.**
Purchase Cost	3,60,000	Purchase cost 4,000 × 86	3,44,000
Ordering cost	1,890	Ordering cost	Nil
Carrying cost	1,800	Carrying cost 1/2 ×4,000 × 12	24,000
Total cost	3,63,690		3,68,000

This special offer at Rs. 86 per unit should not be accepted as its total cost is higher by Rs. 4,310 (3, 68,000 – 3, 63,690).as compared to original offer.

Question 10

Joy Toy Limited deals in trading of 'superhero' toy figure. The annual demand for the toy car is 14,400 units. The company incurs fixed order placement and transportation cost of

Rs.212 each time an order is placed. Each toy costs Rs. 450 and the trader has a carrying cost of 25 percent p.a. The company has been offered a quantity discount of 8% on the purchase of 'superhero' toy figure provided the order size is 5,000 units at a time.

Required:

(i) COMPUTE the economic order quantity

(ii) STATE whether the quantity discount offer can be accepted.

(MTP March '23 & Oct 20, Old & New SM)

Answer 10

i. Calculation of Economic Order Quantity (EOQ) = $\sqrt{\frac{2AO}{C}}$

= $\sqrt{\frac{2 \times 14{,}400 \text{ units Rs.}212}{\text{Rs.}450 \times 25\%}}$ = 233 units

ii. Evaluation of Profitability of Different Options of Order Quantity

(A)	When EOQ is ordered	(Rs.)
Purchase Cost	(14,400 units x Rs.450)	64,80,000
Ordering Cost	[(14,400 units/233 units) x Rs.212]	13,102
Carrying Cost	(233 units x 1/2 x 450 x 25%)	13,106
Total Cost		65,06,208

(B) When Quantity Discount of 8% is accepted

		(Rs.)
Purchase Cost	(14,400 units x Rs.414)	59,61,600
Ordering Cost	[(14,400 units/5,000 units) x Rs212]	611
Carrying Cost	(5,000 units x 1/2 x Rs.414 x 25%)	2,58,750
Total Cost		62,20,961

Advise – The total cost of inventory is lower if quantity discount is accepted. The company would save Rs.2, 85,247 (Rs.65, 06,208 - Rs.62, 20,961).

Note: Figures may change slightly because of approximation and decimals)

Question 11

EXPLAIN the advantages that would accrue in using the LIFO method of pricing for the valuation of raw material stock.

(MTP April'21)

Answer 11

The advantages that would accrue in using the LIFO method of pricing for the valuation of raw material stock are as follows:

• The cost of materials issued will be either nearer to and or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues.

• The use of the method during the period of rising prices does not reflect undue high profit in the income statement as it was under the first-in-first-out or average method. In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.

• In the case of falling prices profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.

• Over a period, the use of LIFO helps to iron out the fluctuations in profits.

• In the period of inflation LIFO will tend to show the correct profit and thus avoid paying undue taxes to some extent.

Question 12

The annual demand for an item of raw material is 48,000 units and the purchase price is Rs. 80 per unit. The cost of processing an order is Rs. 1,350 and the annual cost of storage is Rs. 15 per unit.

(i) DETERMINE is the optimal order quantity and total relevant cost for the order?

(ii) If the cost of processing an order is Rs. 800 and all other data remain same, then DETERMINE the differential cost?

(iii) If the supplier offers bulk purchase of 48,000 units at a price of Rs. 72 and cost of placing the is Nil, SHOULD the order be accepted?

(MTP Nov '21)

Answer 12

(i) Optimal order quantity i.e. E.O.Q.

$= \sqrt{\frac{2\times 48,000\times 1,350}{15}} = \sqrt{86,40,000}$ = 2, 939 units

Relevant Cost of this order quantity	Rs.
Ordering cost = 48,000 / 2,939 =16.33, say 17 orders at Rs.1,350	22,950.00
Carrying Cost = 1/2 × 2, 939 × 15	22,042.50
Relevant cost	**44,992.50**

(ii) Revised EOQ = $\sqrt{\frac{2\times48,000\times800}{15}}$ = 2,263 units

Relevant Cost of this order quantity	Rs.
Ordering cost =48,000 / 2,2,63 21.21, say 22 orders at Rs. 800	17,600.00
Carrying cost = 1/2 × 2,263 × 15	16,972.50
Relevant cost	**34,572.50**

Differential cost = 44,992.50 – 34,572.50 = **Rs. 10,420**

(iii) In case of discount in purchase price, the total cost of Purchase cost, ordering cost and carrying cost should be compared.

Original offer at Rs. 80 per unit		**Supplier offered at Rs. 72 per unit**	
	Rs.		**Rs.**
Purchase Cost (48,000 × 80)	38,40,000.00	Purchase cost (48,000 × 72)	34,56,000.00

Ordering cost	22,950.00	Ordering cost	0.00
Carrying cost	22,042.50	Carrying cost½ × 48, 000 ×15	3,60,000.00
Total cost	38,84,992.50		38,16,000.00

This special offer at Rs. 72 per unit should be accepted as it saves Rs. 68,992.50 as compared to original offer.

Question 13

A company uses four raw materials A, B, C and D for a particular product for which the following data apply :–

Raw Material	Usage per unit of product (Kg.)	Re-order Quantity (Kg.)	Price per Kg. (Rs.)	Delivery period (in weeks)			Reorder level (Kg.)	Minimum Level (Kg.)
				Minimum	Average	Maximum		
A	12	12,000	12	2	3	4	60,000	?
B	8	8,000	22	5	6	7	70,000	?
C	6	10,000	18	3	5	7	?	25,500
D	5	9,000	20	1	2	3	?	?

Weekly production varies from 550 to 1,250 units, averaging 900 units of the said product. What would be the following quantities:–

(i) Minimum Stock of A?

(ii) Maximum Stock of B?

(iii) Re-order level of C?

(iv) Average stock level of A?

(v) Re-order level of D?

(vi) Minimum Stock level of D?

(RTP Nov '20) (Same concept different figures MTP April '21, Old & New SM)

Answer 13

(i) Minimum stock of A

Re-order level – (Average consumption × Average time required to obtain delivery)

= 60,000 kg. – (900units × 12 kg. × 3 weeks) = 27,600 kg.

(ii) Maximum stock of B

Re-order level + Re-order quantity– (Min. Consumption × Min. Re-order period)

= 70,000 kg.+ 8,000 kg– (550units ×8 kg.× 5 weeks).

=78,000–22,000 = 56,000 kg.

(iii) Re-order level of C

Maximum re-order period × Maximum Usage

= 7 weeks × (1,250units × 6 kg.) = 52,500 kg.

OR

= Minimum stock of C+(Average consumption × Average delivery time)

= 25,500 kg. + [(900 units ×6 kg.)×5 weeks] =52,500 kg.

(iv) Average stock level of A

$= \frac{\text{Minimum Stock+Maximum}}{\text{Stock 2}}$ (Refer to Working Note)

$= \frac{27,600+58,800}{2}$ = 43,200 kg.

Working note

Maximum stock of A = ROL + ROQ – (Minimum consumption × Minimum re-order period)

= 60,000 kg. + 12,000 kg. – [(550units × 12 kg.) × 2 weeks] = 58,800 kg.

(v) Re-order level of D

Maximum re-order period × Maximum Usage

= 3 weeks × (1,250 unit's × 5 kg.) = 18,750 kg

(vi) Minimum stock of D

Re-order level – (Average consumption × Average time required to obtain delivery)

= 18,750 kg. – (900units × 5 kg. × 2 weeks) = 9,750 kg.

Question 14

Surekha Limited Produces 4000 Litres of paints on a quarterly basis. Each Litre requires 2 kg of raw material. The cost of placing one order for raw material is Rs. 40 and the purchasing price of raw material is Rs. 50 per kg. The storage cost and interest cost is 2% and 6% per annum respectively.

The lead time for procurement of raw material is 15 days. Calculate Economic Order Quantity and Total Annual Inventory Cost in respect of the above raw material.

(PYP Nov'19)

Answer 14

Working:

Calculation of Annual demand of raw material

= 4,000 Litres (per quarter) x 4 (No. of Quarter in a year) x 2 kg. (Raw material required for each Litre of paint) = 32,000 kg.

Calculation of Carrying cost

Storage rate = 2%

Interest Rate = 6%

Total = 8% per annum

Carrying cost per unit per annum = 8% of Rs. 50 = Rs. 4 per unit per annum

$$= \sqrt{\frac{2 \times \text{Annual demand(A)} \times \text{Ordering Cost per order(O)}}{\text{Carrying Cost per unit per annum(C)}}}$$

(i) EOQ = $\sqrt{\frac{2 \times 32{,}000\text{kg.} \times Rs.40}{Rs.4}}$ = 800 Kg

(ii) Total Annual Inventory Cost

Purchasing cost of 32,000 kg @ Rs.50 per kg	Rs. 16, 00,000
Ordering Cost $\left(\frac{32{,}000kg}{800kg} \times Rs.40\right)$	Rs.1,600
Carrying Cost of Inventory $\left(\frac{15\ days}{\mathbf{30\ days}} \times 800\ kg\ \times\ Rs.40\right)$	Rs.1,600
	Rs. 16,03,200

Important Note:-

This was a theoretical question based on Inventory Control. Below Average performance was observed by the examinees.

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Question 15

A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2022-23:

(i) Annual demand of Alpha	**8,000 units**
(ii) Cost of placing an order	**Rs. 200 per order**
(iii) Cost per unit of Alpha	**Rs. 400**
(iv) Carrying cost p.a.	**20%**

The company has been offered a quantity discount of 4 % on the purchase of 'Alpha' provided the order size is 4,000 components at a time.

Required:

(i) COMPUTE the economic order quantity

(ii) STATE whether the quantity discount offer can be accepted.

(Study material)

Answer 15

(i) Calculation of Economic Order Quantity

EOQ = $\sqrt{\frac{2AO}{C}}$= $\sqrt{\frac{2\times 8{,}000\ units\times Rs.200}{Rs.400\times 20\%}}$=200 units

(ii) Evaluation of Profitability of Different Options of Order Quantity

(a) When EOQ is ordered

		(Rs.)
Purchase Cost	(8,000 units× Rs. 400)	32,00,000
Ordering Cost	[(8,000 units/200 units) ×Rs. 200]	8,000
Carrying Cost	(200 units× Rs.400× ½ ×20/100)	8,000
Total Cost		**32,16,000**

(b) When Quantity Discount is accepted

		(Rs.)
Purchase Cost	(8,000 units × Rs. 384*)	30,72,000
Ordering Cost	[(8,000 units/4000 units) × Rs. 200] ×	400
Carrying Cost	(4000 units × Rs. 384× ½× 20/100)	1,53,600
Total Cost		**32,26,000**

*Unit Cost Rs. 400

Less Quantity Discount @ 4% = 16

Purchase Cost = 400- 16 =Rs.384

Advise – The total cost of inventory is lower if EOQ is adopted.

Hence, the company is advised not to accept the quantity discount.

Question 16

(b) WHAT will be your answer to the above question if there are no discounts offered and the price per ton is Rs. 1,500?

(Study material)

Answer 16

If there will are no discount offer then the purchase quantity should be equal to EOQ. The EOQ is as follows:

EOQ = $\sqrt{\frac{2AO}{C}}$

Where A = annual inventory requirement,

O = ordering cost per order and

C = carrying cost per unit per annum.

= $\sqrt{\frac{2\times 5{,}000 \text{ units}\times \text{Rs.}1200}{20\%\times \text{Rs.}1{,}500}}$ = 200 units

Topic 8 EOQ with Discounts & Differential Costs

Question 17

Joy Toy Limited deals in trading of 'superhero' toy figure. The annual demand for the toy car is 14,400 units. The company incurs fixed order placement and transportation cost of Rs.212 each time an order is placed. Each toy costs Rs. 450 and the trader has a carrying cost of 25 percent p.a. The company has been offered a quantity discount of 8% on the purchase of 'superhero' toy figure provided the order size is 5,000 units at a time.

Required:

(i) COMPUTE the economic order quantity

(ii) STATE whether the quantity discount offer can be accepted.

(MTP March '23 & Oct 20, Old & New SM)

Answer 17

i. Calculation of Economic Order Quantity (EOQ) = $\sqrt{\frac{2AO}{C}}$

= $\sqrt{\frac{2 \times 14{,}400 \text{ units Rs.}212}{\text{Rs.}450 \times 25\%}}$ = 233 units

ii. Evaluation of Profitability of Different Options of Order Quantity

(A)	When EOQ is ordered	(Rs.)
Purchase Cost	(14,400 units x Rs.450)	64,80,000
Ordering Cost	[(14,400 units/233 units) x Rs.212]	13,102
Carrying Cost	(233 units x 1/2 x 450 x 25%)	13,106
Total Cost		65,06,208

(B) When Quantity Discount of 8% is accepted

		(Rs.)
Purchase Cost	(14,400 units x Rs.414)	59,61,600
Ordering Cost	[(14,400 units/5,000 units) x Rs212]	611
Carrying Cost	(5,000 units x 1/2 x Rs.414 x 25%)	2,58,750

Total Cost		62,20,961

Advise – The total cost of inventory is lower if quantity discount is accepted. The company would save Rs.2, 85,247 (Rs.65, 06,208 - Rs.62, 20,961).

Note: Figures may change slightly because of approximation and decimals)

Question 18

Calculate EOQ and Total Variable Cost with the Current Unit Price

1. **Annual Demand= 10,000 units**
2. **Unit Price= Rs. 30.00**
3. **Order Cost= Rs. 25.00**
4. **Storage Rate= 3% per annum**
5. **Interest Rate= 10% per annum**
6. **Obsolescence Rate= 7% per annum**

(MTP April'21)

Answer 18

Calculate EOQ and Total Variable Cost with the Current Unit Price

Step 1: Calculate Carrying Cost per Unit per Annum

Carrying Cost (C) = Storage Rate + Interest Rate + Obsolescence Rate

C = 3% + 10% + 7% = 20%

C = 20% of $Rs.30$ = 0.20 × 30 = $Rs.6$

Step 2: Calculate EOQ

EOQ = $\sqrt{\frac{2 \times A \times O}{C}}$

$= \sqrt{\frac{2 \times 10,000 \times 25}{6}}$

$== \sqrt{\frac{500,000}{6}}$

$= \sqrt{83,333.33}$

= 289 Units

Step 3: Calculate Total Variable Cost

(a) Purchase Price for 10,000 units:

Total Purchase Price = 10,000 × 30 = *Rs*.300,000

(b) Ordering Cost:

Number of Orders = 10,000/289 = 35 orders

Total Ordering Cost = 35 × 25 = *Rs*. 875

(c) Carrying Cost:

Average Inventory = $\frac{EOQ}{2} = \frac{289}{2}$ = 144.5 units

Total Carrying Cost = 144.5 × 6 = *Rs*. 867

(d) Total Variable Cost:

Total Variable Cost = Total Purchase Price + Total Ordering Cost + Total Carrying Cost

Total Variable Cost = 300,000 + 875 + 867 = *Rs*. 301,742

Question 19

XYZ Ltd is engaged in the business of manufacturing product "A". The material required for the manufacture of Product A is Material "B". Each unit of Product A requires 2 Kgs of Material B, however the yield of each unit of Material B is 80% of the input.

The Details governing the production requirements for the year is as follows:

a. Projected sales of product A for the period - 10,000 units.

b. Opening stock of product A - 948 units

c. Opening stock of Raw Material B - 2,630 Kgs

d. Ordering cost per order - Rs.500

e. Rate of Overdraft - 12.5%

f. Obsolescence Rate - 12.5%

g. Purchase price of Material B - Rs.20 per Kg

h. Current purchase policy - Quarterly

i. Max usage is more than minimum usage by - 100 Kgs

j. Waiting time from date of order - 4 to 8 days

Based on the above information determine the following:

i. Economic Order Quantity

ii. Re-Order Quantity

iii. Re-Order Level

iv. Maximum Stock

v. Minimum Stock

vi. Profitability analysis on EOQ v. ROQ

vii. If a volume discount of 5% is provided for a quarterly purchase by the supplier, will your answer to (vi) above change?

(RTP Sep. 2025)

Answer 19

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Projected sales of product A - 10,000

Unit Requirement of Material B - 2 Kgs of B per unit of A

Yield of Material B - 80%

Hence the revised requirement of Material B - 2.5 Kgs (2/80%)

Opening stock of Product A - 948

Product A to be produced - 9,052

Material B required @ 2.5 Kgs per unit of A - 22,630 Kgs

Less: Opening stock of Material B - 2,630 Kgs

Purchase Requirement (A) of Material B - 20,000 Kgs

Order cost per order - Rs.500

Purchase price per unit - Rs.20

Carrying Cost (Interest + Obsolescene) - 25% of 20 = Rs.5

(i) EOQ = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 20{,}000\ units \times Rs.500}{Rs.5}}$ = 2,000kgs

(ii) ROQ (Quarterly Purchase policy) - 5,000 Kgs

Material Requirement - 22,630

Average Consumption - 62 Kgs

Max usage – Min Usage = 100Kgs

Max usage + Min Usage = 124Kgs (Formulating average usage with max & min)

Hence Minimum Usage = 12 Kgs and Maximum Usage = 112 Kgs

Lead time – 4 to 8 days

(iii) Re-Order level = Max Usage x Max Lead Time

= 112 Kgs x 8 Days = 896 Kgs

(iv) Maximum Stock = Re-order Level + Economic order Quantity – (Min Use x Min Lead time)

= 896 + 2000 – (12x4) = 2,848 Kgs

(If ROQ is assumed as 5,000 the answer will be different)

Maximum Stock = Re-order Level + Re-order Quantity – (Min Use x Min Lead time)

= 896 + 5,000 – (12x4) = 5,848 Kgs

(v) Minimum Stock = Re-Order level – (Average Use x Average Lead)

= 896 – (62x6) = 524 Kgs

(vi) Profitability analysis on EOQ v. ROQ

Particulars	EOQ	ROQ
Annual Requirement (A)	20,000	20,000
Quantity Ordered(B)	2,000	5,000
No. of Orders (C) = (A)/(B)	10	4
Order cost @ Rs.500	5,000	2,000
Average Inventory	1,000	2,500
Carrying Cost @ Rs.5	5,000	12,500
Associated Costs	10,000	14,500

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Savings in EOQ		4,500

(vii) After 5% Discount

Particulars	EOQ	ROQ
Annual Requirement (A)	20,000	20,000
Quantity Ordered(B)	2,000	5,000
No of Orders (C) = (A)/(B)	10	4
Order cost @ Rs.500	5,000	2,000
Average Inventory	1,000	2,500
Carrying Cost @ Rs.5 & 4.75	5,000	11,875
Discount	0	-20000
Net Costs	10,000	-6,125
Benefit of ROQ over EOQ		16,125

Topic 9 Re-order Level, Max/Min/Danger Level

Question 20

Arnav Electronics manufactures electronic home appliances. It follows weighted average Cost method for inventory valuation. Following are the data of component X:

Date	Particulars	Units	Rate per unit (Rs.)
15-12-19	Purchase Order- 008	10,000	9,930
30-12-19	Purchase Order- 009	10,000	9,780
01-01-20	Opening stock	3,500	9,810
05-01-20	GRN*-008 (against the Purchase Order- 008)	10,000	-
05-01-20	MRN**-003 (against the Purchase Order- 008)	500	-
06-01-20	Material Requisition-011	3,000	-
07-01-20	Purchase Order- 010	10,000	9,750
10-01-20	Material Requisition-012	4,500	-
12-01-20	GRN-009 (against the Purchase Order- 009)	10,000	-
12-01-20	MRN-004 (against the Purchase Order- 009)	400	-
15-01-20	Material Requisition-013	2,200	-
24-01-20	Material Requisition-014	1,500	-
25-01-20	GRN-010 (against the Purchase Order- 010)	10,000	-
28-01-20	Material Requisition-015	4,000	-

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31-01-20	**Material Requisition-016**	**3,200**	**-**

***GRN- Goods Received Note; **MRN- Material Returned Note Based on the above data, you are required to CALCULATE:**

(i) Re-order level

(ii) Maximum stock level

(iii) Minimum stock level

(iv) PREPARE Store Ledger for the period January 2020 and DETERMINE the value of stock as on 31-01- 2020.

(v) Value of components used during the month of January, 2020.

(vi) Inventory turnover ratio.

(RTP May'20)

Answer 20

Workings:

Consumption is calculated on the basis of material requisitions:

Maximum component usage = 4,500 units (Material requisition on 10-01-20) Minimum component usage

= 1,500 units (Material requisition on 24-01-20)

Lead time is calculated from purchase order date to material received date

Maximum lead time = 21 days (15-12-2019 to 05-01-2020)

Minimum lead time = 14 days (30-12-2019 to 12-01-2020)

Calculations:

(i) Re-order level

= Maximum usage × Maximum lead time

= 4,500 units × 21 days = 94,500 units

(ii) Maximum stock level

= Re-order level + Re-order Quantity – (Min. Usage × Min. lead time)

= 94,500 units + 10,000 units – (1,500 units × 14 days)

= 1, 04,500 units – 21,000 units = 83,500 units

(iii) Minimum stock level

= Re-order level – (Avg. consumption × Avg. lead time)

= 94,500 units – (3,000 units × 17.5 days)

= 94,500 units – 52,500 units

= 42,000 units

(iv) Store Ledger for the month of January 2020:

Date	Receipts				Issue				Balance		
	GRN/ MRN	Units	Rate Rs.	Amt. (Rs.'000)	MRN/ MR	Units	Rate Rs.	Amt. (Rs.'000)	Units	Rate Rs.	Amt. (Rs.'000)
01-01-20	-	-	-	-	-	-	-	-	3,500	9,810	34,335
05-01-20	008	10,000	9,930	99,300	003	500	9,930	4,965	13,000	9,898	1,28,670

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06-01-20	-	-	-	-	011	3,000	9,898	29,694	10,000	9,898	98,980
10-01-20	-	-	-	-	012	4,500	9,898	44,541	5,500	9,898	54,439
12-01-20	009	10,000	9,780	9,7800	004	400	9,780	3,912	15,100	9,823	1,48,327
15-01-20	-	-	-	-	013	2,200	9,823	21,611	12,900	9,823	1,26,716
24-01-20	-	-	-	-	014	1,500	9,823	14,734	11,400	9,823	1,11,982
25-01-20	010	10,000	9,750	9,7500	-	-	-	-	21,400	9,789	2,09,482
28-01-20	-	-	-	-	015	4,000	9,789	39,156	17,400	9,789	1,70,326
31-01-20	-	-	-	-	016	3,200	9,789	31,325	14,200	9,789	1,39,001

Note: Decimal figures may be rounded-off to the nearest rupee value wherever required)

Value of stock as on 31-01-2020 ('000) = Rs.1, 39,001

(v) Value of components used during the month of January 2020:

Sum of material requisitions 011 to 016 ('000)

= Rs.29, 694 + Rs.44, 541 + Rs.21, 611 + Rs.14, 734 + Rs.39, 156 + Rs.31, 325 = Rs.1, 81,061

(vi) Inventory Turnover Ratio

$$= \frac{\text{Value of materials used}}{\text{Average stock value}}$$

$= \frac{\text{Rs.1,81,061}}{(1,3,001+34,335)/2} = \frac{\text{Rs.1,81,061}}{\text{Rs.86,668}} = 2.09$

Question 21

An automobile company purchases 27,000 spare parts for its annual requirements. The cost per order is Rs. 240 and the annual carrying cost of average inventory is 12.5%. Each spare part costs Rs. 50. At present, the order size is 3,000 spare parts. (Assume that number of days in a year = 360 days)

Find out:

(i) How much the company's cost would be saved by opting EOQ model?

(ii) The Re-order point under EOQ model if lead time is 12 days.

(iii) How frequently should orders for procurement be placed under EOQ model?

(PYP Nov 20)

Answer 21

Working Notes:

Annual requirement (A) = 27,000 units

Cost per order (O) = Rs.240

Inventory carrying cost (i) = 12.5%

Cost per unit of spare (c) = Rs.50

Carrying cost per unit (i × c) = Rs.50 × 12.5% = Rs.6.25

Economic Order Quantity (EOQ) = $\sqrt{\frac{2\times A\times O}{C\times i}}$

$= \sqrt{\frac{2\times 27,000\times 240}{6.25}}$ = 1440 Units

(i) Calculation of saving by opting EOQ:

	Existing Order policy	**EOQ Model**
No. of orders	9 $\left(\frac{27,000}{3,000}\right)$	18.75 or 19 $\left(\frac{27,000}{1,440}\right)$
A. Ordering Cost (Rs.)	2,160 (Rs. 240 × 9)	4,500$\left\{240 \times \left(\frac{27,000}{1,440}\right)\right\}$
B. Carrying cost (Rs.)	9,375$\left(\frac{3,000 \times Rs.6.25}{2}\right)$	4,500$\left(\frac{1,440 \times Rs.6.25}{2}\right)$
Total cost (A+B) (Rs.)	**11,535**	**9,000**

Savings of Cost by opting EOQ Model = Rs. 11,535 – Rs. 9,000 = Rs. 2,535

(ii) Re-order point under EOQ:

Re-order point/ Re-order level = Maximum consumption × Maximum lead time

Consumption per day = $\frac{27,000\ units}{360\ days}$ = 75 units

Re-order point/ Re-order level = 75 units × 12 days = 900 units

(iii) Frequency of Orders (in days):

= $\frac{360\ \text{days}}{\text{No.of orders a year}}$

= $\frac{360\ \text{days}}{19}$ = 18.95 days or 19 days

Question 22

A Company uses three raw materials A, B and C for a particular product for which the following data apply:

Raw Material	Usage per unit of Product (Kgs.)	Re-order quantity (Kgs.)	Price per Kg.	Delivery period (in weeks)			Re-order level (Kgs)	Minimum level (Kgs.)
				Minimum	Average	Maximum		
A	10	10,000	10	1	2	3	8,000	?
B	4	5,000	30	3	4	5	4,750	?
C	6	10,000	15	2	3	4	?	2,000

Weekly production varies from 175 to 225 units, averaging 200 units of the said product. COMPUTE the following quantities:

(i) Minimum stock of A,

(ii) Maximum stock of B,

(iii) Re-order level of C,

(iv) Average stock level of A.

(Study material)

Answer 23

(i) Minimum stock of A

Re-order level – (Average rate of consumption × Average time required to obtain fresh delivery)

= 8,000 – (200 × 10 × 2) = 4,000 kgs.

(ii) Maximum stock of B

Re-order level + Re-order quantity – (Minimum consumption × Minimum delivery period)

= 4,750 + 5,000 – (175 × 4 × 3)

= 9,750 – 2,100

= 7,650 kgs.

(iii) Re-order level of C

Maximum delivery period × Maximum usage

= 4 × 225 × 6 = 5,400 kgs.

OR

Re-order level of C

= Minimum level of C + [Average rate of consumption × Average time required to obtain fresh delivery]

= 2,000 + [(200 × 6) × 3] kgs = 5,600 kgs.

(iv) Average stock level of A

= Minimum stock level of A + ½ Re-order quantity of A

= 4,000 + ½ × 10,000 = 4,000 + 5,000 = 9,000 kgs

OR

Average Stock level of A

$$= \frac{\text{Minimum stock level of A + Maximum stock level of A}}{2}$$

(Refer to working note)

$=\frac{4,000+16,250}{2}$ =10,125 Kgs

Working note:

Maximum stock of A = ROL+ ROQ – (Minimum consumption × Minimum re-order period)

= 8,000 + 10,000 – [(175 × 10) × 1] = 16,250 kgs

Question 23

From the details given below, CALCULATE:

(i) Re-ordering level

(ii) Maximum level

(iii) Minimum level

(iv) Danger level.

Re-ordering quantity is to be calculated on the basis of following information:

Cost of placing a purchase order is Rs. 4,000

Number of units to be purchased during the year is 5, 00,000

Purchase price per unit, inclusive of transportation cost is Rs. 50

Annual cost of storage per unit is Rs.10.

Details of lead time: Average - 10 days, Maximum - 15 days Minimum- 5 days, for emergency purchases- 4 days.

Rate of consumption: Average: 1,500 units per day,

Maximum: 2,000 units per day.

Answer 23

Basic Data:

A (Number of units to be purchased annually) = 5, 00,000 units

O (Ordering cost per order) = Rs. 4,000

C (Annual cost of storage per unit) = Rs. 10

Purchase price per unit inclusive of transportation cost = Rs. 50

Computations:

(i) Re-ordering level (ROL) = Maximum usage per period × Maximum lead time

= 2,000 units per day × 15 days

= 30,000 units

(ii) Maximum level = ROL + ROQ – [Min. rate of consumption × Min. lead time] (Refer to working notes 1 and 2)

= 30,000 units + 20,000 units – [1,000 units per day×5 days]

= 45,000 units

(iii) Minimum level = ROL–Average rate of consumption× Average re-order-period

= 30,000 units – (1,500 units per day × 10 days)

= 15,000 units

(iv) Danger level = Average consumption × Lead time for emergency purchases

= 1,500 units per day × 4 days

= 6,000 units

Working Notes:

1. Minimum rate of consumption per day

Avg. rate of consumption = $\frac{\text{Minimum rate of Consumption+Maximum rate of consumption}}{2}$

1,500 units per day = $\frac{\text{X units/day 2,000 units per day}}{2}$ or X

= 1,000 units per day.

2. Re-order Quantity (ROQ) = $\sqrt{\frac{2\times 5,00,000\ units\times 4,000}{10}}$ =20,000 units

Question 24

Rounak Ltd. is the manufacturer of monitors for PCs. A monitor requires 4 units of Part -M. The following are the details of its operation during 20X8:

Average monthly market demand	**2,000 Monitors**
Ordering cost	**Rs. 1,000 per order**
Inventory carrying cost	**20% per annum**
Cost of Pat	**Rs. 350 per part**
Normal usage	**425 parts per week**
Minimum usage	**140 parts per week**
Maximum usage	**710 parts per week**
Lead time to supply	**3-5 weeks**

COMPUTE from the above:

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(i) Economic Order Quantity (EOQ). If the supplier is willing to supply quarterly 30,000 units of Part- M at a discount of 5%, is it worth accepting?

(ii) Reorder level

(iii) Maximum level of stock

(iv) Minimum level of stock.

(RTP Nov'18)

Answer 24

A = Annual usage of parts = Monthly demand for monitors × 4 parts × 12 months

= 2,000monitors × 4 parts × 12 months = 96,000 units O = Ordering cost per order = Rs. 1,000/- per order

C1 = Cost per part =Rs. 350/-

iC1 = Inventory carrying cost per unit per annum

= 20% × Rs. 350 = Rs. 70/- per unit, per annum Economic order quantity (EOQ):

$$E.O.Q = \sqrt{\frac{2AO}{iC1}}$$

$$= \sqrt{\frac{2 \times 96{,}000 \text{ units} \times 1{,}000}{"70}}$$

= 1,656 parts (approx.)

The supplier is willing to supply 30,000 units at a discount of 5%, therefore cost of each part shall be Rs. 350 – 5% of 350 = Rs. 332.5

Total cost (when order size is 30,000 units):

= Cost of 96,000 units + ordering cost + carrying cost.

= (96,000 units × Rs. 332.50) + (96,000 units / 30,000 units × ’1,000) + 1/2 (30,000 units × 20% × Rs. 332.50)

= Rs. 3, 19, 20,000 + Rs. 3,200* + Rs. 9, 97,500= Rs. 3, 29, 20,700

Total cost (when order size is 1,656 units):

= (96,000 units × Rs. 350) + + (96,000 units / 1,656 units × ’1,000) + 1/2 (1,656 units × 20% × Rs. 350)

= Rs. 3, 36, 00,000 + Rs. 57,970* + Rs. 57,960 = Rs. 3, 37, 15,930

Since, the total cost under the supply of 30,000 units with 5% discount is lower than that when order size is

1,656 units, therefore the offer should be accepted.

Note: While accepting this offer consideration of capital blocked on order size of 30,000 units has been ignored.

*Order size can also be taken in absolute figure.

(1) Reorder level

= Maximum consumption × Maximum re-order period

= 710 units × 5 weeks = 3,550 units

(2) Maximum level of stock

= Re-order level + Reorder quantity – (Min. usage × Min. reorder period)

= 3,550 units + 1,656 units – (140 units × 3 weeks) = 4,786 units.

(3) Minimum level of stock

= Re-order level – Normal usage × Average reorder period

= 3,550 units – (425 units × 4 weeks) = 1,850 units.

Question 25

A company produces a product 'AB' by using two raw materials - 'Material Ae' and 'Material Be' in the ratio of 5:3.

A sales volume of 50,000 kgs is estimated for the month of December by the managers expecting the trend will continue for entire year. The ratio of input and output is 8:5.

Other Information about Raw Material Ae is as follows:

Purchase Price Rs. 150 per kg

Re-order period 2 to 3 days

Carrying Cost 12%

Note: Material Ae is perishable in nature and if not used within 3.5 days of purchase it becomes obsolete. To place an order for material 'Ae', the company has to incur an administrative cost of Rs. 375 per order. At present, material 'Ae' is purchased in a lot of 7,500 kgs. to avail the discount on purchase. Company works for 25 days in a month and production is carried out evenly.

You are required to CALCULATE:

(i) Economic Order Quantity (EOQ) for Material Ae;

(ii) Maximum stock level for Material Ae.

(MTP Sep'22)

Answer 25

(i) Monthly production of AB = 50,000 kgs

Raw material required = 50,000/5 x 8 = 80,000 kgs Material Ae and Material Be ratio = 5:3

Therefore, material Ae = 80,000/8 x 5 =50,000 kgs

Calculation of EOQ= √(((2 × (Annual demand × cost per order))/(Annual holding cost per unit))

EOQ= √((2 ×50,000 kgs × 12 x 375)/(12% of Rs.150)) = 5,000 kgs

(ii) Calculation of maximum stock level of Material Ae which is perishable in nature and is required to be used within 3.5 days.

(a) Stock equals to 3.5 days consumption = 50,000 kgs/ 25 days x 3.5 days = 7,000 kgs

(b) Maximum stock level for Material Ae

Maximum stock = Reorder quantity + reorder level – (minimum consumption x minimum lead time)

Where, reorder quantity = 7,500 kgs

Reorder level = maximum consumption* x maximum lead time

= 50,000/ 25 x 3 days = 6,000 kgs

Now, Maximum stock level = 7,500 kgs + 6,000 kgs – (50,000 /25 days x 2 days) = 9,500 kgs

Stock required for 3.5 days consumption is lower than the maximum stock level calculated above.

Therefore, maximum stock level will be 7,000 kgs.

(*since production is processed evenly throughout the month hence material consumption will also be even.)

Topic 10 ABC Analysis, Inventory Turnover

Question 26

Sky & Co., an unregistered supplier under GST, purchased material from Vye Ltd. which is registered under GST. The following information is available for one lot of 5,000 units of material purchased:

Listed price of one lot	**Rs. 2,50,000**
Trade discount	**@ 10% on listed price**
CGST and SGST (Credit Not available)	**12% (6% CGST + 6% SGST) Cash discount @ 10%**
(Will be given only if payment is made within 30 days.)	
Toll Tax paid	**Rs. 5,000**
Freight and Insurance	**Rs. 17,000**
Demurrage paid to transporter	**Rs. 5,000**
Commission and brokerage on purchases	**Rs. 10,000 Amount deposited for returnable**
containers	**Rs. 30,000 Amount of refund on returning**
the container	**Rs. 20,000**
Other Expenses	**@ 2% of total cost**
20% of material shortage is due to normal reasons.	

The payment to the supplier was made within 21 days of the purchases. You are required to CALCULATE cost per unit of material purchased by Sky & Co.

(RTP May '22) (Same concept different figures MTP March '22 & Sep '23)

Answer 26

Calculation of cost per unit:

Particulars		Units	(Rs.)
Listed Price of Materials		5,000	2,50,000
Less: Trade discount @ 10% on invoice price			(25,000)
			2,25,000
Add: CGST @ 6% of Rs. 2,25,000			13,500
Add: SGST @ 6% of Rs. 2,25,000			13,500
			2,52,000
Add: Toll Tax			5,000
Freight and Insurance			17,000
Commission and Brokerage Paid			10,000
Add: Cost of returnable containers:			
Amount deposited	Rs. 30,000		
Less: Amount refunded	Rs. 20,000		10,000
			2,94,000
Add: Other Expenses @ 2% of Total Cost $\left(\frac{2,94,000}{98} \times 2\right)$			6,000

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Total cost of material		3,00,000
Less: Shortage material due to normal reasons @ 20%	1,000	-
Total cost of material of good units	4,000	3,00,000
Cost per unit (Rs. 3,00,000/4,000 units)		75

Note:

1. GST is payable on net price i.e., listed price less discount.

2. Cash discount is treated as interest and finance charges; hence it is ignored.

3. Demurrage is penalty imposed by the transporter for delay in uploading or off -loading of materials. It is an abnormal cost and not included.

4. Shortage due to normal reasons should not be deducted from cost to ascertain total cost of good units.

Question 27

MM Ltd. has provided the following information about the items in its inventory.

Item Code Number	Units	Unit Cost (Rs.)
101	**25**	**50**
102	**300**	**01**
103	**50**	**80**

104	75	08
105	225	02
106	75	12

MM Ltd. has adopted the policy of classifying the items constituting 15% or above of Total Inventory Cost as 'A' category, items constituting 6% or less of Total Inventory Cost as 'C' category and the remaining items as 'B' category.

You are required to:

(i) Rank the items on the basis of % of Total Inventory Cost.

(ii) Classify the items into A, B and C categories as per ABC Analysis of Inventory Control adopted by MM Ltd.

(PYP July 21)

Answer 27

(i) Statement of Total Inventory Cost and Ranking of items

Item code no.	Units	% of Total units	Unit cost (Rs.)	Total Inventory cost (Rs.)	% of Total Inventory cost	Ranking
101	25	3.33	50	1,250	16.67	2
102	300	40.00	01	300	4.00	6
103	50	6.67	80	4,000	53.33	1

104	75	10.00	08	600	8.00	4
105	225	30.00	02	450	6.00	5
106	75	10.00	12	900	12.00	3
	750	100	153	7,500	100	

(ii) Classifying items as per ABC Analysis of Inventory Control

Basis for ABC Classification as % of Total Inventory Cost

15% & above -- 'A' items

7% to 14% -- 'B' items

6% & Less -- 'C' items

Ranking	Item code No.	% of Total units	Total Inventory cost (Rs.)	% of Total Inventory Cost	Category
1	103	6.67	4,000	53.33	
2	101	3.33	1,250	16.67	
Total	2	10.00	5,250	70.00	A
3	106	10.00	900	12.00	
4	104	10.00	600	8.00	

Total	2	20.00	1,500	20.00	B
5	105	30.00	450	6.00	
6	102	40.00	300	4.00	
Total	2	70.00	750	10.00	C
Grand Total	6	100	7,500	100	

Important Note:-

It was a practical problem on inventory control for assigning ranks based on inventory cost percentage. The second part was related to ABC classification by following the criteria given in the question. Most of the examinees answered in the correct line. Above average performance was observed.

Question 28

EXPLAIN the concept of "ABC Analysis" as a technique of inventory control.

(Study material)

Answer 28

ABC Analysis: This system exercises discriminating control over different items of inventory on the basis of the investment involved. Usually the items are classified into three categories according to their relative importance, namely, their value and frequency of replenishment during a period.

(i) 'A' Category: This category of items consists of only a small percentage i.e., about 10% of the total items handled by the stores but require heavy investment about 70% of inventory value, because of their high prices or heavy requirement or both. Items under this category

can be controlled effectively by using a regular system which ensures neither over-stocking nor shortage of materials for production. Such a system plans its total material requirements by making budgets. The stocks of materials are controlled by fixing certain levels like maximum level, minimum level and re-order level.

(ii) 'B' Category: This category of items is relatively less important; they may be 20% of the total items of material handled by stores. The percentage of investment required is about 20% of the total investment in inventories. In the case of these items, as the sum involved is moderate, the same degree of control as applied in 'A' category of items is not warranted. The orders for the items, belonging to this category may be placed after reviewing their situation periodically.

(iii) 'C' Category: This category of items does not require much investment; it may be about 10% of total inventory value but they are nearly 70% of the total items handled by store. For these categories of items, there is no need of exercising constant control. Orders for items in this group may be placed either after six months or once in a year, after ascertaining consumption requirements. In this case the objective is to economies on ordering and handling costs.

Advantages of ABC analysis:

The advantages of ABC analysis are the following:

(i) Continuity in production: It ensures that, without there being any danger of interruption of production for want of materials or stores, minimum investment will be made in inventories of stocks of materials or stocks to be carried.

(ii) Lower cost: The cost of placing orders, receiving goods and maintaining stocks is minimized especially if the system is coupled with the determination of proper economic order quantities.

(iii) Less attention required: Management time is saved since attention need to be paid only to some of the items rather than all the items, as would be the case if the ABC system was not in operation.

(iv) Systematic working: With the introduction of the ABC system, much of the work connected with purchases can be systematized on a routine basis, to be handled by subordinate staff.

(2) Fast Moving, Slow Moving and Non-Moving (FSN) Inventory: It is also known as FNS (Fast, Normal and Slow moving) classification of inventory analysis. Under this system, inventories are controlled by classifying them on the basis of frequency of usage. The classification of items into these three categories depends on the nature and managerial discretion. A threshold range on the basis of inventory turnover is decided and classified accordingly.

(i) Fast Moving- This category of items is placed nearer to store issue point and the stock is reviewed frequently for making of fresh orders.

(ii) Slow Moving- This category of items is stored little far and stock is reviewed periodically for any obsolescence, and may be shifted to Non-moving category.

(iii) Non-Moving- This category of items is kept for disposal. This category of items is reported to the management and an appropriate provision for loss may be created.

Some of the reasons for slow moving and non-moving inventories are stated below:

(i) Failure of production management to communicate the updated requirement to the stores management

(ii) Technological upgradation in terms of new machine requiring new kind of material or existing material becoming obsolete.

(iii) Lack of periodic review of inventories.

By careful observation, timely identification and adoption of inventory management techniques such as maintenance of minimum level or just in time approach, one can manage slow moving and non-moving inventories. We may calculate inventory turnover ratio and present the reports of comparison of actual and standards with variations, if any to the management.

(3) Vital, Essential and Desirable (VED): Under this system of inventory analysis, inventories are classified on the basis of its criticality for the production function and final product. Generally, this classification is done for spare parts which are used for production.

(i) Vital- Items are classified as vital when its unavailability can interrupt the production process and cause a production loss. Items under this category are strictly controlled by setting re-order level.

(ii) Essential- Items under this category are essential but not vital. The unavailability may cause sub standardization and loss of efficiency in production process. Items under this category are reviewed periodically and get the second priority.

(iii) Desirable- Items under this category are optional in nature, unavailability does not cause any production or efficiency loss.

For instance, in hospital administration, stock of medicines and essential chemicals are categorized as VED or FSN inventory. In case of life saving, rare and critical drugs, they are being categorized as vital inventory. They are the ones whose unavailability can interrupt smooth service. Those inventories which are optional or substitutes, not leading to loss in efficiency would be categorized as desirable inventories. FNS categorization helps the store keepers in hospitals to keep a check on medicines whose expiry date is close and needs to be disposed off at the earliest. The quantity of slow-moving drugs are maintained accordingly.

(4) High Cost, Medium Cost, and Low Cost (HML) Inventory: Under this system, inventory is classified on the basis of the cost of an individual item, unlike ABC analysis where inventories are classified on the basis of overall value of inventory. A range of cost is used to classify the inventory items into the three categories. High-Cost inventories are given more priority for control, whereas Medium-cost and Low-cost items are comparatively given lesser priority.

Topic 11 VED Analysis

Question 29

Write a short note on VED analysis of Inventory Control.

(PYP July '21)

Answer 29

Vital, Essential and Desirable (VED): Under this system of inventory analysis, inventories are classified on the basis of its criticality for the production function and final product. Generally, this classification is done for spare parts which are used for production.

(i) Vital- Items are classified as vital when its unavailability can interrupt the production process and cause a production loss. Items under this category are strictly controlled by setting re-order level.

(ii) Essential- Items under this category are essential but not vital. The unavailability may cause sub standardization and loss of efficiency in production process. Items under this category are reviewed periodically and get the second priority.

(iii) Desirable- Items under this category are optional in nature; unavailability does not cause any production or efficiency loss.

Important Note:-

It was a theoretical question requiring examinees to write a short note on the concept of VED analysis of Inventory Control. Performance of the examinees was below average.

Topic 12 HML Classification

(Conceptual only – see explanation in text)

Topic 13 Store Ledger & Pricing Methods (FIFO, LIFO, WAM)

Question 31

The following are the details of receipts and issues of a material of stores in a manufacturing company for the period of three months ending 30th June, 2022:

Receipts:

Date	Quantity (kg.)	Rate per kg. (Rs.)
April 10	1,600	50.00
April 20	2,400	49.00
May 5	1,000	51.00
May 17	1,100	52.00
May 25	800	52.50
June 11	900	54.00
June 24	1,400	55.00

There was 1,500 kg. in stock at April 1, 2022 which was valued at Rs. 48.00 per kg.

Issues:

Date	Quantity (kg.)
April 4	1,100
April 24	1,600
May 10	1,500

May 26	**1,700**
June 15	**1,500**
June 21	**1,200**

Issues are to be priced on the basis of weighted average method.

The stock verifier of the company reported a shortage of 80 kgs. on 31st May, 2022 and 60 kgs. on 30th June, 2022.

You are required to PREPARE a Stores Ledger Account.

(MTP Oct'22)

Answer 31

Stores Ledger Account for the three months ending 30th June, 2022 (Weighted Average Method)

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Date	Receipts				Issues				Balance		Rate for further Issue (Rs.)
	GRN No.	Qty. (Kg.)	Rates (Rs.)	Amounts	MR No.	Qty. (Kg.)	Rates (Rs.)	Amount (Rs.)	Qty. (Kg.)	Amount (Rs.)	
April 1									1,500	72,000	48.00
April 4						1,100	48.00	52,800	400	19,200	48.00
April 10		1,600	50.00	80,000					2,000	99,200	$\frac{99,200}{2,000} = 49.60$
April 20		2,400	49.00	1,17,600					4,400	216,800	$\frac{2,16,800}{4,400} = 49.30$
April 24						1,600	49.30	78,880	2,800	137,920	$\frac{1,37,920}{2,800} = 49.30$
May 5		1,000	51.00	51,000					3,800	188,920	$\frac{1,88,920}{3,800} = 49.70$
May 10						1,500	49.70	74,550	2,300	114,370	$\frac{1,14,370}{2,300} = 49.70$
May 17		1,100	52.00	57,200					3,400	171,570	$\frac{1,71,570}{3,400} = 50.50$
May 25		800	52.50	42,000					4,200	213,570	$\frac{2,13,570}{4,200} = 50.90$
May 26						1,700	50.90	86,530	2,500	127,040	$\frac{1,27,040}{2,500} = 50.90$
May 31					Shortage	80			2,420	127,040	$\frac{1,27,040}{2,420} = 52.50$
June 11		900	54.00	48,600					3,320	175,640	$\frac{1,75,640}{3,320} = 49.60$
June 15						1,500	52.90	79,350	1,820	96,290	$\frac{99,200}{2,000} = 52.90$
June 21						1,200	52.90	63,480	620	32,810	$\frac{32,810}{620} = 52.90$
June 24		1,400	55.00	77,000					2,020	109,810	$\frac{1,09,810}{2,020} = 54.40$
June 30					Shortage	60			1,960	109,810	$\frac{1,09,810}{1,960} = 56.00$

Question 32

Explain: FIFO and LIFO method of stores issue.

(PYP May '18)

Answer 32

First-in First-out (FIFO) method: It is a method of pricing the issues of materials, in the order in which they are purchased. In other words, the materials are issued in the order in which they arrive in the store or the items longest in stock are issued first. Thus each issue of material only recovers the purchase price which does not reflect the current market price.

This method is considered suitable in times of falling price because the material cost charged to production will be high while the replacement cost of materials will be low.

Last-in-First-out (LIFO) method: It is a method of pricing the issues of materials. This method is based on the assumption that the items of the last batch (lot) purchased are the first to be issued. Therefore, under this method the prices of the last batch (lot) are used for pricing the issues, until it is exhausted, and so on. If however, the quantity of issue is more than the quantity of the latest lot than earlier (lot) and its price will also be taken into consideration. During inflationary period or period of rising prices, the use of LIFO would help to ensure that the cost of production determined on the above basis is approximately the current one.

Question 33

Prepare a statement showing the pricing of issues, on the basis of (a) Simple Average, and (b) Weighted Average Methods from the following information pertaining to material 'X'.

Date	
Sep. 1	**Purchased 100 units @Rs 10.00 each.**
Sep. 2	**Purchased 200 units @Rs 10.20 each.**
Sep. 5	**Issued 250 units to Job A**
Sep. 7	**Purchased 300 units @Rs 10.50 each**
Sep. 10	**Purchased 200 units @Rs 10.80 each**
Sep. 13	**Issued 200 units to Job B**
Sep. 20	**Purchased 100 units @Rs 11.00 each.**

Sep. 18	**Issued 200 units to Job C**
Sep. 25	**Issued 150 units to Job D**

(Practice Question)

Answer 33

(a) SIMPLE AVERAGE METHOD

STORES LEDGER ACCOUNT

Date	**Receipts**			**Issues**			**Balance**	
Sep.	**Qty.**	**Rate**	**Amt.**	**Qty.**	**Rate**	**Amt.**	**Qty.**	**Amt.**
1.	100	10.00	1,000	-	-	-	100	1,000
2.	200	10.20	2040	-	-	-	300	3040
5.	-	-	-	250	$\frac{10 + 10.20}{2}$	2,525	50	515
7.	300	10.50	3,150	-	-	-	350	3,665
10.	200	10.80	2,160	-	-	-	550	5,825
13.	-	-	-	200	$\frac{10.20 + 10.50 + 10.80}{3}$	2,100	350	3725
18.	-	-	-	200	$\frac{10.50 + 10.80}{2}$	2,130	150	1,595
20.	100	11.00	1,100	-	-	-	250	2,695

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25.	-	-	-	150	$\frac{10.80 + 11.00}{2}$	1,635	100	1,060

CLOSING STOCK: 100 Units, Value: Rs. 1,060.

(b) WEIGHTED AVERAGE METHOD

STORES LEDGER ACCOUNT

Date	**Receipts**			**Issues**			**Balance**		
Sep.	**Qty.**	**Rate**	**Amt.**	**Qty.**	**Rate**	**Amt.**	**Qty.**	**Rate**	**Amt.**
1.	100	10.00	1,000	-	-	-	100	10.00	1,000
2.	200	10.20	2,040	-	-	-	300	10.13	3,040
5.	-	-	-	250	10.13	2,533.30	50	10.13	506.70
7.	300	10.50	3,150	-	-	-	350	10.45	3,656.70
10.	200	10.80	2,160	-	-	-	550	10.58	5,816.70
13.	-	-	-	200	10.58	2,116.00	350	10.58	3,700.70
18.	-	-	-	200	10.58	2,116.00	150	10.58	1,584.70
20.	100	11.00	1,100	-	-	-	250	10.74	2684.70
25.	-	-	-	150	10.74	1,611.00	100	10.74	1,030.70

CLOSING STOCK: 100 Units, Value: Rs. 1073.70

Working Notes:

Rate = $\frac{3,040}{300}$ = Rs. 10.13

Rate = $\frac{5,816.70}{550}$ = Rs. 10.58

Rate = $\frac{3,656.70}{350}$ = Rs. 10.45

Rate = $\frac{2,684.70}{250}$ = Rs. 10.74

Question 34

The following receipts and issues were recorded. Prepare stores ledger account under (a) FIFO, (b) LIFO method.

Date: March 2024	
2nd	**Purchases 200 units @ Rs.200 Per unit**
4th	**Issued 150 units**
6th	**Purchases 200 units @ Rs.220**
10th	**Issued 100 units**
16th	**Purchases 200 units @ Rs.210**
18th	**Issued 220 units**
24th	**Purchases 150 units @ Rs.230**
25th	**Issued 190 units**
28th	**Issued 30 units**

(Practice Question)

Answer 34

(a) Stores Ledger Account for the month of March, 2024 (FIFO)

Date	**Receipts**	**Issues**	**Balance**

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March	Units.	Rate	Amt.	Units.	Rate	Amt.	Units.	Rate	Amt.
2	200	200	40,000	-	-	-	200	200	40,000
4	-	-	-	150	200	30,000	50	200	10,000
6	200	220	44,000	-	-	-	50 200	200 220	10,000 44,000
10	-	-	-	50 50	200 220	10,000 11,000	150	220	33,000
16	200	210	42,000	-	-	-	150 200	220 210	33,000 42,000
18	-	-	-	150 70	220 210	33,000 14700	130	210	27300
24	150	230	34500	-	-	-	130 150	210 230	27300 34500
25	-	-	-	130 60	210 230	27300 13800	90	230	20700
28	-	-	-	30	230	6900	**60**	**230**	**13800**

(b) Stores Ledger Account for the month of March, 2024 (LIFO)

Date	Receipts			Issues			Balance		
March	Units.	Rate	Amt.	Units.	Rate	Amt.	Units.	Rate	Amt.
2	200	200	40,000	-	-	-	200	200	40,000
4	-	-	-	150	200	30,000	50	200	10,000
6	200	220	44,000	-	-	-	50 200	200 220	10,000 44,000
10	-	-	-	100	220	22,000	50 100	200 220	10,000 22,000
16	200	210	42,000	-	-	-	50 100 200	200 220 210	10,000 22,000 42,000
18	-	-	-	200 20	210 220	42,000 44,00	50 80	200 220	10,000 17,600
24	150	230	34500	-	-	-	50 80 150	200 220 230	10,000 17,600 34,500
25	-	-	-	150 40	230 220	34,500 8,800	50 40	200 220	10,000 17,600

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28	-	-	-	30	220	6,600	**50** **10**	**200** **220**	**10,000** **2,200**

Question 35

The following are the details of receipt and issue of material 'AXE' in a manufacturing Co. during the month of April 2023:

Date	**Particulars**	**Quantity (kg)**	**Rate per kg**
April 4	**Purchase**	**3,000**	**Rs. 16**
April8	**Issue**	**1,000**	
April15	**Purchase**	**1,500**	**Rs. 18**
April 20	**Issue**	**1,200**	
April 25	**Return to supplier out of purchase made on April 15**	**300**	
April 26	**Issue**	**1,000**	
April 28	**Purchase**	**500**	**Rs. 17**

Opening stock as on 01-04-2023 is 1,000 kg @ Rs. 15 per kg.

On 30th April, 2023 it was found that 50 kg of material 'AXE' was fraudulently misappropriated by the store assistant and never recovered by the Company.

Required:

(i) Prepare a store ledger account under each of the following method of pricing the issue:

(a) Weighted Average Method (b) LIFO

(ii) What would be the value of material consumed and value of closing stock as on 30-04-2023 as per these two methods?

(Practice Question)

Answer 35

(i) (a) Stores Ledger Account for the month of April, 2023 (Weighted Average Method)

	Receipt			Issue			Balance		
Date	Qty Units	Rate (Rs.)	Amount (Rs.)	Qty Units	Rate (Rs.)	Amount (Rs.)	Qty Units	Rate (Rs.)	Amount (Rs.)
1-4-23	_	_	_	_	_	_	1,000	15.00	15,000
4-4-23	3,000	16.00	48,000	_	_	_	4,000	15.75	63,000
8-4-23	_	_	_	1,000	15.75	15,750	3,000	15.75	47,250
15-4-23	1,500	18.00	27,000	_	_	_	4,500	16.50	74,250
20-4-23	_	_	_	1,200	16.50	19,800	3,300	16.50	54,450
25-4-23	_	_	_	300	18.00	5,400	3,000	16.35	49,050
26-4-23	_	_	_	1,000	16.35	16,350	2,000	16.35	32,700
28-4-23	500	17.00	8,500	_	_	_	2,500	16.48	41,200
30-4-23	_	_	_	50	16.48	824	2,450	16.48	40,376

(b) Stores Ledger Account for the month of April, 2019 (LIFO)

Date	Qty Units	Rate (Rs.)	Amount (Rs.)	Qty Units	Rate (Rs.)	Amount (Rs.)	Qty Units	Rate (Rs.)	Amount (Rs.)
1-4-23	_	_	_	_	_	_	1,000	15	15,000
4-4-23	3,000	16	48,000	_	_	_	1,000	15	15000
							3,000	16	48,000
8-4-23	_	_	_	1,000	16	16,000	1,000	15	15,000
							2,000	16	32,000
15-4-23	1,500	18	27,000	_	_	_	1,000	15	15,000
							2,000	16	32,000
							1,500	18	27,000
20-4-23	_	_	_	1,200	18	21,600	1,000	15	15,000
							2,000	16	32,000
							300	18	5,400
25-4-23	_	_	_	300	18	5,400	1,000	15	15,000
							2,000	16	32,000
26-4-23	_	_	_	1,000	16	16,000	1,000	15	15,000
							1,000	16	16,000
28-4-23	500	17	8,500	_	_	_	1,000	15	15,000
							1,000	16	16,000
							500	17	8,500
30-4-23	_	_	_	50	17	850	1,000	15	15,000

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							1,000	16	16,000
							450	17	7,650

(ii)Value of Material Consumed and Closing Stock

	Weighted Average method (Rs.)	**LIFO method(Rs.)**
Opening stock as on 01-04-2023	15,000	15,000
Add: Purchases	83,500	83,500
	98,500	98,500
Less: Return to supplier	5,400	5,400
Less: Abnormal loss	824	850
Less: Closing Stock as on 30-04-2023	40,376	38,650
Value of Material Consumed	51,900	53,600

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Question 36

The following is the summary of receipts and issues of material in a factory for May 2023. Prepare the Stores Ledger (only the quantity and rate columns of the Receipts and Issues are required) according to

(i) First In First Out Method;

(ii) Last In First Out Method;

(iii) Compute the Inventory Turnover Ratio under both (i) and (ii). Which method shows a more favourable situation? (For the purpose of this ratio, do not include shortage value in production cost.)

Date: May 2023	Transaction
1	Opening Balance 500 units @ Rs. 25 per unit
3	Issue 70 units
4	Issue 100 units
8	Issue 80 units
13	Received from supplier 200 units @ Rs. 24.5 per unit
14	Returned to Stores 15 units @ Rs. 24 per unit
16	Issue 180 units
20	Received from supplier 240 units @ Rs. 24.75 per unit
24	Issue 304 units
25	Received from supplier 320 units @ Rs. 24·5 per unit
26	Issue 112 units
27	Returned to Stores 12 units @ Rs. 24.5 per unit
28	Received from supplier 100 units @ Rs. 25 per unit

There was a shortage of 5 units on the 15th and 8 units on the 27th.

(Practice Question)

Answer 36

Date	Receipts	Qty (units)	Rate (Rs.)	FIFO Method			LIFO Method		
				Issue	Qty (Units)	Rate (Rs.)	Issue	Qty (units)	Rate (Rs.)

May 2023									
1	Opening Balance	500	25	-	-	-		-	-
3	-	-	-	To Production	70	25	To Production	70	25
4	-	-	-	To Production	100	25	To Production	100	25
8	-	-	-	To Production	80	25	To Production	80	25
13	From Supplier	200	24.5	-	-	-	-	-	-
14	Returned to stores	15	24	-	-	-	-	-	-
15	-	-	-	(Shortage)	5	25	(Shortage)	5	24
16	-	-	-	To Production	180	25	To Production (180)	10 170	24 24.5
20	From Supplier	240	24.75	-	-	-	-	-	-
24	-	-	-	To Production (304)	65 200 15 24	25 24.5 24 24.75	To Production (304)	240 30 34	24.75 24.5 25
25	From supplier	320	24.5						
26	-	-	-	To Production	112	24.75	To Production	112	24.5
27	-	-	-	(Shortage)	8	24.75	(Shortage)	8	24.5

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27	Returned Stores	12	24.5	-	-	-	-	-	-
28	From Supplier	100	25	-	-	-	-	-	-

	FIFO Method		**LIFO Method**	
	Units	**Rs.**	**Units**	**Rs.**
Total Issued to production	846	21,001	846	20,924
Less: Returns	27	654	27	654
Net Cost of Consumption	819	20,347	819	20,270
Closing inventory value		13,010		13,094
Opening inventory value		12,500		12,500
Total		25,510		25,594
Average inventory at cost	= Rs. 25,510/2	= 12,755	= Rs. 25,594/2	= 12,797
Inventory Turnover Ratio =	$\frac{\text{Material Cost of Sales}}{\text{Average Inventory}}$			
	$\frac{\text{Rs. } 20{,}347}{Rs. 12{,}755}$		$\frac{\text{Rs. } 20{,}270}{Rs. 12{,}797}$	
	= 1.595 or 1.6		= 1.584 or 1.6	

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Working Notes:

(i) Calculation of closing inventory value

96 @ 24.75 =	Rs. 2,376	316@ 25 =	Rs. 7,900
320 @ 24.5 =	Rs.7,840	212 @ 24.5 =	Rs.5,194
12 @ 24.5 =	294		
100 @ 25 =	2,500		
528	Rs. 13,010	528	Rs. 13,094

(ii) Calculation of value issued to production

495 @ 25 =	Rs. 12,375	284 @ 25 =	Rs. 7,100
200 @ 24.5 =	4,900	10 @ 24 =	240
15 @ 24 =	360	312 @ 24.5=	7,644
136 @ 24.75=	3,366	240 @ 24.75=	5,940
846	Rs. 21,001	846	Rs. 20,924

Conclusion: Inventory turnover ratio (1.595) under FIFO method shows a more favourable situation.

Question 37

The following transactions took place in request of Material during the month of September 2015.

Date	Particulars	Quantity	Rate per unit
Sept. - 1	Received	500	10
Sept. - 10	Received	300	12
Sept. - l5	Issued	700	---
Sept. - 20	Received	400	14
Sept. – 25	Issued	300	---
Sept. – 27	Received	500	11
Sept. - 30	Issued	200	---

You are request to write up stores Ledger under FIFO, LIFO.

(Practice Question)

Answer 37

STORES LEDGER ACCOUNT (FIFO METHOD)

Date	Particulars	RECEIPTS			ISSUES			BALANCE		
		Qty	Rate	Amount	Qty	Rate	Amount	Qty	Rate	Amount
Sept. 1	Goods rec. note No.	500	10	5000	---	---	---	500	10	5000
Sept.10	Goods rec. note No.	300	12	3600	---	---	---	500 300	10 12	5000 3600

Sept.15	Requisition slip No.	---	---	---	500 200	10 12	5000 2400	100	12	1200
Sept.20	Goods rec. note No.	400	14	5600	---	---	---	100 400	12 14	1200 5600
Sept.25	Requisition slip No.	---	---	---	100 200	12 14	1200 2800	200	14	2800
Sept.27	Goods rec. note No.	500	11	5500	---	---	---	200 500	14 11	2800 5500
Sept.30	Requisition slip No.	---	---	---	200	14	2800	500	11	5500

closing stock 500 units Rs.5500

LAST IN FIRST OUT METHOD (LIFO)

Date	Particulars	RECEIPTS			ISSUES			BALANCE		
		Qty	Rate	Amount	Qty	Rate	Amount	Qty	Rate	Amount
Sept. 1	Goods rec. note No.	500	10	5000	---	---	---	500 300	10 12	5000 3600
Sept.10	Goods rec. note No.	300	12	3600	---	---	---	300	12	3600
Sept.15	Requisition slip No.	---	---	---	300 400	12 10	3600 4000	100	10	1000

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Sept.20	Goods rec. note No.	400	14	5600	---	---	---	100 400	10 14	1000 5600
Sept.25	Requisition slip No.	---	---	---	300	14	4200	100 100	10 14	1000 1400
Sept.27	Goods rec. note No.	500	11	5500	---	---	---	100 100 500	10 14 11	1000 1400 5500
Sept.30	Requisition slip No.	---	---	---	200	11	2200	100 100 300	10 14 11	1000 1400 3300

Closing stock 500 units of Rs.5700

Question 38

Prepare a statement showing the pricing of issues, on the basis of

a. Simple Average and

b. Weighted Average methods from the following information pertaining to Material D

2022 March	
1	**Purchased 100 units @ Rs. 10 each**
2	**Purchased 200 units @ Rs. 10.20 each**

5	**Issued 250 units to Job X vide M.R. No. 12**
7	**Purchased 200 units @ Rs. 10.50 each**
10	**Purchased 300 units @ Rs. 10.80 each**
13	**Issued 200 units to Job Y vide M.R. No. 15**
18	**Issued 200 units to Job Z vide M.R. No. 17**
20	**Purchased 100 units @ Rs. 11 each**
25	**Issued 150 units to Job K vide M.R. No. 25**

(Practice Question)

Answer 38

a. Simple Average Method

Stores Ledger Account

Date	**RECEIPTS**			**ISSUES**			**BALANCE**		
2022	**Qty**	**Rate**	**Amount**	**Qty**	**Rate**	**Amount**	**Qty**	**Rate**	**Amount**
01/03	100	10	1000				100	10	1000
02/03	200	10.20	2040				300		3040
05/03				250	10.10	2525	50		515
07/03	200	10.50	2100				250		2615

10/03	300	10.80	3240				550		5855
13/03				200	10.50	2100	350		3755
18/03				200	10.65	2130	150		1625
20/03	100	11	1100				250		2725
25/03				150	10.90	1635	100		1090

Working Notes

1. Calculation of Simple Average Price for

$$\text{Issue on } 05/03/2022 = \frac{10 + 10.20}{2} = \text{Rs. } 10.10$$

$$\text{Issue on } 13/03/2022 = \frac{10.20 + 10.50 + 10.80}{3} = \text{Rs. } 10.50$$

$$\text{Issue on } 18/03/2022 = \frac{10.50 + 10.80}{2} = \text{Rs. } 10.65$$

$$\text{Issue on } 25/03/2022 = \frac{10.80 + 11}{2} = \text{Rs. } 10.90$$

b. Weighted Average Method

Stores Ledger Account

Date 2022	RECEIPTS			ISSUES			BALANCE		
	Qty	Rate	Amount	Qty	Rate	Amount	Qty	Rate	Amount
01/03	100	10	1000				100	10	1000
02/03	200	10.20	2040				300	10.13	3040

05/03				250	10.13	2533	50	10.13	507
07/03	200	10.50	2100				250	10.43	2607
10/03	300	10.80	3240				550	10.63	5847
13/03				200	10.63	2126	350	10.63	3721
18/03				200	10.63	2126	150	10.63	1595
20/03	100	11	1100				250	10.78	2695
25/03				150	10.78	1617	100	10.78	1078

Question 39

Case Scenarios

The purchase committee of A Ltd. has been entrusted to review the material procurement policy of the company. The chief marketing manager has appraised the committee that the company at present produces a single product X by using two raw materials A and B in the ratio of 3:2. Material A is perishable in nature and has to be used within 10 days from Goods received note (GRN) date otherwise material becomes obsolete. Material B is durable in nature and can be used even after one year. Material A is purchased from the local market within 1 to 2 days of placing order. Material B, on the other hand, is purchased from neighboring state and it takes 2 to 4 days to receive the material in the store.

The purchase price of per kilogram of raw material A and B is Rs.30 and Rs.44 respectively exclusive of taxes. To place an order, the company has to incur an administrative cost of Rs.1, 200. Carrying cost for Material A and B is 15% and 5% respectively. At present material

A is purchased in a lot of 15,000 kg. to avail 10% discount on market price. GST applicable for both the materials is 18% and the input tax credit is availed.

The sales department has provided an estimate that the company could sell 30,000 kg. In January 2024 and also projected the same trend for the entire year.

The ratio of input and output is 5:3. Company works for 25 days in a month and production is carried out evenly.

(Study material)

The following queries/ calculations to be kept ready for purchase committees' reference:

(i) For the month of January 2024, what would be the quantity of the materials to be requisitioned for both material A and B?

(a) 9,000 kg & 6,000 kg respectively

(b) 18,000 kg & 12,000 kg respectively

(c) 27,000 kg & 18,000 kg respectively

(d) 30,000 kg & 20,000 kg respectively.

Ans. - (d) Monthly Production of X = 30,000 kgs.

Raw Material Required = $\frac{30,000}{3}$x5 =50,000 kgs.

Material A= $\frac{50,000}{5}$x 3 = 30,000 kg.

Material B= $\frac{50,000}{5}$x 2 = 20,000 kg.

(ii) The economic order quantity (EOQ) for both the material A & B:

(a) 13,856 kg & 16,181 kg respectively

(b) 16,197 kg & 17,327 kg respectively

(c) 16,181 kg & 17,165 kg respectively

(d) 13,197 kg & 17,165 kg respectively

Ans. - (a) Calculation of Economic Order Quantity (EOQ):

Material A= $\sqrt{\frac{2\times\text{Annualconsumption}\times\text{Ordercost}}{\text{Carryingcostperunitp.a.}}}$

=$\sqrt{\frac{2\times(30{,}000\text{x}12)\times 1{,}200}{15\%\text{ of }30}}$ =13,856 kg.

Material B= $\sqrt{\frac{2\times(20{,}000\text{x}12)\times 1{,}200}{5\%\text{ of }44}}$ =16,181 kg.

(iii) What would the maximum stock level for material A:

(a) 18,200 kg.

(b) 12,000 kg.

(c) 16,000 kg.

(d) 16,200 kg.

Ans. - (b) Calculation of Maximum Stock level: Since, the Material A is perishable in nature and it required to be used within 10 days, hence, the Maximum Stock Level shall be lower of two:

(a) Stock equal to 10 days consumption

= $\frac{30{,}000}{25}$x 10 days =12,000 kg.

(b) Maximum Stock Level for Material A:

Re-order Quantity + Re-order level – (Min consumption* × Min. lead time)

Where,

Re-order Quantity = 15,000 kg.

Re-order level = Max. Consumption* × Max. Lead time

= 30,000/25 × 2 days = 2,400 kg.

Maximum stock Level = 15,000 kg. + 2,400 kg. - (30,000/25 × 1 day)

= 17,400 – 1,200 = 16,200 kg.

Stock required for 10 days consumption is lower than the maximum stock level calculated through the formula. Therefore, Maximum Stock Level will be 12,000 kg.

(*Since, production is processed evenly throughout the month hence material consumption will also be even.)

(iv) Calculate saving/ loss in purchase of Material A if the purchase order quantity is equal to EOQ.

(a) Profit of Rs. 3, 21,201.

(b) Loss of Rs. 3, 21,201.

(c) Profit of Rs.2, 52,500.

(d) Loss of Rs. 2, 52,500.

Ans. - (b) Calculation of Savings/ loss in Material A if purchase quantity equals to EOQ.

	Purchase Quantity = 15,000 kg.	**Purchase Quantity = EOQ i.e. 13,856 kg.**
Annual consumption	3, 60,000 kg. (30,000 × 12 months)	3, 60,000 kg. (30,000 × 12 months)

No. of orders [Note- (i)]	30 (3,60,000 ÷ 12,000)	30 (3,60,000 ÷ 12,000)
Ordering Cost (a)	Rs.36,000 (Rs.1200 × 30)	Rs.36,000 (Rs.1200 × 30)
Carrying Cost (b) [Note- (ii)]	Rs.30,375 (15% of Rs.27 × 7,500)	Rs.31,176 (15% of Rs.30 × 6,928)
Purchase Cost (c) (for good portion)	Rs.97,20,000 (Rs.27 × 3,60,000)	Rs.1,08,00,000 (Rs.30 × 3,60,000)
Loss due to obsolescence (d) [Note- (iii)]	Rs.24,30,000 [Rs.27 × (30 × 3,000)]	Rs.16,70,400 [Rs.30 × (30 × 1,856)]
Total Cost [(a) + (b) + (c) + (d)]	Rs.1,22,16,375	Rs. 1,25,37,576

Purchasing of material -A at present policy of 15,000 kg. Saves Rs. 3, 21,201.

Notes: (i) Since, material gets obsolete after 10 days, the quantity in excess of 10 days consumption i.e. 12,000 kg. are wasted. Hence, after 12,000 kg. a fresh order needs to be given.

(ii) Carrying cost is incurred on average stock of Materials purchased.

(iii) The excess quantity of material becomes obsolete and loss has to be incurred.

(v) What would the minimum stock level for material A:

(a) 1,800 kg.

(b) 1,200 kg.

(c) 600 kg.

(d) 2,400 kg.

Ans. - (c) Minimum Stock Level for Material A

= Re-order level – (Average Consumption Rate x Average Reorder Period)

= 2400 – (1200 x 1.5) = 600 kgs

Re-order level = Max. Consumption* × Max. Lead time

= 30,000/25 × 2 days = 2,400 kg.

Average Consumption Rate = (30,000/25 + 30,000/25)/2

= 1,200 Kg

Average Re-order Period = (1 + 2)/2 =1.5 Days

Stock required for 10 days consumption is lower than the maximum stock level calculated through the formula. Therefore, Maximum Stock Level will be 12,000 kg.

(*Since, production is processed evenly throughout the month hence material consumption will also be even.)

Topic 14 Normal & Abnormal Losses

Question 40

STATE how normal and abnormal loss of material arising during storage are treated in Cost Accounts?

(Study material)

Answer 40

TREATMENT OF NORMAL AND ABNORMAL LOSS OF MATERIALS

Loss of materials during handling, storage, process may occur any of the following forms:

(i) Waste: The portion of raw material which is lost during storage or production and discarded. The waste may or may not have any value.

Treatment of Waste

Normal- Cost of normal waste is absorbed by good production units.

Abnormal- The cost of abnormal loss is transferred to Costing Profit and loss account.

(ii) Scrap: The materials that result from production which are discarded and disposed-off without further treatment. Generally, scrap has either no value or insignificant value. Sometimes, it may be reintroduced into the process as raw material.

Treatment of Scrap

Normal- The cost of scrap is borne by good units and income arises on account of realizable value is deducted from the cost.

Abnormal- The scrap account should be charged with full cost. The credit is given to the job or process concerned. The profit or loss in the scrap account, on realization, will be transferred to the Costing Profit and Loss Account.

(iii) Spoilage: It is the term used for materials which are badly damaged in manufacturing operations, that do not meet the specification required by the customers and they cannot be rectified economically and hence taken out of the process to be disposed off in some manner without further processing.

Treatment of Spoilage

Normal- Normal spoilage (i.e., which is inherent in the operation) costs are included in costs, either by charging the loss due to spoilage to the production order or by charging it to the production overhead so that it is spread over all the products.

Any value realized from spoilage is credited to production order or production overhead account, as the case may be.

Abnormal- The cost of abnormal spoilage (i.e., arising out of causes not inherent in manufacturing process) is charged to the Costing Profit and Loss Account. When spoiled work is the result of rigid specification, the cost of spoiled work is absorbed by good production while the cost of disposal is charged to production overhead.

(iv) Defectives: It signifies those units or portions of production which do not meet the quality standards. Defectives arise due to sub-standard materials, bad-supervision, bad-planning, poor workmanship, inadequate-equipment and careless inspection.

The defectives which can be re-made as per the quality standard by using additional materials are known as reworks. Reworks include repairs, reconditioning and refurbishing.

Defectives which cannot be brought up to the quality standards are known as rejects. The rejects may either be disposed-off or re-cycled for production process.

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Treatment of Defectives:

Normal- An amount equal to the cost less realizable value on sale of defectives are charged to material cost of good production.

Abnormal- Material cost of abnormal defectives are not included in material cost but treated as loss after giving credit to the realizable value of such defectives. The material cost of abnormal loss is transferred to costing profit and loss account.

Reclamation of loss from defective units

In the case of articles that have been spoiled, it is necessary to take steps to reclaim as much of the loss as possible. For this purpose:

(i) All defective units should be sent to a place fixed for the purpose;

(ii) These should be dismantled;

(iii) Goods and serviceable parts should be separated and taken back into the stock;

(iv) Parts which can be made serviceable by further work should be separated and sent to the workshop for the purpose and taken into stock after the defects have been removed; and

(v) Parts which cannot be made serviceable should be collected in one place for being melted or sold off.

Printed forms should be used to record quantities for all purposes aforementioned.

Difference between Waste and Scrap

Waste	Scrap
It is connected with raw material or inputs to the production process.	It is the loss connected with the output
Waste of materials may be visible or invisible.	Scraps are generally identifiable and has physical substance.
Generally, waste has no recoverable value.	Scraps are termed as by-products and has small recoverable value.

Difference between Scrap and Defectives

Scrap	Defectives
It is the loss connected with the output	This type of loss is connected with the output as well as the input.

Scraps are not intended but cannot be eliminated due to the nature of material or process itself.	Defectives also are not intended but can be eliminated through a proper control system.
Generally, scraps are not used or rectified.	Defectives can be used after rectification.
Scraps have insignificant recoverable value.	Defectives are sold at a lower value from that of the good one.

Distinction between Spoilage and Defectives: The difference between spoilage and defectives is that while spoilage cannot be repaired or reconditioned, defectives can be rectified and transferred, either back to the standard production or to the seconds. The problem of accounting for defective work is in relation to the costs of rectification or rework.

(v) Obsolescence: Obsolescence is defined as "the loss in the intrinsic value of an asset due to its supersession". In simple words, obsolescence refers to the loss in the value of an asset due to technological advancements.

Treatment: Materials may become obsolete under any of the following circumstances:

(i) where it is a spare part or a component of a machinery that is used in manufacturing and is now obsolete;

(ii) where it is used in the manufacturing of a product which has now become obsolete;

(iii) where the material itself is replaced by another material due to either improved quality or fall in price.

In all the three cases, the value of the obsolete material held in stock is a total loss and immediate steps should be taken to dispose it off at the best available price. The loss arising out of obsolete materials is an abnormal loss and it does not form part of the cost of manufacture.

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Topic 15 Treatment of Purchase-related Expenses

Question 41

State how the following items are treated in arriving at the value of cost of material purchased:

(i) Detention Charges/Fines

(ii) Demurrage

(iii) Cost of Returnable containers

(iv) Central Goods and Service Tax (CGST)

(v) Shortage due to abnormal reasons.

(PYP Jan 21)

Answer 41

Treatment of items in arriving at the value of cost of material Purchased

S. No.	Items	Treatment
(i)	**Detention charges/ Fine**	Detention charges/ fines imposed for non- compliance of rule or law by any statutory authority. It is an abnormal cost and not included with cost of purchase.
(ii)	**Demurrage**	Demurrage is a penalty imposed by the transporter for delay in uploading or offloading of materials. It is an abnormal cost and not included with cost of purchase.

(iii)	**Cost of returnable containers**	Treatment of cost of returnable containers are as follows: Returnable Containers: If the containers are returned and their costs are refunded, then cost of containers should not be considered in the cost of purchase. If the amount of refund on returning the container is less than the amount paid, then, only the short fall is added with the cost of purchase.
(iv)	**Central Goods and Service Tax (CGST)**	Central Goods and Service Tax (CGST) is paid on manufacture and supply of goods and collected from the buyer. It is excluded from the cost of purchase if the input credit is available for the same. Unless mentioned specifically CGST is not added with the cost of purchase.
(v)	**Shortage due to abnormal reasons**	Shortage arises due to abnormal reasons such as material mishandling, pilferage, or due to any avoidable reasons are not absorbed by the good units. Losses due to abnormal reasons are debited to costing profit and loss account.

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Question 42

Write down the treatment of following items associated with purchase of materials.

(i) Cash discount

(ii) IGST

(iii) Demurrage

(iv) Shortage

(v) Basic Custom Duty

(PYP May'22)

Answer 42

Treatment of items associated with purchase of materials is tabulated as below

S.No.	Items	Treatment
(i)	Cash Discount	Cash discount is not deducted from the purchase price. It is treated as interest and finance charges. It is ignored.
(ii)	Integrated Goods and Service Tax (IGST)	Integrated Goods and Service Tax (IGST) is paid on inter- state supply of goods and provision of services and collected from the buyers. It is excluded from the cost of purchase if credit for the same is available. Unless mentioned specifically it should not form part of cost of purchase.
(iii)	Demurrage	Demurrage is a penalty imposed by the transporter for delay in uploading or offloading of materials. It is an abnormal cost and not included with cost of purchase
(iv)	Shortage	Shortage in materials are treated as follows: Shortage due to normal reasons: Good units absorb the cost of shortage due to normal reasons. Losses due to breaking of bulk, evaporation, or due to any unavoidable conditions etc. are the reasons of normal loss. Shortage due to abnormal reasons: Shortage arises due to abnormal reasons such as material mishandling, pilferage, or due to any avoidable reasons are not absorbed by the good units. Losses due to abnormal reasons are debited to costing profit and loss account.

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(v)	Basic Custom Duty	Basic Custom duty is paid on import of goods from outside India. It is added with the purchase cost.

Topic 16 Obsolescence, Waste, Scrap, Spoilage

Question 43

Explain obsolescence and circumstances under which materials become obsolete. State the steps to be taken for its treatment.

(PYP Nov '18)

Answer 43

Obsolescence: Obsolescence is defined as "the loss in the intrinsic value of an asset due to its supersession".

Materials may become obsolete under any of the following circumstances:

(i) Where it is a spare part, or a component of a machinery used in manufacture and that machinery becomes obsolete;

(ii) Where it is used in the manufacture of a product which has become obsolete;

(iii) Where the material itself is replaced by another material due to either improved quality or fall in price.

Treatment: In all three cases, the value of the obsolete material held in stock is a total loss and immediate steps should be taken to dispose it off at the best available price. The loss arising out of obsolete materials on abnormal loss does not form part of the cost of manufacture.

Important Note:-

This was a theoretical question on obsolescence of material. Below average performance was observed.

Question 44

Anil & Company buys its annual requirement of 36,000 units in 6 instalments. Each unit costs RS.1 and the ordering cost is RS.25. The inventory carrying cost is estimated at 20% of unit value. FIND the total annual cost of the existing inventory policy. CALCULATE, how much money can be saved by Economic Order Quantity?

(Study material)

Answer 44

(a) Total Annual Cost in Existing Inventory Policy

Particulars	**(Rs.)**
Ordering cost (6 orders @ Rs. 25)	150
Carrying cost of average inventory (36,000 ÷ 6) = 6,000 units per order	
Average inventory = 3,000 units	
Carrying cost = 20% of Rs. 1 × 3,000 = 3,000 × 0.20	600
Total cost	**A 750**

(b) Total Annual Cost in E.O.Q

EOQ = $\sqrt{\frac{2\times36,000\times25}{Rs.1\times20\%}}$=3000 units

Particulars	(Rs.)
No. of orders = 36,000 ÷3,000 units = 12 orders	
Ordering cost (12 × Rs. 25) =	300
Carrying cost of average inventory (3,000 ×0.20) ÷ 2 =	300
Total Cost	**B 600**
Savings due to E.O.Q Rs.(750 – 600) (A – B)	**150**

Note: As the units purchase cost of Rs. 1 does not change in both the computation, the same has not been considered to arrive at total cost of inventory for the purpose of savings.

Topic 17 Just-in-Time (JIT) Inventory Management

Question 45

Which system of inventory management is known as 'Demand pull' or 'Pull through' system of production? Explain. Also, specify the two principles on which this system is based.

(PYP Nov 22)

Answer 45

Just in Time (JIT) Inventory Management is also known as 'Demand pull' or 'Pull through' system of production. In this system, production process actually starts after the order for the products is received. Based on the demand, production process starts and the requirement for raw materials is sent to the purchase department for purchase.

It is a system of inventory management with an approach to have a zero inventories in stores. According to this approach material should only be purchased when it is actually required for production.

JIT is based on two principles

(i) Produce goods only when it is required and

(ii) The products should be delivered to customers at the time only when they want.

Question 46

ABC Electronics Ltd. is facing challenges in managing its inventory. The company has been experiencing production delays due to stockouts, excessive inventory storage costs, and the presence of outdated components in its warehouse. The management is exploring methods to streamline their inventory management system to address these issues.

To tackle these problems, they are considering the following strategies:

(i) Danger Level

(ii) Just in Time Inventory Management

(iii) Maximum stock level and Minimum Stock level

(iv) Obsolescence

Write brief notes on the above strategies.

(Practice Question)

Answer 46

(i) Danger level: It is the level at which normal issues of the raw material inventory are stopped and emergency issues are only made.

It can be calculated as below:

Danger Level = Average Consumption* × Lead time for emergency purchase

*Some time minimum consumption is also used.

(ii) Just in Time Inventory Management-JIT is a system of inventory management with an approach to have zero inventories in stores. According to this approach material should only be purchased when it is actually required for production.

JIT is based on two principles

(i) Produce goods only when it is required and

(ii) The products should be delivered to customers at the time only when they want.

It is also known as 'Demand pull' or 'Pull through' system of production. In this system, production process actually starts after the order for the products is received. Based on the demand, production process starts and the requirement for raw materials is sent to the purchase department for purchase.

(iii) Maximum Stock Level: It is the highest level of quantity for any material which can be held in stock at any time. Any quantity beyond this level cause extra amount of expenditure due to engagement of fund, cost of storage, obsolescence etc.

It can be calculated as below:

Maximum Stock Level = Re-order Level + Re-order Quantity - (Minimum Consumption Rate × Minimum Re-order Period)

Here, Re-order Quantity may be EOQ

And

Minimum Stock Level: It is lowest level of material stock, which must be maintained in hand at all times, so that there is no stoppage of production due to non-availability of inventory.

It is calculated as below:

Minimum Stock Level = Re-order Stock Level - (Average Consumption Rate × Average Re-order Period)

(iv) Obsolescence- Obsolescence is defined as "the loss in the intrinsic value of an asset due to its supersession". In simple words, obsolescence refers to the loss in the value of an asset due to technological advancements.

Treatment: Materials may become obsolete under any of the following circumstances:

(i) where it is a spare part or a component of a machinery that is used in manufacturing and is now obsolete;

(ii) where it is used in the manufacturing of a product which has now become obsolete;

(iii) where the material itself is replaced by another material due to either improved quality or fall in price.

In all the three cases, the value of the obsolete material held in stock is a total loss and immediate steps should be taken to dispose it off at the best available price. The loss arising out of obsolete materials is an abnormal loss and it does not form part of the cost of manufacture.

Topic 18 Short Notes / Theory Questions

Question 47

WRITE short notes on any three of the following:

(i) Danger Level

(ii) Just in Time Inventory Management

(iii) Maximum stock level and Minimum Stock level

(iv) Obsolescence

Answer 47

(i) Danger level: It is the level at which normal issues of the raw material inventory are stopped and emergency issues are only made.

It can be calculated as below:

Danger Level = Average Consumption* × Lead time for emergency purchase

*Some time minimum consumption is also used.

(ii) Just in Time Inventory Management-JIT is a system of inventory management with an approach to have zero inventories in stores. According to this approach material should only be purchased when it is actually required for production.

JIT is based on two principles

(i) Produce goods only when it is required and

(ii) The products should be delivered to customers at the time only when they want.

It is also known as 'Demand pull' or 'Pull through' system of production. In this system, production process actually starts after the order for the products is received. Based on the demand, production process starts and the requirement for raw materials is sent to the purchase department for purchase.

(iii) Maximum Stock Level: It is the highest level of quantity for any material which can be held in stock at any time. Any quantity beyond this level cause extra amount of expenditure due to engagement of fund, cost of storage, obsolescence etc.

It can be calculated as below:

Maximum Stock Level = Re-order Level + Re-order Quantity - (Minimum Consumption Rate × Minimum Re-order Period)

Here, Re-order Quantity may be EOQ

And

Minimum Stock Level: It is lowest level of material stock, which must be maintained in hand at all times, so that there is no stoppage of production due to non-availability of inventory.

It is calculated as below:

Minimum Stock Level = Re-order Stock Level - (Average Consumption Rate × Average Re-order Period)

(iv) Obsolescence- Obsolescence is defined as "the loss in the intrinsic value of an asset due to its supersession". In simple words, obsolescence refers to the loss in the value of an asset due to technological advancements.

Treatment: Materials may become obsolete under any of the following circumstances:

(i) where it is a spare part or a component of a machinery that is used in manufacturing and is now obsolete;

(ii) where it is used in the manufacturing of a product which has now become obsolete;

(iii) where the material itself is replaced by another material due to either improved quality or fall in price.

In all the three cases, the value of the obsolete material held in stock is a total loss and immediate steps should be taken to dispose it off at the best available price. The loss arising out of obsolete materials is an abnormal loss and it does not form part of the cost of manufacture.

Question 48

Write a short note on VED analysis of Inventory Control.

(PYP July '21)

Answer 48

Vital, Essential and Desirable (VED): Under this system of inventory analysis, inventories are classified on the basis of its criticality for the production function and final product. Generally, this classification is done for spare parts which are used for production.

(i) Vital- Items are classified as vital when its unavailability can interrupt the production process and cause a production loss. Items under this category are strictly controlled by setting re-order level.

(ii) Essential- Items under this category are essential but not vital. The unavailability may cause sub standardization and loss of efficiency in production process. Items under this category are reviewed periodically and get the second priority.

(iii) Desirable- Items under this category are optional in nature; unavailability does not cause any production or efficiency loss.

Important Note:-

It was a theoretical question requiring examinees to write a short note on the concept of VED analysis of Inventory Control. Performance of the examinees was below average.

Question 49

EXPLAIN the concept of "ABC Analysis" as a technique of inventory control.

(Study material)

Answer 49

ABC Analysis: This system exercises discriminating control over different items of inventory on the basis of the investment involved. Usually the items are classified into three categories according to their relative importance, namely, their value and frequency of replenishment during a period.

(i) 'A' Category: This category of items consists of only a small percentage i.e., about 10% of the total items handled by the stores but require heavy investment about 70% of inventory

value, because of their high prices or heavy requirement or both. Items under this category can be controlled effectively by using a regular system which ensures neither over-stocking nor shortage of materials for production. Such a system plans its total material requirements by making budgets. The stocks of materials are controlled by fixing certain levels like maximum level, minimum level and re-order level.

(ii) 'B' Category: This category of items is relatively less important; they may be 20% of the total items of material handled by stores. The percentage of investment required is about 20% of the total investment in inventories. In the case of these items, as the sum involved is moderate, the same degree of control as applied in 'A' category of items is not warranted. The orders for the items, belonging to this category may be placed after reviewing their situation periodically.

(iii) 'C' Category: This category of items does not require much investment; it may be about 10% of total inventory value but they are nearly 70% of the total items handled by store. For these categories of items, there is no need of exercising constant control. Orders for items in this group may be placed either after six months or once in a year, after ascertaining consumption requirements. In this case the objective is to economies on ordering and handling costs.

Advantages of ABC analysis:

The advantages of ABC analysis are the following:

(i) Continuity in production: It ensures that, without there being any danger of interruption of production for want of materials or stores, minimum investment will be made in inventories of stocks of materials or stocks to be carried.

(ii) Lower cost: The cost of placing orders, receiving goods and maintaining stocks is minimized especially if the system is coupled with the determination of proper economic order quantities.

(iii) Less attention required: Management time is saved since attention need to be paid only to some of the items rather than all the items, as would be the case if the ABC system was not in operation.

(iv) Systematic working: With the introduction of the ABC system, much of the work connected with purchases can be systematized on a routine basis, to be handled by subordinate staff.

(2) Fast Moving, Slow Moving and Non-Moving (FSN) Inventory: It is also known as FNS (Fast, Normal and Slow moving) classification of inventory analysis. Under this system, inventories are controlled by classifying them on the basis of frequency of usage. The classification of items into these three categories depends on the nature and managerial discretion. A threshold range on the basis of inventory turnover is decided and classified accordingly.

(i) Fast Moving- This category of items is placed nearer to store issue point and the stock is reviewed frequently for making of fresh orders.

(ii) Slow Moving- This category of items is stored little far and stock is reviewed periodically for any obsolescence, and may be shifted to Non-moving category.

(iii) Non-Moving- This category of items is kept for disposal. This category of items is reported to the management and an appropriate provision for loss may be created.

Some of the reasons for slow moving and non-moving inventories are stated below:

(i) Failure of production management to communicate the updated requirement to the stores management

(ii) Technological upgradation in terms of new machine requiring new kind of material or existing material becoming obsolete.

(iii) Lack of periodic review of inventories.

By careful observation, timely identification and adoption of inventory management techniques such as maintenance of minimum level or just in time approach, one can manage slow moving and non-moving inventories. We may calculate inventory turnover ratio and present the reports of comparison of actual and standards with variations, if any to the management.

(3) Vital, Essential and Desirable (VED): Under this system of inventory analysis, inventories are classified on the basis of its criticality for the production function and final product. Generally, this classification is done for spare parts which are used for production.

(i) Vital- Items are classified as vital when its unavailability can interrupt the production process and cause a production loss. Items under this category are strictly controlled by setting re-order level.

(ii) Essential- Items under this category are essential but not vital. The unavailability may cause sub standardization and loss of efficiency in production process. Items under this category are reviewed periodically and get the second priority.

(iii) Desirable- Items under this category are optional in nature, unavailability does not cause any production or efficiency loss.

For instance, in hospital administration, stock of medicines and essential chemicals are categorized as VED or FSN inventory. In case of life saving, rare and critical drugs, they are being categorized as vital inventory. They are the ones whose unavailability can interrupt smooth service. Those inventories which are optional or substitutes, not leading to loss in efficiency would be categorized as desirable inventories. FNS categorization helps the store keepers in hospitals to keep a check on medicines whose expiry date is close and needs to be disposed off at the earliest. The quantity of slow-moving drugs are maintained accordingly.

(4) High Cost, Medium Cost, and Low Cost (HML) Inventory: Under this system, inventory is classified on the basis of the cost of an individual item, unlike ABC analysis where inventories are classified on the basis of overall value of inventory. A range of cost is used to classify the inventory items into the three categories. High-Cost inventories are given more priority for control, whereas Medium-cost and Low-cost items are comparatively given lesser priority.

Question 50

The rate of change in the composition of employee force over the average number of employees for the year is computed as 9% under 'separation method'. However, the same

rate is computed as 15% and 30% under 'replacement method' and 'flux method' respectively.

Considering the average number of employees on roll during the year as 200, FIND OUT the number of employees -

(i) replaced, (ii) left and discharged and (iii) recruited and joined

(a) Replaced- 18 employees, left and discharged- 30 employees and recruited & joined- 42 employees

(b) Replaced- 30 employees, left and discharged- 42 employees and recruited & joined- 18 employees

(c) Replaced- 30 employees, left and discharged- 18 employees and recruited & joined- 42 employees

(d) Replaced- 42 employees, left and discharged- 18 employees and recruited & joined- 30 employees

(MTP Jan 2025)

Answer 50

(c) Replaced- 30 employees, left and discharged- 18 employees and recruited & joined- 42 employees

(i) Number of employees replaced:

Employee Turnover rate (Replacement method)

$$= \left(\frac{\text{No. of Replacements}}{\text{Average number of employees on roll}} \times 100\right)$$

Or, $\left(\frac{15}{100}\right) = \left(\frac{\text{No. of Replacements}}{200}\right)$

Or, Number of Replacements = $\left(\frac{200 \times 15}{100}\right)$ =30

(ii) Number of employees left and discharged:

Employee turnover rate (Separation method)

$= \left(\frac{\text{No. of Seprations(S)}}{\text{Average number of employees on roll}} \times 100\right)$

Or, $\left(\frac{9}{100}\right) = \left(\frac{S}{200}\right)$

Or, S =18

Hence, number of employees left and discharged = 18

(iii) Number of employees recruited and joined:

Employee turnover rate (Flux method)

$= \left(\frac{\text{No. of Seprations(S)+No.of Accessions (A)}}{\text{Average number of employees on roll}} \times 100\right)$

Or, $\left(\frac{30}{100}\right) = \left(\frac{18+A}{200}\right)$

Or, A = $\left(\frac{6000}{100} - 18\right)$ = 42

Hence, number of employees recruited and joined = 42

Topic 19 Case Studies / Practical Problems

Case Scenarios

Question 51

The purchase committee of A Ltd. has been entrusted to review the material procurement policy of the company. The chief marketing manager has appraised the committee that the company at present produces a single product X by using two raw materials A and B in the ratio of 3:2. Material A is perishable in nature and has to be used within 10 days from Goods

received note (GRN) date otherwise material becomes obsolete. Material B is durable in nature and can be used even after one year. Material A is purchased from the local market within 1 to 2 days of placing order. Material B, on the other hand, is purchased from neighboring state and it takes 2 to 4 days to receive the material in the store.

The purchase price of per kilogram of raw material A and B is Rs.30 and Rs.44 respectively exclusive of taxes. To place an order, the company has to incur an administrative cost of Rs.1, 200. Carrying cost for Material A and B is 15% and 5% respectively. At present material A is purchased in a lot of 15,000 kg. to avail 10% discount on market price. GST applicable for both the materials is 18% and the input tax credit is availed.

The sales department has provided an estimate that the company could sell 30,000 kg. In January 2024 and also projected the same trend for the entire year.

The ratio of input and output is 5:3. Company works for 25 days in a month and production is carried out evenly.

(Study material)

The following queries/ calculations to be kept ready for purchase committees' reference:

(i) For the month of January 2024, what would be the quantity of the materials to be requisitioned for both material A and B?

(a) 9,000 kg & 6,000 kg respectively

(b) 18,000 kg & 12,000 kg respectively

(c) 27,000 kg & 18,000 kg respectively

(d) 30,000 kg & 20,000 kg respectively.

Ans. - (d) Monthly Production of X = 30,000 kgs.

Raw Material Required = $\frac{30,000}{3}$x5 =50,000 kgs.

Material A= $\frac{50,000}{5}$x 3 = 30,000 kg.

Material B= $\frac{50,000}{5}$x 2 = 20,000 kg.

(ii) The economic order quantity (EOQ) for both the material A & B:

(a) 13,856 kg & 16,181 kg respectively

(b) 16,197 kg & 17,327 kg respectively

(c) 16,181 kg & 17,165 kg respectively

(d) 13,197 kg & 17,165 kg respectively

Ans. - (a) Calculation of Economic Order Quantity (EOQ):

Material A= $\sqrt{\frac{2\times Annualconsumption\times Ordercost}{Carryingcostperunitp.a.}}$

= $\sqrt{\frac{2\times(30,000x12)\times 1,200}{15\%\ of\ 30}}$ =13,856 kg.

Material B= $\sqrt{\frac{2\times(20,000x12)\times 1,200}{5\%\ of\ 44}}$ =16,181 kg.

(iii) What would the maximum stock level for material A:

(a) 18,200 kg.

(b) 12,000 kg.

(c) 16,000 kg.

(d) 16,200 kg.

Ans. - (b) Calculation of Maximum Stock level: Since, the Material A is perishable in nature and it required to be used within 10 days, hence, the Maximum Stock Level shall be lower of two:

(a) Stock equal to 10 days consumption

= $\frac{30,000}{25}$x 10 days =12,000 kg.

(b) Maximum Stock Level for Material A:

Re-order Quantity + Re-order level – (Min consumption* × Min. lead time)

Where,

Re-order Quantity = 15,000 kg.

Re-order level = Max. Consumption* × Max. Lead time

= 30,000/25 × 2 days = 2,400 kg.

Maximum stock Level = 15,000 kg. + 2,400 kg. - (30,000/25 × 1 day)

= 17,400 – 1,200 = 16,200 kg.

Stock required for 10 days consumption is lower than the maximum stock level calculated through the formula. Therefore, Maximum Stock Level will be 12,000 kg.

(*Since, production is processed evenly throughout the month hence material consumption will also be even.)

(iv) Calculate saving/ loss in purchase of Material A if the purchase order quantity is equal to EOQ.

(a) Profit of Rs. 3, 21,201.

(b) Loss of Rs. 3, 21,201.

(c) Profit of Rs.2, 52,500.

(d) Loss of Rs. 2, 52,500.

Ans. - (b) Calculation of Savings/ loss in Material A if purchase quantity equals to EOQ.

	Purchase Quantity = 15,000 kg.	**Purchase Quantity = EOQ i.e. 13,856 kg.**
Annual consumption	3,60,000 kg. (30,000 × 12 months)	3,60,000 kg. (30,000 × 12 months)
No. of orders [Note- (i)]	30 (3,60,000 ÷ 12,000)	30 (3,60,000 ÷ 12,000)
Ordering Cost (a)	Rs.36,000 (Rs.1200 × 30)	Rs.36,000 (Rs.1200 × 30)
Carrying Cost (b) [Note- (ii)]	Rs.30,375 (15% of Rs.27 × 7,500)	Rs.31,176 (15% of Rs.30 × 6,928)
Purchase Cost (c) (for good portion)	Rs.97,20,000 (Rs.27 × 3,60,000)	Rs.1,08,00,000 (Rs.30 × 3,60,000)
Loss due to obsolescence (d) [Note- (iii)]	Rs.24,30,000 [Rs.27 × (30 × 3,000)]	Rs.16,70,400 [Rs.30 × (30 × 1,856)]
Total Cost [(a) + (b) + (c) + (d)]	Rs.1,22,16,375	Rs. 1,25,37,576

Purchasing of material -A at present policy of 15,000 kg. Saves Rs. 3, 21,201.

Notes: (i) Since, material gets obsolete after 10 days, the quantity in excess of 10 days consumption i.e. 12,000 kg. are wasted. Hence, after 12,000 kg. a fresh order needs to be given.

(ii) Carrying cost is incurred on average stock of Materials purchased.

(iii) The excess quantity of material becomes obsolete and loss has to be incurred.

(v) What would the minimum stock level for material A:

(a) 1,800 kg.

(b) 1,200 kg.

(c) 600 kg.

(d) 2,400 kg.

Ans. - (c) Minimum Stock Level for Material A

= Re-order level – (Average Consumption Rate x Average Reorder Period)

= 2400 – (1200 x 1.5) = 600 kgs

Re-order level = Max. Consumption* × Max. Lead time

= 30,000/25 × 2 days = 2,400 kg.

Average Consumption Rate = (30,000/25 + 30,000/25)/2

= 1,200 Kg

Average Re-order Period = (1 + 2)/2 =1.5 Days

Stock required for 10 days consumption is lower than the maximum stock level calculated through the formula. Therefore, Maximum Stock Level will be 12,000 kg.

(*Since, production is processed evenly throughout the month hence material consumption will also be even.)

Chapter 3

Employee Cost and Direct Expenses

Topic 1 Time Keeping & Time Booking

Descriptive Question

Question 1

Z Ltd is working by employing 50 skilled workers. It is considering the introduction of an incentive scheme - either Halsey Scheme (with 50% Bonus) or Rowan Scheme - of wage payment for increasing the labour productivity to adjust with the increasing demand for its products by 40%. The company feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient incentive for them to produce more and the company has accordingly given assurance to the workers. Because of this assurance, an increase in productivity has been observed as revealed by the figures for the month of April, 2020:

Hourly rate of wages (guaranteed)	**Rs. 50**
Average time for producing one unit by one worker at the previous performance (this may be taken as time allowed)	**1.975 hours**
Number of working days in a month	**24**
Number of working hours per day of each worker	**8**
Actual production during the month	**6,120 units**

Required:

(i) Calculate the effective increase in earnings of workers in percentage terms under Halsey and Rowan scheme.

(ii) Calculate the savings to Z Ltd in terms of direct labour cost per unit under both the schemes.

(iii) Advise Z Ltd about the selection of the scheme that would fulfil its assurance of incentivizing workers and also to adjust with the increase in demand.

(PYP Jan 21) (Same concept different figures Old & New SM)

Answer 1

Working Notes:

1. Total time wages of 50 workers per month:

= No. of working days in the month × No. of working hours per day of each worker × Hourly rate of wages × No. of workers

= 24 days × 8 hrs. × Rs. 50 × 50 workers = Rs. 4, 80,000

2. Time saved per month:

Time allowed per unit to a worker 1.975 hours

No. of units produced during the month by 50 workers 6,120 units

Total time allowed to produce 6,120 units (6,120 × 1.975 hrs.) 12,087 hours

Actual time taken to produce 6,120 units (24 days × 8 hrs. × 50 workers) 9,600 hours

Time saved (12,087 hours – 9,600 hours) 2,487 hours

3. Bonus under Halsey scheme to be paid to 50 workers: Bonus

= (50% of time saved) × hourly rate of wages

= 50/100 × 2,487 hours × Rs. 50 = Rs. 62,175

Total wages to be paid to 50 workers are (Rs. 4, 80,000 + Rs. 62,175) Rs. 5, 42,175, if Z Ltd. considers the introduction of Halsey Incentive Scheme to increase the worker productivity.

4. Bonus under Rowan Scheme to be paid to 50 workers:

Bonus = $\frac{\text{Time taken}}{\text{Time allowed}} \times Time\ Saved \times hourly\ rate$

= $\frac{9{,}600 \text{ hours}}{12{,}087 \text{ hours}} \times 2{,}487\ hours \times Rs.\ 50 = Rs.\ 98{,}764$

Total wages to be paid to 50 workers are (Rs. 4, 80,000 + Rs. 98,764) Rs. 5, 78,764, if Z Ltd. Considers the introduction of Rowan Incentive Scheme to increase the worker productivity.

(i) (a) Effective hourly rate of earnings under Halsey scheme:

(Refer to Working Notes 1, 2 and 3)

= $\frac{\text{Total time wages of 50 workers+Total bonus under Halsey scheme}}{\text{Total hours worked}}$

= $\frac{Rs.4{,}80{,}000+Rs.62{,}175}{9{,}600\ hours}$ = Rs. 56.48

Effective increase in earnings of worker (in %) = $\frac{Rs.56.48-Rs.50}{Rs.50} \times 100 = 2.96\%$

(b) Effective hourly rate of earnings under Rowan scheme:

(Refer to Working Notes 1, 2 and 4)

= $\frac{\text{Total time wages of 50 workers+Total bonus under Halsey scheme}}{\text{Total hours worked}}$

= $\frac{\text{Rs.4,80,000+Rs.96,875}}{\text{9,600 hours}}$ = Rs. 60.29

Effective increase in earnings of worker (in %) = $\frac{\text{Rs.60.29}-\text{Rs.50}}{\text{Rs.50}} \times 100 = 20.58\%$

(ii) (a) Saving in terms of direct labour cost per unit under Halsey scheme:

(Refer to Working Note 3)

Labour cost per unit (under time wage scheme)

= 1.975 hours × Rs. 50 = Rs. 98.75

Labour cost per unit (under Halsey scheme)

$= \frac{\text{Total wages paid under the schem}}{\text{Total number of units produced}} = \frac{\text{Rs.5,42,175}}{6,120}$ = Rs.88.60

Saving per unit = Rs. 98.75 – Rs. 88.60 = Rs. 10.15

(b) Saving in terms of direct worker cost per unit under Rowan Scheme:

(Refer to Working Note 4)

Labour cost per unit under Rowan scheme = Rs. 5, 78,764/6,120 units= Rs. 94.57 Saving per unit = Rs. 98.75 – Rs. 94.57 = Rs. 4.18

(iii) Calculation of Productivity:

Normal Production Hours worked/Unit per Hour	4,861
(9,600/1.975) Actual Production Units	6,120
Increase in labour productivity	1,259
% Productivity i.e. increase in production/Normal production	25.9%

Advice: Rowan plan fulfils the company's assurance of 20% increase over the present earnings of workers. This would increase productivity by 25.9% only. It will not adjust with the increase in demand by 40%.

MCQ

Question 2

The rate of change in the composition of employee force over the average number of employees for the year is computed as 9% under 'separation method'. However, the same

rate is computed as 15% and 30% under 'replacement method' and 'flux method' respectively.

Considering the average number of employees on roll during the year as 200, FIND OUT the number of employees -

(i) replaced, (ii) left and discharged and (iii) recruited and joined

(a) Replaced- 18 employees, left and discharged- 30 employees and recruited & joined- 42 employees

(b) Replaced- 30 employees, left and discharged- 42 employees and recruited & joined- 18 employees

(c) Replaced- 30 employees, left and discharged- 18 employees and recruited & joined- 42 employees

(d) Replaced- 42 employees, left and discharged- 18 employees and recruited & joined- 30 employees

(MTP Jan 2025)

Ans: (c) Replaced- 30 employees, left and discharged- 18 employees and recruited & joined- 42 employees

(i) Number of employees replaced:

Employee Turnover rate (Replacement method)

$= \left(\frac{\text{No. of Replacements}}{\text{Average number of employees on roll}} \times 100\right)$

Or, $\left(\frac{15}{100}\right) = \left(\frac{\text{No. of Replacements}}{200}\right)$

Or, Number of Replacements = $\left(\frac{200 \times 15}{100}\right)$ =30

(ii) Number of employees left and discharged:

Employee turnover rate (Separation method)

$= \left(\frac{\text{No. of Seprations(S)}}{\text{Average number of employees on roll}} \times 100\right)$

Or, $\left(\frac{9}{100}\right) = \left(\frac{S}{200}\right)$

Or, S =18

Hence, number of employees left and discharged = 18

(iii) Number of employees recruited and joined:

Employee turnover rate (Flux method)

$= \left(\frac{\text{No. of Seprations(S)+No.of Accessions (A)}}{\text{Average number of employees on roll}} \times 100\right)$

Or, $\left(\frac{30}{100}\right) = \left(\frac{18+A}{200}\right)$

Or, A = $\left(\frac{6000}{100} - 18\right)$ = 42

Hence, number of employees recruited and joined = 42

Topic 2 Steps in Setting Labour Time Standards

Descriptive Question

Question 3

Discuss the accounting treatment of Idle time and overtime wages.

(MTP May'20, April '19, RTP May'19, Old & New SM)

Answer 3

Accounting treatment of idle time wages & overtime wages in cost accounts: Normal idle time is treated as a part of the cost of production. Thus, in the case of direct workers, an

allowance for normal idle time is built into the labour cost rates. In the case of indirect workers, normal idle time is spread over all the products or jobs through the process of absorption of factory overheads.

Under Cost Accounting, the overtime premium is treated as follows:

If overtime is resorted to at the desire of the customer, then the overtime premium may be charged to the job directly.

If overtime is required to cope with general production program or for meeting urgent orders, the overtime premium should be treated as overhead cost of particular department or cost center which works overtime.

Overtime worked on account of abnormal conditions should be charged to costing Profit & Loss Account. If overtime is worked in a department due to the fault of another department the overtime premium should be charged to the latter department.

OR

Normal idle time: It is the time which cannot be avoided or reduced in the normal course of business. It is treated as a part of cost of production. Thus, in the case of direct workers an allowance for normal idle time is considered setting of standard hours or standard rate. In case of indirect workers, normal idle time is considered for the computation of overhead rate.

Abnormal idle time: Apart from normal idle time, there may be factors which give rise to abnormal idle time. Abnormal idle time cost is not included as a part of production cost and is shown as a separate item in the Costing Profit and Loss Account. The cost of abnormal idle time should be further categorized into controllable and uncontrollable. For each category, the break-up of cost due to various factors should be separately shown. This would help the management in fixing responsibility for controlling idle time. Management should aim at eliminating controllable idle time and on a long- term basis reducing even the normal idle time. This would require a detailed analysis of the causes leading to such idle time.

Causes of Overtime and Treatment of Overtime premium in cost accounting

Causes	Treatment
(1) The customer may agree to bear the entire charge of overtime because urgency of work.	(1) If overtime is resorted to at the desire of the customer, then overtime premium may be charged to the job directly.
(2) Overtime may be called for to make up any shortfall in production due to some unexpected development.	(2) If overtime is required to cope with general production programmes or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.
(3) Overtime work may be necessary to make up a shortfall in production due to some fault of management.	(3) If overtime is worked in a department due to the fault of another department, the overtime premium should be charged to the latter department.
(4) Overtime work may be resorted to, to secure an out-turn in excess of the normal output to take advantage of an expanding market or of rising demand	(4) Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost, but to Costing Profit and Loss Account.

Question 4

Discuss the steps involved in setting labour time standards.

(PYP Dec '21)

Answer 4

Procedure of Setting Labour Time Standards

The following are the steps involved in setting labour standards:

(a) Standardization: Products to be produced are decided based on production plan and customer's order.

(b) Labour specification: Types of labour and labour time is specified. Labour time specification is based on past records and it takes into account normal wastage of time.

(c) Standardization of methods: Selection of proper machines to use proper sequence and method of operations.

(d) Manufacturing layout: A plan of operation for each product listing the operations to be performed is prepared.

(e) Time and motion study: It is conducted for selecting the best way of completing the job or motions to be performed by workers and the standard time which an average worker will take for each job. This also takes into account the learning efficiency and learning effect.

(f) Training and trial: Workers are trained to do the work and time spent at the time of trial run is noted down.

Important Note:-

This theory question to discuss steps involved in setting Labour Time Standards. Majority of the examinees were unable to answer it correct. Performance of the examinees was poor.

Topic 3 Labour Turnover – Concepts & Calculation

Descriptive Question

Question 5

Anirban Ltd. wants to ascertain the profit lost during the year 20X8-X9 due to increased labour turnover. For this purpose, they have given you the following information

(1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.

(2) 20% of the output during training period was defective. Cost of rectification of a defective unit was Rs.25.

(3) Potential productive hours lost due to delay in recruitment were 1, 00,000 hours.

(4) Selling price per unit is Rs.180 and P/V ratio is 20%.

(5) Settlement cost of the workers leaving the organization was Rs.1, 83,480.

(6) Recruitment cost was Rs.1, 56,340

(7) Training cost was Rs.1, 13,180.

You are required to CALCULATE the profit lost by the company due to increased labour turnover during the year 2018-19.

(MTP April '19 & Sep '23, RTP May '18)

Answer 5

Output by experienced workers in 50,000 hours = 50,000/10= 5,000 units

Output by new recruits = 60% of 5,000 = 3,000 units

Less of output = 5,000 – 3,000 = 2,000 units

Total loss of output = 10,000 + 2,000 = 12,000 units

Contribution per unit = 20% of 180 = Rs.36

Total contribution cost = 36 × 12,000 = Rs.4, 32,000

Cost of repairing defective units = 3,000 × 0.2 × 25 = Rs.15, 000

Profit forgone due to labour turnover

	(Rs.)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2018-19	9,00,000

Question 6

RST Company Ltd. has computed labour turnover rates for the quarter ended 31st March, 2017 as 20%, 10% and 5% under flux method, replacement method and separation method respectively. If the number of workers replaced during that quarter is 50.

Calculate:

(i) Workers recruited and joined

(ii) Workers left and discharged and

(iii) Average number of workers on roll.

(MTP Oct'18,) (Same concept different figures MTP Mar'21, MTP Oct'22)

Answer 6

Labour Turnover Rate (Replacement Method) $= \frac{\text{No.of Workers replaced}}{\text{Average no.of workers}} \times 100$

Or, $\frac{10}{100} = \frac{50}{\text{Average no.of workers}}$

Thus, Average No. of workers = 500

Labour Turnover Rate (Separation Method) = $\frac{\text{No.of Workers replaced}}{\text{Average no.of workers}} \times 100$

Or, $\frac{10}{100} = \frac{\text{Average no.of workers}}{50}$

Thus, No. of workers separated =25

Labour Turnover Rate (Flux Method) = $\frac{\text{No.of Separations+No.of Accession (Joinings)}}{\text{Average no.of workers}} \times 100$

Or, $\frac{20}{100} = \frac{25+ \text{No.of Accession (Joinings)}}{500}$

Or, 100(25+No.of Accessions) = 10,000

Or, 25+No. of Accessions = 100

Thus, No. of Accessions = 100-25=75

Accordingly,

(i) Workers recruited and Joined = 75

(ii) Workers left and discharged = 25

(iii) Average number of workers on roll = 500

Question 7

A company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three workers, which are under consideration of the management.

	I	II	III

Actual hours worked	380	100	540
Hourly rate of wages (in Rs.)	40	50	60
Productions in units:			
- Product A	210	-	600
- Product B	360	-	1350
- Product C	460	250	-
Standard time allowed per unit of each product is:			
	A	B	C
Minutes	15	20	30

For the purpose of piece rate, each minute is valued at Rs. 1/- You are required to COMPUTE the wages of each worker under:

(i) Guaranteed hourly rate basis.

(ii) Piece work earning basis, but guaranteed at 75% of basic pay (Guaranteed hourly rate if his earnings are less than 50% of basic pay.)

(iii) Premium bonus basis where the worker received bonus based on Rowan scheme.

(MTP May '20, RTP May'19)(Same concept different figures MTP Nov'21)

Answer 7

(i) Computation of Wages of Each Worker Under Guaranteed Hourly Rate Basis

Worker	Actual hours worked (Hours)	Hourly wage rate (Rs.)	Wages (Rs.)
I	380	40	15,200
II	100	50	5,000
III	540	60	32,400

(ii) Computation of Wages of each worker under piece work earning basis

Product	Piece rate per unit (Rs.)	Worker-I		Worker-II		Worker-III	
		Units	Wages(Rs.)	Units	Wages(Rs.)	Units	Wages(Rs.)
A	15	210	3,150	-	-	600	9,000
B	20	360	7,200	-	-	1,350	27,000
C	30	460	13,800	250	7,500	-	-
Total			24,150		7,500		36,000

Since each worker's earnings are more than 50% of basic pay. Therefore, worker -I, II and III will be paid the wages as computed i.e. Rs. 24,150, Rs. 7,500 and Rs. 36,000 respectively.

Working Note:

a. Piece rate per unit

Product	Standard time per unit in minute	Piece rate each minute (Rs.)	Piece rate per unit (Rs.)

A	15	1	15
B	20	1	20
C	30	1	30

(ii) Computation of wages of each worker under Premium bonus basis (where each worker receives bonus based on Rowan Scheme

Worker	Time Allowed (Hr.)	Time Taken (Hr.)	Time saved (Hr.)	Wage Rate per hour(Rs.)	Earnings (Rs.)	Bonus (Rs.)*	Total Earning (Rs.)
I	402.5	380	22.5	40	15,200	850	16,050
II	125	100	25	50	5,000	1,000	6,000
III	600	540	60	60	32,400	3,240	35,640

Working Note:

1. Time allowed to each worker

Worker	Product-A	Product-B	Product-C	Total Time (Hours)
I	210 units × 15= 3,150	360 units × 20= 7,200	460 units × 30= 13,800	24,150/60 = 402.50
II	-	-	250 units × 30 = 7,500	7,500/60 = 125

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III	600 units × 15 = 9,000	1, 350 units × 20= 27,000	-	36,000/60= 600

Time Taken / Time Allowed X Time Saved × Wage Rate

Worker-I = $\frac{380}{402.5}$ × 22.5 ×40 = 850

Worker- II = $\frac{100}{125}$ × 25 ×50 = 1,000

Worker- III = $\frac{540}{600}$ × 60 ×60 = 3,240

Question 8

HR Ltd. is progressing in its legal industry. One of its trainee executives, Mr. H, in the Personnel department has calculated labour turnover rate 24.92% for the last year using Flux method.

Following is the data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Records clerk	**810**	**1,620**	**90**	**2,340**
Human Resource Manager	**?**	**30**	**90**	**60**
Legal Secretary	**?**	**90**	**--**	**?**
Staff Attorney	**?**	**30**	**30**	**?**
Associate Attorney	**?**	**30**	**--**	**45**
Senior Staff Attorney	**6**	**--**	**--**	**18**

Senior Records clerk	**12**	**--**	**--**	**51**
Litigation attorney	**?**	**--**	**--**	**?**
Employees transferred from the Subsidiary Company				
Senior Staff Attorney	**--**	**12**	**--**	**--**
Senior Records clerk	**--**	**39**	**--**	**--**
Employees transferred to the Subsidiary Company				
Litigation attorney	**--**	**--**	**90**	**--**
Associate Attorney	**--**	**--**	**15**	**--**

At the beginning of the year there were total 1,158 employees on the payroll of the company. The opening strength of the Legal Secretary, Staff Attorney and Associate Attorney were in the ratio of 3: 3: 2.

The company has decided to abandon the post of Litigation attorney and consequently all the Litigation attorneys were transferred to the subsidiary company.

The company and its subsidiary are maintaining separate set of books of account and separate Personnel Department.

You are required to:

(a) CALCULATE Labour Turnover rate using Replacement method and Separation method.

(b) VERIFY the Labour turnover rate calculated under Flux method by Mr. H

(RTP Nov'22)

Answer 8

Working Notes:

(i) Calculation of no. of employees at the beginning and end of the year

	At the Beginning of the year	**At the end of the year**
Records clerk	810	2,340
Human Resource Manager [Left- 90 + Closing- 60 – Joined- 30]	120	60
Legal Secretary*	45	135
Staff Attorney*	45	45
Associate Attorney*	30	45
Senior Staff Attorney	6	18
Senior Records clerk	12	51
Litigation attorney	90	0
Total	1,158	2,694

(*) At the beginning of the year:

Strength of Legal Secretary, Staff Attorney and Associate Attorney = [1158 – {810 + 120 + 6 + 12 + 90} employees] or [1158 – 1038 = 120 employees]

[{Legal Secretary - $120 \times \frac{3}{8}$ = 45 & Associate Attorney - $120 \times \frac{3}{8}$ = 30employees}]

At the end of the year:

[Legal Secretary -(Opening 45 + 90 Joining) = 135; Staff Attorney - (Opening 45 + 30 Joined – 30 Left) = 45]

(ii) No. of Employees Separated, Replaced and newly recruited during the year

Particulars	Separations	New Recruitment	Replacement	Total Joining
Records clerk	90	1,530	90	1,620
Human Resource Manager	90	--	30	30
Legal Secretary	--	90	--	90
Staff Attorney	30	--	30	30
Associate Attorney	15	15	15	30
Senior Staff Attorney	--	12	--	12
Senior Records clerk	--	39	--	39
Litigation attorney	90	--	--	--
Total	315	1,686	165	1,851

(Since, HR Ltd. and its subsidiary are maintaining separate Personnel Department, so transfer-in and transfer-out are treated as recruitment and separation respectively.)

(a) Calculation of Labour Turnover rate:

Replacement Method= $\frac{\text{No.of employees replaced during the year}}{\text{Average no. of employees onroll}} \times 100$

$= \frac{165}{(1,158+2,694)/2} \times 100$

$= \frac{165}{1,926} \times 100 = 8.57\%$

Separation Method= $\frac{\text{No.of employees separated duringthe year}}{\text{Average no. of employees onroll}} \times 100$

$= \frac{315}{1,926} \times 100 = 16.36\%$

(b) Labour Turnover rate under Flux Method:

$= \frac{\text{No.of employees(Joined + Separated)duringthe year}}{\text{Average no. of employees onroll}} \times 100$

$= \frac{\text{No.of employees (Replaced + New recruited + Separated) during the year}}{\text{Average no.of employees on roll}} \times 100$

$= \frac{1,851+315}{1,926} \times 100 = 112.46\%$

Labour Turnover rate calculated by Mr. H is incorrect as it seems he has not taken the No. of new recruitment while calculating the labour turnover rate under Flux method.

Question 9

Following information is given of a newly setup organization for the year ended on 31st March, 2021.

Number of workers replaced during the period	**50**
Number of workers left and discharged during the period	**25**
Average number of workers on the roll during the period	**500**

You are required to:

(i) Compute the Employee Turnover Rates using Separation Method and Flux Method.

(ii) Equivalent Employee Turnover Rates for (i) above, given that the organization was setup on 31st January, 2021.

(PYP July '21)

Answer 9

(i) Employee Turnover rate:

Using Separation method:

$$= \frac{\text{Number of employees Separated during the period}}{\text{Averange number of employees during the period on roll}} \times 100$$

$$= \frac{25}{500} \times 100 = 5\%$$

Using Flux method:

$$= \frac{\text{Number of employees Separated+Number of employees Replaced During the Period}}{\text{Averange number of employees during the period on roll}} \times 100$$

$$= \frac{50+25}{500} \times 100 = 15\%$$

(ii) Equivalent Employee Turnover Rate:

$$= \frac{\text{Employee Turn over rate for the period}}{\text{Number of Days in the period}} \times 365$$

Using Separation method = 5/60 X 365 = 30.42%

Or, = 5/60 X 360 = 30%

Or, 5/2 X 12 = 30%

Using Flux method = 15/60 × 365 =91.25%

Or, = 15/60 X 360 = 30%

Or, 15/2 X 12 = 30%

Important Note:-

It was a practical problem requiring computation of Employee turnover rates and Equivalent employee turnover rates by using separation method and flux method. Most of the examinees were not well acquainted with the concept of equivalent employee turnover rates. Performance of the examinees was below average.

Question 10

Rowan Premium Bonus system does not motivate a highly efficient worker as a less efficient worker and a highly efficient worker can obtain same bonus under this system. Discuss with an example.

(PYP July 21)

Answer 10

Rowan Premium Plan: According to this system a standard time allowance is fixed for the performance of a job and bonus is paid if time is saved.

Under Rowan System, the bonus is that proportion of the time wages as time saved bears to the standard time.

Bonus = $\frac{\text{Time taken}}{\text{Time allowed}} \times Time\ Saved \times hourly\ rate$

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Example explaining highly efficient worker and less efficient worker obtaining same bonus:

Time rate (per Hour)	Rs. 60
Time allowed	8 hours.
Time taken by 'X'	6 hours.
Time taken by 'Y'	2 hours.

Bonus = $\frac{\text{Time taken}}{\text{Time allowed}} \times Time\ Saved \times hourly\ rate$

For 'X' = $\frac{2\ \text{hours}}{8\ hours} \times 6\ hours \times Rs.\ 60$ = Rs. 90

For 'Y' = $\frac{6\ \text{hours}}{8\ hours} \times 2\ hours \times Rs.\ 60$ = Rs. 90

From the above example, it can be concluded that a highly efficient worker may obtain same bonus as less efficient worker under this system.

Important Note:-

It was a theoretical question on Rowan Premium Bonus Plan testing the knowledge of the examinees that in what situation efficient and less efficient workers will get the same bonus. Majority of examinees did not answer properly. Performance of the examinees was below average.

Question 11

PQR Limited has replaced 72 workers during the quarter ended 31st March 2022. The labour rates for the quarter are as follows:

Flux method	**16%**
Replacement method	**8%**
Separation method	**5%**

You are required to ascertain:

(i) Average number of workers on roll (for the quarter),

(ii) Number of workers left and discharged during the quarter,

(iii) Number of workers recruited and joined during the quarter,

(iv) Equivalent employee turnover rates for the year.

(PYP May'22, Old & New SM)

Answer 11

Working Note:

(i) Average number of workers on roll (for the quarter):

Employee Turnover rate using Replacement method

$= \frac{\text{No of replacements}}{\text{Average number of workers on roll}} \times 100$

Or, $\frac{8}{10} = \frac{72}{\text{Average number of workers on roll}} \times 100$

Average number of workers on roll = 900

(ii) Number of workers left and discharged:

Employee turnover rate (Separation method)

$= \frac{\text{No of Separations(S)}}{\text{Average number of workers on roll}} \times 100 = \frac{5}{10} = \frac{S}{900}$ Or, S = 45 Hence, number of workers left and discharged comes to 45

(iii) Number of workers recruited and joined:

Employee turnover rate (Flux method)

$= \frac{\text{No.of Separations} * (S) + \text{No.of Accessions(A)}}{\text{Average number of workers on roll}}$

Or, $\frac{16}{10} - \frac{45+A}{900}$ Or, $\left[\frac{1,44,00}{100} - 45\right] = 99$

Using Flux method = $\frac{16\%}{1} \times 4 = 64\%$

Using Replacement method= $\frac{8\%}{1} \times 4 = 32\%$

Using Separation method= $\frac{5\%}{1}$ × 4= 20%

Question 12

DISCUSS the two types of cost associated with labour turnover.

(Study material)

Answer 12

Cost of Employees (Labour) Turnover: Two types of costs which are associated with employee turnover are:

(a) Preventive Costs: The cost incurred to prevent employee turnover or keep it as lowest as possible. Cost incurred for prevention of employee turnover includes the following:

(i) Cost of medical benefit provided to the employees;

(ii) Cost incurred on employees' welfare like pension etc.

(iii) Cost on other benefits with an objective to retain employees.

(b) Replacement Costs: These are the costs which arise due to employee turnover. If employees leave soon after they acquire the necessary training and experience of good work, additional costs will have to be incurred on new workers, i.e., cost of recruitment, training and induction, abnormal breakage and scrap and extra wages and overheads due to the inefficiency of new workers.

It is obvious that a company will incur very high replacement costs if the rate of employee turnover is high. Similarly, only adequate preventive costs can keep Employee turnover at a low level. Each company must, therefore, work out the optimum level of Employee turnover keeping in view its personnel policies and the behaviour of replacement cost and preventive costs at various levels of Employee turnover rates.

MCQ

Question 13

Labour turnover is measured by-

(a) Number of persons replaced/ average number of workers

(b) Numbers of persons separated / number of workers at the beginning of the year

(c) (Number of persons replaced + number of persons separated)/ (number of persons at the beginning + the number of persons at the end of the year)

(d) None of the above

(Study material)

Ans: (a) Number of persons replaced/ average number of workers

Reason:

Labour turnover refers to the rate at which employees leave and are replaced in an organization. There are three main methods to measure it, and the one mentioned in the question is the Replacement Method, which is:

Labour Turnover (Replacement Method) = (Number of persons replaced / Average number of workers) × 100

This method focuses on how many workers were replaced, not just how many left.

Question 14

Important factors for control of employee cost can be-

(a) Time and Motion Study

(b) Control over idle time and overtime

(c) Control over employee turnover

(d) All of the above

(Study material)

Ans: (d) All of the above

Reason:

All options help control employee cost:

(a) Time and Motion Study → improves efficiency

(b) Control over idle time and overtime → avoids unnecessary wage cost

(c) Control over employee turnover → reduces hiring and training expenses

Topic 4 Incentive Schemes – Theory & Calculation

Descriptive Question

Question 15

A, B and C are three industrial workers working in Sports industry and are experts in making cricket pads. A, B and C are working in Mahi Sports, Virat Sports and Sikhar Sports companies respectively. Workers are paid under different incentive schemes. Company wise incentive schemes are as follows:

Company	Incentive scheme
Mahi Sports	Emerson's efficiency system
Virat Sports	Merrick differential piece rate system
Sikhar Sports	Taylor's differential piece work system

The relevant information for the industry is as under:

Standard working hours	**8 hours a day**
Standard output per hour (in units)	**2**
Daily wages rate	**Rs.360**
No. of working days in a week	**6 days**

Actual outputs for the week are as follows:

A	B	C
132 units	**108 units**	**96 units**

You are required to calculate effective wages rate and weekly earnings of all the three workers.

(MTP March '19)

Answer 15

Calculation of effective wages rate and weekly earnings of the workers A, B and C

Workers	**A**	**B**	**C**
Standard Output	96 units (8 hrs. × 2 units × 6 days)	96 units (8 hrs. × 2 units × 6 days)	96 units (8 hrs. × 2 units × 6 days)
Actual Output	132 units	108 units	96 units

Efficiency (%)	$\frac{132 \text{ units}}{96 \text{ units}} \times 100 = 137.5$	$\frac{108 \text{ units}}{96 \text{ units}} \times 100 = 112.5$	$\frac{96 \text{ units}}{96 \text{ units}} \times 100 = 100$
Daily wages Rate	Rs.360	Rs.360	Rs.360
Incentive system	Emerson's Efficiency System	Merrick differential piece rate system	Taylor's differential piece work system
Rate of Bonus	57.5% of time rate (20% + 37.5%)	20% of ordinary piece rate	25% of ordinary piece rate
Effective Wage Rate	Rs.70.875 per hour $\left(\frac{\text{Rs. } 360}{8 \text{ Hours}} \ 157.5\%\right)$	Rs.27 per piece $\left(\frac{\text{Rs. } 360}{16 \text{ Units}} \ 120\%)\right)$	Rs.28.125 per piece $\left(\frac{\text{Rs. } 360}{16 \text{ Units}} \ 125\%\right)$
Total weekly earnings	Rs.3,402 (8 hours × 6 days × Rs.70.875)	Rs.2,916 (108 units × Rs.27)	Rs.2,700 (96 units × Rs.28.125)

Question 16

R Ltd. is facing increasing employee turnover in the factory and before analysing the causes and taking remedial steps; the management wants to have an idea of the profit foregone as a result of employee turnover in the last year. Last year sales amounted to Rs. 99, 63,960 and P/V ratio was 20%. The total number of actual hours worked by the direct employee force was 5.34 lakhs. The actual direct employee hours included 36,000 hours attributable to training new recruits, out of which half of the hours were unproductive. As a result of the delays by the Personnel Department in filling vacancies due to employee turnover 1, 20,000 potentially productive hours (excluding unproductive training hours) were lost. The costs incurred consequent on employee turnover revealed, on analysis, the following:

Settlement cost due to leaving	**Rs. 52,584**
Recruitment costs	**Rs. 32,088**
Selection costs	**Rs. 15,300**
Training costs	**Rs. 36,588**

Assuming that the potential production lost as a consequence of employee turnover could have been sold at prevailing prices, FIND the profit foregone last year on account of employee turnover.

(MTP April '22) (Same concept different figures Old & New SM)

Answer 16

Workings:

(i) Computation of productive hours	
Actual hours worked	5,34,000
Less: Unproductive training hours	18,000
Actual productive hours	5,16,000

(ii) Productive hours lost:

Loss of potential productive hours + Unproductive training hours

= 1, 20,000 + 18,000 = 1, 38,000 hours

(iii) Loss of contribution due to unproductive hours:

Sales value / Actual productive hours ×Total unproductive hours =

Rs. 99, 63,960 / 5, 16,000 hrs. × 1, 38,000 hours = Rs. 26, 64,780

Contribution lost for 1, 38,000 hours = Rs. 26, 64,780/100 × 20= Rs. 5, 32,956

Computation of profit forgone on account of employee turnover

	(Rs.)
Contribution foregone (as calculated above)	5,32,956
Settlement cost due to leaving	52,584
Recruitment cost	32,088
Selection cost	15,300
Training costs	36,588
Profit foregone	6,69,516

Question 17

A total of 108 labour hours have been put in a particular job card for repair work engaging a semiskilled and skilled labour (Mr. Deep and Mr. Sam respectively). The hours devoted by both the workers individually on daily basis for this particular job are given below:

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
10.5	**8.0**	**10.5**	**9.5**	**10.5**

The skilled labour also worked on Saturday for 10 hours.

Sunday is a weekly holiday and each worker has to work for 8 hours on all week days and 5 hours on Saturdays; the workers are however paid full wages for Saturday (8 hours for 5 hours worked).

Semi-skilled and skilled worker is paid ordinary wage @ Rs. 400 and Rs. 600 respectively per day of 8 hours labour. Further, the workers are also paid dearness allowance @ 20%.

Extra hours worked over and above 8 hours are also paid at ordinary wage rate however, overtime premium of 100% of ordinary wage rate is paid if a worker works for more than 9 hours in a day AND 48 hours in a week.

You are required to COMPUTE the wages payable to Mr. Deep (Semi-skilled) and Mr. Sam (Skilled).

(RTP May '22)

Answer 17

Calculation of total normal hours to be paid for Mr. Deep (Semi-skilled):

Day	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
	A	**B**	**C**	**D = C×2**	**E = A+B+D**
Monday	8	1	1½	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10

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Friday	8	1	1½	3	12
Saturday	--	--	--	--	
Total	40	4	5	10	54

Calculation of total normal hours to be paid for Mr. Sam (Skilled):

Day	**Normal hours**	**Extra hours**	**Overtime hours**	**Equivalent normal hours for overtime worked**	**Total normal hours**
	A	**B**	**C**	**D = C×2**	**E = A+B+D**
Monday	8	1	1½	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	5	3*+1	1**	2	11
Total	**45**	**8**	**6**	**12**	**65**

*Mr. Sam will be paid for equivalent 8 normal working hours at ordinary wage rate, though 5 hours of working is required on Saturday. Further, extra 9th hour worked will also be paid at ordinary wage rate. ** Overtime of 1 hour worked over and above 9 hours will be paid at overtime rate.

Wages payable:

	Mr. Deep	Mr. Sam
Basic Wages per hour (Rs. 400/8, Rs. 600/8) (Rs.)	50	75
Dearness allowance per hour (@ 20%) (Rs.)	10	15
Hourly rate (Rs.)	60	90
Total equivalent normal hours	54	65
Total Wages payable (Rs.)	3,240	5,850

Question 18

A skilled worker is paid a guaranteed wage rate of Rs. 120 per hour. The standard time allowed for a job is 6 hour. He took 5 hours to complete the job. He is paid wages under Rowan Incentive Plan.

(i) Calculate his effective hourly rate of earnings under Rowan Incentive Plan.

(ii) If the worker is placed under Halsey Incentive Scheme (50%) and he wants to maintain the same effective hourly rate of earnings, calculate the time in which he should complete the job.

(RTP Nov '23)

Answer 18

(i) Effective hourly rate of earnings under Rowan Incentive Plan

Earnings under Rowan Incentive plan =

(Actual time taken X wage rate) + $\frac{\text{Time saved}}{\text{Time Allowed}}$ × Time taken × Wage rate

= (5 hours X Rs. 120) + ($\frac{\mathbf{1\ hour}}{\text{6 hours}}$ × 5 $hours \times Rs.$ 120)

= Rs. 600 +Rs. 100 = Rs. 700

(ii) Let time taken = X

∴ Effective hourly rate = $\frac{\text{Earnings under Halsay Scheme}}{\text{Time taken}}$

Or, Effective hourly rate under Halsey Incentive plan

= $\frac{(\text{Time taken} \times \text{Rate}) + 50\% \text{ of Rate} \times (\text{Time allowed} - \text{Time taken})}{\text{Time taken}}$

Or, Rs.140 = $\frac{(\text{X} \times \text{Rs.120}) + 50\% \text{ of Rs.120} \times (6 - \text{X})}{\text{X}}$

Or, 140X = 120X + 360 – 60X

Or, 80X = 360

Or, X = $\frac{360}{80}$ = 4.5 hours

Therefore, to earn effective hourly rate of Rs.140 under Halsey Incentive Scheme worker has to complete the work in 4.5 hours.

Question 19

How would you account for idle capacity cost in Cost Accounting?

(RTP Nov '23)

Answer 19

Idle capacity costs are treated in the following ways in Cost Accounts:

(i) If the idle capacity cost is due to unavoidable reasons: A supplementary overhead rate may be used to recover the idle capacity cost. In this case, the costs are charged to the production capacity utilised.

(ii) If the idle capacity cost is due to avoidable reasons: Such as faulty planning, etc. the cost should be charged to Costing Profit and Loss Account.

(iii) If the idle capacity cost is due to trade depression, etc.: Being abnormal in nature the cost should also be charged to the Costing Profit and Loss Account.

(iv) If the idle capacity cost is due to seasonal factors, then the cost should be charged to cost of production by inflating overhead rate.

Question 20

Explain the treatment of over and under absorption of overheads in cost accounts.

(RTP Nov '23)

Answer 20

Treatment of over and under absorption of overheads are:

(i) Writing off to costing P&L A/c: Small difference between the actual and absorbed amount should simply be transferred to costing P&L A/c, if difference is large then investigate the causes and after that abnormal loss/ gain shall be transferred to costing P&L A/c.

(ii) Use of supplementary Rate: Under this method the balance of under and over absorbed overheads may be charged to cost of W.I.P., finished stock and cost of sales proportionately with the help of supplementary rate of overhead.

(iii) Carry Forward to Subsequent Year: Difference should be carried forward in the expectation that next year the position will be automatically corrected.

Question 21

Distinguish between cost allocation and cost absorption.

(RTP Nov '23)

Answer 21

Distinguish between Cost allocation and Cost absorption:

Cost allocation is the allotment of whole item of cost to a cost centre or a cost unit. In other words, it is the process of identifying, assigning or allowing cost to a cost centre or a cost unit.

Cost absorption is the process of absorbing all indirect costs or overhead costs allocated or apportioned over particular cost center or production department by the units produced.

Question 22

M/s Zeba Private Limited allotted a standard time of 40 hours for a job and the rate per hour is Rs. 75.

The actual time taken by a worker is 30 hours.

You are required to calculate the total earnings under the following plans:

(i) Halsey Premium Plan (Rate 50%) (ii) Rowan Plan

(iii) Time Wage System (iv) Piece Rate System

(v) Emerson Plan

(PYP May '19)

Answer 22

(i) Halsey Premium plan:

= (Time taken × Rate per hour) + $\left(\frac{1}{2} \times \text{Time saved} \times \text{Rate per hour}\right)$

= (30 hours × Rs. 75) + $\left(\frac{1}{2} \times 10 \text{ hours} \times \text{Rs. } 75\right)$

(ii) Rowan Premium plan:

= (Time taken × Rate per hour) + $\left(\frac{\text{Time Saved}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate per hour}\right)$

= (30 hours × Rs. 75) + (40 × 30 × Rs. 75)

= Rs. 2,250 + Rs. 375 = Rs. 2,625

= Rs. 2,250 + Rs. 562.5 = Rs. 2,812.5 or Rs. 2,813

(iii) Time wage system:

= Time taken × Rate per hour

= 30 × Rs. 75 = Rs. 2,250

(iv) Piece Rate System:

= Std. Time × Rate per hour

= 40 × Rs. 75 = Rs. 3,000

(v) Emerson plan:

Efficiency level = 40/30 = 133.33% Time taken × (120% + 33.33%) of Rate

= 30 hours × 153.33% of Rs. 75

= Rs. 3,450

Important Note:

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In this numerical problem of 'Employee Cost' students were asked to calculate earnings under various plans. Candidate failed to calculate earnings in job/piece rate system and Emerson's plan. Performance of the examinees was average.

Question 23

Discuss any four objectives of 'Time keeping' in relation to attendance and payroll procedures.

(PYP Nov 20)

Answer 23

The objectives of time-keeping in relation to attendance and payroll procedures are as follows:

(i) For the preparation of payrolls.

(ii) For calculating overtime.

(iii) For ascertaining and controlling employee cost.

(iv) For ascertaining idle time.

(v) For disciplinary purposes.

(vi) For overhead distribution

Question 24

Mr. A. is working by employing 10 skilled workers. He is considering the introduction of some incentive scheme - either Halsey Scheme (with 50% bonus) or Rowan Scheme - of wage payment for increasing the Employee productivity to cope with the increased demand for the product by 25%. He feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient

incentive for them to produce more and he has accordingly given this assurance to the workers.

As a result of the assurance, the increase in productivity has been observed as revealed by the following figures for the current month:

Hourly rate of wages (guaranteed)	**Rs.40**
Average time for producing 1 piece by one worker at the previous performance (This may be taken as time allowed)	**2 hours**
No. of working days in the month	**25**
No. of working hours per day for each worker	**8**
Actual production during the month	**1,250 units**

Required:

(i) CALCULATE effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.

(ii) CALCULATE the savings to Mr. A in terms of direct labour cost per piece under the schemes.

(Study material)

Answer 24

Working Notes:

1. Actual time taken to produce 1,250 pieces

= No. of working days in the month × No. of working hours per day of each worker × No. of workers

= 25 days × 8 hrs. × 10 workers = 2,000 hours

2. Total time wages of 10 workers per month:

= No. of working days in the month × No. of working hours per day of each worker × Hourly rate of wages × No. of workers

= 25 days × 8 hrs. × Rs.40 × 10 workers = Rs.80, 000

3. Time saved per month:

Time allowed per piece to a worker	2 hours
No. of units produced during the month by 10 workers	1,250 pieces
Total time allowed to produce 1,250 pieces (1,250 × 2 hours)	2,500 hours
Actual time taken to produce 1,250 pieces	2,000 hours
Time saved (2,500 hours – 2,000 hours)	500 hours

4. Bonus under Halsey scheme to be paid to 10 workers:

Bonus = (50% of time saved) × hourly rate of wages

= 50/100 × 500 hours × Rs.40 = Rs.10, 000

Total wages to be paid to 10 workers are (Rs.80, 000 + Rs.10, 000) Rs.90, 000, if Mr. A considers the introduction of Halsey Incentive Scheme to increase the employee productivity.

5. Bonus under Rowan Scheme to be paid to 10 workers:

Bonus = $\frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{hourly rate}$

$= \frac{2{,}000\text{hours}}{2{,}500\text{hours}} \times 500 \text{ hours} \times \text{Rs. } 40 = \text{Rs. } 16{,}000$

Total wages to be paid to 10 workers are (Rs.80,000 + Rs.16,000) Rs. 96,000, if Mr. A considers the introduction of Rowan Incentive Scheme to increase the Employee productivity.

(i) (a) Effective hourly rate of earnings under Halsey scheme:

(Refer to Working Notes 1, 2, 3 and 4)

$$=\frac{\text{Total time wages of 10 workers+Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$=\frac{\text{Rs.80,000+Rs.10,000}}{\text{2,000hours}} = \text{Rs. 45}$$

(b) Effective hourly rate of earnings under Rowan scheme:

(Refer to Working Notes 1, 2, 3 and 5)

$$=\frac{\text{Total time wages of 10 workers+Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$=\frac{\text{Rs.80,000+Rs.16,000}}{\text{2,000hours}} = \text{Rs. 48}$$

(ii) (a) Saving in terms of direct Employee cost per piece under Halsey scheme:

(Refer to Working Note 4)

Employee cost per piece (under time wage scheme)

= 2hours × Rs.40 = Rs.80.

Employee cost per piece (under Halsey scheme)

$$=\frac{\text{Total wages paid under the scheme}}{\text{Total number of units produced}} = =\frac{\text{Rs.90,000}}{\text{1,250}} = \text{Rs.72}$$

Saving per piece: (Rs.80 – Rs.72) = Rs.8

(b) Saving in terms of direct Employee cost per piece under Rowan Scheme:

(Refer to Working Note 5)

Employee cost per piece under Rowan scheme

= Rs.96, 000/1,250 units = Rs.76.80

Saving per piece = Rs.80 – Rs.76.80 = Rs.3.20

Question 25

Wage negotiations are going on with the recognised employees' union, and the management wants you as an executive of the company to formulate an incentive scheme with a view to increase productivity.

The case of three typical workers A, B and C who produce respectively 180,120 and 100 units of the company's product in a normal day of 8 hours is taken up for study.

Assuming that day wages would be guaranteed at Rs. 75 per hour and the piece rate would be based on a standard hourly output of 10 units, CALCULATE the earnings of each of the three workers and the employee cost per 100 pieces under (i) Day wages, (ii) Piece rate, (iii) Halsey scheme, and (iv) The Rowan scheme.

Also CALCULATE under the above schemes the average cost of labour for the company to produce 100 pieces.

(Study material)

Answer 25

Calculation of earnings under different wage schemes:

(i) Day wages

Worker	Day wages (Rs.)	Actual Output (Units)	Labour cost per 100 pieces (Rs.)
A	600	180	333.33
B	600	120	500.00
C	600	100	600.00

Total	1,800	400	

Average labour cost to produce 100 pieces:

$$=\frac{\text{Total wages paid}}{\text{Total output}} \text{ x100}$$

$$=\frac{\text{Rs.1,800}}{\text{400 units}} \text{ x100 = Rs.450}$$

(ii) Piece rate

Worker	Actual Output (Units)	Piece rate (Rs.)	Wages earned (Rs.)	Labour cost per 100 pieces (Rs.)
A	180	7.50	1,350	750.00
B	120	7.50	900	750.00
C	100	7.50	750	750.00
Total	400		3,000	

Average cost of labour for the company to produce 100 pieces:

$$=\frac{\text{Rs.3,000}}{\text{400 units}} \text{ x100 = Rs.750}$$

(iii) Halsey Scheme

Worker	Actual Output (Units)	Std. time (Hrs.)	Actual time (Hrs.)	Time saved (Hrs.)	Bonus hours (50% of	Rate per hour (Rs.)	Total wages (Rs.)	Labour cost per 100 pieces (Rs.)

					time saved)			
	A	B	C	D=B-C	E	F	G = F x (C+E)	H=G/A*100
A	180	18	8	10	5	75	975	541.67
B	120	12	8	4	2	75	750	625.00
C	100	10	8	2	1	75	675	675.00
Total	400						2,400	

Average cost of labour for the company to produce 100 pieces

$=\frac{\text{Rs.2,400}}{\text{400 units}}$ x100 = Rs.600

(iv) Rowan Scheme:

Worker	Actual Output (Units)	Std. time (Hrs.)	Actual time (Hrs.)	Time saved (Hrs.)	Bonus hours*	Rate per hour (Rs.)	Total wages including bonus (Rs.)	Labour cost per 100 pieces (Rs.)
	A	B	C	D=B-C	E	F	G=F×(C+E)	H=G/A*100
A	180	18	8	10	4.44	75	933	518.33
B	120	12	8	4	2.67	75	800	666.67
C	100	10	8	2	1.60	75	720	720.00

Total	400						2,453	

* Bonus hours $=\frac{\text{TimeSaved}}{\text{Std.Time}}$ x Actual time

Average cost of labour for the company to produce 100 pieces

$=\frac{\text{Rs.2,453}}{\text{400 units}}$ x100 = Rs.613.25

Question 26

The following expenditures were incurred in Aditya Ltd. For the month of March 2023:

		(Rs.)
(i)	**Paid for power & fuel**	**4,80,200**
(ii)	**Wages paid to factory workers**	**8,44,000**
(iii)	**Bill paid to job workers**	**9,66,000**
(iv)	**Royalty paid for production**	**8,400**
(v)	**Fee paid to technician hired for the job**	**96,000**
(vi)	**Administrative overheads**	**76,000**
(vii)	**Commission paid to sales staffs**	**1,26,000**

You are required to CALCULATE direct expenses for the month.

(Study material)

Answer 26

Calculation of Direct Expenses

		(Rs.)
(i)	Paid for power & fuel	4,80,200
(ii)	Bill paid to job workers	9,66,000
(iii)	Royalty paid for production	8,400
(iv)	Fee paid to the technician	96,000
	Total Direct expenses	**15,50,600**

Notes:

(i) Wages paid to factory workers is direct employee cost.

(ii) Administrative overhead is indirect expense.

(iii) Commission paid to sales staffs comes under selling expenses.

Question 27

The management of a company wants to formulate an incentive plan for the workers with a view to increase productivity. The following particulars have been extracted from the books of company:

Piece Wage rate **Rs.10**

Weekly working hours **40**

Hourly wages rate **Rs.40 (guaranteed)**

Standard/normal time per unit 15 minutes.

Actual output for a week:

Worker A: **176 pieces**

Worker B: **140 pieces**

Under Halsey scheme, worker gets a bonus equal to 50% of Wages of time saved.

CALCULATE earning of workers under Halsey's and Rowan's premium scheme.

(MTP Jan 2025)

Answer 27

(c) Calculation of earnings for workers under different incentive plans:

Halsey's Premium Plan:	**Worker – A**	**Worker – B**
Actual time taken	40 hours	40 hours
Standard time for actual Production	44 hours $\left(\frac{176 \text{ Pcs} \times 15 \text{ Min.}}{60 \text{ Min.}}\right)$	35 hours $\left(\frac{140 \text{ Pcs} \times 15 \text{ Min.}}{60 \text{ Min.}}\right)$
Minimum Wages	Rs. 1,600 (40 hours x Rs.40)	Rs.1,600 (40 hours x Rs.40)
Bonus	Rs.80 {50% (44-40) x Rs.40}	No bonus
Earning	Rs.1,680	Rs.1,600
Rowan's Premium Plan:		
Minimum Wages (as above)	Rs.1,600	Rs.1,600

Bonus	Rs.145.45 $\left(\frac{4 \text{ hours}}{44 \text{ hours}} \ 40 \text{ hours} \times \text{Rs. } 40\right)$	No bonus
Earning	Rs.1,745.45	Rs.1,600

Question 28

Shivi is working by employing 10 skilled workers. It is considering the introduction of some incentive scheme – either Halsey scheme (with 50% bonus) or Rowan scheme of wage payment for increasing the labour productivity to cope with the increased demand for the product by 25%. She feels that, if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it would act as sufficient incentive for them to produce more and she has accordingly given this assurance to the workers.

As a result of this assurance, the increase in productivity has been observed as revealed by the following figures for the current month:

Hourly rate of wages (guaranteed) Rs. 2.00

Average time for producing 1 piece by one worker at the

previous performance (this may be taken as time allowed) 2 hours

Number of working days in the month 25

Number of working hours per day for each worker 8

Actual production during the month 1,250 units

Required:

(1) CALCULATE effective rate of earnings per hour under Halsey scheme and Rowan scheme.

(2) CALCULATE the savings of Navya in terms of direct labour cost per piece under the above schemes.

(3) ADVISE Navya about the selection of the scheme to fulfill her assurance.

(MTP Jan 2025)

Answer 28

Production during the month 1,250 units

Time allowed for 1,250 units @ 2 hours per unit (1,250 x 2 hours) 2,500 hours

Actual time taken 25 days x 8 hours x 10 workers 2,000 hours

Time saved 500 hours

Labour cost per piece under time rate scheme: 2 hours x Rs. 2 = Rs. 4

Calculation of effective hourly rate under:

Halsey Scheme:

	(Rs.)
Basic wages of 10 workers: 2,000 hours @ Rs. 2 per hour	4,000
Bonus 50% x (500 hours x Rs. 2)	5,00
Total wages for 2,000 hours	4,500

Effective hourly rate of earning = $\frac{\text{Rs.4,500}}{\text{2,000 hours}}$ = Rs. 2.25

Labour cost per piece =$\frac{\text{Rs.4,500}}{\text{1,250 units}}$ = Rs. 3.60

Saving in terms of direct labour cost per piece (Rs. 4.00 – Rs. 3.60) = Rs. 0.40

Rowan Scheme:

	(Rs.)
Basic wages (as calculated under Halsey scheme)	4,000
Bonus:500hours $\times \frac{2{,}000\ hours}{2{,}500\ hours}$ × Rs.2	800
Total wages for 2,000 hours 4,800	4,800

Effective hourly rate of earning = $\frac{\text{Rs.}4{,}800}{2{,}000\ \text{hours}}$ = Rs. 2.40

Labour cost per piece = $\frac{\text{Rs.}4800}{1{,}250\ \text{units}}$ = Rs. 3.84

Saving in terms of direct labour cost per piece (Rs. 4.00 – Rs. 3.84) = Rs. 0.16

Advise: Shivi should introduce Halsey incentive scheme, as it gives more saving than the Rowan incentive scheme.

Question 29

PR Ltd. totally understands the importance of employee motivation and retention, thus, it has implemented a structured wage policy. The basic wage rate is set at Rs. 100 per hour along with Dearness Allowance (DA) of 50%, which is competitive within the industry. To encourage productivity and compensate for the demands of overtime, the company offers enhanced rates for hours worked beyond the standard schedule. The normal working days are from Monday to Saturday, and the worker would be paid overtime premium of- 75% of basic wage rate (inclusive of DA) for working before and after normal working hours, and 125% of basic wage rate (inclusive of DA) for working on Sundays.

Throughout the previous year, the following hours were worked-

Normal time	**4,00,000 hours**
Overtime before and after normal working hours	**80,000 hours**
Overtime on Sundays	**20,000 hours**
Total	**5,00,000 hours**

However, the hours recorded for job 'PR123' are as follows:

Normal time	**4,000 hours**
Overtime before and after normal working hours	**400 hours**
Overtime on Sundays	**100 hours**
Total	**4,500 hours**

You are required to CALCULATE the employee cost chargeable to job 'PR123' and the treatment of overtime premium:

(i) Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.

(ii) Where overtime is worked irregularly to meet the requirements of production.

(MTP May 2025)

Answer 29

Workings

Basic wage rate = Rs. (100 + Rs. 50 for DA) per hour = Rs. 150 per hour

Overtime wage rate before and after working hours

= Rs. 150 + 75% of Rs. 150

= Rs. 262.50 per hour

Overtime wage rate for Sundays = Rs. 150 + 125% of Rs. 150

= Rs. 337.50 per hour

Computation of average inflated wage rate (including overtime premium)

Particulars	(Rs.)
Annual wages for the previous year for normal time (4, 00,000 hrs. × Rs. 150)	6,00,00,000
Wages for overtime before and after working hours (80,000 hrs. × Rs. 262.50)	2,10,00,000
Wages for overtime on Sundays (20,000 hrs. × Rs. 337.50)	67,50,000
Total wages for 5, 00,000 hrs.	8,77,50,000

Average inflated wage rate = $\frac{Rs.8,77,50,000}{5,00,000\ hrs.}$ = Rs. 175.50

(i) Where overtime is worked regularly as a policy due to workers' shortage:

The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate.

Hence, employee cost chargeable to job 'PR123'

= Total hours × Inflated wage rate

= 4,500 hrs. × Rs. 175.50 = Rs. 7, 89,750

(ii) Where overtime is worked irregularly to meet the requirements of production:

Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:

Employee cost chargeable to Job 'PR123'

= 4,500 hours @ Rs. 150 per hour

= Rs. 6, 75,000

Factory overhead = {400 hrs. × Rs. (75% of Rs. 150)} + {100 hrs. × Rs. (125% of Rs. 150)}

= {Rs.45, 000 + Rs.18, 750}

= Rs.63, 750

Question 30

Pi and Qu are part of a manufacturing team that handles multiple jobs within the production process. Detailed description of their respective monthly wages is provided below:

The standard working hours for the month are 210. Overtime is compensated at twice the sum of basic wages and dearness allowance. The employer's contributions to State Insurance and the Provident Fund are equal to the employees' contributions. Employees Pi and Qu were assigned to jobs A, S, and D in the following proportions:

Particulars	Pi	Qu
(i) Basic Wages (Rs.)	12,000	15,000
(ii) Dearness Allowance	50%	50%
(iii) Contribution to provident Fund (on basic wages)	10%	10%

(iv) Contribution to Employee's State Insurance (on basic wages)	**1.75%**	**1.75%**
(v) Overtime (Hours)	**8**	**--**

Jobs	**A**	**S**	**D**
Worker Pi	**30%**	**30%**	**40%**
Worker Qu	**30%**	**50%**	**20%**

Overtime was done on job S.

You are required to CALCULATE the earnings of Pi and Qu and allocate the employee cost to each job A, S, and D.

(RTP may 2025)

Answer 30

Statement showing Earnings of Workers Pi and Qu

	Pi (Rs.)	**Qu (Rs.)**
Basic wages	12,000	15,000
Dearness Allowance (50% of Basic Wages)	6,000	7,500
Overtime wages (Refer to Working Note)	1,371	--
Gross wages earned	19,371	22,500

Less: Contribution to Provident fund	(1,200)	(1,500)
Less: Contribution to ESI	(210)	(263)
Net wages earned	17,961	20,737

Statement of Employee Cost:

Pi (Rs.)	**Pi (Rs.)**	**Qu (Rs.)**
Gross Wages (excluding overtime)	18,000	22,500
Add: Employer's contribution to PF	1,200	1,500
Add: Employer's contribution to ESI	210	263
Gross wages earned	19,410	24,263

Statement Showing Allocation of Wages to Jobs

	Total Wages (Rs.)	**Jobs**		
		A (Rs.)	**S (Rs.)**	**D (Rs.)**
Worker Pi:				
- Ordinary Wages (3: 3 : 4)	19,410	5,823	5,823	7,764
- Overtime	1,371	--	1,371	--
Worker Qu:				

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- Ordinary Wages (3 : 5 : 2)	24,263	7,279	12,131	4,853
	45,044	13,102	19,325	12,617

Working Note:

Over time = 2 x $\left(\frac{\text{Basic wage + DA}}{\text{210 hours}}\right)$ x 8 hours

= 2 x $\left(\frac{\text{Rs.18,000}}{\text{210 hours}}\right)$ x 8 hours

= Rs.1, 371

Question 31

AeBee Publishers works for various educational institutes for editing, binding, printing of various books and magazines on job work basis. Currently, the company has employed 30 workers and pays them on hour rate basis for each job assigned. To complete one of the process of binding, the average time allowed to an employee is 8 hours for a 10 pages magazine.

In the month of March, two employees 'Cee' and 'Dee' were given 21 and 30 units of magazines respectively for binding work. The following are the details of the work assigned:

Particulars	'Cee'	'Dee'
Work assigned	21 units	30 units
Time taken	78 hours	114 hours

The existing rate of wages is Rs. 60 per hour along with bonus as per Halsey System.

However, a new wage agreement has been signed between the employees and the company where, employees will be paid Rs. 65 per hour with effect from the April month.

But, inadvertently, for the month of March, the accountant of the company paid the wages to these employees considering rate of wages as Rs. 65 per hour.

You are required to CALCULATE the following:

(i) Amount of loss that the company has incurred due to incorrect rate selection in the month of March.

(ii) Loss incurred by the company due to incorrect rate selection if it had followed Rowan scheme of bonus payment.

(iii) Amount that could have been saved if Rowan Scheme of bonus payment were followed.

(RTP Jan 2025)

Answer 31

Particulars	**'Cee'**	**'Dee'**
No. of assigned (unitsbinding work)	21	30
Hour allowed per magazine (Hours)	8	8
Total hours allowed (Hours)	168	240
Hours Taken (Hours)	78	114
Hours Saved (Hours)	90	126

(i) Calculation of loss incurred due to incorrect rate selection

(While calculating loss only excess rate per hour has been taken)

Particulars	**'Cee' (Rs.)**	**'Dee' (Rs.)**	**Total (Rs.)**

Basic Wages	390 (Hrs. ×Rs. 78 5)	570 (Hrs. × Rs. 114 5)	960
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	225 (50% of Hrs. × 90 Rs. 5)	315 (50% of Hrs. × 126 Rs. 5)	540
Excess Wages Paid	**615**	**885**	**1,500**

(ii) Amount of loss if Rowan scheme of bonus payment were followed

Particulars	**'Cee'** **(Rs.)**	**'Dee'** **(Rs.)**	**Total (Rs.)**
Basic Wages	390.00 (8 Hrs. × Rs. 75)	570.00 (Hrs. × Rs. 114 5)	960.00
Bonus (as per Rowan Scheme) Time Allowed × Time Saved x Excess Rate) (Time Taken	208.93 (78 168× 90 × Rs. 5) =	299.25 (114 240× 126 × Rs. 5) =	508.18
Excess Wages Paid	**598.93**	**869.25**	**1,468.18**

(iii) Calculation of amount that could have been saved if Rowan Scheme were followed

Particulars	**'Cee'**	**'Dee'**	**Total (Rs.)**

	(Rs.)	(Rs.)	
Wages paid under Halsey Scheme	615.00	885.00	1,500.00
Wages paid under Rowan Scheme	598.93	869.25	1,468.18
Difference (Savings)	**16.07**	**15.75**	**31.82**

Case Scenarios

Question 32

The board of the J Ltd. has been appraised by the General Manager (HR) that the employee attrition rate in the company has increased. The following facts has been presented by the GM (HR):

(1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.

(2) 20% of the output during training period was defective. Cost of rectification of a defective unit was Rs.25.

(3) Potential productive hours lost due to delay in recruitment were 1, 00,000 hours.

(4) Selling price per unit is Rs. 180 and P/V ratio is 20%.

(5) Settlement cost of the workers leaving the organization was Rs. 1, 83,480.

(6) Recruitment cost was Rs.1, 56,340

(7) Training cost was Rs. 1, 13,180

You being an associate finance to GM (HR), has been asked the following questions:

(i) How much quantity of output is lost due to labour turnover?

(a) 10,000 units

(b) 8,000 units

(c) 12,000 units

(d) 12,600 units

Ans.- (c) Output by experienced workers in 50,000 hours

$=\frac{50,000}{10}$=5,000 units

∴ Output by new recruits = 60% of 5,000 = 3,000 units

Loss of output = 5,000 – 3,000 = 2,000 units

Total loss of output = Due to delay recruitment + Due to inexperience

= 10,000 + 2,000 = 12,000 units

(ii) How much loss in the form of contribution, the company incurred due to labour turnover?

(a) Rs. 4, 32,000

(b) Rs. 4, 20,000

(c) Rs. 4, 36,000

(d) Rs. 4, 28,000

Ans. - (a) Contribution per unit = 20% of Rs.180 = Rs.36

Total contribution lost = Rs.36 × 12,000 units = Rs.4, 32,000

(iii) What is the cost repairing of defective units?

(a) Rs. 75,000

(b) Rs. 15,000

(c) Rs. 50,000

(d) Rs. 25,000

Ans. - (b) Cost of repairing defective units = 3,000 units × 0.2 × Rs. 25 = Rs. 15,000

(iv) Calculate the profit lost by the company due to increased labour turnover.

(a) Rs.7, 50,000

(b) Rs. 15, 00,000

(c) Rs. 5, 00,000

(d) Rs. 9, 00,000

Ans. - (d) Calculation of loss of profit due to labour turnover

	(Rs.)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180

Settlement cost of workers leaving	1,83,480
Profit forgone in 2022-23	9,00,000

(v) How much quantity of output is lost due to inexperience of the new worker?

(a) 1,000 units

(b) 2,600 units

(c) 2,000 units

(d) 12,600 units

Ans. - (c) Output by experienced workers in 50,000 hours

$=\frac{50,000}{10}$=5,000 units

∴ Output by new recruits = 60% of 5,000 = 3,000 units

Loss of output = 5,000 – 3,000 = 2,000 units

Question 33

Mr. A works in a manufacturing company where he is paid bonus according to the Halsey 50% plan, besides the normal wages. The relevant data is as below:

Time Rate (per hour)	**Rs. 100**
Time allowed	**10 hours**
Time taken	**5 hours**

Time saved	**5 hours**

Mr. A believes that his bonus under Halsey system is getting reduced by 50%, thus intending to shift towards Rowan Premium Plan.

You are required to CALCULATE the total earnings of Mr. A as per Halsey plan and Rowan Premium plan & ENUMERATE the reason for difference in both the earnings.

(a) Total earnings as per Halsey plan- Rs. 500 and as per Rowan Premium plan- Rs.750. Earnings under Halsey Plan is lower than that of Rowan Premium plan as the bonus is getting reduced by 50%.

(b) Total earnings as per Halsey plan- Rs.750 and as per Rowan Premium plan- Rs.500. Earnings under Rowan Premium plan is lower than that of Halsey plan as the actual time taken is 50% of the time allowed.

(c) Total earnings as per Halsey plan- Rs.750 and as per Rowan Premium plan- Rs.750. When the actual time taken is 50% of the time allowed, the earnings under Halsey and Rowan Plans are equal.

(d) Total earnings as per Halsey plan- Rs.250 and as per Rowan Premium plan- Rs.250. Total earnings under both the Plans are equal as the time taken under both the plans are same.

(RTP may 2025)

Ans: (c) Total earnings as per Halsey plan- Rs.750 and as per Rowan Premium plan- Rs.750. When the actual time taken is 50% of the time allowed, the earnings under Halsey and Rowan Plans are equal.

Calculation of total earnings:

As per Halsey 50% plan

= Time taken × Time rate + (50% of Time saved × Time rate)

= 5 hrs. × Rs.100 + [1/2 × (5 hrs. × Rs.100)]

= Rs.500 + Rs.250 = Rs.750

As per Rowan Premium plan

=Time taken × Rate per hour + $\left(\frac{\text{Time Saved}}{\text{Time Allowed}}\right)$ × Time taken × Rate per hour)

=5 hours × Rs.100 + $\left(\frac{5\ hors}{10\ hours}\right)$ × Time taken × Rate per hour)

= Rs.500 + Rs.250 = Rs.750

When the actual time taken is 50% of the time allowed, the earnings under Halsey and Rowan Plans are equal.

Question 34

Phalsa Ltd. pays its workers on time-basis because their services cannot be tangibly measured. The company's normal working week includes 5 days of 8 hours each. Sometimes, the workers needs to work late at night which was 3 nights of 3 hours each for the current week. The average output produced per worker for the week is 120 units.

Information regarding incentive rate is as follows:

Rate of Payment

Day shift: Rs. 320 per hour

Night shift: Rs. 450 per hour

However, this time-basis payment made workers lazy, making their expected output lower. As workers started doing more of the night shifts for higher earnings with minimal impact on the outputs, the company decided to shift on to a system of payments on output basis. Information regarding amended incentive rate is as follows:

Time-rate (as usual):Rs. 320 per hour

Basic time allowed for 15 units: 5 hours

Piece-work rate: Add 15% to basic piece-rate

In the amended incentive system, the normal weekly working hours remained the same while production increased to 135 units.

CALCULATE the labour cost per unit as per the existing incentive system, along with the amended incentive system.

(a) Rs. 140.42 and Rs. 122.67 respectively

(b) Rs. 124.81 and Rs. 138.00 respectively

(c) Rs. 124.81 and Rs. 122.67 respectively

(d) Rs. 140.42 and Rs. 138.00 respectively

(RTP Jan 2025)

Ans: (a) Rs. 140.42 and Rs. 122.67 respectively

Calculation of existing labour cost per unit (time basis)

Normal weekly hours = 5 days x 8 hours = 40 hours

Night shift hours = 3 nights x 3 hours = 9 hours

Average production per week = 120 units

Weekly wages:		
Normal shift	(40 hours × Rs. 320)	Rs. 12,800
Night shift	(9 hours × Rs. 450)	Rs. 4,050
Total wages		Rs. 16,850

Labour cost per unit	$\left(\frac{\text{Rs. } 16{,}850}{120\ units}\right)$	Rs. 140.42

Calculation of amended labour cost per unit (piece basis)

15 units are produced in 5 hours

Therefore, to produce 135 units, hours required is $\frac{5 \text{ hours}}{15\ units}$ ×135 units =45 hours.

Labour cost of producing 135 units:

At basic time rate (45 hours × Rs. 320) = Rs. 14,400

Add: Bonus @ 15% on basic Piece rate

$\frac{\text{Rs.}14{,}400}{135 \text{ units}}$ ×15%]× 135 units =Rs. 2,160

Earning for the week = Rs. 16,560

Labour cost per unit = $\left(\frac{\text{Rs.}16{,}560}{135\ units}\right)$

= Rs. 122.67

Question 35

The existing incentive system of Sakshi Limited is as under:

Normal working week	**5 days of 8 hours each plus 3 late shifts of 3 hours each**
Rate of Payment	**Day work: Rs. 160 per hour** **Late shift: Rs. 225 per hour**

Average output per operator for 49-hours week i.e. including 3 late shifts	**240 articles**

In order to increase output and eliminate overtime, it is decided to switch on to a system of payment by results. The following information is obtained:

Time-rate (as usual)	**Rs. 160 per hour**
Basic time allowed for 15 articles	**2.5 hours**
Piece-work rate	**Add 20% to basic piece-rate**
Premium Bonus	**Add 50% to time.**

If during the last week 270 articles are produced in a 40-hour week.

Required:

(i) CALCULATE weekly earnings for one operator under the following systems:

(a) Existing time-rate

(b) Straight piece-work

(c) Rowan system

(d) Halsey premium system

(ii) PREPARE a Statement showing hours worked, weekly earnings, number of articles produced and labour cost per article for one operator under the above systems.

(RTP Sep. 2025)

Answer 35

(a) Existing time rate

Weekly wages:		
Normal shift	(40 hours × Rs.160):	Rs. 6,400
Late shift	(9 hours × Rs.225)	Rs. 2,025
		Rs. 8,425

(b) Piece Rate System

15 articles are produced in 2.5 hours

Therefore, to produce 270 articles, hours required is $\frac{2.5 \text{ hours}}{15 \text{ articles}}$ × 270 articles = 45 hours

Cost of producing 270 articles:

At basic time rate (45 hours × Rs.160)	Rs.7200
Add: Bonus @ 20% on basic Piece rate	Rs.1440
Earning for the week	Rs.8640

(c) Rowan Premium System

(i) Time allowed for producing 270 articles $\left(\frac{2.5 \text{ hours}}{15 \text{ articles}} \times 270 \text{ articles} \times 150\%\right)$ = 67.5 hours

(ii) Time taken to produce 270 articles = 40.0 hours

(iii) Time Saved = 67.5 – 40 = 27.5 hours

Earnings under Rowan Premium system:

= (Time taken × Rate per hour) + $\left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hour}\right)$

= (40 hours × Rs.160) + $\left(\frac{27.5 \text{ hours}}{67.5 \text{ hours}} \times 40 \text{ hours} \times \text{Rs. } 160\right)$

=Rs. 6,400 + Rs. 2,607.41= Rs. 9,007.41

(d) Halsey Premium System

= (Time taken× Rate per hour) + ($\frac{1}{2}$ × Time saved × Rate per hour)

= (40 hours × Rs.160) + ($\frac{1}{2}$ × 27.5 hours × Rs.160)

(ii) Statement showing hours worked, weekly earnings, number of articles produced and cost per article

Method of Payment	Hours worked	Weekly earnings (Rs.)	Number of articles produced	Labour cost per article (Rs.)
Existing time rate	49	8,425.00	240	35.10
Straight piece rate system	40	8,640.00	270	32.00
Rowan Premium System	40	9,007.41	270	33.36
Halsey Premium System	40	8,600.00	270	31.85

Topic 5 Overtime – Concept & Effects

Question 36

Discuss the remedial steps to be taken to minimize the labour turnover.

(MTP Oct'19)

Answer 36

The following steps are useful for minimizing labour turnover:

(a) Exit interview: An interview to be arranged with each outgoing employee to ascertain the reasons of his leaving the organization.

(b) Job analysis and evaluation: to ascertain the requirement of each job.

(c) Organization should make use of a scientific system of recruitment, placement and promotion for employees.

(d) Organization should create healthy atmosphere, providing education, medical and housing facilities for workers.

(e) Committee for settling workers grievances.

Question 37

Explain the treatment of Overtime Premium in following situations:

(i) SV & Co. wants to grab some special orders, and overtime is required to meet the same.

(ii) Dept. X has to work overtime to make up a shortfall in production due to some fault of management in dept. Y.

(iii) S Ltd. has to work overtime regularly throughout the year as a policy due to the workers' shortage.

(iv) Due to flood in Odisha, RS Ltd. has to work overtime to complete the job.

(v) A customer requested the company MN Ltd. to expedite the job because of his urgency of work.

(PYP May'22)

Answer 37

Treatment of Overtime premium in different situations

Situation	Treatment
(i) SV & Co. wants to grab some special orders, and overtime is required to meet the same.	If overtime is required to cope with general production programmes or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.
(ii) Dept. X has to work overtime to make up a shortfall in production due to some fault of management in dept. Y.	If overtime is worked in a department due to the fault of another department, the overtime premium should be charged to the latter department (Y).
(iii) S Ltd. has to work overtime regularly throughout the year as a policy due to the workers' shortage.	The overtime premium is treated as a part of employee cost and job is charged at an effective average wage rate.
(iv) Due to flood in Odisha, RS Ltd. has to work overtime to complete the job.	Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost, but to Costing Profit and Loss Account.

(v) A customer requested the company MN Ltd. to expedite the job because of his urgency of work.	Where overtime is worked at the request of the customer, overtime premium is also charged to the job/ customer directly.

Question 38

A skilled worker, in PK Ltd., is paid a guaranteed wage rate of Rs.15.00 per hour in a 48-hour week. The standard time to produce a unit is 18 minutes. During a week, a skilled worker -Mr. 'A' has produced 200 units of the product. The Company has taken a drive for cost reduction and wants to reduce its labour cost.

You are required to:

(i) Calculate wages of Mr. 'A' under each of the following methods:

(A) Time rate,

(B) Piece -rete with a guaranteed weekly wage,

(C) Halsey Premium Plan

(D) Rowan Premium Plan

(ii) Suggest which bonus plan i.e. Halsey Premium Plan or Rowan Premium Plan, the company should follow.

(PYP Nov 22)

Answer 38

(i) Calculation of wages of Mr. 'A' under different wage schemes:

A. Time rate

Wages = Time Worked × Rate for the time

= 48 hours x Rs.15

= Rs.720

B. Piece rate with a guaranteed weekly wage

Wages = Number of units produced × Rate per unit

= 200 units x Rs.4.50*

= Rs.900

*(Rs.15 / 60 minutes) x 18 minutes = Rs.4.50

C. Halsey Premium Plan

Wages = Time taken × Time rate + 50% of time saved × Time rate

Wages = Time taken × Time rate + 50% (Standard time – Actual time) × Time rate

= (48 hours x Rs.15) + 50% of (60 hours# – 48 hours) x Rs.15

= Rs.720 + Rs.90

= Rs.810

(200 units x 18 minutes) / 60 minutes = 60 hours

D. Rowan Premium Plan

Wages = Time taken X Rate per hour + $\frac{\text{Time Saved}}{\text{Time Allowed}}$ X Time taken X Rate per hour

= (48 hours X Rs.15) + $\left(\frac{60-48 \text{ hours}}{60\text{hours}} \text{ X } 48 \text{ hours X Rs. } 15\right)$

= Rs.720 + Rs.144

= Rs.864

(ii) The company may follow Halsey Premium Plan over Rowan Premium Bonus Plan as the total wages paid is lower than that of Rowan Premium Bonus Plan.

Question 39

DISCUSS the effect of overtime payment on productivity.

(MTP May 2025)

Answer 39

Effect of overtime payment on productivity: Overtime work should be resorted to only when it is extremely essential because it involves extra cost. The overtime payment increases the cost of production in the following ways:

1. The overtime premium paid is an extra payment in addition to the normal rate.

2. The efficiency of operators during overtime work may fall and thus output may be less than normal output.

3. In order to earn more the workers may not concentrate on work during normal time and thus the output during normal hours may also fall.

4. Reduced output and increased premium of overtime will bring about an increase in cost of production.

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Question 40

A company has 120 direct labourers. Each labourer is paid Rs. 800 per 40 hour week. Owing to customer demands and timelines, Overtime is resorted to a maximum of 30 hours per week compensated at the weekly time rate with a premium of 50% over the regular wage. The current output works out to 6 units per man hour which is the standard output. The introduction of an incentive scheme could enhance productivity to 8 units per man hour. However, the incentive scheme if introduced would not have an overtime policy in place for extra hours worked. Budgeted weekly production is 38,400 units. The selling price is Rs. 22 per unit and direct costs other than labour is Rs. 16 per unit. The variable overheads is

Rs. 1 per labour hour and Fixed overhead is Rs. 18,000 per week. PREPARE a statement to demonstrate the effect of shifting from an overtime policy to:

(i) Halsey Incentive Scheme

(ii) Rowan Incentive Scheme

(MTP May 2025)

Answer 40

Projected weekly output	38,400 units
No of units per man hour	6 units
No of Man hours needed	6,400 hours
No of hours available	4,800 hours
Overtime needed	1,600 hours
Therefore, total wages during overtime:	
Normal Wages (6,400 x 20)	1,28,000
Overtime premium (1,600 x 10)	16,000
Total Wages	1,44,000
Upon introduction of incentive scheme	
No of units per man hour	8 units
No. of man hours needed	4,800 hours

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Time saved (OT saved)	1,600 hours

Halsey Scheme Incentive

= 50% of time saved × Time rate

= 1,600 hours x 20 per hour x 50% = 16,000

Total Labour Cost = 96,000 + 16,000 = 1, 12,000

Rowan Scheme Incentive

$= \frac{\text{Time Taken}}{\text{Time Allowed}}$ ×Time saved × hourly rate

= (1,600/6,400) x 4,800 x 20 = 24,000

Total Labour Cost = 96,000 + 24,000 = 1, 20,000

Statement of profitability

Particulars	Overtime	Halsey	Rowan
Sales @ Rs. 22	8,44,800	8,44,800	8,44,800
Less: Direct costs	6,14,400	6,14,400	6,14,400
Less: Labour	1,44,000	1,12,000	1,20,000
Less: Variable Overhead	6,400	4,800	4,800
Less: Fixed Overhead	18,000	18,000	18,000
Profit	62,000	95,600	87,600

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Topic 6 Idle Time – Concept & Treatment

Descriptive Question

Question 41

BRIEF OUT advantages and disadvantages of Halsey Premium Plan.

(MTP April '22)

Answer 41

Advantages	Disadvantages
1. Time rate is guaranteed while there is opportunity for increasing earnings by increasing production.	1. Incentive is not so strong as with piece rate system. In fact the harder the worker works, the lesser he gets per piece.
2. The system is equitable in as much as the employer gets a direct return for his efforts in improving production methods and providing better equipment.	2. The sharing principle may not be liked by employees.

Question 42

Archika Tyre Manufacturing Private Limited has four workers Ram, Shyam, Mohan & Kundan who are paid wages on the basis of Rs. 100 per day, Rs. 120 per day, Rs. 130 per day & Rs. 2500 per month respectively. Standard working days in a week are six of 8 hours per day. For the month of October 2022, there was only one holiday other than Sunday for which no payment was made to employees except Kundan who was paid for full month. Sundays are considered paid holidays i.e. employees are paid for Sunday also even there is no working on that day. Provident fund contribution is 8% of monthly wages by employer

and employee each. ESI contribution is 5% of monthly wages by employer and 4% of monthly wages by employee.

On the basis of above information, you are required to CALCULATE (regarding the month of October 2022):

(i) Amount of net wages receivable by each employee from the employer.

(ii) What is the total amount of Provident Fund required to be deposited by employer?

(iii) What is the total amount of ESI required to be deposited by employer?

(iv) What is the total labour cost to employer?

(v) If total material cost is Rs. 20,000 for October 2022 and overheads are charged equal to labour cost, calculate total cost for the month.

(MTP Sep'22)

Answer 42

(i) Calculation of net wages receivable by each employee from the employer (October 2022):

	Ram (Rs.)	**Shyam (Rs.)**	**Mohan (Rs.)**	**Kundan (Rs.)**	**Total (Rs.)**
Wages for October 2022	3,000 (Rs. 100 x 30 days)	3,600 (Rs. 120 x 30 days)	3,900(Rs. 130 x 30 days)	2,500	13,000
Less: Employee Contribution to PF @ 8%	240	288	312	200	1,040
Less: Employee	120	144	156	100	520

Contribution to ESI @ 4%					
Net Wages Receivable	2,640	3,168	3,432	2,200	11,440

(ii) Calculation of total amount of Provident Fund required to be deposited by employer (October 2022):

	(Rs.)
Total Wages for the month	13,000
Employer's Contribution to Provident Fund @8% of Rs. 13,000	1,040
Add: Employee's Contribution to Provident Fund @8% of Rs. 13,000	1,040
Total amount of Provident Fund required to be deposited by employer	**2,080**

(iii) Calculation of total amount of ESI required to be deposited by employer (October 2022):

	(Rs.)
Total Wages for the month	13,000
Employer's Contribution to ESI @5% of Rs. 13,000	650
Add: Employee's Contribution to ESI @4% of Rs. 13,000	520
Total amount of ESI required to be deposited by employer	**1,170**

(iv) Total labour cost to employer (October 2022):

	(Rs.)
Total Wages for the month	13,000
Add: Employer's Contribution to Provident Fund @8% of Rs. 13,000	1,040
Add: Employer's Contribution to ESI @5% of Rs. 13,000	650
Total labour cost to employer	**14,690**

(v) Calculation of Total Cost for October 2022

	(Rs.)
Total Material Cost	20,000
Total Labour Cost	14,690
Total Overheads (Equal to Labour Cost)	14,690
Total Cost	**49,380**

Question 43

STATE various causes of and treatment of Overtime Premium in Cost Accounting.

(MTP Oct'22)

Answer 43

Causes and Treatment of Overtime premium in cost accounting

Causes	Treatment
(1) The customer may agree to bear the entire charge of overtime because urgency of work.	(1) If overtime is resorted to at the desire of the customer, then overtime premium may be charged to the job directly.
(2) Overtime may be called for to make up any shortfall in production due to some unexpected development.	(2) If overtime is required to cope with general production programmes or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.
(3) Overtime work may be necessary to make up a shortfall in production due to some fault of management.	(3) If overtime is worked in a department due to the fault of another department, the overtime premium should be charged to the latter department.
(4) Overtime work may be resorted to, to secure an out-turn in excess of the normal output to take advantage of an expanding market or of rising demand	(4) Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost, but to Costing Profit and Loss Account.

Question 44

The rate of change of labour force in a company during the year ending 31st March, 2023 was calculated as 13%,8% and 5% respectively under 'Flux Method', 'Replacement method' and 'Separation method'. The number of workers separated during the year is 40.

You are required to calculate:

(i) Average number of workers on roll.

(ii) Number of workers replaced during the year.

(iii) Number of new accessions i.e. new recruitment.

Number of workers at the beginning of the year.

(MTP Oct '23)

Answer 44

(i) Labour Turnover Rate (Separation Method)

$$= \frac{\text{No.of workers separated}}{\text{Average no.of workers on roll}}$$

Or, $\frac{5}{100} = \frac{40}{\text{Average no.of workers on roll}}$

Or, Average no. of workers on roll = 800

(ii) Labour Turnover Rate (Replacement method)

$$= \frac{\text{No.of workers replaced}}{\text{Average no.of workers on roll}}$$

Or, $\frac{8}{100} = \frac{\text{No.of workers replaced}}{800}$

Or, No. of workers replaced = 64

(iii) Labour Turnover Rate (Flux Method)

$$= \frac{\text{No.of Separations + No.of accessions (New recruitments)}}{\text{Average no.of workers on roll}}$$

Or, $\frac{13}{100} = \frac{40+\text{No.of accessions (New recruitments)}}{800}$

Or, 100 (40 + No. of Accessions) = 10,400

Or, No. of new accessions = 64

(iv) No. of workers at the beginning of the year

Let workers at the beginning of the year were 'X'

Average no. of workers on roll = $\frac{\text{workers at the begining+workers at the end}}{2}$

800 = $\frac{\text{X+(X+New accessions −Separations)}}{2}$

800 = $\frac{\text{X+(X+64−40)}}{2}$

800 = $\frac{\text{X+(X+24)}}{2}$

2 X = 1,600 – 24 or, X = 788 workers

Question 45

ADV Pvt. Ltd. manufactures a product which requires skill and precision in work to get quality products. The company has been experiencing high labour cost due to slow speed of work. The management of the company wants to reduce the labour cost but without compromising with the quality of work. It wants to introduce a bonus scheme but is indifferent between the Halsey and Rowan scheme of bonus.

For the month of November 2019, the company budgeted for 24,960 hours of work. The workers are paid '80 per hour.

Required:

CALCULATE and suggest the bonus scheme where the time taken (in %) to time allowed to complete the works is (a) 100% (b) 75% (c) 50% & (d) 25% of budgeted hours.

(RTP Nov'19)

Answer 45

The Cost of labour under the bonus schemes are tabulated as below:

Time Allowed	Time taken	Wages (Rs.)	Bonus (Rs.)		Total Wages (Rs.)		Earning per hour (Rs.)	
			Halsey*	Rowan**	Halsey	Rowan	Halsey	Rowan
(1)	(2)	(3)= (2) ×Rs. 80	(4)	(5)	(6)= (3) + (4)	(7)= (3) + (5)	(8)= (6)/(2)	(9)= (7)/(2)
24,960	24,960	19,96,800	-	-	19,96,800	19,96,800	80.00	80.00
24,960	18,720	14,97,600	2,49,600	3,74,400	17,47,200	18,72,000	93.33	100.00
24,960	12,480	9,98,400	4,99,200	4,99,200	14,97,600	14,97,600	120.00	120.00
24,960	6,240	4,99,200	7,48,800	3,74,400	12,48,000	8,73,600	200.00	140.00

* Bonus under Halsey Plan = 50% of (Time Allowed – Time Taken) × Rate per hour

** Bonus under Rowan Plan = $\frac{\text{Time taken}}{\text{Time allowed}}$ ×Time saved× Rate per hour

Rowan scheme of bonus keeps checks on speed of work as the rate of incentive increases only up to 50% of time taken to time allowed but the rate decreases as the time taken to time allowed comes below 50%. It provides incentives for efficient workers for saving in time but also puts check on careless speed. On implementation of Rowan scheme, the management of ADV Pvt. Ltd. would resolve issue of the slow speed work while maintaining the skill and precision required maintaining the quality of product.

Question 46

SMC Company Limited is producing a particular design of toys under the following existing incentive system:

Normal working hours in the week	**48 hours**
Late shift hours in the week	**12 hours**
Rate of payment	**Normal working: Rs.150 per hour**
	Late shift: Rs.300 per hour

Average output per operator for 60 hours per week (including late shift hours): 80 toys.

The company's management has now decided to implement a system of labour cost payment with either the Rowan Premium Plan or the Halsey Premium Plan in order to increase output, eliminate late shift overtime, and reduce the labour cost.

The following information is obtained:

The standard time allotted for ten toys is seven and half hours.

Time rate: Rs.150 per hour (as usual).

Assuming that the operator works for 48-hours in a week and produces 100 toys, you are required to calculate the weekly earnings for one operator under-

(i) The existing Time Rate,

(ii) Rowan Premium Plan and,

(iii) Halsey Premium Plan (50%).

(May '23)

Answer 46

Working Notes:

(1) Effective rate per hour:

Incentive for 60 hours = (Rs.150 × 48 hours + Rs.300 × 12 hours)

= 7,200 + 3,600 = Rs.10, 800

= Rs.10, 800 ÷ 60 hours = Rs.180 per hour

(2) Time taken/ allowed to produce 100 toys:

= (60 hours ÷ 80 toys) × 100 toys = 75 hours

(3) Time saved = Time Allowed – Time Taken

= 75 hours – 48 hours = 27 hours

(i) Calculation of weekly earnings for one operator under the existing time rate:

= (48 hours x Rs.150) + (12 hours x Rs.300) = Rs.10, 800

Alternative solution

= Effective rate per hour (WN-1) × Time required for 100 toys (WN-2)

= Rs.180 × 75 hours = Rs.13, 500

(ii) Calculation of weekly earnings for one operator under Rowan Premium plan:

(Time taken × Rate per hour) + (Time Saved/ Time Allowed × Time taken × Rate per hour)

= (48 hours × Rs.150) + [(27 ÷ 75) × 48 × Rs.150]

= 7,200 + 2,592 = Rs.9, 792

(iii) Calculation of weekly earnings for one operator under Halsey Premium plan:

(Time taken × Rate per hour) + (50% of Time Saved × Rate per hour)

= (48 hours × Rs.150) + (50% of 27 hours × Rs.150)

= Rs.7, 200 + Rs.2, 025 = Rs.9, 225

Question 47

How does the high employee turnover increase the cost of production? Explain.

(May '23)

Answer 47

High Employee Turnover increases the cost of production

Replacement costs are the costs which arise due to employee turnover. If employees leave soon after they acquire the necessary training and experience of good work, additional costs will have to be incurred on new workers, i.e., cost of recruitment, training and induction, abnormal breakage and scrap and extra wages and overheads due to the inefficiency of new workers. It is obvious that a company will incur very high replacement costs if the rate of employee turnover is high. Similarly, only adequate preventive costs can keep Employee turnover at a low level. Each company must, therefore, work out the optimum level of Employee turnover keeping in view its personnel policies and the behaviour of replacement cost and preventive costs at various levels of Employee turnover rates.

Question 50

EXPLAIN the meaning of Idle time and SHOW the treatment for the following causes of Idle time.

Causes	**Treatment**
1. The time lost between factory gate and the place of work,	
2. The interval between one job and another,	
3. Idle time may also arise due to abnormal factors like lack of coordination	

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4. Power failure, Breakdown of machines	

(MTP May 2025)

Answer 50

Idle Time - The time during which no production is carried-out because the worker remains idle but are paid. In other words, it is the difference between the time paid and the time booked. Idle time can be normal or abnormal. The time for which employees are paid includes holidays, paid leaves, allowable rest or off time etc.

Causes	Treatment
1. The time lost between factory gate and the place of work, 2. The interval between one job and another,	It is treated as a part of cost of production. Thus, in the case of direct workers an allowance for normal idle time is considered setting of standard hours or standard rate. In case of indirect workers, normal idle time is considered for the computation of overhead rate
3. Idle time may also arise due to abnormal factors like lack of coordination 4. Power failure, Break-down of machines	Abnormal idle time cost is not included as a part of production cost and is shown as a separate item in the Costing Profit and Loss Account.

MCQ's

Question 51

Idle time is the time under which-

(a) Full wages are paid to workers

(b) No productivity is given by the workers

(c) Both (a) and (b)

(d) None of the above

(Study material)

Ans: (c) Both (a) and (b)

Reason:

Idle time refers to the time during which:

(a) Workers are paid full wages, but

(b) They do not produce any output due to reasons like machine breakdown, lack of materials, etc.

Question 52

Cost of idle time due to non- availability of raw material is-

(a) Charged to overhead costs

(b) Charged to respective jobs

(c) Charged to costing profit and loss account

(d) None of the above

(Study material)

Ans: (c) Charged to costing profit and loss account

Reason:

Idle time due to abnormal causes like non-availability of raw material is considered abnormal idle time. Its cost is not related to normal production activity, so it is not included in job or overhead costs.

Instead, it is directly charged to the costing Profit and Loss Account to reflect it as an abnormal loss.

Question 53

Standard time of a job is 60 hours and guaranteed time rate is Rs.0.30 per hour. What is the amount of wages under Rowan plan if job is completed in 48 hours?

(a) Rs.16.20

(b) Rs.17.28

(c) Rs.18.00

(d) Rs.14.40

(Study material)

Ans: (b) Rs.17.28

Reason:

Under the Rowan Plan, a worker is paid:

Wages = Time taken × Rate + Bonus

Bonus = (Time saved / Standard time) × Time taken × Rate

This method rewards efficiency but controls the bonus, so workers don't earn excessively by rushing.

In this case:

Standard Time = 60 hours

Time Taken = 48 hours

Time Rate = Rs.0.30/hour

Time Saved = 12 hours

So, wages = (48 × 0.30) + [(12 / 60) × 48 × 0.30]

= Rs.14.40 + Rs.2.88 = Rs.17.28

Question 54

Suppose the units of a product are produced at the rate of 4 units per useful direct labour hour. Direct labour idle time is 10% of hours paid for. Sales of 1,000 units are budgeted and finished goods stock is expected to rise by 100 units. The budgeted direct labour hours for the production would be:

(a) 306

(b) 250

(c) 275

(d) 400

(RTP Sep. 2025)

Ans: (a) 306

Total production required = Budgeted sales + Increase in finished goods stock = 1,000 + 100 =1,100 units

Production rate = 4 units per useful direct labour hour

Useful hours = $\frac{1{,}100 \text{ units}}{4 \text{ units /hour}}$ = 275 hours

Useful hours = 90% of paid hours:

Paid hours = 275/90% = 305.55 = 306 hours

Topic 7 Employee Cost Components

Descriptive Question

Question 55

Following data have been extracted from the books of M/s. ABC Private Limited:

(i) Salary (each employee, per month) Rs. 30,000

(ii) Bonus 25% of salary

(iii) Employer's contribution to PF, ESI etc. 15% of salary

(iv) Total cost at employees' welfare activities Rs. 6, 61,500 per annum

(v) Total leave permitted during the year 30 days

(vi) No. of employees 175

(vii) Normal idle time 70 hours per annum

(viii) Abnormal idle time (due to failure of power supply) 50 hours

(ix) Working days per annum 310 days of 8 hours

You are required to calculate:

1. Annual cost of each employee

2. Employee cost per hour

3. Cost of abnormal idle time, per employee

(PYP Nov '18)

Answer 55

1.

Annual cost of each employee	**Rs.**
1. Salary (30,000×12)	3,60,000
2. Bonus (25% of Salary)	90,000
3. Employees Contribution to PF (15% of Salary)	54,000
4. Employers welfare (661500/175)	3,780
Total Annual Cost	5,07,780

2.

Effective Working hours (310 days × 8 hours)	2480 hours
Less: Leave days (30 days × 8 hours)	240 hours*
Available Working hours	2240 hours
Less: Normal Loss @70 hours	2170 hours
Employee Cost per hour $\frac{507780}{2170}$	= Rs. 234

*It is assumed 310 working days are without taking leave permitted into consideration

3. Cost of abnormal idle time per employee = Rs. 234× 50 hours= Rs. 11700 Alternative solution for Part (2) and (3)

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(2) Calculation of Employee cost per hour:

Working hours per annum	2,480 *
Less: Normal Idle time hours	70
Effective hours	2,410
Employee cost	5,07,780
Employee cost per hour	210.70

*It is assumed 310 working days are after adjusting leave permitted during the year.

(3) Cost of Abnormal idle time per employee:

Abnormal Idle time hours	50
Employee cost per hour	210.70
Cost of Abnormal idle time (210.70 ×50)	10,534.85

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Important Note:

The Sub part (i) was numerical question on employees cost. Most of the examinees did not answer in the correct line.

Question 56

A worker takes 15 hours to complete a piece of work for which time allowed is 20 hours. His wage rate is Rs. 5 per hour. Following additional information are also available:

Material cost of work Rs. 50

Factory overheads 100% of wages

Calculate the factory cost of work under the following methods of wage payments:

(i) Rowan Plan

(ii) Halsey Plan

(PYP May '18)

Answer 56

	Rs.
(i) Rowan Plan: Normal time wage = 15 hours @ Rs. 5 =	75
Bonus = Time saved /Time allowed × (Time taken × Time rate) = 5/20 x (15 x 5)	18.75
	93.75
(ii) Halsey Plan: Normal time wage = 15 hours @ Rs. 5 =	75
Bonus = 50% of (Time saved x Time rate) = 50% of (5x5) =	12.5
	87.5

Statement of Comparative Factory cost of work

	Rowan Plan Rs.	**Halsey Plan Rs.**
Materials	50	50

Direct Wages	93.75	87.5
Prime Cost	143.75	137.5
Factory Overhead (100% of Direct wages)	93.75	87.5
Factory Cost	237.5	225

Question 57

Following are the particulars of two workers 'R' and 'S' for a month:

Particulars	R	S
(i) Basic Wages (Rs.)	**15,000**	**30,000**
(ii) Dearness Allowance	**50%**	**50%**
(iii) Contribution to EPF (on basic wages)	**7%**	**7.5%**
(iv) Contribution to ESI (on basic wages)	**2%**	**2%**
(v) Overtime (hours)	**20**	**-**

The normal working hours for the month are 200 hrs. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to State Insurance and Provident Fund are at equal rates with employees' contributions.

Both workers were employed on jobs A, B and C in the following proportions:

Jobs	A	B	C
R	75%	10%	15%
S	40%	20%	40%

Overtime was done on job 'A'. You are required to :

(i) Calculate ordinary wage rate per hour of 'R' and 'S'.

(ii) Allocate the worker's cost to each job 'A', 'B' and 'C'.

(PYP Nov 20, Old & New SM).

Answer 57

(i) Calculation of Net Wages paid to Worker 'R' and 'S'

Particulars	R (Rs.)	S (Rs.)
Basic Wages	15,000.00	30,000.00
Dearness Allowance (DA) (50% of Basic Wages)	7,500.00	15,000.00
Overtime Wages (Refer to Working Note 1)	4,500.00	--
Gross Wages earned	27,000.00	45,000.00
Less: Provident Fund (7% × Rs. 15,000); (7.5% × Rs. 30,000)	(1,050.00)	(2,250.00)
Less: ESI (2% × Rs. 15,000); (2% × Rs. 30,000)	(300.00)	(600.00)

Net Wages paid	**25,650.00**	**42,150.00**

Calculation of ordinary wage rate per hour of Worker 'R' and 'S'

Particulars	R (Rs.)	S (Rs.)
Gross Wages (Basic Wages + DA) (excluding overtime)	22,500.00	45,000.00
Employer's contribution to P.F. and E.S.I.	1,350.00	2,850.00
	23,850.00	47,850.00
Ordinary wages Labour Rate per hour (Rs. 23,850 ÷ 200 hours); (Rs. 47,850 ÷ 200 hours)	**119.25**	**239.25**

(ii) Statement Showing Allocation of workers cost to each Job

	Total Wages	Jobs		
		A	B	C
Worker R				
Ordinary Wages (15:2:3)	23,850.00	17,887.50	2,385.00	3577.50
Overtime	4500.00	4500.00		
Worker S				
Ordinary Wages (2:1:2)	47,850.00	19,140.00	9,570.00	19,140.00

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	76,200.00	**41,527.50**	**11,955.00**	**22,717.50**

Working Note:

Normal Wages are considered as basic wages.

Over Time = $\frac{2\times(\text{Basic wage}+\text{D.A.})\times 20\text{hours}}{200\text{ hours}}$

= $\frac{2\times \text{Rs.}22{,}500\times 20\text{hours}}{200}$ = Rs. 4,500

Question 58

Out of the following methods attendance is marked by recognizing an employee based on physical and behavioral traits-

(a) Punch Card Attendance method

(b) Bio- Metric Attendance system

(c) Attendance Register method

(d) Token Method

(Study material)

Ans: (b) Bio- Metric Attendance system

Reason:

The Bio-Metric Attendance System identifies employees using physical and behavioral traits such as fingerprints, facial recognition, or iris scan. This ensures accurate and tamper-proof attendance records.

Topic 8 Over/Under Absorption of Overheads

Question 59

A job can be executed either through workman A or B. A takes 32 hours to complete the job while B finishes it in 30 hours. The standard time to finish the job is 40 hours.

The hourly wage rate is same for both the workers. In addition workman A is entitled to receive bonus according to Halsey plan (50%) sharing while B is paid bonus as per Rowan plan. The works overheads are absorbed on the job at Rs. 7.50 per labour hour worked. The factory cost of the job comes to Rs. 2,600 irrespective of the workman engaged.

INTERPRET the hourly wage rate and cost of raw materials input. Also show cost against each element of cost included in factory cost.

(RTP Nov.'18)

Answer 59

Calculation of:

1. Time saved and wages:

Workmen	**A**	**B**
Standard time (hrs.)	40	40
Actual time taken (hrs.)	32	30
Time saved (hrs.)	8	10
Wages paid @ Rs. x per hr. (Rs.)	32X	30X

2. Bonus Plan:

	Halsey	Rowan
Time saved (hrs.)	8	10
Bonus (Rs.)	4X	7.5 X
	$\left\|\frac{8hrs \times X}{2}\right\|$	$10\left\|\frac{hrs}{40\ hrs} \times 30hrs. \times 'X\right\|$

3. Total wages:

Workman A: 32x + 4x = Rs. 36x

Workman B: 30x + 7.5x = Rs. 37.5x

Statement of factory cost of the job

Workmen	A (Rs.)	B (Rs.)
Material cost (assumed)	y	y
Wages (shown above)	36x	37.5x
Works overhead	240	225
Factory cost (given)	2,600	2,600

The above relations can be written as follows:

36x + y + 240 = 2,600 (i)

37.5x+ y+ 225 = 2,600 (ii)

Subtracting (i) from (ii) we get 1.5x – 15 = 0

Or, 1.5 x = 15

Or, x = Rs. 10 per hour

On substituting the value of x in (i) we get y = Rs. 2,000

Hence the wage rate per hour is Rs. 10 and the cost of raw material is Rs. 2,000 on the job.

Question 60

GZ Ld. pays the following to a skilled worker engaged in production works. The following are the employee benefits paid to the employee:

(a)	**Basic salary per day**	**Rs.1,000**
(b)	**Dearness allowance (DA)**	**20% of basic salary**
(c)	**House rent allowance**	**16% of basic salary**
(d)	**Transport allowance**	**Rs.50 per day of actual work**
(e)	**Overtime**	**Twice the hourly rate (considers basic and DA), only if works more than 9 hours a day otherwise no overtime allowance. If works for more than 9 hours a day then overtime is considered after 8th hours.**
(f)	**Work of holiday and Sunday**	**Double of per day basic rate provided works at least 4 hours. The holiday and Sunday basic is eligible for all allowances and statutory deductions.**
(g)	**Earned leave & Casual leave**	**These are paid leave.**

(h)	**Employer's contribution to Provident fund**	**12% of basic and DA**
(i)	**Employer's contribution to Pension fund**	**7% of basic and DA**

The company normally works 8-hour a day and 26-day in a month. The company provides 30 minutes lunch break in between.

During the month of August 2020, Mr.Z works for 23 days including 15th August and a Sunday and applied for 3 days of casual leave. On 15th August and Sunday he worked for 5 and 6 hours respectively without lunch break.

On 5th and 13th August he worked for 10 and 9 hours respectively. During the month Mr. Z worked for 100 hours on Job no.HT200. You are required to CALCULATE:

(i) Earnings per day

(ii) Effective wages rate per hour of Mr. Z.

(iii) Wages to be charged to Job no.HT200.

(RTP Nov '20)

Answer 60

Workings:

1. Normal working hours in a month = (Daily working hours – lunch break) × no. of days

= (8 hours – 0.5 hours) × 26 days = 195 hours

2. Hours worked by Mr.Z = No. of normal days worked + Overtime + holiday/ Sunday worked

= (21 days × 7.5 hours) + (9.5 hours + 8.5 hours) + (5 hours + 6 hours)

= 157.5 hours + 18 hours + 11 hours = 186.50 hours.

(i) Calculation of earnings per day

Particulars	**Amount (Rs.)**
Basic salary (Rs.1,000 × 26 days)	26,000
Dearness allowance (20% of basic salary)	5,200
	31,200
House rent allowance (16% of basic salary)	4,160
Employer's contribution to Provident fund (12% × Rs.31,200)	3,744
Employer's contribution to Pension fund (7% × Rs.31,200)	2,184
	41,288
No. of working days in a month (days)	26
Rate per day	1,588
Transport allowance per day	50
Earnings per day	1,638

(ii) Calculation of effective wage rate per hour of Mr. Z:

Particulars	**Amount (Rs.)**
Basic salary (Rs.1,000 × 26 days)	26,000

Additional basic salary for Sunday & holiday (Rs.1,000 × 2 days)	2,000
	5,600
Dearness allowance (20% of basic salary)	33,600
House rent allowance (16% of basic salary)	4,480
Transport allowance (Rs.50 × 23 days)	1,150
Overtime allowance (Rs.160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × Rs.33,600)	4,032
Employer's contribution to Pension fund (7% × Rs.33,600)	2,352
Total monthly wages	46,254
Hours worked by Mr. Z (hours)	186.5
Effective wage rate per hour	248

*(Daily Basic + DA) ÷ 7.5 hours

= (1,000+200) ÷ 7.5 = Rs.160 per hour

(iii) Calculation of wages to be charged to Job no. HT200

= Rs. 248 × 100 hours = Rs. 24,800

Question 61

JBL Sisters operates a boutique which works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 8 hours for boutique work on a piece of garment. In the month of December 2020, two workers M and J were given 15 pieces and 21 pieces of garments respectively for boutique work. The following are the details of their work:

	M	J
Work assigned	15 pcs.	21 pcs.
Time taken	100 hours	140 hours

Workers are paid bonus as per Halsey System. The existing rate of wages is Rs. 60 per hour. As per the new wages agreement the workers will be paid Rs. 72 per hour w.e.f. 1stJanuary 2021. At the end of the month December 2020, the accountant of the company has wrongly calculated wages to these two workers taking Rs. 72 per hour.

Required:

(i) CALCULATE the loss incurred due to incorrect rate selection.

(ii) CALCULATE the loss incurred due to incorrect rate selection, had Rowan scheme of bonus payment followed.

(iii) CALCULATE the loss/ savings if Rowan scheme of bonus payment had followed.

(iv) DISCUSS the suitability of Rowan scheme of bonus payment for JBL Sisters?

(RTP May '21)

Answer 61

Workings Notes:

Calculation of Total hours saved:

	M	J
No. of garments assigned (Pieces.)	15	21
Hour allowed per piece (Hours)	8	8
Total hours allowed (Hours)	120	168
Hours Taken (Hours)	100	140
Hours Saved (Hours)	20	28

(i) Calculation of loss incurred due to incorrect rate selection:

(While calculating loss only excess rate per hour has been taken)

	M	J	Total (Rs.)
Basic Wages	1,200 (100 Hrs. × Rs.12)	1,680(140Hrs.× Rs.12)	2,880
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	120 (50% of 20 Hrs. × Rs.12)	168 (50% of 28 Hrs. × Rs.12)	288
Excess Wages Paid	1,320	1,848	3,168

(ii) Calculation of loss incurred due to incorrect rate selection had Rowan scheme of bonus payment followed:

	M	J	Total (Rs.)

Basic Wages	1,200 (100 Hrs. × Rs.12)	1,680 (140 Hrs. × Rs.12)	2,880
Bonus (as per Rowan Scheme) $\left(\frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Excess Rate}\right)$	200 $\left(\frac{100}{120} \times 20 \times \text{Rs. } 12\right)$	280 $\left(\frac{140}{168} \times 28 \times \text{Rs. } 12\right)$	480
Excess Wages Paid	1,400	1,960	3,360

(iii) Calculation of amount that could have been saved if Rowan Scheme were followed

	M	**J**	**Total (Rs.)**
Wages paid under Halsey Scheme	1,320	1,848	3,168
Wages paid under Rowan Scheme	1,400	1,960	3,360
Difference (loss)	(80)	(112)	(192)

(iv) Rowan Scheme of incentive payment has the following benefits, which is suitable with the nature of business in which JBL Sisters operates:

(a) Under Rowan Scheme of bonus payment, workers cannot increase their earnings or bonus by merely increasing its work speed. Bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.

(b) If the rate setting department commits any mistake in setting standards for time to be taken to complete the works, the loss incurred will be relatively low.

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Topic 10 MCQs

Multiple Choice Questions (MCQ's)

Question 62

Time and motion study is conducted by-

(a) Time keeping department

(b) Personnel department

(c) Payroll department

(d) Engineering department

(Study material)

Ans: (d) Engineering department

Reason:

Time and Motion Study involves analyzing:

- Time taken to complete tasks (Time study), and
- Movements involved in performing them (Motion study) to improve work efficiency and productivity.

This technical and analytical work is typically carried out by the Engineering Department, as it requires understanding of processes, machinery, and workflow design.

Question 63

Identify, which one of the following, does not account for increasing labour productivity-

(a) Job satisfaction

(b) Motivating workers

(c) High labour turnover

(d) Proper supervision and control

(Study material)

Ans: (c) High labour turnover

Reason:

High labour turnover means frequent exit and replacement of employees, which disrupts workflow, increases training costs, and reduces overall efficiency — thus lowering labour productivity.

Question 64

Time booking refers to a method wherein …… of an employee is recorded.

(a) Attendance

(b) Food expenses

(c) Health status

(d) Time spent on a particular job

(Study material)

Ans: (d) Time spent on a particular job

Reason:

Time booking refers to the method of recording the actual time an employee spends on a specific job, task, or activity. It helps in:

- Calculating labour cost per job
- Analyzing efficiency and productivity
- Preparing accurate job costing

Question 65

Employee Cost includes-

(a) Wages and salaries

(b) Allowances and incentives

(c) Payment for overtime

(d) All of the above

(Study material)

Ans: (d) All of the above

Reason:

Employee Cost includes all payments and benefits given to employees for services rendered. This covers:

(a) Wages and salaries → Basic compensation

(b) Allowances and incentives → Dearness allowance, bonuses, performance incentives

(c) Payment for overtime → Extra wages for hours worked beyond normal time

Question 66

If the time saved is less than 50% of the standard time, then the wages under Rowan and Halsey premium plan on comparison gives-

(a) More wages to workers under Rowan plan than Halsey plan

(b) More wages to workers under Halsey plan than Rowan plan

(c) Equal wages under two plans

(d) None of the above

(Study material)

Ans: (a) More wages to workers under Rowan plan than Halsey plan

Reason:

When time saved is less than 50% of standard time:

The Rowan Plan gives a higher bonus because the bonus is proportional to both time saved and actual time taken, leading to a more gradual increase in bonus.

The Halsey Plan gives 50% of the time saved as a bonus, which grows linearly.

So, for smaller savings (less than 50%), the Rowan Plan yields higher total wages than the Halsey Plan.

Question 67

If overtime is required for meeting urgent orders, the overtime premium should be charged as-

(a) Respective job

(b) Overhead cost

(c) Costing P& L A/c

(d) None of above

(Study material)

Ans: (a) Respective job

Reason:

When overtime is worked specifically to meet urgent customer orders, the overtime premium (extra wages paid over normal rate) is directly attributable to that job.

Therefore, it should be charged to the respective job, as it forms part of the cost incurred to complete that particular job on time.

Chapter 4

Overheads-Absorption Costing Method

Topic 1 Overhead Classification

Multiple Choice Questions (MCQs)

Question 1

Primary packing cost is a part of:

(a) Direct material cost

(b) Production Cost

(c) Selling overheads

(d) Distribution overheads

(Study material)

Ans: (b) Production Cost

Reason:

Primary packing is the essential packaging required to make the product ready for sale or use (e.g., bottles for medicine, boxes for soap). It is considered a part of the manufacturing process.

Hence, the cost of primary packing is included in the Production Cost, not in selling or distribution expenses.

Question 2

Director's remuneration and expenses form part of:

(a) Production overhead

(b) Administration overhead

(c) Selling overhead

(d) Distribution overhead

(Study material)

Ans: (b) Administration overhead

Reason:

Director's remuneration and related expenses are associated with the overall management and policy-making functions of the organization rather than directly contributing to production, selling, or distribution activities. Therefore, they are classified as administration overheads, which include costs incurred in the direction, control, and administration of an enterprise.

Question 3

Which of the following is not the classification of overhead based on its functionality?

(a) Factory Overhead

(b) Administrative Overhead

(c) Fixed Overhead

(d) Selling Overhead

(Study material)

Ans: (c) Fixed Overhead

Reason:

Overheads can be classified in two major ways:

1. By function – such as:

- Factory (Production) Overhead
- Administrative Overhead
- Selling Overhead
- Distribution Overhead

2. By behavior – such as:

- Fixed Overhead
- Variable Overhead
- Semi-variable Overhead

Since Fixed Overhead is a classification based on behavior and not on functionality, it is not a classification of overhead based on its function.

Question 4

Bad debt is an example of:

(a) Distribution overhead

(b) Production overhead

(c) Selling overhead

(d) Administration overhead

(Study material)

Ans: (c) Selling overhead

Reason:

Bad debts arise when customers fail to pay for goods or services sold on credit. Since these losses are directly linked to the act of selling and extending credit to promote sales, they are treated as part of selling overheads. Selling overheads include all expenses related to promoting sales and securing orders, including credit-related costs like bad debts.

Topic 2 Allocation vs Apportionment

Descriptive Question

Question 5

A Ltd. manufactures two products- A and B. The manufacturing division consists of two production departments P1 and P2 and two service departments S1 and S2. Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P1 is based on direct machine hours, while the rate of Department P2 is based on direct Labour hours. In applying overheads, the pre-determined rates are multiplied by actual hours.

(Oct.'2020)

For allocating the service department costs to production departments, the basis adopted is as follows:

(i) Cost of Department S1 to Department P1 and P2 equally, and

(ii) Cost of Department S2 to Department P1 and P2 in the ratio of 2:1 respectively. The following budgeted and actual data are available:

Annual profit plan data:

Factory overheads budgeted for the year:

Departments	**P1**	**27,51,000**	**S1**	**8,00,000**

	P2	24,50,000	S2	6,00,000

Budgeted output in units: Product A 50,000; B 30,000.

Budgeted raw-material cost per unit: Product A Rs. 120; Product B Rs. 150.

Budgeted time required for production per unit:

Department P1: **Product A: 1.5 machine hours**

Product B: 1.0 machine hour

Department P2:

Product A: 2 Direct Labour hours

Product B: 2.5 Direct Labour hours

Average wage rates budgeted in Department P2 are:

Product A - Rs. 72 per hour and Product B – Rs. 75 per hour. All materials are used in Department P1 only.

Actual data (for the month of Jan, 2020):

Units actually produced: **Product A: 4,000 units**

Product B: 3,000 units

Actual direct machine hours worked in Department P1:

On Product A 6,100 hours, Product B 4,150 hours. Actual direct Labour hours worked in Department

P2: On Product A 8,200 hours, Product B 7,400 hours.

Costs actually incurred:		Product A		Product B

Raw materials		**Rs. 4,89,000**		**Rs. 4,56,000**
Wages		**5,91,900**		**5,52,000**
Overheads: Department	**P1**	**2,50,000**	**S1**	**80,000**
	P2	**2,25,000**	**S2**	**60,000**

You are required to:

(i) COMPUTE the pre-determined overhead rate for each production department.

(ii) PREPARE a performance report for Jan, 2020 that will reflect the budgeted costs and actual costs.

(MTP, Oct'20) (Same concept different figures Old & New SM)

Answer 5

(i) Computation of pre-determined overhead rate for each production department from budgeted data

	Production Department		**Service Department**	
Budgeted factory overheads for the year (Rs.)	27,51,000	24,50,000	8,00,000	6,00,000
Allocation of service department S1's costs to production departments P1 and P2 equally (Rs.)	4,00,000	4,00,000	(8,00,000)	--

Allocation of service department S2's costs to production departments P1 and P2 in the ratio of 2:1 (Rs.)	4,00,000	2,00,000	--	(6,00,000)
Total	35,51,000	30,50,000	--	--
Budgeted machine hours in department P1 (working note-1)	1,05,000	--	--	--
Budgeted labour hours in department P2 (working note-1)	--	1,75,000	--	--
Budgeted machine/ labour hour rate	33.82	17.43	--	--

(ii) Performance report for Jan, 2020

(When 4,000 and 3,000 units of Products A and B respectively were actually produced)

	Budgeted (Rs.)	**Actual (Rs.)**
Raw materials used in Dept. P1:		
A : 4,000 units × Rs.120	4,80,000	4,89,000
B : 3,000 units × Rs.150	4,50,000	4,56,000
Direct Labour cost (on the basis of Labour hours worked in department P2)		
A: 4,000 units × 2 hrs. × Rs. 72	5,76,000	5,91,900

B: 3,000 units × 2.5 hrs. × Rs. 75	5,62,500	5,52,000
Overhead absorbed on machine hour basis in Dept. P1:		
A: 4,000 units × 1.5 hrs. × Rs.33.82	2,02,920	1,96,420*
B : 3,000 units × 1 hr. × Rs.33.82	1,01,460	1,33,630*
Overhead absorbed on Labour hour basis in Dept. P2:		
A: 4,000 units × 2 hrs. × Rs.17.43	1,39,440	1,49,814**
B: 3,000 units × 2.5 hrs. × Rs.17.43	1,30,725	1,35,198**
	26,43,045	27,03,962

* (Refer to working note 4) ** (Refer to working note 5)

Working notes

1.

	Product A	**Product B**	**Total**
Budgeted output (units)	50,000	30,000	
Budgeted machine hours in Dept. P1	75,000 (50,000×1.5 hrs.)	30,000 (30,000×1 hr.)	1,05,000
Budgeted Labour hours in Dept. P2	1,00,000 (50,000×2 hrs.)	75,000 (30,000×2.5hrs.)	1,75,000

2.

	Product A	Product B	Total
Actual output (units)	4,000	3,000	
Actual machine hours utilized in Dept. P1	6,100	4,150	10,250
Actual labour hours utilised in Dept. P2	8,200	7,400	15,600

3. Computation of actual overhead rates for each production department from actual data

	Production Department		Service Department	
Actual factory overheads for the month of Jan, 2020 (Rs.)	2,50,000	2,25,000	80,000	60,000
Allocation of service Dept. S1's costs to production Dept. P1 and P2 equally (Rs.)	40,000	40,000	(80,000)	--
Allocation of service Dept. S2's costs to production Dept. P1 and P2 in the ratio of 2:1 (Rs.)	40,000	20,000	--	(60,000)
Total	3,30,000	2,85,000	--	--
Actual machine hours in Dept. P1 (working note 2)	10,250	--		
Actual labour hours in Dept. P2 (working note 2)	--	15,600		

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Actual machine/ labour hour rate (Rs.)	32.20	18.27		

4. Actual overheads absorbed (based on machine hours)

A: 6,100 hrs. × Rs.32.20 = 1, 96,420

B: 4,150 hrs. ×Rs. 32.20=1, 33,630

5. Actual overheads absorbed (based on labour hours)

A: 8,200 hrs. × Rs.18.27 = 1, 49,814

B: 7,400 hrs. × Rs.18.27 =1, 35,198

Question 6

The Union Ltd. has the following account balances and distribution of direct charges on 31st March, 2019.

	Total	**Production Depts.**		**Service Depts.**	
		Machine Shop	**Packing**	**General Plant**	**Stores**
Allocated Overheads:	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**
Indirect labour	**29,000**	**8,000**	**6,000**	**4,000**	**11,000**
Maintenance Material	**9,900**	**3,400**	**1,600**	**2,100**	**2,800**
Misc. supplies	**5,900**	**1,500**	**2,900**	**900**	**600**

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Supervisor's salary	16,000	--	--	16,000	--
Cost & payroll salary	80,000	--	--	80,000	--

Overheads to be apportioned:

Power	78,000
Rent	72,000
Fuel and Heat	60,000
Insurance	12,000
Taxes	8,400
Depreciation	1,20,000

The following data were compiled by means of the factory survey made in the previous year:

	Floor Space	Radiator Section	No. of employees	Investment	H.P. hours
Machine Shop	2,000 Sq. ft.	45	20	8,00,000	3,500
Packing	800 Sq. ft.	90	12	2,40,000	500
General Plant	400 Sq. ft.	30	4	80,000	--
Stores & maintenance	1,600 Sq. ft.	60	8	1,60,000	1,000

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Expenses charged to the stores departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%;

General Plant overheads is distributed on the basis of number of employees.

(a) PREPARE an overhead distribution statement with supporting schedules to show computations and basis of distribution.

(b) DETERMINE the service department distribution by simultaneous equation method.

(RTP May '19) (Same concept different figures Old & New SM)

Answer 6

(a) Overhead Distribution Statement

	Production Departments		**Service Departments**	
	Machine Shop	**Packing**	**General Plant**	**Stores**
Allocated Overheads:	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**
Indirect labour	8,000	6,000	4,000	11,000
Maintenance Material	3,400	1,600	2,100	2,800
Misc. supplies	1,500	2,900	900	600
Supervisor's salary	--	--	16,000	--

Cost & payroll salary	--	--	80,000	--
Total allocated overheads	12,900	10,500	1,03,000	14,400
Add: Apportioned Overheads (As per Schedule below)	1,84,350	70,125	22,775	73,150
	1,97,250	80,625	1,25,775	87,550

Schedule of Apportionment of Overheads

Item of Cost	Basis	Production Departments		Service Departments	
		Machine Shops (Rs.)	Packing (Rs.)	General Plant (Rs.)	Stores (Rs.)
Power	HP hours (7 : 1 : - : 2)	54,600	7,800	--	15,600
Rent	Floor space (5 : 2 : 1 : 4)	30,000	12,000	6,000	24,000
Fuel & Heat	Radiator sec. (3 : 6 : 2 : 4)	12,000	24,000	8,000	16,000
Insurance	Investment (10 : 3 : 1 : 2)	7,500	2,250	750	1,500
Taxes	Investment (10 : 3 : 1 : 2)	5,250	1,575	525	1,050

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Depreciation	Investment (10 : 3 : 1 : 2)	75,000	22,500	7,500	15,000
		1,84,350	70,125	22,775	73,150

(b) Re-distribution of Overheads of Service Departments to Production Departments:

Let, the total overheads of General Plant = 'a' and the total overheads of Stores = 'b'

a = 1, 25,775 + 0.3b..... (i)

b = 87,550 + 0.2a..... (ii)

Putting the value of 'b' in equation no. (i) a = 1, 25,775 + 0.3 (87,550 + 0.2a)

Or a = 1, 25,775 + 26,265 + 0.06a

Or 0.94a = 1, 52,040 or a = 1, 61,745 (appx.)

Putting the value of a = 1, 61,745 in equation no. (ii) To get the value of 'b'

b = 87,550 + 0.2 × 1, 61,745 = 1, 19,899

Secondary Distribution Summary

Particulars	**Total (Rs.)**	**Machine Shops (Rs.)**	**Packing (Rs.)**
Allocated and Apportioned overheads as per Primary distribution	2,77,875	1,97,250.00	80,625.00
- General Plant	1,61,745	80,872.50 $(1,61,745 \times \frac{5}{10})$	48,523.50 $(1,61,745 \times \frac{3}{10})$

- Stores	1,19,899	59,949.50 (1, 19,899 × 50%)	23,979.80 (1, 19,899 ×20%)
		3,38,072.00	1,53,128.30

Multiple Choice Questions (MCQs)

Question 7

The allotment of whole items of cost to cost centres or cost units is called:

(a) Overhead absorption

(b) Cost apportionment

(c) Cost allocation

(d) None of the above

(Study material)

Ans: (c) Cost allocation

Reason:

Cost allocation means assigning a specific, whole cost directly to a particular cost centre or cost unit, as it is clearly identifiable with that unit.

Question 8

The difference between actual factory overhead and absorbed factory overhead will be usually at the minimum level, provided pre- determined overhead rate is based on:

(a) Maximum capacity

(b) Direct labour hours

(c) Machine hours

(d) Normal capacity

(Study material)

Ans: (d) Normal capacity

Reason:

When the pre-determined overhead rate is based on normal capacity, it reflects the average expected activity level over time, considering normal operating conditions. This helps minimize the difference between actual and absorbed overhead, leading to more accurate cost allocation.

Topic 3 Primary & Secondary Distribution

Descriptive Question

Question 9

Pretz Ltd. is a manufacturing company having two production departments, 'A' & 'B' and two service departments 'X' & 'Y'. The following is the budget for March, 2022:

	Total (Rs.)	A (Rs.)	B (Rs.)	X (Rs.)	Y (Rs.)
Direct material		**2,00,000**	**4,00,000**	**4,00,000**	**2,00,000**
Direct wages		**10,00,000**	**4,00,000**	**2,00,000**	**4,00,000**
Factory rent	**9,00,000**				

Power (Machine)	**5,10,000**				
Depreciation	**2,00,000**				
General Lighting	**3,00,000**				
Perquisites	**4,00,000**				
Additional information:					
Area (Sq. ft.)		**500**	**250**	**250**	**500**
Capital value of assets (Rs. lakhs)		**40**	**80**	**20**	**20**
Light Points		**10**	**20**	**10**	**10**
Machine hours		**1,000**	**2,000**	**1,000**	**1,000**
Horse power of machines		**50**	**40**	**15**	**25**

A technical assessment of the apportionment of expenses of service departments is as under:

	A	**B**	**X**	**Y**
Service Dept. 'X' (%)	**55**	**25**	**–**	**20**
Service Dept. 'Y' (%)	**60**	**35**	**5**	**–**

You are required to:

(a) PREPARE a statement showing distribution of overheads to various departments.

(b) PREPARE a statement showing re-distribution of service departments expenses to production departments using-

(i) Simultaneous equation method

(ii) Trial and error method

(iii) Repeated Distribution Method.

(RTP May '22)

Answer 9

(a) Primary Distribution of Overheads

	Basis	Total (Rs.)	A (Rs.)	B (Rs.)	X (Rs.)	Y (Rs.)
Direct materials	Direct	6,00,000	–	–	4,00,000	2,00,000
Direct wages	Direct	6,00,000	–	–	2,00,000	4,00,000
Factory rent (2:1:1:2)	Area	9,00,000	3,00,000	1,50,000	1,50,000	3,00,000
Power (Machine) (10:16:3:5)*	H.P. × Machine Hrs.	5,10,000	1,50,000	2,40,000	45,000	75,000
Depreciation (2:4:1:1)	Capital value	2,00,000	50,000	1,00,000	25,000	25,000
General Lighting	Light Points	3,00,000	60,000	1,20,000	60,000	60,000

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(1:2:1:1)						
Perquisites (5:2:1:2)	Direct Wages	4,00,000	2,00,000	80,000	40,000	80,000
		35,10,000	**7,60,000**	**6,90,000**	**9,20,000**	**11,40,000**

*{(1000×50): (2000×40): (1000×15): (1000×25)}

(50000: 80000: 15000: 25000)

(10: 16: 3: 5)

(b) (i) Redistribution of Service Department's expenses using 'Simultaneous equation method'

X	9,20,000 + 0.05 Y
Y	11,40,000 + 0.20 X

Substituting the value of X,

Y = 11, 40,000 + 0.20 (9, 20,000 + 0.05 Y)

= 13, 24,000 + 0.01 Y

Y - 0.01Y = 13, 24,000

Y = 13, 24,000 / 0.99

Y = Rs. 13, 37,374

The total expense of Y is Rs. 13, 37,374 and that of X is Rs. 9, 86,869 i.e., Rs. 9, 20,000 + (0.05 × Rs. 13, 37,374).

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (Rs.)	**B (Rs.)**
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of Rs. 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of Rs. 13,37,374)	8,02,424	4,68,081
	21,05,202	**14,04,798**

(ii) Redistribution of Service Department's expenses using 'Trial and Error Method':

	Service Departments	
	X (Rs.)	**Y (Rs.)**
Overheads as per primary distribution	9,20,000	11,40,000
(i) Apportionment of Dept-X expenses to Dept-Y (20% of Rs. 9,20,000)	---	1,84,000
	---	13,24,000
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of Rs. 13,24,000)	66,200	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of Rs. 66,200)	---	13,240

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(ii) Apportionment of Dept-Y expenses to Dept-X (5% of Rs. 13,240)	662	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of Rs. 662)		132
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of Rs. 132)	7	
Total	**9,86,869**	**13,37,372**

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (Rs.)	**B (Rs.)**
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of Rs. 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of Rs. 13,37,372)	8,02,423	4,68,080
	21,05,201	14,04,797

(iii) Redistribution of Service Department's expenses using 'repeated distribution method':

	A (Rs.)	**B (Rs.)**	**X (Rs.)**	**Y (Rs.)**
Overhead as per primary distribution	7,60,000	6,90,000	9,20,000	11,40,000

Dept. X overhead apportioned in the ratio (55:25:—:20)	5,06,000	2,30,000	(9,20,000)	1,84,000
Dept. Y overhead apportioned in the ratio (60:35:5: —)	7,94,400	4,63,400	66,200	(13,24,000)
Dept. X overhead apportioned in the ratio (55:25:—:20)	36,410	16,550	(66,200)	13,240
Dept. Y overhead apportioned in the ratio (60:35:5: —)	7,944	4,634	662	(13,240)
Dept. X overhead apportioned in the ratio (55:25:—:20)	364	166	(662)	132
Dept. Y overhead apportioned in the ratio (60:35:5: —)	79	46	7	(132)
Dept. X overhead apportioned in the ratio (55:25:—:20)	4	3	(7)	-
	21,05,201	**14,04,799**	-	-

Question 10

DISCUSS the problems of controlling the selling and distribution overheads.

(Study material)

Answer 10

Control of selling and distribution expenses is a difficult task. The reasons for this are as follows:

1. The incidence of selling and distribution overheads depends mainly on external factors, such as distance of market, extent and nature of competition, terms of sales, etc. which are beyond the control of management.

2. These overheads are dependent upon the customers, behaviour, their liking and disliking, tastes etc. Therefore, as such control over the overheads may result in loss of customers.

3. These expenses being of the nature of policy costs are not amenable to control.

In spite of the above difficulties, the following methods may be used for controlling them.

(a) Comparison with past performance - According to this method, selling and distribution overheads are compared with the figures of the previous period. Alternatively, the expenses may be expressed as a percentage of sales, and the percentages may be compared with those of the past period. This method is suitable for small concerns.

(b) Budgetary Control - A budget is set up for selling and distribution expenses. The expenses are classified into fixed and variable. If necessary, a flexible budget may be prepared indicating the expenses at different levels of sales. The actual expenses are compared with the budgeted figures and in the case of variances suitable actions are taken.

(c) Standard Costing - Under this method standards are set up in relation to the standard sales volume. Standards may be set up for salesmen, territories, products etc. Once the standards are set up, comparison is made between the actuals and standards: variances are enquired into and suitable action taken.

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Question 11

The ABC Company has the following account balances and distribution of direct charges on 31st March.

	Total	Production Depts.		Service Depts.	
		Machine shop	Packing	Gen. Plant	Store & Maintenance
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Allocated Overheads:					
Indirect labour	14,650	4,000	3,000	2,000	5,650
Maintenance material	5,020	1,800	700	1,020	1,500
Misc. supplies	1,750	400	1,000	150	200
Superintendent's salary	4,000	–	–	4,000	–
Cost & payroll salary	10,000	–	–	10,000	–
Overheads to be apportioned:					
Power	8,000				
Rent	12,000				
Fuel and heat	6,000				

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Insurance	1,000				
Trade License fees	2,000				
Depreciation	1,00,000				
	1,64,420	6,200	4,700	17,170	7,350

The following data were compiled by means of the factory survey made in the previous year:

	Floor Space (Sqft)	Radiator Sections	No. of Employees	Investment (Rs.)	H.P hours
Machine Shop	2,000	45	20	6,40,000	3,500
Packing	800	90	10	2,00,000	500
General Plant	400	30	3	10,000	-
Store & Maintenance	1,600	60	5	1,50,000	1,000
	4,800	225	38	10,00,000	5,000

Expenses charged to the stores and maintenance departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%; General Plant overheads is distributed on the basis of number of employees:

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(a) An overhead distribution statement.

(b) Distribution of the service departments' expense to production departments.

(Study material)

Answer 11

(a) Overhead Distribution Statement

Particulars	**Production Department**		**Service Department**	
	Machine	**Packing**	**General Plant**	**Stores & Maint.**
Allocated Expenses:				
Indirect labour	4,000	3,000	2,000	5,650
Maintenance material	1,800	700	1,020	1,500
Superintendent's salary	-	-	4,000	-
Misc. supplies	400	1,000	150	200
Cost & payroll salaries	-	-	10,000	-
Total Allocated Overheads	6,200	4,700	17,170	7,350
Apportioned expenses (as per schedule below)	77,720	25,800	2,830	22,650
Total overheads	**83,920**	**30,500**	**20,000**	**30,000**

Schedule of Apportioned Expenses

Item	Basis	Total Amount	Production Depts.		Service Depts.	
			Machine shop	Packing	Gen. Plant	Store & Maint.
		(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Power (7:1:-:2)	HP hours	8,000	5,600	800	-	1,600
Rent (5:2:1:4)	Floor Space	12,000	5,000	2,000	1,000	4,000
Fuel and heat (3:6:2:4)	Radiator Secs.	6,000	1,200	2,400	800	1,600
Insurance (64:20:1:15)	Investment	1,000	640	200	10	150
Trade license fees (64:20:1:15)	Investment	2,000	1,280	400	20	300
Depreciation (64:20:1:15)	Investment	1,00,000	64,000	20,000	1,000	15,000
Total		1,29,000	77,720	25,800	2,830	22,650

(b) Distribution of Service Department Expenses

	Production Depts.	Service Depts.

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	Machine shop	Packing	Gen. Plant	Store & Maint.
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Total Expense [as per (a)]	83,920	30,500	20,000	30,000
Dist. of Store & Maint. (5:2:3)	15,000	6,000	9,000	-30,000
Dist. of General plant (4:2:1)	16,571	8,286	-29,000	4,143
Dist. of Store & Maint. (5:2:3)	2,072	829	1,242	-4,143
Dist. of General plant (4:2:1)	710	355	-1,242	177
Dist. of Store & Maint. (5:2:3)	89	35	53	-177
Dist. of General plant (4:2:1)	35	18	-53	0
Total	**1,18,397**	**46,023**		

Question 12

Baba Ltd. belongs to an automotive industry, manufacturing hybrid bicycles. The production of bicycles passes through three departments, viz. X1, Y2, Z3. The bicycles being equipped with gears needs quality check from time to time. Thus, the company also operates two service departments, namely quality control (QC) and maintenance (M), for its bicycle.

Following information is extracted from the accounting books regarding expenses as incurred/ charged:

Particulars	(Rs.)
Rent and Rates	40,00,000
General Lighting	4,80,000
Indirect Wages	15,51,200
Power	12,00,000
Depreciation on Machines	80,00,000
Sundries	77,56,000

Additional information:

	Production Departments			Service Departments	
	X1	Y2	Z3	QC	M
Direct wages (Rs.)	24,00,000	16,00,000	24,00,000	12,00,000	1,56,000
Working hours	6,140	8,950	4,838	-	-
Value of machines (Rs.)	4,80,00,000	6,40,00,000	8,00,00,000	40,00,000	40,00,000
H.P. of machines	120	60	100	20	-

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Light points	**20**	**30**	**40**	**20**	**10**
Floor space (sq. ft.)	**4,000**	**5,000**	**6,000**	**4,000**	**1,000**

A technical assessment unveiled the following basis for the apportionment of expenses of service departments:

	X1	**Y2**	**Z3**	**QC**	**M**
QC	**20%**	**30%**	**40%**	**-**	**10%**
M	**40%**	**20%**	**30%**	**10%**	**-**

You are required to DETERMINE the following:

(i) Overheads distributed to all the departments, viz. X1, Y2, Z3, QC and M.

(ii) Overheads total and rate per hour under all the Production Departments after redistribution of Service Department's Overhead.

(iii) Total cost of a bicycle, considering the Direct Material and labour Cost of Rs.20,000 and Rs.12,000 respectively, which is being processed for manufacturing in Departments X1, Y2 and Z3 for 4, 5 and 3 hours respectively.

(MTP Jan 2025)

Answer 12

(a) (i) Statement Showing Distribution of Overheads of Baba Ltd.

Particulars	**Basis**	**Total**	**Production Departments**			**Service Departments**	
			X1	**Y2**	**Z3**	**QC**	**M**

		(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Direct wages	Actual	13,56,000	-	-	-	12,00,000	1,56,000
Rent & rates	Area	40,00,000	8,00,000	10,00,000	12,00,000	8,00,000	2,00,000
General lighting	Light points	4,80,000	80,000	1,20,000	1,60,000	80,000	40,000
Indirect wages	Direct wages	15,51,200	4,80,000	3,20,000	4,80,000	2,40,000	31,200
Power	H.P.	12,00,000	4,80,000	2,40,000	4,00,000	80,000	–
Depreciation of machines	Value of machines	80,00,000	19,20,000	25,60,000	32,00,000	1,60,000	1,60,000
Sundries	Direct wages	77,56,000	24,00,000	16,00,000	24,00,000	12,00,000	1,56,000
		2,43,43,200	61,60,000	58,40,000	78,40,000	37,60,000	7,43,200

(ii) Redistribution of Service Department's Expenses over Production Departments

	X1 (Rs.)	Y2 (Rs.)	Z3 (Rs.)	QC (Rs.)	M (Rs.)
Total overhead distributed as above	61,60,000	58,40,000	78,40,000	37,60,000	7,43,200
Dept. QC Overheads apportioned (20:30:40:—:10)	7,52,000	11,28,000	15,04,000	-37,60,000	3,76,000

Dept. M overheads apportioned (40:20:30:10:—)	4,47,680	2,23,840	3,35,760	1,11,920	-11,19,200
Dept. QC Overheads apportioned (20:30:40:—:10)	22,384	33,576	44,768	-1,11,920	11,192
Dept. M overheads apportioned (40:20:30:10:—)	4,477	2,238	3,358	1,119	-11,192
Dept. QC Overheads apportioned (20:30:40:—:10)	224	336	448	-1,119	112
Dept. M overheads apportioned (40:20:30:10:—)	45	22	34	11	-112
Dept. QC Overheads apportioned (20:30:40:—:10)	2	3	5	-11	-
Total	**73,86,812**	**72,28,015**	**97,28,373**		
Working hours	6,140	8,950	4,838		
Rate per hour	**1,203**	**808**	**2,011**		

(iii) Determination of total cost of a bicycle:

Particulars	(Rs.)
Direct material cost	20,000
Direct labour cost	12,000
Overhead cost (See working note)	14,885
	46,885

Working Note:

Overhead cost

= (Rs.1, 203 × 4 hrs.) + (Rs.808 × 5 hrs.) + (Rs.2, 011 × 3 hrs.)

= Rs.4, 812 + Rs.4, 040 + Rs.6, 033 = Rs.14, 885

Question 13

Arnav Ltd. has three production departments M, N and O and two service departments P and Q. The following particulars are available for the month of September, 2024:

	(Rs.)
Lease rental	**35,000**
Power & Fuel	**4,20,000**
Wages to factory supervisor	**6,400**
Electricity	**5,600**

Depreciation on machinery	**16,100**
Depreciation on building	**18,000**
Payroll expenses	**21,000**
Canteen expenses	**28,000**
ESI and Provident Fund Contribution	**58,000**

Followings are the further details available:

Particulars	M	N	O	P	Q
Floor space (square meter)	**1,200**	**1,000**	**1,600**	**400**	**800**
Light points (nos.)	**42**	**52**	**32**	**18**	**16**
Cost of machines (Rs.)	**12,00,000**	**10,00,000**	**14,00,000**	**4,00,000**	**6,00,000**
No. of employees (nos.)	**48**	**52**	**45**	**15**	**25**
Direct Wages (Rs.)	**1,72,800**	**1,66,400**	**1,53,000**	**36,000**	**53,000**
HP of Machines	**150**	**180**	**120**	**-**	**-**
Working hours (hours)	**1,240**	**1,600**	**1,200**	**1,440**	**1,440**

The expenses of service department are to be allocated in the following manner:

	M	N	O	P	Q
P	**30%**	**35%**	**25%**	**-**	**10%**
Q	**40%**	**25%**	**20%**	**15%**	**-**

You are required to CALCULATE the overhead absorption rate per hour in respect of the three production departments.

(MTP May 2025)

Answer 13

Primary Distribution Summary

Item of cost	Basis of apportionment	Total (Rs.)	Production Dept.			Service Dept.	
			M (Rs.)	N (Rs.)	O (Rs.)	P (Rs.)	Q (Rs.)
Lease rental	Floor space (6 : 5 : 8 : 2 : 4)	35,000	8,400	7,000	11,200	2,800	5,600
Power & Fuel	HP of Machines × Working hours (93: 144 : 72)	4,20,000	1,26,408	1,95,728	97,864	--	--
Supervisor's wages*	Working hours (31 : 40 : 30)	6,400	1,964	2,535	1,901	--	--
Electricity	Light points (21: 26: 16 : 9 : 8)	5,600	1,470	1,820	1,120	630	560

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Depreciation on machinery	Value of machinery (6 : 5 : 7 : 2 : 3)	16,100	4,200	3,500	4,900	1,400	2,100
Depreciation on building	Floor space (6 : 5 : 8 : 2 : 4)	18,000	4,320	3,600	5,760	1,440	2,880
Payroll expenses	No. of employees (48: 52: 45: 15: 25)	21,000	5,448	5,903	5,108	1,703	2,838
Canteen expenses	No. of employees (48: 52: 45: 15: 25)	28,000	7,265	7,870	6,811	2,270	3,784
ESI and PF contribution	Direct wages (864: 832: 765: 180: 265)	58,000	17,244	16,606	15,268	3,593	5,289
		6,08,100	**1,76,719**	**2,44,562**	**1,49,932**	**13,836**	**23,051**

* Wages to supervisor is to be distributed to production departments only.

Let 'P' be the overhead of service department P and 'Q' be the overhead of service department Q.

P = 13,836 + 0.15 Q

Q = 23,051 + 0.10 P

Substituting the value of Q in P we get

P = 13,836 + 0.15 (23,051 + 0.10 P)

P = 13,836 + 3,457.65 + 0.015 P

0.985 P = 17,293.65

∴P = Rs. 17,557

∴Q = 23,051 + 0.10 × 17,557

= Rs. 24,806.70 or Rs. 24,807

Secondary Distribution Summary

Particulars	Total	M	N	O
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Allocated and Apportioned over-heads as per primary distribution	5,71,213	1,76,719	2,44,562	1,49,932
P (90% of Rs.17,557)	15,801	5,267	6,145	4,389
Q (85% of Rs.24,807)	21,086	9,923	6,202	4,961
		1,91,909	2,56,909	1,59,282

Overhead rate per hour

	M	N	O
Total overheads cost (Rs.)	1,91,909	2,56,909	1,59,282
Working hours	1,240	1,600	1,200
Rate per hour (Rs.)	154.77	160.57	132.74

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Question 14

SA Ltd. has three production (M1, M2 and A1) and three service departments (Stores, Engineering services and General service). Engineering department serves the M1 and M2 only.

The relevant information related with Product X and Y are as follows:

	Product X	Product Y
M1	10 Machine hours	6 Machine hours
M2	4 Machine hours	14 Machine hours
A1	14 Direct labour hours	18 Direct labour hours

The annual budgeted overhead cost for the year is

	Indirect Wages (Rs.)	Consumable Supplies (Rs.)
M1	9,30,400	2,52,000
M2	8,26,800	3,64,000
A1	3,24,400	84,000
Stores	1,64,000	56,000
Engineering Service	1,06,800	84,000
General Service	1,50,400	64,000

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	(Rs.)
– Depreciation on Machinery	**7,92,000**
– Insurance of Machinery	**1,44,000**
– Insurance of Building	**64,800 (Total building insurance cost for M1 is one third of annual premium)**
– Power	**1,29,600**
– Light	**1,08,000**
– Rent	**2, 53,500 (The general service deptt. is located in a building owned by the company. It is valued at Rs. 1, 20,000 and is charged into cost at notional value of 8% per annum. This cost is additional to the rent shown above)**
The value of issues of materials to the production departments are in the same proportion as shown above for the Consumable supplies.	

The following data are also available:

Department	Book value Machinery (Rs.)	Area (Sq. ft.)	Effective H.P. hours %	Production Direct Labour hour	Capacity Machine hour
M1	24,00,000	5,000	50	2,00,000	40,000
M2	18,00,000	6,000	35	1,50,000	50,000

A1	6,00,000	8,000	05	3,00,000	–
Stores	2,40,000	2,000	–	–	–
Engg. Service	7,20,000	2,500	10	–	–
General Service	2,40,000	1,500	–	–	–

Required:

(i) PREPARE an overhead analysis sheet, showing the bases of apportionment of overhead to departments.

(ii) PREPARE a statement allocating service department overheads to production department ignoring the apportionment of service department costs among service departments.

(iii) CALCULATE suitable overhead absorption rate for the production departments.

(iv) CALCULATE the overheads to be absorbed by two products, X and Y.

(RTP Sep. 2025)

Answer 14

(i) Summary of Apportionment of Overheads

Items	Basis of Apportionment	Total Amount	Production Deptt.			Service Deptt.		
			M1	M2	A1	Store Service	Engineering Service	General Service

Indirect wages	Allocation given	25,02,800	9,30,400	8,26,800	3,24,400	1,64,000	1,06,800	1,50,400
Consumable supplies	Allocation given	9,04,000	2,52,000	3,64,000	84,000	56,000	84,000	64,000
Depreciation	Capital value of machine (20:15:5:2:6:2)	7,92,000	3,16,800	2,37,600	79,200	31,680	95,040	31,680
Insurance of Machine	Capital value of machine (20:15:5:2:6:2)	1,44,000	57,600	43,200	14,400	5,760	17,280	5,760
Insurance on Building	1/3rd to M1 Balance area basis (:12:16:4:5:3)	64,800	21,600	12,960	17,280	4,320	5,400	3,240
Power	HP Hr% (10:7:1:-:2 :-)	1,29,600	64,800	45,360	6,480	–	12,960	–
Light	Area (10:12:16:4:5:3)	1,08,000	21,600	25,920	34,560	8,640	10,800	6,480
Rent*	Area (10:12:16:4:5 :-)	2,53,500	53,940	64,720	86,300	21,580	26,960	--
Total		48,98,700	17,18,740	16,20,560	6,46,620	2,91,980	3,59,240	2,61,560

*Rent to be apportioned among the departments which actually use the rented building. The notional rent is imputed cost and is not included in the calculation.

(ii) Allocation of service departments overheads

Service Deptt.	Basis of Apportionment	Production Deptt.			Service Deptt.		
		M1	M2	A1	Store Service	Engineering Service	General Service
Store	Ratio of consumable value (126 : 182 : 42)	1,05,120	1,51,820	35,040	(2,91,980)	–	–
Engineering service	In Machine hours Ratio of M1 and M2 (4 : 5)	1,59,660	1,99,580	–	–	(3,59,240)	–
General service	Labour hour Basis (20 : 15 : 30)	80,480	60,360	1,20,720	–	–	(2,61,560)
Production Department allocated in (i)		17,18,740	16,20,560	6,46,620			
Total		20,64,000	20,32,320	8,02,380			

(iii) Overhead Absorption rate

	M1	M2	A1
Total overhead allocated	20,64,000	20,32,320	8,02,380
Machine hours	40,000	50,000	–
Labour hours	–	–	3,00,000

Rate per machine hour	51.60	40.65	–
Rate per Direct labour	–	–	2.67

(iv) Statement showing overhead absorption for Product X and Y

Machine Deptt.	Absorption Rate	Product X		Product Y	
		Hours	(Rs.)	Hours	(Rs.)
M1	51.60	10	516.00	6	309.60
M2	40.65	4	162.60	14	569.10
A1	2.67	14	37.38	18	48.06
			715.98		926.76

Topic 4 Single vs Multiple Overhead Rates

Question 15

Explain Single and Multiple Overhead Rates.

(MTP March '18, Old & New SM)

Answer 15

Single and Multiple Overhead Rates:

Single overhead rate: It is one single overhead absorption rate for the whole factory. It may be computed as follows:

Single overhead rate = $\frac{\text{Overhead costs for the entire factory}}{\text{Total quantity of the base selected}}$

The base can be total output, total labour hours, total machine hours, etc.

The single overhead rate may be applied in factories which produces only one major product on a continuous basis. It may also be used in factories where the work performed in each department is fairly uniform and standardized. Multiple overhead rate: It involves computation of separate rates for each production department, service department, cost center and each product for both fixed and variable overheads. It may be computed as follows:

Multiple overhead rate= $\frac{\text{Overhead allocated / apportioned to each department / cost centre or product}}{\text{Corresponding base}}$

Under multiple overhead s rate, jobs or products are charged with varying amount of factory overheads depending on the type and number of departments through which they pass.

However, the number of overheads rate which a firm may compute would depend upon two opposing factors viz. the degree of accuracy desired and the clerical cost involved.

Question 16

SNS Trading Company has three Main Departments and two Service Departments. The data for each department is given below:

Departments	**Expenses (in Rs.)**	**Area in (Sq. Mtr)**	**Number of Employees**
Main Department:			
Purchase Department	**5,00,000**	**12**	**800**
Packing Department	**8,00,000**	**15**	**1700**

Distribution Department	**3,50,000**	**7**	**700**
Service Departments:			
Maintenance Department	**6,40,000**	**4**	**200**
Personnel Department	**3,20,000**	**6**	**250**

The cost of Maintenance Department and Personnel Department is distributed on the basis of 'Area in Square Metres' and 'Number of Employees' respectively.

You are required to:

(i) Prepare a Statement showing the distribution of expenses of Service Departments to the Main Departments using the "Step Ladder method" of Overhead Distribution.

(ii) Compute the Rate per hour of each Main Department, given that, the Purchase Department, Packing Department and Distribution Department works for 12 hours a day, 24 hours a day and 8 hours a day respectively. Assume that there are 365 days in a year and there are no holidays.

(PYP July 21)

Answer 16

(i) Schedule Showing the Distribution of Expenses of Service Departments using Step ladder method.

	Main Department			**Service Department**	
	Purchase (Rs.)	**Packing (Rs.)**	**Distribution (Rs.)**	**Maintenance (Rs.)**	**Personnel (Rs.)**

Expenses	5,00,000	8,00,000	3,50,000	6,40,000	3,20,000
Distribution of Maintenance Department (12:15:7:-:6)	1,92,000	2,40,000	1,12,000	(6,40,000)	96,000
Distribution of Personnel Department (800:1700:700 :-:-)	1,04,000	2,21,000	91,000	-	(4,16,000)
Total	7,96,000	12,61,000	5,53,000	-	-

(ii) Calculation of Expenses rate per hour of Main Department

	Purchase	**Packing**	**Distribution**
Total apportioned expenses (Rs.)	7,96,000	12,61,000	5,53,000
Total Hours worked	4,380 (12 x 365)	8,760 (24 x 365)	2,920 (8 x 365)
Expenses rate per hour (Rs.)	**181.74**	**143.95**	**189.38**

Important Note:-

This practical problem was based on distribution of overheads by using step ladder method and calculation of rate per hour. Many examinees faced hardship to understand the concept of step ladder method; hence the overhead distribution was not done correctly leading to

wrong calculation of overhead rate per hour. Performance of the examinees was below average.

Question 17

DISCUSS the step method and reciprocal service method of secondary distribution of overheads.

(Study material)

Answer 17

Re-apportionment of Service Department Overheads over Production Departments

The re-apportionment of the service department cost to the production department is known as secondary distribution. The suggestive bases that may be adopted for re-apportionment are given below:

Cost of the Service Departments:	Basis
1. Maintenance and Repair shop 2. Planning and progress 3. Tool room	Direct labour hours, Machine hours, Direct labour wages, Asset value x Hours worked
4. Canteen and Welfare 5. Hospital and Dispensary 6. Personnel Department	No of direct workers No. of employees etc.
7. Time-keeping	No. of card punched, No. of employees

8. Computer Section	Computer hours, Specific allocation to departments
9. Power House (electric lighting cost)	Floor area, Cubic content, No. of electric Points, Wattage.
10. Power House (electric power cost)	Horse power, Kwh, Horse power × Machine hours, Kwh × Machine hours
11. Stores Department	No. of requisitions, Weight or value of Materials issued.
12. Transport Department	Crane hours, Truck hours, Truck mileage, Truck tonnage, Truck ton- hours, Tonnage handled. No. of packages of Standard size
13. Fire Protection	Capital values
14. Inspection	Inspection hours

Notes:

(1) Repairs included in repairs shop cost, building maintenance cost included in maintenance shop cost etc. should be apportioned on the basis of capital values. (2) Economy, practicability, equitability and reliability are the matters of consideration for selection of the base.

Methods for Re-apportionment: The re-apportionment of service department expenses over the production departments may be carried out by using any one of the following methods:

(i) Direct re-distribution method.

(ii) Step method of secondary distribution or non-reciprocal method.

(iii) Reciprocal Service method.

(i) Direct Re-Distribution Method: Service department costs under this method are apportioned over the production departments only, ignoring the services rendered by one service department to the other. To understand the applications of this method, go through the illustration which follows.

(ii) Step Method or Non-Reciprocal Method: This method gives cognizance to the services rendered by service department to another service department. Therefore, as compared to previous method, this method is more complicated because a sequence of apportionments has to be selected here. The sequence here begins with the department that renders maximum number of services to the other service department(s). In other words, the cost of the service department that serves the largest number of services to the other service department(s) and production department(s) is distributed first. After this, the cost of service department serving the next largest number of departments is apportioned.

This process continues till the cost of last service department is apportioned. The cost of last service department is apportioned among production departments only.

Some authors are of the view that the cost of service department with largest amount of cost should be distributed first.

(iii) Reciprocal Service Method: This method recognises the fact that where there are two or more service departments they may render services to each other and, therefore, these inter-departmental services are to be given due weight while re-distributing the expenses of the service departments.

The methods available for dealing with reciprocal services are:

(a) Simultaneous equation method;

(b) Trial and error method;

(c) Repeated distribution method.

(a) Simultaneous Equation Method: - According to this method firstly, the costs of service departments are ascertained. These costs are then re-distributed to production departments on the basis of given percentages.

(b) Trial and Error Method:- According to this method the cost of one service cost centre is apportioned to another service cost centre. The cost of another service centre plus the share received from the first cost centre is again apportioned to the first cost centre. This process is repeated till the amount to be apportioned becomes negligible, that means repeated distribution method is followed to the extent of service departments only. All apportioned amounts for each service cost centre are added to get the total apportioned cost. These total service cost centre costs are redistributed to the production departments. Trial and error method and Simultaneous equation method gives the same result.

(c) Repeated Distribution Method:- Under this method, service departments' costs are distributed to other service and production departments on agreed percentages and this process continues to be repeated, till the figures of service departments are either exhausted or reduced to too small a figure.

Topic 5 Departmental Overhead Rate

Question 18

In a factory, a machine is considered to work for 208 hours in a month. It includes maintenance time of 8 hours and set up time of 20 hours. The expense data relating to the machine are as under:

Cost of the machine is Rs. 5, 00,000. Life 10 years. Estimated scrap value at the end of life is Rs. 20,000.

	(Rs.)
Repairs and maintenance per annum	**60,480**

Consumable stores per annum	**47,520**
Rent of building per annum **(The machine under reference occupies 1/6 of the area)**	**72,000**
Supervisor's salary per month (Common to three machines)	**6,000**
Wages of operator per month per machine	**2,500**
General lighting charges per month allocated to the machine	**1,000**
Power 25 units per hour at Rs. 2 per unit	

Power is required for productive purposes only. Set up time, though productive, does not require power. The Supervisor and Operator are permanent. Repairs and maintenance and consumable stores vary with the running of the machine.

Required

COMPUTE a two-tier machine hour rate for (a) set up time, and (b) running time.

(MTP Aug.'18)

Answer 18

Working Notes:

1. (i) Effective hours for standing charges (208 hours – 8 hours) = 200 hours

(ii) Effective hours for variable costs (208 hours – 28 hours) = 180 hours

2. Standing Charges per hour

	Cost per month (Rs.)	Cost per hour (Rs.) (Cost per month÷ 200 hours)
Supervisor's salary $\left(\frac{\text{Rs.6,000}}{\text{3 machines}}\right)$	2,000	10.00
Rent of building $\left(\frac{1}{6} \times \frac{\text{Rs.72,000}}{\text{12 month}}\right)$	1,000	5.00
General lighting	1,000	5.00
Total Standing Charges	4,000	20.00

3. Machine running expenses per hour

	Cost per month (Rs.)	Cost per hour (Rs.)
Depreciation $\left(\frac{\text{Rs.(5,00,000} - \text{20,000)}}{\text{10 years}} \times \frac{1}{\text{12 month}}\right)$	4,000	20.00 $\left(\frac{\text{Rs.4,000}}{\text{200hours}}\right)$
Wages	2,500	12.50 $\left(\frac{\text{Rs.2,500}}{\text{200hours}}\right)$
Repairs & Maintenance	5,040	28.00 $\left(\frac{\text{Rs.5,040}}{\text{180 hours}}\right)$
Consumable stores	3,960	22.00 $\left(\frac{\text{Rs.3,960}}{\text{180 hours}}\right)$
Power (25 units × Rs.2 × 180 hours)	9,000	50.00
Total Machine Expenses	24,500	132.50

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Computation of Two – tier machine hour rate	Set up time rate per machine hour	Running time rate per machine hour
	(Rs.)	(Rs.)
Standing Charges	20.00	20.00
Machine expenses :		
Depreciation	20.00	20.00
Repair and maintenance	-	28.00
Consumable stores	-	22.00
Power	-	50.00
Machine hour rate of overheads	40.00	140.00
Wages	12.50	12.50
Comprehensive machine hour rate	52.50	152.50

Question 19

M/s. NOP Limited has its own power plant and generates its own power. Information regarding power requirements and power used are as follows:

	Production Dept.	Service Dept.

	A	B	X	Y
	(Horse power hours)			
Needed capacity production	20,000	25,000	15,000	10,000
Used during the quarter ended September 2018	16,000	20,000	12,000	8,000

During the quarter ended September 2018, costs for generating power amounted to Rs. 12.60 lakhs out of which Rs. 4.20 lakhs was considered as fixed cost.

Service department X renders services to departments A, B, and Y in the ratio of 6:4:2 whereas department Y renders services to department A and B in the ratio of 4: 1.

The direct labour hours of department A and B are 67500 hours and 48750 hours respectively.

Required:

1 Prepare overheads distribution sheet.

2 Calculate factory overhead per labour hour for the dept. A and dept. B.

(PYP Nov '18)

Answer 19

(1) Overheads distribution Sheet

Item	Basis	Total Amount (Rs.)	Production Departments		Service Departments	
			A (Rs.)	B (Rs.)	X (Rs.)	Y (Rs.)

Variable overheads (Rs. 12.60 lakhs-Rs. 4.20 lakhs)	Horse Power hours used	8,40,000	2,40,000	3,00,000	1,80,000	1,20,000
Fixed Overheads	Horse power for Capacity production	4,20,000	1,20,000	1,50,000	90,000	60,000
Total Overheads		12,60,000	3,60,000	4,50,000	2,70,000	1,80,000
Service dept. X allocated to A, B & Y	As per the ratio given 6:4:2	(2,70,000)	1,35,000	90,000		45,000
Service dept. Y allocated to A & B	As per the ratio of 4:1	(1,80,000+45000 =2,25,000)	1,80,000	45,000		
Total Overheads of Production departments			6,75,000	5,85,000		

(2) Calculation of Factory overhead per labour hour Item Production Departments

	A (Rs.)	B (Rs.)
Total overheads	6,75,000	5, 85,000
Direct labour hours	67,500	48,750
Factory overheads per hour	10	12

Topic 6 Machine Hour Rate

Question 20

V Ltd. manufactures luggage trolleys for airports. The factory, in which the company undertakes all of its production, has two production departments- 'Fabrication' and 'Assembly', and two service departments- 'Stores' and 'Maintenance'.

The following information have been extracted from the company's budget for the financial year ended 31st March, 2019:

Particulars	Rs.	Rs.
Allocated Overhead Costs		
Fabrication Department		15,52,000
Assembly Department		7,44,000
Stores Department		2,36,000
Maintenance Department		1,96,000
Other Overheads		
Factory rent		15,28,000
Factory building insurance		1,72,000
Plant & machinery insurance		1,96,000
Plant & Machinery Depreciation		2,65,000

Subsidy for staffs' canteen		**4,48,000**
Direct Costs		
Fabrication Department:		
Material	**63,26,000**	
Labour	**8,62,000**	**71,88,000**
Assembly Department:		
Material	**1,42,000**	
Labour	**13,06,000**	**14,48,000**

The following additional information is also provided:

	Fabrication Department	**Assembly Department**	**Stores Department**	**Maintenance Department**
Floor area (square meters)	**24,000**	**10,000**	**2,500**	**3,500**
Value of plant & machinery (Rs.)	**16,50,000**	**7,50,000**	**75,000**	**1,75,000**
No. of stores requisitions	**3,600**	**1,400**	**-**	**-**

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Maintenance hours required	2,800	2,300	400	-
No. of employees	120	80	38	12
Machine hours	30,00,000	60,000		
Labour hours	70,000	26,00,000		

Required:

(i) PREPARE a table showing the distribution of overhead costs of the two service departments to the two production departments using step method; and

(ii) Calculate the most appropriate overhead recovery rate for each department.

(iii) Using the rates calculated in part (ii) above, CALCULATE the full production costs of the following job order:

Job number IGI2019

Direct Materials Rs. 2, 30,400

Direct Labour:

Fabrication Department 240 hours @ Rs. 50 per hour

Assembly Department 180 hours @ Rs. 50 per hour

Machine hours required:

Fabrication Department 210 hours

Assembly Department 180 hours

(MTP Oct. '19 & April '23)

Answer 20

(i) Table of Primary Distribution of Overheads

Particulars	Basis of Apportionment	Total Amount	Production Department		Service Departments	
			Fabrication	Assembly	Stores	Maintenance
Overheads Allocated		27,28,000	15,52,000	7,44,000	2,36,000	1,96,000
Direct Costs Other Overheads:	Actual	86,36,000	71,88,000	14,48,000	-	-
Factory rent	Floor Area (48:20:5:7)	15,28,000	9,16,800	3,82,000	95,500	1,33,700
Factory building insurance	Floor Area (48:20:5:7)	1,72,000	1,03,200	43,000	10,750	15,050
Plant & Machinery insurance	Value of Plant & Machinery (66:30:3:7)	1,96,000	1,22,038	55,472	5,547	12,943
Plant & Machinery Depreciation	Value of Plant & Machinery (66:30:3:7)	2,65,000	1,65,000	75,000	7,500	17,500
Canteen Subsidy	No. of Employees (60:40:19:6)	4,48,000	2,15,040	1,43,360	68,096	21,504
		1,39,73,000	1,02,62,078	28,90,832	4,23,393	3,96,697

Re-distribution of Service Departments' Expenses:

Particulars	Basis of Apportionment	Production Department		Service Departments	
		Fabrication	Assembly	Stores	Maintenance
Overheads as per Primary distribution	As per Primary distribution	1,02,62,078	28,90,832	4,23,393	3,96,697
Maintenance Department Cost	Maintenance Hours (28:23:4 :-)	2,01,955	1,65,891	28,851	(3,96,697)
		1,04,64,033	30,56,723	4,52,244	-
Stores Department	No. of Stores Requisition (18:7 :-:)	3,25,616	1,26,628	(4,52,244)	-
		1,07,89,649	31,83,351	-	-

(ii) Overhead Recovery Rate

Department	Apportioned Overhead (Rs.) (I)	Basis of Overhead Recovery Rate (II)	Overhead Recovery Rate (Rs.) [(I) ÷ (II)]
Fabrication	1,07,89,649	30,00,000 Machine Hours	3.60 per Machine Hour
Assembly	31,83,351	26,00,000 Labour Hours	1.22 per Labour Hour

(iii) Calculation of full production costs of Job no. IGI2019.

Particulars	Amount (Rs.)
Direct Materials	2,30,400
Direct Labour:	
Fabrication Deptt.(240 hours × Rs.50)	12,000
Assembly Deptt. (180 hours × Rs.50)	9,000
Production Overheads:	
Fabrication Deptt. (210 hours × Rs. 3.60)	756
Assembly Deptt. (180 hours × Rs. 1.22)	220
Total Production Cost	2,52,376

Question 21

A manufacturing unit has purchased and installed a new machine at a cost of Rs. 24, 90,000 to its fleet of 5 existing machines. The new machine has an estimated life of 12 years and is expected to realise Rs. 90,000 as scrap value at the end of its working life.

Other relevant data are as follows:

(i) Budgeted working hours are 2,496 based on 8 hours per day for 312 days. Plant maintenance work is carried out on weekends when production is totally halted. The estimated maintenance hours are 416. During the production hours machine set -up and

change over works are carried out. During the set-up hours no production is done. A total 312 hours are required for machine set-ups and change overs.

(ii) An estimated cost of maintenance of the machine is Rs. 2, 40,000 p.a.

(iii) The machine requires a component to be replaced every week at a cost of Rs. 2,400.

(iv) There are three operators to control the operations of all the 6 machines. Each operator is paid Rs. 30,000 per month plus 20% fringe benefits.

(v) Electricity: During the production hours including set-up hours, the machine consumes 60 units per hour. During the maintenance the machine consumes only 10 units per hour. Rate of electricity per unit of consumption is Rs. 6.

(vi) Departmental and general works overhead allocated to the operation during last year was Rs. 5, 00,000. During the current year it is estimated to increase by 10%.

Required:

COMPUTE the machine hour rate.

(RTP May '21)

Answer 21

Working Note:

1. Effective machine hour:

= Budgeted working hours – Machine Set-up time

= 2,496 hours – 312 hours = 2,184 hours.

2. Operators' salary per annum:

Salary (3 operators × Rs.30,000 × 12 months)	Rs. 10,80,000

Add: Fringe benefits (20% of Rs.10,80,000)	Rs. 2,16,000
	Rs. 12,96,000

3. Depreciation per annum

$= \frac{Rs.24,90,000 - Rs.90,000}{12\ Years}$ = Rs. 2, 00,000

Computation of Machine hour Rate

	Amount p.a. (Rs.)	**Amount per hour (Rs.)**
Standing charges		
Operators' Salary $\left(\frac{\text{Rs.}12,96,000}{6\text{ machines}} \times \frac{1}{2,184\text{ hours}}\right)$	12,96,000	98.90
Departmental and general overheads:		
(Rs. 5, 00,000 × 110%) $\left(\frac{\text{Rs.}5,50,000}{6\text{ machines}} \times \frac{1}{2,184\text{ hours}}\right)$	5,50,000	41.97
(A)	18,46,000	140.87
Machine Expenses		
Depreciation $\left(\frac{\text{Rs.}2,00,000}{2,184\text{ hours}}\right)$	2,00,000	91.58
Electricity:		
During working hours (2,496 hours × 60 units ×Rs.6)	8,98,560	411.43

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During maintenance hours (416 hours × 10 units ×Rs.6)	24,960	11.43
Component replacement cost (2,400 × 52 weeks)	1,24,800	57.14
Machine maintenance cost	2,40,000	109.89
(B)	14,88,320	681.47
Machine Hour Rate (A + B)		822.34

Question 22

USP Ltd. is the manufacturer of 'double grip motorcycle tyres'. In the manufacturing process, it undertakes three different jobs namely, Vulcanising, Brushing and Striping. All of these jobs require the use of a special machine and also the aid of a robot when necessary. The robot is hired from outside and the hire charges paid for every six months is Rs.2, 70,000. An estimate of overhead expenses relating to the special machine is given below:

• Rent for a quarter is Rs. 18,000.

• The cost of the special machine is Rs. 19, 20,000 and depreciation is charged @10% per annum on straight line basis.

• Other indirect expenses are recovered at 20% of direct wages.

The factory manager has informed that in the coming year, the total direct wages will be Rs. 12, 00,000 which will be incurred evenly throughout the year.

During the first month of operation, the following details are available from the job book: Number of hours the special machine was used

Jobs	Without the aid of the robot	With the of the robot

Vulcanising	500	400
Brushing	1000	400
Striping	-	1200

You are required to:

(i) Compute the Machine Hour Rate for the company as a whole for a month (A) when the robot is used and (B) when the robot is not used.

(ii) Compute the Machine Hour Rate for the individual jobs i.e. Vulcanising, Brushing and Striping.

(PYP Nov 22, Old & New SM)

Answer 22

Working notes:

(I) Total machine hours use (500 + 1,000 + 400 + 400 + 1,200)	3,500
(II) Total machine hours without the use of robot (500 + 1,000)	1,500
(III) Total machine hours with the use of robot (400 + 400 + 1,200)	2,000
(IV) Total overheads of the machine per month	
Rent (Rs. 18,000 ÷ 3 months)	6,000

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Depreciation [(Rs. 19,20,000 x 10%) ÷ 12 months]	16,000
Indirect expenses [(Rs. 12,00,000 x 20%) ÷ 12 months]	20,000
Total	42,000
(V) Robot hire charges for a month (Rs. 2,70,000 ÷ 6 months)	Rs. 45,000
(VI) Overheads for using machines without robot $\frac{Rs.42,000}{3,500\ hrs.}$ X 1,500 hrs. =	Rs. 18,000
(VII) Overheads for using machines with robot $\frac{Rs.42,000}{3,500\ hrs.}$ X 1,500 hrs. =	Rs. 18,000

(i) Computation of Machine hour rate for the individual job

(A) When the robot was used: $\frac{\text{Rs.}69,000}{2,000\ \text{hours}}$ = Rs. 34.50 per hour

(B) When the robot was not used: $\frac{\text{Rs.}18,000}{1,500\ \text{hours}}$ = Rs. 12 per hour

(ii)

	Rate per hour	**Job**					
		Vulcanising		**Brushing**		**Striping**	
	(Rs.)	Hrs.	(Rs.)	Hrs.	(Rs.)	Hrs.	(Rs.)
Overheads							
Without robot	12.00	500	6,000	1,000	12,000	-	-
With robot	34.50	400	13,800	400	13,800	1,200	41,400

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Total		900	19,800	1,400	25,800	1,200	41,400
Machine hour rate			22		18.43		34.50

Question 23

A machine shop has 8 identical Drilling machines manned by 6 operators. The machine cannot be worked without an operator wholly engaged on it. The original cost of all these machines works out to Rs. 8 lakhs. These particulars are furnished for a 6 months period:

Normal available hours per month	**208**
Absenteeism (without pay) hours	**18**
Leave (with pay) hours	**20**
Normal idle time unavoidable-hours	**10**
Average rate of wages per worker for 8 hours a day.	**Rs.800**
Production bonus estimated	**15% on wages**
Value of power consumed	**Rs.80,500**
Supervision and indirect labour	**Rs.33,000**
Lighting and electricity	**Rs.12,000**

These particulars are for a year

Repairs and maintenance including consumables- 3% of value of machines. Insurance-Rs.40, 000

Depreciation- 10% of original cost.

General management expenses allocated- Rs. 54,530.

You are required to COMPUTE a comprehensive machine hour rate for the machine shop.

(Study material)

Answer 23

Computation of comprehensive machine hour rate of machine shop

Particulars	(Rs.)
Operator's wages (Refer to working note 2)	7,38,000
Production bonus (15% on wages)	1,10,700
Power consumed	80,500
Supervision and indirect labour	33,000
Lighting and electricity	12,000
Repairs and maintenance (3%× Rs.8 lakh×½)	12,000
Insurance (Rs. 40,000 × ½)	20,000
Depreciation (10%× Rs. 8 lakh×½)	40,000
Sundry works expenses (Rs.12,000 × ½)	6,000

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General management expenses (Rs.54,530 × ½)	27,265
	10,79,465

Machine hour rate = $\frac{\text{Rs. Total overheads of machine shop}}{\text{Hours of machines operation}}$

$=\frac{\text{Rs. } 10,79,465}{\text{Hours of machines operation}}$ (Refer to working note 1) = Rs.149.93

Working notes

1. Computation of hours, for which 6 operators are available for 6 months.

	For 6 months and 6 operators
Normal available hours (208 x 6 months x 6 operators)	7,488
Less: Absenteeism hours (18 x 6 operators)	(108)
Paid hours	**7,380**
Less: Leave hours (20 x 6 operators)	(120)
Less: Idle time hours (10 x 6 operators)	(60)
Effective working hours	**7,200**

As machines cannot be worked without an operator wholly engaged on them therefore, hours for which 6 operators are available for 6 months are the hours for which machines can be used. Hence 7,200 hours represent effective working hours.

2. Computation of operator's wages

Average rate of wages: $\frac{\text{Rs.}800}{8 \text{ hours}}$ = Rs. 100 per hour

Total wages paid to 6 operators for 6 months = 7,380 hours × Rs. 100 =Rs. 7, 38,000

Question 24

During half year ending inter departmental review meeting of P Ltd., cost variance report was discussed and the performance of the departments were assessed. The following figures were presented.

For a period of first six months of the financial year, following information were extracted from the books:

Actual production overheads	**Rs. 34,08,000**
The above amount is inclusive of the following payments made:	
Paid as per court's order	**Rs. 4,50,000**
Expenses of previous year booked in current year	**Rs. 1,00,000**
Paid to workers for strike period under an award	**Rs. 4,20,000**
Obsolete stores written off	**Rs. 36,000**

Production and sales data for the six months are as under: Production:	
Finished goods	**1,10,000 units**

Works-in-progress	
(50% complete in every respect)	**80,000 units**
Sale:	
Finished goods	**90,000 units**

Machine worked during the period was 3,000 hours.

At the of preparation of revenue budget, it was estimated that a total of Rs. 50, 40,000 would be required for budgeted machine hours of 6,000 as production overheads for the entire year.

During the meeting, a data analytic report revealed that 40% of the over/under-absorption was due to defective production policies and the balance was attributable to increase in costs.

You were also present at the meeting; the chairperson of the meeting has asked you to be ready with the followings for the performance appraisal of the departmental heads:

(Study material)

(i) How much was the budgeted machine hour rate used to recover overhead?

(a) Rs. 760

(b) Rs. 820

(c) Rs.780

(d) Rs. 840

Ans: (d) Budgeted Machine hour rate (Blanket rate)

$= \frac{Rs.\ 50{,}40{,}000}{6{,}000\ hours}$ = Rs. 840 per hour

(ii) How much amount of production overhead has been recovered (absorbed) upto the end of half year end?

(a) Rs.25, 20,000

(b) Rs.34, 08,000

(c) Rs. 24, 00,000

(d) Rs.24, 60,000

Ans: (a) Rs. 25, 20,000

(iii) What is the amount of overhead under/ over absorbed?

(a) 1, 18,000 over-absorbed

(b) 1, 18,000 under- absorbed

(c) 18,000 over-absorbed

(d) 18,000 under-absorbed

Ans: (a)

	Amount (Rs.)	**Amount (Rs.)**
Total production overheads actually incurred during the period		34,08,000
Less: Amount paid to worker as per court order	4,50,000	
Expenses of previous year booked in the current year	1,00,000	

Wages paid for the strike period under an award	4,20,000	
Obsolete stores written off	36,000	10,06,000
		24,02,000
Less: Production overheads absorbed as per machine hour rate (3,000 hours × Rs. 840*)		25,20,000
Amount of over absorbed production overheads		1,18,000

* Budgeted Machine hour rate (Blanket rate) calculated in part (i)

(iv) What is the supplementary rate for apportionment of over/under absorbed overheads over WIP, Finished goods and Cost of sales?

(a) Rs. 0.315 per unit

(b) Rs. 0.472 per unit

(c) Rs. 0.787 per unit

(d) Rs. 1 per unit

Ans: (b) Accounting treatment of over absorbed production overheads: As, 40% of the over absorbed overheads were due to defective production policies, this being abnormal, hence should be credited to Costing Profit and Loss Account.

Amount to be credited to Costing Profit and Loss Account =Rs. 1, 18,000× 40% = Rs. 47,200.

Balance of over absorbed production overheads should be distributed over Works in progress, finished goods and Cost of sales by applying supplementary rate*.

Amount to be distributed = Rs. 1, 18,000× 60% = Rs.70, 800

Supplementary rate = $\frac{Rs.70,800}{1,50,000\ units}$ = Rs. 0.472 per unit.

(v) What is the amount of over/under absorbed overhead apportioned to Work in Progress?

(a) Rs. 9,440

(b) Rs. 42,480

(c) Rs. 18,880

(d) Rs. 70,800

Ans: (c) Apportionment of over absorbed production overheads over WIP, Finished goods and Cost of sales:

	Equivalent completed units	**Amount (Rs.)**
Work-in-Progress (80,000 units × 50% ×0.472)	40,000	18,880
Finished goods (20,000 units × 0.472)	20,000	9,440
Cost of sales (90,000 units × 0.472)	90,000	42,480
Total	1,50,000	70,800

Topic 7 Treatment of Unabsorbed/Over-absorbed Overheads

Question 25

A work-shop has 8 identical machines operated by 6 operators. The machine cannot work without an operator wholly engaged on it. The original cost of all the 8 machines works out to Rs. 64, 00,000. The following particulars are furnished for a six months' period:

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Normal available hours per operator	**1,248**
Absenteeism (without pay) hours per operator	**18**
Leave (with pay) hours per operator	**20**
Normal unavoidable idle time-hours per operator	**10**
Production bonus estimated	**10% on wages**
Power consumed	**Rs. 80,500**
Supervision and Indirect Labour	**Rs. 33,000**
Lighting and Electricity	**Rs. 12,000**
Average rate of wages per day of 8 hours per operator	**Rs. 200**
The following particulars are given for a year:	
Insurance	**Rs. 7,20,000**
Sundry work Expenses	**Rs. 1,00,000**
Management Expenses allocated	**Rs. 10,00,000**
Depreciation	**10% on the original cost**

Repairs and Maintenance (including consumables): 5% of the value of all the machines. Prepare a statement showing the comprehensive machine hour rate for the machine shop.

(MTP Sep'22)

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Answer 25

Workings:

Particulars	Six months 6 operators (Hours)
Normal available hours half yearly (1,248 x 6 operators)	7,488
Less: Absenteeism hours (18 x 6 operators)	(108)
Paid hours (A)	7,380
Less: Leave hours (20 x 6 operators)	(120)
Less: Normal idle time (10 x 6 operators)	(60)
Effective working hours	7,200

Computation of Comprehensive Machine Hour Rate

Particulars	**Amount for six months (Rs.)**
Operators' wages (7,380/8 x200)	1,84,500
Production bonus (10% on wages)	18,450
Power consumed	80,500
Supervision and indirect labour	33,000
Lighting and Electricity	12,000

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Repair and maintenance {(5% × Rs. 64,00,000)/2}	1,60,000
Insurance (Rs. 7,20,000/2)	3,60,000
Depreciation {(Rs. 64,00,000 × 10%)/2}	3,20,000
Sundry Work expenses (Rs. 1,00,000/2)	50,000
Management expenses (Rs. 10,00,000/2)	5,00,000
Total Overheads for 6 months	17,18,450
Comprehensive Machine Hour Rate =Rs.17,18,450/7,200 hours	Rs. 238.67

Question 26

XYZ Ltd. manufactures a single product. It recovers factory overheads at a pre - determined rate of 20 per man-day.

During the year 2020-21, the total factory overheads incurred and the man-days actually worked were 35.50 lakhs and 1.50 lakh days respectively. Out of the amount of 35.50 lakhs, 2.00 lakhs were in respect of wages for stick period and 1.00 lakh was in respect of expenses of previous year booked in this current year. During the period, 50,000 units were sold. At the end of the period, 12,000 completed units were held in stock but there was no opening stock of finished goods. Similarly, there was no stock of uncompleted units at the beginning of the period but at the end of the period there were 20,000 uncompleted units which may be treated as 65% complete in all respects. On investigation, it was found that 40% of the unabsorbed overheads were due to factory inefficiency and the rest were attributable to increase in the cost of indirect materials and indirect labour. You are required to:

(i) Calculate the amount of unabsorbed overheads during the year 2020 -21.

(ii) Show the accounting treatment of unabsorbed overheads in cost accounts and pass journal entry.

(PYP Dec '21)

Answer 26

(i) Amount of under-absorption of overheads during the year 2020-21

		(Rs.)
Total production overheads actually incurred during the year 2020-21		35,50,000
Less: Wages paid during strike period	Rs.2,00,000	
Wages of previous year booked in current year	Rs.1,00,000	3,00,000
Net production overheads actually incurred: (A)		32,50,000
Production overheads absorbed by 1.50 lakh man-days @ Rs. 20 per man-day: (B)		30,00,000
Amount of under-absorption of production overheads: [(A)–(B)]		2,50,000

(ii) Accounting treatment of under absorption of production overheads: It is given in the statement of the question that 62,000 units (50,000 sold + 12,000 closing stock – 0 opening stock) were completely finished and 20,000 units were 65% complete, 40% of the under-absorbed overheads were due to factory inefficiency and the rest were attributable to increase in cost of indirect materials and indirect labour.

	(Rs.)

1. (40% of Rs.2, 50,000) i.e. Rs. 1, 00,000 of under – absorbed overheads were due to factory inefficiency. This being abnormal, should be debited to the Costing Profit and Loss A/c	1,00,000
2. Balance (60% of Rs. 2,50,000) i.e. Rs. 1,50,000 of under – absorbed overheads should be distributed over work-in- progress, finished goods and cost of sales by using supplementary rate	1,50,000
Total under-absorbed overheads	2,50,000

Apportionment of unabsorbed overheads of Rs.1, 50,000 over work-in-progress, finished goods and cost of sales.

	Equivalent Completed units	**(Rs.)**
Work-in-progress (13,000 units × Rs. 2) (Refer to Working Note)	20000 * 65% = 13,000	26,000
Finished goods (12,000 units × Rs. 2)	12,000	24,000
Cost of sales (50,000 units × Rs. 2)	50,000	1,00,000
	75,000	1,50,000

Journal entry:

Work-in-progress control A/c	Dr.	Rs. 26,000	
Finished goods control A/c	Dr.	Rs. 24,000	
Cost of Sales A/c	Dr.	Rs. 1,00,000	

Costing Profit & Loss A/c	Dr.	Rs. 1,00,000	
To Overhead control A/c			Rs. 2,50,000

Working Note:

Supplementary overhead absorption rate = $\frac{\text{Rs.}1,50,000}{75,000 \text{ units}}$ = Rs. 2 per unit

Important Note:-

The question tested the knowledge of examinees on the treatment of unabsorbed Overheads in cost accounting. Examinees had to calculate unabsorbed overheads and pass journal entry after allocating them to Cost of Sales, WIP, and Finished stock by using supplementary rate. Performance of the examinees was above average.

Question 27

EXPLAIN what are the methods of re-apportionment of service department expenses over the production departments? Discuss.

(Study material)

Answer 27

Re-apportionment of Service Department Overheads over Production Departments

The re-apportionment of the service department cost to the production department is known as secondary distribution. The suggestive bases that may be adopted for re-apportionment are given below:

Cost of the Service Departments:	**Basis**

1. Maintenance and Repair shop 2. Planning and progress 3. Tool room	Direct labour hours, Machine hours, Direct labour wages, Asset value x Hours worked
4. Canteen and Welfare 5. Hospital and Dispensary 6. Personnel Department	No of direct workers No. of employees etc.
7. Time-keeping	No. of card punched, No. of employees
8. Computer Section	Computer hours, Specific allocation to departments
9. Power House (electric lighting cost)	Floor area, Cubic content, No. of electric Points, Wattage.
10. Power House (electric power cost)	Horse power, Kwh, Horse power × Machine hours, Kwh × Machine hours
11. Stores Department	No. of requisitions, Weight or value of Materials issued.
12. Transport Department	Crane hours, Truck hours, Truck mileage, Truck tonnage, Truck ton- hours, Tonnage handled. No. of packages of Standard size
13. Fire Protection	Capital values
14. Inspection	Inspection hours

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Notes:

(1) Repairs included in repairs shop cost, building maintenance cost included in maintenance shop cost etc. should be apportioned on the basis of capital values. (2) Economy, practicability, equitability and reliability are the matters of consideration for selection of the base.

Methods for Re-apportionment: The re-apportionment of service department expenses over the production departments may be carried out by using any one of the following methods:

(i) Direct re-distribution method.

(ii) Step method of secondary distribution or non-reciprocal method.

(iii) Reciprocal Service method.

(i) Direct Re-Distribution Method: Service department costs under this method are apportioned over the production departments only, ignoring the services rendered by one service department to the other. To understand the applications of this method, go through the illustration which follows.

(ii) Step Method or Non-Reciprocal Method: This method gives cognizance to the services rendered by service department to another service department. Therefore, as compared to previous method, this method is more complicated because a sequence of apportionments has to be selected here. The sequence here begins with the department that renders maximum number of services to the other service department(s). In other words, the cost of the service department that serves the largest number of services to the other service department(s) and production department(s) is distributed first. After this, the cost of service department serving the next largest number of departments is apportioned.

This process continues till the cost of last service department is apportioned. The cost of last service department is apportioned among production departments only.

Some authors are of the view that the cost of service department with largest amount of cost should be distributed first.

(iii) Reciprocal Service Method: This method recognises the fact that where there are two or more service departments they may render services to each other and, therefore, these inter-departmental services are to be given due weight while re-distributing the expenses of the service departments.

The methods available for dealing with reciprocal services are:

(a) Simultaneous equation method;

(b) Trial and error method;

(c) Repeated distribution method.

(a) Simultaneous Equation Method: - According to this method firstly, the costs of service departments are ascertained. These costs are then re-distributed to production departments on the basis of given percentages.

(b) Trial and Error Method:- According to this method the cost of one service cost centre is apportioned to another service cost centre. The cost of another service centre plus the share received from the first cost centre is again apportioned to the first cost centre. This process is repeated till the amount to be apportioned becomes negligible, that means repeated distribution method is followed to the extent of service departments only. All apportioned amounts for each service cost centre are added to get the total apportioned cost. These total service cost centre costs are redistributed to the production departments. Trial and error method and Simultaneous equation method gives the same result.

(c) Repeated Distribution Method:- Under this method, service departments' costs are distributed to other service and production departments on agreed percentages and this process continues to be repeated, till the figures of service departments are either exhausted or reduced to too small a figure.

Question 28

In a manufacturing unit, factory overhead was recovered at a pre-determined rate of Rs.25 per man-day. The total factory overhead expenses incurred and the man-days actually worked were Rs. 41.50 lakhs and 1.5 lakh man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold.

On analysing the reasons, it was found that 60% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase in overhead costs.

EXPLAIN how would unabsorbed overheads be treated in Cost Accounts?

(Study material)

Answer 28

Computation of unabsorbed overheads

	(Rs.)
Man-days worked	1,50,000
Overhead actually incurred	41,50,000
Less: Overhead absorbed @ 25 per man-day (25 × 1,50,000)	37,50,000
Unabsorbed overheads	4,00,000
Unabsorbed overheads due to defective planning (i.e. 60% of Rs. 4,00,000)	2,40,000
Balance of unabsorbed overhead	1,60,000

Treatment of unabsorbed overheads in Cost Accounts

(i) The unabsorbed overheads of Rs. 2, 40,000 due to defective planning to be treated as abnormal and therefore be charged to Costing Profit and Loss Account.

(ii) The balance unabsorbed overheads of Rs. 1, 60,000 be charged to production i.e., 40,000 units at the supplementary overhead absorption rate i.e., Rs.4 per unit (Refer to Working Note)

	(Rs.)
Charge to Costing Profit and Loss Account as part of the cost of unit sold (30,000 units @ Rs. 4 p.u.)	1,20,000
Add: To closing stock of finished goods (10,000 units @ Rs.4 p.u.)	40,000
Total	1,60,000

Working Note:

Supplementary overhead absorption rate = $\frac{\text{Rs.1,60,000}}{\text{40,000 units}}$ = Rs. 4 p.u.

Question 29

"Fixed overhead costs are not affected in monetary terms during a given period by a change in output". But this statement holds good provided:

(a) Increase in output is not substantial

(b) Increase in output is substantial

(c) Both (a) and (b)

(d) None of the above

(Study material)

Ans: (a) Increase in output is not substantial

Topic 8 Basis of Apportionment

Question 30

State the bases of apportionment of following overhead costs:

(i) Air-conditioning

(ii) Time keeping

(iii) Depreciation of plant and machinery

(iv) Power/steam consumption

(v) Electric power (Machine operation)

(PYP Nov '18)

Answer 30

Overhead Cost	Bases of Apportionment
(i) Air- conditioning	Floor area, or volume of department
(ii) Time keeping	Number of workers
(iii) Depreciation of plant and machinery	Capital values
(iv) Power/steam consumption	Technical estimates
(v) Electric power (machine operation)	Horse power of machines, or Number of machine hour, or value of machines or units consumed. Kilo-watt hours.

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Topic 8 Repeated Distribution Method

Question 31

RN Ltd. is a manufacturing company producing single product. The following information is available relating to current financial year:

Activity Level	**100%**
Sales and production (units)	**4,400**
(Rs.)	
Sales	**88,00,000**
Production costs:	
- Variable	**35,20,000**
- Fixed	**8,80,000**
Selling and distribution costs:	
- Variable	**17,60,000**
- Fixed	**13,20,000**

Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. Thus, at 50% activity level, fixed production cost and fixed selling and distribution costs remains the same and other data/figures which are variable changes proportionately.

The normal level of activity for the year is 4,400 units.

There were no stock at the beginning of the year.

In the first quarter, 1,210 units were produced and 880 units were sold.

You are required to COMPUTE the profit for the quarter using-

(i) Absorption costing

(ii) Marginal costing.

(MTP May 2025)

Answer 31

(i) Profit for the Quarter (Absorption Costing)

Particulars	**(Rs.)**	**(Rs.)**
Sales revenue (880 units × $\frac{\text{Rs.88,00,000}}{\text{4,400 units}}$): (A)		17,60,000
Less: Production costs:		
- Variable cost (1,210 units × $\frac{\text{Rs.35,20,000}}{\text{4,400 units}}$)		9,68,000
- Fixed overheads absorbed (1,210 units × Rs. 200*)	2,42,000	12,10,000
Add: Opening stock		--
Less: Closing Stock[$\frac{\text{Rs.12,10,000}}{\text{1,210 units}}$ x 330 units]		(3,30,000)
Cost of Goods sold		8,80,000
Less: Adjustment for over-absorption of fixed production overheads **		(22,000)

Add: Selling & Distribution Overheads:		
- Variable (880 units × $\frac{\text{Rs.}17,60,000}{4,400 \text{ units}}$)		3,52,000
- Fixed (1/4th of Rs. 13,20,000)	3,30,000	6,82,000
Cost of Sales (B)		15,40,000
Profit {(A) – (B)}		2,20,000

* Absorption rate: Rs. 8, 80,000/4,400 = Rs. 200 per unit

** Actual fixed production overhead - Absorbed fixed production overhead

= Rs. 8, 80,000/4 - 2, 42,000 = Rs. (22,000)

(ii) Profit for the Quarter (Marginal Costing)

Particulars	**(Rs.)**	**(Rs.)**
Sales revenue (880 units × $\frac{\text{Rs.}88,00,000}{4,400 \text{ units}}$): (A)		17,60,000
Less: Production costs:		
- Variable cost (1,210 units × $\frac{\text{Rs.}35,20,000}{4,400 \text{ units}}$)		9,68,000
Add: Opening stock		--
Less: Closing Stock [$\frac{\text{Rs.}9,68,000}{1,210 \text{ units}}$x 330 units]		(2,64,000)
Variable cost of goods sold		7,04,000

Add: Selling & Distribution Overheads:		
- Variable (880 units × $\frac{\text{Rs.}17,60,000}{4,400 \text{ units}}$))		3,52,000
Cost of Sales (B)		10,56,000
Contribution {(C) = (A) – (B)}		7,04,000
Less: Fixed Costs:		
- Production cost ($\frac{\text{Rs.}8,80,000}{4}$)	(2,20,000)	
- Selling & distribution cost($\frac{\text{Rs.}13,20,000}{4}$)	(3,30,000)	(5,50,000)
Profit		1,54,000

Topic 9 Capacity Concepts

Question 32

M/s Avyukt Automobile Parts has four identical machines in its factory. Cost of each machine is Rs. 5, 00,000 with expected scrap value of 10% at the end of its effective life (9 years). The expected annual running hours of machine is expected to run for 2,200 hours. The other details in respect of the machine shop are:

(I) Factory Rent	**Rs. 5,000 per month**
(II) Lighting of Factory	**Rs. 3,000 per month**

(III) Operator Wages (Two operators and each operator is in charge of two machines)	**Rs.10,000 per month (per Operator)**
(IV) Fixed repairs and maintenance charges per machine	**2,000 per quarter**
(V) Insurance premium for the machine (Annual)	**3% of cost**
(VI) Forman's salary (Devoted 1/6th of his time to this factory)	**Rs. 2,500 per month**
(VII) Other factory overhead (Annual)	**Rs.40,000**
(VIII) Power Consumption per machine per hour	**80 units**
(IX) Rate of Power	**Rs. 150 for 100 units**
(X) Unproductive Hours lost during repairs	**50 per annum**
(XI) Unproductive Hours Lost while Job Setting	**650 per annum**

You are required to COMPUTE a comprehensive machine hour rate assuming power is used during operating time only.

(MTP April '22)

Answer 32

Computation of Comprehensive Machine Hour Rate per Machine

Particulars	**Per Annum (Rs.)**	**Per Hour (Rs.)**
Standing Charges:		

Depreciation (Working Note 2)	50,000	
Factory Rent (Rs. 5,000 x 12 months / 4)	15,000	
Lighting of Factory (Rs. 3,000 x 12 months / 4)	9,000	
Operator Wages (Rs. 10,000 x 12 months / 2)	60,000	
Repairs and maintenance (Rs. 2,000 x 4)	8,000	
Insurance premium (Rs. 5, 00,000 x 3%)	15,000	
Forman's salary (Rs. 2,500 x 12 x ⅛ / 4)	1,250	
Other factory overhead (Rs. 40,000 / 4)	10,000	
	1,68,250	
Standing Charges per hour (Rs. 1,68,250/1,500 hours)		112.17
Running Charges:		
Power (80 units x Rs. 150 / 100)		120.00
Comprehensive Machine Hour Rate		232.17

Working Notes:

1. Computation of Total Operative Hours

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Total Running Hours:	2,200
Less: Unproductive hours lost during repairs	50
Less: Unproductive hours Lost while Job Setting	650
Total Operative Hours	**1,500 per annum**

2. Calculation of Annual Depreciation

$$\text{Annual Depreciation} = \frac{\text{Purchase Cost} - \text{Estimated Scrap Value}}{\text{Effective life in years}}$$

$$= \frac{\text{Rs.5,00,000} - \text{Rs.50,000}}{\text{9 Years}} = \text{Rs. 50,000}$$

Question 33

…….. Capacity is defined as actually utilised capacity of a plant.

(a) Theoretical

(b) Installed

(c) Practical

(d) Normal

(Study material)

Ans: (c) Practical

Question 34

Normal capacity of a plant refers to the difference between:

(a) Maximum capacity and practical capacity

(b) Practical capacity and normal capacity

(c) Practical capacity and estimated idle capacity as revealed by long term sales trend.

(d) Maximum capacity and actual capacity

(Study material)

Ans: (c) Practical capacity and estimated idle capacity as revealed by long term sales trend.

Chapter 5

Activity Based Costing

Topic 1 Introduction to ABC & Benefits

Question 1

STATE what are the benefits of ABC?

(Study material)

Answer 1

BENEFITS OF ACTIVITY BASED COSTING

The main benefits of using Activity Based Costing are:

(i) More accurate costing of products/services.

(ii) Overhead allocation is done on logical basis.

(iii) It enables better pricing policies by supplying accurate cost information.

(iv) Utilizes unit cost rather than just total cost

(v) Help to identify non-value added activities which facilitates cost reduction.

(vi) It is helpful to the organizations with multiple products.

(vii) It highlights problem areas which require attention of the management.

Question 2

Which of the following is not a benefit of ABC?

(a) Accurate cost allocation

(b) Improved decision making

(c) Better control on activity and costs

(d) Reduction of prime cost 8.

(Study material)

Ans: (d) Reduction of prime cost 8.

Topic 2 Levels of Activities under ABC

Question 3

SMP Pvt. Ltd. manufactures three products using three different machines. At present the overheads are charged to products using labour hours. The following statement for the month of September 2019, using the absorption costing method has been prepared:

Particulars	Product X (using machine A)	Product Y (using machine B)	Product Z (using machine C)
Production units	45,000	52,500	30,000
Material cost per unit (Rs.)	350	460	410
Wages per unit@ Rs.80 per hour	240	400	560

Overhead cost per unit (Rs.)	**240**	**400**	**560**
Total cost per unit (Rs.)	**830**	**1,260**	**1,530**
Selling price (Rs.)	**1,037.50**	**1,575**	**1,912.50**

The following additional information is available relating to overhead cost drivers.

Cost driver	Product X	Product Y	Product Z	Total
No. of machine set-ups	**40**	**160**	**400**	**600**
No. of purchase orders	**400**	**800**	**1,200**	**2,400**
No. of customers	**1,000**	**2,200**	**4,800**	**8,000**

Actual production and budgeted production for the month is same. Workers are paid at standard rate.

Out of total overhead costs, 30% related to machine set-ups, 30% related to customer order processing and customer complaint management, while the balance proportion related to material ordering.

Required:

(i) COMPUTE overhead cost per unit using activity based costing method.

(ii) DETERMINE the selling price of each product based on activity-based costing with the same profit mark-up on cost.

(RTP Nov'19)

Answer 3

Workings:

Total labour hours and overhead cost:

Particulars	**Product X**	**Product Y**	**Product Z**	**Total**
Production units	45,000	52,500	30,000	1,27,500
Hour per unit	3	5	7	
Total hours	1,35,000	2,62,500	2,10,000	6,07,500
Rate per hour				Rs.80.00
Total overhead				Rs.4,86,00,000

Cost per activity and driver

Activity	Machine Set-up	Customer order processing	Customer complaint management	Total
Total overhead (Rs.)	1,45,80,000	1,45,80,000	1,94,40,000	4,86,00,000
No. of drivers	600	2,400	8,000	
Cost per driver (Rs.)	24,300	6,075	2,430	

(i) Computation of Overhead cost per unit:

Particulars	**Product X**	**Product Y**	**Product Z**

No. of machine set-ups	40	160	400
Cost per driver (Rs.)	24,300	24,300	24,300
Total Machine set-up cost (Rs.) [A]	9,72,000	38,88,000	97,20,000
No. of purchase orders	400	800	1,200
Cost per driver (Rs.)	6,075	6,075	6,075
Total order processing cost (Rs.) [B]	24,30,000	48,60,000	72,90,000
No. of customers	1,000	2,200	4,800
Cost per driver (Rs.)	2,430	2,430	2,430
Total customer complaint management cost (Rs.) [C]	24,30,000	53,46,000	1,16,64,000
Total Overhead cost (Rs.)[A+B+C]	58,32,000	1,40,94,000	2,86,74,000
Production units	45,000	52,500	30,000
Cost per unit (Rs.)	129.60	268.46	955.80

Determination of Selling price per unit

Particulars	**Product X (using machine A)**	**Product Y (using machine B)**	**Product Z (using machine C)**

Material cost per unit (Rs.)	350.00	460.00	410.00
Wages per unit@ Rs.80 per hour	240.00	400.00	560.00
Overhead cost per unit (Rs.)	129.60	268.46	955.80
Total cost per unit (Rs.)	719.60	1,128.46	1,925.80
Profit (25% profit mark-up)(Rs.)	179.90	282.11	481.45
Selling price (Rs.)	899.50	1,410.57	2,407.25

Question 4

Describe the various levels of activities under 'ABC' methodology.

(PYP Nov 20, Old & New SM)

Answer 4

Various Level of Activities under ABC Methodology

Level of Activities	Meaning
1. Unit level activities	These are those activities for which the consumption of resources can be identified with the number of units produced.

2. Batch level activities	The activities such as setting up of a machine or processing a purchase order are performed each time a batch of goods is produced. The cost of batch related activities varies with number of batches made, but is common (or fixed) for all units within the batch.
3. Product level activities	These are the activities which are performed to support different products in product line.
4. Facilities level activities	These are the activities which cannot be directly attributed to individual products. These activities are necessary to sustain the manufacturing process and are common and joint to all products manufactured.

Question 5

DESCRIBE various levels of activities under ABC.

(Study material)

Answer 5

LEVEL OF ACTIVITIES UNDER ABC METHO-DOLOGY/COST HIERARCHY

These categories are generally accepted today, but were first identified by Cooper (1990). The categories of activities help to determine the type of activity cost driver required.

The categories of activities are:

Level of Activities	Meaning	Example

1. Unit level activities	These are those activities for which the consumption of resources can be identified with the number of units produced.	• The use of indirect materials/consumables tends to increase in proportion to the number of units produced. • The inspection or testing of every item produced, if this was deemed necessary or, perhaps more likely, every 100th item produced.
2. Batch level activities	The activities such as setting up of a machine or processing a purchase order are performed each time a batch of goods is produced. The cost of batch related activities varies with number of batches made, but is common (or fixed) for all units within the batch.	• Material ordering–where an order is placed for every batch of production • Machine set-up costs–where machines need resetting between each different batch of production. • Inspection of products where the first item in every batch is inspected rather than every 100th item quoted above.
3. Product level activities	These are the activities which are performed to support different products in product line	• Designing the product, • Producing parts specifications • Keeping technical drawings of products up to date.

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4. Facilities level activities	These are the activities which cannot be directly attributed to individual products. These activities are necessary to sustain the manufacturing process and are common and joint to all products manufactured	• Maintenance of buildings • Plant security

Topic 3 Cost Drivers

Question 6

'Humara - Apna' bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods.

The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget:

Activity	Present Cost (Rs.)	Estimation for the budget period
ATM Services:		
(a)Machine Maintenance	**4,00,000**	**All fixed, no change.**
(b) Rents	**2,00,000**	**Fully fixed, no change.**

(c) Currency	**1,00,000**	**Expected to double during budget period.**
Replenishment Cost	**7,00,000**	**(This activity is driven by no. of ATM transactions)**
Computer Processing	**5,00,000**	**Half this amount is fixed and no change is expected.** **The variable portion is expected to increase to three times the current level. (This activity is driven by the number of computer transactions)**
Issuing Statements	**18,00,000**	**Presently, 3 lakh statements are made. In the budget period, 5 lakh statements are expected.** **For every increase of one lakh statement, one lakh rupees is the budgeted increase.** **(This activity is driven by the number of statements)**
Computer Inquiries	**2,00,000**	**Estimated to increase by 80% during the budget period.** **(This activity is driven by telephone minutes)**

The activity drivers and their budgeted quantifies are given below:

Activity Drivers	**Deposits**	**Loans**	**Credit Cards**

No. of ATM Transactions	**1,50,000**	**---**	**50,000**
No. of Computer Processing Transactions	**15,00,000**	**2,00,000**	**3,00,000**
No. of Statements to be issued	**3,50,000**	**50,000**	**1,00,000**
Telephone Minutes	**3,60,000**	**1,80,000**	**1,80,000**

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card Accounts.

Required

(i) CALCULATE the budgeted rate for each activity.

(ii) PREPARE the budgeted cost statement activity wise.

(iii) COMPUTE the budgeted product cost per account for each product using (i) and (ii) above.

(MTP April '19 & Oct '23, Old & New SM) (MTPApr'22)

Answer 6

Statement Showing "Budgeted Cost per unit of the Product"

Activity	Activity Cost (Budgeted (Rs.)	Activity Driver	No. of Units of Activity Driver (Budget)	Activity Rate (Rs.)	Deposits	Loans	Credit Cards
ATM Services	8,00,000	No. of ATM Transaction	2,00,000	4.00	6,00,000	---	2,00,000

Computer Processing	10,00,000	No. of Computer Transaction	20,00,000	0.50	7,50,000	1,00,000	1,50,000
Issuing Statements	20,00,000	No. of Statements	5,00,000	4.00	14,00,000	2,00,000	4,00,000
Customer Inquiries	3,60,000	Telephone Minutes	7,20,000	0.50	1,80,000	90,000	90,000
Budgeted Cost	41,60,000				29,30,000	3,90,000	8,40,000
Units of Product (as estimated in the budget period)					58,600	13,000	14,000
Budgeted Cost per unit of the product					50	30	60

Working Note

Activity	Budgeted Cost (Rs.)	Remark
ATM Services:		
(a) Machine Maintenance	4,00,000	– All fixed, no change.
(b) Rents	2,00,000	– Fully fixed, no change.
(c) Currency Replenishment Cost	2,00,000	– Doubled during budget period.
Total	8,00,000	
Computer Processing	2,50,000	– Rs.2, 50,000 (half of Rs.5, 00,000) is fixed and no change is expected.

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	7,50,000	– Rs.2, 50,000 (variable portion) is expected to increase to three times the current level.
Total	10,00,000	
Issuing Statements	18,00,000	– Existing.
	2,00,000	– 2 lakh statements are expected to be increased in budgeted period. For every increase of one lakh statement, one lakh rupees is the budgeted increase.
Total	20,00,000	
Computer Inquiries	3,60,000	- Estimated to increase by 80% during the budget period. (Rs.2, 00,000 x 180%)
Total	3,60,000	

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Question 7

The profit margin of BABY Hairclips Company were over 20% of sales producing BROWN and BLACK hairclips.

During the last year, GREEN hairclips had been introduced at 10% premium in selling price after the introduction of YELLOW hairclips earlier five years back at 10/3% premium. However, the manager of the company is disheartened with the sales figure for the current financial year as follows:

Traditional Income Statement

	Brown	Black	Yellow	Green	Total
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Direct Labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Overhead (3 times of direct	60,00,000	48,00,000	10,80,000	1,20,000	1,20,00,000
labour)					
Total Operating Income	20,00,000	16,00,000	4,14,000	60,000	40,74,000
Return on Sales (in %)	13.3%	13.3%	14.8%	18.2%	13.5%

It is a known fact that customers are ready to pay premium amount for YELLOW and GREEN hairclips for their attractiveness; and the percentage returns are also high on new products.

At present, all of the Plant's indirect expenses are allocated to the products at 3 times of the direct labour expenses. However, the manager is interested in allocating indirect expenses on the basis of activity cost to reveal real earner.

He provides support expenses category-wise as follows:

Support Expenses	(Rs.)
Indirect Labour	40,00,000
Labour Incentives	32,00,000

Computer Systems	**20,00,000**
Machinery depreciation	**16,00,000**
Machine maintenance	**8,00,000**
Energy for machinery	**4,00,000**
Total	**1,20,00,000**

He provides following additional information for accomplishment of his interest: Incentives to be allocated @ 40% of labour expenses (both direct and indirect).

Indirect labours are involved mainly in three activities. About half of indirect labour is involved in handling production runs. Another 40% is required just for the physical changeover from one color hairclip to another because YELLOW hairclips require substantial labour for preparing the machine as compared to other colour hairclips. Remaining 10% of the time is spend for maintaining records of the products in four parts.

Another amount spent on computer system of Rs. 20, 00,000 is for maintenance of documents relating to production runs and record keeping of the four products. In aggregate, approx... 80% of the amount expend is involved in the production run activity and approx... 20% is used to keep records of the products in four parts. Other overhead expenses i.e. machinery depreciation, machine maintenance and energy for machinery are incurred to supply machine capacity to produce all the hairclips (practical capability of 20,000 hours).

Activity Cost Drivers:

Particulars	Brown	Black	Yellow	Green	Total
Sales Volume (units)	**1,00,000**	**80,000**	**18,000**	**2,000**	**2,00,000**

Selling Price (Rs.)	**150**	**150**	**155**	**165**	
Material cost (Rs.)	**50**	**50**	**52**	**55**	
Machine hours per unit (Hrs.)	**0.10**	**0.10**	**0.10**	**0.10**	**20,000**
Production runs	**100**	**100**	**76**	**24**	**300**
Setup time per run (Hrs.)	**4**	**1**	**6**	**4**	

You are required to –

(i) CALCULATE operating income and operating income as per percentage of sales using activity based costing system.

(i) STATE the reasons for different operating income under traditional income system and activity-based costing system.

(RTP Nov'22)

Answer 7

Calculation of operating income using Activity Based Costing Calculation of Cost-Driver rate

Activity	**Overhead cost**	**Allocation**	**Overhead cost**	**Cost-driver level**	**Cost driver rate**
	(Rs.)		**(Rs.)**		**(Rs.)**
	56,00,000	50%	28,00,000	300 Production runs	9,333.33

Indirect labour +40% for incentives		40%	22,40,000	1052* Setup hours	2,129.28
		10%	5,60,000	4 Number of parts	1,40,000
Computer Systems	20,00,000	80%	16,00,000	300 Production runs	5,333.33
		20%	4,00,000	4 Number of parts	1,00,000
Machinery depreciation	16,00,000	100%	16,00,000	20,000 Machine hours	80
Machine Maintenance	8,00,000	100%	8,00,000	20,000 Machine hours	40
Energy for Machinery	4,00,000	100%	4,00,000	20,000 Machine hours	20

* (100 x 4) + (100 x 1) + (76 x 6) + (24 x 4)

= (400 + 100 + 456 + 96) = 1052 setup hours

Activity Based Costing

	Brown	**Black**	**Red**	**Green**	**Total**
Quantity (units)	1,00,000	80,000	18,000	2,000	2,00,000

	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Less: Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Less: Direct labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Less: 40% incentives on direct labour	8,00,000	6,40,000	1,44,000	16,000	16,00,000
(A)	72,00,000	57,60,000	13,50,000	1,64,000	1,44,74,000
Indirect labour + incentives					
- 50% based on Production runs	9,33,333 (9,333.33 x100)	9,33,333 (9,333.33 x 100)	7,09,334 (9,333.33 x 76)	2,24,000 (9,333.33 x 24)	28,00,000
- 40% based on Setup hours	8,51,711 (2,129.28 x 400)	2,12,928 (2,129.28 x100)	9,70,951 (2,129.28 x456)	2,04,410 (2,129.28 x 96)	22,40,000
- 10% based on number of parts Computer Systems	1,40,000 (1,40,000 x 1)	1,40,000	1,40,000	1,40,000	5,60,000

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- 80% based on Production runs	5,33,333 (5,333.33 x 100)	5,33,333 (5,333.33 x 100)	4,05,334 (5,333.33 x 76)	1,28,000 (5,333.33x 24)	16,00,000
- 20% based on number of parts	1,00,000 (1,00,000 x1)	1,00,000	1,00,000	1,00,000	4,00,000
Machinery depreciation	8,00,000 (80 x 0.1 x 1,00,000)	6,40,000 (80 x 0.1 x 80,000)	1,44,000 (80 x 0.1 x 18,000)	16,000 (80 x 0.1 x 2,000)	16,00,000
Machine Maintenance	4,00,000 (40 x 0.1 x 1,00,000)	3,20,000 (40 x 0.1 x 80,000)	72,000 (40 x 0.1 x 18,000)	8,000 (40 x 0.1 x 2,000)	8,00,000
Energy for Machinery	2,00,000 (20 x 0.1 x 1,00,000)	1,60,000 (20 x 0.1 x 80,000)	36,000 (20 x 0.1 x 18,000)	4,000 (20 x 0.1 x 2,000)	4,00,000
Total Overheads (B)	39,58,377	30,39,594	25,77,619	8,24,410	1,04,00,000
Operating Income (A-B)	32,41,623	27,20,406	(12,27,619)	(6,60,410)	40,74,000
Return on Sales (%)	21.61	22.67	(44.00)	(200.12)	13.53

The difference in the operating income under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more accurate.

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Question 8

PP Limited is in the process of implementation of Activity Based Costing System in the organisation. For this purpose, it has identified the following Business Functions in its organisation:

(i) Research and Development

(ii) Design of Products, Services and Procedures

(iii) Customer Service

(iv) Marketing

(v) Distribution

You are required to specify two cost drivers for each Business Function Identified above.

(PYP Nov 22)

Answer 8

Business functions	Cost Driver
Research and Development	Number of research projects Personnel hours on a project Technical complexities of the project
Design of products, services and procedures	Number of products in design Number of parts per product Number of engineering hours

Customer Service	Number of service calls Number of products serviced Hours spent on servicing products
Marketing	Number of advertisements Number of sales personnel Sales revenue
Distribution	Number of units distributed Number of customers Weight of items distributed

Question 9

Chispy Chip Ltd. manufactures 3 types of packed chips namely Crunchy Potato, Crispy Corn and Crumbly Banana and offers to sell them at wholesale price to the retailers. The following data is available for the current year:

	Crunchy Potato (Rs.)	**Crispy corn (Rs.)**	**Crumbly Banana (Rs.)**
Revenues	**1,53,35,250**	**1,63,36,900**	**1,55,23,850**
Cost of goods sold	**1,12,70,000**	**1,27,37,400**	**1,18,45,000**

The information regarding cost pool activities and their cost driver is also provided below:

Cost Pool Activity	Total Cost (Rs.)	Cost Driver
Placing of orders	17,94,000	No. of purchase orders
Physical delivery of goods	28,98,000	No. of deliveries
Stocking of goods on store shelves	19,87,200	Hours of shelf-stocking time
Supervising cost	13,80,000	Direct labour hours
Quality Inspections	9,03,900	No. of Inspections

Further, bifurcation of cost driver of the individual type of Chips is as follows:

Particulars	Crunchy Potato	Crispy corn	Crumbly Banana
Number of purchase orders placed	1,127	1,242	1,219
Number of deliveries made	2,185	2,668	2,392
Hours of shelf-stocking time	6,072	7,130	6,670
Direct Labour hours	19,159	19,435	18,906
Number of Inspections done	759	782	736

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Due to banana being ripening in nature, it takes double the time during inspection than the other type of Chips.

You are required to CALCULATE the operating income and its percentage of the revenue for each product line:

(i) if the company allocates all the support cost to product lines on the basis of cost of goods sold.

(ii) if the company allocates all the support cost to product lines using an activity-based costing system.

(MTP May 2025)

Answer 9

Working notes:

1. Total support cost:

Particulars	Amount (Rs.)
Placing of orders	17,94,000
Physical delivery of goods	28,98,000
Stocking of goods on store shelves	19,87,200
Supervising cost	13,80,000
Quality Inspections	9,03,900
Total	89,63,100

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total Support Cost}}{\text{Total Cost of Goods Sold}} \times 100$$

$$= \frac{\text{Rs.89,63,100}}{\text{Rs.3,58,52,400}} \times 100 = 25\%$$

3. Cost for each activity cost driver:

Activity (1)	Total cost (Rs.) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Placing of orders	17,94,000	1,127 + 1,242 + 1,219 = 3,588 purchase orders	Rs. 500 per purchase order
Physical delivery of goods	28,98,000	2,185 + 2,668 + 2,392 = 7,245 deliveries	Rs. 400 per delivery
Stocking of goods on store shelves	19,87,200	6,072 + 7,130 + 6,670 = 19,872 hours of shelf-stocking	Rs. 100 per stocking hour
Supervising cost	13,80,000	19,159 + 19,435 + 18,906 = 57,500 direct labour hour	Rs. 24 per direct labour hour
Quality Inspections	9,03,900	759 + 782 + (736 x 2*) = 3,013 inspections	Rs. 300 per inspection

* As the inspection duration for Crumbly Banana Chips is double, its base would be doubled to calculate cost driver rate under Activity Based Costing.

(i) Statement of Operating income and its percentage of revenues for each product line (When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Crunchy Potato (Rs.)	**Crispy corn (Rs.)**	**Crumbly Banana (Rs.)**	**Total (Rs.)**
Revenues: (A)	1,53,35,250	1,63,36,900	1,55,23,850	4,71,96,000
Cost of Goods sold (COGS): (B)	1,12,70,000	1,27,37,400	1,18,45,000	3,58,52,400
Support cost (25% of COGS): (C) (Refer working notes)	28,17,500	31,84,350	29,61,250	89,63,100
Total cost: (D) = {(B) + (C)}	1,40,87,500	1,59,21,750	1,48,06,250	4,48,15,500
Operating income: E= {(A)-(D)}	12,47,750	4,15,150	7,17,600	23,80,500
Operating income as a percentage of revenues: (E/A) × 100)	8.14%	2.54%	4.62%	5.04%

(ii) Statement of Operating income and its percentage of revenues for each product line (When support costs are allocated to product lines using an activity-based costing system)

	Crunchy Potato (Rs.)	Crispy corn (Rs.)	Crumbly Banana (Rs.)	Total (Rs.)
Revenues: (A)	1,53,35,250	1,63,36,900	1,55,23,850	4,71,96,000
Cost & Goods sold	1,12,70,000	1,27,37,400	1,18,45,000	3,58,52,400
Placing of orders	5,63,500 (1,127 x Rs. 500)	6,21,000 (1,242 x Rs. 500)	6,09,500 (1,219 x Rs. 500)	17,94,000
Physical delivery of goods	8,74,000 (2,185 x Rs. 400)	10,67,200 (2,668 x Rs. 400)	9,56,800 (2,392 x Rs. 400)	28,98,000
Stocking of goods on store shelves	6,07,200 (6,072 x Rs. 100)	7,13,000 (7,130 x Rs. 100)	6,67,000 (6,670 x Rs. 100)	19,87,200
Supervising cost	4,59,816 (19,159 x Rs. 24)	4,66,440 (19,435 x Rs. 24)	4,53,744 (18,906 x Rs. 24)	13,80,000
Quality Inspections	2,27,700 (759 x Rs. 300)	2,34,600 (782 x Rs. 300)	4,41,600 (736 x 2 x Rs. 300)	9,03,900
Total cost: (B)	1,40,02,216	1,58,39,640	1,49,73,644	4,48,15,500

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Operating income C:{(A)-(B)}	13,33,034	4,97,260	5,50,206	23,80,500
Operating income as a percentage of revenues: (C/A) × 100)	8.69%	3.04%	3.54%	5.04%

Question 10

Provide EXAMPLE(S) of the cost driver for the following cost pools:

Cost Pool
Quality Control
Research and Development
Machine Maintenance
Employee Training Costs
Customer Service

(MTP May 2025)

Answer 10

Cost Pool	Cost Driver
Quality Control	• Number of Inspections • Product Units Produced
Research and Development	• Number of research projects • Personnel hours on a project
Machine Maintenance	• Machine Hours
Employee Training Costs	• Number of Training Hours • Employees Trained
Customer Service	• Number of service calls • Number of products serviced • Hours spent on servicing products

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Question 11

A cost driver is:

(a) An item of production overheads

(b) A common cost which is shared over cost centers

(c) Any cost relating to transport

(d) An activity which generates costs

(Study material)

Ans: (d) An activity which generates costs

Reason:

A cost driver is defined as any factor or activity that causes a change in the cost of an operation. In cost accounting, especially in Activity-Based Costing (ABC), cost drivers are used to allocate overhead costs based on the actual activities that incur those costs.

Question 12

Which of the following statements are true: (1) Activity based Management involves activity analysis and performance measurement. (2) Activity based costing serves as a major source of information in ABM.

(a) (1) True; (2) False

(b) (1) True; (2) True

(c) (1) False; (2) True

(d) (1) False; (2) False

(Study material)

Ans: (b) (1) True; (2) True

Reason:

(1) ABM focuses on improving efficiency through activity analysis and performance measurement.

(2) ABC provides accurate cost data on activities, which ABM uses for better decision-making.

Question 13

The key elements of activity based budgeting are:

(a) Type of activity to be performed

(b) Quantity of activity to be performed

(c) Cost of activity to be performed

(d) All of the above

(Study material)

Ans: (d) All of the above

Reason:

Activity-Based Budgeting (ABB) focuses on budgeting costs based on activities required to produce goods or services. It involves:

- Type of activity – What needs to be done
- Quantity of activity – How much needs to be done
- Cost of activity – What it will cost to perform the activity

Topic 4 Overhead Allocation using ABC

Question 14

Linex Limited manufactures three products P, Q and R which are similar in nature and are usually produced in production runs of 100 units. Product P and R require both machine hours and assembly hours, whereas product Q requires only machine hours. The overheads incurred by the company during the first quarter are as under:

Machine Department expense	**18,48,000**
Assembly Department expenses	**6,72,000**

Setup costs	**90,000**
Stores receiving cost	**1,20,000**
Order processing and dispatch	**1,80,000**
Inspect and Quality control cost	**36,000**

The date related to the three products during the period are as under:

	P	Q	R
Units produced and sold	**15,000**	**12,000**	**18,000**
Machine hours worked	**30,000 hrs.**	**48,000 hrs.**	**54,000 hrs.**
Assembly hours worked (direct labour hours)	**15,000 hrs.**	**-**	**27,000 hrs.**
Customers' orders executed (in numbers)	**1,250**	**1,000**	**1,500**
Number of requisitions raised on the stores	**40**		

Required

PREPARE a statement showing details of overhead costs allocated to each product type using activity based costing.

(MTP March '19)

Answer 14

Calculation of "Activity Rate"

Cost Pool	Cost (Rs.) [A]	Cost Driver [B]	Cost Driver Rate (Rs.) [C] = [A]÷[B]
Machine Department Expenses	18,48,000	Machine Hours (1, 32,000 hrs.)	14.00
Assembly Department Expenses	6,72,000	Assembly Hours (42,000 hrs.)	16.00
Setup Cost	90,000	No. of Production Runs (450*)	200.00
Stores Receiving Cost	1,20,000	No. of Requisitions Raised on the Stores (120)	1,000.00
Order Processing and Dispatch	1,80,000	No. of Customers Orders Executed (3,750)	48.00
Inspection and Quality Control Cost	36,000	No. of Production Runs (450*)	80.00
Total (Rs.)	29,46,000		

*Number of Production Run is 450 (150 + 120 + 180)

Statement Showing "Overheads Allocation"

Particulars of Cost	Cost Driver	P	Q	R	Total

Machine Department Expenses	Machine Hours	4,20,000 (30,000 × Rs.14)	6,72,000 (48,000 × Rs.14)	7,56,000 (54,000 × Rs.14)	18,48,000
Assembly	Assembly Hours	2,40,000	---	4,32,000	6,72,000
Department Expenses		(15,000 × Rs.16)		(27,000 × Rs.16)	
Setup Cost	No. of	30,000	24,000	36,000	90,000
	Production Runs	(150 × Rs.200)	(120 × Rs.200)	(180 × Rs.200)	
Stores Receiving Cost	No. of Requisitions Raised on the Stores	40,000 (40 × Rs.1,000)	30,000 (30 × Rs.1,000)	50,000 (50 × Rs.1,000)	1,20,000
Order Processing and Dispatch	No. of Customers Orders Executed	60,000 (1,250 × Rs.48)	48,000 (1,000 × Rs.48)	72,000 (1,500 × Rs.48)	1,80,000
Inspection and Quality Control Cost	No. of Production Runs	12,000 (150 × Rs.80)	9,600 (120 × Rs.80)	14,400 (180 × Rs.80)	36,000

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Overhead (Rs.)		8,02,000	7,83,600	13,60,400	29,46,000

Question 15

Bank of Surat operated for years under the assumption that profitability can be increased by increasing Rupee volume. But that has not been the case. Cost analysis has revealed the following:

Activity	Activity Cost (Rs.)	Activity Driver	Activity Capacity
Providing ATM Service	1,00,000	No. of Transactions	2,00,000
Computer Processing	10,00,000	No. of Transactions	25,00,000
Issuing Statements	8,00,000	No. of Statements	5,00,000
Customer Inquiries	3,60,000	Telephone Minutes	6,00,000

The following annual information on three products was also made available:

Activity Driver	Checking Accounts	Personal Loans	Gold Visa
Units of Product	30,000	5,000	10,000
ATM Transactions	1,80,000	0	20,000
Computer Transactions	20,00,000	2,00,000	3,00,000
Number of Statements	3,00,000	50,000	1,50,000

Telephone Minutes Required	**3,50,000**	**90,000**	**1,60,000**

(i) CALCULATE rates for each activity.

(ii) Using the rates computed in requirement (i), Calculate the cost of each product.

(MTP March '18)

Answer 15

(i) Statement Showing "Activity Rate"

Activity	Activity Cost [a] (Rs.)	Activity Driver	No. of Units of Activity Driver [b]	Activity Rate [a] / [b] (Rs.)
Providing ATM Service	1,00,000	No. of ATM Transactions	2,00,000	0.50
Computer Processing	10,00,000	No. of Computer Transactions	25,00,000	0.40
Issuing Statements	8,00,000	No. of Statements	5,00,000	1.60
Customer Inquiries	3,60,000	Telephone Minutes	6,00,000	0.60

(ii) Statement Showing "Cost of Product"

Activity	Checking Accounts (Rs.)	Personal Loans (Rs.)	Gold Visa (Rs.)

Providing ATM Service	90,000 (1,80,000 tr.× Rs. 0.50)	---	10,000 (20,000 tr. × Rs. 0.50)
Computer Processing	8,00,000 (20,00,000 tr. × Rs. 0.40)	80,000 (2,00,000 tr. × Rs. 0.40)	1,20,000 (3,00,000 tr. × Rs. 0.40)
Issuing Statements	4,80,000 (3,00,000 st. × Rs. 1.60)	80,000 (50,000 st. × Rs.1.60)	2,40,000 (1,50,000 st. × Rs. 1.60)
Customer Inquiries	2,10,000 (3,50,000 min. × Rs. 0.60)	54,000 (90,000 min. × Rs. 0.60)	96,000 (1,60,000 min. × Rs. 0.60)
Total Cost [a]	Rs. 15,80,000	Rs. 2,14,000	Rs. 4,66,000
Units of Product [b]	30,000	5,000	10,000
Cost of each Product [a] / [b]	52.67	42.80	46.60

Question 16

Wool mark Ltd. manufactures three types of products namely P, Q and R. The data relating to a period are as under:

Particulars	P	Q	R
Machine hours per unit	**10**	**18**	**14**
Direct Labour hours per unit @ Rs. 20	**4**	**12**	**8**

Direct Material per unit (Rs.)	**90**	**80**	**120**
Production (units)	**3,000**	**5,000**	**20,000**

Currently the company uses traditional costing method and absorbs all production overheads on the basis of machine hours. The machine hour rate of overheads is Rs. 6 per hour. The company proposes to use activity based costing system and the activity analysis is as under:

Particulars	**P**	**Q**	**R**
Batch size (units)	**150**	**500**	**1,000**
Number of purchase orders per batch	**3**	**10**	**8**
Number of inspections per batch	**5**	**4**	**3**
The total production overheads are analyzed as under:			
Machine set up costs	**20%**		
Machine operation costs	**30%**		
Inspection costs	**40%**		
Material procurement related costs	**10%**		

Required:

(i) Calculate the cost per unit of each product using traditional method of absorbing all production overheads on the basis of machine hours.

(ii) Calculate the cost per unit of each product using activity based costing principles.

(MTP Oct.'18, Old & New SM)(Same concept different figures MTP Mar'22)

Answer 16

(i) Statement Showing "Cost per unit - Traditional Method"

Particulars of Costs	P (Rs.)	Q (Rs.)	R (Rs.)
Direct Materials	90	80	120
Direct Labour [(4, 12, 8 hours) X Rs.20]	80	240	160
Production Overheads [(10, 18, 14 hours) X Rs.6]	60	108	84
Cost per unit	230	428	364

(ii) Statement Showing "Cost per unit - Activity Based Costing"

Products	P	Q	R
Production (units)	3,000	5,000	20,000
	(Rs.)	(Rs.)	(Rs.)
Direct Materials (90, 80, 120)	2,70,000	4,00,000	24,00,000
Direct Labour (80, 240, 160)	2,40,000	12,00,000	32,00,000
Machine Related Costs @ Rs.1.80 per hour (30,000, 90,000, 2,80,000)	54,000	1,62,000	5,04,000

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Setup Costs @ Rs.9,600 per setup (20, 10, 20)	1,92,000	96,000	1,92,000
Inspection Costs @ Rs.4,800 per inspection (100, 40, 60)	4,80,000	1,92,000	2,88,000
Purchase Related Costs @ Rs.750 per purchase (60, 100, 160)	45,000	75,000	1,20,000
Total Costs	12,81,000	21,25,000	67,04,000
Cost per unit(Total Cost ÷Units)	427.00	425.00	335.20

Workings

Number of Batches, Purchase Orders, and Inspections-

	Particulars	**P**	**Q**	**R**	**Total**
A.	Production (units)	3,000	5,000	20,000	
B.	Batch Size (units)	150	500	1,000	
C.	Number of Batches [A ÷B]	20	10	20	50
D.	Number of Purchase Order per batch	3	10	8	
E.	Total Purchase Orders[C ÷ D]	60	100	160	320
F.	Number of Inspections per batch	5	4	3	
G.	Total Inspections [C ÷ F]	100	40	60	200

Total Machine Hours-

	Particulars	P	Q	R
A.	Machine Hours per unit	10	18	14
B.	Production (units)	3,000	5,000	20,000
C.	Total Machine Hours [A × B]	30,000	90,000	2,80,000

Total Machine Hours = 4, 00,000

Total Production Overheads-

= 4, 00,000 hrs. X Rs. 6= Rs. 24, 00,000

Cost Driver Rates-

Cost Pool	%	Overheads	Cost Driver	Cost Driver Rate
		(Rs.)	(Units)	(Rs.)
Setup	20%	4,80,000	50	9,600 per Setup
Inspection	40%	9,60,000	200	4,800 per Inspection
Purchases	10%	2,40,000	320	750 per Purchase
Machine Hours	30%	7,20,000	4,00,000	1.80 per Machine Hour

Question 17

SMD Limited manufactures four products namely A, B, C and D using the same production and process facilities. The company has been following conventional method of costing and wishes to shift to activity-based costing system.

The data pertaining to four products are:

Product	Units produced	Material per unit (Rs.)	Labour hours per unit	Machine hours per unit
A	1,500	140	1	3
B	2,500	90	3	2
C	10,000	180	2	6
D	6,000	150	1.5	4

The following activity volumes are associated to the production process for the relevant period –

	Number of Inspections	Number of Material Movements	Number of set-ups
A	200	15	100
B	250	20	125
C	900	100	600
D	650	85	400

The cost data also states that:

- **Direct Labour cost: Rs. 60 per hour**

- **Machine hour rate: Rs. 280 per hour**
- **Production overheads are absorbed on machine hour basis.**
- **For activity-based costing, a thorough, analysis of the production process revealed that: Costs relating to set-ups and inspection bears the equal percentage while costs relating to machinery accounts for 20% of the production overhead. Costs relating to material handling stands at 50% of costs relating to machinery. You are required to:**

(i) Prepare a statement showing the unit costs and total costs of each product using the absorption costing method.

(ii) Prepare a statement showing the unit costs and total costs of each product using activity – based costing system.

(MTP Sep'22)

Answer 17

(i) Cost per unit - Conventional Costing: Absorption rate method

Particulars	**A (Rs.)**	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**
Material	140	90	180	150
Labour @ Rs. 60 per labour hour	60	180	120	90
Overheads @ Rs. 280 per machine hour	840	560	1680	1120
Cost per unit (in Rs.)	1,040	830	1,980	1,360
No of units	1,500	2,500	10,000	6,000
Total cost (Rs.)	15,60,000	20,75,000	1,98,00,000	81,60,000

(ii) Statement of apportionment of overheads:

Amount (Rs.)

Type of Cost	Cost Driver	A	B	C	D
Setups	No of Setups	7,48,000 (100 x7,480)	9,35,000 (125x7,480)	44,88,000 (600 x 7,480)	29,92,000 (400 x7,480)
Machinery	Machine hours	2,52,000 (4,500 x 56)	2,80,000 (5,000 x 56)	33,60,000 (60,000 x 56)	13,44,000 (24,000 x 56)
Material Handling	No. of Movements of material	1,78,500 (15 x 11,900)	2,38,000 (20 x 11,900)	11,90,000 (100 x11,900)	10,11,500 (85 x 11,900)
Inspection	No. of Inspections	9,16,300(200 x4,581.50)	11,45,375(25 0x4,581.50)	41,23,350(90 0x4,581.50)	29,77,975(65 0x4,581.50)
Total		20,94,800	25,98,375	1,31,61,350	83,25,475
Output Units		1,500	2,500	10,000	6,000
Overhead/ unit		1,396.53	1,039.35	1,316.14	1,387.58

Statement showing Cost per unit and Total cost using Activity Based Costing

Particulars	A (Rs.)	B (Rs.)	C (Rs.)	D (Rs.)

Material	140.00	90.00	180.00	150.00
Labour	60.00	180.00	120.00	90.00
Total	200.00	270.00	300.00	240.00
No. of units	1,500	2,500	10,000	6,000
Total cost (excluding overheads)	3,00,000	6,75,000	30,00,000	14,40,000
Add: Overheads (as calculated)	20,94,800	25,98,375	1,31,61,350	83,25,475
Total cost	23,94,800	32,73,375	1,61,61,350	97,65,475
Cost per unit	1,596.53	1,309.35	1,616.14	1,627.58

Working Notes:

1. Calculation of Total machine hours

Particulars	A	B	C	D
(a) Machine hours per unit	3	2	6	4
(b) Production(units)	1,500	2,500	10,000	6,000
(c) Total machine hours (a) x(b)	4,500	5,000	60,000	24,000

Total Machine hours = 93,500

Total production overheads= 93,500 x 280 = Rs. 2, 61, 80,000

2. Calculation of cost driver rate

Cost pool	Amount of cost (Rs.)	Cost Driver (basis)	Cost Driver (units)	Cost Driver Rate (Rs.)
Setups	91,63,000	No. of Setups	1,225	7,480 per set up
Machinery	52,36,000	Machine Hrs.	93,500	56 per machine hour
Material Handlings	26,18,000	No. of Material Movements	220	11,900 per material movement
Inspection	91,63,000	No. of Inspections	2,000	4,581.50 per inspection
	2,61,80,000			

Question 18

Bopanna Ltd. produces three products Zm, Rm and Pm using the same plant and resources. It has given the following information for the year ended on 31st March 2022:

	Zm	Rm	Pm
Production Quantity (units)	**6000**	**7200**	**9840**
Cost per unit:			
Direct Material (Rs.)	**450**	**420**	**880**
Direct Labour (Rs.)	**80**	**150**	**200**

Budgeted direct labour rate was Rs.40 per hour and the production overheads, shown in table below, were absorbed to products using direct labour hour rate.

Company followed Absorption Costing Method. However, the company is now considering adopting Activity Based Costing Method.

	Budgeted Overheads (Rs.)	Cost Driver	Remarks
Material Procurement	2,50,000	No. of orders	No. of orders was 30 units for each product.
Set-up	1,50,000	No. of production Runs	All the three products are produced in production runs of 50 units.
Quality Control	1,00,000	No. of Inspections	Done for each production run.
Maintenance	3,00,000	Maintenance hours	Total maintenance hours were 10,000 and was allocated in the ratio of 2:1:2 between X, Y & Z.

Required:

(i) CALCULATE the total cost per unit of each product using the Absorption Costing Method.

(ii) CALCULATE the total cost per unit of each product using the Activity Based Costing Method.

(MTP March '23)(Same concept different figures PYP Jan'21)

Answer 18

(i) Traditional Absorption Costing

	Zm	Rm	Pm	Total
(a) Quantity (units)	6,000	7,200	9,840	23,040
(b) Direct labour per unit (Rs.)	80	150	200	-
(c) Direct labour hours (a × b)/Rs. 40	12,000	27,000	49,200	88,200

Overhead rate per direct labour hour = Budgeted overheads / Budgeted labour hours

= (Rs.2, 50,000 + Rs.1, 50,000 + Rs. 1, 00,000 + Rs.3, 00,000) / 88,200 hours

= Rs.8, 00,000 / 88,200 hours

= Rs.9 per direct labour hour (approx.)

Calculation of Cost per Unit

	Zm	Rm	Pm
Direct Costs:			
Direct Material	450	420	880
Direct Labour (Rs.)	80	150	200
Production Overhead: (Rs.)	18	33.75	45
	(80× 9/40)	(150× 9/40)	(200× 9/40)
Total cost per unit (Rs.)	548	603.75	1125

(ii) Calculation of Cost-Driver level under Activity Based Costing

	Zm	Rm	Pm	Total
Quantity (units)	6,000	7,200	9,840	-
No. of orders (to be rounded off for fraction)	200 (6,000 /30)	240 (7,200 /30)	328 (9,840 / 30)	768
No. of production runs	120 (6,000 /50)	144 (7,200 /50)	197 (9,840 / 50)	461
No. of Inspections (done for each production run)	120	144	197	461
Maintenance hours	4,000	2,000	4,000	10,000

Calculation of Cost-Driver rate

Activity	Budgeted Cost (Rs.)	Cost-driver level	Cost Driver rate (Rs.)
	(a)	(b)	(c) = (a) / (b)
Material procurement	2,50,000	768	325.5
Set-up	1,50,000	461	325.5
Quality control	1,00,000	461	217.0
Maintenance	3,00,000	10,000	30.0

Calculation of total cost of products using Activity Based Costing

Particulars	Product		
	Zm (Rs.)	Rm (Rs.)	Pm (Rs.)
Direct Material	450	420	880
Direct Labour	80	150	200
Prime Cost per unit (A)	530	570	1080
Material procurement	10.85 (325.5×200/6000)	10.85 (325.5×240/7200)	10.85 (325.5×328/9840)
Set-up	6.51 (325.5×120/6000)	6.51 (325.5×144/7200)	6.51 (325.5×196.8/9840)
Quality control	4.34 (217×120/6000)	4.34 (217×144/7200)	4.34 (217×196.8/9840)
Maintenance	20.0 (4000×30/6000)	8.3 (2000×30/7200)	12.2 (4000×30/9840)
Overhead Cost per unit(B)	41.7	30.0	33.9
Total Cost per unit (A + B)	571.7	600.0	1113.9

Question 19

MST Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

Activity	Cost Driver	Capacity	Cost (Rs.)
Power	Kilowatt hours	50,000 kilowatt hours	40,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	60,00,000

The company makes three products M, S and T. For the year ended March 31, 20X 9, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
M	10,000	3,500
S	20,000	2,500
T	15,000	3,000

Required:

(i) PREPARE a statement showing cost allocation to each product from each activity.

(ii) CALCULATE the cost of unused capacity for each activity.

(iii) STATE the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.

(RTP May'19) (Same concept different figures Old & New SM)

Answer 19

Statement of cost allocation to each product from each activity

	Product

	M (Rs.)	S (Rs.)	T (Rs.)	Total (Rs.)
Power (Refer to working note)	8,00,000 (10,000 kWh × Rs.80)	16,00,000 (20,000 kWh × Rs.80)	12,00,000 (15,000 kWh × Rs.80)	36,00,000
Quality Inspections	21,00,000	15,00,000	18,00,000	54,00,000
(Refer to working note)	(3,500 inspections × Rs.600)	(2,500 inspections × Rs.600)	(3,000 inspections × Rs.600)	

Working Note:

Rate per unit of cost driver:

Power: (Rs.40, 00,000 ÷ 50,000 kWh) = Rs.80/kWh

Quality Inspection: (Rs.60, 00,000 ÷ 10,000 inspections) = Rs.600 per inspection

(ii) Calculation of cost of unused capacity for each activity:

	(Rs.)
Power (Rs.40,00,000 – Rs.36,00,000)	4,00,000
Quality Inspections (Rs.60,00,000 – Rs.54,00,000)	6,00,000
Total cost of unused capacity	10,00,000

(ii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing & capacity management

- Effect on pricing decisions.

- Effect on performance evaluation

- Effect on financial statements

- Regulatory requirements.

- Difficulties in forecasting for any capacity level.

Question 20

MNO Ltd. manufactures two types of equipment A and B and absorbs overheads on the basis of direct labour hours. The budgeted overheads and direct labour hours for the month of March 2019 are Rs. 15, 00,000 and 25,000 hours respectively. The information about the company's products is as follows:

	Equipment	
	A	**B**
Budgeted Production Volume	**3,200 units**	**3,850 units**
Direct Material Cost	**Rs. 350 per unit**	**Rs. 400 per unit**
Direct Labour Cost		
A: 3 hours @ Rs. 120 per hour	**Rs. 360**	
B: 4 hours @ Rs. 120 per hour		**Rs. 480**

Overheads of Rs. 15, 00,000 can be identified with the following three major activities:

Order Processing: **Rs. 3, 00,000**

Machine Processing: **Rs. 10, 00,000**

Product Inspection: **Rs. 2, 00,000**

These activities are driven by the number of orders processed, machine hours worked and inspection hours respectively. The data relevant to these activities is as follows:

	Orders processed	Machine hours worked	Inspection hours
A	400	22,500	5,000
B	200	27,500	15,000
Total	600	50,000	20,000

Required:

(i) Prepare a statement showing the manufacturing cost per unit of each product using the absorption costing method assuming the budgeted manufacturing volume is attained.

(ii) Determine cost driver rates and prepare a statement showing the manufacturing cost per unit of each product using activity based costing, assuming the budgeted manufacturing volume is attained.

(iii) MNO Ltd.'s selling prices are based heavily on cost. By using direct labour hours as an application base, calculate the amount of cost distortion (under coasted or over coasted) for each equipment.

(PYP May '19) (Same concept different figures Old & New SM)

Answer 20

(i)	Overheads application base: Direct labour hours	Equipment	Equipment
		A (Rs.)	B (Rs.)

	Direct material cost	350	400
	Direct labour cost	360	480
	Overheads*	180	240
		890	1120

*Pre-determined rate = $\frac{\text{Budgeted Overheads}}{\text{Budgeted Direct Labour hours}} = \frac{\text{Rs.15,00,000}}{\text{25,000 hours}}$ = Rs. 60

(ii) Estimation of Cost-Driver rate

Activity	**Overhead cost**	**Cost-driver level**	**Cost driver rate**
	(Rs.)		**(Rs.)**
Order processing	3,00,000	600 Orders processed	500
Machine processing	10,00,000	50,000 Machine hours	20
Inspection	2,00,000	15,000 Inspection hours	10
		Equipment	**Equipment**
		A (Rs.)	**B (Rs.)**
Direct material cost		350	400
Direct labour cost		360	480
Prime Cost(A)		**710**	**880**

Overhead Cost		
Order processing 400: 200	2,00,000	1,00,000
Machine processing 22,500: 27,500	4,50,000	5,50,000
Inspection 5,000: 15,000	50,000	1,50,000
Total overhead cost	**7,00,000**	**8,00,000**

(Overheads cost per unit for each overhead can also be calculated)

Per unit cost	**A (Rs.)**	**B (Rs.)**
7,00,000 /3,200 (B)-A	218.75	
8,00,000/ 3,850 (B)-B		207.79
Unit manufacturing cost (A+B)	928.75	1,087.79

(iii) Calculation of Cost Distortion

	Equipment	**Equipment**
	A (Rs.)	**B (Rs.)**
Unit manufacturing cost–using direct labour hours as an application base	890.00	1,120.00
Unit manufacturing cost-using activity based costing	928.75	1,087.79

Cost distortion	**-38.75**	**32.21**

Important Note:-

In this numerical question related to 'Activity Based Costing', students were asked to calculate cost per unit based on absorption costing & Activity based costing method, cost distortion and cost driver. Performance of the students was above average in this question. Overall performance in this question was average.

Question 21

ABC Ltd. is engaged in production of three types of Fruit Juices: Apple, Orange and Mixed Fruit.

The following cost data for the month of March 2020 are as under:

Particulars	Apple	Orange	Mixed Fruit
Units produced and sold	**10,000**	**15,000**	**20,000**
Material per unit (Rs.)	**8**	**6**	**5**
Direct Labour per unit (Rs.)	**5**	**4**	**3**
No. of Purchase Orders	**34**	**32**	**14**
No. of Deliveries	**110**	**64**	**52**
Shelf Stocking Hours	**110**	**160**	**170**

Overheads incurred by the company during the month are as under:

	(Rs.)
Ordering costs	**64,000**
Delivery costs	**1,58,200**
Shelf Stocking costs	**87,560**

Required:

- **Calculate cost driver's rate.**
- **Calculate total cost of each product using Activity Based Costing.**

(PYP Nov 20)

Answer 21

(i) Calculation Cost-Driver's rate

Activity	**Overhead cost (Rs.)**	**Cost-driver level**	**Cost driver rate (Rs.)**
	(A)	**(B)**	**(C) = (A)/(B)**
Ordering	64,000	34 + 32 + 14= 80 no. of purchase orders	800
Delivery	1,58,200	110 + 64 + 52 = 226 no. of deliveries	700
Shelf stocking	87,560	110 + 160 + 170 = 440 shelf stocking hours	199

(ii) Calculation of total cost of products using Activity Based Costing

Particulars	Fruit Juices		
	Apple (Rs.)	**Orange (Rs.)**	**Mixed Fruit (Rs.)**
Material cost	80,000 (10,000 x Rs. 8)	90,000 (15,000 x Rs. 6)	1,00,000 (20,000 x Rs. 5)
Direct labour cost	50,000 (10,000 x Rs. 5)	60,000 (15,000 x Rs. 4)	60,000 (20,000 x Rs. 3)
Prime Cost (A)	**1,30,000**	**1,50,000**	**1,60,000**
Ordering cost	27,200 (800 x 34)	25,600 (800 x 32)	11,200 (800 x 14)
Delivery cost	77,000 (700 x 110)	44,800 (700 x 64)	36,400 (700 x 52)
Shelf stocking cost	21,890 (199 x 110)	31,840 (199 x 160)	33,830 (199 x 170)
Overhead Cost (B)	**1,26,090**	**1,02,240**	**81,430**
Total Cost (A + B)	**2,56,090**	**2,52,240**	**2,41,430**

Question 22

PQR Ltd. is engaged in the production of three products P, Q and R. The company calculates Activity Cost Rates on the basis of Cost Driver capacity which is provided as below:

Activity	Cost Driver	Cost Driver Capacity	Cost (Rs.)
Direct Labour hours	Labour hours	30,000 Labour hours	3,00,000
Production runs	No. of Production runs	600 Production runs	1,80,000
Quality Inspections	No. of Inspection	8000 Inspections	2,40,000

The consumption of activities during the period is as under:

Activity / Products	P	Q	R
Direct Labour hours	10,000	8,000	6,000
Production runs	200	180	160
Quality Inspection	3,000	2,500	1,500

You are required to:

(i) Compute the costs allocated to each Product from each Activity.

(ii) Calculate the cost of unused capacity for each Activity.

(iii) A potential customer has approached the company for supply of 12,000 units of a new product. 'S' to be delivered in lots of 1500 units per quarter. This will involve an initial design cost of Rs. 30,000 and per quarter production will involve the following:

Direct Material	Rs. 18,000
Direct Labour hours	1,500 hours

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No. of Production runs	**15**
No. of Quality Inspection	**250**

Prepare cost sheet segregating Direct and Indirect costs and compute the Sales value per quarter of product 'S' using ABC system considering a markup of 20% on cost.

(PYP July 21)

Answer 22

(i) Statement of cost allocation to each product from each activity

	Product			
	P (Rs.)	**Q (Rs.)**	**R (Rs.)**	**Total (Rs.)**
Direct Labour hours (Refer to working note)	1,00,000 (10,000 Labour hours × Rs.10)	80,000 (8,000 Labour hours × Rs.10)	60,000 (6,000 Labour hours × Rs.10)	2,40,000
Production runs (Refer to working note)	60,000 (200 Production runs × Rs. 300)	54,000 (180 Production runs × Rs. 300)	48,000 (160 Production runs × Rs. 300)	1,62,000
Quality Inspections (Refer to working note)	90,000 (3,000 Inspections × Rs.30)	75,000 (2,500 Inspections × Rs. 30)	45,000 (1,500 Inspections × Rs. 30)	2,10,000

Working note:

Rate per unit of cost driver

Direct Labour hours	(Rs. 3,00,000/30,000 Labour hours)	Rs. 10 per Labour hour
Production runs	(Rs. 1,80,000/600 Production runs)	Rs. 300 per Production run
Quality Inspection	(Rs. 2,40,000/8,000 Inspections)	Rs. 30 per Inspection

(ii) Computation of cost of unused capacity for each activity

Particulars	**(Rs.)**
Direct Labour hours [(Rs. 3,00,000 – Rs. 2,40,000) or (6,000 x Rs. 10)]	60,000
Production runs [(Rs.1,80,000 – Rs.1,62,000) or (60 x Rs.300)]	18,000
Quality Inspection [(Rs.2,40,000 – Rs.2,10,000) or (1,000 x Rs. 30)]	30,000
Total cost of unused capacity	1,08,000

(iii) Cost sheet and Computation of Sales value per quarter of product 'S' using ABC system

Particulars	**(Rs.)**
1500 units of product 'S' to be delivered per quarter	
Initial design cost per quarter (Rs. 30,000 / 8 quarters)	3,750
Direct Material Cost	18,000
Direct Labour Cost (1,500 Labour hours x Rs. 10)	15,000

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Direct Costs (A)	**36,750**
Set up Cost (15 Production runs × Rs. 300)	4,500
Inspection Cost (250 Inspections × Rs. 30)	7,500
Indirect Costs (B)	**12,000**
Total Cost (A + B)	**48,750**
Add: Mark-up (20% on cost)	9,750
Sale Value	**58,500**
Selling Price per unit 'S' (Rs. 58,500/1500 units)	**39**

Important Note:-

It was a practical problem testing the knowledge of examinees on the topic Activity Based Costing, requiring examinees to identify cost of allocated capacity and unused capacity on three products. It also required examinees to find out sales value of the offered new product by segregating cost into direct and indirect cost. First two sub parts i.e. allocation of cost and determination of cost of unused capacity were answered well, but examinees failed to segregate cost into direct and indirect in the third sub part. Performance of the examinees was above average.

Question 23

STATE what are the practical applications of ABC?

(Study material)

Answer 23

PRACTICAL APPLICATIONS OF ACTIVITY BASED COSTING

As a Decision-Making Tool

ABC can act as a decision making tool in the following ways:

(i) ABC along with some other cost management technique can be utilized to improve performance and profitability of an organization.

(ii) Wholesale distributors can gain significant advantage in the decision-making process through implementation of ABC concepts by correlating costs to various activities. Introduction of new product or vendor can be better decided through ABC.

(iii) ABC can assist in decisions related to facility and resource expansion. Often the basis for relocation or opening of a new distribution center is based on cost associations. Reduction in freight or other logistic costs can offset the expense of the new facility, staff or equipment. The ABC model can identify the specific cost elements being targeted, providing a much clearer picture which aids in management actions.

(iv) ABC augments decision support for human resources. Since the activity (and therefore costs) can be associated to an individual, new levels of financial performance can be determined. This might be evident in the case of branch management or sales.

(v) Companies who wish to determine price based on cost plus markup basis find ABC method of costing very relevant and are able to determine competitive prices for their products.

As Activity Based Management

Meaning of Activity Based Management

The term Activity Based Management (ABM) is used to describe the cost management application of ABC. The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers. ABM utilizes cost information gathered through ABC.

Various analysis in Activity Based Management

The various types of analysis involved in ABM are as follows:

(1) Cost Driver Analysis: The factors that cause activities to be performed need to be identified in order to manage activity costs. Cost driver analysis identifies the causal factors.

(2) Activity Analysis.

(a) Value-Added Activities (VA): The value-added activities are those activities which are indispensable in order to complete the process. The customers are usually willing to pay (in some way) for these services. For example, polishing furniture by a manufacturer dealing in furniture is a value added activity.

(b) Non-Value-Added Activities (NVA): The NVA activity represents work that is not valued by the external or internal customer. NVA activities do not improve the quality or function of a product or service, but they can adversely affect costs and prices. Moving materials and machine set up for a production run are examples of NVA activities.

(3) Performance Analysis: Performance analysis involves the identification of appropriate measures to report the performance of activity centres or other organisational units, consistent with each unit's goals and objectives.

Activity Based Management in Business

Activity Based Management can be used in the following ways

(i) Cost Reduction: ABM helps the organisation to identify costs against activities and to find opportunities to streamline or reduce the costs or eliminate the entire activity, especially if there is no value added.

(ii) Business Process Re-engineering: Business process re-engineering involves examining business processes and making substantial changes to how organisation currently operates. ABM is a powerful tool for measuring business performance, determining the cost of business output and is used as a means of identifying opportunities to improve process efficiency and effectiveness.

(iii) Benchmarking: Benchmarking is a process of comparing of ABC-derived activity costs of one segment of company with those of other segments. It requires uniformity in the definition of activities and measurement of their costs.

(iv) Performance Measurement: Many organisations are now focusing on activity performance as a means of facing competitors and managing costs by monitoring the efficiency and effectiveness of activities.

Area	Measure
Quality of purchased component	Zero defects
Quality of output	% yield
Customer awareness	Orders; number of complaints

Facilitate Activity Based Budgeting

Meaning of Activity Based Budgeting (ABB)

Activity based budgeting analyse the resource input or cost for each activity. It provides a framework for estimating the amount of resources required in accordance with the budgeted level of activity. Actual results can be compared with budgeted results to highlight both, in financial and non-financial terms, those activities with major discrepancies from budget for potential reduction in supply of resources. It is a planning and control system which seeks to support the objectives of continuous improvement. It means planning and controlling the expected activities of the organization to derive a cost-effective budget that meet forecast workload and agreed strategic goals. ABB is the reversing of the ABC process to produce financial plans and budgets.

Key Elements of ABB

The three key elements of activity based budgeting are as follows:-

- Type of work to be done

- Quantity of work to be done
- Cost of work to be done

Benefits of ABB

Few benefits of activity based budgeting are as follows:-

(i) Activity Based Budgeting (ABB) can enhance accuracy of financial forecasts and increasing management understanding.

(ii) When automated, ABB can rapidly and accurately produce financial plans and models based on varying levels of volume assumptions.

(iii) ABB eliminates much of the needless rework created by traditional budgeting techniques.

Question 24

Woolmark Ltd. manufactures three types of products namely P, Q and R. The data relating to a period are as under:

Particulars	P	Q	R
Machine hours per unit	10	18	14
Direct Labour hours per unit	4	12	8
Direct Material per unit (Rs.)	90	80	120
Production (units)	3,000	5,000	20,000

Currently the company uses traditional costing method and absorbs all production overheads on the basis of machine hours. The machine hour rate of overheads is Rs. 6 per hour. Direct labour hour rate is Rs. 20 per hour.

The company proposes to use activity based costing system and the activity analysis is as under:

Particulars	P	Q	R
Batch size (units)	150	500	1,000
Number of purchase orders per batch	3	10	8
Number of inspections per batch	5	4	3

The total production overheads are analyzed as under:

Machine set up costs……	20%
Machine operation costs…….	30%
Inspection costs……	40%
Material procurement related costs……..	10%

Required

(i) CALCULATE the cost per unit of each product using traditional method of absorbing all production overheads on the basis of machine hours.

(ii) CALCULATE the cost per unit of each product using activity based costing principles.

(Study material)

Answer 24

(i) Statement Showing "Cost per unit - Traditional Method"

Particulars of Costs	P (Rs.)	Q (Rs.)	R (Rs.)
Direct Materials	90	80	120
Direct Labour [(4, 12, 8 hours) x Rs. 20]	80	240	160
Production Overheads [(10, 18, 14 hours) x Rs. 6]	60	108	84
Cost per unit	**230**	**428**	**364**

(ii) Statement Showing "Cost per unit - Activity Based Costing"

Products	P	Q	R
Production (units)	3,000	5,000	20,000
	(Rs.)	**(Rs.)**	**(Rs.)**
Direct Materials (90, 80, 120)	2,70,000	4,00,000	24,00,000
Direct Labour (80, 240, 160)	2,40,000	12,00,000	32,00,000
Machine Related Costs @ Rs.1.80 per hour (30,000, 90,000, 2,80,000)	54,000	1,62,000	5,04,000
Setup Costs @ Rs.9,600 per setup (20, 10, 20)	1,92,000	96,000	1,92,000
Inspection Costs @ Rs. 4,800 per inspection (100, 40, 60)	4,80,000	1,92,000	2,88,000

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Products	P	Q	R
Purchase Related Costs @ Rs. 750 per purchase (60, 100, 160)	45,000	75,000	1,20,000
Total Costs	12,81,000	21,25,000	67,04,000
Cost per unit (Total Cost ⁄ Units)	427.00	425.00	335.20

Workings

Number of Batches, Purchase Orders, and Inspections-

	Particulars	**P**	**Q**	**R**	**Total**
A.	Production (units)	3,000	5,000	20,000	
B.	Batch Size (units)	150	500	1,000	
C.	Number of Batches (A÷B)	20	10	20	50
D.	Number of Purchase Order per batch	3	10	8	
E.	Total Purchase Orders [C x D]	60	100	160	320
F.	Number of Inspections per batch	5	4	3	
G.	Total Inspections [C x F]	100	40	60	200

Total Machine Hours-

	Particulars	**P**	**Q**	**R**

A.	Machine Hours per unit	10	18	14
B.	Production (units)	3,000	5,000	20,000
C.	Total Machine Hours [A x B]	30,000	90,000	2,80,000

Total Machine Hours = 4, 00,000

Total Production Overheads-

= 4, 00,000 hrs. x Rs. 6 = Rs. 24, 00,000

Cost Driver Rates-

Cost Pool (Rs.)	**%**	**Overheads**	**Cost Driver Basis**	**Cost Driver (Rs.)**	**Cost Driver Rate**
Setup	20%	4,80,000	Number of batches	50	9,600 per Setup
Inspection	40%	9,60,000	Number of inspections	200	4,800 per Inspection
Purchases	10%	2,40,000	Number of purchases	320	750 per Purchase
Machine Operation	30%	7,20,000	Machine Hours	4,00,000	1.80 per Machine Hour

Question 25

Xtyle Ltd. is a leading manufacturer in the textile industry, renowned for its commitment to quality and innovation. With decades of experience, the company specializes in producing a diverse range of textile products, including high-quality towels, designed to meet the varying needs of itscustomers. The company offers mainly three types of towel, viz. Hand towels, Kitchen towels and Gym towels, catering to both everyday use and specialized applications. Below are the key production data for a recent period:

Particulars	Hand towels	Kitchen towels	Gym towels
Production (units)	9,000	15,000	60,000
Machine hours per unit	10	18	14
Direct Labour hours per unit	4	12	8
Direct Material per unit (Rs.)	450	400	600

Currently, the company utilizes a traditional costing method, which assigns all production overhead costs based on the number of machine hours used. The overhead cost is calculated at a rate of Rs.30 per machine hour. Additionally, the direct labour cost is charged at Rs.100 per hour.

Now, the company plans to implement an Activity-Based Costing (ABC) system to enhance cost accuracy and provide a clearer understanding of the costs associated with each product.

The activity analysis is provided as under:

Particulars	Hand towels	Kitchen towels	Gym towels

Batch size (units)	**450**	**1,500**	**3,000**
Number of purchase orders per batch	**3**	**10**	**8**
Store delivery	**45**	**80**	**125**
Number of inspections per batch	**5**	**4**	**3**

Further, the total production overheads can be divided into several key categories. Machine setup costs account for 20% of the total, while inspection costs make up 35%. Material procurement-related costs represent 10%, and store delivery costs also constitute 10%. Finally, machine operation costs contribute 25% to the overall overheads. This breakdown provides insight into how resources are allocated across various activities within the production process.

You are required to CALCULATE the cost per unit of each product using -

(i) Traditional method.

(ii) Activity based costing principles.

(MTP Jan 2025)

Answer 25

(i) Statement Showing "Cost per unit - Traditional Method"

Particulars of Costs	**Hand towels**	**Kitchen towels**	**Gym towels**
	(Rs.)	**(Rs.)**	**(Rs.)**

Direct Materials	450	400	600
Direct Labour [(4, 12, 8 hours) × Rs. 100]	400	1,200	800
Production Overheads [(10, 18, 14 hours) × Rs. 30]	300	540	420
Cost per unit	1,150	2,140	1,820

(ii) Statement Showing "Cost per unit - Activity Based Costing"

Products	**Hand towels**	**Kitchen towels**	**Gym towels**
Production (units)	9,000	15,000	60,000
	(Rs.)	**(Rs.)**	**(Rs.)**
Direct Materials	40,50,000 (9,000 units x Rs. 450)	60,00,000 (15,000 units x Rs. 400)	3,60,00,000 (60,000 units x Rs. 600)
Direct Labour (refer Part (i) above)	36,00,000 (9,000 units x Rs. 400)	1,80,00,000 (15,000 units x Rs. 1,200)	4,80,00,000 (60,000 units x Rs. 800)
Setup Costs @ Rs. 1,44,000 per setup	28,80,000 (20 setups x Rs. 1,44,000)	14,40,000 (10 setups x Rs. 1,44,000)	28,80,000 (20 setups x Rs. 1,44,000)
Inspection Costs @ Rs. 63,000 per inspection	63,00,000 (100 inspections x Rs. 63,000)	25,20,000 (40 inspections x Rs. 63,000)	37,80,000 (60 inspections x Rs. 63,000)

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Purchase Related Costs @ Rs. 11,250 per purchase order	6,75,000 (60 purchase orders x Rs. 11,250)	11,25,000 (100 purchase orders x Rs. 11,250)	18,00,000 (160 purchase orders x Rs. 11,250)
Store delivery costs @ Rs. 14,400 per store delivery	6,48,000 (45 store delivery x Rs. 14,400)	11,52,000 (80 store delivery x Rs. 14,400)	18,00,000 (125 store delivery x Rs. 14,400)
Machine Related Costs @ Rs. 7.5 per hour	6,75,000 (90,000 hours x Rs. 7.5)	20,25,000 (2,70,000 hours x Rs. 7.5)	63,00,000 (8,40,000 hours x Rs. 7.5)
Total Costs	1,88,28,000	3,22,62,000	10,05,60,000
Cost per unit (Total Cost ÷ no. of Units)	2,092	2,151	1,676

Working Notes:

A. Number of Batches, Purchase Orders, Inspections and Store Deliveries-

	Particulars	**Hand towels**	**Kitchen towels**	**Gym towels**	**Total**
A.	Production (units)	9,000	15,000	60,000	
B.	Batch Size (units)	450	1,500	3,000	
C.	Number of Batches (A÷B)	20	10	20	50

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D.	Number of Purchase Order per batch	3	10	8	
E.	Total Purchase Orders [C × D]	60	100	160	320
F.	Number of Inspections per batch	5	4	3	
G.	Total Inspections [C × F]	100	40	60	200
H.	Total Store Deliveries	45	80	125	250

B. Total Machine Hours-

	Particulars	Hand towels	Kitchen towels	Gym towels
A.	Machine Hours per unit	10	18	14
B.	Production (units)	9,000	15,000	60,000
C.	Total Machine Hours [A × B]	90,000	2,70,000	8,40,000

Total Machine Hours = 12, 00,000

Total Production Overheads-

= 12, 00,000 hrs. × Rs. 30 = Rs. 3, 60, 00,000

C. Cost Driver Rates-

Cost Pool	%	Overheads	Cost Driver Basis	Cost Driver	Cost Driver Rate

		(Rs.)		(Units)	(Rs.)
Setup	20%	72,00,000	Number of batches	50	1,44,000 per Setup
Inspection	35%	1,26,00,000	Number of inspections	200	63,000 per Inspection
Purchases	10%	36,00,000	Number of purchase order	320	11,250 per Purchase order
Store delivery	10%	36,00,000	Number of store deliveries	250	14,400 per store delivery
Machine Operation	25%	90,00,000	Machine Hours	12,00,000	7.5 per Machine Hour

Topic 5 Product Costing using ABC

Question 26

ZA Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Product	Product	Product	
	A	B	C	
Direct Materials	**100**	**80**	**80**	**Rs./u**

Direct Labour @Rs.10/ hour	30	40	50	Rs./u
Production Overheads	30	40	50	Rs./u
Total Cost	160	160	180	Rs./u
Quantity Produced	20,000	40,000	60,000	Units

ZA Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost (Rs.)
Stores Receiving	Purchase Requisitions	5,92,000
Inspection	Number of Production Runs	17,88,000
Dispatch	Orders Executed	4,20,000
Machine Setup	Number of Setups	24,00,000

The following information is also supplied:

Details	Product A	Product B	Product C
No. of Setups	360	390	450
No. of Orders Executed	180	270	300
No. of Production Runs	750	1,050	1,200

No. of Purchase Requisitions	**300**	**450**	**500**

Required:

CALCULATE activity based production cost of all the three products.

(MTP May '20, RTP May 18)

Answer 26

The total production overheads are Rs.52, 00,000: Product A: 20,000 ×

Rs.30 = Rs.6, 00,000 Product B: 40,000 ×

Rs.40 = Rs.16, 00,000 Product C: 60,000 ×

Rs.50 = Rs.30, 00,000

On the basis of ABC analysis this amount will be apportioned as follows:

Statement Showing "Activity Based Production Cost"

Activity Cost Pool	**Cost Driver**	**Ratio**	**Total Amount (Rs.)**	**A (Rs.)**	**B (Rs.)**	**C (Rs.)**
Stores Receiving	Purchase Requisition	6:9:10	5,92,000	1,42,080	2,13,120	2,36,800
Inspection	Production Runs	5:7:8	17,88,000	4,47,000	6,25,800	7,15,200
Dispatch	Orders Executed	6:9:10	4,20,000	1,00,800	1,51,200	1,68,000

Machine Setups	Setups	12:13:15	24,00,000	7,20,000	7,80,000	9,00,000
Total Activity Cost				14,09,880	17,70,120	20,20,000
Quantity Produces				20,000	40,000	60,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				130	120	130
Total				200.49	164.25	163.67

Question 27

BABYSOFT is a global brand created by Bio-organic Ltd. The company manufactures three range of beauty soaps i.e. BABYSOFT- Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond. The budgeted costs and production for the month of December, 2019 are as follows:

	BABYSOFT- Gold		**BABYSOFT- Pearl**		**BABYSOFT- Diamond**	
Production of soaps (Units)	**4,000**		**3,000**		**2,000**	
Resources per Unit:	**Qty**	**Rate**	**Qty**	**Rate**	**Qty**	**Rate**
- Essential Oils	**60 ml**	**Rs. 200 / 100 ml**	**55 ml**	**Rs. 300 / 100ml**	**65 ml**	**Rs. 300 / 100 ml**

- Cocoa Butter	20 g	Rs. 200 / 100 g	20 g	Rs. 200 / 100g	20 g	Rs. 200 / 100 g
- Filtered Water	30 ml	Rs. 15 / 100 ml	30 ml	Rs. 15 / 100ml	30 ml	Rs. 15 / 100 ml
- Chemicals	10 g	Rs. 30 / 100g	12 g	Rs. 50 / 100g	15 g	Rs. 60 / 100 g
- Direct Labour	30 minutes	Rs. 10 /hour	40 minutes	Rs. 10 / hour	60 minutes	Rs. 10 / hour

Bio-organic Ltd. followed an Absorption Costing System and absorbed its production overheads, to its products using direct Labour hour rate, which were budgeted at Rs. 1, 98,000.

Now, Bio-organic Ltd. is considering adopting an Activity Based Costing system. For this, additional information regarding budgeted overheads and their cost drivers is provided below:

Particulars	(Rs.)	Cost drivers
Forklifting cost	58,000	Weight of material lifted
Supervising cost	60,000	Direct labour hours
Utilities	80,000	Number of Machine operations

The number of machine operators per unit of production are 5, 5, and 6 for BABYSOFT- Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond respectively.

(Consider (i) Mass of 1 litre of Essential Oils and Filtered Water equivalent to 0.8 kg and 1 kg respectively (ii) Mass of output produced is equivalent to the mass of input materials taken together.) You are requested to:

(i) PREPARE a statement showing the unit costs and total costs of each product using the absorption costing method.

(ii) PREPARE a statement showing the product costs of each product using the ABC approach.

(iii) STATE what are the reasons for the different product costs under the two approaches?

(MTP Oct.'2020, Old & New SM)

Answer 27

Traditional Absorption Costing

	BABYSOFT - Gold	**BABYSOFT- Pearl**	**BABYSOFT- Diamond**	**Total**
(a)Production of soaps (Units)	4,000	3,000	2,000	9,000
(b) Direct Labour (minutes)	30	40	60	-
(c)Direct Labour hours(a × b)/60 minutes	2,000	2,000	2,000	6,000

Overhead rate per direct Labour hour:

= Budgeted overheads / Budgeted Labour hours = Rs.1, 98,000 / 6,000 hours

= Rs.33 per direct Labour hour

Unit Costs:

	BABYSOFT- Gold (Rs.)	BABYSOFT- Pearl (Rs.)	BABYSOFT- Diamond (Rs.)
Direct costs/ Direct Labour	5.00 $\left(\frac{10\times30}{60}\right)$	6.67 $\left(\frac{10\times40}{60}\right)$	10.00 $\left(\frac{10\times60}{60}\right)$
Direct Material (refer working note 1)	167.50	251.50	248.50
Production overhead	16.50 $\left(\frac{33\times30}{60}\right)$	22.00 $\left(\frac{33\times40}{60}\right)$	33.00 $\left(\frac{33\times60}{60}\right)$
Total unit costs	189.00	244.17	291.50
Number of units	4,000	3,000	2,000
Total costs	**7,56,000**	**7,32,510**	**5,83,000**

Working note-1

Calculation of Direct material cost

	BABYSOFT- Gold (Rs.)	BABYSOFT- Pearl (Rs.)	BABYSOFT- Diamond (Rs.)
	120.00	165.00	195.00
Essential oils	(200 * 60) /100	(300 * 55)/100	(300 * 65)/100
Cocoa Butter	40.00 (200 * 20)/100	40.00 (200 * 20)/100	40.00 (200 * 20)/100

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Filtered water	4.50 (15 * 30) /100	4.50 (15 * 30)/100	4.50 (15 *30) /100
Chemicals	3.00 (30 *10)/100	6.00 (50 *12)/100	9.00 60 *15/100
Total costs	167.50	215.50	248.50

Activity Based Costing

	BABYSOFT- Gold	**BABYSOFT- Pearl**	**BABYSOFT- Diamond**	**Total**
Quantity (units)	4,000	3,000	2,000	-
Weight per unit (grams)	108 {(60×0.8)+20+30+10}	106 {(55×0.8)+20+30+12}	117 {(65×0.8)+20+30+15}	-
Total weight (grams)	4,32,000	3,18,000	2,34,000	9,84,000
Direct Labour (minutes)	30	40	60	-

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Direct Labour hours	2,000 (4,000* 30)/60	2,000 (3,000*40)/60	2,000 (2,000 *60)/60	6,000
Machine operations per unit	5	5	6	-
Total operations	20,000	15,000	12,000	47,000

Forklifting rate per gram	Rs. 58,000/9,84,000 grams = Rs.0.06 per gram
Supervising rate per direct Labour hour	Rs. 60,000 / 6,000 hours Labour hour = Rs.10 per
Utilities rate per machine operations	Rs. 80,000/ 47,000 machine operations = Rs. 1.70 per machine operations

Unit Costs under ABC:

	BABY SOFT- Gold (Rs.)	**BABY SOFT- Pearl (Rs.)**	**BABY SOFT- Diamond (Rs.)**
Direct Costs:			
- Direct Labour	5.00	6.67	10.00

- Direct material	167.50	215.50	248.50
Production Overheads:			
Forklifting cost	6.48 (0.06* 108)	6.36 (0.06 *106)	7.02 (0.06* 117)
Supervising cost	5.00 (10* 30)/60	6.67 (10 *40)/60	10.00 (10 *60)/60
Utilities	8.50 (1.70 * 5)	8.50 (1.70 * 5)	10.20 (1.70 * 6)
Total unit costs	192.48	243.70	285.72
Number of units	4,000	3,000	2,000
Total costs	**7,69,920**	**7,31,100**	**5,71,440**

(ii) Comments: The difference in the total costs under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more precise.

Question 28

ABY Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to production period December, 2020:

Product	**A**	**B**	**C**	**D**
Output in units	**1,440**	**1,200**	**960**	**1,008**
Cost per unit:				

Direct Materials	**Rs. 84**	**Rs. 90**	**Rs. 80**	**Rs. 96**
Direct Labour	**Rs. 20**	**Rs. 18**	**Rs. 14**	**Rs. 16**
Machine hours per unit	**4**	**3**	**2**	**1**

The four products are similar and are usually produced in production runs of 48 units per batch and are sold in batches of 24 units. Currently, the production overheads are absorbed using machine hour rate. The production overheads incurred by the company for the period December, 2020 are as follows:

	(Rs.)
Machine department costs:	
Rent, deprecation and supervision	**2,52,000**
Set-up Costs	**80,000**
Store receiving costs	**60,000**
Inspection	**40,000**
Material handling and dispatch	**10,368**

During the period December, 2020, the following cost drivers are to be used for allocation of overheads cost:

Cost	**Cost driver**
Set-up Costs	**Number of production runs (batches)**
Stores receiving	**Requisition raised**

Inspection	**Number of production runs (batches)**
Material handling and dispatch	**Orders executed**

It is also determined that:

(i) Machine department costs should be apportioned among set-up, stores receiving and inspection activities in proportion of 4: 3: 2.

(ii) The number of requisitions raised on stores is 50 for each product. The total number of material handling and dispatch orders executed during the period are 192 and each order being for a batch size of 24 units of product.

Required:

i. CALCULATE the total cost of each product, if all overhead costs are absorbed on machine-hour rate basis.

ii. CALCULATE the total cost of each product using activity-based costing

(MTP Mar 2021)

Answer 28

(i) Total Overhead = Rs. (2, 52,000 + 80,000 + 60,000 + 40,000 + 10,368) = Rs. 4, 42,368

Total machine hours = 1,440 × 4 + 1,200 × 3 + 960 × 2 + 1,008 × 1

= 5,760 + 3,600 + 1,920 + 1,008 = 12,288 M.Hrs

∴ Overhead recovery rate/M.H.= $\frac{\text{Rs.4,42,369}}{\text{12,288 M.Hours}}$ = Rs. 36

Cost Statement when overheads are absorbed on machine hours rate basis

Product	**A**	**B**	**C**	**D**

Output in units	1,440	1,200	960	1,008
Cost per unit:	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Direct material	84	90	80	96
Direct labour	20	18	14	16
Overhead (@ Rs. 36)	144 (4 × Rs.36)	108 (3 × Rs.36)	72 (2 ×Rs.36)	36 (1×Rs.36)
Total cost per unit	248	216	166	148
Total cost	3,57,120	2,59,200	1,59,360	1,49,184

(ii) (1) Machine department costs of Rs. 2,52,000 to be apportioned to set-up cost, store receiving and inspection in 4: 3: 2 i.e. Rs. 1,12,000, Rs. 84,000 and Rs. 56,000 respectively.

(2) One production run = 48 units. Hence, the number of production runs of different products:

A= $\frac{1,440}{48}$ =30, B= $\frac{1,200}{48}$ =25, C= $\frac{960}{48}$ =20, D= $\frac{1,008}{48}$ =21, OR TOTAL RUN 96

(3) One batch order is of 24 units. So the number of batches of different products:

A= $\frac{1,440}{24}$ =60, B= $\frac{1,200}{24}$ =50, C= $\frac{960}{24}$ =40, D= $\frac{1,008}{24}$ =42, or total 192 batches.

(4) Computation of Cost driver rates

Activity	Activity Cost (Rs.)	Cost driver	Quantity	Cost driver rate

Set-up	80,000 + 1,12,000 = 1,92,000	No. of production run	96	Rs. 2,000 per production run
Store-receiving	60,000 + 84,000 = 1,44,000	Requisition raised	50 * 4 = 200	Rs. 720 per requisition
Inspection	40,000 + 56,000 = 96,000	No. of production run	96	Rs. 1,000 per production run
Material handling	10,368	Orders executed (No. of batches)	192	Rs. 54 per batch

(5) Cost statement under Activity Based Costing:

Product	**A**	**B**	**C**	**D**
Output in units	1,440	1,200	960	1,008
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Material	1,440 * 84 = 1,20,960	1,200 * 90 = 1,08,000	960 *80 = 76,800	1,008 * 96 = 96,768
Labour	1,440 * 20 = 28,800	1,200 * 18 = 21,600	960 * 14 = 13,440	1,008 * 16 = 16,128
	1,49,760	1,29,600	90,240	1,12,896
Overhead cost:				

Set up	2,000 * 30 = 60,000	2,000 * 25 = 50,000	2,000 * 20 = 40,000	2,000 * 21 = 42,000
Store receiving	720 * 50 = 36,000	720 * 50 = 36,000	720 * 50= 36,000	720 * 50 = 36,000
Inspection	1,000 * 30 = 30,000	1,000 *25 = 25,000	1,000 * 20 = 20,000	1,000 * 21 = 21,000
Material handling	54 * 60 = 3,240	54 * 50 = 2,700	54 * 40 = 2,160	54 * 42 = 2,268
Total overhead cost	1,29,240	1,13,700	98,160	1,01,268
Total cost	2,79,000	2,43,300	1,88,400	2,14,164
Total cost per unit (Total cost / Output)	193.75	202.75	196.25	212.46

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Question 29

Discuss with example the level of activity method of segregating semi-variable costs into fixed and variable costs.

(MTP Oct. '18)

Answer 29

Level of activity method: Under this method, the variable overhead may be determined by comparing two levels of output with the amount of expenses at those levels. Since the fixed

element does not change, the variable element may be ascertained with the help of the following formula.

$$= \frac{\text{Change in the amount of expense}}{\text{Change in the quantity of output}}$$

Suppose the following information is available:

	Production Units	Semi-variable expenses (Rs.)
January	100	260
February	140	300
Difference	40	40

The variable cost: $\frac{\text{Change in semi-variable expense}}{\text{Change in production volume}} = \frac{40}{40 \text{ units}} = 1$

Thus, in January, the variable cost will be 100 × Re. 1 = Rs. 100 and the fixed cost element will be (Rs. 260 – Rs. 100) or Rs. 160. In February, the variable cost will be 140 × Re. 1 = Rs. 140 whereas the fixed cost element will remain the same, i.e., Rs. 160.

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Question 30

WRITE DOWN the corresponding cost drivers related to the following activity cost pools: Inspecting and testing costs, Setting-up machines cost, Machining costs, Supervising Costs, Ordering and Receiving Materials cost.

(MTP Sep'22)

Answer 30

Activity Cost Pools	Related Cost Drivers

Inspecting and testing costs	Number of tests
Setting up machines cost Machining costs	Number of set-ups Machine hours
Supervising Costs	Direct labour hours
Ordering and Receiving Materials cost	Number of purchase orders

Question 31

ANI Limited is a trader of a Product Z. It has decided to analyse the profitability of its five new customers. It buys Z article at Rs.5, 400 per unit and sells to retail customers at a listed price of Rs.6, 480 per unit. The data pertaining to five customers are:

	Customers				
	A	**B**	**C**	**D**	**E**
Units sold	**4,500**	**6,000**	**9,500**	**7,500**	**12,750**
Listed Selling Price	**Rs.6,480**	**Rs.6,480**	**Rs.6,480**	**Rs.6,480**	**Rs.6,480**
Actual Selling Price	**Rs.6,480**	**Rs.6,372**	**Rs.5,940**	**Rs.6,264**	**Rs.5,832**
Number of Purchase orders	**15**	**25**	**30**	**25**	**30**
Number of Customer visits	**2**	**3**	**6**	**2**	**3**
Number of deliveries	**10**	**30**	**60**	**40**	**20**

Kilometers travelled per delivery	**20**	**6**	**5**	**10**	**30**
Number of expedited deliveries	**0**	**0**	**0**	**0**	**1**

Its five activities and their cost drivers are:

Activity	Cost Driver Rate
Order taking	**Rs.4,500 per purchase order**
Customer visits	**Rs.3,600 per customer visit**
Deliveries	**Rs.7.50 per delivery Km travelled**
Product handling	**Rs.22.50 per case sold**
Expedited deliveries	**Rs.13,500 per expedited delivery**

Required:

(i) COMPUTE the customer-level operating income of each of five retail customers (A, B, C, D and E).

(ii) STATE the factors ANI Limited should consider in deciding whether to drop a customer.

(MTP Oct'22)

Answer 31

Working note:

Computation of revenues (at listed price), discount, and cost of goods sold and customer level operating activities costs:

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	Customers				
	A	**B**	**C**	**D**	**E**
Units sold: (a)	4,500	6,000	9,500	7,500	12,750
Revenues (at listed price) (Rs.): (b) {(a)×Rs.6,480)}	2,91,60,000	3,88,80,000	6,15,60,000	4,86,00,000	8,26,20,000
Revenues (at listed price) (Rs.): (c) {(a) ×Actual selling price)}	2,91,60,000 (4,500×6,480)	3,82,32,000 (6,000×6,372)	5,64,30,000 (9,500×5,940)	4,69,80,000 (7,500×6,264)	7,43,58,000 (12,750×5,832)
Discount (Rs.) (d) {(b) – (c)}	0	6,48,000	51,30,000	16,20,000	82,62,000
Cost of goods sold (Rs.) : (d) {(a) x Rs.5,400}	2,43,00,000	3,24,00,000	5,13,00,000	4,05,00,000	6,88,50,000
Customer level operating activities costs					
Order taking costs (Rs.): (No. of purchase orders × Rs. 4,500)	67,500	1,12,500	1,35,000	1,12,500	1,35,000
Customer visits costs (Rs.) (No. of customer	7,200	10,800	21,600	7,200	10,800

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visits x Rs. 3,600)					
Delivery vehicles travel costs (Rs.) (Kms travelled by delivery vehicles x Rs. 7.50 Per km.)	1,500	1,350	2,250	3,000	4,500
Product handling costs (Rs.) {(a) x Rs. 22.50}	1,01,250	1,35,000	2,13,750	1,68,750	2,86,875
Cost of expediting deliveries (Rs.) {No. of expedited deliveries x Rs. 13,500}	-	-	-	-	13,500
Total cost of customer level operating activities (Rs.)	1,77,450	2,59,650	3,72,600	2,91,450	4,50,675

(i) Computation of Customer level operating income

	Customers				
	A	**B**	**C**	**D**	**E**

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	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Revenues (At list price) (Refer to working note)	2,91,60,000	3,82,32,000	5,64,30,000	4,69,80,000	7,43,58,000
Less: Cost of goods sold (Refer to working note)	(2,43,00,000)	(3,24,00,000)	(5,13,00,000)	(4,05,00,000)	(6,88,50,000)
Gross margin	48,60,000	58,32,000	51,30,000	64,80,000	55,08,000
Less: Customer level operating activities costs (Refer to working note)	(1,77,450)	(2,59,650)	(3,72,600)	(2,91,450)	(4,50,675)
Customer level operating income	46,82,550	55,72,350	47,57,400	61,88,550	50,57,325

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(ii) Factors to be considered for dropping a customer:

Dropping customers should be the last resort to be taken by an entity. Factors to be considered should include:

- What is the expected future profitability of each customer?

- Are the currently least profitable or low profitable customers are likely to be highly profitable in the future?

- What costs are avoidable if one or more customers are dropped?

- Can the relationship with the "problem" customers be restructured so that there is at "win-win" situation.

Question 32

Hygiene Care Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Hand Wash	Detergent Powder	Dishwasher
Direct Materials (Rs. / P.u.)	150	120	120
Direct Labour @Rs.10/ hour (Rs. / P.u.)	45	60	75
Production Overheads (Rs. / P.u.)	40	50	40
Total Cost (Rs. / P.u.)	235	230	235
Quantity Produced (Units)	30,000	60,000	90,000

Hygiene Care Ltd. was absorbing overheads on the basis of direct labour hours. Management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost (Rs.)
Goods Receiving	Number of Dispatch Order	8,88,000
Inspecting and Testing costs	Number of Production Runs	26,82,000
Dispatching	Number of dispatch order	6,30,000
Storage Cost	Number of Batches of material	36,00,000

The following information is also supplied:

Details	Hand Wash	Detergent Powder	Dishwasher
Batches of material	720	780	900
Number of dispatch order	360	540	600
No. of Production Runs	1,500	2,100	2,400
Number of Dispatch Orders	600	900	1,000

Required:

CALCULATE activity-based production cost of all the three products.

(RTP May 23)

Answer 32

1. The Total Production Overhead are 78, 00,000

Items	Labour Hour	Overheads allocation on the basis of direct Labour Hour (Rs.)
Labour Hour Ratio	(4.5:6:7.5)	
Hand Wash	1,35,000	9,00,000
Detergent Powder	3,60,000	24,00,000
Dishwasher	6,75,000	45,00,000
Total	11,70,000	78,00,000

2. On the basis of ABC analysis this amount will be apportioned as follows: Statement Showing "Activity Based Production Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (Rs.)	Hand Wash (Rs.)	Detergent Powder (Rs.)	Dishwasher (Rs.)
Goods Receiving	Dispatch order	06:09:10	8,88,000	2,13,120	3,19,680	3,55,200
Inspecting and Testing costs	Production Runs	05:07:08	26,82,000	6,70,500	9,38,700	10,72,800
Dispatching	Dispatch Order	06:09:10	6,30,000	1,51,200	2,26,800	2,52,000

Storage Cost	Batches of material	12:13:15	36,00,000	10,80,000	11,70,000	13,50,000
Total Activity Cost				21,14,820	26,55,180	30,30,000
Quantity Produces				30,000	60,000	90,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				195	180	195
Total				265.49	224.25	228.67

Note: This question can also be solved by using cost driver rate

Question 33

PQR Pens Ltd. manufactures two products - 'Gel Pen' and 'Ball Pen'. It furnishes the following data for the year 2017:

Product	Annual Output (Units)	Total Machine Hours	Total number of Purchase orders	Total number of set-ups

Gel Pen	**5,500**	**24,000**	**240**	**30**
Ball Pen	**24,000**	**54,000**	**448**	**56**

The annual overheads are as under:	
Particulars	**Rs.**
Volume related activity costs	**4,75,020**
Set up related costs	**5,79,988**
Purchase related costs	**5,04,992**

Calculate the overhead cost per unit of each Product - Gel Pen and Ball Pen on the basis of: (i) Traditional method of charging overheads (ii) Activity based costing method and (iii) Find out the difference in cost per unit between both the methods.

(PYP May '18)

Answer 33

(i) Statement Showing Overhead Cost per unit "Traditional Method"

	Gel Pen (Rs.)	**Ball Pen (Rs.)**
Units Overheads (Rs.)	5,500	24,000
(Refer to W.N.)	4, 80,000 (20 x 24,000 hrs.)	10, 80,000 (20 x 54,000 hrs.)
Overhead Rate per Unit (Rs.)	87.27(Rs. 4,80,000 / 5,500 units)	(Rs. 10,80,000 /24,000 units)

Working Notes:

Overhead Rate per Machine Hour $= \frac{\text{Total overhead incurred by the Compamy}}{\text{Total Machine Hours}}$

$=\frac{4,75,020+5,79,888+5,04,992}{24,000 \text{ hours}+54,000 \text{ hours}} =\frac{15,60,000}{78,000 \text{ hours}}$ = Rs. 20 per machine hour

(ii) Statement Showing "Activity Based Overhead Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (Rs.)	Gel Pen (Rs.)	Ball Pen (Rs.)
Volume Related Activity Costs	Machine hours	24:54	4,75,020	1,46,160	3,28,860
Setup Related Costs	No. of Setups	30:56	5,79,988	2,02,321	3,77,667
Purchase Related Costs	No. of Purchase Orders	240:448	5,04,992	1,76,160	3,28,832
Total Cost				5,24,641	10,35,359
Output (units)				5,500	24,000
Unit Cost (Overheads)				95.39	43.13

(iii)

	Gel Pen (Rs.)	Ball Pen (Rs.)
Overheads Cost per unit (Rs.) (Traditional Method)	87.27	45

Overheads Cost per unit (Rs.) (ABC)	95.39	43.13
Difference per unit	-8.12	+1.87

(Volume related activity cost, set up related costs and purchase related cost can also be calculated under Activity Base Costing using Cost driver rate. However, there will be no changes in the final answer.)

Question 34

XYZ Ltd. is engaged in manufacturing two products- Express Coffee and Instant Coffee. It furnishes the following data for a year:

Product	Actual Output (units)	Total Machine hours	Total Number of Purchase orders	Total Number of set ups
Express Coffee	**5,000**	**20,000**	**160**	**20**
Instant Coffee	**60,000**	**1,20,000**	**384**	**44**

The annual overheads are as under:

Particulars	Rs.
Machine Processing costs	**7,00,000**
Set up related costs	**7,68,000**
Purchase related costs	**6,80,000**

You are required to:

(i) Compute the costs allocated to each product – Express Coffee and Instant Coffee from each activity on the basis of Activity- Based Costing (ABC) method.

(ii) Find out the overhead cost per unit of each product – Express coffee and Instant coffee based on (i) above.

(PYP Nov 22)

Answer 34

(i) Estimation of Cost-Driver rate

Activity	**Overhead cost**	**Cost-driver level**	**Cost driver rate**
	(Rs.)		**(Rs.)**
Machine processing	7,00,000	1,40,000 Machine hours	5
Set up Costs	7,68,000	64 Number of set up	12,000
Purchase related Costs	6,80,000	544 Number of purchase order	1250

Cost Allocation under Activity based Costing

	Express Coffee	**Instant Coffee**
	(Rs.)	**(Rs.)**
Overhead Cost		

Machine processing (Cost Driver rate - Rs. 5) (or 20,000:1,20,000)	5 × 20,000 = 1,00,000	5 × 1,20,000 = 6,00,000
Set up Costs (Cost Driver rate - Rs. 12,000)) (or 20:44)	12,000 × 20 = 2,40,000	12,000 × 44 = 5,28,000
Purchase related Costs(Cost Driver rate-Rs. 1250) (or 160:384)	1,250 × 160 = 2,00,000	1,250 × 384 = 4,80,000
Total overhead cost	5,40,000	16,08,000

(ii) Overhead Cost per unit

Per unit Overhead cost	**(Rs.)**	**(Rs.)**
5,40,000 /5,000	108	
16,08,000/60,000		26.80

Question 35

STATE what is Activity based costing. How are product costs determined in ABC?

(Study material)

Answer 35

MEANING AND DEFINITION

Activity Based Costing is an accounting methodology that assigns costs to activities rather than products or services. This enables resources & overhead costs to be more accurately

assigned to products & services that consume them. ABC is a technique which involves identification of cost with each cost driving activity and making it as the basis for apportionment of costs over different cost objects/ jobs/ products/customers or services.

ABC assigns cost to activities based on their use of resources. It then assigns cost to cost objects, such as products or customers, based on their use of activities. ABC can track the flow of activities in organization by creating a link between the activity (resource consumption) and the cost object.

CIMA defines 'Activity Based Costing' as "An approach to the costing and monitoring of activities which involves tracing resource consumption and costing final outputs. Resources are assigned to activities, and activities to cost objects based on consumption estimates. The latter utilize cost drivers to attach activity costs to outputs."

TRADITIONAL ABSORPTION COSTING VS ABC

Cost Allocation under Traditional and Activity Based Costing System In traditional absorption costing overheads are first related to cost centres (Production & Service Centres) and then to cost objects, i.e., products. In ABC overheads are related to activities or grouped into cost pools. Then they are related to the cost objects, e.g., products. The two processes are, therefore, very similar, but the first stage is different, as ABC uses activities instead of functional departments (cost centres). The problem with functional departments is that they tend to include a series of different activities, which incur a number of different costs that behave in different ways. Activities also tend to run across functions; for instance, procurement of materials often includes raising a requisition note in a manufacturing department or stores. It is not raised in the purchasing department where most procurement costs are incurred. Activity costs tend to behave in a similar way to each other i.e., they have the same cost driver. Therefore, ABC gives a more realistic picture of the way in which costs behave.

Difference between Activity Based Costing and Traditional Absorption Costing

Activity Based Costing	Traditional Absorption Costing

1. Overheads are related to activities and grouped into activity cost pools.	1. Overheads are related to cost centers/departments.
2. Costs are related to activities and hence are more realistic.	2 Costs are related to cost centers and hence not realistic of cost behaviour.
3 Activity–wise cost drivers are determined.	3. Time (Hours) are assumed to be the only cost driver governing costs in all departments.
4. Activity–wise recovery rates are determined and there is no concept of a single overhead recovery rate.	4. Either multiple overhead recovery rates (for each department) or a single overhead recovery rate may be determined for absorbing overheads.
5. Cost are assigned to cost objects, e.g. customers, products, services, departments, etc.	5. Costs are assigned to Cost Units i.e. to products, or jobs or hours.
6. Essential activities can be simplified and unnecessary activities can be eliminated. Thus, the corresponding costs are also reduced/ minimized. Hence ABC aids cost control.	6. Cost Centers/ departments cannot be eliminated. Hence, not suitable for cost control.

STAGES IN ACTIVITY BASED COSTING (ABC)

The different stages in ABC calculations are listed below:

(1) Identify the different activities within the organisation: Usually the number of cost centres that a traditional overhead system uses is quite small, say up to fifteen. In ABC, the number of activities will be much more, say 200; the exact number will depend on how the

management subdivides the organisation's activities. It is possible to break the organisation down into many very small activities. But if ABC is to be acceptable as practical system it is necessary to use larger groupings, say, 40 activities may be used in practice. The additional number of activities over cost centres means that ABC should be more accurate than the traditional method regardless of anything else. Some activities may be listed as follows:-

• Production schedule changes

• Customer liaison

• Purchasing

• Production process set up

• Quality control

• Material handling

• Maintenance

(2) Relate the overheads to the activities, both support and primary, that caused them. This creates 'cost pools' or 'cost buckets'. This will be done using resource cost drivers that reflect causality.

(3) Support activities are then spread across the primary activities on some suitable base, which reflects the use of the support activity. The base is the cost driver that is the measure of how the support activities are used.

(4) Determine the activity cost drivers that will be used to relate the overheads collected in the cost pools to the cost objects/products. This is based on the factor that drives the consumption of the activity. The question to ask is – what causes the activity to incur costs? In production scheduling, for example, the driver will probably be the number of batches ordered.

(5) Calculate activity cost driver rates for each activity, just as an overhead absorption rate would be calculated in the traditional system.

Activity cost driver rate = $\frac{\text{Total cost of activity}}{\text{Activity driver}}$

The activity driver rate can be used not only to identify cost of products, as in traditional absorption costing, but it can also be used for costing other cost objects such as customers/customer segments and distribution channels. The possibility of costing objects other than products is part of the benefit of ABC. The activity cost driver rates will be multiplied by the different amounts of each activity that each product/other cost object consumes.

Examples of Cost Drivers

Some of the examples of cost drivers for different activity pools in a production department are stated below:

Activity Cost Pools	Related Cost Drivers
Ordering and Receiving Materials cost	Number of purchase orders
Setting up machines costs	Number of set-ups
Machining costs	Machine hours
Assembling costs	Number of parts
Inspecting and testing costs	Number of tests
Painting costs	Number of parts
Supervising Costs	Direct labour hours

Question 36

STATE what is Activity based Management. How does ABC help ABM?

(Study material)

Answer 36

As Activity Based Management

Meaning of Activity Based Management

The term Activity Based Management (ABM) is used to describe the cost management application of ABC. The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers. ABM utilizes cost information gathered through ABC.

Various analysis in Activity Based Management

The various types of analysis involved in ABM are as follows:

(1) Cost Driver Analysis: The factors that cause activities to be performed need to be identified in order to manage activity costs. Cost driver analysis identifies the causal factors.

(2) Activity Analysis.

(a) Value-Added Activities (VA): The value-added activities are those activities which are indispensable in order to complete the process. The customers are usually willing to pay (in some way) for these services. For example, polishing furniture by a manufacturer dealing in furniture is a value added activity.

(b) Non-Value-Added Activities (NVA): The NVA activity represents work that is not valued by the external or internal customer. NVA activities do not improve the quality or function of a product or service, but they can adversely affect costs and prices. Moving materials and machine set up for a production run are examples of NVA activities.

(3) Performance Analysis: Performance analysis involves the identification of appropriate measures to report the performance of activity centres or other organisational units, consistent with each unit's goals and objectives.

Activity Based Management in Business

Activity Based Management can be used in the following ways

(i) Cost Reduction: ABM helps the organisation to identify costs against activities and to find opportunities to streamline or reduce the costs or eliminate the entire activity, especially if there is no value added.

(ii) Business Process Re-engineering: Business process re-engineering involves examining business processes and making substantial changes to how organisation currently operates. ABM is a powerful tool for measuring business performance, determining the cost of business output and is used as a means of identifying opportunities to improve process efficiency and effectiveness.

(iii) Benchmarking: Benchmarking is a process of comparing of ABC-derived activity costs of one segment of company with those of other segments. It requires uniformity in the definition of activities and measurement of their costs.

(iv) Performance Measurement: Many organisations are now focusing on activity performance as a means of facing competitors and managing costs by monitoring the efficiency and effectiveness of activities.

Area	Measure
Quality of purchased component	Zero defects
Quality of output	% yield
Customer awareness	Orders; number of complaints

Question 37

H-2025 Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Product	Product	Product	
	A	B	C	
Direct Materials	50	40	40	Rs./u
Direct Labour @ Rs. 10/ hour	30	40	50	Rs./u
Production Overheads	30	40	50	Rs./u
Total Cost	110	120	140	Rs./u
Quantity Produced	10,000	20,000	30,000	Units

H-2025 Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost
Stores Receiving	Purchase Requisitions	2,96,000
Inspection	Number of Production Runs	8,94,000

Dispatch	**Orders Executed**	**2,10,000**
Machine Setup	**Number of Setups**	**12,00,000**

The following information is also supplied:

Details	Product A	Product B	Product C
No. of Setups	**360**	**390**	**450**
No. of Orders Executed	**180**	**270**	**300**
No. of Production Runs	**750**	**1,050**	**1,200**
No. of Purchase Requisitions	**300**	**450**	**500**

Required

CALCULATE activity based production cost of all the three products.

(MTP May 2025)

Answer 37

The total production overheads are Rs. 26, 00,000:

Product A: 10,000 × Rs. 30 = Rs. 3, 00,000

Product B: 20,000 × Rs. 40 = Rs. 8, 00,000

Product C: 30,000 × Rs. 50 = Rs. 15, 00,000

On the basis of ABC analysis this amount will be apportioned as follows:

Statement Showing "Activity Based Production Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (Rs.)	A (Rs.)	B (Rs.)	C (Rs.)
Stores Receiving	Purchase Requisition	6:9:10	2,96,000	71,040	1,06,560	1,18,400
Inspection	Production Runs	5:7:8	8,94,000	2,23,500	3,12,900	3,57,600
Dispatch	Orders Executed	6:9:10	2,10,000	50,400	75,600	84,000
Machine Setups	Setups	12:13:15	12,00,000	3,60,000	3,90,000	4,50,000
			Total Activity Cost	7,04,940	8,85,060	10,10,000
			Quantity Sold	10,000	20,000	30,000
			Unit Cost (Overheads)	70.49	44.25	33.67
			Add: Conversion Cost	80	80	90
			Total	150.49	124.25	123.67

Question 38

Which of the following is not a correct match:

Activity	Cost Driver

(a) Production Scheduling	**Number of Production runs**
(b) Dispatching	**Number of dispatch orders**
(c) Goods receiving	**Goods received orders**
(d) Inspection	**Machine hours**

(Study material)

Ans: (d) Inspection – Machine Hours Incorrect match

Reason:

(a) Production Scheduling – Number of Production Runs Correct

(b) Dispatching – Number of Dispatch Orders Correct

(c) Goods Receiving – Goods Received Orders Correct

(d) Inspection – Machine Hours Incorrect match

Inspection costs are usually driven by the number of inspections, batches, or units inspected, not machine hours. Machine hours are typically used as a cost driver for machine-related overheads, not inspection activities.

Question 39

Production set up costs Rs. 3, 50,000; Total production is 50,000 units of each of the products X and Y; Production in each run is 2,000 units of X or 5,000 units of Y. Company uses activity-based costing to calculate the unit cost of its products. Set-up cost per unit of Y will be

(a) Rs. 4.00

(b) Rs. 2.40

(c) Rs. 2.00

(d) Rs. 3.60

(MTP May 2025)

Ans: (c) Rs. 2 per unit

Number of runs for X = $\frac{\text{Total Production of X}}{\text{Batch Size of X}}$ = 50,000/2,000 = 25 runs

Number of runs for Y = $\frac{\text{Total Production of Y}}{\text{Batch Size of Y}}$ = 50,000/5,000 = 10 runs

Set-up cost per run = $\frac{\text{Total Set up Cost}}{\text{Total Runs}}$ = 3, 50,000/35 = Rs. 10,000 per run

Set-up cost per unit of Y = $\frac{\text{Set up Cost per Run}}{\text{Batch Size of Y}}$ = 10,000/5, 000 = Rs. 2 per unit

Question 40

With the rise in carbon dioxide, a greenhouse gas, release in the environment, when fossil fuels are burned, Earth's natural greenhouse effect is becoming too weak causing global warming.

To contribute towards global environment for the betterment, various cars and scooters manufacturing companies are shifting their production towards electric vehicles (EVs) manufacturing. Companies are heavily investing in research, development and production of EVs.

Olay Ltd. is also one the companies belonging to scooter manufacturing industry. Watching its rivalries shifting their production to EVs, the management of Olay Ltd. decided to take the advantage of this open opportunity.

It had been only 4 years since the company started its production of EVs, but last year, the management of the company also decided to expand its product line to 3 variants of the scooter, viz., Olay EV Max, Olay EV Ultra and Olay EV Pro.

The following information is provided for the current year from the books of Olay Ltd.:

	Olay EV Max	Olay EV Ultra	Olay EV Pro
Average revenue per unit (Rs.)	84,975	1,15,500	2,17,800
Average cost of goods sold per unit (Rs.)	82,500	1,10,000	1,98,000

Last year, when the company initially expanded its product line, the sales were not much noticeable comparative to its earlier category of scooters. The company could only sold 528, 330 and 110 units of Olay EV Max, Olay EV Ultra and Olay EV Pro respectively against the order received of 616, 396 and 165 units respectively. However, with the increasing awareness about the EVs, more people started buying EVs and, during the current year, the company's order and sales jumped to five times the last year.

For earlier years, Olay Ltd. used gross margin percentage method to evaluate the relative profitability for all of its EVs.

However, from current year, company plans to use activity based costing for analysing the profitability.

The Activity analysis of Olay Ltd. is as under:

Activity Area	Cost-allocation base
Customer purchase order processing	Purchase orders by customers
Line-item ordering	Line-items per purchase order

Store delivery	**Unit sold**
Cartons dispatched to stores	**Cartons dispatched to a store per Unit**
Shelf-stocking at customer store	**Hours of shelf-stocking**

All the support costs for the current year amounts to Rs. 66, 23,760. These support costs are assigned to all the activity areas. The cost in each area and the quantity of the cost allocation basis used in that area are as follows:

Activity Area	Total costs (Rs.)	Total Units of Cost-allocation base
Line-item ordering	**14,04,480**	**66,110 line items**
Cartons dispatched to store	**16,72,000**	**3,39,240 cartons**
Shelf-stocking at customer store	**2,25,280**	**2,904 hours**

The Customer purchase order processing costs Rs.17, 60,000 along with the store delivery cost of Rs.15, 62,000.

Some of the other information is also provided below:

	Olay EV Max	Olay EV Ultra	Olay EV Pro
Average number of line items per order	**10**	**12**	**14**
Average number of cartons shipped per store unit	**16**	**80**	**300**

Average number of hours of shelf-stocking per store delivery	**0.1**	**0.6**	**3**

The company wants you to FIGURE OUT the following to ascertain which of the product line is more profitable:

(RTP Sep. 2025)

(i) For the current year, how much is the order received and the units sold for Olay EV Max, Olay EV Ultra and Olay EV Pro respectively?

(a) Order received- 616, 396 and 165 units; sold- 528, 330 and 110 units of Olay EV Max, Olay EV Ultra and Olay EV Pro respectively.

(b) Order received- 3,696, 2,376 and 990 units; sold- 3,168, 1,980 and 660 units of Olay EV Max, Olay EV Ultra and Olay EV Pro respectively.

(c) Order received- 528, 330 and 110 units; sold- 616, 396 and 165 units of Olay EV Max, Olay EV Ultra and Olay EV Pro respectively

(d) Order received- 3,080, 1,980 and 825 units; sold- 2,640, 1,650 and 550 units of Olay EV Max, Olay EV Ultra and Olay EV Pro respectively.

Ans: (d) Order received- 3,080, 1,980 and 825 units; sold- 2,640, 1,650 and 550 units of Olay EV Max, Olay EV Ultra and Olay EV Pro respectively.

Particulars	**Olay EV Max (units)**	**Olay EV Ultra (units)**	**Olay EV Pro (units)**	**Total (units)**
Previous year order received	616	396	165	1177
Current Year order (5 times the last year)	3,080	1,980	825	5,885

Previous year sales	528	330	110	968
Current Year sales (5 times the last year)	2,640	1,650	550	4,840

(ii) The total gross-margin percentage and the operating income percentage, for the current year would be:

(a) Gross-margin - 3.72% and operating income - 4.96%

(b) Gross-margin - 4.96% and operating income - 3.72%

(c) Gross-margin - 4.96% and operating income - 4.96%

(d) Gross-margin - 3.72% and operating income - 3.72%

Ans: (b) Gross-margin - 4.96% and operating income - 3.72%

Statement of gross margin percentage and operating income percentage

Particulars	Olay EV Max	Olay EV Ultra	Olay EV Pro	Total
Revenues (A) (Rs.)	22,43,34,000 (2,640 × Rs.84,975)	19,05,75,000 (1,650 × Rs.1,15,500)	11,97,90,000 (550 × Rs.2,17,800)	53,46,99,000
Less: Cost of goods sold (B) (Rs.)	21,78,00,000 (2,640 × Rs.82,500)	18,15,00,000 (1,650 × Rs.1,10,000)	10,89,00,000 (550 × Rs.1,98,000)	50,82,00,000

Gross Margin (A - B) (Rs.)	65,34,000	90,75,000	1,08,90,000	2,64,99,000
Less: Operating costs (Rs.)				66,23,760
Operating income (Rs.)				1,98,75,240
Gross Margin %				4.96%
Operating income %				3.72%

(iii) The cost driver rate relating to all the five activity areas would be:

(a) Customer purchase order processing- Rs.363.64 per order, Line item ordering- Rs.21.24 per line item order, Store delivery- Rs.265.42 per unit sold, Cartons dispatched- Rs.4.93 per dispatch and Shelf-stocking at customer store- Rs.77.58 per hour.

(b) Customer purchase order processing- Rs.299.07 per order, Line item ordering- Rs.21.24 per line item order, Store delivery- Rs.322.73 per unit sold, Cartons dispatched- Rs.4.93 per dispatch and Shelf-stocking at customer store- Rs.77.58 per hour.

(c) Customer purchase order processing- Rs.299.07 per order, Line item ordering- Rs.77.58 per line item order, Store delivery- Rs.322.73 per unit sold, Cartons dispatched- Rs.4.93 per dispatch and Shelf-stocking at customer store- Rs.21.24 per hour.

(d) Customer purchase order processing- Rs.322.73 per order, Line item ordering- Rs.21.24 per line item order, Store delivery- Rs.299.07 per unit sold, Cartons dispatched- Rs.4.93 per dispatch and Shelf-stocking at customer store- Rs.77.58 per hour.

Ans: (b) Customer purchase order processing- Rs.299.07 per order, Line item ordering- Rs.21.24 per line item order, Store delivery- Rs.322.73 per unit sold, Cartons dispatched- Rs.4.93 per dispatch and Shelf-stocking at customer store- Rs.77.58 per hour.

Computation of cost driver rate relating to all the activity areas

Particulars	(Rs.)
Customer purchase order processing (Rs. 17,60,000/ 5,885 orders)	299.07 per order
Line item ordering (Rs. 14,04,480/ 66,110 line items)	21.24 per line item order
Store delivery (Rs. 15,62,000/ 4,840 unit sold)	322.73 per unit sold
Cartons dispatched (Rs. 16,72,000/ 3,39,240 dispatches)	4.93 per dispatch
Shelf-stocking at customer store (Rs. 2,25,280/ 2,904 hours)	77.58 per hour

(iv) The operating cost of the individual product line, as per the method proposed for the current year w.r.t. profitability analysis, would be:

(a) Olay EV Max- Rs.16, 11,013, Olay EV Ultra- Rs.23, 56,890 and Olay EV Pro- Rs.26, 56,059

(b) Olay EV Max- Rs.23, 56,890, Olay EV Ultra- Rs.26, 56,059 and Olay EV Pro- Rs.16, 11,013

(c) Olay EV Max- Rs.26, 56,059, Olay EV Ultra- Rs.16, 11,013 and Olay EV Pro- Rs.23, 56,890

(d) Olay EV Max- Rs.26, 56,059, Olay EV Ultra- Rs.23, 56,890 and Olay EV Pro- Rs.16, 11,013

Ans: (d) Olay EV Max- Rs.26, 56,059, Olay EV Ultra- Rs.23, 56,890 and Olay EV Pro- Rs.16, 11,013

Computation of operating cost

	Olay EV Max (Rs.)	Olay EV Ultra (Rs.)	Olay EV Pro (Rs.)	Total (Rs.)
Customer purchase order processing	9,21,136 (Rs. 299.07 × 3,080 orders)	5,92,159 (Rs. 299.07 × 1,980 orders)	2,46,733 (Rs. 299.07 × 825 orders)	17,60,027
Line item ordering	6,54,192 (Rs. 21.24 × 10 x 3,080 orders)	5,04,662 (Rs. 21.24 × 12 x 1,980 orders)	2,45,322 (Rs. 21.24 × 14 × 825 orders)	14,04,176
Store delivery	8,52,007 (Rs. 322.73 × 2,640 unit sold)	5,32,505 (Rs. 322.73 × 1,650 unit sold)	1,77,502 (Rs. 322.73 × 550 unit sold)	15,62,013
Cartons dispatched	2,08,243 (Rs. 4.93 × 16 cartons × 2,640 units)	6,50,760 (Rs. 4.93 × 80 cartons × 1,650 units)	8,13,450 (Rs. 4.93 × 300 cartons × 550 units)	16,72,453
Shelf stocking	20,481 (Rs. 77.58 × 2,640 deliveries × 0.1 Av. hrs.)	76,804 (Rs. 77.58 × 1,650 deliveries × 0.6 Av. Hrs.)	1, 28,007 (Rs. 77.58 × 550 deliveries × 3 Av. Hrs.)	2,25,292
Operating cost	26,56,059	23,56,890	16,11,013	66,23,962*

*Difference due to rounding off.

(v) Operating income as a percentage of revenues of each product line, namely Olay EV Max, Olay EV Ultra and Olay EV Pro, when all the support costs are allocated using an activity-based costing system would be:

(a) Olay EV Max- 1.73%, Olay EV Ultra- 3.53% and Olay EV Pro- 7.75%

(b) Olay EV Max- 1.18%, Olay EV Ultra- 1.24% and Olay EV Pro- 1.34%

(c) Olay EV Max- 2.91%, Olay EV Ultra- 4.76% and Olay EV Pro- 9.09%

(d) Olay EV Max- 1.78%, Olay EV Ultra- 3.70% and Olay EV Pro- 8.52%

Ans: (a) Olay EV Max- 1.73%, Olay EV Ultra- 3.53% and Olay EV Pro- 7.75%

Operating Income Statement (using the Activity based Costing system)

	Olay EV Max	**Olay EV Ultra**	**Olay EV Pro**
Revenues (Rs.) (A)	22,43,34,000 (2,640 × Rs. 84,975)	19,05,75,000 (1,650 × Rs. 1,15,500)	11,97,90,000 (550 × Rs. 2,17,800)
Less: Cost of goods sold (Rs.) (B)	21,78,00,000 (2,640 × Rs. 82,500)	18,15,00,000 (1,650 × Rs. 1,10,000)	10,89,00,000 (550 × Rs. 1,98,000)
Gross Margin (Rs.) (C) (A - B)	65,34,000	90,75,000	1,08,90,000
Operating cost (Rs.) (D) (Refer to (iv) part of the answer)	26,56,059	23,56,890	16,11,013

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Operating income (Rs.) (E) (C–D)	38,77,941	67,18,110	92,78,987
Operating income (in %) (Operating income/ Revenue) × 100	1.73%	3.53 %	7.75 %

Topic 6 Comparison: ABC vs Traditional Costing

Question 41

Asian Mfg. Co. has decided to increase the size of the store. It wants the information about the probability of the individual product lines: Lemon, Grapes and Papaya. It provides the following data for the 2018 for each product line:

Particulars	Lemon	Grapes	Papaya
Revenues (Rs.)	**79,350**	**2,10,060**	**1,20,990**
Cost of goods sold (Rs.)	**60,000**	**1,50,000**	**90,000**
Cost of bottles returned (Rs.)	**1,200**	**0**	**0**
Number of purchase orders placed	**36**	**84**	**36**
Number of deliveries received	**30**	**219**	**66**
Hours of shelf stocking time	**54**	**540**	**270**

Items sold	**12,600**	**1,10,400**	**30,600**

Asian Mfg. Co. also provides the following information for the year 2018:

Activity	Description of Activity	Total Costs (Rs.)	Cost Allocation Basis
Bottle returns	**Returning of empty bottles to the store**	**1,200**	**Direct tracing to product line**
Ordering	**Placing of orders of purchases**	**15,600**	**156 purchase orders**
Delivery	**Physical delivery and the receipts of merchandise**	**25,200**	**315 deliveries**
Self- stocking	**Stocking of merchandise on store shelves and ongoing restocking**	**17,280**	**864 hours of time**
Customer support	**Assistance provided to customers including bagging and checkout**	**30,720**	**1,53,600 items sold**

Required

(i) Asian Mfg. Co. currently allocates store support costs (all costs other than the cost of goods sold) to the product line on the basis of the cost of goods sold of each product line. CALCULATE the operating income and operating income as the percentage of revenue of each product line.

(ii) If Asian Mfg. Co. allocates store support costs (all costs other than the cost of goods sold) to the product lines on the basis of ABC system, CALCULATE the operating income and operating income as the percentage of revenue of each product line.

(iii) SHOW a comparison statement.

(MTP Oct. '19)

Answer 41

(i) Absorption Costing System Operating Income-

Particulars	Lemon	Grapes	Papaya	Total
Revenue	79,350	2,10,060	1,20,990	4,10,400
Less: Cost of Goods Sold	60,000	1,50,000	90,000	3,00,000
Less: Store Support Cost	18,000	45,000	27,000	90,000
Operating Income	1,350	15,060	3,990	20,400
Operating Income (%)	1.70	7.17	3.30	4.97

(ii) ABC System Overhead Allocation Rate-

Activity	Total Costs (Rs.)	Quantity of Cost Allocation Base	Overhead Allocation Rate (Rs.)
Ordering	15,600	156 Purchase Orders	100.00
Delivery	25,200	315 Delivering Orders	80.00
Shelf Stocking	17,280	864 Self Stocking Hours	20.00

Customer Support	30,720	1,53,600 Items Sold	0.20

Store Support Cost-

Particulars	Cost Driver	Lemon	Grapes	Papaya	Total
Bottle Returns	Direct	1,200	0	0	1,200
Ordering	Purchase Orders	3,600	8,400	3,600	15,600
Delivery	Deliveries	2,400	17,520	5,280	25,200
Self -Stocking	Hours of time	1,080	10,800	5,400	17,280
Customer Support	Items Sold	2,520	22,080	6,120	30,720
Grand Total		10,800	58,800	20,400	90,000

Operating Income-

Particulars	Lemon	Grapes	Papaya	Total
Revenue	79,350	2,10,060	1,20,990	410,400
Less: Cost of Goods Sold	60,000	1,50,000	90,000	300,000
Less: Store Support Cost	10,800	58,800	20,400	90,000
Operating Income	8,550	1,260	10,590	20,400
Operating Income (%)	10.78	0.60	8.75	4.97

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(iii) Comparison

Particulars	Lemon	Grapes	Papaya	Total
Under Traditional Costing System	1.70%	7.17%	3.30%	4.97%
Under ABC System	10.78%	0.60%	8.75%	4.97%

Question 42

EXPLAIN in brief the problems of traditional costing where overhead costs are allocated based on volume.

(Study material)

Answer 42

Overhead, in Traditional Costing System, overhead costs are grouped together under cost center and then absorbed into product costs on either of the basics such as direct labour hours, machine hours, volume etc. In certain cases, this traditional costing system gives inaccurate cost information. Though, it should not be assumed that all traditional absorption costing systems are not accurate enough to give adequate information for pricing purposes or other long-run management decision purposes. Some traditional systems treat overheads in a detailed way and relate them to service cost centres as well as production cost centres. The service centre overheads are then spread over the production cost centres before absorption rates are calculated. The main cause of inaccuracy is in the calculation of the overhead rate itself, which is usually based on direct labour hours or machine hours. These rates assume that products that take longer to make, generate more overheads and so on.

Organisations, who do not wish to know how much it costs to make a product with precise accuracy, may be happy with traditional costing system. Others, however, fix their price on cost basis and need to determine it with reasonable accuracy. The latter organisations have

been greatly benefitted from the development of activity-based costing (ABC), which is considered as a modern absorption costing method, and was evolved to give more accurate product costs.

Question 43

A cost driver:

(a) Is a force behind the overhead cost?

(b) Is an allocation base

(c) Is a transaction that is a significant determinant of cost

(d) All of the above

(Study material)

Ans: (d) All of the above

Topic 7 Customer Profitability Analysis

Question 44

RST Limited specializes in the distribution of pharmaceutical products. It buys from the pharmaceutical companies and resells to each of the three different markets.

(i) General Supermarket Chains

(ii) Drugstore Chains

(iii) Chemist Shops

The following data for the month of April in respect of RST Limited has been reported:

	General Supermarket Chains (Rs.)	Drugstore Chains (Rs.)	Chemist Shops (Rs.)
Average revenue per delivery	84,975	28,875	5,445
Average cost of goods sold per delivery	82,500	27,500	4,950
Number of deliveries	330	825	2,750

In the past, RST Limited has used gross margin percentage to evaluate the relative profitability of its distribution channels. The company plans to use activity –based costing for analysing the profitability of its distribution channels.

The Activity analysis of RST Limited is as under:

Activity Area	Cost Driver
Customer purchase order processing	Purchase orders by customers
Line-item ordering	Line-items per purchase order
Store delivery	Store deliveries
Cartons dispatched to stores	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	Hours of shelf-stocking

The April month's operating costs (other than cost of goods sold) of RST Limited are Rs. 8, 27,970. These operating costs are assigned to five activity areas. The cost in each area and

the quantity of the cost allocation basis used in that area for the month of April are as follows:

Activity Area	Total costs (Rs.)	Total Units of Cost Allocation Base
Customer purchase order processing	2,20,000	5,500 orders
Line-item ordering	1,75,560	58,520 line items
Store delivery	1,95,250	3,905 store deliveries
Cartons dispatched to store	2,09,000	2,09,000 cartons
Shelf-stocking at customer store	28,160	1,760 hours

Other data for the month of April include the following:

	General Supermarket Chains	Drugstore Chains	Chemist Shops
Total number of orders	385	990	4,125
Average number of line items per order	14	12	10
Total number of store deliveries	330	825	2,750
Average number of cartons	300	80	16

shipped per store delivery			
Average number of hours of shelf-stocking per store delivery	**3**	**0.6**	**0.1**

Required:

(i) COMPUTE gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.

(ii) COMPUTE the rate per unit of the cost-allocation base for each of the five activity areas.

(iii) COMPUTE the operating income of each distribution channel using the activity-based costing information. Comment on the results. What new insights are available with the activity-based cost information?

(iv) DESCRIBE four challenges one would face in assigning the total operating costs of Rs. 8, 27,970 to five activity areas.

(Old & New SM, MTP Sep '23)

Answer 44

(i) RST Limited's

Statement of operating income and gross margin percentage for each of its three distribution channel

Particulars	General Super Market Chains	Drug store Chains	Chemist Shops	Total
Revenues: (Rs.)	2,80,41,750 (330 × Rs. 84,975)	2,38,21,875 (825 × Rs. 28,875)	1,49,73,750 (2,750 × Rs. 5,445)	6,68,37,375

Less: Cost of goods sold: (Rs.)	2,72,25,000 (330 × Rs. 82,500)	2,26,87,500 (825 × Rs. 27,500)	1,36,12,500 (2,750 × Rs. 4,950)	635,25,000
Gross Margin :(Rs.)	8,16,750	11,34,375	13,61,250	33,12,375
Less: Other operating costs: (Rs.)				8,27,970
Operating income: (Rs.)				24,84,405
Gross Margin	2.91%	4.76 %	9.09%	4.96%
Operating income%				3.72

(ii) Computation of rate per unit of the cost allocation base for each of the five activity areas for the month of April

	(Rs.)
Customer purchase order processing(Rs. 2,20,000/ 5,500 orders)	40 per order
Line item ordering (Rs. 1,75,560/ 58,520 line items)	3 per line item order
Store delivery (Rs. 1,95,250/ 3,905 store deliveries)	50 per delivery

Cartons dispatched (Rs. 2,09,000/ 2,09,000 dispatches)	1 per dispatch
Shelf-stocking at customer store (Rs.)(Rs. 28,160/ 1,760 hours)	16 Per hour

(iii) Operating Income Statement of each distribution channel in April (Using the Activity based Costing information)

	General Super Market Chains	**Drugstore Chains**	**Chemist Shops**
Gross margin (Rs.) : (A) (Refer to (i) part of the answer)	8,16,750	11,34,375	13,61,250
Operating cost (Rs.): (B) (Refer to working note)	1,62,910	1,90,410	4,74,650
Operating income (Rs.): (A–B)	6,53,840	9,43,965	8,86,600
Operating income (in %) (Operating income/Revenue) ×100	2.33	3.96	5.92

Comments and new insights: The activity-based cost information highlights, how the 'Chemist Shops' uses a larger amount of RST Ltd.'s resources per revenue than do the other two distribution channels. Ratio of operating costs to revenues, across these markets is:

General supermarket chains (Rs. 1,62,910/ Rs. 2,80,41,750) × 100	0.58%
Drug store chains (Rs. 1,90,410/ Rs. 2,38,21,875) × 100	0.80%
Chemist shops (Rs. 4,74,650/ Rs. 1,49,73,750) ×100	3.17%

Working note:

Computation of operating cost of each distribution channel:

	General Super Market Chains (Rs.)	Drugstore Chains (Rs.)	Chemist Shops (Rs.)
Customer purchase order processing	15,400 (Rs. 40 × 385 orders)	39,600 (Rs. 40 × 990 orders)	1,65,000 (Rs. 40 ×4125 orders)
Line item	16,170	35,640	1,23,750
ordering	(Rs. 3 × 14 x385)	(Rs. 3 × 12 x990)	(Rs. 3 × 10 ×4125)
Store delivery	16,500(Rs. 50 × 330 deliveries)	41,250(Rs. 50 × 825 deliveries)	1,37,500(Rs. 50 × 2750 deliveries)
Cartons dispatched	99,000(Rs.1× 300 cartons × 300 deliveries)	66,000(Rs.1 × 80 cartons × 825 deliveries)	44,000(Rs.1 × 16 cartons × 2,750 deliveries)
Shelf stocking	15,840(Rs. 16 × 330 deliveries × 3 Av. hrs.)	7,920(Rs. 16 × 825 deliveries ×0.6 Av. hrs.)	4,400(Rs. 16 × 2,750 deliveries × 0.1 Av. hrs.)
Operating cost	1,62,910	1,90,410	4,74,650

(iv) Challenges faced in assigning total operating cost of Rs. 8, 27,970:

- Choosing an appropriate cost driver for activity area.

- Developing a reliable data base for the chosen cost driver.

- Deciding, how to handle costs that may be common across several activities.

- Choice of the time period to compute cost rates per cost driver.

- Behavioural factors.

Question 45

Breeze Ltd has decided to analyses the profitability of its five new customers. It buys soft drink bottles in cases at Rs. 54 per case and sells them to retail customers at a list price of Rs. 64.80 per case. The data pertaining to five customers are given below:

Particulars	Customers				
	Aey	Bee	Cee	Dee	Eey
Number of Cases Sold	9,360	14,200	62,000	38,000	9,800
List Selling Price (Rs.)	64.80	64.80	64.80	64.80	64.80
Actual Selling Price (Rs.)	64.80	64.08	58.80	60.24	58.32
Number of Purchase Orders	30	50	60	50	60
Number of Customers visits	4	6	12	4	6
Number of Deliveries	20	60	120	80	40
Kilometers travelled per delivery	40	12	10	20	60
Number of expedite Deliveries	0	0	0	0	2

Its five activities and their cost drivers are:

Activity	Cost Driver
Order taking	Rs. 240 per purchase order
Customer visits	Rs. 360 per each visit
Deliveries	Rs. 4.80 per delivery km travelled
Product Handling	Rs. 2.40 per case sold
Expedited deliveries	Rs. 120 per such delivery

You are REQUIRED to:

(i) Compute the customer level operating income of each of five retail customers by using the Cost Driver rates.

(ii) Examine the results to give your comments on Customer 'Dee' in comparison with Customer 'Cee' and on Customer 'Eye' in comparison with Customer 'Aye'.

(MTP Oct.'2021, PYP Nov '19)

Answer 45

Working note: Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

Particulars	Customers				
	Aye	Bee	Cee	Dee	Eey
Cases sold: (a)	9,360	14,200	62,000	38,000	9,800

Revenues (at listed price) (Rs.): (b) {(a) × Rs. 64.80)}	6,06,528	9,20,160	40,17,600	24,62,400	6,35,040
Discount (Rs.): (c) {(a) × Discount per case}	-	10,224(14,200 cases × Rs. 0.72)	3,72,000(62,000 cases × Rs. 6)	1,73,280(38,000 cases × Rs. 4.56)	63,504 (9,800 cases × Rs. 6.48)
Cost of goods sold (Rs.): (d) {(a) × Rs. 54}	5,05,440	7,66,800	33,48,000	20,52,000	5,29,200
Customer level operating activities costs					
Order taking costs (Rs.): (No. of purchase × Rs. 240)	7,200	12,000	14,400	12,000	14,400
Customer visits costs (Rs.) (No. of customer visits × Rs. 360)	1,440	2,160	4,320	1,440	2,160

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Delivery vehicles travel costs (Rs.) (Kms travelled by delivery vehicles × Rs. 4.80 per km.)	3,840	3,456	5,760	7,680	11,520
Product handling costs (Rs.) {(a) ×Rs. 2.40}	22,464	34,080	1,48,800	91,200	23,520
Cost of expediting deliveries (Rs.) {No. of expedited deliveries × Rs. 120}	-	-	-	-	240
Total cost of customer level operating activities (Rs.)	34,944	51,696	1,73,280	1,12,320	51,840

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I. Computation of Customer level operating income

Particulars	Customers				
	Aey (Rs.)	**Bee (Rs.)**	**Cee (Rs.)**	**Dee (Rs.)**	**Eey (Rs.)**
Revenues (At list price) (Refer to working note)	6,06,528	9,20,160	40,17,600	24,62,400	6,35,040
Less: Discount (Refer to working note)	-	10,224	3,72,000	1,73,280	63,504
Revenue (At actual price)	6,06,528	9,09,936	36,45,600	22,89,120	5,71,536
Less: Cost of goods sold (Refer to working note)	5,05,440	7,66,800	33,48,000	20,52,000	5,29,200
Gross margin	1,01,088	1,43,136	2,97,600	2,37,120	42,336
Less: Customer level operating activities costs (Refer to working note)	34,944	51,696	1,73,280	1,12,320	51,840
Customer level operating income	66,144	91,440	1,24,320	1,24,800	(9,504)

II. Comments

Customer Dee in comparison with Customer Cee: Operating income of Customer Dee is more than that of Customer Cee, despite having only 61.29% (38,000 units) of the units' volume sold in comparison to Customer Cee (62,000 units). Customer Cee receives a higher percent of discount i.e. 9.26% (Rs. 6) while Customer Dee receive a discount of 7.04% (Rs. 4.56). Though the gross margin of customer Cee (Rs. 2,97,600) is more than that of Customer Dee (Rs. 2,37,120) but total cost of customer level operating activities of Cee (Rs. 1,73,280) is more in comparison to Customer Dee (Rs. 1,12,320). As a result, operating income is more in case of Customer Dee.

Customer Eey in comparison with Customer Aey: Customer Eey is not profitable while Customer Aey is profitable. Customer Eey receives a discount of 10% (Rs. 6.48) while Customer Aey doesn't receive any discount. Sales Volume of Customer Aey and Eey is almost same. However, total cost of customer level operating activities of Eey is far more (Rs. 51,840) in comparison to Customer Aey (Rs. 34,944). This has resulted in occurrence of loss in case of Customer Eey.

Important Note:-

This was a numerical problem from the topic 'Concepts of Activity Based Costing (ABC)' which required preparing customer level operating income using cost driver rates and examining the result and commenting on the customer by comparison of result/ other parameters. Performance of the examinees was above average.

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Question 46

The following budgeted information relates to B Ltd. for the year 2021:

	Products		
	X	**Y**	**Z**
Production and Sales (units)	**1,00,000**	**80,000**	**60,000**

	(Rs.)	(Rs.)	(Rs.)
Selling price per unit	45	90	70
Direct cost per unit	25	45	50
	Hours	Hours	Hours
Machine department (machine hours per unit)	3	4	5
Assembly department (direct labour hours per unit)	6	4	3

The estimated overhead expenses for the year 2021 will be as below:

Machine Department Rs. 36, 80,000 Assembly

Department 27, 50,000

Overhead expenses are apportioned to the products on the following basis:

Machine Department **On the basis of machine hours**

Assembly Department **On the basis of labour hours**

After a detailed study of the activities the following cost pools and their respective cost drivers are found:

Cost Pool	Amount (Rs.)	Cost Driver	Quantity
Machining services	32,20,000	Machine hours	9,20,000 hours
Assembly services	22,00,000	Direct labour hours	11,00,000 hours

Set-up costs	**4,50,000**	**Machine set-ups**	**9,000 set-ups**
Order processing	**3,60,000**	**Customer orders**	**7,200 orders**
Purchasing	**2,00,000**	**Purchase orders**	**800 orders**

	Products		
	X	**Y**	**Z**
Machine set-ups	**4,500**	**3,000**	**1,500**
Customer orders	**2,200**	**2,400**	**2,600**
Purchase orders	**300**	**350**	**150**

You are required to PREPARE a product-wise profit statement using:

(i) Absorption costing method;

(ii) Activity-based method.

(MTP Nov '21) (RTP May '21)

Answer 46

(i) Profit Statement using Absorption costing method:

	Particulars	**Product**			**Total**
		X	**Y**	**Z**	

A.	Sales Quantity	1,00,000	80,000	60,000	2,40,000
B.	Selling price per unit (Rs.)	45	90	70	
C.	Sales Value (Rs.) [A×B]	45,00,000	72,00,000	42,00,000	1,59,00,000
D.	Direct cost per unit (Rs.)	25	45	50	
E.	Direct Cost (Rs.) [A×D]	25,00,000	36,00,000	30,00,000	91,00,000
F.	Overheads:				
(i)	Machine department (Rs.) (Working note-1)	12,00,000	12,80,000	12,00,000	36,80,000
(ii)	Assembly department (Rs.) (Working note-1)	15,00,000	8,00,000	4,50,000	27,50,000
G.	Total Cost (Rs.) [E+F]	52,00,000	56,80,000	46,50,000	1,55,30,000
H.	Profit (C-G)	(7,00,000)	15,20,000	(4,50,000)	3,70,000

(ii) Profit Statement using Activity based costing (ABC) method:

	Particulars	**Product**			**Total**
		X	**Y**	**Z**	
A.	Sales Quantity	1,00,000	80,000	60,000	
B.	Selling price per unit (Rs.)	45	90	70	

C.	Sales Value (Rs.) [A×B]	45,00,000	72,00,000	42,00,000	1,59,00,000
D.	Direct cost per unit (Rs.)	25	45	50	
E.	Direct Cost (Rs.) [A×D]	25,00,000	36,00,000	30,00,000	91,00,000
F.	Overheads: (Refer working note-3)				
(i)	Machining services (Rs.)	10,50,000	11,20,000	10,50,000	32,20,000
(ii)	Assembly services (Rs.)	12,00,000	6,40,000	3,60,000	22,00,000
(iii)	Set-up costs (Rs.)	2,25,000	1,50,000	75,000	4,50,000
(iv)	Order processing (Rs.)	1,10,000	1,20,000	1,30,000	3,60,000
(v)	Purchasing (Rs.)	75,000	87,500	37,500	2,00,000
G.	Total Cost (Rs.) [E+F]	51,60,000	57,17,500	46,52,500	1,55,30,000
H.	Profit (Rs.) (C-G)	(6,60,000)	14,82,500	(4,52,500)	3,70,000

Working Notes:

1.

		Products			
		X	**Y**	**Z**	**Total**
A.	Production (units)	1,00,000	80,000	60,000	

B.	Machine hours per unit	3	4	5	
C.	Total Machine hours [A×B]	3,00,000	3,20,000	3,00,000	9,20,000
D.	Rate per hour (Rs.)	4	4	4	
E.	Machine Dept. cost [C×D]	12,00,000	12,80,000	12,00,000	36,80,000
F.	Labour hours per unit	6	4	3	
G.	Total labour hours [A×F]	6,00,000	3,20,000	1,80,000	11,00,000
H.	Rate per hour (Rs.)	2.5	2.5	2.5	
I	Assembly Dept. cost [G×H]	15,00,000	8,00,000	4,50,000	27,50,000

Machine hour rate = Rs. 36, 80,000 / 9, 20,000 hours = Rs. 4

Labour hour rate = Rs. 27, 50,000 / 11, 00,000 hours = Rs. 2.5

2. Calculation of cost driver rate

Cost Pool	Amount (Rs.)	Cost Driver	Quantity	Driver rate (Rs.)
Machining services	32,20,000	Machine hours	9,20,000 hours	3.50
Assembly services	22,00,000	Direct labour hours	11,00,000 hours	2.00

Set-up costs	4,50,000	Machine set- ups	9,000 set-ups	50.00
Order processing	3,60,000	Customer orders	7,200 orders	50.00
Purchasing	2,00,000	Purchase orders	800 orders	250.00

3. Calculation of activity-wise cost

		Products			
		X	**Y**	**Z**	**Total**
A.	Machining hours (Refer Working note-1)	3,00,000	3,20,000	3,00,000	9,20,000
B.	Machine hour rate (Rs.) (Refer Working note-2)	3.5	3.5	3.5	
C.	Machining services cost (Rs.) [A×B]	10,50,000	11,20,000	10,50,000	32,20,000
D.	Labour hours (Refer Working note-1)	6,00,000	3,20,000	1,80,000	11,00,000
E.	Labour hour rate (Rs.) (Refer Working note-2)	2	2	2	
F.	Assembly services cost (Rs.) [D×E]	12,00,000	6,40,000	3,60,000	22,00,000
G.	Machine set-ups	4,500	3,000	1,500	9,000

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H.	Rate per set-up (Rs.) (Refer Working note-2)	50	50	50	
I.	Set-up cost (Rs.) [G×H]	2,25,000	1,50,000	75,000	4,50,000
J.	Customer orders	2,200	2,400	2,600	7,200
K.	Rate per order (Rs.) (Refer Working note-2)	50	50	50	
L.	Order processing cost (Rs.) [J×K]	1,10,000	1,20,000	1,30,000	3,60,000
M.	Purchase orders	300	350	150	800
N.	Rate per order (Rs.) (Refer Working note-2)	250	250	250	
O.	Purchasing cost (Rs.) [M×N]	75,000	87,500	37,500	2,00,000

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Question 47

KD Ltd. is following Activity based costing. Budgeted overheads, cost drivers and volume are as follows:

Cost pool	Budgeted overheads (Rs.)	Cost driver	Budgeted volume
Material procurement	**18,42,000**	**No. of orders**	**1,200**

Material handling	8,50,000	No. of movement	1,240
Maintenance	24,56,000	Maintenance hours	17,550
Set-up	9,12,000	No. of set-ups	1,450
Quality control	4,42,000	No. of inspection	1,820

The company has produced a batch of 7,600 units, its material cost was Rs.24, 62,000 and wages Rs.4, 68,500. Usage activities of the said batch are as follows:

Material orders	56
Material movements	84
Maintenance hours	1,420 hours
Set-ups	60
No. of inspections	18

Required:

(i) CALCULATE cost driver rates.

(ii) CALCULATE the total and unit cost for the batch.

(MTP April '23) (Same concept different figures RTP Nov'20)

Answer 47

(i) Calculation of cost driver rate:

Cost pool	Budgeted overheads (Rs.)	Cost driver	Cost driver rate (Rs.)

Material procurement	18,42,000	1,200	1,535.00
Material handling	8,50,000	1,240	685.48
Maintenance	24,56,000	17,550	139.94
Set-up	9,12,000	1,450	628.97
Quality control	4,42,000	1,820	242.86

(ii) Calculation of cost for the batch:

Particulars	Amount (Rs.)	Amount (Rs.)
Material cost		24,62,000.00
Wages		4,68,500.00
Overheads:		
- Material procurement (Rs.1,535×56 orders)	85,960.00	
- Material handling (Rs.685.48×84 movements)	57,580.32	
- Maintenance (Rs.139.94×1,420 hours)	1,98,714.80	
- Set-up (Rs.628.97×60 set-ups)	37,738.20	
- Quality control (Rs.242.86×18 inspections)	4,371.48	3,84,364.80
Total Cost		33,14,864.80

No. of units		7,600
Cost per units		436.17

Question 48

Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 20X7-X8 for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	**Rs. 39,67,500**	**Rs. 1,05,03,000**	**Rs. 60,49,500**
Cost of goods sold	**Rs. 30,00,000**	**Rs. 75,00,000**	**Rs. 45,00,000**
Cost of bottles returned	**Rs. 60,000**	**Rs. 0**	**Rs. 0**
Number of purchase orders placed	**360**	**840**	**360**
Number of deliveries received	**300**	**2,190**	**660**
Hours of shelf-stocking time	**540**	**5,400**	**2,700**
Items sold	**1,26,000**	**11,04,000**	**3,06,000**
Family store also provides the following information for the year 20X7-X8:			

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Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	Rs. 60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	Rs.7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	Rs.12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	Rs. 8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	Rs.15,36,000	15,36,000 items sold

Required:

(i) Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. CALCULATE the operating income and operating income as a % of revenues for each product line.

(ii) If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using and activity based costing system, Calculate the operating income and operating income as a % of revenues for each product line.

(RTP Nov'18, RTP May'20, Nov'21, Old & New SM)

Answer 48

Statement of operating income and operating income as a percentage of revenues for each product line (When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks	Fresh Produce	Packaged Foods	Total
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS): (B)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS): (C) (Refer working notes)	9,00,000	22,50,000	13,50,000	45,00,000
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: E= {(A)-(D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (E/A) × 100)	1.70%	7.17%	3.30%	4.97%

Working Notes

1. Total support cost:	**(Rs.)**
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000

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Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total Support Cost}}{\text{Total Cost of goods sold}} \times 100$$

$$= \frac{\text{Rs.45,00,000}}{\text{Rs.1,50,00,000}} \times 100 = 30\%$$

3. Cost for each activity cost driver:

Activity	Total cost (Rs.)	Cost allocation base	Cost driver rate
(1)	**(2)**	**(3)**	**(4) = [(2) ÷ (3)]**
Ordering	7,80,000	1,560 purchase orders	Rs.500 per purchase order
Delivery	12,60,000	3,150 deliveries	Rs.400 per delivery
Shelf-stocking	8,64,000	8,640 hours	Rs.100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	Rs.1 per item sold

(i) Statement of operating income and operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity-based costing system)

	Soft Drinks	Fresh Produce	Packaged Food	Total
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost*(300:2190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5400:2700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income C: {(A)- (B)}	4,27,500	63,000	5,29,500	10,20,000
Operating income as a % of revenues	10.78%	0.60%	8.75%	4.97%
* Refer to working note 3				

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Question 49

A Drug Store is presently selling three types of drugs namely 'Drug A', 'Drug B' and 'Drug C'. Due to some constraints, it has decided to go for only one product line of drugs. It has provided the following data for year 2020-21 for each product line:

	Drugs Types		
	A	**B**	**C**
Revenues (in Rs.)	**74,50,000**	**1,11,75,000**	**1,86,25,000**
Cost of goods sold (in Rs.)	**41,44,500**	**68,16,750**	**1,20,63,750**
Number of purchase orders placed (in nos.)	**560**	**810**	**630**
Number of deliveries received	**950**	**1,000**	**850**
Hours of shelf-stocking time	**900**	**1,250**	**2,350**
Units sold (in Nos.)	**1,75,200**	**1,50,300**	**1,44,500**

Following additional information is also provided:

Activity	Description of activity	Total Cost (Rs.)	Cost-allocation base
Drug License fee	**Drug License fee**	**5,00,000**	**To be distributed in ratio 2:3:5 between A, B and C**
Ordering	**Placing of orders for purchases**	**8,30,000**	**2,000 purchase orders**

Delivery	**Physical delivery and receipt of foods**	**18,20,000**	**2,800 deliveries**
Shelf stocking	**Stocking of goods**	**32,40,000**	**4,500 hours of shelf-stocking time**
Customer Support	**Assistance provided to customers**	**28,20,000**	**4,70,000 units sold**

You are required to:

(i) Calculate the operating income and operating income as a percentage (%) of revenue of each product line if:

(a) All the support costs (Other than cost of goods sold) are allocated in the ratio of cost of goods sold.

(b) All the support costs (Other than cost of goods sold) are allocated using activity-based costing system.

(ii) Give your opinion about choosing the product line on the basis of operating income as a percentage (%) of revenue of each product line under both the situations as above.

(PYP Dec '21)

Answer 49

(i) (a) Statement of operating income and operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Drug A (Rs.)	**Drug B (Rs.)**	**Drug C (Rs.)**	**Total (Rs.)**

Revenues: (A)	74,50,000	1,11,75,000	1,86,25,000	3,72,50,000
Cost of Goods sold (COGS): (B)	41,44,500	68,16,750	1,20,63,750	2,30,25,000
Support cost (40% of COGS): (C) (Refer working notes)	16,57,800	27,26,700	48,25,500	92,10,000
Total cost: (D) = {(B) + (C)}	58,02,300	95,43,450	1,68,89,250	3,22,35,000
Operating income: E = {(A)-(D)}	16,47,700	16,31,550	17,35,750	50,15,000
Operating income as a % of revenues: (E/A) × 100)	22.12%	14.60%	9.32%	13.46%

Working notes:

1. Total support cost:

	(Rs.)
Drug Licence Fee	5,00,000
Ordering	8,30,000
Delivery	18,20,000
Shelf stocking	32,40,000
Customer support	28,20,000

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Total support cost	92,10,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total Support Cost}}{\text{Total Cost of Goods Sold}} \text{ X } 100$$

$$= \frac{\text{Rs.92,10,000}}{\text{2,30,25,000}} \text{ X } 100 = 40\%$$

3. Cost for each activity cost driver:

Activity (1)	Total cost (Rs.) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	8,30,000	2,000 purchase orders	Rs. 415 per purchase order
Delivery	18,20,000	2,800 deliveries	Rs. 650 per delivery
Shelf-stocking	32,40,000	4,500 hours	Rs. 720 per stocking hour
Customer support	28,20,000	4,70,000 units sold	Rs. 6 per unit sold

(b) Statement of operating income and operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity-based costing system)

	Drug A (Rs.)	Drug B (Rs.)	Drug C (Rs.)	Total (Rs.)
Revenues: (A)	74,50,000	1,11,75,000	1,86,25,000	3,72,50,000
Cost & Goods sold	41,44,500	68,16,750	1,20,63,750	2,30,25,000

Drug Licence Fee	1,00,000	1,50,000	2,50,000	5,00,000
Ordering cost* (560:810:630)	2,32,400	3,36,150	2,61,450	8,30,000
Delivery cost* (950:1000:850)	6,17,500	6,50,000	5,52,500	18,20,000
Shelf stocking cost* (900:1250:2350)	6,48,000	9,00,000	16,92,000	32,40,000
Customer Support cost* (175200:150300:144500)	10,51,200	9,01,800	8,67,000	28,20,000
Total cost: (B)	67,93,600	97,54,700	1,56,86,700	3,22,35,000
Operating income C: {(A)-(B)}	6,56,400	14,20,300	29,38,300	50,15,000
Operating income as a % of revenues	8.81%	12.71%	15.78%	13.46%

*** Refer to working note 3**

(i) Comparison on the basis of operating income as per the percentage (%) of revenue:

(a) When support costs are allocated to product lines on the basis of cost of goods sold of each product

	Drug A (Rs.)	**Drug B (Rs.)**	**Drug C (Rs.)**	**Total (Rs.)**
Operating income as a % of revenues	22.12%	14.60%	9.32%	13.46%

On comparing the operating income as a % of revenue of each product, Drug A is the most profitable product line, though its revenue is least but with highest units sold.

(b) When support costs are allocated to product lines using an activity -based costing System

	Drug A (Rs.)	**Drug B (Rs.)**	**Drug C (Rs.)**	**Total (Rs.)**
Operating income as a % of revenues	8.81%	12.71%	15.78%	13.46%

On comparing the operating income as a % of revenue of each product, Drug C is the most profitable product line, though its unit sold is least but with highest revenue.

Important Note:-

This Numerical Question tested the knowledge of examinees on the topic Activity Based Costing. The first part of the question required apportionment of overheads cost on the basis of cost of goods sold ratio and to calculate income as percentage of revenue for three products. In the second part, allocation of overheads based on activity based cost drivers and to calculate income as percentage of revenue for three products. Finally choose the best product in both methods on the basis of income as percentage of revenue. Most of the students answered will in the second part of the question. Performance of the examinees was good.

Question 50

STATE what are the limitations of ABC?

(Study material)

Answer 50

LIMITATIONS OF ACTIVITY BASED COSTING

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The main limitations using Activity Based Costing are:

(i) It is more expensive, particularly in comparison with traditional costing system.

(ii) It is not helpful to the small organizations.

(iii) It may not be applied to organizations with limited products.

(iv) Selection of the most suitable cost driver may not be easy/ may be difficult or complicated.

Question 51

Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at Rs. 90 per case and sells to retail customers at a list price of Rs. 108 per case. The data pertaining to five customers are:

	Customers				
	A	**B**	**C**	**D**	**E**
Cases sold	**4,680**	**19,688**	**1,36,800**	**71,550**	**8,775**
Listed Selling Price	**Rs. 108**	**Rs.108**	**Rs. 108**	**Rs.108**	**Rs. 108**
Actual Selling Price	**Rs.108**	**Rs.106.20**	**Rs. 99**	**Rs. 104.40**	**Rs. 97.20**
Number of Purchase orders	**15**	**25**	**30**	**25**	**30**
Number of Customer visits	**2**	**3**	**6**	**2**	**3**
Number of deliveries	**10**	**30**	**60**	**40**	**20**

Kilometres travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

Its five activities and their cost drivers are:

Activity	Cost Driver Rate
Order taking	Rs. 750 per purchase order
Customer visits	Rs. 600 per customer visit
Deliveries	Rs. 5.75 per delivery Km travelled
Product handling	Rs. 3.75 per case sold
Expedited deliveries	Rs. 2,250 per expedited delivery

Required:

(i) COMPUTE the customer-level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.

(ii) STATE what insights are gained by reporting both the list selling price and the actual selling price for each customer.

(Study material)

Answer 51

Working note:

Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

	Customers				
	A	**B**	**C**	**D**	**E**
Cases sold: (a)	4,680	19,688	1,36,800	71,550	8,775
Revenues (at listed price) (Rs.): (b) {(a) × Rs. 108)}	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Discount ( ): (c) Rs. {(a) × Discount per case}	-	35,438(19,688 cases × Rs. 1.80)	12,31,200(1,36,800 cases × Rs.9)	2,57,580(71,550 cases × Rs. 3.60)	94,770(8,775 cases × Rs. 10.80)
Cost of goods sold (Rs.) : (d) {(a) × Rs. 90}	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Customer level operating activities costs					
Order taking costs (Rs.): (No. of purchase × Rs.750)	11,250	18,750	22,500	18,750	22,500
Customer visits costs (Rs.) (No. of customer visits × Rs. 600)	1,200	1,800	3,600	1,200	1,800

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Delivery vehicles travel costs (Rs.) (Rs.5.75 per km) (Kms travelled by delivery vehicles × Rs. 5.75 per km.)	1,150 (5.75 x 10x20)	1,035 (5.75 x 30 x 6)	1,725 (5.75 x 60x 5)	2,300 (5.75 x 40 x 10)	3,450 (5.75 x 20 x 30)
Product handling costs (Rs.) {(a) × Rs. 3.75}	17,550	73,830	5,13,000	2,68,313	32,906
Cost of expediting deliveries (Rs.) {No. of expedited deliveries × Rs.2,250}	-	-	-	-	2,250
Total cost of customer level operating activities (Rs.)	31,150	95,415	5,40,825	2,90,563	62,906

(i) Computation of Customer level operating income

	Customers				
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**
Revenues (At list price) (Refer to working note)	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700

Less: Discount (Refer to working note)	-	35,438	12,31,200	2,57,580	94,770
Revenue (At actual price)	5,05,440	20,90,866	1,35,43,200	74,69,820	8,52,930
Less: Cost of goods sold (Refer to working note)	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Gross margin	84,240	3,18,946	12,31,200	10,30,320	63,180
Less: Customer level operating activities costs (Refer to working note)	31,150	95,415	5,40,825	2,90,563	62,906
Customer level operating income	53,090	2,23,531	6,90,375	7,39,757	274

Comment on the results:

Customer D is the most profitable customer. D's profits are even higher than C (whose revenue is the highest) despite having only 52.30% of the unit volume of customer C. The main reason is that C receives a discount of Rs. 9 per case while customer D receives only a Rs.3.60 discount per case.

Customer E is the least profitable. The profits of E is even less than A (whose revenue is least) Customer E received a discount of Rs. 10.80 per case, makes more frequent orders, requires more customer visits and requires more delivery kms. in comparison with customer A.

(ii) Insight gained by reporting both the list selling price and the actual selling price for each customer:

Separate reporting of both-the listed and actual selling prices enables Alpha Ltd. to examine which customer has received what discount per case, whether the discount received has any relationship with the sales volume. The data given below provides us with the following information;

Sales volume	Discount per case (Rs.)
C (1,36,800 cases)	9.00
D (71,550 cases)	3.60
B (19,688 cases)	1.80
E (8,775 cases)	10.80
A (4,680 cases)	0

The above data clearly shows that the discount given to customers per case has a direct relationship with sales volume, except in the case of customer E. The reasons for Rs. 10.80 discount per case for customer E should be explored.

Question 52

The sales department of A Limited is analyzing the customer profitability for its Product Z. It has decided to analyse the profitability of its five new customers using activity-based costing method. It buys Product Z at Rs. 5,400 per unit and sells to retail customers at a listed price of Rs. 6,480 per unit. The data pertaining to five customers are:

	Customers

	A	B	C	D	E
Units sold	4,500	6,000	9,500	7,500	12,750
Listed Selling Price	Rs.6,480	Rs.6,480	Rs.6,480	Rs.6,480	Rs.6,480
Actual Selling Price	Rs.6,480	Rs.6,372	Rs.5,940	Rs.6,264	Rs.5,832
Number of Purchase orders	15	25	30	25	30
Number of Customer visits	2	3	6	2	3
Number of deliveries	10	30	60	40	20
Kilometers travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

After a detailed analysis and computation, the following activities has been identified and respective cost has been calculated:

Activity	Cost Driver Rate
Order taking	**Rs.4,500 per purchase order**
Customer visits	**Rs.3,600 per customer visit**
Deliveries	**Rs. 7.50 per delivery Km travelled**
Product handling	**Rs. 22.50 per case sold**
Expedited deliveries	**Rs. 13,500 per expedited delivery**

You have been assigned the following task of computing different cost information for managerial decision making:

(Study material)

(i) How much cost on customer visit is incurred on customer E?

(a) Rs. 7,200

(b) Rs. 10,800

(c) Rs. 21,600

(d) Rs. 3,600

Ans. (b) Rs. 10,800

(ii) What is the cost of goods sold for customer D?

(a) Rs. 2, 43, 00,000

(b) Rs. 3, 24, 00,000

(c) Rs. 5, 13, 00,000

(d) Rs. 4, 05, 00,000

Ans. (d) Rs. 4, 05, 00,000

(iii) How much is the cost of expediting delivery for customer A?

(a) Rs. 13,500

(b) Rs. 27,000

(c) Rs. 40,500

(d) Rs. 0

Ans. (d) Rs. 0

(iv) Compute the customer-level operating income of each of customers A.

(a) Rs. 55, 72,350

(b) Rs. 46, 82,550

(c) Rs. 47, 57,400

(d) Rs. 50, 57,325

Ans. (b) Rs. 46, 82,550

(v) Compute the customer-level operating income of each of five retail customers D and E.

(a) Rs. 46, 82,550 & 50, 65,720

(b) Rs. 55, 72,350 & 46, 85,500

(c) Rs. 47, 57,400 & 55, 72,350

(d) Rs. 61, 88,550 & 50, 57,325

Ans. (d) Rs. 61, 88,550 & 50, 57,325

Working note:

1. Computation of revenues (at listed price), discount, and cost of goods sold and customer level operating activities costs:

	Customers				
	A	**B**	**C**	**D**	**E**
Units sold: (a)	4,500	6,000	9,500	7,500	12,750
Revenues (at listed price) (Rs.): (b) {(a) × Rs. 6,480)}	2,91,60,000	3,88,80,000	6,15,60,000	4,86,00,000	8,26,20,000
Revenues (at listed price) (Rs.): (c) {(a) ×Actual selling price)}	2,91,60,000 (4,500 × 6,480)	3,82,32,000 (6,000 × 6,372)	5,64,30,000 (9,500 × 5,940)	4,69,80,000 (7,500 × 6,264)	7,43,58,000 (12,750 × 5,832)
Discount (Rs.) (d) {(b) – (c)}	0	6,48,000	51,30,000	16,20,000	82,62,000
Cost of goods sold (Rs.) : (e)	2,43,00,000	3,24,00,000	5,13,00,000	4,05,00,000	6,88,50,000

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{(a) x Rs.5,400}					
Customer level operating activities costs					
Order taking costs (Rs.): (No. of purchase orders × Rs. 4,500)	67,500	1,12,500	1,35,000	1,12,500	1,35,000
Customer visits costs (Rs.) (No. of customer visits x Rs. 3,600)	7,200	10,800	21,600	7,200	10,800
Delivery vehicles travel costs (Rs.) (Kms travelled by delivery vehicles x Rs. 7.50 per km.)	1,500	1,350	2,250	3,000	4,500
Product handling costs (Rs.) {(a) x Rs. 22.50}	1,01,250	1,35,000	2,13,750	1,68,750	2,86,875
Cost of expediting deliveries (Rs.)	-	-	-	-	13,500

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{No. of expedited deliveries x Rs.13,500}					
Total cost of customer level operating activities (Rs.)	1,77,450	2,59,650	3,72,600	2,91,450	4,50,675

Computation of Customer level operating income

	Customers				
	A	**B**	**C**	**D**	**E**
	(Rs.)	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**
Revenues (At list price) (Refer to working note)	2,91,60,000	3,82,32,000	5,64,30,000	4,69,80,000	7,43,58,000
Less: Cost of goods sold (Refer to working note)	(2,43,00,000)	(3,24,00,000)	(5,13,00,000)	(4,05,00,000)	(6,88,50,000)
Gross margin	48,60,000	58,32,000	51,30,000	64,80,000	55,08,000
Less: Customer level operating activities costs	(1,77,450)	(2,59,650)	(3,72,600)	(2,91,450)	(4,50,675)

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(Refer to working note)					
Customer level operating income	46,82,550	55,72,350	47,57,400	61,88,550	50,57,325

Question 53

The HomeMart is the latest trending brand offering home improvement appliances with broadest selection of products with highly competitive prices. The sale is increasing year by year with huge multiples. Current year also the sales reached triple the last year. The reason being company having good customer support where it provides after sales assistance over phone per item sold. Though it costs only Re. 1 per item sold to the company, it enhanced to Rs. 49, 15,200 last year making a huge impact on the total support cost.

All the company's appliances have been majorly categorised into three product lines namely Fancy fans, Home decors, Assembled furniture. During the current year, the company's revenue as generated is Rs. 3, 80, 88,000, Rs. 10, 08, 28,800 and Rs. 5, 80, 75,200 respectively. However, the cost of god sold is Rs. 2, 88, 00,000, Rs. 7, 20, 00,000 and Rs. 4, 32, 00,000 respectively.

In business, there's a saying "The packaging sells the product the first time, but what's inside sells the product a second time". Following the saying, the company has the policy of taking back the cartons of the products sold relating to Fancy fans to reduce the packaging cost. However, for smooth returning of cartons, the company has to incur certain carrier cost on its own which is Rs. 5, 76,000 for the current year and allocating the same directly to the said product.

Some other information relating to each of the product lines is provided below:

	Fancy fans	**Home decors**	**Assembled furniture**

Items sold	**12,09,600**	**1,05,98,400**	**29,37,600**
Number of deliveries received	**600**	**4,380**	**1,320**
Number of purchase orders placed	**720**	**1,680**	**720**
Hours of shelf-stocking time	**1,080**	**10,800**	**5,400**

The company also provides the following basis of cost allocation:

Activity	Description of activity	Total Cost	Cost-allocation base
Delivery	**Physical delivery and receipt of products**	**1,20,96,000**	**6,300 deliveries**
Ordering	**Placing of orders for purchases**	**74,88,000**	**3,120 purchase orders**
Shelf stocking	**Stocking of products in warehouse**	**82,94,400**	**17,280 hours of shelf-stocking time**

The company wants you to FIGURE OUT the following to ascertain which of the product line is more profitable:

(RTP May 2025)

i. The total support cost and its percentage to the cost of goods sold would be:

(a) Rs. 3, 33, 69,600 and 23.17%

(b) Rs. 4, 32, 00,000 and 30%

(c) Rs. 3, 33, 69,600 and 30%

(d) Rs. 4, 32, 00,000 and 23.17%

Ans: (b) Rs. 4, 32, 00,000 and 30%

Total support cost	**(Rs.)**
Cartons returned	5,76,000
Delivery	1,20,96,000
Ordering	74,88,000
Shelf stocking	82,94,400
Customer support (Rs. 49,15,200 x 3)	1,47,45,600
Total support cost	4,32,00,000
	(Rs.)
Fancy fans	2,88,00,000
Home decors	7,20,00,000
Assembled furniture	4,32,00,000
Total cost of goods sold (COGS)	14,40,00,000

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Percentage of support cost to the cost of goods sold (COGS):

$$= \frac{\text{Total Support Cost}}{\text{Total Cost of Goods Sold}} \times 100$$

$$= \frac{4,32,00,000}{14,40,00,000} \times 100 = 30\%$$

ii. Operating income as a percentage of revenues of each product line, namely Fancy fans, Home decors, Assembled furniture, when all the support costs are allocated on the basis of cost of goods sold would be:

A. 6.87%, 12.05% and 8.38% respectively

B. 12.05%, 6.87% and 8.38% respectively

C. 1.70%, 7.17% and 3.30% respectively

D. 7.17%, 3.30% and 1.70% respectively

Ans: (**C**)1.70%, 7.17% and 3.30% respectively

Particulars	**Fancy Fans (Rs.)**	**Home decors (Rs.)**	**Assembled furniture (Rs.)**
Revenue: (A)	3,80,88,000	10,08,28,800	5,80,75,200
Cost of Goods sold (COGS): (B)	2,88,00,000	7,20,00,000	4,32,00,000
Support cost (30% of COGS): (C) (as calculated in i. above)	86,40,000	2,16,00,000	1,29,60,000
Total cost: (D) = {(B) + (C)}	3,74,40,000	9,36,00,000	5,61,60,000

Operating income: E= {(A)-(D)}	6,48,000	72,28,800	19,15,200
Operating income as a percentage of revenues: (E/A) × 100)	1.70%	7.17%	3.30%

iii. The cost driver rate relating to Delivery, Ordering, Shelf stocking and Customer support would be:

(a) Delivery- Rs. 1,920 per delivery, Ordering- Rs. 2,400 per purchase order, Shelf stocking- Rs. 480 per stocking hour and Customer support- Re. 1 per item sold

(b) Delivery- Rs. 2,400 per delivery, Ordering- Rs. 1,920 per purchase order, Shelf stocking- Rs. 480 per stocking hour and Customer support- Re. 1 per item sold

(c) Delivery- Rs. 1,920 per delivery, Ordering- Rs. 2,400 per purchase order, Shelf stocking- Rs. 480 per stocking hour and Customer support- Rs. 3 per item sold

(d) Delivery- Rs. 480 per delivery, Ordering- Rs. 2,400 per purchase order, Shelf stocking- Rs.1, 920 per stocking hour and Customer support- Rs. 3 per item sold

Ans: (a) Delivery- Rs. 1,920 per delivery, Ordering- Rs. 2,400 per purchase order, Shelf stocking- Rs. 480 per stocking hour and Customer support- Re. 1 per item sold

Activity (1)	**Total cost (Rs.) (2)**	**Cost allocation base (3)**	**Cost driver rate (4) = [(2) ÷ (3)]**
Delivery	1,20,96,000	6,300 deliveries	Rs. 1,920 per delivery

Ordering	74,88,000	3,120 purchase orders	Rs. 2,400 per purchase order
Shelf-stocking	82,94,400	17,280 hours of shelf-stocking time	Rs. 480 per stocking hour
Customer support	1,47,45,600	1,47,45,600 items sold	Re. 1 per item sold (given)

iv. Operating income of each product line, namely Fancy fans, Home decors, Assembled furniture, when all the support costs are allocated using an activity-based costing system would be:

(a) Rs. 16,84,800, Rs. -2,05,92,000 and Rs. -7,92,000 respectively

(b) Rs. 3,64,03,200, Rs. 12,14,20,800 and Rs. 5,88,67,200 respectively

(c) Rs. 92,88,000, Rs. 2,88,28,800 and Rs. 1,48,75,200 respectively

(d) Rs. 41, 04,000, Rs. 6, 04,800 and Rs. 50, 83,200 respectively

Ans: (d) Rs. 41, 04,000, Rs. 6, 04,800 and Rs. 50, 83,200 respectively

	Fancy Fans (Rs.)	**Home decors (Rs.)**	**Assembled furniture (Rs.)**
Revenues: (A)	3,80,88,000	10,08,28,800	5,80,75,200
Cost & Goods sold	2,88,00,000	7,20,00,000	4,32,00,000

Carton return costs (Directly attributable to Fancy fans)	5,76,000	0	0
Delivery cost (Rs. 1,920 per delivery)	11,52,000 (600 x Rs. 1,920)	84,09,600 (4,380 x Rs. 1,920)	25,34,400 (1,320 x Rs. 1,920)
Ordering cost (Rs. 2,400 per purchase order)	17,28,000 (720 x Rs. 2,400)	40,32,000 (1,680 x Rs. 2,400)	17,28,000 (720 x Rs. 2,400)
Shelf stocking cost (Rs. 480 per stocking hour)	5,18,400(1,080 x Rs. 480)	51,84,000(10,800 x Rs. 480)	25,92,000(5,400 x Rs. 480)
Customer Support cost (Rs. 1 per item sold)	12,09,600(12,09,600 x Rs. 1)	1,05,98,400(1,05,98,400 x Rs. 1)	29,37,600 (29,37,600 x Rs. 1)
Total Cost: (B)	3,39,84,000	10,02,24,000	5,29,92,000
Operating income: (C) = (A) - (B)	41,04,000	6,04,800	50,83,200

v. Operating income as a percentage of revenues of each product line, namely Fancy fans, Home decors, Assembled furniture, when all the support costs are allocated using an activity-based costing system would be:

(a) 4.42%, -20.42% and -1.36% respectively

(b) 10.78%, 0.60% and 8.75% respectively

(c) 24.39%, 28.59% and 25.61% respectively

(d) 4.39%, 8.59% and -1.36% respectively

Ans: (b) 10.78%, 0.60% and 8.75% respectively

	Fancy Fans (Rs.)	**Home decors (Rs.)**	**Assembled furniture (Rs.)**
Operating income (from iv. Above) (A)	41,04,000	6,04,800	50,83,200
Revenues (B)	3,80,88,000	10,08,28,800	5,80,75,200
Operating income as a percentage of revenues: (A/B) × 100)	10.78%	0.60%	8.75%

Topic 8 Implementation Requirements of ABC

Question 54

RVP Cinema provides the following data for the year 2020-21:

Particulars	**Premium Hall (Rs.)**	**Recliner Hall (Rs.)**	**7D Hall (Rs.)**	**Cafeteria (Rs.)**
Revenue	**11,55,000**	**18,75,000**	**9,30,000**	**5,25,000**
Cost of Goods sold	-	-	-	**4,51,125**

Digital media cost	6,19,800	9,46,875	4,02,900	-
Number of Credit Card transactions	75,000	90,000	60,000	45,000
Number of Tests	12,000	18,000	15,000	7,500
Number of Setups	225	450	150	75
Area in Square feet	3,000	4,500	2,250	750
Number of Customer contacts	2,62,500	3,00,000	1,50,000	37,500
Number of Customer online orders	2,10,000	2,47,500	1,20,000	22,500

Cost analysis has revealed the following:

Activity	Activity Cost (Rs.)	Activity Driver	Activity Capacity
Marketing Expenses	2,25,000	Number of Customer contacts	7,50,000
Website Maintenance Expenses	1,50,000	Number of Customer online orders	6,00,000
Credit Card Processing Fees	1,35,000	Number of Credit Card transactions	2,70,000
Cleaning Equipment Cost	3,15,000	Number of square feet	10,500

Inspecting and testing costs	**2,62,500**	**Number of tests**	**52,500**
Setting up machine's costs	**4,50,000**	**Number of set-ups**	**900**

Required:

(i) If RVP Cinema allocates all costs (other than Cost of Goods sold and Digital Media costs) to the departments on the basis of Activity Based Costing system, CALCULATE the operating income and percentage of operating income of each department.

(ii) RVP Cinema operated for years under the assumption that profitability can be increased by increasing net revenue from Cafeteria. However, the Supervisor of RVP Cinema wants to shut down Cafeteria. On the basis of (i) above, STATE whether the contention of the Supervisor is valid or not.

(MTP Apr.'2021)

Answer 54

Computation showing Rates for each Activity

Activity	**Activity Cost(Rs.) (A)**	**Activity driver**	**Activity Capacity (B)**	**Activity Rate (A/B)**
Marketing Expenses	2,25,000	Number of Customer Contacts	7,50,000	0.30
Website Maintenance Expenses	1,50,000	Number of Customer Online orders	6,00,000	0.25
Credit Card Processing Fees	1,35,000	Number of Credit card transactions	2,70,000	0.50

Cleaning Equipment Cost	3,15,000	Number of Square Feet	10,500	30.00
Inspecting and Testing Cost	2,62,500	Number of Tests	52,500	5.00
Setting up machine's cost	4,50,000	Number of set-ups	900	500.00

Activity based Cost for each Department

Activity	Premium Hall (Rs.)	Recliner Hall (Rs.)	7D Hall (Rs.)	Cafeteria (Rs.)
Marketing Expenses	78,750	90,000	45,000	11,250
	(2,62,500 x 0.3)	(3,00,000 x 0.3)	(1,50,000 x 0.3)	(37,500 x 0.3)
Website Maintenance Expenses	52,500	61,875	30,000	5,625
	(2,10,000 x 0.25)	(2,47,500 x 0.25)	(1,20,000 x 0.25)	(22,500 x 0.25)
Credit Card Processing Fees	37,500	45,000	30,000	22,500
	(75,000 x 0.5)	(90,000 x 0.5)	(60,000 x 0.5)	(45,000 x 0.5)
Cleaning Equipment Cost	90,000	1,35,000	67,500	22,500
	(3,000 x 30)	(4,500 x 30)	(2,250 x 30)	(750 x 30)
Inspecting and	60,000	90,000	75,000	37,500

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Testing Cost	(12,000 x 5)	(18,000 x 5)	(15,000 x 5)	(7,500 x 5)
Setting up machine's cost	1,12,500	2,25,000	75,000	37,500
	(225 x 500)	(450 x 500)	(150 x 500)	(75 x 500)
Total	4,31,250	6,46,875	3,22,500	1,36,875

(i) Statement of Operating Income and Operating Income percentage for each Department

Particulars	**Premium Hall (Rs.)**	**Recliner Hall (Rs.)**	**7D Hall (Rs.)**	**Cafeteria (Rs.)**
Revenues (Given) (A)	11,55,000	18,75,000	9,30,000	5,25,000
Cost of Goods Sold (given) (B1)	-	-	-	4,51,125
Digital Media Cost (given) (B2)	6,19,800	9,46,875	4,02,900	-
Activity Based Cost (as per Workings) (B3)	4,31,250	6,46,875	3,22,500	1,36,875
Operating Cost (B) (B1+ B2 + B3)	10,51,050	15,93,750	7,25,400	5,88,000
Operating Income/(Loss) (C = A – B)	1,03,950	2,81,250	2,04,600	(63,000)
Percentage of profit/(loss) on sales	9%	15%	22%	(12%)

(ii) Contention of Supervisor is valid as operating income of Cafeteria is negative i.e. (Rs. 63,000) or percentage of profit/loss is (12%).

Question 55

L Limited manufactures three products P, Q and R which are similar in nature and are usually produced in production runs of 100 units. Product P and R require both machine hours and assembly hours, whereas product Q requires only machine hours. The overheads incurred by the company during the first quarter are as under:

	Rs.
Machine Department expenses	18,48,000
Assembly Department expenses	6,72,000
Setup costs	90,000
Stores receiving cost	1,20,000
Order processing and dispatch	1,80,000
Inspect and Quality control cost	36,000

The data related to the three products during the period are as under:

	P	Q	R
Units produced and sold	15,000	12,000	18,000
Machine hours worked	30,000 hrs.	48,000 hrs.	54,000 hrs.
Assembly hours worked (direct labour hours)	15,000 hrs.	-	27,000 hrs.

Customers' orders executed (in numbers)	**1,250**	**1,000**	**1,500**
Number of requisitions raised on the stores	**40**	**30**	**50**

Prepare a statement showing details of overhead costs allocated to each product type using activity-based costing.

(RTP Nov '23)

Answer 55

Calculation of "Activity Rate"

Cost Pool	Cost (Rs.) [A]	Cost Driver [B]	Cost Driver Rate (Rs.) [C] = [A]÷[B]
Machine Department Expenses	18,48,000	Machine Hours (1, 32,000 hrs.)	14.00
Assembly Department Expenses	6,72,000	Assembly Hours (42,000 hrs.)	16.00
Setup Cost	90,000	No. of Production Runs (450*)	200.00
Stores Receiving Cost	1,20,000	No. of Requisitions Raised on the Stores (120)	1,000.00
Order Processing and Dispatch	1,80,000	No. of Customers Orders Executed (3,750)	48.00

Inspection and Quality Control Cost	36,000	No. of Production Runs (450*)	80.00
Total (Rs.)	**29,46,000**		

*Number of Production Run is 450 (150 + 120 + 180)

Statement Showing "Overheads Allocation"

Particulars of Cost	Cost Driver	P	Q	R	Total
Machine Department Expenses	Machine Hours	4,20,000 (30,000 × Rs.14)	6,72,000 (48,000 × Rs.14)	7,56,000 (54,000 × Rs.14)	18,48,000
Assembly Department Expenses	Assembly Hours	2,40,000 (15,000 × Rs.16)	---	4,32,000 (27,000 × Rs.16)	6,72,000
Setup Cost	No. of Production Runs	30,000 (150 × Rs.200)	24,000 (120 × Rs.200)	36,000 (180 × Rs.200)	90,000
Stores Receiving Cost	No. of Requisitions Raised on the Stores	40,000 (40 ×Rs.1,000)	30,000 (30 × Rs.1,000)	50,000 (50 × Rs.1,000)	1,20,000
Order Processing and Dispatch	No. of Customers Orders Executed	60,000 (1,250 × Rs.48)	48,000 (1,000 × Rs.48)	72,000 (1,500 × Rs.48)	1,80,000

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Inspection and Quality Control Cost	No. of Production Runs	12,000 (150 × Rs.80)	9,600 (120 × Rs.80)	14,400 (180 × Rs.80)	36,000
Overhead (Rs.)		8,02,000	7,83,600	13,60,400	29,46,000

Question 56

DEFINE the following terms:

(i) Cost driver

(ii) Activity cost pool

(Study material)

Answer 56

(i) Activity: Activity, here, refers to an event that incurs cost.

(ii) Cost Object: It is an item for which cost measurement is required e.g. a product or a customer.

(iii) Cost Driver: It is a factor that causes a change in the cost of an activity. There are two categories of cost driver.

• **Resource Cost Driver:** It is a measure of the quantity of resources consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool.

• **Activity Cost Driver:** It is a measure of the frequency and intensity of demand, placed on activities by cost objects. It is used to assign activity costs to cost objects.

(iv) Cost Pool: It represents a group of various individual cost items. It consists of costs that have same cause and effect relationship. Example machine set-up.

Examples of Cost Drivers:

Business Functions	Cost Driver
Research and Development	• Number of research projects • Personnel hours on a project
Design of products, services and procedures	• Number of products in design • Number of parts per product • Number of engineering hours
Customer Service	• Number of service calls • Number of products serviced • Hours spent on servicing products
Marketing	• Number of advertisements • Number of sales personnel • Sales revenue
Distribution	• Number of units distributed • Number of customers

Question 57

A manufacturing company in India wants to replace its traditional costing system by ABC. It produces a number of products, each having complex production process of different degree. SUGGEST various requirements for installing activity based costing.

Answer 57

REQUIREMENTS IN ABC IMPLEMENTATION

A number of distinct practical stages are required in the ABC implementation which are given as below:

(1) Staff Training: The co-operation of the workforce is critical to the successful implementation of ABC. Staff training should be done to create an awareness on the purpose of ABC.

(2) Process Specification: Informal, but structured interviews with key members of personnel will identify the different stages of the production process, the commitment of resources to each, processing times and bottlenecks.

(3) Activity Definition: The activities must be defined clearly in the early stage in order to manage the problems, if any, effectively. There might be overloading of information from the new data, but the same is needed in codification.

(4) Activity Driver Selection: Cost driver for each activity shall be selected.

(5) Assigning Cost: A single representative activity driver can be used to assign costs from the activity pools to the cost objects.

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Question 58

XYZ Constructions is a leading engineering and construction company providing a range of infrastructure and industrial services. Recently, they have been asked to quote for residential building construction (RBC) and industrial plant construction (IPC) projects. However, they are winning fewer RBC contracts than expected.

XYZ Constructions has a policy to price all jobs at budgeted total cost plus 50%. Overheads are currently absorbed on a labour-hour basis. The company believes that switching to

activity-based costing (ABC) to absorb overheads would reduce the costs associated with RBC and make them more competitive.

You are provided with the following data:

Overhead category	Annual Overhead (Rs. Lakhs)	Activity driver	Total number of activities per year
Supervisors	Rs.120	Site visits	600
Project Planners	Rs. 80	Planning documents	300
Property related	Rs.400	Labour hours	50,000
Total	Rs.600		

For a typical RBC: Material cost: Rs. 5 lakhs, Labour hours: 1,200 hours, Site visits: 2 visits, Planning documents: 2 documents

For a typical IPC: Material cost: Rs. 12 lakhs, Labour hours: 2,500 hours, Site visits: 10 visits, Planning documents: 8 documents

Labour is paid at Rs. 100 per hour.

Required:

(a) CALCULATE the cost and quoted price of an RBC and an IPC using labour hours to absorb the overheads.

(b) CALCULATE the cost and quoted price of an RBC and an IPC using ABC to absorb the overheads.

(c) Assuming that the cost of an RBC falls by nearly 7% and the price of an IPC rises by about 2% as a result of the change to ABC, SUGGEST possible pricing strategies for the two services

offered by XYZ Constructions. Additionally, suggest two reasons other than high prices for the current poor sales of RBC.

(MTP Jan 2025)

Answer 58

(a) Cost and Quoted Price Using Labour Hours to Absorb Overheads

		RBC (Rs. in lakhs)	IPC (Rs. in lakhs)
Materials		5.00	12.00
Labour	1200 x Rs. 100; 2500 x Rs. 100	1.20	2.50
Overheads	1200 x Rs. 1200; 2500 x Rs. 1200	14.40	30.00
Total cost		20.60	44.50
Add: Profit	50% of Total Cost	10.30	22.25
Quoted Price		30.90	66.75

(b) Cost and Quoted Price Using ABC

Step 1: Calculate Overhead Rates for Each Activity

Overhead Category	Total Overhead (Rs. Lakhs)	Activity Driver	Activity Rate

Site Engineers	Rs. 120	Site Visits	Rs. 120 / 600 = Rs. 20,000 per site visit
Project Planners	Rs. 80	Planning Documents	Rs. 80 / 300 = Rs. 26,667 per planning document
Equipment Depreciation	Rs. 400	Labour Hours	Rs. 400 / 50,000 = Rs. 800 per labour hour

Step 2: Allocate Overheads Using ABC

		RBC (in lakhs)	**IPC (in lakhs)**
Materials		5.00	12.00
Labour	1200xRs.100; 2500 x Rs.100	1.20	2.50
Overheads			
Site Engineers	2 x Rs. 20,000; 10 x Rs. 20,000	0.40	2.00
Project Planners	2 x Rs. 26,667; 8 x Rs. 26,667	0.53	2.13
Equipment Depreciation	1200 x Rs. 800; 2500 x Rs. 800	9.60	20.00
Total cost		16.73	38.63

Add: Profit	50% of Total Cost	8.37	19.32
Quoted Price		25.10	57.95

(c) Possible pricing strategies for the two services offered by XYZ Constructions

- The pricing policy is a matter for XYZ Constructions to decide. They could elect to maintain the current 50% mark-up on cost and if they did the price of the RBC would fall by around 7% in line with the costs. This should make them more competitive in the market.
- They could also reduce the prices by a little less than 7% (say 5%) in order to increase internal margins a little.

Reasons other than high prices for the current poor sales of RBC:

- If the quality of work or the reputation and reliability of the builder are questionable, lowering prices is unlikely to boost sales. While it is possible that XYZ Constructions has a strong reputation for IPC but not for RBC, it is more likely that a poor reputation would impact all their products. Poor service or inflexibility in meeting customer needs may also hurt sales and can't be fixed by lowering prices. ي Poor marketing strategies also discourage customers from selecting XYZ Constructions.
- XYZ Constructions faces competition and may need to adopt a more competitive pricing strategy, such as 'going rate pricing,' instead of simply adding a markup to costs.
- XYZ Constructions could enter the market by pricing some projects competitively to establish a foothold. Completed projects could then be leveraged to attract new customers.

Question 59

In activity based costing, costs are accumulated by activity using:

(a) Cost drivers

(b) Cost objects

(c) Cost pools

(d) Cost benefit analysis

(Study material)

Ans: (c) Cost pools

Reason:

In activity-based costing, costs are accumulated by activity into cost pools, which are then allocated to cost objects based on their usage of the activities. Cost drivers are used to assign these costs from the pools to the products or services.

Question 60

Steps in ABC include:

(a) Identification of activities and their respective costs

(b) Identification of cost driver of each activity and computation of an allocation rate per activity

(c) Allocation of overhead cost to products/ services based on the activities involved

(d) All of the above

(Study material)

Ans: (d) All of the above

Reason:

Activity-Based Costing (ABC) is a method used to allocate overhead costs to products and services based on the activities that generate those costs. The steps involved in ABC include:

Identification of activities and their respective costs: This is the first step where the various activities that incur costs are identified. These could include production activities, maintenance, quality control, etc.

Identification of cost driver of each activity and computation of an allocation rate per activity: Once activities are identified, the next step is to determine the "cost driver" for each activity. A cost driver is a factor that causes the cost of an activity. For example, the number of machine hours might be the cost driver for machine maintenance activities. The allocation rate is then calculated based on the cost driver.

Allocation of overhead costs to products/services based on the activities involved: After identifying cost drivers and allocation rates, the overhead costs are allocated to products or services based on the activities they consume. For example, if a product requires more machine hours, it will be allocated a higher share of the machine maintenance cost.

Question 61

The steps involved for installation of ABC in a manufacturing company include the following except:

(a) Borrowing fund

(b) Feasibility study

(c) Building up necessary IT infrastructure and training of line employees

(d) Strategy and value chain analysis

(Study material)

Ans: (a) Borrowing fund

Reason:

The installation of Activity-Based Costing (ABC) in a manufacturing company primarily involves steps such as conducting a feasibility study, building up necessary IT infrastructure, training employees, and analyzing the strategy and value chain. These steps help in setting up an ABC system that can efficiently allocate costs based on activities. However, borrowing funds is not a direct step involved in implementing ABC. ABC is more about managing internal resources, processes, and activities, rather than external financing.

Question 62

A manufacturing company based in India is planning to transition from its traditional costing system to Activity-Based Costing (ABC) in order to improve cost accuracy and gain better insights into product profitability. Given the company's diverse product portfolio and the complexity of its production processes, the implementation of ABC is expected to provide a more precise allocation of overheads.

You are required to SUGGEST the key practical stages involved in successfully implementing an Activity-Based Costing system.

(RTP Sep. 2025)

Answer 62

A number of distinct practical stages that are required in the ABC implementation are given below:

(1) Staff Training: The co-operation of the workforce is critical to the successful implementation of ABC. Staff training should be done to create an awareness on the purpose of ABC.

(2) Process Specification: Informal, but structured interviews with key members of personnel will identify the different stages of the production process, the commitment of resources to each, processing times and bottlenecks.

(3) Activity Definition: The activities must be defined clearly in the early stage in order to manage the problems, if any, effectively. There might be overloading of information from the new data, but the same is needed in codification.

(4) Activity Driver Selection: Cost driver for each activity shall be selected.

(5) Assigning Cost: A single representative activity driver can be used to assign costs from the activity pools to the cost objects.

Topic 9 Challenges in Implementing ABC

Question 63

Explain 'Activity Based Budgeting'.

(PYP Nov '18)

Answer 63

Activity Based Budgeting (ABB)

• Activity based budgeting analyse the resource input or cost for each activity.

• It provides a framework for estimating the amount of resources required in accordance with the budgeted level of activity.

• Actual results can be compared with budgeted results to highlight both in financial and non-financial terms those activities with major discrepancies from budget for potential reduction in supply of resources.

• It is a planning and control system which seeks to support the objectives of continuous improvement.

• It means planning and controlling the expected activities of the organization to derive a cost- effective budget that meet forecast workload and agreed strategic goals.

• ABB is the reversing of the ABC process to produce financial plans and budgets.

Topic 10 Benchmarking & Performance Measurement

Question 64

M/s. HMB Limited is producing a product in 10 batches each of 15000 units in a year and incurring following overheads their on:

	Amount (Rs.)
Material procurement	22,50,000
Maintenance	17,30,000
Set-up	6,84,500
Quality control	5,14,800

The prime costs for the year amounted to Rs. 3, 01, 39,000.

The company is using currently the method of absorbing overheads on the basis of prime cost. Now it wants to shift to activity-based costing. Information relevant to Activity drivers for a year are as under:

Activity Driver	Activity Volume
No. of purchase orders	1500
Maintenance hours	9080
No. of set-ups	2250

No. of inspections	**2710**

The company has produced a batch of 15000 units and has incurred Rs. 26, 38,700 and Rs. 3, 75,200 on materials and wages respectively.

The usage of activities of the said batch are as follows:

Materials orders	**48 orders**
Maintenance hours	**810 hours**
No. of set-ups	**40**
No. of inspections	**5**
You are required to:	

(i) Find out cost of product per unit on absorption costing basis for the said batch.

(ii) Determine cost driver rate, total cost and cost per unit of output of the said batch on the basis of activity based costing.

(PYP Nov '18)

Answer 64

Working Note:

Overhead Absorption Rate = $\frac{51,79,300}{3,01,39,000}$ ×100 = 17.18%

(i) Cost of Product Under Absorption Costing

Item of Cost	Amount (Rs.)

Material	26,38,700
Wages	3,75,200
Prime Cost	30,13,900
Overheads $\frac{51,79,300}{3,01,39,000}$ ×30,13,900	5,17,930
Total Cost	35,31,830
Units	15,000
Cost per unit	235.46

(ii) Cost driver rate, total cost and cost per unit on the basis of activity-based costing method

Absorption Costing

Calculation of Cost Driver rate:

Activity	Rs.	Activity Volume	Cost Driver Rate
Material Procurement	22,50,000	1500	1500
Maintenance	17,30,000	9080	190.53
Setup	6,84,500	2250	304.22
Quality Control	5,14,800	2710	189.96

Calculation of total Cost and cost per unit:

Item of Cost	Amount (Rs.)
Material	26,38,700
Wages	3,75,200
Prime Cost	30,13,900
Material Purchase 22,50,000 / 1,500 × 48	72,000
Maintenance 17,30,000 / 9,080×810	1,54,328
Setup 6,84,500 / 2,250 × 40	12,169
Quality Control 5,14,800 / 2,710 × 25	4,749
Total Cost	32,57,146
Units	15,000
Cost per unit	217.14

Important Note:-

In this question, Part (i) was related to the calculation of cost per unit on absorption costing basis, in which most of the examinees did not understand the concept of calculation of absorption rate. Part (ii) is related to the Activity based costing and significant number of examinees answered in correct line and obtained 4 to 6 marks.

Question 65

Star Limited manufacture three products using the same production methods. A conventional product costing system is being used currently. Details of the three products for a typical period are:

Product	Labour Hrs. per unit	Machine Hrs. per unit	Materials per Unit1	Volume in Units
AX	1.00	2.00	35	7,500
BX	0.90	1.50	25	12,500
CX	1.50	2.50	45	25,000

Direct Labour costs Rs. 20 per hour and production overheads are absorbed on a machine hour basis. The overhead absorption rate for the period is Rs. 30 per machine hour.

1 Material cost per unit

Management is considering using Activity Based Costing system to ascertain the cost of the products.

Further analysis shows that the total production overheads can be divided as follows:

Particulars	%
Cost relating to set-ups	40
Cost relating to machinery	10
Cost relating to material handling	30
Costs relating to inspection	20

Total production overhead	**100**

The following activity volumes are associated with the product line for the period as a whole. Total activities for the period:

Product	No. of set-ups	No. of movements of Materials	No. of inspections
AX	**350**	**200**	**200**
BX	**450**	**280**	**400**
CX	**740**	**675**	**900**
Total	**1,540**	**1,155**	**1,500**

Required:

(i) Calculate the cost per unit for each product using the conventional method.

(ii) Calculate the cost per unit for each product using activity based costing method.

(PYP May'22)

Answer 65

I. Statement showing "Cost per unit" using "conventional method"

Particulars of Costs	**AX**	**BX**	**CX**
	(Rs.)	**(Rs.)**	**(Rs.)**
Direct Materials	35	25	45

Direct Labour	20	18	30
Production Overheads	60	45	75
Cost per unit	115	88	150

II. Statement Showing "Cost per unit using "Activity Based Costing"

Products	**AX**	**BX**	**CX**
Production (units)	7,500	12,500	25,000
	(Rs.)	**(Rs.)**	**(Rs.)**
Direct Materials	2,62,500	3,12,500	11,25,000
Direct Labour	1,50,000	2,25,000	7,50,000
Machine Related Costs	45,000	56,250	1,87,500

Products	**AX**	**BX**	**CX**
Setup Costs	2,62,500	3,37,500	5,55,000
Material handling Cost	1,50,000	2,10,000	5,06,250
Inspection Costs	77,000	1,54,000	3,46,500
Total Costs	9,47,000	12,95,250	34,70,250

Cost per unit (Total Cost ÷ Units)	126.267	103.62	138.81

Working Notes:

Calculation of Total Machine hours

Particulars	AX	BX	X
(A) Machine hours per unit	2	1.5	2.5
(B) Production (units)	7,500	12,500	25,000
(C) Total Machine hours (A× B)	15,000	18,750	62,500

Total Machine hours = 96,250

Total Production overheads = 96,250 × 30 = Rs. 28, 87,500

Calculation of Cost Driver Rate

Cost Pool	%	Overheads (Rs.)	Cost Driver (Basis)	Cost Driver (Units)	Cost Driver Rate (Rs.)
Set up	40	11,55,000	No of set ups	1,540	750 per set up
Machine Operation	10	2,88,750	Machine hours	96,250	3 per machine hour
Material Handling	30	8,66,250	No of material movement	1,155	750 per material movement
Inspection	20	5,77,500	No of inspection	1,500	385 per inspection

Topic 11 Suitability/Usefulness of ABC

Question 66

EXPLAIN the Usefulness/Suitability of ABC.

(MTP Jan 2025)

Answer 66

ABC is particularly needed by organisations for product costing in the following situations:

1. High amount of overhead: When production overheads are high and form significant costs, ABC is more useful than traditional costing system.

2. Wide range of products: ABC is most suitable, when, there is diversity in the product range or there are multiple products.

3. Presence of non-volume related activities: When non-volume related activities e.g. material handling, inspection set-up, are present significantly and traditional system cannot be applied, ABC is a superior and better option. ABC will identify non-value-adding activities in the production process that might be a suitable focus for attention or elimination.

4. Stiff competition: When the organisation is facing stiff competition and there is an urgent requirement to compute cost accurately and to fix the selling price according to the market situation, ABC is very useful. ABC can also facilitate in reducing cost by identifying non-value-adding activities in the production process that might be a suitable focus for attention or elimination.

Topic 12 Activity-Based Budgeting (ABB)

Question 67

DEFINE Activity based Budgeting. STATE what are its key elements?

(Study material)

Answer 67

Facilitate Activity Based Budgeting

Meaning of Activity Based Budgeting (ABB)

Activity based budgeting analyse the resource input or cost for each activity. It provides a framework for estimating the amount of resources required in accordance with the budgeted level of activity. Actual results can be compared with budgeted results to highlight both, in financial and non-financial terms, those activities with major discrepancies from budget for potential reduction in supply of resources. It is a planning and control system which seeks to support the objectives of continuous improvement. It means planning and controlling the expected activities of the organization to derive a cost-effective budget that meet forecast workload and agreed strategic goals. ABB is the reversing of the ABC process to produce financial plans and budgets.

Key Elements of ABB

The three key elements of activity based budgeting are as follows:-

- Type of work to be done
- Quantity of work to be done
- Cost of work to be done

Benefits of ABB

Few benefits of activity based budgeting are as follows:-

(i) Activity Based Budgeting (ABB) can enhance accuracy of financial forecasts and increasing management understanding.

(ii) When automated, ABB can rapidly and accurately produce financial plans and models based on varying levels of volume assumptions.

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(iii) ABB eliminates much of the needless rework created by traditional budgeting techniques.

Chapter 6

Cost Sheet

Topic 1 Functional Classification of Cost

Question 1

From the following data of A Ltd., Calculate

(i) Material Consumed; (ii) Prime Cost and (iii) Cost of production.

		Amount (Rs.)
(i)	Repair & maintenance paid for plant & machinery	9,80,500
(ii)	Insurance premium paid for inventories	26,000
(iii)	Insurance premium paid for plant & machinery	96,000
(iv)	Raw materials purchased	64,00,000
(v)	Opening stock of raw materials	2,88,000
(vi)	Closing stock of raw materials	4,46,000
(vii)	Wages paid	23,20,000
(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100

(x) Quality control cost for the products in manufacturing process	**86,000**
(xi)Research & development cost for improvement in production process	**92,600**
(xii) Administrative cost for:	
- Factory & production	**9,00,000**
- Others	**11,60,000**
(xiii) Amount realized by selling scrap generated during the manufacturing process	**9,200**
(xiv) Packing cost necessary to preserve the goods for further processing	**10,200**
(xv)Salary paid to Director (Technical)	**8,90,000**

(MTP Oct. '19, RTP May 20, Nov 18)

Answer 1

Calculation of Cost of Production of A Ltd. for the period.....

Particulars	Amount (Rs.)
Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)

Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for inventories	26,000
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,43,100
Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,47,000
Less: Amount realised by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,48,000

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Notes:

Other administrative overhead does not form part of cost of production.

Salary paid to Director (Technical) is an administrative cost.

Question 2

DESCRIBE how costs are classified on the basis of function.

(Study material)

Answer 2

FUNCTIONAL CLASSIFICATION OF ELEMENTS OF COST

Under this classification, costs are divided according to the function for which they have been incurred. The following are the classification of costs based on functions:

(i) Production/ Manufacturing Cost

(ii) Administration Cost

(iii) Selling Cost

(iv) Distribution Cost

(v) Research and Development costs etc.

Topic 2 Elements of Cost & Conversion Cost

Question 3

From the following figures, calculate cost of production and profit for the month of March 20X9.

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	Amount (Rs.)		Amount (Rs.)
Stockon1st March, 20X9		**Purchase of raw materials**	**28,57,000**
- Raw materials	**6,06,000**	**Sale of finished goods**	**1,34,00,000**
- Finished goods	**3,59,000**	**Direct wages**	**37,50,000**
Stock on 31st March, 20X9		**Factory expenses**	**21,25,000**
- Raw materials	**7,50,000**	**Office and administration expenses**	**10,34,000**
- Finished goods	**3,09,000**	**Selling and distribution expenses**	**7,50,000**
Work-in-process:		**Sale of scrap**	**26,000**
- On 1st March, 20X9	**12,56,000**		
- On 31st March, 20X9	**14,22,000**		

(MTP March '19, RTP May'18)

Answer 3

Calculation of Cost of Production and Profit for the month ended March, 20X9:

Particulars	Amount (Rs.)	Amount (Rs.)

Materials consumed:		
- Opening stock	6,06,000	
- Add: Purchases	28,57,000	
	34,63,000	
- Less: Closing stock	(7,50,000)	27,13,000
Direct wages		37,50,000
Prime cost		64,63,000
Factory expenses		21,25,000
		85,88,000
Add: Opening W-I-P		12,56,000
Less: Closing W-I-P		(14,22,000)
Factory cost		84,22,000
Less: Sale of scrap		(26,000)
Cost of Production		83,96,000
Add: Opening stock of finished goods		3,59,000
Less: Closing stock of finished goods		(3,09,000)

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Cost of Goods Sold		84,46,000
Office and administration expenses		10,34,000
Selling and distribution expenses		7,50,000
Cost of Sales		1,02,30,000
Profit (balancing figure)		**31,70,000**
Sales		1,34,00,000

Question 4

Following figures has been extracted from the books of M/s A&R Brothers:

	Amount (Rs.)
Stock on 1st March, 2020	
- Raw materials	**6,06,000**
- Finished goods	**3,59,000**
Stock on 31st March, 2020	
- Raw materials	**7,50,000**
- Finished goods	**3,09,000**

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Work-in-process:	
- On 1st March, 2020	**12,56,000**
- On 31st March, 2020	**14,22,000**
Purchase of raw materials	**28,57,000**
Sale of finished goods	**1,34,00,000**
Direct wages	**37,50,000**
Factory expenses	**21,25,000**
Office and administration expenses	**10,34,000**
Selling and distribution expenses	**7,50,000**
Sale of scrap	**26,000**

You are required to COMPUTE:

(i) Value of material consumed

(ii) Prime cost

(iii) Cost of production

(iv) Cost of goods sold

(v) Cost of sales

(vi) Profit/ loss

(MTP May 20 & Oct '23)

Answer 4

Cost Sheet of M/s A&R Brothers for the month ended March 2020:

	Particulars	Amount (Rs.)	Amount (Rs.)
(i)	Materials consumed:		
	- Opening stock	6,06,000	
	- Add: Purchases	28,57,000	
		34,63,000	
	- Less: Closing stock	(7,50,000)	27,13,000
	Direct wages		37,50,000
(ii)	Prime cost		64,63,000
	Factory expenses		21,25,000
			85,88,000
	Add: Opening W-I-P		12,56,000
	Less: Closing W-I-P		(14,22,000)
	Factory cost		84,22,000
	Less: Sale of scrap		(26,000)

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(iii)	Cost of Production		83,96,000
	Add: Opening stock of finished goods		3,59,000
	Less: Closing stock of finished goods		(3,09,000)
(iv)	Cost of Goods Sold		84,46,000
	Office and administration expenses		10,34,000
	Selling and distribution expenses		7,50,000
(v)	Cost of Sales		1,02,30,000
(vi)	Profit (balancing figure)		31,70,000
	Sales		1,34,00,000

Question 5

The following data are available from the books and records of A Ltd. for the month of April 2022:

Particulars	Amount (Rs.)
Stock of raw materials on 1st April 2022	**10,000**
Raw materials purchased	**2,80,000**
Manufacturing wages	**70,000**

Depreciation on plant	**15,000**
Expenses paid for quality control check activities	**4,000**
Lease Rent of Production Assets	**10,000**
Administrative Overheads (Production)	**15,000**
Expenses paid for pollution control and engineering & maintenance	**1,000**
Stock of raw materials on 30th April 2022	**40,000**
Primary packing cost	**8,000**
Research & development cost (Process related)	**5,000**
Packing cost for redistribution of finished goods	**1,500**
Advertisement expenses	**1,300**

Stock of finished goods as on 1st April 2022 was 200 units having a total cost of Rs. 28,000. The entire opening stock of finished goods has been sold during the month Production during the month of April, 2022 was 3,000 units. Closing stock of finished goods as on 30th April, 2022 was 400 units.

You are required to:

I. Prepare a Cost Sheet for the above period showing the:

(i) Cost of Raw Material consumed

(ii) Prime Cost

(iii) Factory Cost

(iv) Cost of Production

(v) Cost of goods sold

(vi) Cost of Sales

II. Calculate selling price per unit, if sale is made at a profit of 20% on sales.

(PYP May'22)

Answer 5

Statement of Cost (for the month of April, 2022)

S. No.	Particulars	Amount (Rs.)	Amount (Rs.)
	Opening stock of Raw material	10,000	
	Add: Purchase of Raw material	2,80,000	
	Less: Closing stock of raw materials	(40,000)	
(i)	Raw material consumed		2,50,000
	Manufacturing wages		70,000
(ii)	Prime Cost		3,20,000
	Factory/work overheads:		
	Depreciation on plant	15,000	
	Lease rent of production Asset	10,000	

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	Expenses paid for pollution control and engineering & Maintenance	1,000	26,000
(iii)	Factory/Work Cost		3,46,000
	Expenses paid for quality control check activity		4,000
	Research and Development Cost		5,000
	Administration Overheads (Production)		15,000
	Primary Packing Cost		8,000
(iv)	Cost of Production		3,78,000
	Add: Opening stock of finished goods		28,000
	Less: Closing stock of finished goods		(50,400)
(v)	Cost of Goods Sold		3,55,600
	Advertisement expenses		1,300
	Packing cost for redistribution of finished goods sold		1,500
(vi)	Cost of Sales		3,58,400

Note: Valuation of closing stock of finished goods

$=\frac{\text{Rs.3,78,000}}{\text{300 units}} \times$ 400 Units = Rs.50, 400

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Cost per unit sold= $\frac{\text{Rs.3,58,400}}{200+3,000+400}$ = Rs. 128 per unit

∴Selling Price= $\frac{128}{80\%}$ = Rs.160 per unit

Question 6

The books of Adarsh Manufacturing Company present the following data for the month of April:

Direct labour cost Rs.17, 500 being 175% of works overheads.

Cost of goods sold excluding administrative expenses Rs.56,000.

Inventory accounts showed the following opening and closing balances:

	April 1 (Rs.)	April 30 (Rs.)
Raw materials	**8,000**	**10,600**
Work-in-progress	**10,500**	**14,500**
Finished goods	**17,600**	**19,000**

Other data are:

	(Rs.)
Selling expenses	**3,500**
General and administration expenses	**2,500**
Sales for the month	**75,000**

You are required to:

(i) FIND out the value of materials purchased.

(ii) PREPARE a cost statement showing the various elements of cost and also the profit earned.

(Study material)

Answer 6

(i) Computation of the value of materials purchased

To find out the value of materials purchased, reverse calculations from the given data can be presented as below:

Particulars	**(Rs.)**
Cost of goods sold	**56,000**
Add: Closing stock of finished goods	19,000
Less: Opening stock of finished goods	(17,600)
Cost of production	**57,400**
Add: Closing stock of work-in-progress	14,500
Less: Opening stock of work-in-progress	(10,500)
Works cost	**61,400**
Less: Factory overheads: $\left(\frac{\text{Rs.}17,500\times100}{175}\right)$	(10,000)

Prime cost	**51,400**
Less: Direct labour	(17,500)
Raw material consumed	**33,900**
Add: Closing stock of raw materials	10,600
Raw materials available	44,500
Less: Opening stock of raw materials	(8,000)
Value of materials purchased	**36,500**

(ii) Cost statement

	(Rs.)
Raw material consumed [Refer to statement (i) above]	33,900
Add: Direct labour cost	17,500
Prime cost	**51,400**
Add: Factory overheads	10,000
Works cost	**61,400**
Add: Opening work-in-progress	10,500
Less: Closing work-in-progress	(14,500)

Cost of production	**57,400**
Add: Opening stock of finished goods	17,600
Less: Closing stock of finished goods	(19,000)
Cost of goods sold	**56,000**
Add: General and administration expenses	2,500
Add: Selling expenses	3,500
Cost of sales	**62,000**
Profit (Balance figure Rs. 75,000 – Rs. 62,000)	13,000
Sales	**75,000**

Topic 3 Advantages of Cost Sheet

Question 7

STATE the advantages of a cost sheet.

(Study material)

Answer 7

Advantages of Cost Sheet or Cost Statements

The main advantages of a Cost Sheet are as follows:

(i) It provides the total cost figure as well as cost per unit of production.

(ii) It helps in cost comparison.

(iii) It facilitates the preparation of cost estimates required for submitting tenders.

(iv) It provides sufficient help in arriving at the figure of selling price.

(v) It facilitates cost control by disclosing operational efficiency.

Topic 4 Treatment of Special Items in Cost Sheet

Question 8

EXPLAIN the treatment of given items of Cost in Cost Sheet/Statement

(i) Abnormal costs

(ii) Subsidy/Grant/Incentives

(iii) Penalty, fine, damages, and demurrage

(iv) Interest and other finance costs

(MTP May 2025)

Answer 8

Treatment of various items of Cost in Cost Sheet/Statement

(i) Abnormal costs: Any abnormal cost, where it is material and quantifiable, shall not form part of cost of production or acquisition or supply of goods or provision of service. Examples of abnormal costs are:

(a) Cost pertaining to or arising out of a pandemic e.g. COVID-19

(b) Cost associated with employees due to sudden lockdown.

(ii) Subsidy/Grant/Incentives: Any such type of payment received/ receivable are reduced from the cost objects to which such amount pertains.

(iii) Penalty, fine, damages, and demurrage: These types of expenses are not form part of cost.

(iv) Interest and other finance costs: Interest, including any payment in the nature of interest for use of non-equity funds and incidental cost that an entity incurs in arranging those funds. Interest and finance charges are not included in cost of production. Interest and Financing Charges shall be presented in the cost statement as a separate item of cost of sales.

Question 9

The figures listed below are derived from the Trial Balance of EVS & Co. as of 31st March:

	Dr. (Rs.)	Cr. (Rs.)
Opening Inventories:		
Finished Stock	**10,96,000**	
Raw Materials	**19,18,000**	
Work-in-Process	**27,40,000**	
Office Appliances	**2,38,380**	
Plant & Machinery	**63,08,850**	
Building	**27,40,000**	
Sales		**1,35,21,600**
Sales Return and Rebates	**1,91,800**	

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Cash discount allowed on sales	**1,17,820**	
Materials Purchased	**43,84,000**	
Freight incurred on Materials	**2,19,200**	
Purchase Returns		**65,760**
Direct employee cost	**21,92,000**	
Indirect employee cost	**2,46,600**	
Drawing and Designing cost	**1,37,000**	
Repairs and maintenance of factory	**1,91,800**	
Heat, Light and Power expenses	**8,90,500**	
Pollution Control Expenses	**2,56,190**	
Sales Commission	**4,60,320**	
Sales Promotion	**3,08,250**	
Distribution Deptt. - Salaries and Expenses	**2,46,600**	
Office - Salaries and Expenses	**1,17,820**	
Packing Cost to make the product marketable	**3,15,100**	
Printing and Stationery expenses	**89,050**	

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Bank Charges paid	**8,220**	

Further details are available as follows:

(i)	**Closing Inventories:**	
	Finished Goods	**Rs. 15,75,500**
	Raw Materials	**Rs. 24,66,000**
	Work-in-Process	**Rs. 26,30,400**
(ii)	**Outstanding direct employee cost**	**Rs. 1,09,600**
(iii)	**Depreciation to be provided on:**	
	Office Appliances	**15%**
	Plant and Machinery	**40%**
	Buildings	**10%**
(iv)	**70% of the Heat, Light and Power expenses is related to the Factory and the remaining 30% is equally shared between the Office and Selling Department.**	
	Depreciation on Buildings is to be distributed at a similar percentage between the Factory, Office and the Selling Department as that of the Heat, Light and Power.	

With the help of the above information, you are required to PREPARE a condensed Profit and Loss Statement of EVS & Co. for the year ended 31st March along with the following schedules:

(i) Cost of Sales (showing Prime Cost, Gross Works Cost, Cost of production, Cost of Goods Sold and Cost of Sales)

(ii) Selling and Distribution Expenses.

(iii) Administration Expenses

(RTP May 2025)

Answer 9

Profit and Loss Statement of EVS & Co. for the year ended 31st March

Particulars	(Rs.)	(Rs.)
Gross Sales	1,35,21,600	
Less: Returns and rebates	(1,91,800)	1,33,29,800
Less: Cost of Sales [See Schedule (i)]		(1,20,21,887)
Net Operating Profit		13,07,913
Less: Cash discount allowed on sales		(1,17,820)
Net Profit		11,90,093

(i) Schedule of Cost of Sales

Particulars	(Rs.)	(Rs.)
Raw Material (Inventory opening balance)		19,18,000
Add: Material Purchased		43,84,000

Add: Freight on Material		2,19,200
Less: Purchase Returns	(65,760)	45,37,440
64,55,440		
Less: Closing Raw Material Inventory		(24,66,000)
Materials consumed in Production		39,89,440
Direct employee cost (Rs. 21,92,000 + Rs. 1,09,600)		23,01,600
Prime Cost		62,91,040
Factory Overheads:		
Indirect employee cost		2,46,600
Drawing and Designing cost		1,37,000
Repairs and maintenance of factory		1,91,800
Heat, Light and Power (Rs. 8,90,500 × 70%)		6,23,350
Pollution Control Expenses		2,56,190
Depreciation of Plant (40% of Rs.63,08,850)		25,23,540
Depreciation of Building (10% of Rs.27, 40,000 × 70%)	1,91,800	41,70,280

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Gross Works Cost		1,04,61,320
Add: Opening Work-in-Process inventory		27,40,000
Less: Closing Work-in-Process inventory		(26,30,400)
Cost of production		1,05,70,920
Add: Opening Finished Goods inventory		10,96,000
Less: Closing Finished Goods inventory		(15,75,500)
Cost of Goods Sold		1,00,91,420
Add: Administration Expenses [See Schedule (iii)]		4,25,522
Add: Selling and Distribution Expenses [See Schedule (ii)]		15,04,945
Cost of Sales		1,20,21,887

Note: Cash discount allowed on sales will not form part of Cost Sheet.

(ii) Schedule of Selling and Distribution Expenses

Particulars	(Rs.)
Sales Commission	4,60,320
Sales Promotion	3,08,250
Distribution Deptt. - Salaries and Expenses	2,46,600

Heat, Light and Power (Rs. 8, 90,500 x 15%)	1,33,575
Depreciation of Building (10% of Rs. 27, 40,000 × 15%)	41,100
Packing Cost to make the product marketable	3,15,100
	15,04,945

(iii) Schedule of Administration Expenses

Particulars	(Rs.)
Office Salaries and Expenses	1,17,820
Depreciation of Office Appliances (Rs. 2, 38,380 x 15%)	35,757
Depreciation of Building (10% of Rs. 27, 40,000 × 15%)	41,100
Heat, Light and Power (Rs. 8, 90,500 x 15%)	1,33,575
Printing and Stationery expenses	89,050
Bank Charges paid	8,220
	4,25,522

Topic 5 Basic Cost Sheet with Adjustments

Question 10

Xim Ltd. manufactures two types of boxes 'Super' and 'Normal'. The cost data for the year ended 31st March, 2021 is as follows:

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	(Rs.)
Direct Materials	12,00,000
Direct Wages	6,72,000
Production Overhead	2,88,000
Total	21,60,000

There was no work-in-progress at the beginning or at the end of year. It is further ascertained that:

1. Direct materials cost per unit in 'Super' was twice as much of direct material in 'Normal'.

2. 2% cash discount was received for payment made within 30 days to the creditors of Direct materials.

3. Direct wages per unit for 'Normal' were 60% of those of 'Super'.

4. Production overhead per unit was at same rate for both the types of boxes.

5. Administration overhead was 200% of direct labour for each type.

6. Selling cost was Rs. 1 per 'Super' type.

7. Production and sales during the year were as follows:

Production		Sales	
Type	No. of units	Type	No. of units
Super	60,000	Super	54,000

Normal	**1,80,000**		

8. Selling price was Rs. 30 per unit for 'Super'.

9. Company was also involved in a copyright infringement case related to the manufacturing process of 'Super' production. As per the verdict, it had to pay penalty of Rs. 50,000.

PREPARE Cost Sheet of Xim Ltd. for 'Super' showing:

(i) Cost per unit and Total Cost

(ii) Profit per unit and Total Profit

(MTP Oct 21, PYP Nov 20)

Answer 10

Particulars	Per unit (Rs.)	Total (Rs.)
Direct materials (Working note- (i))	8.00	4,80,000
Direct wages (Working note- (ii))	4.00	2,40,000
Prime cost	12.00	7,20,000
Production overhead (Working note- (iii))	1.20	72,000
Factory Cost	13.20	7,92,000
Administration Overhead (200% of direct wages)	8.00	4,80,000
Cost of production	21.20	12,72,000
Less: Closing stock (60,000 units – 54,000 units)	-	1,27,200

Cost of goods sold i.e. 54,000 units	21.20	11,44,800
Selling cost	1.00	54,000
Cost of sales/ Total cost	22.20	11,98,800
Profit	7.80	4,21,200
Sales value (Rs. 30 × 54,000 units)	30.00	16,20,000

Working Notes:

(i) Direct material cost per unit of 'Normal' = M Direct material cost per unit of 'Super' = 2M

Total Direct Material cost = 2M × 60,000 units + M × 1, 80,000 units

Or, Rs. 12, 00,000 = 1, 20,000 M + 1, 80,000 M

Or, M = $\frac{\text{Rs.}12,00,000}{3,00,000}$ = Rs. 4

Therefore, Direct material Cost per unit of 'Super' = 2 × Rs. 4 = Rs. 8

(ii) Direct wages per unit for 'Super' = W

Direct wages per unit for 'Normal' = 0.6W

So, (W x 60,000) + (0.6W x 1, 80,000) = Rs. 6, 72,000

W = Rs. 4 per unit

(iii) Production overhead per unit = Rs. 2, 88,000 (60,000 + 1, 80,000) = Rs. 1.20

Production overhead for 'Super' = Rs. 1.20 × 60,000 units = Rs. 72,000

Notes:

1. Administration overhead is specific to the product as it is directly related to direct labour as mentioned in the Question and hence to be considered in cost of production only.

2. Cash discount is treated as interest and finance charges; hence, it is ignored.

3. Penalty paid against the copyright infringement case is an abnormal cost; hence, not included.

Question 11

The following data relates to manufacturing of a standard product during the month of February, 2022:

Particulars	Amount (in Rs.)
Stock of Raw material as on 01-02-2022	**1,20,000**
Work in Progress as on 01-02-2022	**75,000**
Purchase of Raw material	**3,00,000**
Carriage Inwards	**30,000**
Direct Wages	**1,80,000**
Cost of special drawing	**45,000**
Hire charges paid for Plant (Direct)	**36,000**
Return of Raw Material	**60,000**
Carriage on return	**9,000**

Expenses for participation in Industrial exhibition	**12,000**
Maintenance of office building	**3,000**
Salary to office staff	**37,500**
Legal charges	**3,750**
Depreciation on Delivery van	**9,000**
Warehousing charges	**2,250**
Stock of Raw material as on 28-02-2022	**45,000**
Stock of Work in Progress as on 28-02-2022	**36,000**

- **Store overheads on materials are 10% of material consumed.**
- **Factory overheads are 20% of the Prime cost.**
- **10% of the output was rejected and a sum of Rs. 7,500 was realized on sale of scrap.**
- **10% of the finished product was found to be defective and the defective products were rectified at an additional expenditure which is equivalent to 20% of proportionate direct wages.**
- **The total output was 8,000 units during the month.**

You are required to PREPARE a Cost Sheet for the above period showing the:

(i) Cost of Raw Material consumed.

(ii) Prime Cost

(iii) Work Cost

(iv) Cost of Production

(v) Cost of Sales

(MTP March '22, PYP July '21)

Answer 11

Statement of Cost for the month of February, 2022

Particulars	Amount (Rs.)	Amount (Rs.)
(i) Cost of Material Consumed:		
Raw materials purchased (Rs.3,00,000 – Rs.60,000)	2,40,000	
Carriage inwards	30,000	
Add: Opening stock of raw materials	1,20,000	
Less: Closing stock of raw materials	(45,000)	3,45,000
Direct Wages		1,80,000
Direct expenses:		
Cost of special drawing	45,000	
Hire charges paid for Plant (Direct)	36,000	81,000
(ii) Prime Cost		6,06,000
Carriage on return	9,000	
Store overheads (10% of material consumed)	34,500	

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Factory overheads (20% of Prime cost)	1,21,200	
Additional expenditure for rectification of defective products (refer working note)	3,240	1,67,940
Gross factory cost		7,73,940
Add: Opening value of W-I-P		75,000
Less: Closing value of W-I-P		(36,000)
(iii) Works/ Factory Cost		8,12,940
Less: Realisable value on sale of scrap		(7,500)
(iv) Cost of Production		8,05,440
Add: Opening stock of finished goods		-
Less: Closing stock of finished goods		-
Cost of Goods Sold		8,05,440
Administrative overheads:		
Maintenance of office building	3,000	
Salary paid to Office staff	37,500	
Legal Charges	3,750	44,250

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Selling overheads:		
Expenses for participation in Industrial exhibition	12,000	12,000
Distribution overheads:		
Depreciation on delivery van	9,000	
Warehousing charges	2,250	11,250
(v) Cost of Sales		8,72,940

Working Notes:

1. Number of Rectified units

Total Output 8,000 units

Less: Rejected 10% 800 units

Finished product 7,200 units

Rectified units (10% of finished product) 720 units

2. Proportionate additional expenditure on 720 units

= 20% of proportionate direct wages

= 0.20 x (Rs. 1, 80,000/8,000) x 720

= 3,240

Important Note:-

This practical problem required preparation of cost sheet. Various items were given for adjustment. Most of the examinees were confused about the treatment of some items like

cost of special drawing, hire charges paid for plant, carriage on return and general overheads. Overall performance of the examinees was poor.

Question 12

A factory can produce 1, 80,000 units per annum at its 60% capacity. The estimated costs of production are as under:

Direct material Rs.300 per unit

Direct employee cost Rs.160 per unit

Indirect expenses:

- Fixed Rs.32, 50,000 per annum

- Variable Rs.50 per unit

Semi variable

Rs.20, 000 per month up to 50% capacity and Rs.2, 500 for every

20% increase in the capacity or part thereof.

If production program of the factory is as indicated below and the management desires to ensure a profit of Rs.1, 00, 00,000 for the year, DETERMINE the average selling price at which each unit should be quoted:

First three months of the year- 50% of capacity;

Remaining nine months of the year- 75% of capacity.

(MTP Oct'22)

Answer 12

Statement of Cost

	First three months (Rs.)	Remaining nine months (Rs.)	Total (Rs.)
	37,500 units	1,68,750 units	2,06,250 units
Direct material	1,12,50,000	5,06,25,000	6,18,75,000
Direct employee cost	60,00,000	2,70,00,000	3,30,00,000
Indirect- variable expenses	18,75,000	84,37,500	1,03,12,500
Indirect – fixed expenses	8,12,500	24,37,500	32,50,000
Indirect- semi-variable expenses			
-For first three months @ Rs.20,000 p.m.	60,000		
-For remaining nine months @ Rs.25,000 p.m.		2,25,000	2,85,000
Total cost	1,99,97,500	8,87,25,000	10,87,22,500
Desired profit	-	-	1,00,00,000
Sales value	-	-	11,87,22,500
Average selling price per unit			575.62

Question 13

The following details are available from the books of R Ltd. for the year ending 31st March 2020:

Particulars	Amount (Rs.)
Purchase of raw materials	84,00,000
Consumable materials	4,80,000
Direct wages	60,00,000
Carriage inward	1,72,600
Wages to foreman and store keeper	8,40,000
Other indirect wages to factory staffs	1,35,000
Expenditure on research and development on new production technology	9,60,000
Salary to accountants	7,20,000
Employer's contribution to EPF & ESI	7,20,000
Cost of power & fuel	28,00,000
Production planning office expenses	12,60,000
Salary to delivery staffs	14,30,000
Income tax for the assessment year 2019-20	2,80,000

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Fees to statutory auditor	**1,80,000**
Fees to cost auditor	**80,000**
Fees to independent directors	**9,40,000**
Donation to PM-national relief fund	**1,10,000**
Value of sales	**2,82,60,000**
Position of inventories as on 01-04-2019:	
-Raw Material	**6,20,000**
-W-I-P	**7,84,000**
-Finished goods	**14,40,000**
Position of inventories as on 31-03-2020:	
-Raw Material	**4,60,000**
-W-I-P	**6,64,000**
-Finished goods	**9,80,000**

From the above information PREPARE a cost sheet for the year ended 31st March 2020.

(RTP Nov '20)

Answer 13

Statement of Cost of R Ltd. for the year ended 31st March, 2020:

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Sl. No.	Particulars	Amount (Rs.)	Amount (Rs.)
(i)	Material Consumed:		
	-Raw materials purchased	84,00,000	
	-Carriage inward	1,72,600	
	Add: Opening stock of raw materials	6,20,000	
	Less: Closing stock of raw materials	(4,60,000)	87,32,600
(ii)	Direct employee (labour) cost:		
	-Direct wages	60,00,000	
	-Employer's Contribution towards PF & ESIS	7,20,000	67,20,000
(iii)	Direct expenses:		
	-Consumable materials	4,80,000	
	-Cost of power & fuel	28,00,000	32,80,000
	Prime Cost		1,87,32,600
(iv)	Works/ Factory overheads:		
	-Wages to foreman and store keeper	8,40,000	
	-Other indirect wages to factory staffs	1,35,000	9,75,000

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	Gross factory cost		1,97,07,600
	Add: Opening value of W-I-P		7,84,000
	Less: Closing value of W-I-P		(6,64,000)
	Factory Cost		1,98,27,600
(v)	Research & development cost paid for improvement in production process		9,60,000
(vi)	Production planning office expenses		12,60,000
	Cost of Production		2,20,47,600
	Add: Opening stock of finished goods		14,40,000
	Less: Closing stock of finished goods		(9,80,000)
	Cost of Goods Sold		2,25,07,600
(vii)	Administrative overheads:		
	-Salary to accountants	7,20,000	
	-Fees to statutory auditor	1,80,000	
	-Fees to cost auditor	80,000	
	-Fee paid to independent directors	9,40,000	19,20,000

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(viii)	Selling overheads& Distribution overheads:		
	-Salary to delivery staffs		14,30,000
	Cost of Sales		2,58,57,600
	Profit (balancing figure)		24,02,400
	Sales		2,82,60,000

Note: Income tax and Donation to PM National Relief Fund is avoided in the cost sheet.

Question 14

From the following data of Motilal Ltd., CALCULATE Cost of production:

		(Rs.)
(i)	**Repair & maintenance paid for plant & machinery**	**9,80,500**
(ii)	**Insurance premium paid for inventories**	**26,000**
(iii)	**Insurance premium paid for plant & machinery**	**96,000**
(iv)	**Raw materials purchased**	**64,00,000**
(v)	**Opening stock of raw materials**	**2,88,000**
(vi)	**Closing stock of raw materials**	**4,46,000**
(vii)	**Wages paid**	**23,20,000**

(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100
(x)	Quality control cost for the products in manufacturing process	86,000
(xi)	Research & development cost for improvement in production process	92,600
(xii)	Administrative cost for:	
	-Factory & production	9,00,000
	-Others	11,60,000
(xiii)	Amount realised by selling scrap generated during the manufacturing process	9,200
(xiv)	Packing cost necessary to preserve the goods for further processing	10,200
(xv)	Salary paid to Director (Technical)	8,90,000

(RTP May 23)

Answer 14

Calculation of Cost of Production of Motilal Ltd for the period…..

Particulars	(Rs.)

Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)
Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for inventories	26,000
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,43,100
Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,47,000

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Less: Amount realized by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,48,000

Notes:

(i) Other administrative overhead does not form part of cost of production.

(ii) Salary paid to Director (Technical) is an administrative cost.

Question 15

The following data are available from the books and records of Q Ltd. for the month of April 2020:

Direct Labour Cost = Rs. 1, 20,000 (120% of Factory Overheads)

Cost of Sales = Rs. 4, 00,000

Sales = Rs. 5, 00,000

Accounts show the following figures:

	1st April, 2020 (Rs.)	**30th April, 2020 (Rs.)**
Inventory:		
Raw material	**20,000**	**25,000**
Work-in-progress	**20,000**	**30,000**

Finished goods	**50,000**	**60,000**
Other details:		
Selling expenses		**22,000**
General & Admin. expenses		**18,000**

You are required to prepare a cost sheet for the month of April 2020 showing:

(i) Prime Cost

(ii) Works Cost

(iii) Cost of Production

(iv) Cost of Goods sold

(v) Cost of Sales and Profit earned.

(PYP Jan 21)

Answer 15

Cost Sheet for the Month of April 2020

Particulars	**(Rs.)**
Opening stock of Raw Material	20,000
Add: Purchases [Refer Working Note-2]	1,65,000
Less: Closing stock of Raw Material	(25,000)
Raw material consumed	1,60,000

Add: Direct labour cost	1,20,000
Prime cost	2,80,000
Add: Factory overheads	1,00,000
Gross Works cost	3,80,000
Add: Opening work-in-progress	20,000
Less: Closing work-in-progress	(30,000)
Works Cost	3,70,000
Cost of Production	3,70,000
Add: Opening stock of finished goods	50,000
Less: Closing stock of finished goods	(60,000)
Cost of goods sold	3,60,000
Add: General and administration expenses*	18,000
Add: Selling expenses	22,000
Cost of sales	4,00,000
Profit {Balancing figure (Rs. 5,00,000 – Rs. 4,00,000)}	1,00,000
Sales	5,00,000

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*General and administration expenses have been assumed as not relating to the production activity.

Working Note:

1. Computation of the raw material consumed

Particulars	(Rs.)
Cost of Sales	4,00,000
Less: General and administration expenses	(18,000)
Less: Selling expenses	(22,000)
Cost of goods sold	3,60,000
Add: Closing stock of finished goods	60,000
Less: Opening stock of finished goods	(50,000)
Cost of production/Gross works cost	3,70,000
Add: Closing stock of work-in-progress	30,000
Less: Opening stock of work-in- progress	(20,000)
Works cost	3,80,000
Less: Factory overheads $\left(\frac{Rs.1,20,000}{120} \times 100\right)$	(1,00,000)
Prime cost	2,80,000

Less: Direct labour	(1,20,000)
Raw material consumed	1,60,000

2. Computation of the raw material purchased

Particulars	(Rs.)
Closing stock of Raw Material	25,000
Add: Raw Material consumed	1,60,000
Less: Opening stock of Raw Material	(20,000)
Raw Material purchased	1,65,000

Question 16

The following information is available from SN Manufacturing Limited's for the month of April 2023.

	April 1	April 30
Opening and closing inventories data:		
Stock of finished goods	**2,500 units**	**?**
Stock of raw materials	**Rs. 42,500**	**Rs. 38,600**
Work-in progress	**Rs. 42,500**	**Rs. 42,800**

Other data are:		
Raw materials Purchased		**Rs. 6,95,000**
Carriage inward		**Rs. 36,200**
Direct wages paid		**Rs. 3,22,800**
Royalty paid for production		**Rs. 35,800**
Purchases of special designs, moulds and patterns		**Rs. 1,53,600**
(estimated life 12 Production cycles)		
Power, fuel and haulage (factory)		**Rs. 70,600**
Research and development costs for improving the		**Rs. 31,680**
production process (amortized)		
Primary packing cost (necessary to maintain quality)		**Rs. 6920**
Administrative Overhead		**Rs. 46,765**
Salary and wages for supervisor and foremen		**Rs. 28,000**

Other information:

• Opening stock of finished goods is to be valued at Rs. 8.05 per unit.

• During the month of April, 1, 52,000 units were produced and 1, 52,600 units were sold. The closing stock of finished goods is to be valued at the relevant month's cost of production. The company follows the FIFO method.

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• Selling and distribution expenses are to be charged at 20 paisa per unit.

• Assume that one production cycle is completed in one month.

Required:

(i) Prepare a cost sheet for the month ended on April 30, 2023, showing the various elements of cost (raw material consumed, prime cost, factory cost, cost of production, cost of goods sold, and cost of sales).

(ii) Calculate the selling price per unit if profit is charged at 20 percent on sales.

(May'23)

Answer 16

Cost Sheet for the month of April 2023

Particulars	Amount (Rs.)	Amount (Rs.)
Raw materials consumed:		
Raw materials purchased	6,95,000	
Add: Carriage inward	36,200	
Add: Value of opening stock of raw materials	42,500	
Less: Value of closing stock of raw materials	(38,600)	7,35,100
Direct wages paid		3,22,800
Royalty paid for production		35,800

Amortised cost of special designs, moulds and patterns (Rs.153,600 ÷12)		12,800
Power, fuel and haulage (factory)*		70,600
Prime Cost*		11,77,100
Salary and wages of supervisor and foremen		28,000
Gross Works Cost		12,05,100
Add: Opening stock of WIP		42,500
		(42,800)
Less: Closing stock of WIP Factory/ Works Cost		12,04,800
Research and development cost		
Primary packing cost	31,680	
	6,920	38,600
Cost of Production		12,43,400
Add: Opening stock of finished goods (Rs. 8.05 × 2,500 units)		20,125
Less: Value of closing stock [(2,500+152,000 -1,52,600) ×(12,43,400÷152000)		(15,542)

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Cost of Goods Sold		12,47,983
Add: Administrative overheads		46,765
Add: Selling and distribution expenses (Rs. 0.20 × 1,52,600)		30,520
Cost of Sales		13,25,268
Add: Profit (20% on Sales or 25% on cost of sales)		3,31,317
Sales value		16,56,585
Selling price per unit (Rs. 16,56,585 ÷ 1,52,600 units)		10.86

Question 17

From the following particulars, you are required to PREPARE monthly cost sheet of Aditya Industries:

	(Rs.)
Opening Inventories:	
- Raw materials	**12,00,000**
- Work-in-process	**18,00,000**
- Finished goods (10,000 units)	**9,60,000**

Closing Inventories:	
- Raw materials	14,00,000
- Work-in-process	16,04,000
- Finished goods	?
Raw materials purchased	1,44,00,000
GST paid on raw materials purchased (ITC available)	7,20,000
Wages paid to production workers	36,64,000
Expenses paid for utilities	1,45,600
Office and administration expenses paid	26,52,000
Travelling allowance paid to office staffs	1,21,000
Selling expenses	6,46,000

Machine hours worked- 21,600 hours

Machine hour rate- Rs. 8.00 per hour

Units sold- 1, 60,000

Units produced- 1, 94,000

Desired profit- 15% on sales

(Study material)

Answer 17

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Cost sheet of Aditya Industries for month of……

Units produced- 1, 94,000

Units sold- 1, 60,000

Particulars	(Rs.)	Cost per unit (Rs.)
Raw materials purchased	1,44,00,000	
Add: Opening value of raw materials	12,00,000	
Less: Closing value of raw materials	(14,00,000)	
Materials consumed	1,42,00,000	73.19
Wages paid to production workers	36,64,000	18.89
Expenses paid for utilities	1,45,600	0.75
Prime Cost	**1,80,09,600**	**92.83**
Factory overheads (Rs. 8 × 21,600 hours)	1,72,800	
Add: Opening value of W-I-P	18,00,000	
Less: Closing value of W-I-P	(16,04,000)	
Cost of Production	**1,83,78,400**	**94.73**
Add: Value of opening finished stock	9,60,000	

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Less: Value of closing finished stock (Rs. 94.73 × 44,000)	(41,68,120)	
Cost of Goods Sold	**1,51,70,280**	**94.81**
Office and administration expenses paid	26,52,000	16.58
Travelling allowance paid to office staffs	1,21,000	0.75
Selling expenses	6,46,000	4.04
Cost of Sales	**1,85,89,280**	**116.18**
Add: Profit	32,80,461	20.50
	2,18,69,741	**136.68**

Question 18

Luxz Ltd. is into luxury pens business manufacturing 120 pens in a batch. To process a single batch of 120 pens, company needs to incur following expenditure:

Particulars	(Rs.)
Direct Materials	**57,375**
Direct wages	**6,750**
Batch Set-up cost	**18,900**

For each batch, the company absorbs the Production Overheads at a rate of 20% of direct wages and 15% of the total production cost is allocated to cover selling, distribution, and administrative overheads.

During the month of March, Luxz Ltd. received an order for 2,400 pens and the company aims to achieve a profit margin of 25% on its sales value.

You are required to DETERMINE the total sales value for 2,400 pens.

(MTP Jan 2025)

Answer 18

Determination of total sales value of Luxury pens

Particulars	Amount per Batch (Rs.)	Amount for 2,400 units or 20 batches (Rs.)
Direct materials	57,375	11,47,500
Direct wages	6,750	1,35,000
Batch set-up cost	18,900	3,78,000
Production overheads (20% of direct wages)	1,350	27,000
Total Production Cost	84,375	16,87,500
Selling, distribution and administration cost (15% of Total Production cost)	12,656	2,53,125
Total Cost	97,031	19,40,625

Add: Profit (25% of Sales value or 1/3rd of Total cost)	32,344	6,46,875
Total Sales value	1,29,375	25,87,500

Question 19

The accounts of Ranu Ltd for the year ended 31st March, 2025 shows the following:

Particulars	(Rs.)
Carriage Inward	**7,150**
Administrative Office Salaries	**12,600**
Bad debts written off	**6,500**
Carriage Outward	**4,300**
GST (ITC Allowed)	**10,000**
Salaries related to factory office	**7,000**
Production Wages	**1,20,000**
Repairs - Plant and Machinery, Rent, Rates, Taxes, Insurance etc.	**4,450**
Factory	**8,500**
Office	**2,000**

Sales	**4,50,000**
Stock of Raw materials: 1st April, 2024	**50,000**
31st March, 2025	**64,500**
Materials Purchased (excluding GST)	**2,00,000**
Travelling Expenses	**2,100**
Manager's Salary (1/4 Office and 3/4 Factory)	**10,000**
Depreciation on Plant and Machinery	**6,500**
Depreciation on Office Furniture	**500**
Director's Fees	**6,000**
Gas and Water (Factory)	**1,500**
Gas and Water (Office)	**500**
General Expenses	**3,400**

You are required to PREPARE a cost statement for the year ended 31st March, 2025.

(RTP Sep. 2025)

Answer 19

Ranu Ltd.

Cost Statement for the year ended 31st March, 2025

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Particular	(Rs.)	(Rs.)
Raw Materials Consumed:		
Stock of Raw Materials as on 1st Apr, 2024	50,000	
Add: Materials Purchased	2,00,000	
Add: Carriage Inward	7,150	
Less: Stock of Raw Materials as on 31st March, 2025	(64,500)	
Raw Materials Consumed		1,92,650
Production Wages		1,20,000
Prime Cost		3,12,650
Add: Works/Factory Overheads:		
Salaries related to factory office	7,000	
Repairs to Plant and Machinery	4,450	
Rent, Rates, Taxes, Insurance etc. – Factory	8,500	
Depreciation on Plant and Machinery	6,500	
Gas and Water (Factory)	1,500	
Manager's Salary (3/4)	7,500	

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Works or Factory Overheads		35,450
Works/Factory Cost		3,48,100
Add: Office and Administration Overheads:		
Administrative Office Salaries	12,600	
Rent, Rates, Taxes, Insurance etc. – Office	2,000	
Depreciation on Office Furniture	500	
Director's Fees	6,000	
Gas and Water (Office)	500	
Manager's Salary (1/4)	2,500	
General Expenses	3,400	
Office and Administration Overheads		27,500
Cost of Production/Cost of Goods Sold		3,75,600
Add: Selling and Distribution Overheads		
Carriage Outward	4,300	
Travelling Expenses	2,100	
Selling and Distribution Overheads		6,400

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Total Cost of Sales		3,82,000
Add: Profit (Balancing Figure)		68,000
Sales		4,50,000

Topic 6 With Special Cases (GST, Lease Rent, Royalty)

Question 20

Impact Ltd. provides you the following details of its expenditures for the year ended 31st March, 2021:

S. No.	Particulars	Amount (Rs.)	Amount (Rs.)
(i)	Raw materials purchased		5,00,00,000
(ii)	GST paid under Composition scheme		10,00,000
(iii)	Freight inwards		5,20,600
(iv)	Trade discounts received		10,00,000
(v)	Wages paid to factory workers		15,20,000
(vi)	Contribution made towards employees' PF & ESIS		1,90,000
(vii)	Production bonus paid to factory workers		1,50,000

(viii)	Fee for technical assistance		1,12,000
(ix)	Amount paid for power & fuel		2,62,000
(x)	Job charges paid to job workers		4,50,000
(xi)	Stores and spares consumed		1,10,000
(xii)	Depreciation on:		
	Factory building	64,000	
	Office building	46,000	
	Plant & Machinery	86,000	1,96,000
(xiii)	Salary paid to supervisors		1,20,000
(xiv)	Repairs & Maintenance paid for:		
	Plant & Machinery	58,000	
	Sales office building	50,000	
	Vehicles used by directors	20,600	1,28,600
(xv)	Insurance premium paid for:		
	Plant & Machinery	31,200	
	Factory building	28,100	59,300

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(xvi)	Expenses paid for quality control check activities		25,000
(xvii)	Research & development cost paid for improvement in production process		48,200
(xviii)	Expenses paid for administration of factory work		1,38,000
(xix)	Salary paid to functional mangers:		
	Production control	4,80,000	
	Finance & Accounts	9,60,000	
	Sales & Marketing	12,00,000	26,40,000
(xx)	Salary paid to General Manager		13,20,000
(xxi)	Packing cost paid for:		
	Primary packing necessary to maintain quality	1,06,000	
	For re-distribution of finished goods	1,12,000	2,18,000
(xxii)	Interest and finance charges paid (for usage of non- equity fund)		3,50,000
(xxiii)	Fee paid to auditors		1,80,000

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(xxiv)	Fee paid to legal advisors		1,20,000
(xxv)	Fee paid to independent directors		2,40,000
(xxvi)	Payment for maintenance of website for online sales		1,80,000
(xxvii)	Performance bonus paid to sales staffs		2,40,000
(xxviii)	Value of stock as on 1st April, 2020:		
	Raw materials	9,00,000	
	Work-in-process	4,00,000	
	Finished goods	7,00,000	20,00,000
(xxix)	Value of stock as on 31st March, 2021:		
	Raw materials	5,60,000	
	Work-in-process	2,50,000	
	Finished goods	11,90,000	20,00,000

Amount realized by selling of waste generated during manufacturing process – Rs. 66,000/-

From the above data, you are required to PREPARE Statement of cost of Impact Ltd. for the year ended 31st March, 2021, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

(RTP Nov '21)

Answer 20

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Statement of Cost of Impact Ltd. for the year ended 31st March, 2021:

Sl. No.	Particulars	Amount (Rs.)	Amount (Rs.)
(i)	Material Consumed:		
	Raw materials purchased	5,00,00,000	
	GST paid under Composition scheme*	10,00,000	
	Freight inwards	5,20,600	
	Less: Trade discounts received	(10,00,000)	
	Add: Opening stock of raw materials	9,00,000	
	Less: Closing stock of raw materials	(5,60,000)	5,08,60,600
(ii)	Direct employee (labour) cost:		
	Wages paid to factory workers	15,20,000	
	Contribution made towards employees' PF & ESIS	1,90,000	
	Production bonus paid to factory workers	1,50,000	18,60,000
(iii)	Direct expenses:		
	Fee for technical assistance	1,12,000	

	Amount paid for power & fuel	2,62,000	
	Job charges paid to job workers	4,50,000	8,24,000
	Prime Cost		5,35,44,600
(iv)	Works/ Factory overheads:		
	Stores and spares consumed	1,10,000	
	Depreciation on factory building	64,000	
	Depreciation on plant & machinery	86,000	
	Repairs & Maintenance paid for plant & machinery	58,000	
	Insurance premium paid for plant & machinery	31,200	
	Insurance premium paid for factory building	28,100	
	Salary paid to supervisors	1,20,000	4,97,300
	Gross factory cost		5,40,41,900
	Add: Opening value of W-I-P		4,00,000
	Less: Closing value of W-I-P		(2,50,000)
	Factory Cost		5,41,91,900

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(v)	Quality control cost:		
	Expenses paid for quality control check activities		25,000
(vi)	Research & development cost paid for improvement in production process		48,200
(vii)	Administration cost related with production:		
	-Expenses paid for administration of factory work	1,38,000	
	-Salary paid to Production control manager	4,80,000	6,18,000
(viii)	Less: Realisable value on sale of scrap and waste		(66,000)
(ix)	Add: Primary packing cost		1,06,000
	Cost of Production		5,49,23,100
	Add: Opening stock of finished goods		7,00,000
	Less: Closing stock of finished goods		(11,90,000)
	Cost of Goods Sold		5,44,33,100
(x)	Administrative overheads:		
	Depreciation on office building	46,000	

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	Repairs & Maintenance paid for vehicles used by directors	20,600	
	Salary paid to Manager- Finance & Accounts	9,60,000	
	Salary paid to General Manager	13,20,000	
	Fee paid to auditors	1,80,000	
	Fee paid to legal advisors	1,20,000	
	Fee paid to independent directors	2,40,000	28,86,600
(xi)	Selling overheads:		
	Repairs & Maintenance paid for sales office building	50,000	
	Salary paid to Manager- Sales & Marketing	12,00,000	
	Payment for maintenance of website for online sales	1,80,000	
	Performance bonus paid to sales staffs	2,40,000	16,70,000
(xii)	Packing cost paid for re-distribution of finished goods		1,12,000
(xiii)	Interest and finance charges paid		3,50,000
	Cost of Sales		5,94,51,700

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* GST paid under Composition scheme would be included under cost of material as it is not eligible for input tax credit.

Topic 7 Selling Price & Profit Calculation

Question 21

Following information obtained from the records of a Manufacturing Company for the month of March:

Direct labour cost Rs. 25,000 being 150% of works overheads.

Cost of goods sold excluding administrative expenses Rs. 75,000.

Inventory accounts showed the following opening and closing balances:

	March 1 (Rs.)	March 31 (Rs.)
Raw materials	11,600	15,370
Work-in-progress	15,225	21,025
Finished goods	25,520	27,550

Other information is as follows:	
	(Rs.)
Selling expenses	6,125
General and administration expenses	4,375

Sales for the month	**1,05,250**

Required to:

(i) FIND out the value of materials purchased.

(ii) PREPARE a cost statement showing the various elements of cost and also the profit earned.

(MTP March '23, Old & New SM)

Answer 21

(i) Computation of the value of materials purchased

To find out the value of materials purchased, reverse calculations from the given data can be presented as below:

Particulars	**(Rs.)**
Cost of goods sold	75,000
Add: Closing stock of finished goods	27,550
Less: Opening stock of finished goods	(25,520)
Cost of production	77,030
Add: Closing stock of work-in-progress	21,025
Less: Opening stock of work-in-progress	(15,225)
Works cost	82,830

Less: Factory overheads: [Rs.25,000×100/150]	(16,667)
Prime cost	66,163
Less: Direct labour	(25,000)
Raw material consumed	41,163
Add: Closing stock of raw materials	15,370
Raw materials available	56,533
Less: Opening stock of raw materials	(11,600)
Value of materials purchased	44,933

(ii) Cost statement

	(Rs.)
Raw material consumed [Refer to statement (i) above]	41,163
Add: Direct labour cost	25,000
Prime cost	66,163
Add: Factory overheads	16,667
Works cost	82,830
Add: Opening work-in-progress	15,225

Less: Closing work-in-progress	(21,025)
Cost of production	77,030
Add: Opening stock of finished goods	25,520
Less: Closing stock of finished goods	(27,550)
Cost of goods sold	75,000
Add: General and administration expenses	4,375
Add: Selling expenses	6,125
Cost of sales	85,500
Profit (sales i.e. Rs.1, 05,250 – Cost of sales i.e. Rs. 85,500)	19,750
Sales	1,05,250

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Question 22

A Ltd. produces a single product X. During the month of December 2021, the company has produced 14,560 tonnes of X. The details for the month of December 2021 are as follows:

(i) Materials consumed Rs. 15, 00,000

(ii) Power consumed 13,000 Kwh @ Rs. 7 per Kwh

(iii) Diesels consumed 1,000 litres @ Rs. 93 per litre

(iv) Wages & salary paid – Rs. 64, 00,000

(v) Gratuity & leave encashment paid – Rs. 44, 20,000

(vi) Hiring charges paid for HEMM- Rs. 13, 00,000

(vii) Hiring charges paid for cars used for official purpose – Rs. 80,000

(viii) Reimbursement of diesel cost for the cars – Rs. 20,000

(ix) The hiring of cars attracts GST under RCM @5% without credit.

(x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of despatch) – Rs. 7,000

(xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of despatch) and factory premises is Rs. 6,000 and Rs. 18,000 per month respectively.

(xii) TA/ DA and hotel bill paid for sales manager- Rs. 16,000

(xiii) The company has 180 employees' works for 26 days in a month.

Required:

(a) PREPARE a Cost sheet for the month of December 2021.

(b) COMPUTE Earnings per man shift (EMS) and Output per man shift (OMS) for the month of December 2021.

(RTP May '22)

Answer 22

(a) Cost Sheet of A Ltd. for the month of December 2021

Particulars	Amount (Rs.)	Amount (Rs.)
Materials consumed		15,00,000

Wages & Salary	64,00,000	
Gratuity & leave encashment	44,20,000	1,08,20,000
Power cost (13,000 kwh × Rs. 7)	91,000	
Diesel cost (1,000 ltr. × Rs. 93)	93,000	1,84,000
HEMM hiring charges		13,00,000
Prime Cost		1,38,04,000
AMC cost of CCTV installed at factory premises		18,000
Cost of Production/ Cost of Goods Sold		1,38,22,000
Hiring charges of cars	80,000	
Reimbursement of diesel cost	20,000	
	1,00,000	
Add: GST @5% on RCM basis	5,000	1,05,000
Maintenance cost for weighing bridge	7,000	
AMC cost of CCTV installed at weigh bridge	6,000	13,000
TA/ DA & hotel bill of sales manager		16,000
Cost of Sales		1,39,56,000

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(b) Man shift = 180 employees × 26 days = 4,680 man shifts

Computation of earnings per man shift (EMS):

$$EMS = \frac{\text{Total employee benefits paid}}{\text{Manshift}}$$

$$= \frac{Rs.1,08,20,000}{4,680} = Rs.\ 2,312$$

Computation of Output per man shift (OMS):

$$OMS = \frac{\text{Total output/ Production}}{\text{Manshift}}$$

$$= \frac{14,560\ \text{Tonne}}{4,680} = 3.11\ \text{tone}$$

Question 23

A Ltd. produces a single product X. During the month of July 2023, the company has produced 14,560 tonnes of X. The details for the month of July 2023 are as follows:

(i) Materials consumed Rs. 15, 00,000

(ii) Power consumed in operating production machinery 13,000 Kwh @ Rs. 7 per Kwh

(iii) Diesels consumed in operating production machinery 1,000 litres @ Rs. 93 per litre

(iv) Wages & salary paid – Rs. 64, 00,000

(v) Gratuity & leave encashment paid – Rs. 44, 20,000

(vi) Hiring charges paid for Heavy Earth Moving machines (HEMM) engaged in production - Rs. 13, 00,000. Hiring charges is paid on the basis of production.

(vii) Hiring charges paid for cars used for official purpose – Rs. 80,000

(viii) Reimbursement of diesel cost for the cars – Rs. 20,000

(ix) The hiring of cars attracts GST under RCM @5% without credit.

(x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of despatch) – Rs. 7,000

(xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of despatch) and factory premises is Rs. 6,000 and Rs. 18,000 per month respectively.

(xii) TA/ DA and hotel bill paid for sales manager- Rs. 16,000

(xiii) The company has 180 employees works for 26 days in a month. Required:

PREPARE a Cost sheet for the month of July 2023.

(RTP Nov 23)

Answer 23

Cost Sheet of A Ltd. for the month of July 2023

Particulars	Amount (Rs.)	Amount (Rs.)
Materials consumed		15,00,000
Wages & Salary	64,00,000	
Gratuity & leave encashment	44,20,000	1,08,20,000
Power cost (13,000 kwh × Rs. 7)	91,000	
Diesel cost (1,000 ltr × Rs. 93)	93,000	1,84,000
HEMM hiring charges		13,00,000
Prime Cost		1,38,04,000
AMC cost of CCTV installed at factory premises		18,000

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Cost of Production/ Cost of Goods Sold		1,38,22,000
Hiring charges of cars	80,000	
Reimbursement of diesel cost	20,000	
	1,00,000	
Add: GST @5% on RCM basis	5,000	1,05,000
Maintenance cost for weighing bridge	7,000	
AMC cost of CCTV installed at weigh bridge	6,000	13,000
TA/ DA & hotel bill of sales manager		16,000
Cost of Sales		1,39,56,000

Question 24

XYZ a manufacturing firm, has revealed following information for September, 2019:

	1st September	**30th September**
	(Rs.)	**(Rs.)**
Raw Materials	**2,42,000**	**2,92,000**
Works-in-progress	**2,00,000**	**5,00,000**

The firm incurred following expenses for a targeted production of 1, 00,000 units during the month:

	(Rs.)
Consumable Stores and spares of factory	3,50,000
Research and development cost for process improvements	2,50,000
Quality control cost	2,00,000
Packing cost (secondary) per unit of goods sold	2
Lease rent of production asset	2,00,000
Administrative Expenses (General)	2,24,000
Selling and distribution Expenses	4,13,000
Finished goods (opening)	Nil
Finished goods (closing)	5000 units

Defective output which is 4% of targeted production, realizes Rs. 61 per unit. Closing stock is valued at cost of production (excluding administrative expenses) Cost of goods sold, excluding administrative expenses amounts to Rs. 78,26,000. Direct employees cost is 1/2 of the cost of material consumed.

Selling price of the output is Rs. 110 per unit. You are required to:

(i) Calculate the Value of material purchased

(ii) Prepare cost sheet showing the profit earned by the firm.

(PYP Nov '19)

Answer 24

Workings:

1. Calculation of Sales Quantity:

Particular	Units
Production units	1,00,000
Less: Defectives (4%×1,00,000 units)	4,000
Less: Closing stock of finished goods	5,000
No. of units sold	91,000

2. Calculation of Cost of Production

Particular	Amount (Rs.)
Cost of Goods sold (given)	78,26,000
Add: Value of Closing finished goods	4,30,000
Cost of Production	82,56,000

3. Calculation of Factory Cost

Particular	Amount (Rs.)
Cost of Production	82,56,000
Less: Quality Control Cost	(2,00,000)

Less: Research and Development Cost	(2,50,000)
Add: Credit for Recoveries/Scrap/By- Products/ misc. income (1,00,000 units × 4% ×Rs. 61)	2,44,000
Factory Cost	80,50,000

4. Calculation of Gross Factory Cost

Particular	Amount (Rs.)
Cost of Factory Cost	80,50,000
Less: Opening Work in Process	(2,00,000)
Add: Closing Work in Process	5,00,000
Cost of Gross Factory Cost	83,50,000

5. Calculation of Prime Cost

Particular	Amount (Rs.)
Cost of Gross Factory Cost	83,50,000
Less: Consumable stores & spares	(3,50,000)
Less: Lease rental of production assets	(2,00,000)
Prime Cost	78,00,000

6. Calculation of Cost of Materials Consumed & Labour cost

Let Cost of Material Consumed = M and Labour cost = 0.5M

Prime Cost = Cost of Material Consumed + Labour Cost 78, 00,000 = M + 0.5M

M = 52, 00,000

Therefore, Cost of Material Consumed = Rs. 52, 00,000 and Labour Cost = Rs. 26, 00,000

(i) Calculation of Value of Materials Purchased

Particular	Amount (Rs.)
Cost of Material Consumed	52,00,000
Add: Value of Closing stock	2,92,000
Less: Value of Opening stock	(2,42,000)
Value of Materials Purchased	52,50,000

Cost Sheet

Sl.	Particulars	Total Cost (Rs.)
1.	Direct materials consumed:	
	Opening Stock of Raw Material	2,42,000
	Add: Additions/ Purchases [balancing figure as per requirement (i)]	52,50,000

	Less: Closing stock of Raw Material	(2,92,000)
	Material Consumed	52,00,000
2.	Direct employee (labour) cost	26,00,000
3.	Prime Cost (1+2)	78,00,000
4.	Add: Works/ Factory Overheads	
	Consumable stores and spares	3,50,000
	Lease rent of production asset	2,00,000
5.	Gross Works Cost (3+4)	83,50,000
6.	Add: Opening Work in Process	2,00,000
7.	Less: Closing Work in Process	(5,00,000)
8.	Works/ Factory Cost (5+6-7)	80,50,000
9.	Add: Quality Control Cost	2,00,000
10.	Add: Research and Development Cost	2,50,000
11.	Less: Credit for Recoveries/Scrap/By-Products/misc. income	(2,44,000)
12.	Cost of Production (8+9+10-11)	82,56,000
13.	Add: Opening stock of finished goods	-

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14.	Less: Closing stock of finished goods (5000 Units)	(4,30,000)
15.	Cost of Goods Sold (12+13-14)	78,26,000
16.	Add: Administrative Overheads (General)	2,24,000
17.	Add: Secondary packing	1,82,000
18.	Add: Selling Overheads& Distribution Overheads	4,13,000
19.	Cost of Sales (15+16+17+18)	86,45,000
20.	Profit	13,65,000
21.	Sales 91,000 units@ Rs. 110 per unit	1,00,10,000

Important Note:-

This was a numerical problem from the topic 'Elements of Cost and Preparation of Cost Sheet'. This question required to calculate value of material purchased, prepare cost sheet and calculate profit of the firm based on information provided. Most of the examinees were unable to calculate value of material purchased using reverse calculation. Poor performance was observed.

Question 25

PNME Ltd. manufactures two types of masks- 'Disposable Masks' and 'Cloth Masks'. The cost data for the year ended 31stMarch, 2022 is as follows:

	Rs.

Direct Materials	**12,50,000**
Direct Wages	**7,00,000**
Production	**4,00,000**
Overhead	
Total	**23,50,000**

It is further ascertained that:

- **Direct material cost per unit of Cloth Mask was twice as much of Direct material cost per unit of Disposable Mask.**
- **Direct wages per unit for Disposable Mask were 60% of those for Cloth Mask.**
- **Production overhead per unit was at same rate for both the types of the masks.**
- **Administration overhead was 50% of Production overhead for each type of mask.**
- **Selling cost was Rs. 2 per Cloth Mask.**
- **Selling Price was Rs. 35 per unit of Cloth Mask.**
- **No. of units of Cloth Masks sold- 45,000**
- **No. of units of Production of**

Cloth Masks: 50,000

Disposable Masks: 1, 50,000

You are required to prepare a cost sheet for Cloth Masks showing:

(i) Cost per unit and Total Cost.

(ii) Profit per unit and Total Profit.

(PYP Nov 22)

Answer 25

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Preparation of Cost Sheet for Cloth Masks

No. of units produced = 50,000 units

No. of units sold = 45,000 units

Particulars	Per unit (Rs.)	Total (Rs.)
Direct materials (Working note- (i))	10.00	5,00,000
Direct wages (Working note- (ii))	5.00	2,50,000
Prime cost	15.00	7,50,000
Production overhead (Working note- (iii))	2.00	1,00,000
Factory Cost	17.00	8,50,000
Administration Overhead* (50% of Production Overhead)	1.00	50,000
Cost of production	18.00	9,00,000
Less: Closing stock (50,000 units – 45,000 units)	-	(90,000)
Cost of goods sold i.e. 45,000 units	18.00	8,10,000
Selling cost	2.00	90,000
Cost of sales/ Total cost	20.00	9,00,000
Profit	15.00	6,75,000
Sales value (Rs. 35 × 45,000 units)	35.00	15,75,000

Working Notes:

(i) Direct material cost per unit of Disposable Mask = M

Direct material cost per unit of Cloth Mask = 2M

Total Direct Material cost = 2M × 50,000 units + M × 1, 50,000 units

Or, Rs. 12, 50,000 = 1, 00,000 M + 1, 50,000 M

Or, M = $\frac{Rs.12,50,000}{2,50,000}$ = Rs. 5

Therefore, Direct material Cost per unit of Cloth Mask = 2 × Rs. 5 = Rs. 10

(ii) Direct wages per unit for Cloth Mask = W

Direct wages per unit for Disposable Mask= 0.6W

So, (W x 50,000) + (0.6W x 1, 50,000) = Rs. 7, 00,000

W = Rs.5 per unit

Therefore, Direct material Cost per unit of Cloth Mask = Rs. 5

(iii) Production overhead per unit = $\frac{\text{Rs.}4,00,000}{(50,000+1,50,000)}$ = Rs. 2

Production overhead for Cloth Mask = Rs. 2 × 50,000 units = Rs. 1, 00,000

* Administration overhead is related to production overhead in the question and hence to be considered in cost of production only.

Topic 8 Capacity Level Analysis

Question 26

Aloe Ltd. has the capacity to produce 2, 00,000 units of a product every month. Its works cost at varying levels of production is as under: (Oct.'2020)

Level	Works cost per unit (Rs.)
10%	400
20%	390
30%	380
40%	370
50%	360
60%	350
70%	340
80%	330
90%	320
100%	310

Its fixed administration expenses amount to Rs 3, 60,000 and fixed marketing expenses amount to Rs 4, 80,000 per month respectively. The variable distribution cost amounts to Rs. 30 per unit.

It can sell 100% of its output at Rs. 500 per unit provided it incurs the following further expenditure:

(i) It gives gift items costing Rs. 30 per unit of sale;

(ii) It has lucky draws every month giving the first prize of Rs. 60,000; 2ND prize of Rs. 50,000, 3rd. prize of Rs. 40,000 and ten consolation prizes of Rs. 5,000 each to customers buying the product.

(iii) It spends Rs.2, 00,000 on refreshments served every month to its customers;

(iv) It sponsors a television programmer every week at a cost of Rs.20, 00,000 per month.

It can market 50% of its output at Rs. 560 by incurring expenses referred from (ii) to (iv) above and 30% of its output at Rs. 600 per unit without incurring any of the expenses referred from (i) to (iv) above.

PREPARE a cost sheet for the month showing total cost and profit at 30%, 50% and 100% capacity level & COMPARE its profit.

(Same concept different figures MTP Apr'22, Old & New SM)

Answer 26

Cost Sheet (For the month)

Level of Capacity	**30%**		**50%**		**100%**	
	60,000 units		**1,00,000 units**		**2,00,000 units**	
	Per unit (Rs.)	**Total (Rs.)**	**Per unit (Rs.)**	**Total (Rs.)**	**Per unit (Rs.)**	**Total (Rs.)**
Works Cost	380.00	2,28,00,000	360.00	3,60,00,000	310.00	6,20,00,000
Add: Fixed administration expenses	6.00	3,60,000	3.60	3,60,000	1.80	3,60,000

Add: Fixed marketing expenses	8.00	4,80,000	4.80	4,80,000	2.40	4,80,000
Add: Variable distribution cost	30.00	18,00,000	30.00	30,00,000	30.00	60,00,000
Add: Special Costs:						
Gift items costs	-	-	-	-	30.00	60,00,000
Customers' prizes*	-	-	2.00	2,00,000	1.00	2,00,000
Refreshments	-	-	2.00	2,00,000	1.00	2,00,000
Television programme sponsorship cost			20.00	20,00,000	10.00	20,00,000
Cost of sales	424.00	2,54,40,000	422.40	4,22,40,000	386.20	7,72,40,000
Profit (Bal. fig.)	176.00	1,05,60,000	137.60	1,37,60,000	113.80	2,27,60,000
Sales revenue	600.00	3,60,00,000	560.00	5,60,00,000	500.00	10,00,00,000

*** Customers' prize cost:**

Particulars	Amount (Rs.)
1st Prize	60,000

2nd Prize	50,000
3rd Prize	40,000
Consolation Prizes (10 × Rs. 5,000)	50,000
Total	2,00,000

Comparison of Profit

30% capacity	50% capacity	100% capacity
Rs. 176/Rs. 600× 100	Rs. 137.6 / Rs. 560× 100	Rs.113.8 / Rs.500× 100
29.33 %	24.57%	22.76%

Profit (in value as well as in percentage) is higher at 30% level of capacity than that at 50% and 100% level of capacity.

Question 27

A Ltd. has the following expenditures for the year ended 31st March 2021:

Sl. No.		Amount (Rs.)	Amount (Rs.)
(i)	**Raw materials purchased**		**10,00,00,000**
(ii)	**Freight inward**		**11,20,600**
(iii)	**Wages paid to factory workers**		**29,20,000**

(iv)	Royalty paid for production		1,72,600
(v)	Amount paid for power & fuel		4,62,000
(vi)	Job charges paid to job workers		8,12,000
(vii)	Stores and spares consumed		1,12,000
(viii)	Depreciation on office building		56,000
(ix)	Repairs & Maintenance paid for:		
	-Plant & Machinery	48,000	
	-Sales office building	18,000	66,000
(x)	Insurance premium paid for:		
	-Plant & Machinery	31,200	
	-Factory building	18,100	49,300
(xi)	Expenses paid for quality control check activities		19,600
(xii)	Research & development cost paid for improvement in production process		18,200
(xiii)	Expenses paid for pollution control and engineering & maintenance		26,600

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(xiv)	Salary paid to Sales & Marketing mangers:		10,12,000
(xv)	Salary paid to General Manager		12,56,000
(xvi)	Packing cost paid for:		
	-Primary packing necessary to maintain quality	96,000	
	-For re-distribution of finished goods	1,12,000	2,08,000
(xvii)	Fee paid to independent directors		2,20,000
(xviii)	Performance bonus paid to sales staffs		1,80,000
(xix)	Value of stock as on 1st April, 2020:		
	-Raw materials	18,00,000	
	-Work-in-process	9,20,000	
	-Finished goods	11,00,000	38,20,000
(xx)	Value of stock as on 31st March, 2021:		
	-Raw materials	9,60,000	
	-Work-in-process	8,70,000	
	-Finished goods	18,20,000	36,50,000

Amount realized by selling of scrap and waste generated during manufacturing process – Rs. 86,000/-

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From the above data you are requested to PREPARE Statement of cost for A Ltd. for the year ended 31st March, 2021, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

(MTP March '21 & Sep '23, RTP May'21)(MTP Nov'21 & April '23)

Answer 27

Statement of Cost of A Ltd. for the year ended 31st March, 2021:

Sl. No.	Particulars	Amount (Rs.)	Amount (Rs.)
(i)	Material Consumed:		
	-Raw materials purchased	10,00,00,000	
	-Freight inward	11,20,600	
	Add: Opening stock of raw materials	18,00,000	
	Less: Closing stock of raw materials	(9,60,000)	10,19,60,600
(ii)	Direct employee (labour) cost:		
	-Wages paid to factory workers		29,20,000
(iii)	Direct expenses:		
	-Royalty paid for production	1,72,600	
	-Amount paid for power & fuel	4,62,000	
	-Job charges paid to job workers	8,12,000	14,46,600

	Prime Cost		10,63,27,200
(iv)	Works/ Factory overheads:		
	-Stores and spares consumed	1,12,000	
	-Repairs & Maintenance paid for plant & machinery	48,000	
	-Insurance premium paid for plant & machinery	31,200	
	-Insurance premium paid for factory building	18,100	
	-Expenses paid for pollution control and engineering & maintenance	26,600	2,35,900
	Gross factory cost		10,65,63,100
	Add: Opening value of W-I-P		9,20,000
	Less: Closing value of W-I-P		(8,70,000)
	Factory Cost		10,66,13,100
(v)	Quality control cost:		
	-Expenses paid for quality control check activities		19,600
(vi)	Research & development cost paid for improvement in production process		18,200

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(vii)	Less: Realisable value on sale of scrap and waste		(86,000)
(viii)	Add: Primary packing cost		96,000
	Cost of Production		10,66,60,900
	Add: Opening stock of finished goods		11,00,000
	Less: Closing stock of finished goods		(18,20,000)
	Cost of Goods Sold		10,59,40,900
(ix)	Administrative overheads:		
	-Depreciation on office building	56,000	
	-Salary paid to General Manager	12,56,000	
	-Fee paid to independent directors	2,20,000	15,32,000
(x)	Selling overheads:		
	-Repairs & Maintenance paid for sales office building	18,000	
	-Salary paid to Manager- Sales & Marketing	10,12,000	
	-Performance bonus paid to sales staffs	1,80,000	12,10,000
(xi)	Distribution overheads:		

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	-Packing cost paid for re-distribution of finished goods		1,12,000
	Cost of Sales		10,87,94,900

Question 28

A Ltd. Co. has capacity to produce 1, 00,000 units of a product every month. Its works cost at varying levels of production is as under:

Level	Works cost per unit (Rs.)
10%	**400**
20%	**390**
30%	**380**
40%	**370**
50%	**360**
60%	**350**
70%	**340**
80%	**330**
90%	**320**

100%	310

Its fixed administration expenses amount to Rs. 1, 50,000 and fixed marketing expenses amount to Rs.2, 50,000 per month respectively. The variable distribution cost amounts to Rs. 30 per unit.

It can sell 100% of its output at Rs.500 per unit provided it incurs the following further expenditure:

(a) it gives gift items costing Rs. 30 per unit of sale;

(b) it has lucky draws every month giving the first prize of Rs. 50,000; 2nd prize of Rs. 25,000, 3rd prize of Rs. 10,000 and three consolation prizes of Rs. 5,000 each to customers buying the product.

(c) it spends Rs.1,00,000 on refreshments served every month to its customers;

(d) it sponsors a television programme every week at a cost of Rs. 20,00,000 per month.

It can market 30% of its output at Rs.550 per unit without incurring any of the expenses referred to in (a) to (d) above.

PREPARE a cost sheet for the month showing total cost and profit at 30% and 100% capacity level.

(Study material)

Answer 28

Cost Sheet (For the month)

Level of Capacity	30%	100%
	30,000 units	1,00,000 units

	Per unit (Rs.)	Total (Rs.)	Per unit (Rs.)	Total (Rs.)
Works Cost	**380.00**	**1,14,00,000**	**310.00**	**3,10,00,000**
Add: Fixed administration expenses	5.00	1,50,000	1.50	1,50,000
Add: Fixed marketing expenses	8.33	2,50,000	2.50	2,50,000
Add: Variable distribution cost	30.00	9,00,000	30.00	30,00,000
Add: Special Costs:				
- Gift items costs	—	—	30.00	30,00,000
- Customers' prizes*	—	—	1.00	1,00,000
- Refreshments	—	—	1.00	1,00,000
- Television programme sponsorship cost	—	—	20.00	20,00,000
Cost of sales	**423.33**	**1,27,00,000**	**396.00**	**3,96,00,000**
Profit (Balancing figure)	126.67	38,00,000	104.00	1,04,00,000
Sales revenue	**550.00**	**1,65,00,000**	**500.00**	**5,00,00,000**

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***Customers' prize cost:**

	Amount (Rs.)
1st Prize	50,000
2nd Prize	25,000
3rd Prize	10,000
Consolation Prizes (3 × Rs.5,000)	15,000
Total	1,00,000

Topic 9 Batch Costing / Job Costing

Question 29

The following data relates to the manufacturing project received for the budgeted output of 19,600 units. You are required to CALCULATE the selling price per unit covering a profit of 25% on the selling price.

Direct materials: 40 sq. m. per unit @ Rs. 10.60 per sq. m.

Direct wages: Bonding department 48 hours per unit @ Rs. 25 per hour

Finishing department 30 hours per unit @ Rs. 19 per hour

Budgeted costs and hours per annum- Variable overhead:

	(Rs.)	Total hours
Bonding department	**15,00,000**	**10,00,000**

Finishing department	**6,00,000**	**6,00,000**

Fixed overhead-

	(Rs.)
Production	**15,68,000**
Selling and distribution	**7,84,000**
Administration (General)	**3,92,000**

(March '22)

Answer 29

Decision making Cost Sheet (per unit)

Particulars	**(Amount in Rs.)**	**(Amount in Rs.)**
Direct materials 40 m2 at Rs. 10.60 per m2		424
Direct wages:		
Bonding department- 48 hours at Rs. 25 per hour	1,200	
Finishing department- 30 hours at Rs. 19 per hour	570	1,770
Prime Cost		2,194
Variable overhead:*		

Bonding department- 48 hours at Rs. 1.50 per hour	72	
Finishing department-30 hours at Rs. 1.00 per hour	30	102
Variable production cost		2,296
Fixed production overhead#		80
Total production cost		2,376
Selling and distribution cost$	40	
Administration cost$	20	60
Total Cost		2,436

Selling price per unit = Rs. 2,436 × $\frac{100}{75}$ = Rs. 3,248

Working Notes:

* Variable overhead rates –

Bonding: $\frac{15,00,000}{10,00,000 \text{ hours}}$ = Rs. 1.50

Finishing: $\frac{6,00,000}{6,00,000 \text{ hours}}$ = Rs. 1.00

Fixed production overhead rate per unit of output = $\frac{15,68,000}{19,600 \text{ hours}}$ = Rs. 80

$ Selling and production cost per unit of output = $\frac{7,84,000}{19,600 \text{ hours}}$ = Rs. 40

Administration cost per unit of output = $\frac{3,92,000}{19,600 \text{ hours}}$ = Rs. 20

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Question 30

CT Limited is engaged in producing medical equipment. It has furnished following details related to its products produced during a month:

	Units	Amount (Rs.)
Raw materials		
Opening stock	**1,000**	**90,00,000**
Purchases	**49,000**	**44,10,00,000**
Closing stock	**1,750**	**1,57,50,000**
Works-in-progress		
Opening	**2,000**	**1,75,50,000**
Closing	**1,000**	**94,50,000**
Direct employees' wages, allowances etc.		**6,88,50,000**
Primary packaging cost (per unit)		**1,440**
R&D expenses & Quality control expenses		**2,10,60,000**
Consumable stores, depreciation on plant		**3,42,00,000**
Administrative overheads related to production		**3,15,00,000**
Selling expenses		**4,84,30,800**

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Royalty paid for production		**3,64,50,000**
Cost of web-site (for online sale) maintenance		**60,75,000**
Secondary packaging cost (per unit)		**225**

There was a normal scrap of 250 units of direct material which realized Rs. 5,400 per unit. The entire finished product was sold at a profit margin of 20% on sales. You are required to PREPARE a cost sheet showing:

(i) Prime cost

(ii) Gross works cost

(iii) Factory costs

(iv) Cost of production

(v) Profit

(vi) Sales.

(RTP Nov'22)

Answer 30

Cost Sheet

Particulars	Units	Amount (Rs.)
Material		
Opening stock	1,000	90,00,000
Add: Purchases	49,000	44,10,00,000

Less: Closing stock	(1,750)	(1,57,50,000)
	48,250	43,42,50,000
Less: Normal wastage of materials realized @ Rs. 5,400 per unit	(250)	(13,50,000)
Material consumed		43,29,00,000
Direct employee's wages and allowances		6,88,50,000
Direct expenses- Royalty paid for production		3,64,50,000
Prime cost	48,000	53,82,00,000
Factory overheads - Consumable stores, depreciation etc.		3,42,00,000
Gross Works Cost	48,000	57,24,00,000
Add: Opening WIP	2,000	1,75,50,000
Less: Closing WIP	(1,000)	(94,50,000)
Factory/Works Cost	49,000	58,05,00,000
Administration Overheads related to production		3,15,00,000
R&D expenses and Quality control cost		2,10,60,000
Add: Primary packaging cost @ Rs. 1,440 per unit		7,05,60,000

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Cost of production	49,000	70,36,20,000
Selling expenses		4,84,30,800
Cost of maintaining website for online sale		60,75,000
Secondary packaging cost @ Rs. 225 per unit	49,000	1,10,25,000
Cost of sales		76,91,50,800
Add: Profit @ 20% on sales or 25% of cost		19,22,87,700
Sales value		96,14,38,500

Question 31

Following information is available from the books of YSPP Ltd. for the current year ending 31st March:

S. No.	Particulars	(Rs.)	(Rs.)
(i)	**Raw materials purchased**		**35,00,00,000**
(ii)	**Freight inwards**		**39,22,100**
(iii)	**Wages paid to factory workers**		**1,02,20,000**
(iv)	**Contribution made towards employees' PF & ESIS**		**12,60,000**

(v)	Hire charges paid for hiring specific equipment		8,40,000
(vi)	Amount paid for power & fuel		16,17,000
(vii)	Amount paid for purchase of moulds and patterns (life is equivalent to four years production)		31,36,000
(viii)	Job charges paid to job workers		28,42,000
(ix)	Lease rent paid for production assets		3,92,000
(x)	Depreciation on:		
	Factory building	2,94,000	
	Office building	1,96,000	
	Plant & Machinery	4,41,000	
	Delivery vehicles	3,01,000	12,32,000
(xi)	Salary paid to supervisors		4,41,000
(xii)	Repairs & Maintenance paid for:		
	Plant & Machinery	1,68,000	
	Sales office building	63,000	2,31,000

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(xiii)	Insurance premium paid for:		
	Plant & Machinery	1,09,200	
	Factory building	63,350	
	Stock of raw materials & WIP	1,26,000	2,98,550
(xiv)	Expenses paid for quality control check activities		68,600
(xv)	Salary paid to quality control staffs		3,36,700
(xvi)	Research & development cost paid for improvement in production process		63,700
(xvii)	Expenses paid for administration of factory work		4,15,100
(xviii)	Salary paid to functional mangers:		
	Production control	33,60,000	
	Finance & Accounts	32,13,000	
	Sales & Marketing	35,42,000	1,01,15,000
(xix)	Salary paid to General Manager		43,96,000
(xx)	Packing cost paid for:		

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	Primary packing necessary to maintain quality	3,36,000	
	For re-distribution of finished goods	3,92,000	7,28,000
(xxi)	Fee paid to auditors		6,30,000
(xxii)	Fee paid to independent directors		7,70,000
(xxiii)	Value of stock as on 1st April (beginning):		
	Raw materials	63,00,000	
	Work-in-process	32,20,000	
	Finished goods	38,50,000	1,33,70,000
(xxiv)	Value of stock as on 31st March (ending):		
	Raw materials	33,60,000	
	Work-in-process	30,45,000	
	Finished goods	63,00,000	1,27,05,000

Due to delay in picking up cargo from the port, YSPP Ltd. had to pay Rs. 15,000 as demurrage in the month of March.

From the above data you are required to PREPARE Statement of cost for YSPP Ltd. for the year ended 31st March, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of sales.

Answer 31

(a) Statement of Cost of YSPP Ltd. for the year ended 31st March:

S. NO.	PARTICULARS	(Rs.)	(Rs.)
(I)	Material consumed:		
	Raw materials purchased	35,00,00,000	
	Freight inwards	39,22,100	
	Add: opening stock of raw materials	63,00,000	
	Less: closing stock of raw materials	(33,60,000)	35,68,62,100
(II)	Direct employee (labour) cost:		
	Wages paid to factory workers	1,02,20,000	
	Contribution made towards employees' PF & ESIS	12,60,000	1,14,80,000
(III)	Direct expenses:		
	Hire charges paid for hiring specific equipment	8,40,000	
	Amount paid for power & fuel	16,17,000	
	Amortised cost of moulds and patterns	7,84,000	

	Job charges paid to job workers	28,42,000	60,83,000
	Prime cost		37,44,25,100
(IV)	Works/ factory overheads:		
	Lease rent paid for production assets	3,92,000	
	Depreciation on factory building	2,94,000	
	Depreciation on plant & machinery	4,41,000	
	Repairs & maintenance paid for plant & machinery	1,68,000	
	Insurance premium paid for plant & machinery	1,09,200	
	Insurance premium paid for factory building	63,350	
	Insurance premium paid for stock of raw materials & WIP	1,26,000	
	Salary paid to supervisors	4,41,000	20,34,550
	Gross factory cost		37,64,59,650
	Add: opening value of w-i-p		32,20,000
	Less: closing value of w-i-p		(30,45,000)
	Factory cost		37,66,34,650

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(V)	Quality control cost:		
	Expenses paid for quality control check activities	68,600	
	Salary paid to quality control staffs	3,36,700	4,05,300
(VI)	Research & development cost paid for improvement in production process		63,700
(VII)	Administration cost related with production:		
	-Expenses paid for administration of factory work	4,15,100	
	-Salary paid to production control manager	33,60,000	37,75,100
(VIII)	Add: primary packing cost		3,36,000
	Cost of production		38,12,14,750
	Add: opening stock of finished goods		38,50,000
	Less: closing stock of finished goods		(63,00,000)
	Cost of goods sold		37,87,64,750
(IX)	Administrative overheads:		
	Depreciation on office building	1,96,000	

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	Salary paid to manager- finance & accounts	32,13,000	
	Salary paid to general manager	43,96,000	
	Fee paid to auditors	6,30,000	
	Fee paid to independent directors	7,70,000	92,05,000
(X)	Selling overheads:		
	Repairs & maintenance paid for sales office building	63,000	
	Salary paid to manager- sales & marketing	35,42,000	36,05,000
(XI)	Distribution overheads:		
	Depreciation on delivery vehicles	3,01,000	
(XII)	Packing cost paid for re-distribution of finished goods	3,92,000	6,93,000
	Cost of sales		39,22,67,750

Topic 10 MCQs on Cost Concepts

Multiple Choice Questions (MCQ's)

Question 32

Generally, for the purpose of cost sheet preparation, costs are classified on the basis of:

(a) Functions

(b) Variability

(c) Relevance

(d) Nature

(Study material)

Ans: (a) Functions

Reason:

In cost sheet preparation, costs are typically classified based on functions such as manufacturing, administrative, selling and distribution, etc. This classification helps in determining the cost for each functional area within the organization, making it easier to calculate and analyze cost breakdowns for specific operations. While costs can also be classified based on variability (fixed vs. variable), relevance (relevant vs. irrelevant costs), or nature (materials, labor, overhead), the functional classification is most commonly used for cost sheet preparation.

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Question 33

Which of the following does not form part of prime cost:

(a) Cost of packing

(b) Cost of transportation paid to bring materials to factory

(c) GST paid on raw materials (input credit cannot be claimed)

(d) Overtime premium paid to workers.

(Study material)

Ans: (a) Cost of packing

Reason:

Prime cost includes the direct costs that are directly attributable to the production process, specifically direct materials and direct labor. This typically includes:

- Cost of transportation paid to bring materials to the factory (since it is a direct cost for getting raw materials)
- GST paid on raw materials (if input credit cannot be claimed, it becomes part of the cost of materials)
- Overtime premium paid to workers (since it is directly related to labor costs)

However, the cost of packing does not form part of prime cost because it is considered part of factory overheads (indirect costs) as it is associated with the final product and not directly with the production process.

Question 34

A Ltd. received an order, for which it purchased a special frame for manufacturing, it is a part of:

(a) Direct Materials

(b) Direct expenses

(c) Factory Overheads

(d) Administration Overheads

(Study material)

Ans: (b) Direct expenses

Reason:

The special frame purchased by A Ltd. for manufacturing the product is considered a direct expense because it is a specific cost incurred for the production of that particular order. Direct expenses are costs that are directly attributable to the production of a specific product or job but are not classified as direct materials or direct labor. This could include special tools, frames, or other items that are required for a specific order but aren't part of the general materials inventory.

It is not considered direct materials because it is a specialized item for a specific job, nor does it fall under factory overheads or administration overheads, which are general or indirect costs.

Question 35

Salary paid to plant supervisor is a part of

(a) Direct expenses

(b) Factory overheads

(c) Quality control cost

(d) Administration cost

(Study material)

Ans: (b) Factory overheads

Reason:

The salary paid to the plant supervisor is considered part of factory overheads because it is an indirect cost associated with the overall operation of the manufacturing facility. Factory overheads include all costs that are not directly tied to specific products but are necessary for the manufacturing process. This category encompasses indirect labor (such as plant supervisors), indirect materials, and other overhead costs related to the production process.

The salary is not considered direct expenses, as it is not directly attributable to a specific product. It is also not part of quality control cost or administration cost, as those are separate types of expenses.

Question 36

Depreciation of director's laptop is treated as a part of:

(a) Administration Overheads

(b) Factory Overheads

(c) Direct Expenses

(d) Research & Development cost.

(Study material)

Ans: (a) Administration Overheads

Reason:

The depreciation of the director's laptop is treated as part of administration overheads because it is an indirect cost associated with the general administration of the business. Since the laptop is used for administrative tasks (likely by the director in performing management duties), the depreciation on the laptop falls under administration overheads, which include costs related to the overall management and administration of the company.

It is not classified under factory overheads, as it is not related to production, direct expenses, or research & development costs.

Question 37

A manufacture has set-up a lab for testing of products for compliance with standards, salary of this lab staffs are part of:

(a) Works overheads

(b) Quality Control Cost

(c) Direct Expenses

(d) Research & Development Cost.

(Study material)

Ans: (b) Quality Control Cost

Reason:

The salary of the lab staff working on testing products for compliance with standards is considered part of quality control cost. Quality control costs are incurred to ensure that the products meet the required standards and specifications before they are sold or used. Since the lab is specifically set up for testing products, the staff's salaries directly relate to maintaining the quality of the products, making it part of quality control cost.

It is not part of works overheads, as this typically refers to indirect costs related to the production process, nor is it a direct expense or research & development cost, which are for specific, different purposes.

Question 38

Audit fees paid to auditors is part of:

(a) Administration Cost

(b) Production cost

(c) Selling & Distribution cost

(d) Not shown in cost sheet.

(Study material)

Ans: (a) Administration Cost

Reason:

Audit fees paid to auditors are considered part of administration costs because they are related to the overall administrative and regulatory functions of the company. These costs are incurred to ensure compliance with legal and financial reporting requirements but are not directly related to production or selling activities.

Audit fees do not fall under production costs or selling & distribution costs, as they are not involved in the production or distribution of goods. They are also typically not excluded from the cost sheet, so "Not shown in cost sheet" is not applicable.

Question 39

Salary paid to factory store staff is part of:

(a) Factory overheads

(b) Production Cost

(c) Direct Employee cost

(d) Direct Material Cost.

(Study material)

Ans: (a) Factory overheads

Reason:

The salary paid to factory store staff is part of factory overheads because it is an indirect cost associated with the overall operation of the factory. Factory overheads include costs related

to the support functions within the factory that are not directly tied to the production of specific goods, such as the salaries of factory store staff, who manage inventory but do not directly contribute to the production process.

It is not part of production cost or direct employee cost, as those terms typically refer to direct labor and materials involved in production. Similarly, it is not part of direct material cost because it is related to managing materials, not their direct procurement or usage in production.

Question 40

Canteen expenses for factory workers are part of:

(a) Factory overhead

(b) Administration Cost

(c) Marketing cost

(d) None of the above.

(Study material)

Ans: (a) Factory overhead

Reason:

Canteen expenses for factory workers are considered part of factory overhead because they are indirect costs incurred to support the manufacturing process. Factory overheads include all costs that are necessary for running the factory but are not directly attributable to the production of a specific product, such as maintenance, utilities, and employee welfare expenses like canteen costs.

It is not classified as administration costs, marketing costs, or none of the above, as these are unrelated to the factory's operational costs.

Question 41

A company pays royalty to State Government on the basis of production, it is treated as:

(a) Direct Material Cost

(b) Factory Overheads

(c) Direct Expenses

(d) Administration cost.

(Study material)

Ans: (c) Direct Expenses

Reason:

The royalty paid to the State Government on the basis of production is treated as direct expenses because it is a cost that is specifically tied to the production of goods. Direct expenses are costs that are incurred directly for a particular product or job, but which are not part of the direct materials or direct labor. Since the royalty is based on the level of production, it is directly linked to the manufacturing process, making it a direct expense.

It is not classified as direct material cost, factory overheads, or administration cost, as it is not related to the materials, indirect costs of production, or general administrative activities.

Question 42

Following information is available for the month of March relating to manufacturing of a product:

Particulars	Amount (Rs.)

Cost of Sales	**37,51,540**
Stock of Raw material as on 01st March	**6,50,000**
Direct Wages	**11,44,000**
Hire charges paid for Plant (indirect expenses)	**3,24,740**
Salary to office staff	**1,78,750**
Maintenance of office building	**13,000**
Depreciation on Delivery van	**39,000**
Warehousing charges	**61,750**
Stock of Raw material as on 31st March	**1,95,000**
Realisable value on sale of scrap	**32,500**

Factory overheads are 20% of the Prime cost.

FIND OUT the value of Raw Material purchased with the help of Statement of Cost.

(a) Rs. 10, 40,000

(b) Rs. 14, 95,000

(c) Rs. 26, 39,000

(d) Rs. 34, 91,540

(RTP Jan 2025)

Ans: (a) Rs. 10, 40,000

Statement of Cost for the month of March

Particulars	Amount (Rs.)	Amount (Rs.)
Cost of Material Consumed:		
Raw materials purchased	10,40,000**	
Add: Opening stock of raw materials	6,50,000	
Less: Closing stock of raw materials	(1,95,000)	14,95,000
Direct Wages		11,44,000
Prime Cost		26,39,000*
Hire charges paid for Plant (indirect expenses)	3,24,740	
Factory overheads (20% of Prime cost)	5,27,800	8,52,540
Works/ Factory Cost		34,91,540
Less: Realisable value on sale of scrap		(32,500)
Cost of Production/ Cost of Goods Sold		34,59,040
Administrative overheads:		
Maintenance of office building	13,000	
Salary paid to Office staff	1,78,750	1,91,750

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Distribution overheads:		
Depreciation on delivery van	39,000	
Warehousing charges	61,750	1,00,750
Cost of Sales		37,51,540

(Reverse calculation to be done to find out the value of Raw materials purchased)

* Prime Cost + 3, 24,740 + 20% of Prime Cost = 34, 91,540

1.2 Prime Cost = 34, 91,540 - 3, 24,740 = 31, 66,800

Prime Cost = 26, 39,000

** Raw materials purchased = 14, 95,000 - 6, 50,000 + 1, 95,000 = 10, 40,000

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Chapter 7

Cost Accounting System

Topic 1 Integrated Accounting System

Question 1

A manufacturing company disclosed a net loss of Rs.3, 47,000 as per their cost accounts for the year ended March 31,20X8. The financial accounts however disclosed a net loss of Rs. 5, 10,000 for the same period. The following information was revealed because of scrutiny of the figures of both the sets of accounts.

(i)	Factory Overheads under-absorbed	40,000
(ii)	Administration Overheads over-absorbed	60,000
(iii)	Depreciation charged in Financial Accounts	3,25,000
(iv)	Depreciation charged in Cost Accounts	2,75,000
(v)	Interest on investments not included in Cost Accounts	96,000
(vi)	Income-tax provided	54,000
(vii)	Interest on loan funds in Financial Accounts	2,45,000
(viii)	Transfer fees (credit in financial books)	24,000
(ix)	Stores adjustment (credit in financial books)	14,000

(x) Dividend received	**32,000**

PREPARE a memorandum Reconciliation Account.

(MTP March '19, RTP Nov 20) (Old & New SM, MTP Oct'19)

Answer 1

Memorandum Reconciliation Accounts

	(Rs.)		(Rs.)
To Net Loss as per Costing books	3,47,000	By Administration overheads over Recovered in cost accounts	60,000
To Factory overheads under absorbed in Cost Accounts	40,000	By Interest on investment not included in Cost Accounts	96,000
To Depreciation under charged in Cost Accounts	50,000	By Transfer fees in Financial books	24,000
To Income- Tax not provided in Cost Accounts	54,000	By Stores adjustment(Credit in financial books)	14,000
To Income- Tax not provided in Cost Account	54,000	By Dividend received in financial books	32,000
To Interest on Loan Funds in Financial Accounts	2,45,000		
		By Net loss as per Financial books	5,10,000

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	7,36,000		7,36,000

Question 2

"Is reconciliation of cost accounts and financial accounts necessary in case of integrated accounting system?" EXPLAIN.

(MTP, March '19, March '23, April '23 & Sep '23)(RTP May '22)

Answer 2

In integrated accounting system cost and financial accounts are kept in the same set of books.

Such a system will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains. In fact all information that management requires from a system of Costing for doing its work properly is made available. The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and the management maintains full control over the liabilities and assets of its business.

Since, only one set of books are kept for both cost accounting and financial accounting purpose so there is no necessity of reconciliation of cost and financial accounts.

Question 3

BRIEF OUT advantages of Integrated Accounts.

(MTP April '22, Old & New SM)

Answer 3

Advantages of Integrated Accounts are as follows:

(i) No need for Reconciliation- The Question of reconciling costing profit and financial profit does not arise, as there is only one figure of profit.

(ii) Less efforts- Due to use of one set of books, there is a significant saving in efforts made.

(iii) Less time consuming- No delay is caused in obtaining information as it is provided from books of original entry.

(iv) Economical process- It is economical also as it is based on the concept of "Centralisation of Accounting function".

Question 4

SHOW Journal entries for the following transactions assuming cost and financial accounts are integrated:

(1) Materials issued:	
Direct	**Rs. 6,50,000**
Indirect (to factory)	**Rs. 2,30,000**
(2) Allocation of wages (25% indirect)	**Rs. 9,00,000**
(3) Under/Over absorbed overheads:	
Factory (Over)	**Rs. 60,000**
Administration (Under)	**Rs. 50,000**
(4) Payment to Creditors (Trade payables)	**Rs. 9,00,000**

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(5) Collection from Debtors (Trade receivables)	**Rs. 8,00,000**

(MTP May 20)

Answer 4

Journal Entries under Integrated system of accounting

Particulars		**Rs.**	**Rs.**
(i) Work-in-Progress Control A/c	Dr.	6,50,000	
Factory Overhead Control A/c	Dr.	2,30,000	
To Stores Ledger Control A/c			8,80,000
(Being issue of Direct and Indirect materials)			
(ii) Work-in Progress Ledger Control A/c Factory	Dr.	6,75,000	
Overhead control A/c	Dr.	2,25,000	
To Wages Control A/c			9,00,000
(Being allocation of Direct and Indirect wages)			
(iii) Factory Overhead Control A/c	Dr.	60,000	
To Costing Profit & Loss A/c			60,000
(Being transfer of over absorption of Factory overhead)			

(iv) Costing Profit & Loss A/c	Dr.	50,000	
To Administration Overhead Control A/c			50,000
(Being transfer of under absorption of Administration overhead)			
(v) Trade Payables A/c	Dr.	9,00,000	
To Cash/ Bank A/c			9,00,000
(Being payment made to creditors)			
(vi) Cash/ Bank A/c	Dr.	8,00,000	
To Trade receivables A/c			8,00,000
(Being payment received from debtors)			

Question 5

Explain integrated accounting system and state its advantages.

(PYP May '19)

Answer 5

Integrated Accounting System: Integrated Accounts is the name given to a system of accounting, whereby cost and financial accounts are kept in the same set of books. Obviously, then there will be no separate sets of books for Costing and Financial records.

Integrated accounts provide or meet out fully the information requirement for Costing as well as for Financial Accounts. For Costing it provides information useful for ascertaining the cost

of each product, job, and process, operation of any other identifiable activity and for carrying necessary analysis.

Integrated accounts provide relevant information which is necessary for preparing profit and loss account and the balance sheets as per the requirement of law and also helps in exercising effective control over the liabilities and assets of its business.

Advantages of Integrated Accounting System

The main advantages of Integrated Accounts are as follows:

(i) No need for Reconciliation - The question of reconciling costing profit and financial profit does not arise, as there is only one figure of profit.

(ii) Less efforts - Due to use of one set of books, there is a significant saving in efforts made.

(iii) Less time consuming - No delay is caused in obtaining information as it is provided from books of original entry.

(iv) Economical process - It is economical also as it is based on the concept of "Centralization of Accounting function".

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Important Note:-

This theoretical question was related to advantages of 'Integrated Accounting'. Average performance of the examinees was observed.

Question 6

Explain what are the pre-requisites of integrated accounting.

(PYP Nov 20, RTP May'23) (SM May 22, MTP Mar'22)

Answer 6

The essential pre-requisites for integrated accounts include the following steps:

• The management's decision about the extent of integration of the two sets of books. Some concerns find it useful to integrate up to the stage of prime cost or factory cost while other prefer full integration of the entire accounting records.

• A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.

• An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.

• Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.

• Under this system there is no need for a separate cost ledger. Of course there will be a number of subsidiary ledgers; in addition to the useful Customers' Ledger and the Bought Ledger, there will be: (a) Stores Ledger; (b) Stock Ledger and (c) Job Ledger.

Question 7

Briefly explain the essential features of a good Cost Accounting System.

(PYP May'22, RTP Nov'18, MTP Oct'22)

Answer 7

The essential features, which a good cost accounting system should possess, are as follows:

(a) Informative and simple: Cost accounting system should be tailor-made, practical, simple and capable of meeting the requirements of a business concern. The system of costing should not sacrifice the utility by introducing inaccurate and unnecessary details.

(b) Accurate and authentic: The data to be used by the cost accounting system should be accurate and authenticated; otherwise it may distort the output of the system and a wrong decision may be taken.

(c) Uniformity and consistency: There should be uniformity and consistency in classification, treatment and reporting of cost data and related information. This is required for benchmarking and comparability of the results of the system for both horizontal and vertical analysis.

(d) Integrated and inclusive: The cost accounting system should be integrated with other systems like financial accounting, taxation, statistics and operational research etc. to have a complete overview and clarity in results.

(e) Flexible and adaptive: The cost accounting system should be flexible enough to make necessary amendment and modifications in the system to incorporate changes in technological, reporting, regulatory and other requirements.

(f) Trust on the system: Management should have trust on the system and its output. For this, an active role of management is required for the development of such a system that reflects a strong conviction in using information for decision making.

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Question 8

EXPLAIN what the essential pre-requisites of Integrated Accounting are System.

(Study Material)

Answer 8

Essential pre-requisites for Integrated Accounts

The essential pre-requisites for integrated accounts include the following steps:

1. The management's decision about the extent of integration of the two sets of books. Some concerns find it useful to integrate up to the stage of prime cost or factory cost while other prefers full integration of the entire accounting records.

2. A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.

3. An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.

4. Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.

Under this system there is no need for a separate cost ledger. Of course, there will be a number of subsidiary ledgers; in addition to the useful Customers' Ledger and the Purchase Ledger, there will be: (a) Stores Ledger; (b) Stock Ledger and (c) Job Ledger.

Question 9

STATE what are the advantages of Integrated Accounting?

(Study Material)

Answer 9

The main advantages of Integrated Accounts are as follows:

(a) No need for Reconciliation- The question of reconciling costing profit and financial profit does not arise, as there is only one figure of profit.

(b) Less efforts- Due to use of one set of books, there is a significant saving in efforts made.

(c) Less time consuming- No delay is caused in obtaining information as it is provided from books of original entry.

(d) Economical process- It is economical also as it is based on the concept of "Centralization of Accounting function".

Question 10

Dutta Enterprises operates an Integral system of accounting. You are required to PASS the Journal Entries for the following transactions that took place for the year ended 31st March. (Narrations are not required.)

	(Rs.)
Raw Materials purchased (50% on Credit)	6,00,000
Materials issued to production	4,00,000
Wages paid (50% Direct)	2,00,000
Wages charged to production	1,00,000
Factory Overheads incurred	80,000
Factory Overheads charged to production	1,00,000
Selling and Distribution Overheads incurred	40,000
Finished Goods at cost	5,00,000
Sales (50% Credit)	7,50,000
Closing stock	Nil
Receipts from debtors	2,00,000
Payments to creditors	2,00,000

(Study Material)

Answer 10

		Dr.(Rs.)	Cr.(Rs.)
Stores Ledger Control A/c……	Dr.	6,00,000	
To Payables (Creditors) A/c			3,00,000
To Cash or Bank			3,00,000
Work-in-Process Control A/c……	Dr.	4,00,000	
To Stores Ledger Control A/c			4,00,000
Wages Control A/c……..	Dr.	2,00,000	
To Bank A/c			2,00,000
Factory Overhead Control A/c……	Dr.	1,00,000	
To Wages Control A/c			1,00,000
Work-in-Process Control A/c……	Dr.	1,00,000	
To Wages Control A/c			1,00,000
Factory Overhead Control A/c……	Dr.	80,000	
To Bank A/c			80,000
Work-in-Process Control A/c……	Dr.	1,00,000	
To Factory Overhead Control A/c			1,00,000

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Selling and Dist. Overhead Control A/c	Dr.	40,000	
To Bank A/c			40,000
Finished Goods Control A/c……	Dr.	5,00,000	
To Work-in-Process Control A/c			5,00,000
Cost of Sales A/c……	Dr.	5,40,000	
To Finished Goods Control A/c			5,00,000
To Selling and Distribution Control A/c			40,000
Receivables (Debtors) A/c……	Dr.	3,75,000	
Bank or Cash A/c……		3,75,000	
To Sales A/c	Dr.		7,50,000
Bank A/c……	Dr.	2,00,000	
To Receivables (Debtors) A/c			2,00,000
Payables (Creditors) A/c……..	Dr.	2,00,000	
To Bank A/c			2,00,000

Topic 2 Non-integrated Accounting System

Question 11

Journalise the following transactions, in cost books under Non- Integrated system of Accounting.

(i) Credit Purchase of Material Rs. 27,000

(ii) Manufacturing overhead charged to Production Rs. 6,000

(iii) Selling and Distribution overheads recovered from Sales Rs. 4,000

(vi) Indirect wages incurred Rs. 8,000

(v) Material returned from production to stores Rs. 9,000

(PYP Nov'19, MTP Oct '21)

Answer 11

Journal entries are as follows:

		Dr.	**Cr.**
		(Rs.)	**(Rs.)**
(i) Stores Ledger Control A/c.....	Dr.	27,000	
To Cost Ledger Control A/c			27,000
(ii) Work-in-Process Control A/c.....	Dr.	6,000	
To Manufacturing Overhead Control A/c			6,000
(iii) Cost of Sales A/c.....	Dr.	4,000	

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To Selling & Dist. Overhead Control A/c			4,000
(iv) (1) Wage Control A/c……	Dr.	8,000	
To Cost Ledger Control A/c			8,000
(2) Manufacturing Overhead Control A/c……	Dr.	8,000	
To Wages Control A/c			8,000
OR			
Manufacturing Overhead Control A/c……	Dr.	8,000	
To Cost Ledger Control A/c			8,000
(v) Stores Ledger Control A/c ……	Dr.	9,000	
To Work-in-Process Control A/c			9,000

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Important Note:-

This was a theoretical question based on Non-Integrated system of accounting. Average performance was observed by the examinees.

Topic 3 Reconciliation of Profits

Question 12

The Trading and Profit and Loss Account of a company for the year ended 31-03-2020 is as under:

Trading and Profit and Loss Account

Particulars	Rs.	Particulars	Rs.
To Materials	26,80,000	By Sales (50,000 units)	62,00,000
To Wages	17,80,000	By Closing stock (2,000 units)	1,50,000
To Factory expenses	9,50,000	By Dividend received	80,000
To General administrative expenses	4,80,200		
To Selling Expenses	2,50,000		
To Preliminary expenses written off	70,000		
To Net profit	2,19,800		
	64,30,000		64,30,000

In the Cost Accounts:

(i) Factory expenses have been allocated to production at 20% of Prime Cost.

(ii) General administrative expenses absorbed at 10% of factory cost.

(iii) Selling expenses charged at Rs.10 per unit sold. Required:

PREPARE the Costing Profit and Loss Account of the company and RECONCILE the Profit/Loss with the profit as shown in the Financial Accounts.

(MTP May 20, Aug 18)

Answer 12

Workings:

Preparation of Cost Sheet/ Cost Statement

Particulars	Amount (Rs.)
Materials	26,80,000
Wages	17,80,000
Prime Cost	44,60,000
Add: Factory expenses (20% of Rs. 44,60,000)	8,92,000
Factory Cost / Cost of Production	53,52,000
Less: Closing Stock ($Rs.$ 53,52,000 / 52,000 units × 2,000units)	(2,05,846)
Cost of Goods Sold	51,46,154
Add: General administrative expenses (10% of Rs.53,52,000)	5,35,200
Add: Selling expenses (Rs.10 × 50,000 units)	5,00,000
Cost of Sales	61,81,354

Profit (Balancing figure)	18,646
Sales Value	62,00,000

Costing Profit and Loss Account

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Materials	26,80,000	By Sales	62,00,000
To Wages	17,80,000	By Closing stock	2,05,846
To Factory expenses	8,92,000		
To General administrative expenses	5,35,200		
To Selling expenses	5,00,000		
To Profit (Balancing figure)	18,646		
	64,05,846		64,05,846

Reconciliation of profit as per Cost Accounts and as per Financial Accounts

Particulars	Amount (Rs.)
Profit as per Cost Accounts Additions:	18,646
Additions:	

General administrative expenses (Over-absorbed) (Rs. 5,35,200 - Rs.4,80,200)	55,000
Selling expenses (Overcharged) (Rs. 5,00,000 – Rs. 2,50,000)	2,50,000
Dividend received	80,000
	4,03,646
Deductions:	
Factory expenses (Under -absorbed) (Rs.9,50,000 – 8,92,000)	58,000
Closing stock (Over-valued) (Rs.2,05,846 – Rs. 1,50,000)	55,846
Preliminary expenses written off	70,000
Profit as per Financial Accounts	1,83,846
	2,19,800

Question 13

A manufacturing company disclosed a net profit Rs.10, 20,000 as per their cost accounts for the year ended 31st March, 2023. The financial accounts however disclosed a net profit of Rs. 6, 94,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

	(Rs.)

(i) Factory Overheads under-absorbed	**80,000**
(ii) Administration Overheads over-absorbed	**1,20,000**
(iii) Depreciation charged in Financial Accounts	**6,50,000**
(iv) Depreciation charged in Cost Accounts	**5,50,000**
(v) Interest on investments not included in Cost Accounts	**1,92,000**
(vi) Income-tax provided	**1,08,000**
(vii) Interest on loan funds in Financial Accounts	**4,90,000**
(viii) Transfer fees (credit in financial books)	**48,000**
(ix) Stores adjustment (credit in financial books)	**28,000**
(x) Dividend received	**64,000**

PREPARE a Reconciliation statement.

(MTP April 23, March '21 & March '19)

Answer 13

Statement of Reconciliation

Particulars	Amount (Rs.)	Amount (Rs.)
Net profit as per Cost accounts		10,20,000
Add:		

Administration Overheads over-absorbed	1,20,000	
Interest on investments	1,92,000	
Transfer fees	48,000	
Stores adjustment	28,000	
Dividend received	64,000	4,52,000
Less:		
Factory Overheads under-absorbed	80,000	
Depreciation under charged	1,00,000	
Income-tax provided	1,08,000	
Interest on loan funds	4,90,000	(7,78,000)
Net profit as per Financial accounts		6,94,000

Question 14

The following is the summarized Trading and Profit and Loss Account of XYZ Ltd. for the year ended 31st March 2019:

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
Direct Material	**14,16,000**	**Sales (30,000 units)**	**30,00,000**

Direct wages	**7,42,000**	**Finished stock (2,000units)**	**1,67,500**
Works overheads	**4,26,000**	**Work-in-progress:**	
Administration overheads	**1,50,000**	**- Materials**	**34,000**
Selling and distribution overheads	**1,65,000**	**- Wages**	**16,000**
Net profit for the year	**3,22,500**	**- Works overhead**	**4,000 54,000**
	32,21,500		**32,21,500**

The company's cost records show that in course of manufacturing a standard unit (i) works overheads have been charged @ 20% on prime cost, (ii) administration overheads are related with production activities and are recovered at Rs. 5 per finished unit, and (iii) selling and distribution overheads are recovered at Rs. 6 per unit sold.

You are required to PREPARE:

(i) Costing Profit and Loss Account indicating the net profits,

(ii) A Statement showing reconciliation between profit as disclosed by the Cost Accounts and Financial Accounts.

(RTP May '19)

Answer 14

(i) Costing Profit and Loss Account for the year ended 31st March 2019:

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)

Material consumed	14,16,000	Sales (30,000 units)	30,00,000
Direct wages	7,42,000		
Prime Cost	21,58,000		
Works overheads	4,31,600		
(20% of Prime cost)	25,89,600		
Less: Work in progress	(54,000)		
Factory cost	25,35,600		
Administration overheads (Rs. 5 × 32,000 units)	1,60,000		
Cost of production	26,95,600		
Less: Finished stock	(1,68,475)		
Cost of goods sold	25,27,125		
Selling and distribution	1,80,000		
overheads (Rs. 6 × 30,000 unit)			
Cost of sales	27,07,125		
Profit (balancing figure)	2,92,875		

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	30,00,000		30,00,000

(ii) Statement reconciling the profit as per costing profit and loss account with the profit as per financial accounts

Particulars	Amount (Rs.)	Amount (Rs.)
Profit as per cost records		2,92,875
Add: Overheads over-absorbed:		
- Works overheads (Rs. 4,31,600 – Rs. 4,26,000)	5,600	
- Administration OH (Rs. 1,60,000 – Rs. 1,50,000)	10,000	
- Selling and Distribution (Rs. 1,80,000 – Rs. 1,65,000)	15,000	30,600
Less: Closing stock overvalued (Rs. 1,68,475 – Rs. 1,67,500)		(975)
Profit as per financial accounts		3,22,500

*It is assumed that the number of units Produced

= Number of units sold + Finished stock = 30,000 + 2,000 = 32,000 units.

Question 15

The financial records of Riva Private Limited showed a net profit of Rs.1, 69,500 for the year ended 31st March, 2022. The cost accounts, however, disclosed a net loss of Rs. 88,500 for the same period. The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:

		(Rs.)
(i)	(Administrative overhead under recovered	63,750.0
(ii)	Factory overhead over recovered	3,37,500.0
(iii)	Depreciation under charged in Cost Accounts	65,000.0
(iv)	Dividend received	50,000.0
(v)	Loss due to obsolescence charged in Financial Accounts	42,000.0
(vi)	Income tax provided	1,09,000.0
(vii)	Bank interest credited in Financial Accounts	34,000.0
(viii)	Value of opening stock:	
	In Cost Accounts	4,12,500.0
	In Financial Accounts	3,62,500.0
(ix)	Value of closing stock:	
	In Cost Accounts	3,13,750.0
	In Financial Accounts	3,30,000.0
(x)	Goodwill written-off in Financial Accounts	62,500.0
(xi)	Notional rent of own premises charged in Cost Accounts	1,50,000.0

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(xii)	**Provision for doubtful debts in Financial Accounts**	**37,500.0**

Prepare a reconciliation statement by taking costing net loss as base.

(RTP May 23) (Same concept different figures MTP April '19)

Answer 15

Statement of Reconciliation

Sl. No.	**Particulars**	**(Rs.)**	**(Rs.)**
	Net loss as per Cost Accounts		(88,500)
	Additions		
1	Factory O/H over recovered	3,37,500	
2	Dividend Received	50,000	
3	Bank Interest received	34,000	
4	Difference in Value of Opening Stock	50,000	
	(4,12,500 – 3,62,500)		
5	Difference in Value of Closing Stock	16,250	
	(3,30,000 – 3,13,7500)		
6	Notional Rent of own Premises	1,50,000	6,37,750
	Deductions		

1	Administration O/H under recovered	63,750	
2	Depreciation under charged	65,000	
3	Loss due to obsolescence	42,000	
4	Income tax Provided	1,09,000	
5	Goodwill written-off	62,500	
6	Provision for doubtful debts	37,500	(3,79,750)
	Net Profit as per Financial A/c.		1,69,500

Question 16

M/s Abid Private Limited disclosed a net profit of Rs. 48,408 as per cost books for the year ending 31st March 2019. However, financial accounts disclosed net loss of Rs. 15,000 for the same period. On scrutinizing both the set of books of accounts, the following information was revealed:

Works Overheads under-recovered in Cost Books	**48,600**
Office Overheads over-recovered in Cost Books	**11,500**
Dividend received on Shares	**17,475**
Interest on Fixed Deposits	**21,650**
Provision for doubtful debts	**17,800**
Obsolescence loss not charged in Cost Accounts	**17,200**
Stores adjustments (debited in Financial Accounts)	**35,433**

Depreciation charged in financial accounts **30,000**

Depreciation recovered in Cost Books **35,000**

Prepare a Memorandum Reconciliation Account.

(PYP May '19)

Answer 16

Memorandum Reconciliation Account

Particulars	(Rs.)	Particulars	(Rs.)
To Works overheads under recovered in Cost Accounts	48,600	By Net profit as per Costing books	48,408
To Provision for doubtful debts	17,800	By Office overheads over covered in cost accounts	11,500
To Obsolescence loss	17,200	By Dividend received on shares	17,475
To Store adjustment (Debit)	35,433	By Interest on fixed deposit	21,650
		By Depreciation overcharged	5,000
		By Net loss as per financial accounts	15,000
	1,19,033		1,19,033

[Note: This question may also be solved by taking net loss as per financial accounts as basis.**]**

Important Note:-

This was a numerical problem on 'Reconciliation of profit of cost account and financial account'. Performance of the examinees was above average. Overall performance in this compulsory question was average.

Question 17

GK Ltd. showed net loss of Rs. 2, 43,300 as per their financial accounts for the year ended 31st March, 2018. However, cost accounts disclosed net loss of Rs. 2, 48,300 for the same period. On scrutinizing both the set of books of accounts, the following information were revealed:

Rs.

(i)	**Works overheads over recovered 30,400**	**30,000**
(ii)	**Selling overheads under recovered**	**20,300**
(iii)	**Administrative overheads under recovered**	**27,700**
(iv)	**Depreciation over charged in cost accounts**	**35,100**
(v)	**Bad debts w/off in financial accounts**	**15,000**
(vi)	**Preliminary Exp. w/off in financial accounts**	**5,000**
(vii)	**Interest credited during the year in financial accounts**	**7,500**

Prepare a reconciliation statement reconciling losses shown by financial and cost accounts by taking costing net loss as base.

(PYP May'18)

Answer 17

Reconciliation Statement

Particulars	Rs.	Rs.
Loss as per Cost Accounts		(2,48,300)
Add: Works overheads over recovered	30,400	
Depreciation over charged in cost accounts	35,100	
Interest credited during the year in financial accounts	7,500	73,000
Less: Selling overheads under recovered	20,300	
Administrative overheads under recovered	27,700	
Bad debts w/off in financial accounts	15,000	
Preliminary Exp. w/off in financial accounts	5,000	(68,000)
Loss as per Financial Accounts		(2,43,300)

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Question 18

(Also includes concepts of Cost Sheet)

The Profit and Loss account of ABC Ltd. for the year ended 31st March, 2021 is given below:

Profit and Loss account

(For the year ended 31st March, 2021)

To Direct Material	**6,50,000**	**By Sales (15000 units)**	**15,00,000**
To Direct Wages	**3,50,000**	**By Dividend received**	**9,000**
To Factory overheads	**2,60,000**		
To Administrative overheads	**1,05,000**		
To Selling overheads	**85,000**		
To Loss on sale of investments	**2,000**		
To Net Profit	**57,000**		
	15,09,000		**15,09,000**

- **Factory overheads are 50% fixed and 50% variable.**
- **Administrative overheads are 100% fixed.**
- **Selling overheads are completely variable.**
- **Normal production capacity of ABC Ltd. is 20,000 units.**
- **Indirect Expenses are absorbed in the cost accounts on the basis of normal production capacity.**
- **Notional rent of own premises charged in Cost Accounts is amounting to Rs. 12,000. You are required to:**

(i) Prepare a Cost Sheet and ascertain the Profit as per Cost Records for the year ended 31st March, 2021.

(ii) Reconcile the Profit as per Financial Records with Profit as per Cost Records.

(PYP July 21)

Answer 18

Cost Sheet

(For the year ended 31st March, 2021)

	(Rs.)	(Rs.)
Direct material		6,50,000
Direct wages		3,50,000
Prime cost		10,00,000
Factory Overheads:		
Variable (50% of Rs. 2,60,000)	1,30,000	
Fixed (Rs. 1,30,000 × 15,000/20,000)	97,500	2,27,500
Works cost		12,27,500
Administrative Overheads (Rs. 1,05,000 × 15,000/20,000)		78,750
Notional Rent		12,000
Cost of production		13,18,250
Selling Overheads		85,000
Cost of Sales		14,03,250
Profit (Balancing figure)		96,750

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Sales revenue		15,00,000

(ii) Statement of Reconciliation (Reconciling profit shown by Financial and Cost Accounts)

	(Rs.)	(Rs.)
Profit as per Cost Account		96,750
Add: Dividend received	9,000	
Add: Notional Rent	12,000	21,000
Less: Factory Overheads under-charged in Cost Accounts (Rs. 2,60,000- Rs. 2,27,500)	32,500	
Less: Administrative expenses under-charged in Cost Accounts (Rs. 1,05,000 – Rs. 78,750)	26,250	
Less: Loss on sale of Investments	2,000	(60,750)
Profit as per Financial Accounts		57,000

(Note: Solution can be done considering base profit as per Financial Accounts**)**

Important Note:

It was a practical problem requiring preparation of cost sheet and reconciling profit as per financial records with profit as per cost records. In the preparation of the cost sheet, examinees faced problems in the identification of absorbed indirect expenses on the basis of normal production capacity. Performance of the examinees was below average.

Question 19

R Ltd. showed a Net Profit of Rs. 3, 60,740 as per their cost accounts for the year ended 31st March, 2021. The following information was revealed as a result of scrutiny of the figures from the both sets of accounts:

Sr. No.	Particulars	(Rs.)
i.	Over recovery of selling overheads in cost accounts	10,250
ii.	Over valuation of closing stock in cost accounts	7,300
iii.	Rent received credited in financial accounts	5,450
iv.	Bad debts provided in financial accounts	3,250
v.	Income tax provided in financial accounts	15,900
vi.	Loss on sale of capital asset debited in financial accounts	5,800
vii.	Under recovery of administration overheads in cost accounts	3,600

Required: Prepare a reconciliation statement showing the profit as per financial records.

(PYP Dec '21)

Answer 19

Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(Rs.)	(Rs.)
Net Profit as per Cost Accounts		3,60,740

Add:		
Over recovery of selling overheads in cost accounts	10,250	
Rent received credited in financial accounts	5,450	15,700
		376,440
Less:		
Over valuation of closing stock in cost accounts	7,300	
Bad debts provided in financial accounts	3,250	
Income tax provided in financial accounts	15,900	
Loss on sale of capital asset debited in financial accounts	5,800	
Under recovery of administration overheads in cost accounts	3,600	35,850
Profit as per Financial Accounts		3,40,590

Important Note:-

Question was on preparation of reconciliation statement to calculate the profit as per financial records. This sub part can be considered as an easy one and most of the examinees attempted in the correct line. Performance of the examinees was good.

Question 20

Indicate, for following items, whether to be shown in the Cost Accounts or Financial Accounts:

(i) Preliminary expenses written off during the year

(ii) Interest received on bank deposits

(iii) Dividend, interest received on investments

(iv) Salary for the proprietor at notional figure though not incurred

(v) Charges in lieu of rent where premises are owned

(vi) Rent receivables

(vii) Loss on sale of Fixed Assets

(viii) Interest on capital at notional figure though not incurred

(ix) Goodwill written off

(x) Notional Depreciation on the assets fully depreciated for which book value is Nil.

(PYP Nov 22)

Answer 20

S. No.	Items	Accounts
(i)	Preliminary expenses written off during the year	Financial Accounts
(ii)	Interest received on bank deposits	Financial Accounts

(iii)	Dividend, interest received on investments	Financial Accounts
(iv)	Salary for the proprietor at notional figure though not incurred	Cost Accounts
(v)	Charges in lieu of rent where premises are owned	Cost Accounts
(vi)	Rent receivables	Financial Accounts
(vii)	Loss on the sales of Fixed Assets	Financial Accounts
(viii)	Interest on capital at notional figure though not incurred	Cost Accounts
(ix)	Goodwill written off	Financial Accounts
(x)	Notional Depreciation on the assets fully depreciated for which book value is nil	Cost Accounts

Question 21

Journalize the following transactions assuming the cost and financial accounts are integrated:

Particulars	Amount (Rs.)
Direct Materials issued to production	**Rs. 5,88,000**

Allocation of Wages (Indirect)	**Rs. 7,50,000**
Factory Overheads (Over absorbed)	**Rs. 2,25,000**
Administrative Overheads (Under absorbed)	**Rs. 1,55,000**
Deficiency found in stock of Raw material (Normal)	**Rs. 2,00,000**

(PYP May'22)

Answer 21

Particulars		**(Rs.)**	**(Rs.)**
(i) Work-in-Progress Ledger Control A/c	Dr.	5,88,000	
To Stores Ledger Control A/c			5,88,000
(Being issue of direct materials to production)			
(ii) Factory Overhead control A/c	Dr.	7,50,000	
To Wages Control A/c			7,50,000
(Being allocation of Indirect wages)			
(iii) Factory Overhead Control A/c	Dr.	2,25,000	
To Costing Profit & Loss A/c			2,25,000
(Being transfer of over absorption of Factory overhead)			

(iv) Costing Profit & Loss A/c	Dr.	1,55,000	
To Administration Overhead Control A/c			1,55,000
(Being transfer of under absorption of Administration overhead)			
(v) Factory Overhead Control A/c	Dr.	2,00,000	
To Stores Ledger Control A/c			2,00,000
(Being transfer of deficiency in stock of raw material)			

(Note: Costing P&L = P&L and SLC = MLC**)**

Question 22

EXPLAIN why it is necessary to reconcile the Profits between the Cost Accounts and Financial Accounts.

(Study Material)

Answer 22

When the cost and financial accounts are kept separately, it is imperative that these should be reconciled to make the cost accounts reliable. It is necessary for reconciliation of the two sets of accounts that sufficient details are available to locate the differences and the reasons for the same. It is, therefore, important that in the financial accounts, the expenses should be analysed in the same way as in the cost accounts.

The General Ledger Adjustment Account in the Cost Ledger may be studied to know the items which are included here and how differently these are presented in the financial accounts. The reconciliation of the balances of two sets of accounts is possible by preparing a

Memorandum Reconciliation Account. In this account, the items charged in one set of accounts but not in the other or those charged in excess as compared to the other are identified and collected. These items of differences are either added or subtracted from the profit as shown by one of the accounts. Finally the profits from two sets of accounts are reconciled. The procedure is similar to those which are followed for reconciling bank balance as per bank ledger with the balance as shown in bank statement.

It is important, however, to know the causes which, generally, give rise to differences in the Cost and Financial Accounts.

Question 23

STATE what are the reasons for disagreement of profits as per Cost Accounts and Financial Accounts? Discuss.

(Study Material)

Answer 23

1. Items included in Financial Accounts only-

(a) Purely Financial Expenses:

(i) Interest on loans or bank mortgages.

(ii) Expenses and discounts on issue of shares, debentures etc.

(iii) Other capital losses i.e., loss by fire not covered by insurance etc.

(iv) Losses on the sales of fixed assets and investments

(v) Income tax, donations, subscriptions

(vi) Expenses of the company's share transfer office, if any.

(b) Purely Financial Income

(i) Interest received on bank deposits, loans and investments

(ii) Dividends received

(iii) Profits on the sale of fixed assets and investments

(iv) Transfer fee received.

(v) Rent receivables

2. Item included in Cost Accounts only (notional expenses):

(i) Charges in lieu of rent where premises are owned

(ii) Interest on capital at notional figure though not incurred

(iii) Salary for the proprietor at notional figure though not incurred

(iv) Notional Depreciation on the assets fully depreciated for which book value is nil.

3. Items whose treatment is different in the two sets of accounts: The objective of cost accounting is to provide information to management for decision making and control purposes while financial accounting conforms to external reporting requirements. Hence there are chances that certain items are treated differently in the two sets of accounts. For example, LIFO method for inventory valuation is not recommended by Accounting Standards for Financial Reporting purpose but this method may be adopted for cost accounting purpose if management feels it suitable for making any decision. Similarly cost accounting may use a different method of depreciation than what is allowed under financial accounting.

4. Varying basis of valuation: It is another factor which sometimes is responsible for the difference. It is well known that in financial accounts stock are valued either at cost or market price, whichever is lower. But in Cost Accounts, stocks are only valued at cost.

Question 24

LIST the Financial expenses which are not included in Cost.

Answer 24

1. Items included in Financial Accounts only-

(a) Purely Financial Expenses:

(i) Interest on loans or bank mortgages.

(ii) Expenses and discounts on issue of shares, debentures etc.

(iii) Other capital losses i.e., loss by fire not covered by insurance etc.

(iv) Losses on the sales of fixed assets and investments

(v) Income tax, donations, subscriptions

(vi) Expenses of the company's share transfer office, if any.

(b) Purely Financial Income

(i) Interest received on bank deposits, loans and investments

(ii) Dividends received

(iii) Profits on the sale of fixed assets and investments

(iv) Transfer fee received.

(v) Rent receivables

2. Item included in Cost Accounts only (notional expenses):

(i) Charges in lieu of rent where premises are owned

(ii) Interest on capital at notional figure though not incurred

(iii) Salary for the proprietor at notional figure though not incurred

(iv) Notional Depreciation on the assets fully depreciated for which book value is nil.

3. Items whose treatment is different in the two sets of accounts: The objective of cost accounting is to provide information to management for decision making and control purposes while financial accounting conforms to external reporting requirements. Hence there are chances that certain items are treated differently in the two sets of accounts. For example, LIFO method for inventory valuation is not recommended by Accounting Standards for Financial Reporting purpose but this method may be adopted for cost accounting purpose if management feels it suitable for making any decision. Similarly cost accounting may use a different method of depreciation than what is allowed under financial accounting.

4. Varying basis of valuation: It is another factor which sometimes is responsible for the difference. It is well known that in financial accounts stock are valued either at cost or market price, whichever is lower. But in Cost Accounts, stocks are only valued at cost.

Question 25

STATE when the Reconciliation statement of Cost and Financial accounts is not required.

(Study Material)

Answer 25

Procedure for Reconciliation

There are 3 steps involved in the procedure for reconciliation.

1. Ascertainment of profit as per Financial Accounts

2. Ascertainment of profit as per Cost Accounts

3. Reconciliation of both the profits

Circumstances where reconciliation statement can be avoided: When the Cost and Financial Accounts are integrated - there is no need to have a separate reconciliation statement between the two sets of accounts. Integration means that the same set of accounts fulfil the requirement of both i.e., Cost and Financial Accounts.

Question 26

A company operates on historic job cost accounting system, which is not integrated with the financial accounts. At the beginning of a month, the opening balances in cost ledger were:

	(Rs. in lakhs)
Stores Ledger Control Account	80
Work-in-Process Control Account	20
Finished Goods Control Account	430
Building Construction Account	10
Cost Ledger Control Account	540

During the month, the following transactions took place:

		(Rs. in lakhs)
Materials	Purchased	40
	Issued to production	50
	Issued to factory maintenance	6
	Issued to building construction	4
Wages	Gross wages paid	150
	Indirect wages	40

	For building construction	10
Works Overheads	Actual amount incurred	
	(excluding items shown above)	
	Absorbed in building construction	20
	Under absorbed	8
Royalty paid	(related to production)	5
Selling, Distribution and Administration overheads		25
Sales		450

At the end of the month, the stock of raw material and work-in-Process was Rs. 55 lakhs and Rs. 25 lakhs respectively. The loss arising in the raw material accounts is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

(Study Material)

Answer 26

Cost Ledger Control A/c

Amount (Rs. in lakhs)

	(Rs.)		(Rs.)

To Costing P&L A/c	450	By Balance b/d	540
" Building Construction A/c	44	" Stores Ledger Control A/c	40
" Balance c/d	483	" Wages Control A/c	150
		" Works OH Control A/c	160
		" Royalty A/c	5
		"Admn. OH and S&D OH A/c	25
		" Costing P&L A/c	57
	977		977

Stores Ledger Control A/c

	(Rs.)		**(Rs.)**
To Balance b/d	80	By Work-in-Process A/c	50
" Cost Ledger Control A/c	40	" Works OH Control A/c	6
		"Building Const. A/c	4
		" Works OH Control A/c (Bal. fig.) (loss)	5
		" Balance c/d	55

	120		120

Wages Control A/c

	(Rs.)		(Rs.)
To Cost Ledger Control A/c	150	By Works OH Control A/c	40
		"Building Const. A/c	10
		" Work-in-process Control A/c (Balancing figure)	100
	150		150

Works Overhead Control A/c

	(Rs.)		(Rs.)
To Stores Ledger Control A/c	6	By Building Const. A/c	20
" Wages Control A/c	40	" Work-in-process Control A/c (Balancing figure)	183
" Cost Ledger Control A/c	160	" Costing P&L A/c (under absorption)	8
" Store Ledger Control A/c (loss)	5		
	211		211

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Royalty A/c

	(Rs.)		(Rs.)
To Cost Ledger Control A/c	5	By Work-in-process Control A/c	5
	5		5

Work-in-Process Control A/c

	(Rs.)		(Rs.)
To Balance b/d	20	By Finished Goods Control A/c (Balancing figure)	333
" Stores Ledger Control A/c	50		
" Wages Control A/c	100		
" Works OH Control A/c	183		
" Royalty A/c	5	" Balance c/d	25
	358		358

Finished Goods Control A/c

	(Rs.)		(Rs.)
To Balance b/d	430	By Cost of Goods Sold A/c	360

		(80% of Rs. 450)	
" Work-in-process Control A/c	333	" Balance c/d	403
	763		763

Cost of Goods Sold A/c

	(Rs.)		(Rs.)
To Finished Goods Control A/c	360	By Cost of sales A/c	360
	360		360

Selling, Distribution and Administration Overhead A/c

	(Rs.)		(Rs.)
To Cost Ledger Control A/c	25	By Cost of sales A/c	25
	25		25

Cost of Sales A/c

	(Rs.)		(Rs.)
To Cost of Goods Sold	360	By Costing P&L A/c	385
"Admn. OH and S&D OH A/c	25		

	385		385

Costing P & L A/c

	(Rs.)		**(Rs.)**
To Cost of Sales A/c	385	By Cost Ledger Control A/c (Sales)	450
" Works Overhead Control A/c	8		
" Cost Ledger Control A/c (Profit) (Balancing figure)	57		
	450		450

Building Construction A/c

	(Rs.)		**(Rs.)**
To Balance b/d	10	By Cost Ledger Control A/c	44
" Stores Ledger Control A/c	4		
" Wages Control A/c	10		
" Works OH Control A/c	20		
	44		44

Trial Balance

(Rs. in lakhs)

	Dr. (Rs.)	**Cr. (Rs.)**
Stores control A/c	55	
Work-in-Process A/c	25	
Finished Goods A/c	403	
Cost Ledger Adjustment A/c		483
	483	**483**

Question 27

The following information is available from the financial books of a company having a normal production capacity of 60,000 units for the year ended 31st March:

(i) Sales Rs.10, 00,000 (50,000 units).

(ii) There was no opening and closing stock of finished units.

(iii) Direct Material and Direct Wages cost were Rs. 5, 00,000 and Rs. 2, 50,000 respectively.

(iv) Actual factory expenses were Rs.1, 50,000 of which 60% are fixed.

(v) Actual Administrative expenses were Rs.45, 000 which are completely fixed.

(vi) Actual Selling and Distribution expenses were Rs.30, 000 of which 40% are fixed.

(vii) Interest and dividends received Rs.15, 000.

You are required to:

(a) FIND OUT profit as per financial books for the year ended 31st March;

(b) PREPARE the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March assuming that the indirect expenses are absorbed on the basis of normal production capacity; and

(c) PREPARE a statement reconciling profits shown by financial and cost books.

(Study Material)

Answer 27

(a) Profit & Loss Account

(For the year ended 31st March)

	(Rs.)		**(Rs.)**
To Direct Material	5,00,000	By Sales (50,000 units)	10,00,000
" Direct Wages	2,50,000	" Interest and dividends	15,000
" Factory expenses	1,50,000		
" Administrative expenses	45,000		
" Selling & Dist. Expenses	30,000		
" Net Profit	40,000		
	10,15,000		10,15,000

(b) Cost Sheet

(For the year ended 31st March)

	(Rs.)	(Rs.)
Direct Material		5,00,000
Direct Wages		2,50,000
Prime cost		**7,50,000**
Factory expenses:		
Variable (40% of Rs. 1,50,000)	60,000	
Fixed (Rs. 90,000 × 50,000/60,000)	75,000	1,35,000
Works cost/ Cost of production		**8,85,000**
Administrative expenses: (Rs. 45,000 × 50,000/60,000)		37,500
Selling & Distribution expenses:		
Variable (60% of Rs. 30,000)	18,000	
Fixed* (Rs. 12,000 × 50,000/60,000)	10,000	28,000
Cost of Sales		**9,50,500**
Profit (Balancing figure)		49,500
Sales revenue		**10,00,000**

*It is assumed that the company sells what it generally produces i.e. normal production.

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(c) Statement of Reconciliation

(Reconciling profit shown by Financial and Cost Accounts)

	(Rs.)	**(Rs.)**
Profit as per Cost Account		**49,500**
Add : Income from interest and dividends		15,000
		64,500
Less: Factory expenses under-charged in Cost Accounts (Rs.1,50,000 – Rs. 1,35,000)	15,000	
Administrative expenses under-charged in Cost Accounts (Rs. 45,000 – Rs. 37,500)	7,500	
Selling & distribution expenses under— charged in Cost Accounts (Rs.30,000 – Rs. 28,000)	2,000	(24,500)
Profit as per Financial Accounts		**40,000**

Question 28

M/s. H.K. Piano Company showed a net loss of Rs. 4, 16,000 as per their financial accounts for the year ended 31st March. The cost accounts, however, disclosed a net loss of Rs. 3, 28,000 for the same period. The following information were revealed as a result of scrutiny of the figures of both the sets of books:

		(Rs.)

i.	**Factory Overheads under-recovered**	**6,000**
ii.	**Administration Overheads over-recovered**	**4,000**
iii.	**Depreciation charged in financial accounts**	**1,20,000**
iv.	**Depreciation recovered in costs**	**1,30,000**
v.	**Interest on investment not included in costs**	**20,000**
vi.	**Income-tax provided**	**1,20,000**
vii.	**Transfer fees (credit in financial books)**	**2,000**
viii.	**Stores adjustment (credit in financial books)**	**2,000**

PREPARE a Memorandum reconciliation account.

(Study Material)

Answer 28

	(Rs.)		**(Rs.)**
To Net loss as per costing books	3,28,000	By Administration Overhead over recovered in costs	4,000
" Factory Overheads under-recovered in costs	6,000	"Depreciation overcharged in costs	10,000
" Income-tax not provided in costs	1,20,000	"Interest on investments Not included in costs	20,000

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		" Transfer fees in financial books	2,000
		" Stores adjustment	2,000
		" Net loss as per financial books	4,16,000
	4,54,000		4,54,000

Question 29

WHICH of the following item is not the cause of differences in Financial and Cost Accounts?

(a) Income tax not treated in Cost Accounts

(b) Dividends credited in Financial Accounts

(c) Losses on the sale of investments not treated in Financial Accounts

(d) Cost Accounts showing notional depreciation on the assets fully depreciated for which book value is nil.

(MTP Jan 2025)

Answer 29

(c) Losses on the sale of investments not treated in Financial Accounts

Question 30

Which of the following items is included in cost accounts?

(a) Notional rent

(b) Donations

(c.) Transfer to general reserve

(d) Rent receivable

(Study material)

Ans: (a) Notional rent

Reason: Notional rent is included in cost accounts because it is an imputed or hypothetical cost that is relevant for cost analysis but does not involve actual cash transactions. Notional costs like rent are typically used in cost accounting to allocate costs for resources that are owned by the company but not directly incurred as expenses, such as imputed rent on company-owned property.

The other options—donations, transfer to general reserve, and rent receivable—are not included in cost accounts as they are related to financial accounting or non-operating activities rather than the direct cost of production.

Question 31

When costing loss is Rs. 5,600, administrative overhead under-absorbed being Rs.600, the loss as per financial accounts should be

(a) Rs. 5,600

(b) Rs. 6,200

(c) Rs. 5,000

(d) None of the above

(Study material)

Ans: (b) Rs.6,200

Reason:

When administrative overhead is under-absorbed by Rs.600, it means that the actual administrative overheads incurred were higher than the amount allocated in the cost accounts. To reconcile this difference, the under-absorbed overhead needs to be added back to the costing loss in the financial accounts.

So, the loss as per the financial accounts would be:

Loss as per costing + Under-absorbed administrative overhead=5,600+600=6,200

Therefore, the loss as per financial accounts should be Rs.6, 200.

Question 32

Which of the following items should be added to costing profit to arrive at financial profit?

(a) Over-absorption of works overhead

(b) Interest paid on debentures

(c) Income tax paid

(d) All of the above

(Study material)

Ans: (a) Over-absorption of works overhead

Reason:

Over-absorption of works overhead refers to a situation where the overheads allocated to products in the cost accounts are more than the actual overheads incurred. This excess absorption needs to be added back to the costing profit to arrive at the financial profit because it reflects a higher allocation of costs in the cost accounts compared to what was actually spent.

Interest paid on debentures and income tax paid are not added to costing profit to arrive at financial profit; these are part of the financial accounts and not directly related to costing adjustments.

Question 33

The following figures have been taken from the financial accounts of a manufacturing firm for the year ended 31st March, 2025:

	(Rs.)
Direct material consumption	**20,00,000**
Direct wages	**12,00,000**
Factory overheads	**6,40,000**
Repair and maintenance (Factory-related)	**48,000**
Advertisement expenses (for brand building – capital in nature)	**40,000**
Administrative overheads	**2,80,000**
Selling and distribution overheads	**3,84,000**
Bad debts	**32,000**
Preliminary expenses written off	**16,000**
Legal charges	**4,000**
Depreciation on Plant and Machinery	**1,20,000**

Interest on Loan	**60,000**
Dividends received	**40,000**
Interest on fixed deposit	**8,000**
Sales- 48,000 units	**48,00,000**
Closing stock:	
- Finished stock- 4,000 units	**3,20,000**
- Work-in-process	**96,000**

The cost accounts for the same period reveal that the direct material consumption was Rs.22, 40,000; Factory overhead (including factory related repairs and maintenance and depreciation) is recovered at 20% on prime cost; Administration overhead is recovered @ Rs.4.8 per unit of cost of goods sold and selling and distribution overheads are recovered at Rs.6.40 per unit sold.

Required:

PREPARE Costing and Financial Profit & Loss Accounts and RECONCILE the difference in the profit as arrived at in the two sets of accounts.

(RTP Sep. 2025)

Answer 33

Statement of Cost and Profit

(As per Cost Records)

	(Rs.)

Direct Material	22,40,000
Direct Wages	12,00,000
Prime Cost	34,40,000
Factory Overhead (20% of Rs. 34,40,000)	6,88,000
	41,28,000
Less: Closing Stock (WIP)	-96,000
Works Cost or Cost of production (52,000 units)	40,32,000
Less: Finished Goods (4,000 units @ Rs.77.5385)	-3,10,154
Cost of Goods Sold (48,000 units)	37,21,846
Administrative Overhead (48,000 units @ Rs. 4.8 p.u.)	2,30,400
Selling and Distribution Overhead (48,000 @ Rs. 6.40 p.u.)	3,07,200
Cost of Sales	42,59,446
Net profit (Balancing figure)	5,40,554
Sales Revenue	48,00,000

Profit and Loss Account

(As per financial records)

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Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Direct Material consumed	20,00,000	By Sales	48,00,000
To Direct Wages	12,00,000	By Closing Work-in- process	96,000
To Factory overheads	6,40,000	By Closing Finished stock	3,20,000
To Depreciation on Plant and Machinery	1,20,000		
To Repairs & Maintenance (Factory)	48,000		
To Gross Profit c/d	12,08,000		
	52,16,000		52,16,000
To Administrative overheads	2,80,000	BY Gross Profit b/d	12,08,000
To Selling & distribution overheads	3,84,000	By Dividend received	40,000
To Bad debts	32,000	By Interest on deposit	8,000
To Preliminary expenses	16,000		
To Interest on Loan	60,000		
To Legal charges	4,000		

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To Net profit (balancing figure)	4,80,000		
	12,56,000		12,56,000

Reconciliation Statement

Particulars	Amount (Rs.)	Amount (Rs.)
Net profit as per Financial Profit & Loss A/c		4,80,000
Add: Administrative overheads (2,80,000 - 2,30,400)	49,600	
Selling & Distribution overheads (3,84,000 - 3,07,200)	76,800	
Bad debts	32,000	
Preliminary expenses	16,000	
Interest on loan	60,000	
Legal charges	4,000	
Factory overheads (6,40,000 + 1,20,000 + 48,000 - 6,88,000)	1,20,000	3,58,400
		8,38,400
Less: Difference in value of materials consumed	2,40,000	
Dividend received	40,000	

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Interest on deposit	8,000	
Closing stock (3,20,000 - 3,10,154)	9,846	-2,97,846
Profit as per Costing Profit & Loss A/c		5,40,554

Note: Since advertisement expense is capital in nature, it is not considered in profit and loss account.

Topic 4 Practical Problems (Ledger/Journal)

Question 34

Following information have been extracted from the cost records of XYZ Pvt. Ltd. Stores:

	(Rs.)
Opening balance	**1,08,000**
Purchases	**5,76,000**
Transfer from WIP	**2,88,000**
Issue to WIP	**5,76,000**
Issue for repairs	**72,000**
Deficiency found in stock	**21,600**
Work-in-process:	**(Rs.)**
Opening balance	**2,16,000**

Direct wages applied	**2,16,000**
Overheads charged	**8,64,000**
Closing balance	**1,44,000**
Finished Production:	**(Rs.)**
Entire production is sold at a profit of 15% on cost of WIP	
Wages paid	**2,52,000**
Overheads incurred	**9,00,000**

PREPARE Stores Ledger Control Account, Work-in-Process Control Account, Overheads Control Account and Costing Profit and Loss Account.

(MTP March '18) (Same concept but different figures MTP Oct'18)

Answer 34

Stores Ledger Control A/c

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	1,08,000	By Work in Process A/c	5,76,000
To General Ledger Adjustment A/c	5,76,000	By Overhead Control A/c	72,000
To Work in Process A/c	2,88,000	By Overhead Control A/c (Deficiency)	21,600*

		By Balance c/d	3,02,400
	9,72,000		9,72,000

*Deficiency assumed as normal (alternatively can be treated as abnormal loss)

Work in Process Control A/c

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	2,16,000	By Stores Ledger Control a/c	2,88,000
To Stores Ledger Control A/c	5,76,000	By Costing P/L A/c (Balancing figures being Cost of finished goods)	14,40,000
To Wages Control A/c	2,16,000	By Balance c/d	1,44,000
To Overheads Control A/c	8,64,000		
	18,72,000		18,72,000

Overheads Control A/c

Particulars	(Rs.)	Particulars	(Rs.)
To Stores Ledger Control A/c	72,000	By Work in Process A/c	8,64,000
To Stores Ledger Control A/c	21,600	By Balance c/d (Under absorption)	1,65,600

To Wages Control A/c (Rs. 2,52,000- Rs. 2,16,000)	36,000		
To Gen. Ledger Adjust. A/c	9,00,000		
	10,29,600		10,29,600

Costing Profit & Loss A/c

Particulars	(Rs.)	Particulars	(Rs.)
To Work in process	14,40,000	By Gen. ledger Adjust. A/c (Sales) (Rs. 14, 40,000 × 115%)	16,56,000
To Gen. Ledger Adjust. A/c (Profit)	2,16,000		
	16,56,000		16,56,000

Question 35

The following figures have been taken from the financial accounts of a manufacturing firm for the year ended 31st March, 2021:

	(Rs.)
Direct material consumption	**20,00,000**
Direct wages	**12,00,000**

Factory overheads	**6,40,000**
Administrative overheads	**2,80,000**
Selling and distribution overheads	**3,84,000**
Bad debts	**32,000**
Preliminary expenses written off	**16,000**
Legal charges	**4,000**
Dividend received	**40,000**
Interest on fixed deposit	**8,000**
Sales - 48,000 units	**48,00,000**
Closing stock:	
- Finished stock - 4,000 units	**3,20,000**
- Work-in-process	**96,000**

The cost accounts for the same period reveal that the Direct Material consumption was Rs. 22, 40,000; Factory overhead is recovered at 20% on prime cost; Administration overhead is recovered @ Rs. 4.8 per unit of production; and Selling and Distribution overheads are recovered at Rs. 6.40 per unit sold.

Required:

PREPARE Costing and Financial Profit & Loss Accounts and RECONCILE the difference in the profit as arrived at in the two sets of accounts.

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(MTP, Apr.'21) (Same concept different figures Old & New SM)

Answer 35

Costing Profit and Loss Account

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Direct Material consumed	22,40,000	By Sales	48,00,000
To Direct Wages	12,00,000	By Closing Work-in-process	96,000
Prime Cost	34,40,000	By Closing Finished stock $\left(\frac{Rs.41,28,000-Rs.96,000}{52,000 \text{ units}}\right)$	3,10,154
To Factory overheads (20% of prime cost)	6,88,000		
	41,28,000		
To Administrative overheads (Rs. 4.80 × 52,000* units)	2,49,600		
To Selling & distribution overheads (Rs.6.40 × 48,000 units)	3,07,200		
To Net profit (balancing figure)	5,21,354		

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	52,06,154		52,06,154

* Units produced = Units sold + Closing stock - Opening stock

= 48,000 + 4,000 - 0 = 52,000 units

Financial Profit and Loss Account

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Direct Material consumed	20,00,000	By Sales	48,00,000
To Direct Wages	12,00,000	By Dividend received	40,000
To Factory overheads	6,40,000	By Interest on fixed deposit	8,000
To Administrative overheads	2,80,000	By Closing Work-in-process	96,000
To Selling & distribution overheads	3,84,000	By Closing Finished stock	3,20,000
To Bad debts	32,000		
To Preliminary expenses	16,000		
To Legal charges	4,000		
To Net profit (balancing figure)	7,08,000		

	52,64,000		52,64,000

Reconciliation Statement

Particulars	Amount (Rs.)	Amount (Rs.)
Net profit as per Financial Profit & Loss A/c		7,08,000
Add: Administrative overheads (2,80,000 - 2,49,600)	30,400	
Selling & Distribution overheads (3,84,000 - 3,07,200)	76,800	
Bad debts	32,000	
Preliminary expenses	16,000	
Legal charges	4,000	1,59,200
		8,67,200
Less: Difference in value of materials consumed (22,40,000 - 20,00,000)	2,40,000	
Factory overheads (6,88,000 - 6,40,000)	48,000	
Dividend received	40,000	
Interest on fixed deposit	8,000	
Closing stock (3,20,000 - 3,10,154)	9,846	(3,45,846)

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Profit as per Costing Profit & Loss A/c		5,21,354

Question 36

XYZ Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2020-21:

Particulars	**Amount ('000)**
Opening balances:	
- Stores ledger control A/c	**48,000**
- Work-in-process control A/c	**12,000**
- Finished goods control A/c	**2,58,000**
- Building construction A/c	**6,000**
- Cost ledger control A/c	**3,24,000**
During the year following transactions took place:	
Materials:	
- Purchased	**24,000**
- Issued to production	**30,000**
- Issued to general maintenance	**3,600**

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- Issued to building construction	**2,400**
Wages:	
- Gross wages paid	**90,000**
- Indirect wages paid	**24,000**
- For building construction	**6,000**
Factory overheads:	
- Actual amount incurred (excluding items shown above)	**96,000**
- Absorbed in building construction	**12,000**
- Under-absorbed	**4,800**
Royalty paid	**3,000**
Selling distribution and administration overheads	**15,000**
Sales	**2,70,000**

At the end of the year, the stock of raw material and work-in-process was Rs. 33, 00,000, and Rs.15, 00,000 respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales. Required: PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

(MTP Nov '21) (RTP Nov '21 & May 22)

Answer 36

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Cost Ledger Control Account

Particulars	(Rs.in '000)	Particulars	(Rs.in '000)
To Costing P&L A/c	2,70,000	By Balance b/d	3,24,000
To Building Construction A/c	26,400	By Stores Ledger control A/c	24,000
To Balance c/d	2,89,800	By Wages Control A/c	90,000
		By Factory overhead control A/c	96,000
		By Royalty A/c	3,000
		By Selling. Distribution and Administration overheads	15,000
		By Costing P&L A/c	34,200
	5,86,200		5,86,200

Stores Ledger Control Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Balance b/d	48,000	By WIP control A/c	30,000
To Cost Ledger control A/c	24,000	By Factory overheads control A/c	3,600

		By Building construction A/c	2,400
		By Factory overhead control A/c (loss) (bal. fig.)	3,000
		By Balance c/d	33,000
	72,000		72,000

Wages Control Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Cost Ledger control A/c	90,000	By Factory overhead control A/c	24,000
		By Building Construction A/c	6,000
		By WIP Control A/c (bal. fig.)	60,000
	90,000		90,000

Factory Overhead Control Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Stores Ledger control A/c	3,600	By Building Construction A/c	12,000

To Wages Control A/c	24,000	By Costing P&L A/c	4,800
To Cost Ledger control A/c	96,000	By WIP Control A/c (bal. fig)	1,09,800
To Stores Ledger control A/c (loss)	3,000		
	1,26,600		1,26,600

Royalty Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Cost Ledger control A/c	3,000	By WIP Control A/c	3,000
	3,000		3,000

Work-in-process Control Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Balance b/d	12,000	By Finished goods control A/c (bal. fig)	1,99,800
To Stores Ledger control A/c	30,000		
To Wages Control A/c	60,000		
To Factory overhead control A/c	1,09,800		

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To Royalty A/c	3,000	By Balance c/d	15,000
	2,14,800		2,14,800

Finished Goods Control Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Balance b/d	2,58,000	By Cost of Goods Sold A/c (Refer working note)	2,16,000
To WIP control A/c	1,99,800	By Balance c/d	2,41,800
	4,57,800		4,57,800

Cost of Goods Sold Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Finished Goods control A/c	2,16,000	By Cost of sales A/c	2,16,000
	2,16,000		2,16,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Cost Ledger control A/c	15,000	By Cost of sales A/c	15,000
	15,000		15,000

Cost of Sales Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Cost of Goods Sold A/c	2,16,000	By Costing P&L A/c	2,31,000
To Selling, Distribution and Administration A/c	15,000		
	2,31,000		2,31,000

Costing P&L Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Cost of Sales A/c	2,31,000	By Cost Ledger control A/c	2,70,000
To Factory overhead control A/c	4,800		
To Cost Ledger control A/c	34,200		
	2,70,000		2,70,000

Building Construction Account

Particulars	(Rs. in '000)	Particulars	(Rs. in '000)
To Balance b/d	6,000	By Cost Ledger control A/c	26,400

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To Stores Ledger control A/c	2,400		
To Wages Control A/c	6,000		
To Factory overhead control A/c	12,000		
	26,400		26,400

Trial Balance

Particulars	**Dr.**	**Cr.**
	(Rs. in '000)	**(Rs. in '000)**
Stores Ledger Control A/c	33,000	
WIP Control A/c	15,000	
Finished Goods Control A/c	2,41,800	
Cost Ledger Control A/c		2,89,800
	2,89,800	2,89,800

Working Note:

Cost of Goods sold = $\frac{Rs.\ 2{,}70{,}000 \times 80}{100}$ = Rs. 2, 16,000

Question 37

The following are the balances existed in the books of JPG Ltd. for the year ended, 31st March, 2019:

Particulars	Dr.	Cr.
	(Rs.)	(Rs.)
Stores Ledger Control A/c	30,00,000	
WIP Control A/c	15,00,000	
Finished Goods Control A/c	25,00,000	
Manufacturing Overheads Control A/c		1,50,000
Cost Ledger Control A/c		68,50,000
During the year 2019-20, the following transactions took place:		
Particulars		Amount (Rs.)
Finished product (at cost)		22,50,000
Manufacturing Overhead incurred		8,50,000
Raw material purchased		12,50,000
Factory wages		4,00,000
Indirect labour		2,00,000

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Cost of sales		**17,50,000**
Materials issued to production		**13,50,000**
Sales returned (at cost)		**90,000**
Material returned to suppliers		**1,30,000**
Manufacturing overhead charged to production		**8,50,000**

Required:

PREPARE the following control accounts and Trial balance at the end of the year:

Cost Ledger, Stores Ledger, Work-in-process, Finished Stock, Manufacturing Overhead, Wages and Cost of Sales.

(RTP May'20) (RTP May 18, MTP Oct'22, Old & New SM)

Answer 37

Cost Ledger Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Stores Ledger control A/c	1,30,000	By Balance b/d	68,50,000
To Costing Profit & Loss A/c	17,10,000	By Stores Ledger control A/c	12,50,000
By Wages Control A/c	6,00,000		

To Balance c/d	77,10,000	By Manufacturing overhead control A/c	8,50,000
	95,50,000		95,50,000

Store Ledger Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	30,00,000	By WIP Control A/c	13,50,000
To Cost Ledger control A/c	12,50,000	By Cost Ledger control A/c (return)	1,30,000
		By Balance c/d	27,70,000
	42,50,000		42,50,000

WIP Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	15,00,000	By Finished Stock Control A/c	22,50,000
To Wages Control A/c	4,00,000		
To Stores Ledger control A/c	13,50,000		

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To Manufacturing overhead control A/c	8,50,000	By Balance c/d	18,50,000
	41,00,000		41,00,000

Finished Stock Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	25,00,000	By Cost of Sales A/c	17,50,000
To WIP Control A/c	22,50,000		
To Cost of Sales A/c (sales return)	90,000	By Balance c/d	30,90,000
	48,40,000		48,40,000

Manufacturing Overhead Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Cost Ledger Control A/c	8,50,000	By Balance b/d	1,50,000
To Wages Control A/c	2,00,000	By WIP Control A/c	8,50,000
		By Costing P&L A/c (under recovery)	50,000
	10,50,000		10,50,000

Wages Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Cost Ledger Control A/c	6,00,000	By WIP Control A/c	4,00,000
		By Manufacturing overhead control A/c	2,00,000
	6,00,000		6,00,000

Cost of Sales Account

Particulars	(Rs.)	Particulars	(Rs.)
To Finished Stock Control A/c	17,50,000	By Finished Stock Control A/c (sales return)	90,000
		By Costing Profit & Loss A/c	16,60,000
	17,50,000		17,50,000

Trial Balance

Particulars	Dr. (Rs.)	Cr. (Rs.)
Stores Ledger Control A/c	27,70,000	
WIP Control A/c	18,50,000	
Finished Goods Control A/c	30,90,000	

Cost Ledger Control A/c		77,10,000
	77,10,000	77,10,000

Working:

Costing P&L Account

Particulars	(Rs.)	Particulars	(Rs.)
To Cost of Sales A/c	16,60,000	By Cost Ledger control A/c	17,10,000
To Manufacturing overhead control A/c	50,000		
	17,10,000		17,10,000

Question 38

The financial books of a company reveal the following data for the year ended 31st March, 2023:

	(Rs.)
Opening Stock:	
Finished goods 625 units	**1,06,250**
Work-in-process	**92,000**

01.04.2022 to 31.03.2023	
Raw materials consumed	16,80,000
Direct Labour	12,20,000
Factory overheads	8,44,000
Administration overheads (production related)	3,96,000
Dividend paid	2,44,000
Bad Debts	36,000
Selling and Distribution Overheads	1,44,000
Interest received	76,000
Rent received	92,000
Sales 12,615 units	45,60,000
Closing Stock: Finished goods 415 units	91,300
Work-in-process	82,400

The cost records provide as under:

- **Factory overheads are absorbed at 70% of direct wages.**
- **Administration overheads are recovered at 15% of factory cost.**
- **Selling and distribution overheads are charged at Rs. 6 per unit sold.**
- **Opening Stock of finished goods is valued at Rs. 240 per unit.**

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➢ **The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.**

Required:

(i) Prepare statements for the year ended 31st March, 2023 showing:

➢ **the profit as per financial records**

➢ **The profit as per costing records.**

(ii) Prepare a statement reconciling the profit as per costing records with the profit as per financial records.

(RTP Nov '23 & Nov '22, RTP May'21)

Answer 38

(For the year ended March 31, 2023)

	(Rs.)		**(Rs.)**
To Opening stock of Finished Goods	1,06,250	By Sales	45,60,000
To Work-in-process	92,000	By Closing stock of finished Goods	91,300
To Raw materials consumed	16,80,000	By Work-in-Process	82,400
To Direct labour	12,20,000	By Rent received	92,000
To Factory overheads	8,44,000	By Interest received	76,000
To Administration overheads	3,96,000		

To Selling & distribution overheads	1,44,000		
To Dividend paid	2,44,000		
To Bad debts	36,000		
To Profit	1,39,450		
	49,01,700		49,01,700

Statement of Profit as per costing records (for the year ended March 31, 2023)

	(Rs.)
Sales revenue (A) (12,615 units)	45,60,000
Cost of sales:	
Opening stock (625 units × Rs. 240)	1,50,000
Add: Cost of production of 12,405 units (Refer to working note 2)	43,28,140
Less: Closing stock $\left(\frac{\text{Rs.43,28,140} \times \text{415 Units}}{\text{12,405 Units}}\right)$	(1,44,795)
Production cost of goods sold (12,615 units)	43,33,345
Selling & distribution overheads (12,615 units × Rs.6)	75,690
Cost of sales: (B)	44,09,035

Profit: {(A) – (B)}	1,50,965

(ii) Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(Rs.)	(Rs.)
Profit as per Cost Accounts		1,50,965
Add: Administration overheads over absorbed (Rs.5,64,540 – Rs.3,96,000)	1,68,540	
Opening stock overvalued (Rs.1,50,000 – Rs. 1,06,250)	43,750	
Interest received	76,000	
Rent received	92,000	
Factory overheads over recovered (Rs. 8,54,000 – Rs. 8,44,000)	10,000	3,90,290
Less: Selling & distribution overheads under recovery (Rs. 1,44,000 – Rs. 75,690)	68,310	5,41,255
Closing stock overvalued (Rs.1,44,795 – Rs. 91,300)	53,495	
Dividend	2,44,000	
Bad debts	36,000	(4,01,805)
Profit as per financial accounts		1,39,450

Working notes:

1. Number of units produced

	Units
Sales	12,615
Add: Closing stock	415
Total	13,030
Less: Opening stock	(625)
Number of units produced	12,405

2. Cost Sheet

	(Rs.)
Raw materials consumed	16,80,000
Direct labour	12,20,000
Prime cost	29,00,000
Factory overheads(70% of direct wages)	8,54,000
Factory cost	37,54,000
Add: Opening work-in-process	92,000

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Less: Closing work-in-process	(82,400)
Factory cost of goods produced	37,63,600
Administration overheads(15% of factory cost)	5,64,540
Cost of production of 12,405 units (Refer to working note 1)	43,28,140

Cost of production per unit:

$$=\frac{\text{Total Cost of Production}}{\text{No.of Units Produced}}=\frac{\text{Rs. 43,28,140}}{\text{12,405 Units}}=348.90$$

Question 39

The following balances were extracted from a Company's ledger as on 30th June, 2018:

Particulars	Debit (Rs.)	Credit (Rs.)
Raw material control a/c	**2,82,450**	
Work-in-progress control a/c	**2,38,300**	
Finished stock control a/c	**3,92,500**	
General ledger adjustment a/c		**9,13,250**
Total	**9,13,250**	**9,13,250**

The following transactions took place during the quarter ended 30th September, 2018:

		Rs.
(i)	Factory overheads - allocated to work-in-progress	1,36,350
(ii)	Goods furnished - at cost	13,76,200
(iii)	Raw materials purchased	12,43,810
(iv)	Direct wages - allocated to work-in-progress	2,56,800
(v)	Cost of goods sold	14,56,500
(vi)	Raw materials - issued to production	13,60,430
(vii)	Raw materials - credited by suppliers	27,200
(viii)	Raw materials losses - inventory audit	6,000
(ix)	Work-in-progress rejected (with no scrap value)	12,300
(x)	Customer's returns (at cost) of finished goods	45,900

You are required to prepare:

(i) Raw material control a/c

(ii) Work-in-progress control a/c

(iii) Finished stock control a/c

(iv) General ledger adjustment a/c.

(PYP Nov '18)

Answer 39

(i) Raw Material Control A/c

	(Rs.)		(Rs.)
To Balance b/d	2,82,450	By General Ledger Adjustment A/c	27,200
" General Ledger Adjustment A/c	12,43,810	" Work-in-progress Control A/c	13,60,430
		Costing P & L A/c (Loss) (OR GLA)	6,000
		" Balance c/d	1,32,630
	15,26,260		15,26,260

(ii) Work-in-Progress Control A/c

	(Rs.)		(Rs.)
To Balance b/d	2,38,300	" Finished Goods Control A/c	13,76,200
" Raw Material Control A/c	13,60,430	Costing P&L A/c (OR GLA)	12,300
" Wages Control A/c	2,56,800	" Balance c/d	6,03,380
" Factory OH Control A/c	1,36,350		
	19,91,880		19,91,880

(iii) Finished Goods Control A/c

	(Rs.)		(Rs.)
To Balance b/d	3,92,500	By Cost of goods sold A/c (OR GLA)	14,56,500
General Ledger Adjustment A/c	45,900		
”Work-in-process Control A/c	13,76,200	” Balance c/d	3,58,100
	18,14,600		18,14,600

(iv) General Ledger Adjustment A/c

	(Rs.)		(Rs.)
To Costing P&L A/c (sales) (Balancing figure)	25,68,910	By Balance b/d	9,13,250
” Raw Material Control A/c	27,200	” Raw Material Control A/c	12,43,810
		“Wages Control A/c	2,56,800
		“Factory OH Control A/c	1,36,350
		“Finished Goods Control A/c	45,900
	25,96,110		25,96,110

OR

General ledger adjustment account

	(Rs.)		(Rs.)
To Raw Material Control A/c	27,200	By Balance b/d	9,13,250
” Raw Material control account(loss)	6,000	” Raw Material Control A/c	12,43,810
‘’ WIP control Account (rejection)	12,300	” Wages Control A/c	2,56,800
“ Finished stock Control Account	14,56,500	” Factory OH Control A/c	1,36,350
“ Balance c/d	10,94,110	” Finished Goods Control A/c	45,900
	25,96,110		25,96,110

Working:

Factory Overhead Control A/c

	(Rs.)		(Rs.)
To General Ledger Adjustment A/c	1,36,350	By Work-in-progress A/c	1,36,350
	1,36,350		1,36,350

Important Note:-

This numerical question was related to Non Integrated Accounts. Four different ledgers are required to be prepared. Performance of the examinees was average. The examinees have made mistakes in the posting of particular transaction in concerned account.

Question 40

X Ltd. follows Non-Integrated Accounting System. Financial Accounts of the company show a Net Profit of Rs. 5, 50,000 for the year ended 31st March, 2022. The chief accountant of the company has provided following information from the Financial Accounts and Cost Accounts:

Sr. No	Particulars	(Rs.)
(i)	Legal Chargers Provided in Financial accounts	15,250
(ii)	Interim Dividend received credited in financial accounts	4,50,000
(iii)	Preliminary Expenses written off in financial accounts	25,750
(iv)	Over recovery of selling overheads in cost accounts	11,380
(v)	Profit on sale of capital asset credited in financial accounts	30,000
(vi)	Under valuation of closing stock in cost accounts	25,000
(vii)	Over recovery of production overheads in cost accounts	10,200
(viii)	Interest paid on Debentures shown in financial accounts	50,000

Required:

Find out the Profit (Loss) as per Cost Accounts by preparing a Reconciliation Statement.

(PYP Nov 22)

Answer 40

Reconciliation Statement

(Reconciliation the profit as per financial records with the profit as per costing records)

	Particulars	**(Rs.)**	**Total (Rs.)**
	Profit as per Financial Accounts		5,50,000
Add:	Legal Charges	15,250	
	Preliminary expenses written off	25,750	
	Interest paid	50,000	91,000
			6,41,000
Less:	Under-valuation of closing stock in cost book	25,000	
	Interim Dividend Received	4,50,000	
	Over recovery of selling overheads in cost accounts	11,380	
	Over recovery of production overhead in cost accounts	10,200	
	Profit on sale of Assets	30,000	5,26,580
	Profit as per Cost Accounts		1,14,420

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Question 41

The following incomplete accounts are furnished to you for the month ended 31st October, 2022.

Stores Ledger Control Account		
1.10.2022	**To Balance**	**Rs. 54,000**
Work in Process Control Account		
1.10.2022	**To Balance**	**Rs. 6,000**
Finished Goods Control Account		
1.10.2022	**To Balance**	**Rs. 75,000**
Factory Overheads Control Account		
Total debits for October, 2022		**Rs. 45,000**
Factory Overheads Applied Account		
Cost of Goods Sold Account		
Creditors for Purchases Account		
1.10.2022	**By Balance**	**Rs. 30,000**

Additional information:

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(i) The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 2022 is Rs. 6, 75,000 and the budget of direct labour hours is 4, 50,000.

(ii) The balance in the account of creditors for purchases on 31.10.2022 is Rs.15, 000 and the payments made to creditors in October, 2022 amount to Rs. 1, 05,000.

(iii) The finished goods inventory as on 31st October, 2022 is Rs. 66,000.

(iv) The cost of goods sold during the month was Rs.1, 95,000.

(v) On 31st October, 2022 there was only one unfinished job in the factory. The cost records show that Rs. 3,000 (1,200 direct labour hours) of direct labour cost and Rs. 6,000 of direct material cost had been charged.

(vi) A total of 28,200 direct labour hours were worked in October, 2022. All factory workers earn same rate of pay.

(vii) All actual factory overheads incurred in October, 2022 have been posted.

You are required to FIND:

(a) Materials purchased during October, 2022.

(b) Cost of goods completed in October, 2022.

(c) Overheads applied to production in October, 2022.

(d) Balance of Work-in-Process Control A/c on 31st October, 2022.

(e) Direct Materials consumed during October, 2022.

(f) Balance of Stores Ledger Control Account on 31st October, 2022.

(g) Over absorbed or under absorbed overheads for October, 2022.

(Study Material)

Answer 41

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Working Notes:

(i) Overhead recovery rate per direct labour hour:

Budgeted Factory Overheads = Rs. 6, 75,000

Budgeted Direct Labour hours = 4, 50,000

Overhead recovery rate = $\frac{\text{Budgeted Factory Overheads}}{\text{Budgeted Direct Labour hours}}$

= $\frac{\text{Rs.6,75,000}}{\text{4,50,000 hours}}$ = Rs. 1.50 per direct labour

(ii) Direct Wage rate per hour:

Direct Labour cost of WIP = Rs. 3,000

(On 31st October 2022)

Direct labour hours of WIP = 1,200 hours

Direct wage rate per hour = $\frac{\text{Direct labour cost on WIP}}{\text{Direct labour hours on WIP}}$

= $\frac{\text{Rs. 3,000}}{\text{1,200 hours}}$ = Rs. 2.50

(iii) Total Direct Wages charged to production:

Total direct labour hours spent on production × Direct wage rate per hour

= 28,200 hours × Rs. 2.50 = Rs. 70,500

(a) Material purchased during October, 2022

	(Rs.)
Payment made to creditors	1,05,000
Add: Closing balance in the account of creditors for purchase	15,000

Less: Opening balance	(30,000)
Material Purchased	**90,000**

(b) Cost of Finished Goods in October, 2022

	(Rs.)
Cost of goods sold during the month	1,95,000
Add: Closing finished goods inventory	66,000
Less: Opening finished goods inventory	(75,000)
Cost of goods completed during the month	1,86,000

(c) Overhead applied to production in October, 2022

= 28,200 hours × Rs.1.50 = Rs. 42,300

(d) Balance of Work-in-Process on 31st October, 2022

	(Rs.)
Direct material cost	6,000
Direct labour cost	3,000
Overheads (Rs. 1.50 × 1,200 hours)	1,800
	10,800

(e) Direct material consumed during October, 2022 = Rs. 78,000

(Refer to following Accounts)

Work in Process Control A/c

	(Rs.)		(Rs.)
To Balance b/d	6,000	By Finished goods control A/c [Refer (b) above]	1,86,000
" Wages Control A/c [Refer working note (iii)]	70,500	" Balance c/d [Refer (d)above]	10,800
" Factory OH Control A/c [Refer (c) above]	42,300		
" Material consumed (Balancing fig.)	78,000		
	1,96,800		1,96,800

(f) Balance of Stores Control Account on 31st October, 2022

= Rs. 66,000 (Refer to following Account)

Stores Ledger Control Account

	(Rs.)		(Rs.)
" Balance b/d	54,000	By Work-in-process Control A/c [Refer (e) above]	78,000

" Payables (Creditors) A/c [Refer (a) above}	90,000	" Balance c/d (Balancing fig.)	66,000
	1,44,000		1,44,000

(g) Over-absorbed or under-absorbed overheads for October, 2022:

Balance in Factory Overhead Account below showing that Rs. 2,700 is under-absorbed.

Factory Overhead Account

	(Rs.)		**(Rs.)**
To Bank A/c	45,000	By Work-in-process Control A/c (Factory OH applied)	42,300
		" Costing P/L A/c (Under absorbed)	2,700
	45,000		45,000

Topic 5 MCQs

Multiple Choice Questions (MCQ's)

Question 42

WHICH of the following is the correct journal entry as would appear in the cost books when overhead expenses incurred Rs.500 (Production Rs.250 and Administrative Rs.250)?

(a) Production Overhead Control A/c Dr. Rs.250

Administrative Overhead Control A/c Dr. Rs.250

To Cost Ledger Control A/c Rs.500

(b) Production Overhead Control A/c Dr. Rs.250

Administrative Overhead Control A/c Dr. Rs.250

To Overhead Expenses A/c Rs.500

(c) Cost Ledger Control A/c Dr. Rs.500

To Production Overhead Control A/c Rs.250

To Administrative Overhead Control A/c Rs.250

(d) Overhead Expenses A/c Dr. Rs.500

To Production Overhead Control A/c Rs.250

To Administrative Overhead Control A/c Rs.250

(RTP Sep. 2025)

Ans: (a) Production Overhead Control A/c Dr. Rs.250

Administrative Overhead Control A/c Dr. Rs.250

To Cost Ledger Control A/c Rs.500

Question 43

Under the Non-integrated accounting system

(a) Same ledger is maintained for cost and financial accounts by accountants

(b) Separate ledgers are maintained for cost and financial accounts

(c) (a) and (b) both

(d) None of the above

(Study material)

Ans: (b) Separate ledgers are maintained for cost and financial accounts

Reason:

In a non-integrated accounting system, separate ledgers are maintained for cost accounting and financial accounting purposes. This means that the cost accounting records (related to the production, costs, and overheads) are kept separately from the financial accounting records (which deal with assets, liabilities, and income). These two sets of records are not merged, unlike in an integrated system, where both are maintained in the same set of books.

Question 44

Notional costs

(a) May be included in Integrated accounts

(b) Separate ledgers are maintained for cost and financial accounts

(c) Cannot be included in Non-integrated accounts

(d) None of the above

(Study material)

Ans: (b) Separate ledgers are maintained for cost and financial accounts

Reason:

Notional costs are hypothetical costs (like imputed rent) included in cost accounts. They can be recorded in integrated accounts because both cost and financial records are maintained in the same set of books, allowing for inclusion of such costs for cost analysis.

Question 45

Under Non-integrated accounting system, the account made to complete double entry is

(a) Stores ledger control account

(b) Work in progress control account

(c) Finished goods control account

(d) General ledger adjustment account

(Study material)

Ans: (d) General ledger adjustment account

Reason:

In the non-integrated accounting system, separate ledgers are maintained for cost and financial accounts. To complete double entry, a General Ledger Adjustment Account is used. This account helps reconcile the differences between the cost accounts and the financial accounts, ensuring that the two systems are aligned and the double-entry accounting principle is maintained.

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Question 46

Integrated systems of accounts are maintained

(a) In separate books of accounts for costing and financial accounting purposes

(b) In same books of accounts

(c) Both (a) & (b)

(d) None of the above

(Study material)

Ans: (b) In same books of accounts

Reason:

In an integrated accounting system, both costing and financial accounting records are maintained in the same set of books. This system allows for the seamless recording of financial transactions and cost-related data, reducing the need for separate sets of records and ensuring consistency between the two accounting methods.

Question 47

Under Non-integrated system of accounting, purchase of raw material is debited to which account

(a) Material control account / Stores ledger control account

(b) General ledger adjustment account

(c) Purchase account

(d) None of the above

(Study material)

Ans: (a) Material control account / Stores ledger control account

Reason:

Under the non-integrated accounting system, raw material purchases are debited to the Material Control Account or Stores Ledger Control Account. This account tracks the materials in the cost accounting system. Since the non-integrated system keeps separate books for cost and financial accounting, raw material purchases are recorded in the cost ledger, while the purchase account is used in the financial accounting records.

Question 48

Under Non-integrated accounts, if materials worth Rs. 1,500 are purchased for a special job, then which account will be debited:

(a) Special job account / Work in Process account

(b) Material Control account

(c) Cost Control account

(d) None of the above

(Study material)

Ans: (a) Special job account / Work in Process account

Reason: Under the non-integrated accounting system, when materials are purchased specifically for a special job, the cost of these materials is debited to the Special Job Account or Work in Process (WIP) Account. This is because the materials are directly assigned to a particular job or work in progress, which is tracked separately from general materials inventory. The Material Control Account would track general materials purchases, but for a specific job, the appropriate job or WIP account is debited.

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Question 49

Which account is to be debited if materials worth Rs. 500 are returned to vendor under Non-integrated accounts?

(a) Cost ledger control account

(b) Finished goods control account

(c) WIP control account

(d) None of the above

Ans: (a) Cost ledger control account

Reason:

Under the non-integrated accounting system, when materials are returned to the vendor, the Cost Ledger Control Account is debited. This is because the returned materials reduce the inventory in the cost accounting records, which are maintained separately from the financial accounting records. The Cost Ledger Control Account tracks all material-related transactions in the cost system.



Chapter 8

Unit & Batch Costing

Topic 1 Introduction to Unit & Batch Costing

Question 1

DESCRIBE Unit Costing. WHAT kind of industries follow this method of costing?

(MTP Sep'22)

Answer 1

Unit costing: It is that method of costing where the output produced is identical and each unit of output requires identical cost. Unit costing is synonymously known as single or output costing, but these are subdivision of unit costing method.

This method of costing is followed by industries which produce single output or few variants of a single output, therefore, this method of costing, finds its application in industries like paper, cement, steel works, mining, breweries etc. These types of industries produce identical products and therefore have identical costs.

Question 2

Explain 'Job Costing' and 'Batch Costing'.

(PYP May '18)

Answer 2

Job costing: In this method of costing, cost of each job is ascertained separately. It is suitable in all cases where work is undertaken on receiving a customer's order like a printing press,

motor work shop, etc. This method of costing is used for non- standard and non- repetitive products produced as per customer specifications and against specific orders. Jobs are different from each other and independent of each other. Each Job is unique.

Batch Costing: It is the extension of Job costing. Homogeneous products are produced in a continuous production flow in lots. A batch may represent a number of small orders passed through the factory in batch. Each batch here is treated as a unit of cost and thus separately costed. Here cost per unit is determined by dividing the cost of the batch by number of units produced in the batch.

Question 3

DESCRIBE Unit Costing and Batch Costing giving example of industries where these are used.

(Study material)

Answer 3

UNIT COSTING

Unit costing is that method of costing where the output produced is identical and each unit of output requires identical cost. Unit costing is synonymously known as single or output costing, but these are sub-division of unit costing method. This method of costing is followed by industries which produce single output or few variants of a single output. Under this method costs, are collected and analyzed element wise and then total cost per unit is ascertained by dividing the total cost with the number of units produced. If we have to state it in the form of a formula, then

Cost per unit = $\frac{\text{Total Cost Of Production}}{\text{No.of Units Produced}}$

This method of costing, therefore finds its application in industries like paper, cement, steel works, mining, breweries etc. These types of industries produce identical products and therefore have identical costs.

BATCH COSTING

Batch Costing is a type of specific order costing where articles are manufactured in predetermined lots, known as batch. Under this costing method, the cost object for cost determination is a batch for production rather output as seen in unit costing method.

A batch consists of certain number of units which are processed simultaneously to be for manufacturing operation. Under this method of manufacturing, the inputs are accumulated in the assembly line till it reaches minimum batch size. Soon after a batch size is reached, all inputs in a batch is processed for further operations. Reasons for batch manufacturing may be either technical or economical or both. For example, in pen manufacturing industry, it would be too costly to manufacture one pen of a particular design at a time to meet the demand of one customer. On the other hand, the production, of say 10,000 pens, of the same design will reduce the cost to a sizeable extent.

To initiate production process, an entity has to incur expenditures on engaging workers for production and supervision, setting-up of machine to run for production etc. These are the minimum level of expenditures which have to be incurred each time a batch is run irrespective of number of units produced.

Question 4

DISTINGUISH between Job Costing & Batch Costing.

(Study material)

Answer 4

Sr. No	Job Costing	Batch Costing
1	Method of costing used for non-standard and non-repetitive products produced as per customer specifications and against specific orders.	Homogeneous products produced in a continuous production flow in lots.

2	Cost determined for each Job	Cost determined in aggregate for the entire Batch and then arrived at on per unit basis.
3	Jobs are different from each other and independent of each other. Each Job is unique.	Products produced in a batch are homogeneous and lack of individuality

Question 5

DESCRIBE cost unit and give EXAMPLE(S) of cost unit for the following Industry or Product:

Industry or Product
Construction
Transport
Technology
Oil
Gas
Electricity

(RTP Sep. 2025)

Answer

Cost unit is a unit of product, service or time (or combination of these) in relation to which costs may be ascertained or expressed. These are usually the units of physical measurement like number, weight, area, volume, length, time and value.

Industry or Product	Cost unit(s)
Construction	Square meter, cubic meter
Transport	Passenger- kilometer, tonne-kilometer
Technology	Software license, hardware component
Oil	Barrel, tonne, litre
Gas	Cubic feet
Electricity	Kilowatt-hour (kWh)

Topic 2 EBQ – Concept and Formula

Question 6

In Batch Costing, STATE how is Economic Batch Quantity determined?

(MTP Mar 22, Mar 18)

Answer 6

The economic batch size or Economic Batch Quantity may be determined by calculating the total cost for a series of possible batch sizes and checking which batch size gives the minimum cost. The objective here being to determine the production lot (Batch size) that optimizes on

both set up and inventory holding cots formula. The mathematical formula usually used for its determination is as follows:

$$(EBQ) = \sqrt{\frac{2 \times D \times S}{C}}$$

Where,

D = Annual demand for the product

S =Setting up cost per batch

C=Carrying cost per unit of production

Question 7

Z Ltd. produces product ZZ in batches, management of the Z Ltd. wants to know the number of batches of product ZZ to be produced where the cost incurred on batch setup and carrying cost of production is at optimum level. How will they DETERMINE the optimum batch number?

(Study material)

Answer 7

As the product is produced in batches or lots, the lot size chosen will be critical in achieving least cost of operation. Primarily, the total production cost under batch production comprises of two main costs, namely,

1. Machine Set Up Costs and

2. Inventory holding costs.

If the size is higher, the set up cost may decline due to lesser number of set ups required; but units in inventory will go up leading to higher holding costs. If the lot size is lower, lower inventory holding costs are accomplished but only with higher set up costs. Economic batch quantity is the size of a batch where total cost of set-up and holding costs are at minimum.

The economic batch size or Economic Batch Quantity may be determined by calculating the total cost for a series of possible batch sizes and checking which batch size gives the minimum cost. Alternatively, a formula can be derived which is similar to determination of Economic Order Quantity (EOQ). The objective here being to determine the production lot (Batch size) that optimizes on both set up and inventory holding cots formula. The mathematical formula usually used for its determination is as follows:

EBQ = $\sqrt{\frac{2DS}{C}}$

Where, D = Annual demand for the product

S = Setting up cost per batch

C = Carrying cost per unit of production

Topic 3 Calculation of EBQ

Question 8

Zee Ltd. manufactures pistons used in car engines. As per the study conducted by the Auto Parts Manufacturers Association, there will be a demand of 80 million pistons in the coming year. A Ltd. is expected to have a market share of 2.15% of the total market demand of the pistons in the coming year. It is estimated that it costs Rs. 2.50 as inventory holding cost per piston per month and that the set-up cost per run of piston manufacture is Rs. 4,500.

COMPUTE the optimum run size for piston manufacturing?

(MTP Oct'21) (Same concept different figures MTP Apr 19)

Answer 8

Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2\times D\times S}{C}}$

Where, D = Annual demand i.e. 2.15% of 8, 00, 00,000 = 17, 20,000 units

S = Set-up cost per run = Rs. 4,500

C = Inventory holding cost per unit per annum

= Rs. 2.5 × 12 months = Rs. 30

EBQ = $\sqrt{\frac{2\times 17,20,000\times \text{Rs. } 4,500}{\text{Rs.}30}}$ = 22,716 units

Question 9

Arnav Motors Ltd. manufactures pistons used in car engines. As per the study conducted by the Auto Parts Manufacturers Association, there will be a demand of 80 million pistons in the coming year. Arnav Motors Ltd. is expected to have a market share of 1.15% of the total market demand of the pistons in the coming year. It is estimated that it costs Rs.1.50 as inventory holding cost per piston per month and that the set-up cost per run of piston manufacture is Rs. 3,500.

DETERMINE the optimum run size for piston manufacturing?

(MTP Oct '18)

Answer 9

(i) Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2\times D\times S}{C}}$

Where,	D	= Annual demand i.e. 1.15% of 8,00,00,000 = 9,20,000 units
	S	= Set-up cost per run = Rs. 3,500
	C	= Inventory holding cost per unit per annum = Rs. 1.5 × 12 months = Rs. 18

EBQ = $\sqrt{\frac{2\times 9,20,000 \text{ units}\times 3,500}{18}}$ = 18,915 units

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Question 10

GHI Ltd. manufactures 'Stent' that is used by hospitals in heart surgery. As per the estimates provided by Pharmaceutical Industry Bureau, there will be a demand of 40 Million 'Stents' in the coming year. GHI Ltd. is expected to have a market share of 2.5% of the total market demand of the Stents in the coming year. It is estimated that it costs 1.50 as inventory holding cost per stent per month and that the set-up cost per run of stent manufacture is Rs. 225.

Required:

What would be the optimum run size for Stent manufacture?

(PYP 5 Jan '21) (Same concept different figures RTP May'22)

Answer 10

Computation of Optimum Run size of 'Stents' or Economic Batch Quantity (EBQ)

Economic Batch Quantity (EBQ) = $\sqrt{\frac{2\times D\times S}{C}}$

Where, D = Annual demand for the Stents

= 4, 00, 00,000 × 2.5% = 10, 00,000 units

S = Set- up cost per run= Rs. 225

C = Carrying cost per unit per annum= Rs. 1.50 × 12 = Rs. 18

EBQ = $\sqrt{\frac{2\times 10,00,000\times Rs.225}{Rs.18}}$ = 5,000 units of Stents

Question 11

XYZ Ltd. has obtained an order to supply 48000 bearings per year from a concern. On a steady basis, it is estimated that it costs Rs. 0.20 as inventory holding cost per bearing per month and the set-up cost per run of bearing manufacture is Rs. 384.

You are required to:

Compute the optimum run size and number of runs for bearing manufacture.

(PYP Nov '18)

Answer 11

Optimum batch size or Economic Batch Quantity (EBQ):

EBQ = $\sqrt{\frac{2\times D\times S}{C}} = \sqrt{\frac{2\times 48{,}000\times 384}{2.4}}$ = 3919.18 or 3,920 units

Number of Optimum runs = 48,000 ÷ 3,920 = 12.245 or 13 run

Question 12

AUX Ltd. has an Annual demand from a single customer for 60,000 Covid-19 vaccines. The customer prefers to order in the lot of 15,000 vaccines per order. The production cost of vaccine is Rs. 5,000 per vaccine. The set-up cost per production run of Covid-19 vaccines is Rs. 4,800. The carrying cost is Rs. 12 per vaccine per month.

You are required to:

Find the most Economical Production Run.

(PYP July '21)

Answer 12

Calculation of most Economical Production Run

= $\sqrt{\frac{2\times 60{,}000\times \text{Rs.}4.800}{12\times 12}}$ = 2,000 Vaccine

Question 13

TSK Limited manufactures a variety of products. The annual demand for one of its products-Product 'X' is estimated as Rs.1, 35,000 units. Product 'X' is to be manufactured done in batches. Set up cost of each batch is Rs.3,375 and inventory holding cost is Rs. 5 per unit. It is expected that demand of Product 'X' would be uniform throughout the year.

Required:

Calculate the Economic Batch (EBQ) for Product 'X'.

(PYP May '23)

Answer 13

Economic Batch Quantity (EBQ) = $\sqrt{\frac{2\times D\times S}{C}}$

Where,

D = Annual demand for the product

S = Set-up cost per batch

C = Carrying cost per unit per annum.

$=\sqrt{\frac{2\times D\times S}{C}}=\sqrt{\frac{2\times 1,35,000\times 3375}{5}}$ 13,500 units.

Question 14

A customer has been ordering 90,000 special design metal columns at the rate of 18,000 columns per order during the past years. The production cost per unit comprises Rs.2, 120 for material, Rs.60 for labour and Rs.20 for fixed overheads. It costs Rs.1, 500 to set up for one run of 18,000 column and inventory carrying cost is 5%.

FIND the most economic production run.

(Study material)

Answer 14

Total Cost of production = Rs.2, 120 + 60 + 20 = Rs.2, 200

Calculation of Economic Batch Quantity (EBQ):

EBQ = $\sqrt{\frac{2\times 90,000\times Rs.1,500}{5\%\ of\ Rs.2,200}} = \sqrt{\frac{27,00,00,000}{Rs.110}}$ = 1,567 columns.

Question 15

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is Rs. 324.

COMPUTE what would be the optimum run size for bearing manufacture?

(Study material)

Answer 15

Optimum production run size (Q) = $\sqrt{\frac{2DS}{C}}$

Where,

D = No. of units to be produced within one year.

S = Set-up cost per production run

C = Carrying cost per unit per annum.

= $\sqrt{\frac{2DS}{C}} = \sqrt{\frac{2x24,000xRs.324}{0.10x12}}$ =3,600 bearings.

Topic 4 Comparison of EBQ vs Non-Optimal Batches

Question 16

A Ltd. manufactures mother boards used in smart phones. A smart phone requires one mother board. As per the study conducted by the Indian Cellular Association, there will be a demand of 180 million smart phones in the coming year. A Ltd. is expected to have a market share of 5.5% of the total market demand of the mother boards in the coming year. It is estimated that it costs Rs.6.25 as inventory holding cost per board per month and that the set-up cost per run of board manufacture is Rs.33, 500.

(i) COMPUTE the optimum run size for board manufacturing?

(ii) Assuming that the company has a policy of manufacturing 80,000 boards per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

(RTP Nov '20) (MTP Sep '23)

Answer 16

Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2\times D\times S}{C}}$

Where, D = Annual demand i.e. 5.5% of 18, 00, 00,000 = 99, 00,000 units

S = Set-up cost per run = Rs.33, 500

C = Inventory holding cost per unit per annum = Rs.6.25 × 12 months = Rs.75

EBQ = $\sqrt{\frac{2\times 99,00,000 \text{ Units}\times \text{Rs.}33,500}{\text{Rs.}75}}$ = 94,042.5 Units or 94,043 Units

Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set- ups	Set-up Cost (Rs.)	Inventory holding cost (Rs.)	Total Cost (Rs.)

A	80,000 units	124 $\left(\frac{99,00,000}{80,000}\right)$	41,54,000 (124 × Rs.33,500)	30,00,000 $\left(\frac{80,000 \times Rs.75}{2}\right)$	71,54,000
B	94,043 units	106	35,51,000 (106 × Rs.33,500)	35,26,612.5 $\left(\frac{94,043 \times Rs.75}{2}\right)$	70,77,612.50
	Extra Cost (A – B)				76,387.50

Question 17

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is Rs. 324.

(a) COMPUTE what would be the optimum run size for bearing manufacture?

(b) Assuming that the company has a policy of manufacturing 6,000 bearings per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?

(c) CALCULATE the holding cost at optimum inventory level?

(Study material)

Answer 17

(a) Optimum production run size (Q) = $\sqrt{\frac{2DS}{C}}$

Where,

D = No. of units to be produced within one year.

S = Set-up cost per production run

C = Carrying cost per unit per annum.

$= \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2x24,000xRs.324}{0.10x12}}$ =3,600 bearings.

(b) Total Cost (of maintaining the inventories) when production run size (Q) are 3,600 and 6,000 bearings respectively.

Total cost = Total set-up cost + Total carrying cost.

	When run size is 3,600 bearings	**When run size is 6,000 bearings**
Total set up cost	$= \frac{24,000}{3,600} \times Rs.324 = Rs.2,160$ Or, No. of setups = 6.67 (7 setups) = 7 x 324 = Rs. 2,268	$= \frac{24,000}{6,000} \times Rs.324 = Rs.1,296$
Total Carrying cost	1/2×3,600 × 0.10P × 12 = Rs. 2,160	1/2 × 6,000 × 0.10P × 12 = Rs. 3,600
Total Cost	Rs. 4,320/ Rs. 4,428	Rs. 4,896

Rs. 576/ Rs. 468 is the excess cost borne by the firm due to run size not being economic batch quantity.

(c) Inventory holding cost at EBQ = 1/2 Q × C

(When Q = 3,600 bearings) = 1/2 × 3,600 bearings × 0.10P × 12

= Rs. 2,160

Topic 5 Minimum Inventory Cost & Total Cost Analysis

Question 18

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is Rs. 324.

CALCULATE the holding cost at optimum inventory level?

(Study material)

Answer 18

Inventory holding cost at EBQ = 1/2 Q × C

(When Q = 3,600 bearings) = 1/2 × 3,600 bearings × 0.10P × 12

= Rs. 2,160

Question 19

Wonder Ltd. has a capacity of 120,000 units per annum as its optimum capacity. The production costs are as under:

Direct Material – Rs.90 per unit

Direct Labour- Rs.60 per unit

Overheads:

Fixed: Rs.30, 00,000 per annum

Variable: Rs.100 per unit

Semi Variable: Rs.20, 00,000 per annum up to 50% capacity and an extra amount of Rs.4, 00,000 for every 25% increase in capacity or part thereof. The production is made to order and not for stocks.

If the production programme of the factory is as indicated below and the management desires a profit of Rs.20, 00,000 for the year DETERMINE the average selling price at which each unit should be quoted.

First 3 months: 50% capacity

Remaining 9 months: 80% capacity

Ignore Administration, Selling and Distribution overheads.

(Study material)

Answer 19

Statement of Cost and Total Sales **Amount (Rs.)**

Particulars	First 3 months	Next 9 months	Total
Capacity Utilisation (No of units)	120,000x3/12x50% =15,000	120,000x9/12x80% =72,000	87,000
Direct Material	13,50,000	64,80,000	78,30,000
Direct Labour	9,00,000	43,20,000	52,20,000
Add: Overheads:			
- Fixed (1:3)	7,50,000	22,50,000	30,00,000
- Variable	15,00,000	72,00,000	87,00,000
Semi Variable	5,00,000 (For first 3 months at the rate of Rs.20,00,000)	21,00,000 (at the rate of Rs.28,00,000 for 9 months)	26,00,000
Total cost	50,00,000	2,23,50,000	2,73,50,000
Add: Profit			20,00,000

Sales			2,93,50,000

Average Selling Price =Rs.2, 93, 50,000 ÷ 87,000 units = Rs. 337.356

Topic 6 Profitability and Selling Price Calculation

Question 20

A jobbing factory has undertaken to supply 300 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is Rs.8 per piece.

From the following data CALCULATE the cost and profit per piece of each batch order and overall position of the order for 1,800 pieces.

Month	Batch Output	Material cost	Direct wages	Direct labour
		(Rs.)	(Rs.)	hours
January	310	1150	120	240
February	300	1140	140	280
March	320	1180	150	280
April	280	1130	140	270
May	300	1200	150	300
June	320	1220	160	320

The other details are:

Month	Chargeable expenses	Direct labour
	(Rs.)	(Hours)
January	12,000	4,800
February	10,560	4,400
March	12,000	5,000
April	10,580	4,600
May	13,000	5,000
June	12,000	4,800

(MTP Oct.'2020) (Same concept different figures MTP Mar'21, RTP May'23)

Answer 20

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	310	300	320	280	300	320	1,830
Sale value (Rs.)	2,480	2,400	2,560	2,240	2,400	2,560	14,640
Material cost (Rs.)	1,150	1,140	1,180	1,130	1,200	1,220	7,020
Direct wages (Rs.)	120	140	150	140	150	160	860

Chargeable expenses* (Rs.)	600	672	672	621	780	800	4,145
Total cost (Rs.)	1,870	1,952	2,002	1,891	2,130	2,180	12,025
Profit per batch (Rs.)	610	448	558	349	270	380	2,615
Total cost per unit (Rs.)	6.03	6.51	6.26	6.75	7.10	6.81	6.57
Profit per unit (Rs.)	1.97	1.49	1.74	1.25	0.90	1.19	1.43

Overall position of the order for 1,200 units

Sales value of 1,800 units @ Rs.8 per unit Rs.14, 400

Total cost of 1,800 units @ Rs.6.57 per unit Rs.11, 826

Profit Rs.2, 574

* Chargeable expenses / Direct labour hour for the month X Direct labour hours for batch

Question 21

Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake at least 50 units of any item at a time. A customer has given an order for 600 cakes. To process a batch of 50 cakes, the following cost would be incurred:

Direct materials - Rs. 5,000

Direct wages - Rs. 500

Oven set-up cost Rs. 750

AC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads.

AC requires a profit margin of 25% of sales value. Required:

(i) DETERMINE the price to be charged for 600 cakes.

(ii) CALCULATE cost and selling price per cake.

(iii) DETERMINE what would be selling price per unit if the order is for 605 cakes.

(MTP Aug '18 & March '23) (RTP May '18)

Answer 21

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

	Particulars	Cost per batch (Rs.)	Total Cost (Rs.)
	Direct Material Cost	5,000.00	60,000
	Direct Wages	500.00	6,000
	Oven set-up cost	750.00	9,000
	Add: Production Overheads (20% of Direct wages)	100.00	1,200
	Total Production cost	6,350.00	76,200
	Add: S&D and Administration overheads (10% of Total production cost)	635.00	7,620

	Total Cost	6,985.00	83,820
	Add: Profit (1/3rd of total cost)	2,328.33	27,940
(i)	Sales price	9,313.33	1,11,760
	No. of units in batch	50 units	
(ii)	Cost per unit (Rs.6,985 ÷ 50 units)	139.70	
	Selling price per unit (9,313.33 ÷ 50 units)	186.27	

(iii) If the order is for 605 cakes, then selling price per cake would be as below:

Particulars	Total Cost (Rs.)
Direct Material Cost	60,500
Direct Wages	6,050
Oven set-up cost	9,750
Add: Production Overheads (20% of Direct wages)	1,210
Total Production cost	77,510
Add: S&D and Administration overheads (10% of Total production cost)	7,751
Total Cost	85,261
Add: Profit (1/3rd of total cost)	28,420

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Sales price	1,13,681
No. of units	605 units
Selling price per unit (Rs.1,13,681 ÷ 605 units)	187.90

Question 22

PS Ltd. manufactures articles in predetermined lots simultaneously. The following costs have been incurred for Batch No. 'PS143' in the month of March, 2022:

Units produced 1,000 units

Direct materials cost Rs. 2, 00,000

Direct Labour -

Department A 800 labour hours @ Rs. 100 per hour.

Department B 1,400 labour hours @ Rs. 120 per hour.

Factory overheads are absorbed on labour hour basis and the rates are:

Department A @ Rs. 140 per hour.

Department B @ Rs. 80 per hour.

Administrative overheads are absorbed at 10% of selling price.

The firm expects 25% gross profit (sales value minus factory cost) for determining the selling price.

You are required to CALCULATE the selling price per unit of Batch No. 'PS143'.

(RTP Nov'22)

Answer 22

Statement showing selling price per unit of Batch number 'PS143'

Particulars	Amount (Rs.)	Amount (Rs.)
Direct Materials		2,00,000
Direct Labour		
Department A 800 labour hours @ Rs.100 per hour	80,000	
Department B 1400 labour hours @ Rs.120 per hour	1,68,000	2,48,000
Factory overheads		
Department A 800 labour hours @ Rs.140 per hour	1,12,000	
Department B 1400 labour hours @ Rs.80 per hour	1,12,000	2,24,000
Factory Cost		6,72,000
Add: Administrative overheads (10% of selling price) (6, 72,000/75% x 10%)		89,600
Cost of production		7,61,600
Add: Profit (15% of selling price) (6, 72,000/75% x 15%)		1,34,400
Selling price of batch no 'PS143'		8,96,000

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Selling price per unit (8,96,000 / 1000 units)		896

Alternatively, selling price calculation:-

Selling price assume X

25% = (X – factory cost) / X

Or 0.25 X = X- 6, 72,000

Or 0.75 X = 6, 72,000

Hence X = Rs. 8, 96,000

Question 23

A Ltd. is a pharmaceutical company which produces vaccines for diseases like Monkey Pox, Covid- 19 and Chickenpox. A distributor had given an order for 1,600 Monkey Pox Vaccines. The company can produce 80 vaccines at a time. To process a batch of 80 Monkey Pox vaccines, the following costs would be incurred:

Direct Materials	**Rs.4, 250**
Direct wages	**Rs.500**
Lab set-up cost	**Rs.1, 400**

The Production Overheads are absorbed at a rate of 20% of direct wages and 20% of total production cost is charged in each batch for Selling, distribution and administration Overheads.

The company is willing to earn profit of 25% on sales value.

You are required to determine:

(i) Total Sales value for 1,600 Monkey Pox Vaccines

(ii) Selling price per unit of the Vaccine.

(PYP Nov 22)

Answer 23

(i) & (ii) Calculation of Sales value and Selling price per unit of Monkey Pox vaccine

Particulars	Amount (Rs.) per Batch	Amount (Rs.) for 1600 units or 20 batches	Amount (Rs.) per unit
Direct materials	4,250	85,000	53.125
Direct wages	500	10,000	6.250
Lab set-up cost	1,400	28,000	17.500
Production overheads (20% of direct wages)	100	2,000	1.250
Production Cost	6,250	1,25,000	78.125
Selling, distribution and administration cost (20% of Production cost)	1,250	25,000	15.625
Total Cost	7,500	1,50,000	93.75
Add: Profit (1/3rd of Total cost or 25% of Sales value)	2,500	50,000	31.25
Sales value	10,000	2,00,000	125.00

Question 24

Rio Limited undertakes to supply 1000 units of a component per month for the months of January, February and March. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at Rs. 15 per unit.

From the following data, CALCULATE the profit per unit of each batch order and the overall position of the order for the 3,000 units.

Month	Batch Output (Numbers)	Material Cost (Rs.)	Labour Cost (Rs.)
January	1,250	6,250	2,500
February	1,500	9,000	3,000
March	1,000	5,000	2,000

Labour is paid at the rate of Rs. 2 per hour. The other details are:

Month	Overheads (Rs.)	Total Labour Hours
January	12,000	4,000
February	9,000	4,500
March	15,000	5,000

(Study material)

Answer 24

Statement of Cost and Profit per unit of each batch

	January	February	March	Total
a) Batch Output (Nos.)	1,250	1,500	1,000	3,750
b) Sales Value (@Rs. 15 per unit)	(Rs.) 18,750	(Rs.) 22,500	(Rs.) 15,000	(Rs.) 56,250
Cost				
Material	6,250	9,000	5,000	20,250
Wages	2,500	3,000	2,000	7,500
Overheads	3,750	3,000	3,000	9,750
c) Total	12,500	15,000	10,000	37,500
d) Profit per batch (b) – (c)	6,250	7,500	5,000	18,750
e) Cost per unit (c) ÷ (a)	10	10	10	
f) Profit per unit (d) ÷ (a)	5	5	5	

Overall Position of the Order for 3,000 Units

Sales value (3,000 units × Rs. 15)	Rs.45,000
Less: Total cost (3,000 units × Rs. 10)	30,000
Profit	15,000

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Calculation of overhead per hour:

	January	February	March
i. Labour hours:			
$=\frac{\text{Labour Cost}}{\text{Labour rates per hour}}$	$=\frac{Rs.2,500}{2}$ =1250	$\frac{Rs.3,000}{2}$=1,500	$\frac{Rs.2,000}{2}$=1,000
ii. Overhead per hour:			
$=\frac{\text{Total Overheads}}{\text{Total Labour Hour}}$	$=\frac{Rs.12,000}{4,000}$ = Rs.3	$=\frac{Rs.9,000}{4,500}$ = Rs.2	$=\frac{Rs.15,000}{5,000}$ = Rs.3
iii. Overhead for batch (i) × (ii)	Rs. 3,750	Rs. 3,000	Rs. 3,000

Topic 7 Batch Frequency and Run Intervals

Question 25

M/s. KBC Bearings Ltd. is committed to supply 48,000 bearings per annum to M/s. KMR Fans on a steady daily basis. It is estimated that it costs Rs. 1 as inventory holding cost per bearing per month and that the set up cost per run of bearing manufacture is Rs. 3,200

DETERMINE what would be the interval between two consecutive optimum runs?

(MTP Oct '18, Old & New SM)

Answer 25

Number of Optimum runs = 48,000 ÷ 5,060 = 9.49 or 10 runs Interval between 2 runs (in days) = 365 days ÷ 10 = 36.5 days

Question 26

M/s. KBC Bearings Ltd. is committed to supply 48,000 bearings per annum to M/s. KMR Fans on a steady daily basis. It is estimated that it costs Rs. 1 as inventory holding cost per bearing per month and that the set up cost per run of bearing manufacture is Rs. 3,200

CALCULATE the minimum inventory cost?

(MTP Oct '18, Old & New SM)

Answer 26

Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum

Average Inventory = 5,060 units ÷ 2 = 2,530 units

Carrying Cost per unit per annum = Rs.1 × 12 months = Rs.12

Minimum Inventory Holding Costs = 2,530 units × Rs.12 = Rs.30, 360

Topic 8 Case Studies & Multi-Part Applications

Question 27

Arnav Ltd. operates in beverages industry where it manufactures soft -drink in three sizes of Large (3 litres), Medium (1.5 litres) and Small (600 ml) bottles. The products are processed in batches. The 5,000 litres capacity processing plant consumes electricity of 90 Kilowatts per hour and a batch takes 1 hour 45 minutes to complete. Only symmetric size of products can be processed at a time. The machine set-up takes 15 minutes to get ready for next batch processing. During the set-up, power consumption is only 20%.

(I) The current price of Large, Medium and Small are Rs.150, Rs.90 and Rs.50 respectively.

(II) To produce a litre of beverage, 14 litres of raw material-W and 25 ml of Material-C are required which costs Rs.0.50 and Rs.1, 000 per litre respectively.

(III) 20 direct workers are required. The workers are paid Rs.880 for 8 hours shift of work.

(IV) The average packing cost per bottle is Rs.3

(V) Power cost is Rs.7 per Kilowatt -hour (Kwh)

(VI) Other variable cost is Rs.30, 000 per batch.

(VII) Fixed cost (Administration and marketing) is Rs.4, 90, 00,000.

(VIII) The holding cost is Rs.1 per bottle per annum.

The marketing team has surveyed the following demand (bottle) of products:

Large	Medium	Small
3,00,000	**7,50,000**	**20,00,000**

Required:

CALCULATE net profit/ loss of the organization and also COMPUTE Economic Batch Quantity (EBQ).

(MTP April '22)

Answer 27

Workings:

1. Maximum number of bottles that can be processed in a batch:

$$= \frac{5{,}000 \text{ ltrs}}{\text{Bottle Volume}}$$

Large		Medium		Small	
Qty. (ltr.)	**Max bottles**	**Qty. (ltr.)**	**Max bottles**	**Qty. (ml)**	**Max bottles**
3	1,666	1.5	3,333	600	8,333

For simplicity of calculation small fractions has been ignored.

2. Number of batches to be run:

		Large	Medium	Small	Total
A	Demand	3,00,000	7,50,000	20,00,000	
B	Bottles per batch (Refer WN- 1)	1,666	3,333	8,333	
C	No. of batches [A÷B]	180	225	240	645

For simplicity of calculation small fractions has been ignored.

3. Quantity of Material-W and Material C required to meet demand:

	Particulars	Large	Medium	Small	Total
A	Demand (bottle)	3,00,000	7,50,000	20,00,000	
B	Qty. per bottle (Litre)	3	1.5	0.6	
C	Output (Litre) [A×B]	9,00,000	11,25,000	12,00,000	32,25,000
D	Material-W per litre of output (Litre)	14	14	14	
E	Material-W required (Litre) [C×D]	1,26,00,000	1,57,50,000	1,68,00,000	4,51,50,000
F	Material-C required per litre of output (ml)	25	25	25	

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G	Material-C required (Litre) [(C×F)÷1000]	22,500	28,125	30,000	80,625

4. No. of Man-shift required:

		Large	Medium	Small	Total
A	No. of batches	180	225	240	645
B	Hours required per batch (Hours)	2	2	2	
C	Total hours required (Hours) [A×B]	360	450	480	1,290
D	No. of shifts required [C÷8]	45	57	60	162
E	Total man shift [D×20 workers]	900	1,140	1,200	3,240

For simplicity of calculation small fractions has been ignored.

5. Power consumption in Kwh

		Large	Medium	Small	Total
For processing					
A	No. of batches	180	225	240	645
B	Hours required per batch (Hours)	1.75	1.75	1.75	1.75
C	Total hours required (Hours) [A×B]	315	393.75	420	1,128.75
D	Power consumption per hour (Kwh)	90	90	90	90

E	Total Power consumption 46 (Kwh) [C×D]	28,350	35,437.5	37,800	1,01,587
F	Per batch consumption* (Kwh) [E÷A]	157.5	157.5	157.5	157.5
For set-up					
G	Hours required per batch (Hours)	0.25	0.25	0.25	0.25
H	Total hours required (Hours) [A×G]	45	56.25	60	161.25
I	Power consumption per hour (Kwh) [20%×90]	18	18	18	18
J	Total Power consumption (Kwh) [H×I]	810	1,012.5	1,080	2,902.5
K	Per batch consumption* (Kwh) [J÷A]	4.5	4.5	4.5	4.5

* Per batch consumption can be directly calculated as [Hours required per batch x Power consumption per hour]

Calculation of Profit/ loss per batch:

	Particulars	Large	Medium	Small	Total
A	Demand (bottle)	3,00,000	7,50,000	20,00,000	30,50,000
B	Price per bottle (Rs.)	150	90	50	

C	Sales value (Rs.) [A×B]	4,50,00,000	6,75,00,000	10,00,00,000	21,25,00,000
	Direct Material cost:				
E	Material-W (Rs.) [Qty. in WN-3 × Rs.0.50]	63,00,000	78,75,000	84,00,000	2,25,75,000
F	Material-C (Rs.) [Qty. in WN-3 × Rs.1,000]	2,25,00,000	2,81,25,000	3,00,00,000	8,06,25,000
G	[E+F]	2,88,00,000	3,60,00,000	3,84,00,000	10,32,00,000
H	Direct Wages (Rs.) [Man- shift in WN-4 × × Rs.880]	7,92,000	10,03,200	10,56,000	28,51,200
I	Packing cost(Rs.) [A×Rs.3]	9,00,000	22,50,000	60,00,000	91,50,000
	Power cost (Rs.)				
J	For processing (Rs.) [WN-5 × Rs.7]	1,98,450	2,48,062.5	2,64,600	7,11,112.5
K	For set-up time (Rs.) [WN-5 × Rs.7]	5,670	7,087.5	7,560	20,317.5
L	[J+K]	2,04,120	2,55,150	2,72,160	7,31,430

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M	Other variable cost (Rs.) [No. of batch in WN-2 × Rs.30,000]	54,00,000	67,50,000	72,00,000	1,93,50,000
N	Total Variable cost per batch [G+H+I+L+M]	3,60,96,120	4,62,58,350	5,29,28,160	13,52,82,630
O	Profit/ loss before fixed cost [C-N]	89,03,880	2,12,41,650	4,70,71,840	7,72,17,370
P	Fixed Cost				4,90,00,000
Q	Net Profit [O-P]				2,82,17,370

Computation of Economic Batch Quantity (EBQ):

EBQ= $\sqrt{\frac{2\times D\times S}{C}}$

D = Annual Demand for the Product = Refer A below

S = Set-up cost per batch = Refer D below

C = Carrying cost per unit per annum =Refer E below

	Particulars	**Large**	**Medium**	**Small**
A	Annual Demand (bottle)	3,00,000	7,50,000	20,00,000
B	Power cost for set-up time (Rs.) [Consumption per batch in WN-5 × Rs.7]	31.50	31.50	31.50
C	Other variable cost (Rs.)	30,000	30,000	30,000

D	Total Set-up cost [B+C]	30,031.50	30,031.50	30,031.50
E	Holding cost:	1.00	1.00	1.00
F	EBQ (Bottle)	1,34,234	2,12,243	3,46,592

Case Scenarios

Question 28

Arnav Ltd. operates in beverages industry where it manufactures soft-drink in three sizes of Large (3 litres), Medium (1.5 litres) and Small (600 ml) bottles. The products are processed in batches. The 5,000 litres capacity processing plant consumes electricity of 90 Kilowatts per hour and a batch takes 1 hour 45 minutes to complete. Only symmetric size of products can be processed at a time. The machine set-up takes 15 minutes to get ready for next batch processing. During the set-up power consumption is only 20%.

(i) The current price of Large, Medium and Small are Rs.150, Rs.90 and Rs.50 respectively.

(ii) To produce a litre of beverage, 14 litres of raw material-W and 25 ml of Material-C are required which costs Rs.0.50 and Rs.1, 000 per litre respectively.

(iii) 20 direct workers are required. The workers are paid Rs.880 for 8 hours shift of work.

(iv) The average packing cost per bottle is Rs.3

(v) Power cost is Rs.7 per Kilowatt -hour (Kwh)

(vi) Other variable cost is Rs.30,000 per batch.

(vii) Fixed cost (Administration and marketing) is Rs.4, 90, 00,000.

(viii) The holding cost is Rs.1 per bottle per annum.

The marketing team has surveyed the following demand (bottle) of the product:

Large	Medium	Small
3,00,000	**7,50,000**	**20,00,000**

The following information has been sought from you for the purpose of performance review meeting:

(Study material)

(i) Number of large size bottles that can be processed in a batch?

(a) 5,000 bottles

(b) 1,666 bottles

(c) 3,333 bottles

(d) 8,333 bottles

Ans: (b) Working note 1: Maximum number of bottles that can be processed in a batch:

$$\frac{\text{5,000 ltrs}}{\text{Bottle volume}}$$

Large		Medium		Small	
Qty (ltr)	**Max bottles**	**Qty (ltr)**	**Max bottles**	**Qty (ml)**	**Max bottles**
3	1,666	1.5	3,333	600	8,333

*For simplicity of calculation small fractions has been ignored.

(ii) Total number of batches to be run to process medium size bottles

(a) 180

(b) 225

(c) 240

(d) 645

Ans: (b) Working note 2: Number of batches to be run:

		Large	Medium	Small	Total
A	Demand	3,00,000	7,50,000	20,00,000	
B	Bottles per batch (Refer WN-1)	1,666	3,333	8,333	
C	No. of batches [A÷B]	180	225	240	645

*For simplicity of calculation small fractions has been ignored.

(iii) Material -W required for small size bottles

(a) 1, 26, 00,000 ltrs

(b) 1, 68, 00,000 ltrs

(c) 1, 57, 50,000 ltrs

(d) 1, 51, 50,000 ltrs

Ans: (b) Working note 3

Quantity of Material-W and Material C required to meet demand:

	Particulars	Large	Medium	Small	Total

A	Demand (bottle)	3,00,000	7,50,000	20,00,000	
B	Qty per bottle (Litre)	3	1.5	0.6	
C	Output (Litre) [A×B]	9,00,000	11,25,000	12,00,000	32,25,000
D	Material-W per litre of output (Litre)	14	14	14	
E	Material-W required (Litre) [C×D]	**1,26,00,000**	**1,57,50,000**	**1,68,00,000**	**4,51,50,000**
F	Material-C required per litre of output (ml)	25	25	25	
G	Material-C required (Litre) [(C×F)÷1000]	**22,500**	**28,125**	**30,000**	**80,625**

(iv) Calculate total profit/ loss per batch.

(a) Rs. 3, 46, 28,460

(b) Rs. 2, 56, 28,360

(c) Rs. 2, 82, 17,370

(d) Rs. 1, 88, 56,360

4. (c) Workings:

No. of Man-shift required:

		Large	Medium	Small	Total
A	No. of batches	180	225	240	645
B	Hours required per batch (Hours)	2	2	2	
C	Total hours required (Hours) [A×B]	360	450	480	1,290
D	No. of shifts required [C÷8]	45	57	60	162
E	**Total man shift [D×20 workers]**	**900**	**1,140**	**1,200**	**3,240**

Power consumption in Kwh

		Large	Medium	Small	Total
For processing					
A	No. of batches	180	225	240	645
B	Hours required per batch (Hours)	1.75	1.75	1.75	1.75
C	Total hours required (Hours) [A×B]	315	393.75	420	1,128.75
D	Power consumption per hour	90	90	90	90
E	Power consumption in Kwh [C×D]	28,350	35,437.5	37,800	1,01,587.5
F	Per batch consumption (Kwh) [E÷A]	157.5	157.5	157.5	157.5
For set-up					

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G	Hours required per batch (Hours)	0.25	0.25	0.25	0.25
H	Total hours required (Hours) [A×G]	45	56.25	60	161.25
I	Power consumption per hour [20%×90]	18	18	18	18
J	Power consumption in Kwh [H×I]	810	1,012.5	1,080	2,902.5
K	Per batch consumption (Kwh) [J÷A]	4.5	4.5	4.5	4.5

Calculation of Profit/ loss per batch:

	Particulars	**Large**	**Medium**	**Small**	**Total**
A	Demand (bottle)	3,00,000	7,50,000	20,00,000	30,50,000
B	Price per bottle (Rs.)		150	90	50
C	Sales value (Rs.) [A×B]	4,50,00,000	6,75,00,000	10,00,00,000	21,25,00,000
Direct Material cost:					
E	Material-W (Rs.) [Qty in WN-3 × Rs.0.50]	63,00,000	78,75,000	84,00,000	2,25,75,000
F	Material-C (Rs.) [Qty in WN-3 × Rs.1,000]	2,25,00,000	2,81,25,000	3,00,00,000	8,06,25,000
G	[E+F]	2,88,00,000	3,60,00,000	3,84,00,000	10,32,00,000
H	Direct Wages (Rs.) [Man-shift in WN-4 × × Rs.880]	7,92,000	10,03,200	10,56,000	28,51,200

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I	Packing cost (Rs.) [A× Rs.3]	9,00,000	22,50,000	60,00,000	91,50,000
Power cost (Rs.)					
J	For processing (Rs.) [WN-5 × Rs.7]	1,98,450	2,48,062.5	2,64,600	7,11,112.5
K	For set-up time (Rs.) [WN-5 × Rs.7]	5,670	7,087.5	7,560	20,317.5
L	[J+K]	2,04,120	2,55,150	2,72,160	7,31,430
M	Other variable cost (Rs.) [No. of batch in WN-2 × Rs.30,000]	54,00,000	67,50,000	72,00,000	1,93,50,000
N	Total Variable cost per batch [G+H+I+L+M]	3,60,96,120	4,62,58,350	5,29,28,160	13,52,82,630
O	Profit/ loss before fixed cost [C-N]	89,03,880	2,12,41,650	4,70,71,840	7,72,17,370
P	Fixed Cost				4,90,00,000
Q	**Total Profit [O-P]**				**2,82,17,370**

(v) Compute Economic Batch Quantity (EBQ) for small size bottles.

(a) 1, 34,234 ltrs

(b) 2, 12,243 ltrs

(c) 1, 57,882 ltrs

(d) 3, 46,592 ltrs

Ans: (d) Computation of Economic Batch Quantity (EBQ):

EBQ= = $\sqrt{\frac{2xDxS}{C}}$

D = Annual Demand for the Product = Refer A below

S = Set-up cost per batch = Refer D below

C = Carrying cost per unit per annum =Refer E below

	Particulars	Large	Medium	Small
A	Annual Demand (bottle)	3,00,000	7,50,000	20,00,000
Set-up Cost:				
B	Power cost for set-up time (Rs.) [Consumption per batch in WN- 5 × Rs.7]	31.50	31.50	31.50
C	Other variable cost (Rs.)	30,000	30,000	30,000
D	Total Set-up cost [B+C]	30,031.50	30,031.50	30,031.50
E	Holding cost:	1.00	1.00	1.00
F	**EBQ (Bottle)**	**1,34,234**	**2,12,243**	**3,46,592**

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Chapter 9

Job Costing and Contract Costing

Topic 1 Introduction to Job Costing

Question 1

Distinguish between Job costing and Process Costing. (Any five points of differences)

(PYP May'22, Old & New SM)(MTP Oct '23)

Answer 1

Job Costing	Process Costing
A Job is carried out or a product is produced by specific orders.	The process of producing the product has a continuous flow and the product produced is homogeneous.
Costs are determined for each job.	Costs are compiled on time basis i.e., for production of a given accounting period for each process or department.
Each job is separate and independent of other jobs.	Products lose their individual identity as they are manufactured in a continuous flow.
Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.

Costs are computed when a job is completed. The cost of a job may be determined by adding all costs against the job.	Costs are calculated at the end of the cost period. The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
As production is not continuous and each job may be different, so more managerial attention is required for effective control.	Process of production is usually standardized and is therefore, quite stable. Hence control here is comparatively easier.

Question 2

DESCRIBE Job Costing giving example of industries where it is used.

(Study material)

Answer 2

Meaning of Job Costing

CIMA London defines Job Costing as "the category of basic costing methods which is applicable where the work consists of separate contracts, jobs or batches, each of which is authorized by specific order or contract." According to this method, costs are collected and accumulated according to jobs, contracts, products or work orders. Each job or unit of production is treated as a separate entity for the purpose of costing. Job Costing is carried out for the purpose of ascertaining cost of each job and takes into account the cost of materials, employees and overhead etc. The job costing method is also applicable to industries in which production is carried out in batches. Batch production basically is of the same character as the job order production, the difference being mainly one in the size of different orders.

Principles of Job Costing

The job costing method may be regarded as the principal method of costing since the basic object and purpose of all costing is to:

• Analysis and ascertainment of cost of each unit of production

• Control and regulate cost

• Determine the profitability

The basic principles enunciated for the job costing method are valid essentially for all types of industry. For example, printing; furniture; hardware; ship-building; heavy machinery; interior decoration, repairs and other similar work.

Process of Job Costing

• Prepare a separate cost sheet for each job

• Disclose cost of materials issued for the job

• Employee costs incurred (on the basis of bill of material and time cards respectively)

• When job is completed, overhead charges are added for ascertaining total expenditure

Suitability of Job Costing

• When jobs are executed for different customers according to their specifications.

• When no two orders are alike and each order/job needs special treatment.

• Where the work-in-progress differs from period to period on the basis of the number of jobs in hand.

Question 3

DISTINGUISH between Job Costing & Process Costing.

(Study material)

Answer 3

Difference between Job Costing and Process Costing

The main points which distinguish job costing and process costing are as below:

Job Costing	Process Costing
(i) A Job is carried out or a product is produced by specific orders.	The process of producing the product has a continuous flow and the product produced is homogeneous.
(ii) Costs are determined for each job.	Costs are compiled on time basis i.e., for production of a given accounting period for each process or department.
(iii) Each job is separate and independent of other jobs.	Products lose their individual identity as they are manufactured in a continuous flow.
(iv) Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
(v) Costs are computed when a job is completed. The cost of a job may be determined by adding all costs against the job.	Costs are calculated at the end of the cost period. The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
(vi) As production is not continuous and each job may be different, so more managerial attention is required for effective control.	Process of production is usually standardized and is therefore, quite stable. Hence control here is comparatively easier.

Topic 2 Job Costing Calculations and Applications

Question 4

A factory uses job costing. The following data are obtained from its books for the year ended 31st March, 20X8:

	Amount (Rs.)
Direct materials	**9,00,000**
Direct wages	**7,50,000**
Selling and distribution overheads	**5,25,000**
Administration overheads	**4,20,000**
Factory overheads	**4,50,000**
Profit	**6,09,000**

(i) PREPARE a Job Cost sheet indicating the Prime cost, Cost of Production, Cost of sales and the Sales value.

(ii) In 2018-19, the factory received an order for a job. It is estimated that direct materials required will be Rs.2, 40,000 and direct labour will cost Rs.1, 50,000. DETERMINE what should be the price for the job if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%. The factory recovers overheads as a percentage of Cost of Production, based on cost rates prevailing in the previous year.

(MTP Aug '18) (RTP May '20 & May '18)

Answer 4

(i) Production Statement For the year ended 31st March, 2018

	Amount (Rs.)
Direct materials	9,00,000
Direct wages	7,50,000
Prime Cost	16,50,000
Factory overheads	4,50,000
Cost of Production	21,00,000
Administration overheads	4,20,000
Selling and distribution overheads	5,25,000
Cost of Sales	30,45,000
Profit	6,09,000
Sales value	36,54,000

Calculation of Rates:

1. Percentage of factory overheads to direct wages = Rs.4, 50,000 /Rs.7, 50,000x 100 = 60%

2. Percentage of administration overheads to Cost of production = Rs.4,20,000/Rs.21,00,000 ×100 = 20%

3. Selling and distribution overheads = Rs.5, 25,000 × 115% = Rs.6, 03,750 Selling and distribution overhead % to Cost of production = $\frac{\text{Rs.6,03,750}}{\text{Rs.21,00,000}}$ × 100 = 28.75%

4. Percentage of profit to sales = $\frac{\text{Rs.6,09,000}}{\text{Rs.36,54,000}} \times 100 = 16.67\%$

(ii) Calculation of price for the job received in 2018 -19	
	Amount (Rs.)
Direct materials	2,40,000
Direct wages	1,50,000
Prime Cost	3,90,000
Factory overheads (60% of Rs. 1,50,000)	90,000
Cost of Production	4,80,000
Administration overheads (20% of Rs. 4,80,000)	96,000
Selling and distribution overheads (28.75% of Rs. 4,80,000)	1,38,000
Cost of Sales	7,14,000
Profit (20% of Rs. 7,14,000)	1,42,800
Sales value	8,56,800

Question 5

APFL Ltd. deals in plumbing materials and also provides plumbing services to its customers. On 12th August, 2019, APFL received a job order for a students' hostel to supply and fitting of plumbing materials. The work is to be done on the basis of specification provided by the

hostel owner. Hostel will be inaugurated on 5th September, 2019 and the work is to be completed by 3rd September, 2019. Following are the details related with the job work:

Direct Materials

APFL uses a weighted average method for the pricing of materials issues. Opening stock of materials as on 12th August 2019:

- **15mm GI Pipe, 12 units of 15 feet size @ Rs.600 each**
- **20mm GI Pipe, 10 units of 15 feet size @ Rs.660 each**
- **Other fitting materials, 60 units @ Rs. 26 each**
- **Stainless Steel Faucet, 6 units @ Rs. 204 each**
- **Valve, 8 units @ Rs. 404 each Purchases:**

On 16th August 2019:

- **20mm GI Pipe, 30 units of 15 feet size @ Rs. 610 each**
- **10 units of Valve @ Rs. 402 each on 18th August 2019:**
- **Other fitting materials, 150 units @ Rs. 28 each**
- **Stainless Steel Faucet, 15 units @ Rs. 209 each on 27th August 2019:**
- **15mm GI Pipe, 35 units of 15 feet size @ Rs.628 each**
- **20mm GI Pipe, 20 units of 15 feet size @ Rs.660 each**
- **Valve, 14 units @ Rs. 424 each Issues for the hostel job:**

On 12th August 2019:

- **20mm GI Pipe, 2 units of 15 feet size**
- **Other fitting materials, 18 units on 17th August 2019:**

• 15mm GI Pipe, 8 units of 15 feet size

• Other fitting materials, 30 units on 28th August 2019:

• 20mm GI Pipe, 2 units of 15 feet size

• 15mm GI Pipe, 10 units of 15 feet size

• Other fitting materials, 34 units

• Valve, 6 units On 30th August:

• Other fitting materials, 60 units

• Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ Rs. 50 per hour (includes 12 hours overtime) Helper: 192 hours @ Rs.35 per hour (includes 24 hours overtime) Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ Rs. 13 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

(a) Calculate the total cost of the job.

(b) Calculate the price to be charged from the customer.

(MTP Oct. '19) (RTP Nov '20)

Answer 5

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(a) Calculation of Total Cost for the Hostel Job		
Particulars	**Amount (Rs.)**	**Amount (Rs.)**
Direct Material Cost:		
- 15mm GI Pipe (Working Note-1)	11,051.28	
- 20mm GI Pipe (Working Note-2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	
- Stainless steel faucet 15 units $\times\left(\frac{6\times Rs.204+15\times 209}{21\ Units}\right)$	3,113.57	
-Value 6 units $\times\left(\frac{8\times Rs.404+10\times Rs.402+14\times Rs.424}{32\ Units}\right)$	2,472.75	23,091.95
Direct Labour:		
-Plumber[(180hours×Rs.50)+(12hours×Rs.25)]	9,300.00	
-Helper[(192hours×Rs.35)+(24hours×Rs.17.5)]	7,140.00	16,440.00
- Overheads [Rs. 13 × (180 + 192) hours]		4,836.00
Total Cost		44,367.95

(b) Price to be charged for the job work:

	Amount (Rs.)
Total Cost incurred on the job	44,367.95

Add: 25% Profit on Job Price $\left(\frac{44,367.95}{75\%} \times 25\%\right)$	14,789.32
	59,157.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (Rs.)
17-08-2019	8 units × Rs. 600	4,800.00
28-08-2019	10 units × $\left(\frac{4\times Rs.600+35\times Rs.628}{39\ Units}\right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (Rs.)
12-08-2019	2 units × Rs. 660	1,320.00
28-08-2019	2 units × $\left(\frac{8\times Rs.660+30\times Rs.610+20\times Rs.660}{39\ Units}\right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (Rs.)
12-08-2019	18 units × Rs. 26	468.00

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17-08-2019	30 units × Rs. 26	780.00
28-08-2019	34 units × $\left(\frac{12\times Rs.26+150\times Rs.28}{162\ Units}\right)$	946.96
30-08-2019	60 units × $\left(\frac{12\times Rs.26+150\times Rs.28}{162\ Units}\right)$	1,671.11
		3,866.07

Question 6

MT Ltd. pays the followings to skilled workers engaged in production works. The following are the employee benefits paid to the employees:

(a)	**Basic salary per day**	**Rs.1,000**
(b)	**Dearness allowance (DA)**	**20% of basic salary**
(c)	**House rent allowance**	**16% of basic salary**
(d)	**Transport allowance**	**Rs.50 per day of actual work**
(e)	**Overtime**	**Twice the hourly rate (considers basic and DA), only if works more than 9 hours a day otherwise no overtime allowance. If works for more than 9 hours a day then overtime is considered after 8th hours.**
(f)	**Work of holiday and Sunday**	**Double of per day basic rate provided works at least 4 hours. The holiday and Sunday basic is**

		eligible for all allowances and statutory deductions.
(h)	**Earned leave & Casual leave**	**These are paid leave.**
(h)	**Employer's contribution to Provident fund**	**12% of basic and DA**
(i)	**Employer's contribution to Pension fund**	**7% of basic and DA**

The company normally works 8-hour a day and 26-day in a month. The company provides 30 minutes lunch break in between. During the month of August 2020, Mr.Z works for 23 days including 15th August and a Sunday and applied for 3 days of casual leave. On 15th August and Sunday he worked for 5 and 6 hours respectively without lunch break.

On 5th and 13th August he worked for 10 and 9 hours respectively. During the month Mr. Z worked for

100 hours on Job no.HT200. You are required to CALCULATE:

(i) Earnings per day

(ii) Effective wages rate per hour of Mr. Z.

(iii) Wages to be charged to Job no.HT200

[MTP April '23]

Answer 6

Workings:

1. Normal working hours in a month = (Daily working hours – lunch break) × no. of days

= (8 hours – 0.5 hours) × 26 days = 195 hours

2. Hours worked by Mr.Z = No. of normal days worked + Overtime + holiday/ Sunday worked

= (21 days × 7.5 hours) + (9.5 hours + 8.5 hours) + (5 hours + 6 hours)

= 157.5 hours + 18 hours + 11 hours = 186.50 hours.

(i) Calculation of earnings per day

Particulars	Amount (Rs.)
Basic salary (Rs.1,000 × 26 days)	26,000
Dearness allowance (20% of basic salary)	5,200
	31,200
House rent allowance (16% of basic salary)	4,160
Employer's contribution to Provident fund (12% × Rs.31,200)	3,744
Employer's contribution to Pension fund (7% × Rs.31,200)	2,184
	41,288
No. of working days in a month (days)	26
Rate per day	1,588
Transport allowance per day	50
Earnings per day	1,638

(ii) Calculation of effective wage rate per hour of Mr. Z:

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Particulars	Amount (Rs.)
Basic salary (Rs.1,000 × 26 days)	26,000
Additional basic salary for Sunday & holiday (Rs.1,000 × 2 days)	2,000
Dearness allowance (20% of basic salary)	5,600
	33,600
House rent allowance (16% of basic salary)	4,480
Transport allowance (Rs.50 × 23 days)	1,150
Overtime allowance (Rs.160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × Rs.33,600)	4,032
Employer's contribution to Pension fund (7% × Rs.33,600)	2,352
Total monthly wages	46,254
Hours worked by Mr.Z (hours)	186.5
Effective wage rate per hour	248

*(Daily Basic +DA) ÷ 7.5 hours

= (1,000+200) ÷ 7.5 = Rs.Rs.160 per hour

(iii) Calculation of wages to be charged to Job no. HT200

= Rs.248 × 100 hours = Rs.24, 800

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Question 7

A company has been asked to quote for a job. The company aims to make a net profit of 30% on sales.

The estimated cost for the job is as follows:

Direct materials 10 kg @Rs.10 per kg

Direct labour 20 hours @ Rs.5 per hour

Variable production overheads are recovered at the rate of Rs.2 per labour hour.

Fixed production overheads for the company are budgeted to be Rs.1, 00,000 each year and are recovered on the basis of labour hours.

There are 10,000 budgeted labour hours each year. Other costs in relation to selling, distribution and administration are recovered at the rate of Rs.50 per job.

DETERMINE quote for the job by the Company.

(RTP Nov'18)

Answer 7

Determination of quotation price for the job

Cost	(Rs.)
Direct Material (10kg × Rs.10)	100
Direct Labour (20hrs × Rs.5)	100
Variable production overhead (20hrs × Rs.2)	40

Fixed Overhead (Rs.1,00,000 / 10,000 ×20 Hours)	200
Other costs	50
Total costs	490

Net profit is 30% of sales, therefore total costs represent 70% (Rs. 490 × 100) ÷ 70 = Rs. 700 price to quote for job.

To check Answer is correct; profit achieved will be Rs. 210 (Rs. 700 - Rs. 490) = Rs. 210 ÷ Rs. 700 = 30%

Question 8

KJ Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2020-21:

		(Rs.)
(i)	**Opening Stock of Material**	**15,00,000**
(ii)	**Closing Stock of Material**	**20,00,000**
(iii)	**Purchase of Material**	**1,80,50,000**
(iv)	**Direct Labour**	**90,50,000**
(v)	**Factory Overhead**	**30,80,000**
(vi)	**Administrative Overhead**	**20,50,400**

During the FY 2021-22, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be Rs. 80, 00,000 and Rs. 40, 50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost. Cost of delivery of the components at customer's premises is estimated at Rs. 9, 50,000. You are required to:

(i) CALCULATE the overhead recovery rates based on actual costs for 2020-21.

(ii) PREPARE a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

(RTP May'21, May '22 & Nov '23)

Answer 8

(i) Calculation of Overhead Recovery Rate:

Factory Overhead Recovery Rate = $\frac{\text{Factory Overhead in 2020–21}}{\text{Direct labour Cost in 2020–21}} \times 100$

$=\frac{\text{Rs.30,80,000}}{\text{Rs.90,50,000}} \times 100$ = 34 % of direct labour

Administrative Overhead Recovery Rate = $\frac{\text{Administrative Overhead in 2020–21}}{\text{Factory Cost in 2020–21 (W.N)}} \times 100$

$=\frac{\text{Rs.20,50,400}}{\text{Rs.2,96,80,000}} \times 100$ = 6.91 % of Factory Cost

Working Note: Calculation of Factory Cost in 2020-21

Particulars	Amount (Rs.)
Opening Stock of Material	15,00,000
Add: Purchase of Material	1,80,50,000

Less: Closing Stock of Material	(20,00,000)
Material Consumed	1,75,50,000
Direct Labour	90,50,000
Prime Cost	2,66,00,000
Factory Overhead	30,80,000
Factory Cost	2,96,80,000

(ii) Job Cost Sheet for the order received in 2021-22

Particulars	Amount (Rs.)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of Rs. 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of Rs. 1,34,27,000)	9,27,806
Cost of delivery	9,50,000
Total Cost	1,53,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	51,01,602

Sales value (Price to be quoted for the order)	2,04,06,408

Hence the price to be quoted is Rs. 2, 04, 06,408.

Question 9

In a factory following the Job Costing Method, an abstract from the work-in-progress as on 30th September was prepared as under.

Job No.	Materials (Rs.)	Direct hrs.	Labour (Rs.)	Factory Overheads applied (Rs.)
115	1325	400 hrs.	800	640
118	810	250 hrs.	500	400
120	765	300 hrs.	475	380
	2,900		1,775	1,420

Materials used in October were as follows:

Materials Requisition No.	Job No.	Cost (Rs.)
54	118	300
55	118	425
56	118	515
57	120	665

58	121	910
59	124	720
		3,535

A summary for labour hours deployed during October is as under:

Job No.	Number of Hours	
	Shop A	Shop B
115	25	25
118	90	30
120	75	10
121	65	--
124	25	10
	275	75
Indirect Labour: Waiting of material	20	10
Machine breakdown	10	5
Idle time	5	6
Overtime premium	6	5

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A shop credit slip was issued in October that material issued under Requisition No. 54 was returned back to stores as being not suitable. A material transfer note issued in October indicated that material issued under Requisition No. 55 for Job 118 was directed to Job 124.

The hourly rate in shop A per labour hour is Rs.3 per hour while at shop B, it is Rs.2 per hour. The factory overhead is applied at the same rate as in September. Job 115, 118 and 120 were completed in October.

You are asked to COMPUTE the factory cost of the completed jobs. It is the practice of the management to put a 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost plus 20% basis. DETERMINE the invoice price of these three jobs?

(Study material)

Answer 9

Factory Cost Statement of Completed Job.

Month	**Job No.**	**Materials**	**Direct labour**	**Factory overheads (80% of direct labour cost)**	**Factory cost**
		(Rs.)	**(Rs.)**	**(Rs.)**	**(Rs.)**
September	115	1325	800	640	2765
October	115	--	125	100	225
Total		1325	925	740	2990
September	118	810	500	400	1710

October	118	515	330	264	1109
Total		1325	830	664	2819
September	120	765	475	380	1620
October	120	665	245	196	1106
Total		1430	720	576	2726

Invoice Price of Complete Job

Job No.	**115 (Rs.)**	**118 (Rs.)**	**120 (Rs.)**
Factory cost	2,990.00	2,819.00	2,726.00
Administration and selling overheads @ 10% of factory cost	299.00	281.90	272.60
Total cost	3,289.00	3,100.90	2,998.60
Profit (20% of total cost)	657.80	620.18	599.72
Invoice Price	3,946.80	3,721.08	3,598.32

Assumption: - Indirect labour costs have been included in the factory overhead which has been recovered as 80% of the labour cost.

Question 10

Ares Plumbing and Fitting Ltd. (APFL) deals in plumbing materials and also provides plumbing services to its customers. On 12th August, 2022, APFL received a job order for a

students' hostel to supply and fitting of plumbing materials. The work is to be done on the basis of specification provided by the hostel owner. Hostel will be inaugurated on 5th September, 2022 and the work is to be completed by 3rd September, 2022. Following are the details related with the job work:

Direct Materials

APFL uses a weighted average method for the pricing of materials issues.

Opening stock of materials as on 12th August 2022:

- 15mm GI Pipe, 12 units of (15 feet size) @ Rs. 600 each

- 20mm GI Pipe, 10 units of (15 feet size) @ Rs. 660 each

- Other fitting materials, 60 units @ Rs. 26 each

- Stainless Steel Faucet, 6 units @ Rs. 204 each

- Valve, 8 units @ Rs. 404 each

Purchases:

On 16th August 2022:

- 20mm GI Pipe, 30 units of (15 feet size) @ Rs. 610 each

- 10 units of Valve @ Rs. 402 each

On 18th August 2022:

- Other fitting materials, 150 units @ Rs. 28 each

- Stainless Steel Faucet, 15 units @ Rs. 209 each

On 27th August 2022:

- 15mm GI Pipe, 35 units of (15 feet size) @ Rs. 628 each

- 20mm GI Pipe, 20 units of (15 feet size) @ Rs. 660 each

- Valve, 14 units @ Rs.424 each

Issues for the hostel job:

On 12th August 2022:

- 20mm GI Pipe, 2 units of (15 feet size)

- Other fitting materials, 18 units

On 17th August 2022:

- 15mm GI Pipe, 8 units of (15 feet size)

- Other fitting materials, 30 units

On 28th August 2022:

- 20mm GI Pipe, 2 units of (15 feet size)

- 15mm GI Pipe, 10 units of (15 feet size)

- Other fitting materials, 34 units

- Valve, 6 units

On 30th August 2022:

- Other fitting materials, 60 units

- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ Rs. 50 per hour (includes 12 hours overtime)

Helper: 192 hours @ Rs.35 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

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Overheads are applied @ Rs. 13 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of

25% on sales price.

You are required to

(a) Calculate the total cost of the job.

(b) Calculate the price to be charged from the customer

(Study material)

Answer 10

(a) Calculation of Total Cost for the Hostel Job:

Particulars	**Amount (Rs.)**	**Amount (Rs.)**
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note-3)	3,866.07	
- Stainless steel faucet- 15 units $\times\left(\frac{6\times 204+15\times 209}{21\text{units}}\right)$	3,113.57	
- Valve -6 units $\times\left(\frac{8\times 404+10\times 402+14\times 424}{32\text{units}}\right)$	2,472.75	23,091.95

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Direct Labour:		
- Plumber [(180 hours × Rs. 50) + (12 hours × Rs. 25)]	9,300.00	
- Helper [(192 hours × Rs. 35) + (24 hours × Rs. 17.5)]	7,140.00	16,440.00
- Overheads [Rs.13 × (180 + 192) hours]		4,836.00
Total Cost		44,367.95

(b) Price to be charged for the job work:

	Amount (Rs.)
Total Cost incurred on the job	44,367.95
Add: 25% Profit on Job Price $\left(\frac{44367.95}{75\%} \text{x } 25\%\right)$	14,789.32
	59,157.27

Working Note:

1. Cost of 15mm GI Pipe

Date		**Amount (Rs.)**
17-08-2022	8 units × Rs. 600	4,800.00
28-08-2022	10 units × $\left(\frac{4\times \text{Rs.}600+35\times \text{Rs.}628}{39\text{units}}\right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (Rs.)
12-08-2022	2 units × Rs. 660	1,320.00
28-08-2022	2 units × $\left(\frac{8\times \text{Rs.}660+30\times\text{Rs.}610+20\text{xRs.}660}{58 \text{ units}}\right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (Rs.)
12-08-2022	18 units × Rs. 26	468.00
17-08-2022	30 units × Rs. 26	780.00
28-08-2022	34 units × $\left(\frac{12\times \text{Rs.}26+150\text{xRs.}28}{162 \text{ units}}\right)$	946.96
30-08-2022	60 units × $\left(\frac{12\times \text{Rs.}26+150\text{xRs.}28}{162 \text{ units}}\right)$	1,671.11
		3,866.07

Topic 3 Direct Expenses and Overhead Allocation

Question 11

A Ltd. is an engineering manufacturing company producing job orders on the basis of specifications provided by the customers. During the last month it has completed three jobs

namely A, B and C. The following are the items of expenditures which are incurred in addition to direct materials and direct employee cost:

Office and administration cost - Rs. 6, 00,000

Product blueprint cost for job A - Rs. 2, 80,000

Hire charges paid for machinery used in job work B - Rs. 80,000

Salary to office attendants - Rs. 1, 00,000

One time license fee paid for software used to make computerised graphics for job C - Rs. 1, 00,000.

Salary paid to marketing manager - Rs. 2, 40,000.

Required:

CALCULATE direct expenses attributable to each job.

(MTP Mar 21)

Answer 11

Calculation of Direct expenses

Particulars	Job A (Rs.)	Job B (Rs.)	Job C (Rs.)
Product blueprint cost	2,80,000	--	--
Hire charges paid for machinery	--	80,000	--
License fee paid for software	--	--	1,00,000
Total Direct expenses	2,80,000	80,000	1,00,000

Question 12

Ispat Engineers Limited (IEL) undertook a plant manufacturing work for a client. It will charge a profit mark up of 20% on the full cost of the jobs. The following are the information related to the job:

Direct materials utilized – Rs. 1, 87, 00,000

Direct labour utilized – 2,400 hours at Rs. 80 per hour

Budgeted production overheads are Rs. 48, 00,000 for the period and are recovered on the basis of 24,000 labour hours.

Budgeted selling and administration overheads are Rs. 18, 00,000 for the period and recovered on the basis of total budgeted total production cost of Rs. 36, 00, 00,000.

Required:

Calculate the price to be charged for the job.

(RTP Nov'19)

Answer 12

Calculation of job price

Particulars	**Amount (Rs.)**
Direct materials	1,87,00,000
Direct wages (Rs.80 × 2,400 hours)	1,92,000
Production overheads $\left(\frac{Rs.48,00,000}{24,000\ hrs.} \times 2{,}400\ hrs.\right)$	4,80,000
Production cost	1,93,72,000

Selling and administration overheads $\left(\frac{Rs.18,00,000}{Rs.36,00,000} \times Rs.1,93,72,000\right)$	96,860
Total cost of sales	1,94,68,860
Profit mark-up @ 20%	38,93,772
Price for the job	2,33,62,632

Topic 4 Contract Costing

Question 13

B Limited has taken a contract for Rs. 70, 00,000 and furnishes the following information:

	1st Year	2nd Year
	(Amount in Rs.)	(Amount in Rs.)
Material	**12,50,000**	**13,65,000**
Wages	**12,50,000**	**11,44,000**
Direct Expenses	**4,20,000**	**3,80,000**
Indirect Expenses	**2,70,000**	**2,60,000**
Work Certified	**32,00,000**	**70,00,000**
Work Uncertified	**2,19,000**	**-**

Other Information:

• Plant costing Rs. 3, 40,000 was bought at the commencement of the contract.

• Depreciation of Rs. 85,000 per annum is charged on the plant on Straight Line Method (SLM) basis.

• There is a provision for escalation clause in the contract for increase in material rate and wage rate in the second year only.

• Standard material for the first and second year was Rs. 12,000 units each year @ Rs. 90 per unit whereas the actual consumption was 12,500 @ Rs. 100 per unit in the first year and 13,000 units @ Rs. 105 per unit in the 2ndyear. Standard labour hours for first year were 10,000 hours and for the second year it was 9,000 hours. Standard wage rate was Rs. 120 per hour. The firm has paid for 10,000 hours @ Rs. 125 per hour in the first year and 8,800 hours @ Rs. 130 per hour in the second year.

Required:

(i) Prepare Contract Account for both years without considering escalation clause.

(ii) Compute the total value of contract by considering the escalation clause.

(iii) Compute the total increase / (decrease) in the cost of material and wages for both the years.

(PYP May '23)

Answer 13

i) Contract Account (For 1st Year)

Particulars	(Rs.)	Particulars		(Rs.)
To Material	12,50,000	By work in Progress		
To Wages	12,50,000	Work certified	32,00,000	

To Direct expense	4,20,000	Work uncertified	2,19,000	34,19,000
To Indirect expense	2,70,000			
To Depreciation (Rs.3,40,000 – Rs.2,55,000)	85,000			
To Costing P&L (Notional Profit b/f)	1,44,000			
	34,19,000			34,19,000

Contract Account (For 2nd Year)

Particulars		**(Rs.)**	**Particulars**	**(Rs.)**
To Opening Work in Progress:			By Contractee A/C	70,00,000
Work certified	32,00,000			
Work uncertified	2,19,000	34,19,000		
To Material		13,65,000		
To Wages		11,44,000		
To Direct expenses		3,80,000		
To Indirect expenses		2,60,000		

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To Depreciation (Rs. 2,55,000 – Rs. 1,70,000)	85,000		
To Costing P&L (b/f)	3,47,000		
	70,00,000		70,00,000

ii) Computation of total value of contract after escalation clause

Particulars	**(Rs.)**
Contract Price	70,00,000
Increase in cost of material 12,000 (105 – 90)	1,80,000
Increase in cost of labour 9,000 (130-120)	90,000
	72,70,000

iii) Calculation of Increase/Decrease in cost of material and wages

Year 1	**Standard Cost**	**Actual Cost**	**Increase/Decrease**
Material	10,80,000	12,50,000	1,70,000
	(12,000 x 90)	(12,500 x 100)	--
Labour	12,00,000	12,50,000	50,000
	(10,000 x 120)	(10,000 x 125)	--

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			2,20,000
Year 2	**Standard Cost**	**Actual Cost**	**Increase/Decrease**
Material	10,80,000	13,65,000	2,85,000
	(12,000 x 90)	(13,000 x 105)	--
Labour	10,80,000	11,44,000	64,000
	(9,000 x 120)	(88,000 x 130)	--
			3,49,000

Topic 5 Multiple Choice Questions (MCQs) on Job Costing Concepts

Multiple Choice Questions (MCQ's)

Question 14

In case product produced or jobs undertaken are of diverse nature, the system of costing to be used should be:

(a) Process costing

(b) Operating costing

(c) Job costing

(d) None of the above

(Study material)

Ans: (c) Job costing

Reason:

When the products produced or jobs undertaken are of diverse nature, it implies that each job or product is unique or made-to-order. In such cases, job costing is the most appropriate costing method. Job costing involves tracking costs for each individual job or project separately. This method allows for the assignment of specific costs (materials, labor, overheads) to each distinct job or order, which is essential when products or jobs vary in terms of requirements, size, and specifications. It helps in accurate cost allocation and price setting for each unique product or job.

In contrast, process costing is used for continuous, uniform production, and operating costing is typically used for services or repetitive operations, which wouldn't suit a scenario with diverse jobs or products.

Question 15

The production planning department prepares a list of materials and stores required for the completion of a specific job order, this list is known as:

(a) Bin card

(b) Bill of material

(c) Material requisition slip

(d) None of the above

(Study material)

Ans: (b) Bill of material

Reason:

A Bill of Material (BOM) is a detailed list of all the materials, components, sub-assemblies, and other resources required to complete a specific job order or production process. It is prepared

by the production planning department and outlines the exact materials needed, their quantities, and specifications to manufacture a product or complete a job. This list is essential for ensuring that the required materials are available in the right quantities and at the right time.

- A Bin card is used to record the quantity of materials in stock.
- A Material requisition slip is used to request materials from the store or warehouse for a specific job or production order.

Question 16

Job costing is similar to that under Batch costing except with the difference that a:

(a) Job becomes a cost unit.

(b) Batch becomes the cost unit instead of a job

(c) Process becomes a cost unit

(d) None of the above.

(Study material)

Ans: (a) Job becomes a cost unit.

Reason:

In job costing, each individual job or order is considered a distinct cost unit, and costs are accumulated separately for each job. This method is used when products or services are unique or customized, and each job requires different materials, labor, and overhead costs.

In batch costing, a batch of identical or similar items is treated as the cost unit, and costs are accumulated for the entire batch. The key difference is that in batch costing, the cost is applied to the group of items produced together, while in job costing, the cost is applied to each individual job.

Thus, job costing treats each individual job as a cost unit, whereas batch costing treats the batch as a cost unit.

Question 17

In job costing which of the following documents are used to record the issue of direct material to a job':

(a) Goods received note

(b) Material requisition

(c) Purchase order

(d) Purchase requisition

(Study material)

Ans: (b) Material requisition

Reason:

In job costing, a Material Requisition is used to record the issue of direct materials to a specific job. This document specifies the materials required for a particular job and provides authorization for the materials to be issued from the stores to the production department. It helps in tracking the quantity and cost of materials used in the production of each job.

- Goods received note records the receipt of materials or goods from suppliers.
- Purchase order is used to place an order with a supplier for materials.
- Purchase requisition is an internal document used to request materials for purchase from external suppliers.

Question 18

The most suitable cost system where the products differ in type of materials and work performed is:

(a) Job Costing

(b) Process Costing

(c) Operating Costing

(d) None of these

(Study material)

Ans: (a) Job Costing

Reason:

Job costing is the most suitable cost system when the products differ in the type of materials and work performed. This system is used when each product or job is unique and requires different materials, labor, and overheads. In job costing, costs are accumulated for each specific job, allowing for accurate tracking of expenses for each distinct product or service.

- Process costing is used for continuous, homogeneous production where each unit is identical, such as in the production of chemicals or oil.
- Operating costing is typically used for service industries or repetitive operations, such as transport or utility services, where the focus is on the cost of providing a service rather than producing a unique product.

Question 19

Which of the following statements is true:

(a) Job cost sheet may be used for estimating profit of jobs.

(b) Job costing cannot be used in conjunction with marginal costing.

(c) A production order is an order received from a customer for particular jobs.

(d) None of these.

(Study material)

Ans: (a) Job cost sheet may be used for estimating profit of jobs.

Reason:

A job cost sheet is a detailed record that tracks the costs associated with a specific job or order, including direct materials, direct labor, and overhead costs. It provides a complete breakdown of costs for each job, which can then be used to estimate the profit by comparing the total cost of the job to the revenue generated from it. This makes it a useful tool for estimating the profitability of each job.

- (b) Job costing can indeed be used in conjunction with marginal costing, as both methods can be employed together to analyze costs and profitability, especially in decision-making.
- (c) A production order is typically an internal document in the manufacturing process, not an order received from a customer. A customer order is typically referred to as a sales order, whereas a production order refers to instructions for producing a particular quantity of goods.

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Question 20

Which of the following statements is true:

(a) Job cost sheet may be prepared for facilitating routing and scheduling of the job

(b) Job costing can be suitably used for concerns producing uniformly any specific product

(c) Job costing cannot be used in companies using standard costing

(d) Neither (a) nor (b) nor (c)

(Study material)

Ans: (d) Neither (a) nor (b) nor (c)

Reason:

- Job cost sheets are used for tracking costs, not for routing or scheduling.
- Job costing is not suitable for mass production; process costing is used for uniform production.
- Job costing can be used with standard costing to compare actual and standard costs, so it's not true that it can't be used together.

Therefore, none of the statements are true.

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Chapter 10

Process & Operation Costing

Topic 1 Introduction to Process Costing

(Theory Basis) N/A (Conceptual)

Topic 2 Normal Loss

Question 1

G K Ltd. produces a product "XYZ" which passes through two processes, viz. Process-A and Process-B. The details for the year ending 31st March, 2020 are as follows:

	Process A	Process - B
40,000 units introduced at a cost of	Rs. 3,60,000	-
Material consumed	Rs. 2,42,000	2,25,000
Direct wages	Rs. 2,58,000	1,90,000
Manufacturing expenses	Rs. 1,96,000	1,23,720
Output in units	37,000	27,000
Normal wastage of inputs	5%	10%
Scrap value (per unit)	Rs. 15	20
Selling price (per unit)	Rs. 37	61

Additional Information:

(a) 80% of the output of Process-A, was passed on to the next process and the balance was sold. The

entire output of Process- B was sold.

(b) Indirect expenses for the year was Rs. 4,48,080.

(c) It is assumed that Process-A and Process-B are not responsibility centre.

Required:

(i) PREPARE Process-A and Process-B Account.

(ii) PREPARE Costing Profit & Loss Account showing the net profit/ net loss for the year.

(MTP May '20 & Oct '23)

Answer 1

(i) Process- A Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Inputs	40,000	3,60,000	By Normal wastage (2,000 units × Rs.15)	2,000	30,000
To Material	---	2,42,000	By Abnormal loss A/c (1,000 units × Rs.27)	1,000	27,000
To Direct wages	---	2,58,000	By Process- B (29,600 units × Rs.27)	29,600	7,99,200
To Manufacturing Exp.	---	1,96,000	By Profit & Loss A/c (7,400 units × Rs.27)	7,400	1,99,800

	40,000	10,56,000		40,000	10,56,000

Cost per unit = Rs. 10, 56,000- Rs. 30,000 / 40,000units -2,000 units = Rs. 27 per unit

Normal wastage = 40,000 units × 5% = 2,000 units

Abnormal loss = 40,000 units – (37,000 units + 2,000 units) = 1,000 units

Transfer to Process- B = 37,000 units × 80% = 29,600 units

Sale = 37,000 units × 20% = 7,400 units

Process- B Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	29,600	7,99,200	By Normal wastage (2,960 units × Rs. 20)	2,960	59,200
To Material	---	2,25,000	By Profit& Loss A/c (27,000units×Rs.48)	27,000	12,96,000
To Direct Wages	---	1,90,000			
To Manufacturing Exp.	---	1,23,720			
To Abnormal Gain A/c (360 units × Rs. 48)	360	17,280			
	29,960	13,55,200		29,960	13,55,200

Cost per unit = Rs. 13, 37,920-Rs.59, 200 / 29,600 units – 2,960 units = Rs. 48 per unit

Normal wastage = 29,600 units × 10% = 2,960 units

Abnormal gain = (27,000 units + 2,960 units) – 29,600 units = 360 units

(ii) Costing Profit & Loss Account

Particulars	Amount (Rs.)	Particulars	Amount (Rs.)
To Process- A A/c	1,99,800	By Sales:	2,73,800
To Process- B A/c	12,96,000	- Process-A (7,400 units × Rs. 37)	16,47,000
To Abnormal loss A/c	12,000	- Process- B (27,000 units × Rs. 61)	10,080
To Indirect Expenses	4,48,080	By Abnormal gain	25,000
	19,55,880	By Net loss	19,55,880

Working Notes:

Normal wastage (Loss) Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	2,000	30,000	By Abnormal Gain A/c (360 units × Rs. 20)	360	7,200
To Process- B A/c	2,960	59,200	By Bank (Sales)	4,600	82,000

	4,960	89,200		4,960	89,200

Abnormal Loss Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	1,000	27,000	By Bank A/c (1,000 units × Rs. 15)	1,000	15,000
			By Profit & Loss A/c	---	12,000
	1,000	27,000		1,000	27,000

Abnormal Gain Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Normal loss A/c (360 units × Rs. 20)	360	7,200	By Process- B A/c	360	17,280
To Profit & Loss A/c		10,080			
	360	17,280		360	17,280

Topic 3 Abnormal Loss

Question 2

Following details are related to the work done in Process-I by XYZ Company during the month of March:

(Rs.)

Opening work-in process (2,000 units)	
Materials	**80,000**
Labour	**15,000**
Overheads	**45,000**
Materials introduced in Process-I (38,000 units)	**14,80,000**
Direct Labour	**3,59,000**
Overheads	**10,77,000**
Units scrapped: 3,000 units	
Degree of completion:	
Materials	**100%**
Labour and overheads	**80%**
Closing work-in process: 2,000 units	
Degree of completion:	
Materials	**100%**

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Labour and overheads	**80%**
Units finished and transferred to Process-II:	**35,000 units**

Normal Loss:

5% of total input including opening work-in-process. Scrapped units fetch Rs. 20 per piece.

You are required to PREPARE using average method:

(i) Statement of equivalent production

(ii) Statement of cost

(iii) Statement of distribution cost, and

(iv) Process-I Account, Normal Loss Account and Abnormal Loss Account.

(Old & New SM) (Same concept different figures PYP Nov 20)

Answer 2

(i) Statement of Equivalent Production

Particulars	**Input Units**	**Particulars**	**Output Units**	**Equivalent Production**			
				Material		**Labour & O.H.**	
				%	**Units**	**%**	**Units**
Opening WIP	2,000	Completed and transferred to Process-II	35,000	100	35,000	100	35,000

Units introduced	38,000	Normal Loss (5% of 40,000)	2,000	--	--	--	--
		Abnormal loss (Balancing figure)	1,000	100	1,000	80	800
		Closing WIP	2,000	100	2,000	80	1,600
	40,000		40,000		38,000		37,400

(ii) Statement showing cost for each element

Particulars	Materials (Rs.)	Labour (Rs.)	Overhead (Rs.)	Total (Rs.)
Cost of opening work-in- process	80,000	15,000	45,000	1,40,000
Cost incurred during the month	14,80,000	3,59,000	10,77,000	29,16,000
Less: Realisable Value of normal scrap (Rs. 20 × 2,000 units)	(40,000)	--	--	(40,000)
Total cost: (A)	15,20,000	3,74,000	11,22,000	30,16,000
Equivalent units: (B)	38,000	37,400	37,400	
Cost per equivalent unit: (C) = (A ÷ B)	40.00	10.00	30.00	80.00

(iii) Statement of Distribution of cost

	Amount (Rs.)	Amount (Rs.)

1. Value of units completed and transferred (35,000 units × Rs. 80)		28,00,000
2. Value of Abnormal Loss:		
- Materials (1,000 units × Rs. 40)	40,000	
- Labour (800 units × Rs. 10)	8,000	
- Overheads (800 units × Rs. 30)	24,000	72,000
3. Value of Closing W-I-P:		
- Materials (2,000 units × Rs. 40)	80,000	
- Labour (1,600 units × Rs. 10)	16,000	
- Overheads (1,600 units × Rs. 30)	48,000	1,44,000

(iv) Process-I A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Opening W.I.P:			By Normal Loss (Rs.20 × 2,000 units)	2,000	40,000
- Materials	2,000	80,000	By Abnormal loss	1,000	72,000
- Labour	--	15,000	By Process-I A/c	35,000	28,00,000
- Overheads	--	45,000	By Closing WIP	2,000	1,44,000

To Materials introduced	38,000	14,80,000			
To Direct Labour		3,59,000			
To Overheads		10,77,000			
	40,000	30,56,000		40,000	30,56,000

Normal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process-I A/c	2,000	40,000	By Cost Ledger Control A/c	2,000	40,000
	2,000	40,000		2,000	40,000

Abnormal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process-I A/c	1,000	72,000	By Cost Ledger Control A/c	1,000	20,000
			By Costing Profit & Loss A/c		52,000
	1,000	72,000		1,000	72,000

Question 3

'Healthy Sweets' is engaged in the manufacturing of jiggery. Its process involve sugarcane crushing for juice extraction, then filtration and boiling of juice along with some chemicals and then letting it cool to cut solidified jaggery blocks.

The main process of juice extraction (Process – I) is done in conventional crusher, which is then filtered and boiled (Process – II) in iron pots. The solidified jaggery blocks are then cut, packed and dispatched. For manufacturing 10 kg of jaggery, 100 kg of sugarcane is required, which extracts only 45 litre of juice.

Following information regarding Process – I has been obtained from the manufacturing department of Healthy Sweets for the month of January, 2020:	
	(Rs.)
Opening work-in process (4,500 litre)	
Sugarcane	50,000
Labour	15,000
Overheads	45,000
Sugarcane introduced for juice extraction (1,00,000 kg)	5,00,000
Direct Labour	2,00,000
Overheads	6,00,000
Abnormal Loss: 1,000 kg	
Degree of completion:	

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Sugarcane	**100%**
Labour and overheads	**80%**
Closing work-in process: 9,000 litre Degree of completion:	
Sugarcane	**100%**
Labour and overheads	**80%**

Extracted juice transferred for filtering and boiling: 39,500 litre (Consider mass of 1 litre of juice equivalent to 1 kg)

You are required to PREPARE using average method:

(i) Statement of equivalent production,

(ii) Statement of cost,

(iii) Statement of distribution cost, and

(iv) Process-I Account.

[MTP Oct '20, Old & New SM)

Answer 3

(i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Sugarcane		Labour & O.H.	
				%	Units	%	Units

Opening WIP	4,500	Completed and transferred to Process - II	39,500	100	39,500	100	39,500
Units introduced	1,00,000	Normal Loss (55%* of 1,00,000)	55,000	--	--	--	--
		Abnormal loss	1,000	100	1,000	80	800
		Closing WIP	9,000	100	9,000	80	7,200
	1,04,500		1,04,500		49,500		47,500

* 100 kg of sugarcane extracts only 45 litre of juice. Thus, normal loss = 100 – 45 = 55%

(ii) Statement showing cost for each element

Particulars	Sugarcane (Rs.)	Labour (Rs.)	Overhead (Rs.)	Total (Rs.)
Cost of opening work-in-process	50,000	15,000	45,000	1,10,000
Cost incurred during the month	5,00,000	2,00,000	6,00,000	13,00,000
Total cost: (A)	5,50,000	2,15,000	6,45,000	14,10,000
Equivalent units: (B)	49,500	47,500	47,500	
Cost per equivalent unit: (C) = (A ÷ B)	11.111	4.526	13.579	29.216

(iii) Statement of Distribution of cost

		Amount (Rs.)	Amount (Rs.)
1.	Value of units completed and transferred (39,500 units × Rs. 29.216)		11,54,032
2.	Value of Abnormal Loss:		
	- Sugarcane (1,000 units × Rs. 11.111)	11,111	
	- Labour (800 units × Rs. 4.526)	3,621	
	- Overheads (800 units × Rs. 13.579)	10,863	25,595
3.	Value of Closing W-I-P:		
	- Sugarcane (9,000 units × Rs. 11.111)	99,999	
	- Labour (7,200 units × Rs. 4.526)	32,587	
	- Overheads (7,200 units × Rs. 13.579)	97,769	2,30,355

(iv) Process-I A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Opening W.I.P:			By Normal Loss	55,000	--
- Sugarcane	4,500	50,000	By Abnormal loss (Rs.25,595 + Rs.18) (difference due	1,000	25,613

			to approximation))		
- Labour	--	15,000	By Process-II A/c	39,500	11,54,032
- Overheads	--	45,000	By Closing WIP	9,000	2,30,355
To Sugarcane introduced	100,000	5,00,000			
To Direct Labour		2,00,000			
To Overheads		6,00,000			
	104,500	14,10,000		104,500	14,10,000

Question 4

MP Ltd. produces a Product-X, which passes through three processes, I, II and III. In Process-III a by-product arises, which after further processing at a cost of Rs. 85 per unit, product Z is produced. The information related for the month of September 2020 is as follows:

	Process-I	**Process-II**	**Process-III**
Normal loss	**5%**	**10%**	**5%**
Materials introduced (7,000 units)	**1,40,000**	**-**	**-**
Materials added	**62,000**	**1,36,000**	**84,200**
Direct wages	**42,000**	**54,000**	**48,000**

Direct expenses	**14,000**	**16,000**	**14,000**

Production overhead for the month is Rs. 2, 88,000, which is absorbed as a percentage of direct wages. The scraps are sold at Rs. 10 per unit Product-Z can be sold at Rs. 135 per unit with a selling cost of Rs. 15 per unit No. of units produced: Process-I- 6,600; Process-II- 5,200, Process-III- 4,800 and Product-Z- 600 There is no stock at the beginning and end of the month.

You are required to PREPARE accounts for:

(i) Process-I, II and III

(ii) By-Product-Z

(MTP March '21, RTP Nov'20)

Answer 4

Total direct wages

= Rs. 42,000 + Rs. 54,000 + Rs. 48,000 = Rs. 1, 44,000

Percentage absorption of production overhead on the basis of direct wages

$= \frac{2,88,000}{1,44,000} \times 100 = 200\%$

(i) Process-I A/c

Particulars	Units	Amt. (Rs.)	Particulars	Units	Amt. (Rs.)
To Materials	7,000	1,40,000	By Normal loss (5% of 7,000 units)	350	3,500
To Other materials	-	62,000	By Process-II*	6,600	3,35,955

To Direct wages	-	42,000	By Abnormal loss*	50	2,545
To Direct expenses	-	14,000			
To Production OH (200% of Rs.42,000)	-	84,000			
	7,000	3,42,000		7,000	3,42,000

*Cost per Unit = $\frac{\text{Rs. } 3,42,000-3,500}{7,000-350 \text{ units}}$ = Rs.50.9022

Process-II A/c

Particulars	Units	Amt.(Rs.)	Particulars	Units	Amt.(Rs.)
To Process-I A/c	6,600	3,35,955	By Normal loss (10% of 6,600 units)	660	6,600
To Other materials	-	1,36,000	By Process-III**	5,200	5,63,206
To Direct wages	-	54,000	By Abnormal loss**	740	80,149
To Direct expenses	-	16,000			
To Production OH (200% of Rs.54,000)	-	1,08,000			
	6,600	6,49,955		6,600	6,49,955

*Cost per Unit = $\frac{\text{Rs. } 6,49,955-6,600}{6,600-660 \text{ units}}$ = Rs. 108.3089

Process-III A/c

Particulars	Units	Amt. (Rs.)	Particulars	Units	Amt. (Rs.)
To Process-I A/c	5,200	5,63,206	By Normal loss (5% of 5,200 units)	260	2,600
To Other materials	-	84,200	By Product-X***	4,800	8,64,670
To Direct wages	-	48,000			
To Direct expenses	-	14,000	By Product-Z# (Rs.35 × 600 units)	600	21,000
To Production OH (200% of Rs.48,000)	-	96,000			
To Abnormal gain***	460	82,864			
	5,660	8,88,270		5,660	8,88,270

***Cost per Unit = $\frac{\text{Rs. } 8,05,406-2,600-21,000}{5,200-260-660 \text{ units}}$ = Rs. 180.1396

Realizable value = Rs. 135 – (85+15) = Rs. 35

(ii) By-Product Process A/c

Particulars	Units	Amt. (Rs.)	Particulars	Units	Amt. (Rs.)
To Process-III A/c	600	21,000	By Product-Z	600	81,000

To Processing cost	-	51,000			
To Selling expenses	-	9,000			
	600	81,000		600	81,000

Question 5

An article passes through three successive operations from raw materials stage to the finished product stage. The following data are available from the production records for the month of March, 2021:

Operation	No. of pieces (Input)	No. of pieces (Rejected)	No. of pieces (Output)
1	1,80,000	60,000	1,20,000
2	1,98,000	18,000	1,80,000
3	1,44,000	24,000	1,20,000

(i) DETERMINE the input required to be introduced in the first operation in no. of pieces in order to obtain finished output of 500 pieces after the last operation.

(ii) CALCULATE the cost of raw material required to produce one piece of finished product, if the weight of the finished piece is 0.5 kg. and the price of raw material is Rs. 80 per kg.

(MTP April '21)

Answer 5

Statement of production

Operation	Input	Rejections		Output
		Total	% of output	
1	1,80,000	60,000	50	1,20,000
2	1,98,000	18,000	10	1,80,000
3	1,44,000	24,000	20	1,20,000

(i) Determination of input required to obtain 500 pieces of finished output:

Particulars	No. of pieces
Output required after operation 3	500
Add: Rejection in operation 3 (20%)	100
Output required after operation 2	600
Add: Rejection in operation 2 (10%)	60
Output required after operation 1	660
Add: Rejection in operation 1 (50%)	330
Input required in operation 1	990

ii) Calculation of cost of raw material:

To produce 500 pieces of final output, 990 pieces of inputs are required at operation 1. Thus, to get a finished piece of 0.5 kg. of output, the weight of input required is:

=0.5/500 × 990 = 0.99 kg.

The cost of raw material would be Rs. 80 × 0.99 kg. = Rs.79.20

Question 6

Navyug Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes and the company uses a FIFO process costing system to value work-in process and finished goods. At the end of the last month, a fire occurred in the factory and destroyed some of the paper files containing records of the process operations for the month.

Navyug Ltd. needs your help to prepare the process accounts for the month during which the fire occurred. You have been able to gather some information about the month's operating activities but some of the information could not be retrieved due to the damage. The following information was salvaged:

- **Opening work-in-process at the beginning of the month was 900 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at Rs. 29,970.**
- **Closing work-in-process at the end of the month was 160 litres, 30% complete for labour and 20% complete for overheads.**
- **Normal loss is 10% of input and total losses during the month were 1,800 litres partly due to the fire damage.**
- **Output sent to finished goods warehouse was 4,200 litres.**
- **Losses have a scrap value of Rs. 20 per litre.**
- **All raw materials are added at the commencement of the process.**
- **The cost per equivalent unit (litre) is Rs.39 for the month made up as follows:**

	(Rs.)
Raw Material	**23**

Labour	**7**
Overheads	**9**
	39

REQUIRED:

(i) Calculate the quantity (in litres) of raw material inputs during the month.

(ii) Calculate the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.

(iii) Calculate the values of raw material, labour and overheads added to the process during the month.

(iv) Prepare the process account for the month.

(MTP Oct '21, RTP May'18) Same concept different figures RTP May'20)

Answer 6

(i) Calculation of Raw Material inputs during the month:

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	900	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,260	Process Losses	1,800
		Closing WIP	160
	6,160		6,160

(ii) Calculation of Normal Loss and Abnormal Loss/Gain

Particulars	Litres
Total process losses for month	1,800
Normal Loss (10% input)	526
Abnormal Loss (balancing figure)	1,274

(iii) Calculation of values of Raw Material, Labour and Overheads added to the process:

	Material	Labour	Overheads
Cost per equivalent unit	Rs. 23.00	Rs. 7.00	Rs. 9.00
Equivalent units (litre) (refer the working note)	4,734	4,892	4,966
Cost of equivalent units	Rs. 1,08,882	Rs. 34,244	Rs. 44,694
Add: Scrap value of normal loss (526 units × Rs. 20)	Rs. 10,520	--	--
Total value added	Rs. 1,19,402	Rs. 34,244	Rs. 44,694

Workings: Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)

Opening WIP	900	Units completed:							
Units introduced	5,260	- Opening WIP	900	--	--	270	30	360	40
		- Fresh inputs	3,300	3,300	100	3,300	100	3,300	100
		Normal loss	526	--	--	--	--	--	--
		Abnormal loss	1,274	1,274	100	1,274	100	1,274	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,734		4,892		4,966	

(iv) Process Account for Month

	Litres	**Amount (Rs.)**		**Litres**	**Amount (Rs.)**
To Opening WIP	900	29,970	By Finished goods	4,200	1,63,800
To Raw Materials	5,260	1,19,402	By Normal loss	526	10,520
To Wages	--	34,244	By Abnormal loss	1,274	49,686
To Overheads	--	44,694	By Closing WIP	160	4,304
	6,160	2,28,310		6,160	2,28,310

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Question 7

Following information is available regarding process A for the month of October, 2021:

Production Record:

Units in process as on 01.10.2021	**8,000**
(All materials used, 25% complete for labour and overhead)	**32,000**
New units introduced	
Units completed	**28,000**
Units in process as on 31.10.2021	**12,000**
(All materials used, 33-1/3% complete for labour and overhead)	
Cost Records:	
Work-in-process as on 01.10.2021	**(Rs.)**
Materials	**12,00,000**
Labour	**2,00,000**
Overhead	**2,00,000**
	16,00,000
Cost during the month	
Materials	**51,20,000**

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Labour	**30,00,000**
Overhead	**30,00,000**
	1,11,20,000

Presuming that average method of inventory is used, PREPARE:

(i) Statement of Equivalent Production.

(ii) Statement showing Cost for each element.

(iii) Statement of Apportionment of cost.

(iv) Process Cost Account for Process A.

(MTP Nov '21, RTP May '19) (Same concept different figures RTP Nov'21)

Answer 7

(i) Statement of Equivalent Production (Average cost method)

Input (Units)	**Particulars**	**Output Units**	**Equivalent Production**					
			Materials		**Labour**		**Overheads**	
			(%*)	**Units****	**(%)***	**Units****	**(%)***	**Units****
40,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	WIP	12,000	100	12,000	$33\frac{1}{3}$	4,000		4,000
40,000		40,000		40,000		32,000		32,000

*Percentage of completion ** Equivalent units

(ii) Statement showing Cost for each element

Particulars	Materials	Labour	Overhead	Total
Cost of opening work-in-progress (Rs.)	12,00,000	2,00,000	2,00,000	16,00,000
Cost incurred during the month (Rs.)	51,20,000	30,00,000	30,00,000	1,11,20,000
Total cost (Rs.) : (a)	63,20,000	32,00,000	32,00,000	1,27,20,000
Equivalent units : (B)	40,000	32,000	32,000	
Cost per equivalent unit (Rs.) C= (A÷B)	158	100	100	358

(iii) Statement of Apportionment of cost

	(Rs.)	(Rs.)
Value of output transferred: (A) (28,000 units × Rs. 358)		1,00,24,000
Value of closing work-in-progress: (B)		
Material (12,000 units × Rs.158)	18,96,000	
Labour (4,000 units × Rs. 100)	4,00,000	
Overhead (4,000 units × Rs. 100)	4,00,000	26,96,000
Total cost : (A + B)		1,27,20,000

(iv) Process- A Account

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Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Opening WIP	8,000	16,00,000	By Completed units	28,000	1,00,24,000
To Materials	32,000	51,20,000	By Closing WIP	12,000	26,96,000
To Labour		30,00,000			
To Overhead		30,00,000			
	40,000	1,27,20,000		40,000	1,27,20,000

Question 8

Chill Ltd. uses process costing to manufacture water density sensor for hydro sector. The following information pertains to operations for the month of February:

Particulars	Units
Beginning WIP, February 1	**22,400**
Started in production during February	**1,40,000**
Completed production during February	**1,28,800**
Ending work in progress, February 28	**33,600**

The beginning work in progress was 50% complete for materials and 30% complete for conversion costs. The ending inventory was 80% complete for material and 30% complete for conversion costs.

Costs pertaining to the month of February are as follows:

Beginning inventory costs are material Rs. 1,38,350, direct labour Rs. 1,50,600 and factory overhead Rs. 63,600Cost incurred during February are material Rs. 23,95,000, direct labour Rs. 9,14,400, factory overheads Rs. 19,55,800.

CALCULATE:

(i) Using the FIFO method, the equivalent units of production for material.

(ii) Cost per equivalent unit for conversion cost.

(MTP March '22, Old & New SM)

Answer 8

i. Calculation of equivalent units of production:

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Beginning WIP	22,400	From beginning WIP	22,400	50	11,200	70	15,680
Unit Introduced	1,40,000	Completed output	1,06,400	100	1,06,400	100	1,06,400
		Closing W-I-P	33,600	80	26,880	30	10,080
Total	1,62,400	Total	1,62,400		1,44,480		1,32,160

ii. Calculation of cost per equivalent unit for conversion costs

Particulars	
Direct labour	Rs.9,14,400
Factory overheads	Rs.19,55,800
Total	Rs.28,70,200
Equivalent units	1,32,160 units
Cost per equivalent unit	Rs.21.72

Question 9

WHAT is inter-process profit? STATE its advantages and disadvantages.

(MTP Mar'22)

Answer 9

Inter-Process Profit: To control cost and to measure performance, different processes within an organization are designated as separate profit centres. In this type of organizational structure, the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. The difference between cost and the transfer price is known as inter - process profits. The advantages and disadvantages of using inter-process profit, in the case of process type industries are as follows:

Advantages:

1. Comparison between the cost of output and its market price at the stage of completion is facilitated.

2. Each process is made to stand by itself as to the profitability.

Disadvantages:

1. The use of inter-process profits involves complication.

2. The system shows profits which are not realised because of stock not sold out.

Question 10

A Manufacturing unit manufactures a product which passes through three distinct Processes - A, B and C. The following data is given:

	Process A	Process B	Process C
Material consumed (in Rs.)	36,400	31,500	28,000
Direct wages (in Rs.)	56,000	49,000	42,000

- **The total Production Overhead of Rs. 2, 20,500 was recovered @ 150% of direct wages.**
- **15,000 units at Rs. 28 each were introduced to Process 'A'.**
- **The output of each process passes to the next process and finally, 12,000 units were transferred to Finished Stock Account from Process ' C'.**
- **No stock of materials or work in progress was left at the end. The following additional information is given:**

Process	% of wastage to normal input	Value of Scrap per unit (Rs.)
A	6%	15.40
B	?	28.00

C	**5%**	**14.00**

You are required to:

(i) FIND OUT the percentage of wastage in process 'B', given that the output of Process 'B' is transferred to Process 'C' at Rs. 56 per unit.

(ii) PREPARE Process accounts for all the three processes A, B and C.

(April '22) (Same concept different figures PYP July 21)

Answer 10

Process-A Account

Dr. **Cr.**

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Material introduced	15,000	4,20,000	By Normal Loss A/c [(6% of 15,000 units) x Rs. 15.40]	900	13,860
" Additional material	--	36,400	" Process-B A/c (Rs. 41.31* × 14,100 units)	14,100	5,82,540
" Direct wages	--	56,000			
" Production OH	--	84,000			
	15,000	5,96,400		15,000	5,96,400

* Cost per unit of completed units = $\frac{Total\ Cost - Realisable\ value\ From\ normal\ loss}{Inputs\ units - Normal\ loss\ units}$

= $\frac{\text{Rs. } 5,96,400 - \text{Rs.}13,860}{15,000\ \text{units} - 900\ \text{units}}$ = Rs. 41.31

Process-B Account

Dr. **Cr.**

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process-A A/c	14,100	5,82,540	By Normal Loss A/c [(#13.44% of 14,100 units) x Rs. 28]	1,895	53,060
” Additional material	--	31,500	” Process-C A/c (Rs. 56 × 12,205 units)	12,205	6,83,480
”Production OH	--	73,500			
	14,100	7,36,540		14,100	7,36,540

#Calculation for % of wastage in process ‘B’:

Let’s consider number of units lost under process ‘B’ = b

Now, Total Cost - Realisable value from normal loss / Inputs units - Normal loss units = 56

$=\frac{\text{Rs.}7,36,540-\text{Rs.}28\text{b}}{14,100\text{ units}-\text{b}}$ = Rs. 56

Rs. 7, 36,540 - Rs. 28b = Rs. 7, 89,600 - Rs. 56b

28b = Rs. 53,060 => b = 1,895 units

% of wastage = 1,895 units /14,100 units = 13.44%

Process-C Account

Dr. **Cr.**

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)

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To Process-B A/c	12,205	6,83,480	By Normal Loss A/c [(5% of 12,205 units) x Rs. 14]	610	8,540
” Additional material	--	28,000	” Finished Stock A/c (Rs. 69.68$ × 12,000 units)	12,000	8,36,160
”Direct wages	--	42,000			
” Production OH	--	63,000			
”Abnormal gain (Rs. 69.68$ × 405 units)	405	28,220			
	12,610	8,44,700		12,610	8,44,700

Cost per unit of completed units = $\frac{Total\ Cost - Realisable\ value\ From\ normal\ loss}{Inputs\ units - Normal\ loss\ units}$

$= \frac{\text{Rs. } 8{,}16{,}480 - \text{Rs. } 8{,}540}{12{,}205 \text{ units} - 610 \text{ units}}$ = Rs. 69.68

Important Note:-

It was a practical problem on process costing which required the examinees to prepare process accounts and also find the percentage of wastage in process Y. Very few examinees answered the question in the correct line. Most of the examinees could not calculate the percentage of wastage correctly. Average performance was observed.

Question 11

The following data are available in respect of Process-I for January 20X9:

(1) Opening stock of work in process: 600 units at a total cost of Rs. 4, 20,000.

(2) Degree of completion of opening work in process:

Material	**100%**
Labour	**60%**
Overheads	**60%**

(3) Input of materials at a total cost of Rs.55, 20,000 for 9,200 units.

(4) Direct wages incurred Rs.18, 60,000

(5) Production overhead Rs.8, 63,000.

(6) Units scrapped 200 units. The stage of completion of these units was:

Materials	**100%**
Labour	**80%**
Overheads	**80%**

(7) Closing work in process; 700 units. The stage of completion of these units was:

Material	**100%**
Labour	**70%**
Overheads	**70%**

(8) 8,900 units were completed and transferred to the next process.

(9) Normal loss is 4% of the total input (opening stock plus units put in)

(10) Scrap value is Rs.60 per unit. You are required to:

(i) COMPUTE equivalent production,

(ii) CALCULATE the cost per equivalent unit for each element.

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(iii) CALCULATE the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method.

(April '19) (Same concept different figures MTP Oct'22)

Answer 11

(i) (FIFO Method)

Input		Output		Equivalent Production					
				Materials		Labour		Production Overhead	
Details	Units	Details	Units	%	Units	%	Units	%	Units
Opening Stock	600	From opening stock	600	-	-	40	240	40	240
		- From fresh materials	8,300	100	8,300	100	8,300	100	8,300
		Closing W-I-P	700	100	700	70	490	70	490
Fresh inputs	9,200	Normal loss	392	-	-	-	-	-	-
			9,992		9,000		9,030		9,030
		Less: Abnormal Gain	(192)	100	(192)	100	(192)	100	(192)

	9,800		9,800		8,808		8,838		8,838

(ii) Statement of Cost per equivalent units

Elements	(Rs.)	Cost (Rs.)	Equivalent units (EU)	Cost per EU (Rs.)
Material Cost	55,20,000			
Less: Scrap realisation 392 units @ Rs. 60/- p.u.	(2,3520)	54,96,480	8,808	624.03
Labour cost		18,60,000	8,838	210.45
Production OH Cost		8,63,000	8,838	97.65
Total Cost		82,19,480		932.13

(iii) Cost of Abnormal Gain – 192 Units

	(Rs.)	(Rs.)
Material cost of 192 units @ Rs. 624.03 p.u.	1,19,813.76	
Labour cost of 192 units @ Rs. 210.45 p.u.	40,406.40	
Production OH cost of 192 units @ Rs. 97.65 p.u.	18,748.80	1,78,968.96

Cost of closing WIP – 700 Units

Material cost of 700 equivalent units @ Rs.624.03 p.u.	4,36,821.00	

Labour cost of 490 equivalent units @ Rs. 210.45 p.u.	1,03,120.50	
Production OH cost of 490 equivalent @ Rs. 97.65 p.u.	47,848.50	5,87,790.00

Cost of 8,900 units transferred to next process

(i) Cost of opening W-I-P Stock b/f –600 units	4,20,000.00
(ii) Cost incurred on opening W-I-P stock	
Material cost	—
Labour cost 240 equivalent units @ Rs. 210.45 p.u.	50,508.00
Production OH cost 240 equivalent units @ Rs 97.65 p.u	23,436.00
	4,93,944.00
(iii) Cost of 8,300 completed units	
8,300 units @ Rs. 932.13 p.u.	77,36,679.00
Total cost [(i) + (ii) + (iii))]	86,50,623.00

Question 12

XYZ Ltd. is manufacturer of medicines. It carries on production operation in two processes. The material first passes through Process I, where Medicine ' X' is produced. Following data are given for the month October, 2022:

Opening work-in-progress quantity	**(in Litre)**	**12,000**
(Material 100% and conversion 50% complete)		
Material input quantity	**(in Litre)**	**60,000**
Work completed quantity	**(in Litre)**	**40,000**
Closing work-in-progress quantity	**(in Litre)**	**15,000**
(Material 100% and conversion 80% complete)		
Opening work-in-progress cost		
Material cost	**(In Rs.)**	**1,75,000**
Processing cost	**(In Rs.)**	**1,40,000**
Material input cost	**(In Rs.)**	**7,70,000**
Processing cost	**(In Rs.)**	**8,35,000**

Normal process loss is 15% of material input. It has no realizable value.

Any quantity of Medicine 'X' can be sold for Rs. 42.50 per Litre. Alternatively, it can be transferred to Process II for further processing and then sold as Medicine ' XYZ' for Rs. 50 per Litre. Further materials are added in Process II, which yield 1.25 Litre of Medicine ' XYZ' for every Litre of Medicine 'X' of Process I. Out of the 40,000 Litre of work completed in Process I, 10,000 Litre are sold as Medicine 'X' and 30,000 Litre are passed through Process II for sale as Medicine 'XYZ'.

The monthly costs incurred in Process II (other than the cost of Medicine ' X') are:

Input	**30,000 Litre of Medicine 'X'**
Materials Cost	**Rs. 2,75,000**
Processing Costs	**Rs. 2,50,000**

You are required to:

(i) PREPARE Statement of Equivalent production and determine the cost per Litre of Medicine 'X' in Process I, using the weighted average cost method.

(ii) Company is mulling over the option to sell the 30,000 Litre of Medicine ' X' at Process-I without processing it further in Process-II. WILL IT BE beneficial for the company over the current pattern of processing 30,000 Litre in process-II?

(MTP Sep'22)

Answer 12

(i) Process I Statement of Equivalent Production (Under Weighted Average Method)

Particulars	Input units (in Litre)	Particulars	Output units (in Litre)	Equivalent Production			
				Material		Conversion	
				(%)	Equivalent units (in Litre)	(%)	Equivalent units (in Litre)
Opening WIP	12,000	Units introduced and completed	40,000	100	40,000	100	40,000
New Material Introduced	60,000	Normal Loss (15% of 60,000 litres)	9,000	-	-	-	-

		Closing WIP	15,000	100	15,000	80	12,000
		Abnormal Loss (Bal. fig.)	8,000	100	8,000	100	8,000
	72,000		72,000		63,000		60,000

Statement of Cost for Each Element

Elements of Costs	Material (Rs.)	Conversion Cost (Rs.)
Costs of Opening WIP	1,75,000	1,40,000
Cost of the Process (for the period)	7,70,000	8,35,000
Total Cost	9,45,000	9,75,000
Equivalent Units (in litre)	63,000	60,000
Cost Per equivalent Units (in litre)	Rs. 15	Rs. 16.25

Therefore, Cost of Medicine 'X' is Rs. 31.25 per litre (Rs. 15 + Rs. 16.25)

(ii) Statement showing comparative data to decide whether 30,000 Litres of Medicine 'X' should be further processed into 'XYZ'

	Alternative 1	Alternative 2
	Sell medicine 'X' After Process I (Rs.)	Process further into 'XYZ' (Rs.)

Sales	12,75,000 (30,000 litres x Rs. 42.50)	18,75,000 (37,500 litres x Rs. 50)
Less: Costs		
Process I - Costs (30,000 litres x Rs. 31.25)	9,37,500	9,37,500
Material in Process II	-	2,75,000
Conversion cost in Process II	-	2,50,000
Total Cost	9,37,500	14,62,500
Profit	3,37,500	4,12,500

Hence, company should process further as it will increase profit further by Rs. 75,000 (Rs. 4, 12,500 – Rs. 3, 37,500)

Question 13

SM Pvt. Ltd. manufactures their products in three consecutive processes. The details are as below:

	Process X	**Process Y**	**Process Z**
Transferred to next Process	**60%**	**50%**	
Transferred to warehouse for	**40%**	**50%**	**100%**

sale			

In each process, there is a weight loss of 2% and scrap of 4% of input of each process. The realizable value of scrap of each process is as below:

Process X @ Rs. 3 per ton

Process Y @ Rs. 5 per ton

Process Z @ Rs. 7 per ton.

The following particulars relate to January 2023:

	Process X	Process Y	Process Z
Materials used (in Tons)	1,500	454	189
Rate per ton	Rs. 21.5	Rs. 14	Rs. 12
Direct Wages	Rs. 5,000	Rs. 3,260	Rs. 2,540
Direct Expenses	Rs. 3,820	Rs. 2,775	Rs. 1,900

PREPARE Process Accounts- X, Y and Z & calculate cost per ton at each process.

(MTP March '23) (Same concept different figures RTP Nov'22)

Answer 13

Process X Account

Particulars	Tones	Amount (Rs.)	Particulars	Tones	Amount (Rs.)

To Materials	1,500	32,250	By Weight Loss	30	---
To Wages		5,000	By Scrap	60	180
To Direct Expenses		3,820	By Process Y	846	24,534
			By Warehouse	564	16,356
Total	**1,500**	**41,070**	**Total**	**1,500**	**41,070**

Cost per Ton = (41,070 - 180)/ (1,500-30-60) = Rs. 29 per ton

Process Y account

Particulars	Tones	Amount (Rs.)	Particulars	Tones	Amount (Rs.)
To Process X	846	24,534	By Weight Loss	26	---
To Materials	454	6,356	By Scrap	52	260
To Wages		3,260	By Process Z	611	18,332.5
To Direct Expenses		2,775	By Warehouse	611	18,332.5
Total	**1300**	**36,925**	**Total**	**1300**	**36,925**

Cost per Ton = (36,925-260)/(1,300-26-52)= Rs.30 per ton

Process Z Accounts

Particulars	Tones	Amount (Rs.)	Particulars	Tones	Amount (Rs.)

To Process Y	611	18332.5	By Weight Loss	16	---
To Materials	189	2,268	By Scrap	32	224
To Wages		2,540	By Warehouse	752	24,817
To Direct Expenses		1,900			
Total	**800**	**25,041**	**Total**	**800**	**25041**

Cost per Ton = (25,041-224)/ (800-16-32) = Rs. 33 per ton

Question 14

From the following information for the month of January, 20X9, PREPARE Process-III cost accounts.

Opening WIP in Process-III	**1,600 units at Rs. 24,000**
Transfer from Process-II	**55,400 units at Rs. 6,23,250**
Transferred to warehouse	**52,200 units**
Closing WIP of Process-III	**4,200 units**
Units Scrapped	**600 units**
Direct material added in Process-III	**Rs. 2,12,400**
Direct wages	**Rs. 96,420**

Production overheads	**Rs. 56,400**

Degree of completion:

	Opening Stock	Closing Stock	Scrap
Material	**80%**	**70%**	**100%**
Labour	**60%**	**50%**	**70%**
Overheads	**60%**	**50%**	**70%**

The normal loss in the process was 5% of the production and scrap was sold @ Rs.5 per unit.

(Students may treat material transferred from Process – II as Material – A and fresh material used in Process – III as Material B)

(RTP Nov.'18)

Answer 14

Statement of Equivalent Production Process III

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material -A		Material - B		Labour & Overhead	
				%	Units	%	Units	%	Units
Opening WIP	1,600	Work on Op. WIP	1,600	-	-	20	320	40	640

Process – II Transfer	55,400	Introduced &Completed During the Month	50,600	100	50,600	100	50,600	100	50,600
		Normal Loss (5 % of 52,800 units)	2,640	-	-	-	-	-	-
		Closing WIP	4,200	100	4,200	70	2,940	50	2,100
		Abnormal Gain	(2,040)	100	(2,040)	100			

Working note:

Production units = Opening units + Units transferred from Process-II – Closing Units = 1,600 units + 55,400 units – 4,200 units = 52,800 units

Statement of Cost

		Cost(Rs.)	**Equivalent units**	**Cost per equivalent units (Rs.)**
Material A (Transferred from previous process)		6,23,250		
Less: Scrap value of normal loss (2,640units×Rs. 5)		(13,200)		

		6,10,050	52,760	11.5627
Material B		2,12,400	51,820	4.0988
Labour		96,420	51,300	1.8795
Overheads		56,400	51,300	1.0994
		9,75,270		18.6404
Statement of apportionment of Process Cost				
			Amount (Rs.)	**Amount (Rs.)**
Opening WIP	Material A			24,000
Completed opening	Material B (320 units × Rs. 4.0988)		1311.62	
WIP units-1600				
	Wages (640 units × Rs. 1.8795)		1202.88	
	Overheads (640 units × Rs. 1.0994)		703.62	3,218.12

Introduced & Completed- 50,600 units	50,600 units × Rs. 18.6404			9,43,204.24
Total cost of 52,200 finished goods units				9,70,422.36
Closing WIP units- 4,200	Material A (4,200 units × Rs. 11.5627)			48,563.34
	Material B (2,940 units × Rs. 4.0988)			12,050.47
	Wages (2,100 units × Rs. 1.8795)			3,946.95
	Overheads (2,100 units × Rs. 1.0994)			2,308.74
				66,869.50
Abnormal gain units- 2,040	(2,040 units ×Rs. 18.6404)			38026.42

Process III A/c

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Balance b/d	1,600	24,000	By Normal loss	2,640	13,200

To Process II A/c	55,400	6,23,250	By Finished goods	52,200	9,70,422.36
To Direct material		2,12,400	By Closing WIP	4,200	66,874.06*
To Direct wages		96,420			
To Production overheads		56,400			
To Abnormal gain	2,040	38,026.42			
	59,040	**10,50,496.42**		**59,040**	**10,50,496.42**

* Difference in figure due to rounding off has been adjusted with closing WIP

Question 15

A company produces a component, which passes through two processes. During the month of November, 2020, materials for 40,000 components were put into Process- I of which 30,000 were completed and transferred to Process- II. Those not transferred to Process- II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process- I costs incurred were as follows:

Direct Materials	**Rs. 3,00,000**
Direct Wages	**Rs. 3,50,000**
Factory Overheads	**Rs. 2,45,000**

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There

were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

Packing Materials	**Rs. 80,000**
Direct Wages	**Rs. 71,125**
Factory Overheads	**Rs. 85,350**

Packing material cost is incurred at the end of the second process as protective packing to the completed units of production.

Required:

(i) PREPARE Statement of Equivalent Production, Cost per unit and Process I A/c.

(ii) PREPARE statement of Equivalent Production, Cost per unit and Process II A/c.

(RTP May '21)(Same concept but different figures RTP May'22 & Old & New SM)

Answer 15

Process I

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
40,000	Completed	30,000	100	30,000	100	30,000	100	30,000
	Closing WIP	10,000	100	10,000	50	5,000	50	5,000

40,000		40,000		40,000		35,000		35,000

Particulars	Materials	Labour	Overhead	Total
Cost incurred (Rs.)	3,00,000	3,50,000	2,45,000	8,95,000
Equivalent units	40,000	35,000	35,000	
Cost per equivalent unit (Rs.)	7.50	10.00	7.00	24.50

Process-I Account

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Materials	40,000	3,00,000	By Process-II A/c (30,000 units × Rs.24.5)	30,000	7,35,000
To Labour	-	3,50,000	By Closing WIP*	10,000	1,60,000
To Overhead	-	2,45,000			
	40,000	8,95,000		40,000	8,95,000

* (Material 10,000 units × Rs. 7.5) + (Labour 5,000 units × Rs. 10) + (Overheads 5,000 units × Rs.7) = Rs. 75,000 + Rs. 50,000 + Rs. 35,000 = Rs. 1, 60,000

Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200	--	1,800	--	450	--	450
	Closing WIP	1,800	100		25		25	
30,000		30,000		29,800		28,450		28,450

Particulars	Materials	Labour	Overhead	Total
Process-I Cost	7,35,000	71,125	85,350	7,35,000
Cost incurred (Rs.)	--	--	--	1,56,475
Equivalent units	29,800	28,450	28,450	--
Cost per equivalent unit (Rs.)	24.6644	2.5000	3.0000	30.1644

Process-II Account

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process-I A/c	30,000	7,35,000	By Normal loss A/c	200	--

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To Packing Material	--	80,000	By Finished Goods Stock A/c	28,000*	9,24,604
To Direct Wages	--	71,125	By Closing WIP	1,800**	46,871
To Factory Overhead	--	85,350			
	30,000	9,71,475		30,000	9,71,475

* 28,000 × Rs. 30.1644 = Rs. 8, 44,603 + Rs. 80,000 (Packing Material Cost) = Rs. 9, 24,604

** 1,800 units × Rs. 24.6644 + 450 units × (Rs. 2.5 + Rs.3) = Rs. 46,871

Question 16

EXPLAIN the term Equivalent units used in process industries.

(RTP Nov.'19)

Answer 16

Equivalent Units: Equivalent units or equivalent production units, means converting the incomplete production units into their equivalent completed units. Under each process, an estimate is made of the percentage completion of work-in-process with regard to different elements of costs, viz., material, labour and overheads. It is important that the estimate of percentage of completion should be as accurate as possible. The formula for computing equivalent completed units is: For instance, if 25% of work has been done on the average of units still under process, then 200 such units will be equal to 50 completed units and the cost of work-in process will be equal to the cost of 50 finished units.

Question 17

Describe Operation costing with two examples of industries where operation costing is applied.

(May'18)

Answer 17

This product costing system is used when an entity produces more than one variant of final product using different materials but with similar conversion activities. Which means conversion activities are similar for all the product variants but materials differ significantly. Operation Costing method is also known as Hybrid product costing system as materials costs are accumulated by job order or batch wise but conversion costs i.e. labour and overheads costs are accumulated by department, and process costing methods are used to assign these costs to products. Moreover, under operation costing, conversion costs are applied to products using a predetermined application rate. This predetermined rate is based on budgeted conversion costs. The two example of industries are Ready made garments and Jewellery making.

Question 18

'Dairy Wala Private limited' is engaged in the production of flavoured milk. Its process involve filtration and boiling of milk after that some sugar, flavour, colour is added and then letting it cool to fill the product into clean and sterile bottles. For Producing 10 litre of flavour milk, 100 litre of raw milk is required, which extracts only 45 litres of standardized milk.

Following information regarding Process – I has been obtained from the manufacturing department of Dairy Wala Private limited for the month of December 2022:

Items	**(Rs.)**
Opening work-in process (13,500 litre)	

Milk	**1,50,000**
Labour	**45,000**
Overheads	**1,35,000**
Milk introduced for filtration and boiling (3,00,000 litre)	**15,00,000**
Direct Labour	**6,00,000**
Overheads	**18,00,000**
Abnormal Loss: 3,000 litres	
Degree of completion:	
Milk	**100%**
Labour and overheads	**80%**
Closing work-in process: 27,000 litres	
Degree of completion:	
Milk	**100%**
Labour and overheads	**80%**
Milk transferred for Packing: 1,18,500 litres	
You are required to PREPARE using average method:	

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(i) Statement of equivalent production,	
(ii) Statement of cost,	
(iii) Statement of distribution cost, and	
(iv) Process-I Account.	

(RTP May 23)

Answer 18

(i) Statement of Equivalent Production

Particulars	**Input Units**	**Particulars**	**Output Units**	**Equivalent Production**			
				Milk		**Labour & O.H.**	
				%	**Units**	**%**	**Units**
Opening WIP	13,500	Completed and transferred to Process-II	1,18,500	100	1,18,500	100	1,18,500
Units introduced	3,00,000	Normal Loss (55%* of 3,00,000)	1,65,000	--	--	--	--
		Abnormal loss	3,000	100	3,000	80	2400
		Closing WIP	27,000	100	27,000	80	21,600

	3,13,500		3,13,500		1,48,500		1,42,500

* 100 litre of milk extracts only 45 litre of standardized milk. Thus, normal loss = 100 – 45

= 55%

(ii) Statement showing cost for each element

Particulars	**Milk (Rs.)**	**Labour (Rs.)**	**Overhead (Rs.)**	**Total (Rs.)**
Cost of opening work-in process	1,50,000	45,000	1,35,000	3,30,000
Cost incurred during the month	15,00,000	6,00,000	18,00,000	39,00,000
Total cost: (A)	16,50,000	6,45,000	19,35,000	42,30,000
Equivalent units: (B)	1,48,500	1,42,500	1,42,500	
Cost per equivalent unit: (C) = (A ÷ B)	11.111	4.526	13.578	29.216

(iii) Statement of Distribution of cost

	(Rs.)	**(Rs.)**
1. Value of units completed and transferred (1,18,500 units × Rs. 29.216)		34,62,096
2. Value of Abnormal Loss: -		

Milk (3,000 units × Rs. 11.111)	33,333	
Labour (2400 units × Rs. 4.526)	10,863	
Overheads (2400 units × Rs. 13.579)	32,590	76,786
3. Value of Closing W-I-P:		
Milk (27,000 units × Rs. 11.111)	299997	
Labour (21,600 units × Rs. 4.526)	97,762	
Overheads (21,600 units × Rs. 13.579)	2,93,306	6,91,065

(iv) Process-I A/c

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Opening W.I.P:			By Normal Loss	1,65,000	--
Milk	13,500	1,50,000	By Abnormal Loss (Rs..44 difference due to approximation)	3,000	76,839
Labour	--	45,000	By Process-II A/c	1,18,500	34,62,096
Overheads	--	1,35,000	By Closing WIP	27,000	6,91,065

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To Milk introduced	3,00,000	15,00,000			
To Direct Labour		6,00,000			
To Overheads		18,00,000			
	3,13,500	42,30,000		3,13,500	42,30,000

Question 19

The following information is furnished by ABC Company for Process - II of its manufacturing activity for the month of April 2023:

(i) Opening Work-in-Progress – Nil

(ii) Units transferred from Process I – 55,000 units at Rs. 3, 27,800

(iii) Expenditure debited to Process – II:

Consumables **Rs.1, 57,200**

Labour **Rs.1, 04,000**

Overhead **Rs.52, 000**

(iv) Units transferred to Process III – 51,000 units

(v) Closing WIP – 2,000 units (Degree of completion):

Consumables **80%**

Labour **60%**

Overhead **60%**

(vi) Units scrapped - 2,000 units, scrapped units were sold at Rs. 5 per unit

(vii) Normal loss – 4% of units introduced

You are required to:

(i) Prepare a Statement of Equivalent Production.

(ii) Determine the cost per unit

(iii) Determine the value of Work-in-Process and units transferred to Process – III

(RTP Nov '23)

Answer 19

(i) Statement of Equivalent Production

Input	**Units**	**Output**	**Units**	**Equivalent Production**					
Details		**Particulars**		**Material- A***		**Consumables**		**Labour & Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Units transferred from Process-I	55,000	Units transferred to Process-III	51,000	100	51,000	100	51,000	100	51,000
		Normal loss (4% of 55,000)	2,200	-	-	-	-	-	-

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		Closing W-I-P	2,000	100	2,000	80	1,600	60	1,200
		Abnormal Gain	(200)	100	(200)	100	(200)	100	(200)
	55,000		55,000		52,800		52,400		52,000

*Material A represent transferred-in units from process-I

(ii) Determination of Cost per Unit

Particulars	Amount (Rs.)	Units	Per Unit (Rs.)
(i) Direct Material (Consumables) :			
Value of units transferred from Process-I	3,27,800	52,800	6.00
Less: Value of normal loss (2,200 units × Rs.5)	(11,000)		
	3,16,800	52,800	6.00
(ii) Consumables added in Process-II	1,57,200	52,400	3.00
(iii) Labour	1,04,000	52,000	2.00
(iii) Overhead	52,000	52,000	1.00
Total Cost per equivalent unit			12.00

(iii) Determination of value of Work-in-Process and units transferred to Process-III

Particulars	Units	Rate (Rs.)	Amount (Rs.)
Value of Closing W-I-P:			
Material from Process-I	2,000	6.00	12,000
Consumables	1,600	3.00	4,800
Labour	1,200	2.00	2,400
Overhead	1,200	1.00	1,200
			20,400
Value of units transferred to Process-III	51,000	12.00	6,12,000

Question 20

A product passes through two distinct processes before completion. Following information are available in this respect:

	Process-1	Process 2
Raw materials used	**10000 units**	**-**
Raw material cost (per unit)	**Rs. 75**	**-**
Transfer to next process/Finished good	**9000 units**	**8200 units**
Normal loss (on inputs)	**5%**	**10%**

Direct wages	**Rs. 3,00,000**	**Rs. 5,60,000**
Direct expenses	**50% of direct wages**	**65% of direct wages**
Manufacturing overheads	**25% of direct wages**	**15% of direct wages**
Realizable value of scrap (per unit)	**Rs. 13.50**	**Rs. 145**

8000 units of finished goods were sold at a profit of 15% on cost. There was no opening and closing stock of work-in-progress.

Prepare:

(i) Process-1 and Process-2 Account

(ii) Finished goods Account

(iii) Normal Loss Account

(iv) Abnormal Loss Account

(v) Abnormal Gain Account

(PYP Nov'19) (Same concept different figures Old & New SM)

Answer 20

(i)

Dr. Process-1 Account Cr.

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)

To Raw Material Consumed	10,000	7,50,000	By Normal Loss A/c @ 13.5	500	6,750
” Direct Wages	—	3,00,000	” Process2@133.5	9,000	12,01,500
” Direct Expenses	—	1,50,000	” By Abnormal Loss @ 133.5	500	66,750
“ Manufacturing Overheads		75,000			
	10,000	12,75,000		10,000	12,75,000

Cost per unit of completed units and abnormal loss:

$= \frac{Rs.12,75,000 - Rs.6,750}{10,000\ units - 50\ units}$ =Rs. 133.5

(ii)

Dr. **Process-2 Account** **Cr.**

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process-I A/c	9,000	12,01500	By Normal Loss A/c @ 145	900	1,30,500
” To Direct Wages	--	5,60,000	” By Finished Stock A/c [bal. fig]	8,200	21,04,667
” Direct Expenses	--	3,64,000			

”Manufacturing Overheads	--	84,000			
”To Abnormal gain (Rs. 256.67 × 100 units)	100	25,667			
	9,100	22,35,167		9,100	22,35,167

Cost per unit of completed units and abnormal gain:

$= \frac{\text{Rs.}22,09,500 - \text{Rs.}1,30,500}{8,100 \text{ units}}$ =Rs. 256.17

Dr. **Finished Goods A/c** **Cr.**

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process II A/c	8,200	21,04,667	By Cost of Sales	8,000	20,53,333
			” By Balance c/d	200	51,334
	8,200	21,04,667		8,200	21,04,667

(iii)

Dr. **Normal Loss A/c** **Cr.**

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process I	500	6,750	By abnormal Gain II	100	14,500

Process II	900	1,30,500	By Cash	500	6,750
			By Cash	800	1,16,000
	1400	1,37,250		1400	1,37,250

(iv)

Dr. **Abnormal Loss A/c** **Cr.**

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process I	500	66,750	By Cost Ledger Control A/c	500	6,750
			By Costing P& L A/C (Abnormal Loss)		60,000
		66,750			66,750

(v)

Dr. **Abnormal Gain A/c** **Cr.**

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Normal Loss A/c @ 145	100	14,500	By Process II	100	25,667
To Costing P & L A/C		11,167			

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	100	25,667		100	25,667

Important Note:-

This was a numerical problem from the topic 'Process Costing'. The question required preparing Process accounts, normal loss, abnormal loss and abnormal gain accounts. Generally, well answered by most of the examinees. Performance of the examinees in this question was good.

Question 21

KT Ltd. produces a product EMM which passes through two processes before it is completed and transferred to finished stock. The following data relate to May 2019:

Particulars	Process		Finished stock
	A (Rs.)	B (Rs.)	(Rs.)
Opening Stock	5,000	5,500	10,000
Direct Materials	9,000	9,500	
Direct Wages	5,000	6,000	
Factory Overheads	4,600	2,030	
Closing Stock	2,000	2,490	5,000
Inter-process profit included in opening stock		1,000	4,000

Output of Process A is transferred to Process B at 25% profit on the transfer price and output of Process B is transferred to finished stock at 20% profit on the transfer price.

Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from Process B. Sales during the period are Rs. 75,000.

Prepare the Process cost accounts and finished stock account showing the profit element at each stage.

(PYP May '19) (Same concept different figures Old & New SM)

Answer 21

Process-A A/c

Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)	Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)
Opening stock	5,000	5,000	_	Process BA/c	28,800	21,600	7,200
Direct materials	9,000	9,000	_				
Direct wages	5,000	5,000	_				
	19,000	19,000	_				
Less: Closing stock	(2,000)	(2,000)	_				
Prime Cost	17,000	17,000	_				

Overheads	4,600	4,600	_				
Process Cost	21,600	21,600	_				
Profit (33.33% of total cost)	7,200	-	7,200				
	28,800	21,600	7,200		28,800	21,600	7,200

Process-B A/c

Particulars	**Total (Rs.)**	**Cost (Rs.)**	**Profit (Rs.)**	**Particulars**	**Total (Rs.)**	**Cost (Rs.)**	**Profit (Rs.)**
Opening stock	5,500	4,500	1,000	Finished stock A/c	61,675	41,550	20,125
Process A A/c	28,800	21,600	7,200				
Direct materials	9,500	9,500	_				
Direct wages	6,000	6,000	_				
	49,800	41,600	8,200				

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Less: Closing stock	(2,490)	(2,080)	(410)				
Prime Cost	47,310	39,520	7,790				
Overheads	2,030	2,030	_				
Process Cost	49,340	41,550	7,790				
Profit (25% of total cost)	12,335	-	12,335				
	61,675	41,550	20,125		61,675	41,550	20,125

Finished Stock A/c

Particulars	**Total (Rs.)**	**Cost (Rs.)**	**Profit (Rs.)**	**Particulars**	**Total (Rs.)**	**Cost (Rs.)**	**Profit (Rs.)**
Opening stock	10,000	6,000	4,000	Costing P & L A/c	75,000	44,181	30,819
Process B A/c	61,675	41,550	20,125				
	71,675	47,550	24,125				

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Less: Closing stock	(5,000)	(3,369)	(1,631)				
COGS	66,675	44,181	22,494				
Profit	8,325	-	8,325				
	75,000	44,181	30,819		75,000	44,181	30,819

Important Note:-

In this numerical question of 'Process Costing' examinees were asked to prepare process cost accounts and finished stock account. Examinees made a mistake in the calculation of profit in the closing stock in the Process B Account and Finished Stock Account. Performance of the examinees was not satisfactory. Overall performance in this question was below average.

Question 22

Following details have been provided by M/s AR Enterprises:

(i) Opening works-in-progress - 3000 units (70% complete)

(ii) Units introduced during the year - 17000 units

(iii) Cost of the process (for the period) - Rs. 33, 12,720

(iv) Transferred to next process - 15000 units

(v) Closing works-in-progress - 2200 units (80% complete)

(vi) Normal loss is estimated at 12% of total input (including units in process in the beginning). Scraps realise Rs. 50 per unit. Scraps are 100% complete.

Using FIFO method, compute:

(i) Equivalent production

(ii) Cost per equivalent unit

(PYP Nov '18)

Answer 22

Statement of Equivalent Production Units (Under FIFO Method)

Particulars	Input units	Particulars	Output units	Equivalent Production	
				(%)	Equivalent units
Opening W-I-P	3,000	From opening W-I-P	3,000	30	900
Units introduced	17,000	From fresh inputs	12,000	100	12,000
		Units completed			
		(Transferred to next process)	15,000		
		Normal Loss			
		{12% (3,000 + 17,000 units)}	2,400	--	--
		Closing W-I-P	2,200	80	1760
		Abnormal loss (Balancing figure)	400	100	400

	20,000		11,000		15,060

Computation of cost per equivalent production unit:	
Cost of the Process (for the period)	Rs. 33,12,720
Less: Scrap value of normal loss (Rs. 50 × 2,400 units)	(Rs. 1,20,000)
Total process cost	Rs. 31,92,720

Important Note:-

In this numerical problem of process costing for calculation of equivalent production and cost per equivalent unit. Performance of the examinees was average.

Question 23

Alpha Ltd. is engaged in the production of a product A which passes through 3 different process - Process P, Process Q and Process R. The following data relating to cost and output is obtained from the books of accounts for the month of April 2017:

Particular	Process P	Process Q	Process R
Direct Material	**38,000**	**42,500**	**42,880**
Direct Labour	**30,000**	**40,000**	**50,000**

Production overheads of Rs. 90,000 were recovered as percentage of direct labour.

10,000 kg of raw material @ Rs. 5 per kg. was issued to Process P. There was no stock of materials or work in process. The entire output of each process passes directly to the next process and finally to warehouse. There is normal wastage, in processing, of 10 %.

The scrap value of wastage is Rs. 1 per kg. The output of each process transferred to next process and finally to warehouse are as under:

Process P = 9,000 kg Process Q = 8,200 kg Process R = 7,300 kg

The company fixes selling price of the end product in such a way so as to yield a profit of 25% selling price.

Prepare Process P, Q and R accounts. Also calculate selling price per unit of end product.

(PYP May '18)

Answer 23

Process- P Account

Particulars	Kg.	Amount (Rs.)	Particulars	Kg.	Amount (Rs.)
To Input	10,000	50,000	By Normal wastage (1,000 kg. × Rs. 1)	1,000	1,000
To Direct Material	—	38,000	By Process- Q (9,000 kg. × Rs. 15.50)	9,000	1,39,500
To Direct Labour	—	30,000			
To Production OH (Rs. 90,000 × 3/12)	—	22,500			

	10,000	1,40,500		10,000	1,40,500

Cost per unit = $\frac{\text{Rs.1,40,500} - \text{Rs.1,000}}{\text{10,000 kg.} - \text{1,000 kg.}}$ = Rs. 15.50

Process- Q Account

Particulars	Kg.	Amount (Rs.)	Particulars	Kg.	Amount (Rs.)
To Process-P A/c	9,000	1,39,500	By Normal wastage (900 kg. × Rs. 1)	900	900
To Direct Material	—	42,500	By Process- Q (8,200kg. ×Rs.31)	8,200	2,54,200
To Direct Labour	—	40,000			
To Production OH (Rs.90,000 × 4/12)	—	30,000			
To Abnormal Gain	100	3,100			
(100 kg. × Rs. 31)					
	9,100	2,55,100		9,100	2,55,100

Cost per unit = $\frac{\text{Rs.2,52,000} - \text{Rs.900}}{\text{9,000 kg.} - \text{900 kg.}}$ = Rs.31

Process- R Account

Particulars	Kg.	Amount (Rs.)	Particulars	Kg.	Amount (Rs.)
To Process-Q A/c	8,200	2,54,200	By Normal wastage (820 kg. × Re.1)	820	820
To Direct Material	—	42,880	By Abnormal loss (80 kg. × Rs. 52)	80	4,160
To Direct Labour	—	50,000	By Finished Goods (7,300 kg. × Rs. 52)	7,300	3,79,600
To Production OH (Rs. 90,000 × 5/12)	—	37,500			
	8,200	3,84,580		8,200	3,84,580

Cost per unit = $\frac{\text{Rs.3,84,580} - \text{Rs.820}}{\text{8,200 kg.} - \text{820 kg.}}$ = Rs. 52

Calculation of selling price per unit of end product:

Cost per unit	Rs. 52.00
Add: Profit 25% on selling price i.e. 1/3rd of cost	Rs. 17.33 Selling price per unit
	Rs. 69.33

Question 24

MNO Ltd has provided following details:

- **Opening work in progress is 10,000 units at Rs. 50,000 (Material 100%, Labour and overheads 70% complete).**
- **Input of materials is 55,000 units at Rs. 2, 20,000. Amount spent on Labour and Overheads is Rs. 26,500 and Rs. 61,500 respectively.**
- **9,500 units were scrapped; degree of completion for material 100% and for labour & overheads 60%.**
- **Closing work in progress is 12,000 units; degree of completion for material 100% and for labour & overheads 90%.**
- **Finished units transferred to next process are 43,500 units.**

Normal loss is 5% of total input including opening work in progress. Scrapped units would fetch Rs. 8.50 per unit.

You are required to prepare using FIFO method:

(i) Statement of Equivalent production

(ii) Abnormal Loss Account

(PYP Jan 21)

Answer 24

(i) Statement of Equivalent Production (Using FIFO method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units

Opening WIP	10,000	Completed and transferred to Process-II					
Units introduced	55,000	- From opening WIP	10,000	-		30	3,000
		- From fresh inputs	33,500	100	33,500	100	33,500
			43,500		33,500		36,500
		Normal Loss {5% (10,000 + 55,000 units)}	3,250	-			-
		Abnormal loss (9,500 – 3,250)	6,250	100	6,250	60	3,750
		Closing WIP	12,000	100	12,000	90	10,800
	65,000		**65,000**		**51,750**		**51,050**

Abnormal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process-I A/c (Refer Working Note-2)	6,250	29,698	By Cost Ledger Control A/c (6,250 units × Rs. 8.5)	6,250	53,125

To Costing Profit & Loss A/c	-	23,427			
	6,250	**53,125**		**6,250**	**53,125**

Working Notes:

1. Computation of Cost per unit

Particulars	**Materials (Rs.)**	**Labour (Rs.)**	**Overhead (Rs.)**
Input costs	2,20,000	26,500	61,500
Less: Realizable value of normal	(27,625)	--	--
scrap (3,250 units x Rs. 8.5)			
Net cost	1,92,375	26,500	61,500
Equivalent Units	51,750	51,050	51,050
Cost Per Unit	3.7174	0.5191	1.2047

Total cost per unit = Rs. (3.7174 + 0.5191 + 1.2047) = Rs. 5.4412

2. Valuation of Abnormal Loss

	(Rs.)
Materials (6,250 units × Rs. 3.7174)	23,233.75

Labour (3,750 units × Rs. 0.5191)	1,946.63
Overheads (3,750 units × Rs. 1.2047)	4,517.62
	29,698

Question 25

A product passes through Process-I and Process-II. Particulars pertaining to the Process-I are:

Materials issued to Process-I amounted to Rs. 80,000, Wages Rs. 60,000 and manufacturing overheads were Rs. 52,500. Normal Loss anticipated was 5% of input, 9,650 units of output were produced and transferred out from Process-I to Process-II. Input raw materials issued to Process-I were 10,000 units.

There were no opening stocks.

Scrap has realizable value of Rs. 5 per unit. You are required to prepare:

(i) Process-I Account

(ii) Abnormal Gain/Loss Account

(PYP Dec '21)

Answer 25

(i) Process - I Account

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Materials	10,000	80,000	By Normal loss	500	2,500

			(5%of 10,000)		
To Wages	-	60,000	By Process-II A/c (Rs.20*×9,650units)	9,650	1,93,000
To Manufacturing OH		52,500			
To Abnormal Gain A/c (Rs.20*×150units)	150	3,000			
	10,150	1,95,500		10,150	1,95,500

$= \frac{(80,000+60,000+52,000)-2,500}{10,000-500} = 20$

(ii) Abnormal Gain – Account

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Normal loss A/c	150	750	By Process-I A/c	150	3,000
To Costing P&L A/c	-	2,250			
	150	3,000		150	3,000

Important Note:-

This Numerical question was based on the basic concept of Process Costing. A few examinees made mistake in the calculation of abnormal gain amounts. Overall performance of the examinees was good.

Question 26

STG Limited is a manufacturer of Chemical 'GK', which is required for industrial use. The complete production operation requires two processes. The raw material first passes through Process I, where Chemical 'G' is produced. Following data is furnished for the month April 2022:

Particulars	(In kgs.)
Opening work-in-progress quantity (Material 100% and conversion 50% complete)	9,500
Material input quantity	1,05,000
Work Completed quantity	83,000
Closing work-in-progress quantity (Material 100% and conversion 60% complete)	16,500

You are further provided that:

Particulars	(In Rs.)
Opening work-in-progress cost Material cost	29,500
Processing cost	14,750
Material input cost	3,34,500
Processing cost	2,53,100

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Normal process loss may be estimated to be 10% of material input. It has no realizable value. Any loss over and above normal loss is considered to be 100% complete in material and processing.

The Company transfers 60,000 kgs. of output (Chemical G) from Process I to Process II for producing Chemical 'GK'. Further materials are added in Process II which yield 1.20 kg. Of Chemical 'GK' for every kg. Of Chemical 'G' introduced. The chemicals transferred to Process II for further processing are then sold as Chemical 'GK' for Rs. 10 per kg. Any quantity of output completed in Process I, are sold as Chemical 'G' @ Rs. 9 per kg.

The monthly costs incurred in Process II (other than the cost of Chemical 'G') are: Input 60,000 kg. of Chemical 'G'

Materials Cost Rs. 85,000

Processing Costs Rs. 50,000 You are required:

(i) Prepare and determine the cost per kg. of Chemical 'G' in Process I using the weighted average cost method.

(ii) Prepare a statement showing cost of chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in progress.

(iii) STG is considering the option to sell 60,000 kg. of Chemical 'G' of Process I without processing it further in Process-II. Will it be beneficial for the company over the current pattern of processing 60,000 kg in process-II?

(Note: You are not required to prepare Process Accounts)

(PYP May'22)

Answer 26

Statement of Equivalent Production

Particulars	Input quantity	Particulars	Total	Material		Processing Cost	
				%	Units	%	Units
Opening WIP	9,500	Units completed	83,000	100%	83,000	100%	83,000
Material Input	1,05,000	Normal loss (10% of 1,05,000)	10,500	-	-	-	-
		Abnormal loss (Bal. fig.)	4,500	100%	4,500	100%	4,500
		Closing WIP	16,500	100%	16,500	60%	9,900
	1,14,500		1,14,500		1,04,000		97,400

Statement of Cost for each element

Particulars	Material	Processing	Total cost
	(Rs.)	(Rs.)	(Rs.)
Cost of opening WIP	29,500	14,750	44,250
Cost incurred during the month	3,34,500	2,53,100	5,87,600
Total cost (A)	3,64,000	2,67,850	6,31,850
Equivalent production (B)	1,04,000	97,400	

Cost per kg of Chemical 'G' (A/B)	3.5	2.75	6.25

Alternative Presentation

Statement showing cost per kg of each statement

	(Rs.)	(Rs.)
Material	$=\frac{29,500+\ 3,34,000}{1,04,000}$	3.5
Processing cost	$=\frac{14,750+\ 2,53,100}{1,04,000}$	2.75
Total Cost per kg		6.25

(ii) Statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in- progress

	(Rs.)
Units transferred (60,000 × 6.25)	3,75,000
Abnormal loss (4,500 × 6.25)	28,125
Closing work in progress:	
Material (16,500 × 3.5)	57,750
Processing cost (9,900 × 2.75)	27,225
	84,975

(iii) Calculation of Incremental Profit / Loss after further processing

Particulars	(Rs.)	(Rs.)
Sales if further processed (A) (60,000 x 1.20 x Rs. 10)	7,20,000	
Calculation of cost in Process II		
Chemical transferred from Process I	3,75,000	
Add: Material cost	85,000	
Add: Process cost	50,000	
Total cost of finished stock (B)	5,10,000	
Profit, if further processed (C = A – B)		2,10,000
If sold without further processing then,		
Sales (60,000 x Rs. 9)	5,40,000	
Less: Cost of input without further processing	3,75,000	
Profit without further processing (D)		1,65,000
Incremental Profit after further processing (C – D)		45,000
Additional net profit on further processing in Process II is 45,000. Therefore, it is advisable to process further chemical 'G'.		

Alternative Presentation

Calculation of Incremental Profit / Loss after further processing

	(Rs.)
If 60,000 units are sold @ Rs. 9	5,40,000
If 60,000 units are processed in process II (60,000 × 1.2 × Rs. 10)	7,20,000
Incremental Revenue (A)	1,80,000
Incremental Cost: (B)	
Material Cost	85,000
Processing Cost	50,000
	1,35,000
Incremental Profit (A-B)	45,000

Additional net profit on further processing in Process II is 45,000. Therefore, it is advisable to process further chemical 'G'.

Question 27

N Ltd. produces a product which passes through two processes – Process – I and Process-II. The company has provided following information related to the Financial Year 2021-22:

	Process-I	Process -II
Raw Material @Rs. 65 per unit	**6,500 units**	**-**

Direct Wages	**Rs. 1,40,000**	**Rs. 1,30,000**
Direct Expenses	**30% of Direct Wages**	**35% of Direct Wages**
Manufacturing Overheads	**Rs. 21,500**	**Rs. 24,500**
Realisable value of scrap per unit	**Rs. 4.00**	**Rs. 16.00**
Normal Loss	**250 units**	**500 units**
Units transferred to Process-II / finished stock	**6,000 units**	**5,500 units**
Sales	**-**	**5,000 units**

There was no opening or closing stock of work-in progress. You are required to prepare:

(i) Process-I Account

(ii) Process -II Account

(iii) Finished Stock Account

(PYP Nov 22)

Answer 27

Process-I A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Raw material used (Rs. 65 × 6,500 units)	6,500	4,22,500	By Normal loss (250 units × Rs. 4)	250	1,000

To Direct wages	--	1,40,000	By Process- II A/c (Rs. 100 × 6,000 units)	6,000	6,00,000
To Direct expenses (30% of Rs. 1,40,000)	--	42,000	By Abnormal loss (Rs. 100 × 250 units)	250	25,000
To Manufacturing overhead		21,500			
	6,500	6,26,000		6,500	6,26,000

Cost per unit of completed units and abnormal loss: $\frac{\text{Total Cost} - \text{Realisable Value from Normal Loss}}{\text{Input Units} - \text{Normal Loss Units}}$

$= \frac{\text{Rs.6,26,000} - \text{Rs.1,000}}{\text{6500 units} - \text{250 units}} = \frac{\text{Rs.6,25,000}}{\text{6,250 Units}}$ = Rs. 100

Process- II A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process - I A/c	6,000	6,00,000	By Normal loss (500 units × Rs.16)	500	8,000
To Direct wages	--	1,30,000	By Finished Stock A/c (Rs.144 × 5,500 units)	5,500	7,92,000
To Direct expenses (35% of Rs. 1,30,000)	--	45,500			

To Manufacturing overhead	--	24,500			
	6,000	8,00,000		6,000	8,00,000

Cost per unit of completed units and abnormal loss: $\frac{\text{Total Cost} - \text{Realisable Value from Normal Loss}}{\text{Input Units} - \text{Normal Loss Units}}$

$= \frac{\text{Rs.8,00,000} - \text{Rs.8,000}}{\text{6,000 units} - \text{500 units}} = \frac{\text{Rs.7,92,000}}{\text{5,500 Units}}$ = Rs. 144

Finished Goods Stock A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process II A/c	5,500	7,92,000	By Cost of Sales (Rs.144 × 5,000 units)	5,000	7,20,000
			By Balance c/d	500	72,000
	5,500	7,92,000		5,500	7,92,000

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Question 28

How will you treat normal loss, abnormal loss and abnormal gain in process costing? Explain.

(PYP May '23)

Answer 28

Treatment of normal loss, abnormal loss and abnormal gain in process costing

Treatment of Normal loss in Cost Accounts: The cost of normal process loss in practice is absorbed by good units produced under the process. The amount realised by the sale of normal process loss units should be credited to the process account.

Treatment of Abnormal loss in Cost Accounts: The cost of an abnormal process loss unit is equal to the cost of a good unit. The total cost of abnormal process loss is credited to the process account from which it arises. Cost of abnormal process loss is not treated as a part of the cost of the product. In fact, the total cost of abnormal process loss is debited to costing profit and loss account.

The process account under which abnormal gain arises is debited with the abnormal gain and credited to abnormal gain account which will be closed by transferring to the Costing Profit and Loss account. The cost of abnormal gain is computed on the basis of normal production.

Theoretical Questions

Question 29

EXPLAIN briefly the procedure for the valuation of Work-in-Process.

(Study Material)

Answer 29

VALUATION OF WORK-IN-PROCESS

In the case of process type of industries, it is possible to determine the average cost per unit by dividing the total cost incurred during a given period of time by the total number of units produced during the same period. But this is hardly the case in most of the process type industries where manufacturing is a continuous activity. The reason is that the cost incurred in such industries represents the cost of work carried on opening work-in-process, closing work-in-process and completed units. Thus to ascertain the cost of each completed unit, it is necessary to ascertain the cost of work-in-process in the beginning and at the end of the process.

The valuation of work-in-process presents a good deal of difficulty because it has units under different stages of completion from those in which work has just begun to those which are only a step short of completion. Work-in-process can be valued on actual basis, i.e., materials used on the unfinished units and the actual amount of labour expenses involved. However, the degree of accuracy in such a case cannot be satisfactory. An alternative method is based on converting partly finished units into equivalent finished units.

Question 30

EXPLAIN equivalent units.

(Study Material)

Answer 30

Equivalent units or equivalent production units, means converting the incomplete production units into their equivalent completed units. Under each process, an estimate is made of the percentage completion of work-in-process with regard to different elements of costs, viz., material, labour and overheads. It is important that the estimate of percentage of completion should be as accurate as possible. The formula for computing equivalent completed units is:

Equivalent completed units = (Actual number of units in the process of manufacture) x (Percentage of Work completed)

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Question 31

"Operation costing is defined as refinement of Process costing." EXPLAIN it.

(Study Material)

Answer 31

OPERATION COSTING

This product costing system is used when an entity produces more than one variant of final product using different materials but with similar conversion activities. Which means conversion activities are similar for all the product variants but materials differ significantly. Operation Costing method is also known as Hybrid product costing system as materials costs are accumulated by job order or batch wise but conversion costs i.e. labour and overheads costs are accumulated by department, and process costing methods are used to assign these costs to products. Moreover, under operation costing, conversion costs are applied to products using a predetermined application rate. This predetermined rate is based on budgeted conversion costs.

For example, a company is manufacturing two grades of products, Product- Deluxe and Product- Regular. Both the products pass through a similar production process but require different quality and quantities of raw materials. The cost of raw material is accumulated on the basis of job or batches or units of two variants of products. But the costs for the conversion activities need not to be identified with the product variants as both the Products requires similar activities for conversion. Hence, conversion activity costs are accumulated on the basis of departments or processes only. Example of industries are ready made garments, Shoe making, jewelry etc.

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Practical Problems

Question 32

An English willow company who manufactures cricket bat buys wood as its direct material. The Forming department processes the cricket bats and the cricket bats are then transferred to the Finishing department where stickers are applied. The Forming department began manufacturing 10,000 initial bats during the month of December for the first time and their cost is as follows:

Direct material: Rs. 33,000

Conversion costs: Rs. 17,000

Total Rs. 50,000

A total of 8,000 cricket bats were completed and transferred to the Finishing department, the rest 2,000 were still in the Forming process at the end of the month. All of the forming department's direct material were placed, but, on average, only 25% of the conversion costs was applied to the ending work in progress inventory.

CALCULATE:

(i) Equivalent units of production for each cost.

(ii) The Conversion cost per Equivalent units.

(iii) Cost of closing work in process (WIP) and finished products.

(Study Material)

Answer 32

(i) Calculation of equivalent units of production:

Input Details	**Units**	**Output Particulars**	**Units**	**Equivalent Units**			
				Material		**Conversion cost**	
				%	**Units**	**%**	**Units**
Unit Introduced	10,000	Finished output	8,000	100	8,000	100	8,000
		Closing W-I-P	2,000	100	2,000	25	500

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Total	10,000	Total	10,000		10,000		8,500

(ii) Calculation of cost per equivalent unit

	Direct Material	Conversion costs
Total cost (Rs.)	33,000	17,000
Equivalent units	10,000	8,500
Cost per equivalent unit (Rs.)	3.30	2.00

(iii) The cost of closing work in process (WIP):

COSTS	EQUIVALENT UNITS	RATE (Rs.)	TOTAL COST (Rs.)
Direct Material	2,000	3.30	6,600
Conversion Costs	500	2.00	1,000
Total		7,600	

The cost of finished products:

COSTS	EQUIVALENT UNITS	RATE (Rs.)	TOTAL COST (Rs.)
Direct Material	8,000	3.30	26,400
Conversion Costs	8,000	2.00	16,000
Total			42,400

Question 33

Hill manufacturing Ltd uses process costing to manufacture Water density sensors for hydro sector. The following information pertains to operations for the month of May.

Particulars	Units
Beginning WIP, May 1	16,000
Started in production during May	1,00,000
Completed production during May	92,000
Ending work in progress, May 31	24,000

The beginning work in progress was 60% complete for materials and 20% complete for conversion costs. The ending inventory was 90% complete for material and 40% complete for conversion costs.

Costs pertaining to the month of May are as follows:

Beginning inventory costs are material Rs.27, 670, direct labour Rs.30, 120 and factory overhead Rs.12, 720.

Cost incurred during May are material used, Rs.4, 79,000, direct labour Rs.1, 82,880, factory overheads Rs.3, 91,160.

CALCULATE:

(i) Using the FIFO method, the equivalent units of production for material.

(ii) Cost per equivalent unit for conversion cost.

(Study Material)

Answer 33

(i) Calculation of equivalent units of production:

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Beginning WIP	16,000	Completed Output: From beginning WIP	16,000	40	6,400	80	12,800
Unit Introduced	1,00,000	Completed output: From unit introduced	76,000	100	76,000	100	76,000
		Closing W-I-P	24,000	90	21,600	40	9,600
Total	1,16,000	Total	1,16,000		1,04,000		98,400

(ii) Calculation of cost per equivalent unit for conversion costs

Particulars	Amount (Rs.)
Direct Labour	1,82,880
Factory Overheads	3,91,160

	5,74,040
Equivalent Units	98,400
Cost Per Equivalent Unit (Rs.)	5.83

Question 34

Following information is available regarding Process-I for the month of February:

Production Record:	
Units in process as on 1st February (All materials used, 25% complete for labour and overhead)	**4,000**
New units introduced	**16,000**
Units completed	**14,000**
Units in process as on 28th February (All materials used, 33-1/3% complete for labour and overhead)	**6,000**
Cost Records:	
Work-in-process as on 1st February	**(Rs.)**
Materials	**6,000**
Labour	**1,000**

Overhead	**1,000**
	8,000
Cost during the month:	
Materials	**25,600**
Labour	**15,000**
Overhead	**15,000**
	55,600

Presuming that average method of inventory is used, PREPARE:

(i) Statement of equivalent production.

(ii) Statement showing cost for each element.

(iii) Statement of apportionment of cost.

(iv) Process cost account for Process-I.

(Study Material)

Answer 34

(i) Statement of equivalent production (Average cost method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production	
				Material	Labour & O.H.

				%	Units	%	Units
Opening WIP	4,000	Completed and transferred	14,000	100	14,000	100	14,000
Units introduced	16,000	Closing WIP	6,000	100	6,000	33-1/3	2,000
	20,000		20,000		20,000		16,000

(ii) Statement showing cost for each element

Particulars	Materials (Rs.)	Labour (Rs.)	Overhead (Rs.)	Total (Rs.)
Cost of opening work-in-process	6,000	1,000	1,000	8,000
Cost incurred during the month	25,600	15,000	15,000	55,600
Total cost: (A)	31,600	16,000	16,000	63,600
Equivalent units: (B)		20,000	16,000	16,000
Cost per equivalent unit: (C) = (A ÷ B)	1.58	1	1	3.58

(iii) Statement of apportionment of cost

	Amount (Rs.)	Amount (Rs.)

1. Value of units completed and transferred (14,000 units × Rs. 3.58)		50,120
2. Value of Closing W-I-P:		
- Materials (6,000 units × Rs. 1.58)	9,480	
- Labour (2,000 units × Rs. 1)	2,000	
- Overheads (2,000 units × Rs. 1)	2,000	13,480

(iv) Process-I Cost Account

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Opening W-I-P	4,000	8,000	By Completed units	14,000	50,120
To Materials	16,000	25,600	By Closing W-I-P	6,000	13,480
To Labour	--	15,000			
To Overhead	--	15,000			
	20,000	63,600		20,000	63,600

Question 35

A company produces a component, which passes through two processes. During the month of April, materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100%

complete as to materials cost and 50% complete as to labour and overheads cost. The Process I costs incurred were as follows:

Direct material	**Rs.15000**
Direct wages	**Rs.18000**
Factory overheads	**Rs.12000**

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

No further process material costs occur after introduction at the first process until the end of the second process, when protective packing is applied to the completed components. The process and packing costs incurred at the end of the Process II were:

Packing materials	**Rs.4000**
Direct wages	**Rs.3500**
Factory overheads	**Rs.4500**

Required:

(i) PREPARE Statement of Equivalent Production, Cost per unit and Process-I A/c.

(ii) PREPARE Statement of Equivalent Production, Cost per unit and Process-II A/c.

(Study Material)

Answer 35

(i) Process I – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Equivalent Production units
		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	30,000	10,000	100%	10,000	40,000
Wages	30,000	10,000	50%	5,000	35,000
Overhead	30,000	10,000	50%	5,000	35,000

Process- I

Particulars	Process Cost (Rs.)	Equivalent Production (units)	Process Cost p.u. (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (Rs.) (4) x (5)	Transfer to Process II (2)-(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	15,000	40,000	0.375	10,000	3,750	11,250
Wages	18,000	35,000	0.514	5,000	2,570	15,430
Overhead	12,000	35,000	0.343	5,000	1,715	10,285

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	45,000				8,035	36,965

Process- I A/c

Particulars	Unit	(Rs.)	Particulars	Units	(Rs.)
To Direct material	40,000	15,000	By Process II A/c	30,000	36,965
To Direct wages	--	18,000	By Closing W-I-P	10,000	8,035
To Factory overhead	--	12,000		--	--
	40,000	45,000		40,000	45,000

(ii) Process II – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Equivalent Production units
		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	28,000	1,800	100%	1,800	29,800
Wages	28,000	1,800	25%	450	28,450
Overhead	28,000	1,800	25%	450	28,450

Process II

Particulars	Process Cost (Rs.)	Equivalent Production (units)	Process Cost p.u. (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (Rs.) (4) x (5)	Transfer to Finished Stock (2)-(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	36,965	29,800	1.240	1,800	2,232	34,733
Wages	3,500	28,450	0.123	450	55	3,445
Overhead	4,500	28,450	0.158	450	71	4,429
	44,965				2,358	42,607
Add: Packing Material Cost						4,000
Cost of Finished Stock						46,607

Process II A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process I	30,000	36,965	By Finished Stock	28,000	46,607
To Direct wages	--	3,500	By Normal loss	200	--
To Factory overhead	--	4,500	By WIP stock	1,800	2,358
To Packing charges	--	4,000			

	30,000	48,965		30,000	48,965

Question 36

'Healthy Sweets' is engaged in the manufacturing of jaggery. Its process involve sugarcane crushing for juice extraction, then filtration and boiling of juice along with some chemicals and then letting it cool to cut solidified jiggery blocks.

The main process of juice extraction (Process – I) is done in conventional crusher, which is then filtered and boiled (Process – II) in iron pots. The solidified jaggery blocks are then cut, packed and dispatched. For manufacturing 10 kg of jaggery, 100 kg of sugarcane is required, which extracts only 45 litre of juice.

Following information regarding Process – I has been obtained from the manufacturing department of Healthy Sweets for the month of January:

	(Rs.)
Opening work-in process (4,500 litre)	
Sugarcane	**50,000**
Labour	**15,000**
Overheads	**45,000**
Sugarcane introduced for juice extraction (1,00,000 kg)	**5,00,000**
Direct Labour	**2,00,000**
Overheads	**6,00,000**

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Abnormal Loss: 1,000 kg	
Degree of completion:	
Sugarcane	**100%**
Labour and overheads	**80%**
Closing work-in process: 9,000 litre	
Degree of completion:	
Sugarcane	**100%**
Labour and overheads	**80%**

Extracted juice transferred for filtering and boiling: 39,500 litre

(Consider mass of 1 litre of juice equivalent to 1 kg)

You are required to PREPARE using average method:

(i) Statement of equivalent production,

(ii) Statement of cost,

(iii) Statement of distribution cost, and

(iv) Process-I Account.

(Study Material)

Answer 36

(i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Sugarcane		Labour & O.H.	
				%	Units	%	Units
Opening WIP	4,500	Completed and transferred to Process - II	39,500	100	39,500	100	39,500
Units introduced	1,00,000	Normal Loss (55%* of 1,00,000)	55,000	--	--	--	--
		Abnormal loss	1,000	100	1,000	80	800
		Closing WIP	9,000	100	9,000	80	7,200
	1,04,500		1,04,500		49,500		47,500

* 100 kg of sugarcane extracts only 45 litre of juice.

Thus, normal loss = 100 – 45 = 55%

(ii) Statement showing cost for each element

Particulars	Sugarcane (Rs.)	Labour (Rs.)	Overhead (Rs.)	Total (Rs.)
Cost of opening work-in-process	50,000	15,000	45,000	1,10,000
Cost incurred during the month	5,00,000	2,00,000	6,00,000	13,00,000

Total cost: (A)	5,50,000	2,15,000	6,45,000	14,10,000
Equivalent units: (B)	49,500	47,500	47,500	
Cost per equivalent unit:(C) =(A ÷ B)	11.111	4.526	13.579	29.216

(iii) Statement of Distribution of cost

	Amount (Rs.)	**Amount (Rs.)**
1. Value of units completed and transferred (39,500 units × Rs.29.216)		11,54,032
2. Value of Abnormal Loss:		
- Sugarcane (1,000 units × Rs. 11.111)	11,111	
- Labour (800 units × × Rs. 4.526)	3,621	
- Overheads (800 units × × Rs. 13.579)	10,863	25,595
3. Value of Closing W-I-P:		
- Sugarcane (9,000 units × × Rs. 11.111)	99,999	
- Labour (7,200 units × × Rs. 4.526)	32,587	
- Overheads (7,200 units × × Rs. 13.579)	97,769	2,30,355

(iv) Process-I A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Opening W.I.P:			By Normal Loss	55,000	--
- Sugarcane	4,500	50,000	By Abnormal loss [Rs. 25,595 + Rs. 18 (difference due to approximation)]	1,000	25,613
- Labour	--	15,000	By Process-II A/c	39,500	11,54,032
- Overheads	--	45,000	By Closing WIP	9,000	2,30,355
To Sugarcane introduced	100,000	5,00,000			
To Direct Labour		2,00,000			
To Overheads		6,00,000			
	104,500	14,10,000		104,500	14,10,000

Question 37

Hawtt Veel is a renowned brand of HV Ltd. which manufactures toy car. The manufacturing process of the toy cars at first involve designing the parts, creating the mold and then simultaneously melting the plastic. As the mold created last year is being used as it is for the current year, the first process involves only melting the plastic (Process I). The next process is about injecting the plastic into the mold and assembling the parts formed (Process II).

During the month of April, the materials for 1,20,000 toy cars were put through Process I of which melting process were completed for 90,000 toy cars only before transferring to Process II.

The costs incurred in Process I are as follows:

Direct material Rs. 22, 50,000

Direct wages Rs. 27, 00,000

Factory overheads Rs. 18, 00,000

Degree of completion for those not transferred to Process II is as follows:

Materials 100%

Labour and overheads 50%

Out of those transferred to Process II for injecting and assembling, 84,000 units of toy car were completed and transferred to finished goods store for protective packing. The process of protective packing is done at the end of the Process II and the costs incurred are as follows:

Packing materials Rs. 6, 00,000

Direct wages Rs. 5, 25,000

Factory overheads Rs. 6, 75,000

There was a normal loss of 600 units in Process II with no salvage value.

Some units were still in progress under Process II and thus, shifted for the next month process. The degree of completion for those not transferred to finished goods store is as follows:

Materials 100%

Labour and overheads 25%

You are required to PREPARE-

(i) Statement of Equivalent Production, Cost per unit and Process I A/c.

(ii) Statement of Equivalent Production, Cost per unit and Process II A/c.

(MTP Jan 2025)

Answer 37

(i) Process I – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Equivalent Production units
		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	90,000	30,000	100%	30,000	1,20,000
Wages	90,000	30,000	50%	15,000	1,05,000
Overhead	90,000	30,000	50%	15,000	1,05,000

Process I

Particulars	Process Cost (Rs.)	Equivalent Production (units)	Process Cost p.u. (Rs.) (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (Rs.) (4)x (5)	Transfer to Process II (Rs.) (2)-(6)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	22,50,000	1,20,000	18.750	30,000	5,62,500	16,87,500
Wages	27,00,000	1,05,000	25.714	15,000	3,85,714	23,14,286
Overhead	18,00,000	1,05,000	17.143	15,000	2,57,143	15,42,857
67,50,000					12,05,357	55,44,643

Process I A/c

Particulars	Unit	(Rs.)	Particulars	Units	(Rs.)
To Direct material	1,20,000	22,50,000	By Process II A/c	90,000	55,44,643
To Direct wages	--	27,00,000	By Closing W-I-P	30,000	12,05,357
To Factory overhead	--	18,00,000			
	1,20,000	67,50,000		1,20,000	67,50,000

(ii) Process II – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP	Equivalent Production units

		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	84,000	5,400*	100%	5,400	89,400
Wages	84,000	5,400	25%	1,350	85,350
Overhead	84,000	5,400	25%	1,350	85,350

*(90,000 - 84,000 - 600) units = 5,400 units

Process II

Particulars	Process Cost (Rs.)	Equivalent Production (units)	Process Cost p.u. (Rs.) (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (Rs.) (4) x (5)	Transfer to Finished Stock (Rs.) (2)-(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	55,44,643	89,400	62.021	5,400	3,34,911	52,09,732
Wages	5,25,000	85,350	6.151	1,350	8,304	5,16,696
Overhead	6,75,000	85,350	7.909	1,350	10,677	6,64,323
	67,44,643				3,53,892	63,90,751
Add: Packing Material Cost						6,00,000

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Cost of Finished Stock	69,90,751

Process II A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process I	90,000	55,44,643	By Finished Stock	84,000	69,90,751
To Direct wages	--	5,25,000	By Normal loss	600	--
To Factory overhead	--	6,75,000	By WIP stock	5,400	3,53,892
To Packing charges	--	6,00,000			
	90,000	73,44,643		90,000	73,44,643

Question 38

The following are the details in respect of Process A and Process B of a processing factory:

	Process A (Rs.)	Process B (Rs.)
Materials	**40,000**	**--**
Labour	**40,000**	**56,000**
Overheads	**16,000**	**40,000**

The output of Process A is transferred to Process B at a price calculated to give a profit of 20% on the transfer price and the output of Process B is charged to finished stock at a profit of 25% on the transfer price. The finished stock department realized Rs. 4, 00,000 for the finished goods received from Process B.

You are asked to SHOW process accounts and total profit, assuming that there was no opening or closing work-in-progress.

(MTP Jan 2025)

Answer 38

Dr. Process A Account Cr.

	(Rs.)		(Rs.)
To Materials	40,000	By Transfer to Process B A/c	1,20,000
To Labour	40,000		
To Overheads	16,000		
	96,000		
To Profit (20% of transfer price, i.e., 25% of cost)	24,000		
	1,20,000		1,20,000

Dr. Process B Account Cr.

	(Rs.)		(Rs.)

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To Transferred from Process A A/c	1,20,000	By Transfer to Finished Stock A/c	2,88,000
To Labour	56,000		
To Overheads	40,000		
	2,16,000		
To Profit (20% of transfer price, i.e., 25% of cost)	72,000		
	2,88,000		2,88,000

Statement of Total Profit

	(Rs.)
Profit from Process A	24,000
Profit from Process B	72,000
Profit on Sales (Rs. 4,00,000 – Rs. 2,88,000)	1,12,000
Total Profit	2,08,000

Question 39

PR Ltd., a leading chemical company specializing in the production of specialty chemicals and industrial products, manufactures Product X through two distinct processes – Process-I and Process-II. Known for its innovation in chemical manufacturing, the company uses

advanced technologies and industry best practices to ensure high-quality production. The following information is provided from the books of account for the year:

Particulars	Process- I	Process- II
Raw materials used	1,50,000 units	--
Raw materials cost per unit	Rs. 400	--
Actual Output	1,38,000 units	96,000 units
Output transferred to next process	3/4th	--
Output sold	1/4th	96,000 units
Normal loss (on inputs)	6%	10%
Direct wages	Rs. 39,00,000	Rs. 58,50,000
Direct Expenses	20% of Direct wages	15% of Direct wages
Manufacturing overheads	Rs. 2,25,00,000 to be recovered as a percentage of direct wages	
Realisable value of scrap per unit	Rs. 25	Rs. 40
Selling price per unit of output	Rs. 650	Rs. 9

Management & Selling expenses of Rs.1, 27, 50,000 are directly attributable to the Costing Profit & Loss Account.

You are required to PREPARE the following:

(i) Process-I Account

(ii) Process-II Account

(iii) Abnormal Loss

(iv) Abnormal Gain Account

(v) Costing Profit & Loss Account

(MTP May 2025)

Answer 39

Process- I A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Raw material used (Rs. 400 × 1,50,000 units)	1,50,000	6,00,00,000	By Normal loss (6% of 1,50,000 units) × Rs. 25	9,000	2,25,000
To Direct wages	--	39,00,000	By Process- II A/c (Rs. 520.96 × 1,03,500 units)	1,03,500	5,39,19,360
To Direct expenses (20% of Direct wages)	--	7,80,000	By Abnormal loss (Rs. 520.96 × 3,000 units)	3,000	15,62,880
To Manufacturing overhead [Rs. 2,25,00,000 × (390/975)]	--	90,00,000	By Costing Profit and Loss (P&L)	34,500	1,79,72,760

	1,50,000	7,36,80,000		1,50,000	7,36,80,000

Cost per unit:

$$=\left(\frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal Loss units}}\right)$$

$$=\left(\frac{\text{Rs.7,36,80,000} - \text{Rs.2,25,000}}{\text{1,50,000 units} - \text{9,000 units}}\right) = \text{Rs. 520.96 per unit}$$

Process- II A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process- I A/c	1,03,500	5,39,19,360	By Normal loss (10% of 1,03,500 units) × Rs. 40	10,350	4,14,000
To Direct wages	--	58,50,000	By Costing P & L A/c	96,000	7,59,88,778
To Direct expenses (15% of Direct wages)	--	8,77,500			
To Manufacturing overhead [Rs. 2,25,00,000 × (585/975)]	--	1,35,00,000			
To Abnormal gain (Rs. 791.55 × 2,850 units)	2,850	22,55,918			

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	1,06,350	7,64,02,778		1,06,350	7,64,02,778

Cost per unit:

$$=\left(\frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal Loss units}}\right)$$

$$=\left(\frac{\text{Rs.7,41,46,860} - \text{Rs.4,14,000}}{\text{1,03,500 units} - \text{10,350 units}}\right) = \text{Rs. 791.55 per unit}$$

Abnormal Loss A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Process- I A/c	3,000	15,62,880	By Bank	3,000	75,000
			By Costing P & L A/c		14,87,880
	3,000	15,62,880		3,000	15,62,880

Abnormal Gain A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Normal Loss	2,850	1,14,000	By Process- II A/c	2,850	22,55,918
To Costing P & L A/c		21,41,918			
	2,850	22,55,918		2,850	22,55,918

Costing Profit & Loss Account

Particulars	(Rs.)	Particulars	(Rs.)

To Cost of sales Process I- 1,79,72,760 Process II- 7,59,88,778	9,39,61,538	By Sales Process I- 34,500 @ 650 Process II- 96,000 @ 950	11,36,25,000
To Abnormal loss	14,87,880	By Abnormal gain	21,41,918
To Selling Expenses	1,27,50,000		
To Net Profit	75,67,500		
	11,57,66,918		11,57,66,918

Question 40

A product passes through two processes. The output of Process-I is treated as the raw material of Process-II. The cost incurred at Process- II is as follows:

Particulars	Process-II (Rs.)
Transferred from Process-I A/c	**27,85,700**
Materials issued	**10,00,000**
Labour	**2,00,000**
Manufacturing overhead	**5,00,000**

The output of each process is as under:

Process	Output	Normal Loss

Process-I	**48,750 units**	**2%**
Process-II	**47,000 units**	**5%**

No stock of materials or of work-in-process was left at the end.

(RTP May 2025)

You are required to CALCULATE the value of Abnormal Gain/Loss in Process-II A/c.

(a) Abnormal Gain of Rs. 66,626

(b) Abnormal Loss of Rs. 66,626

(c) Abnormal Gain of Rs. 72,776

(d) Abnormal Loss of Rs. 72,776

Answer 40

Dr. **Process-II Account** **Cr.**

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process-I A/c	48,750	27,85,700	By Normal Loss A/c (5% of 48,750 units)	2,438	--
” Material	--	10,00,000	” Output (Rs. 96.858 × 47,000 units)	47,000	45,52,326
” Labour	--	2,00,000			

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” Manufacturing OH	--	5,00,000			
” Abnormal Gain A/c (Rs. 96.858 × 688 units)	688	66,626 (round off)			
	49,438	45,52,326		49,438	45,52,326

Cost per unit of completed units and abnormal gain:

$$= \left(\frac{\text{Total Cost}}{\text{Input units} - \text{Normal Loss}}\right)$$

$$= \left(\frac{\text{Rs.}44,85,700}{48,750 \text{ units} - 2,438 \text{ units}}\right) = \text{Rs. } 96.858$$

Question 41

Following data are available for a product for the month of July, 2024:

Particulars	**Process- I (Rs.)**	**Process- II (Rs.)**
Opening work-in- progress	**Nil**	**Nil**
Costs incurred during the month:		
- Direct materials		**6,00,000**
- Labour	**1,20,000**	**1,60,000**
- Factory overheads	**2,40,000**	**2,00,000**

Units of production:		
Received in process	40,000	36,000
Completed and transferred	36,000	32,000
Closing work-in-progress	2,000	?
Normal loss in process	2,000	1,500

Production remaining in process has to be valued as follows:

Materials 100% Labour 50% Overheads 50%

There has been no abnormal loss in Process- II.

The company follows weighted average method for valuing inventory.

PREPARE Process Accounts after working out the missing figures and with detailed workings.

(RTP May 2025)

Answer 41

Statement of Equivalent Units (Process- I)

Input (Units)	Particulars	Output (Units)	Equivalent Production			
			Materials		Labour and Overheads	
			(%)	Units	(%)	Units

40,000	Introduced and completed	36,000	36,000	100	36,000	100
	Normal loss	2,000	-	-	-	-
	Closing stock	2,000	2,000	100	1,000	50
40,000		40,000	38,000		37,000	

Computation of cost per Equivalent Unit for each element of cost (Process- I)

Elements of Cost	Total Cost (Rs.)	Equivalent units	Cost per Equivalent units (Rs.)
Direct Materials	6,00,000	38,000	15.7895
Labour	1,20,000	37,000	3.2432
Factory Overheads	2,40,000	37,000	6.4865

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost per unit (Rs.)	Cost (Rs.)	Total (Rs.)
Units introduced	Materials	36,000	15.7895	5,68,422.00	
	Labour	36,000	3.2432	1,16,755.20	

and completed	Overheads	36,000	6.4865	2,33,514.00	9,18,691.20
Closing stock	Materials	2,000	15.7895	31,579.00	
	Labour	1,000	3.2432	3,243.20	
	Overheads	1,000	6.4865	6,486.50	41,308.70

Process- I Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Materials	40,000	6,00,000	By Normal loss	2,000	-
To Labour		1,20,000	By Process II	36,000	9,18,691
To Overheads		2,40,000	By Closing stock	2,000	41,309
	40,000	9,60,000		40,000	9,60,000

Statement of Equivalent Units (Process- II)

Input (Units)	Particulars	Output (Units)	Equivalent Production			
			Materials		Labour and Overheads	
			Units	(%)	Units	(%)
36,000	Units transferred from Process- I					

	Normal loss	1,500	-	-	-	-
	Completed	32,000	32,000	100	32,000	100
	Closing stock (balancing figure)	2,500	2,500	100	1,250	50
36,000		36,000	34,500		33,250	

Computation of cost per Equivalent Unit for each element of cost (Process- I)

Elements of Cost	Total Cost (Rs.)	Equivalent units	Cost per Equivalent units (Rs.)
Cost of 36,000 units transferred from Process- I	9,18,691	34,500	26.6287
Labour	1,60,000	33,250	4.8120
Factory Overheads	2,00,000	33,250	6.0150

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost per unit (Rs.)	Cost (Rs.)	Total (Rs.)
Units introduced and completed	Materials	32,000	26.6287	8,52,118.40	

	Labour	32,000	4.8120	1,53,984.00	
	Overheads	32,000	6.0150	1,92,480.00	11,98,582.40
Closing stock	Materials	2,500	26.6287	66,571.75	
	Labour	1,250	4.8120	6,015.00	
	Overheads	1,250	6.0150	7,518.75	80,105.50

Process- II Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Units introduced	36,000	9,18,691	By Normal loss	1,500	-
To Labour		1,60,000	By Finished stock	32,000	11,98,582
To Overheads		2,00,000	By Closing stock	2,500	80,109*
	36,000	12,78,691		36,000	12,78,691

*Difference arose due to rounding-off has been adjusted.

Question 42

DISCUSS normal and abnormal Process Loss and ENUMERATE their treatment in Cost Accounts.

(RTP Jan 2025)

Answer 42

There are two types of material losses viz. (i) Normal loss and (ii) Abnormal loss.

(i) Normal Process Loss: It is also known as normal wastage. It is defined as the loss of material which is inherent in the nature of work. Such a loss can be reasonably anticipated from the nature of the material, nature of operation, the experience and technical data. It is unavoidable because of nature of the material or the process. It also includes units withdrawn from the process for test or sampling.

Treatment in Cost Accounts: The cost of normal process loss in practice is absorbed by good units produced under the process. The amount realized by the sale of normal process loss units should be credited to the process account.

(ii) Abnormal Process Loss: It is also known as abnormal wastage. It is defined as the loss in excess of the pre-determined loss (Normal process loss). This type of loss may occur due to the carelessness of workers, a bad plant design or operation, sabotage etc. Such a loss cannot obviously be estimated in advance. But it can be kept under control by taking suitable measures.

Treatment in Cost Accounts: The cost of an abnormal process loss unit is equal to the cost of a good unit. The total cost of abnormal process loss is credited to the process account from which it arises. Cost of abnormal process loss is not treated as a part of the cost of the product. In fact, the total cost of abnormal process loss is debited to costing profit and loss account.

Case Scenarios

Question 43

Arnav Ltd. manufactures chemical solutions used in paint and adhesive products. Chemical solutions are produced in different processes. Some of the processes are hazardous in nature which may results in fire accidents.

At the end of the last month, one fire accident occurred in the factory. The fire destroyed some of the paper files containing records of the process operations for the month.

You being an associate to the Chief Manager (Finance), are assigned to prepare the process accounts for the month during which the fire occurred. From the documents and files of other sources, following information could be retrieved:

Opening work-in-process at the beginning of the month was 500 litres, 80% complete for labour and 60% complete for overheads. Opening work-in-process was valued at Rs.2, 78,000.

Closing work-in-process at the end of the month was 100 litres, 20% complete for labour and 10% complete for overheads.

Normal loss is 10% of input (fresh) and total losses during the month were 800 litres partly due to the fire damage.

Output transferred to finished goods was 3,400 litres.

Losses have a scrap value of Rs.20 per litre.

All raw materials are added at the commencement of the process.

The cost per equivalent unit is Rs.660 for the month made up as follows:

Raw Material Rs.300 Labour Rs.200 Overheads Rs.160

The company uses FIFO method to value work-in-process and finished goods.

The following information are required for managerial decisions:

(Study Material)

(i) How much quantity of raw material introduced during the month?

(a) 4,300 Litres

(b) 3,500 Litres

(c) 4,200 Litres

(d) 3,800 Litres

Ans: (d) 3,800 Litres

Inflow into process	Litres	Outflow from process	Litres
Opening WIP	500	Transferred to finished goods	3,400
Quantity introduced (Balancing figure)	3,800	Total loss	800
		Closing WIP	100
	4,300		4,300

(ii) The Quantity of normal loss and abnormal loss are:

(a) Normal loss- 380 litres & Abnormal loss- 420 litres

(b) Normal loss- 350 litres & Abnormal loss – 450 litres

(c) Normal loss- 430 litres & Abnormal loss – 370 litres

(d) Normal loss- 420 litres & Abnormal loss – 380 litres.

Ans: (a) Normal loss- 380 litres & Abnormal loss- 420 litres

Total loss	800 litres
Normal loss (10% of fresh input i.e. 3,800)	380 litres

Abnormal loss	420 litres

(iii) Value of raw material added to the process during the month is:

(a) Rs.10, 10,000

(b) Rs.10, 33,600

(c) Rs.10, 18,400

(d) Rs.10, 20,000

Ans: (b) Rs.10, 33,600

Calculation of Equivalent production units

Input Details	**Units**	**Output Particulars**	**Units**	**Equivalent Production**					
				Material		**Labour**		**Overheads**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening WIP	500	From Opening WIP	500	--	--	20	100	40	200
Fresh inputs	3,800	From fresh units	2900	100	2900	100	2900	100	2900
		Normal loss	380	--	--	--	--	--	--

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		Closing WIP	100	100	100	20	20	10	10
		Abnormal loss	420	100	420	100	420	100	420
	4,300		4,300		3,420		3,440		3,530

Value of raw materials introduced during the month

	Equivalent units	**Cost per EU (Rs.)**	**Total cost (Rs.)**
Total value of raw material	3420	300	10,26,000
Add: Scrap value of normal loss	380	20	7,600
Value of raw material introduced			10,33,600

(iv) Value of labour and overhead in closing Work-in-process are:

(a) Rs.4, 000 & Rs.1, 600 respectively

(b) Rs.20, 000 & Rs.16, 000 respectively

(c) Rs.16, 000 & Rs.9, 000 respectively

(d) Rs.13, 200 & Rs.6, 600 respectively

Ans: (a) Rs.4, 000 & Rs.1, 600 respectively

Value of labour and overhead in closing Work in process

Cost elements	Equivalent units	Cost per EU (Rs.)	Total cost (Rs.)
Labour	20	200	4,000
Overheads	10	160	1,600

(v) Value of output transferred to finished goods is:

(a) Rs.22, 57,200

(b) Rs.20, 06,400

(c) Rs.22, 44,000

(d) Rs.19, 27,200

Ans: (c) Rs.22, 44,000

Value of output transferred to finished goods

Output transferred (Units) × Equivalent cost per unit

3,400 Litres × Rs.660 = Rs.22, 44,000

Question 44

eSalt is the biggest producer of sodium hydroxide in India. This main product of the company has a strong reactivity with other organic compounds. It is highly versatile and is alkaline in nature. However, the basic material required for the production of this product is salt along with the electricity.

The manufacturing process involve electrolysis which produces Halogen as co-product. Modern use of Halogen is widespread. However, the common use is in disinfection like for

purifying drinking water or swimming pool water. It is also an important ingredient of toothpaste. Thus, the company's management affirmed the simultaneous production of Halogen.

During the previous financial year, the company purchased the base material of Rs.5, 34,000. For the current year, company decided to increase the production by 2 times. Due to increased production, the total conversion cost hiked to 3 times. Last year, the conversion cost accounted to Rs.8, 01,000 up to the point at which two products i.e. sodium hydroxide and Halogen are separated.

The production and sales information for current year is provided as below:

	Sodium hydroxide	Halogen
Production/ Sales(in tonne)	24,030	16,020
Selling price per tonne (Rs.)	100	150

During the current year, the management of the company pointed the extensive use of Vinyl which can be produced by further processing Halogen. Having selling price of Rs.250 per tonne higher than that of the Halogen, it was decided not to sell Halogen and further process it into Vinyl. The incremental processing cost took Rs.8, 01,000 producing 10,012.50 tonnes of Vinyl.

(MTP Jan 2025)

You are required to FIGURE OUT the following for managerial decision (MCQs 1 to 5):

(i) For the current year, the amount of base material purchased and the conversion cost up to the point at which two products i.e. Sodium hydroxide and Halogen are separated would be:

A. base material Rs.10, 68,000 and conversion cost Rs.24, 03,000

B. base material Rs.10, 68,000 and conversion cost Rs.16, 02,000

C. base material Rs.16, 02,000 and conversion cost Rs.24, 03,000

D. base material Rs.24, 03,000 and conversion cost Rs.16, 02,000

Ans: (C) base material Rs.16, 02,000 and conversion cost Rs.24, 03,000

Particulars	Base Material	Conversion cost
Previous year cost (Rs.)	5,34,000	8,01,000
Increased by	2 times	--
Increased to	--	3 times
Current year cost (Rs.)	5,34,000 + (5,34,000 x 2) = 16,02,000	8,01,000 x 3 = 24,03,000

(ii) Joint cost to be apportioned between Sodium hydroxide and Halogen as per the physical unit method would be:

A. Sodium hydroxide Rs. 24,03,000 and Halogen Rs. 10,68,000

B. Sodium hydroxide Rs.10, 68,000 and Halogen Rs.16, 02,000

C. Sodium hydroxide Rs.16, 02,000 and Halogen Rs.24, 03,000

D. Sodium hydroxide Rs.24, 03,000 and Halogen Rs.16, 02,000

Ans: (D) Sodium hydroxide Rs.24, 03,000 and Halogen Rs.16, 02,000

Products	Production/ Sales(in tonne)	Joint Cost Apportioned (Rs.)
Sodium hydroxide	24,030	24,03,000

Halogen	16,020	16,02,000
Total	40,050	40,05,000

Joint cost = base material + conversion cost

= 16, 02,000 + 24, 03,000 = 40, 05,000

Apportioned joint cost = $\frac{\text{Total Joint Cost}}{\text{Total Physical Value}}$ × Physical units of each product

For Sodium hydroxide = $\frac{\text{Rs.40,50,000}}{\text{40,050 tonnes}}$ × 24,030 tonnes = Rs. 24, 03,000

For Halogen= $\frac{\text{Rs.40,50,000}}{\text{40,050 tonnes}}$ × 16,020 tonnes = Rs. 16, 02,000

(iii) Joint cost to be apportioned between Sodium hydroxide and Halogen as per the sales value at split- off point method would be:

A. Sodium hydroxide Rs. 20, 02,500 and Halogen Rs. 20, 02,500

B. Sodium hydroxide Rs. 16, 02,000 and Halogen Rs. 24, 03,000

C. Sodium hydroxide Rs. 24, 03,000 and Halogen Rs. 16, 02,000

D. Sodium hydroxide Rs. 10, 68,000 and Halogen Rs. 20, 02,500

Ans: (A) Sodium hydroxide Rs. 20, 02,500 and Halogen Rs. 20, 02,500

Products	**Sales (in Tonne)**	**Selling Price per Tonne (Rs.)**	**Sales Revenue (Rs.)**	**Joint Cost Apportioned (Rs.)**
Sodium hydroxide	24,030	100	24,03,000	20,02,500

Halogen	16,020	150	24,03,000	20,02,500
Total	**40,050**		**48,06,000**	**40,05,000**

Apportioned joint cost = $\frac{\text{Total Joint Cost}}{\text{Total Sale Revenue}}$ × Sale revenue of each product

For Sodium hydroxide = $\frac{\text{Rs.40,50,000}}{\text{Rs.48,06,000}}$ × 24, 03,000 = Rs. 20, 02,500

For Halogen= $\frac{\text{Rs.40,50,000}}{\text{Rs.48,06,000}}$ × 24, 03,000 = Rs. 20, 02,500

(iv) Joint cost to be apportioned between Sodium hydroxide and Halogen as per the estimated net realisable value method would be:

A. Sodium hydroxide Rs. 23, 44,390 and Halogen Rs. 16, 60,610

B. Sodium hydroxide Rs. 17, 16,429 and Halogen Rs. 22, 88,571

C. Sodium hydroxide Rs. 22, 88,571 and Halogen Rs. 17, 16,429

D. Sodium hydroxide Rs. 16, 60,610 and Halogen Rs. 23, 44,390

Ans: (B) Sodium hydroxide Rs. 17, 16,429 and Halogen Rs. 22, 88,571

Products	**Sales (in Tonne)**	**Selling Price per Tonne (Rs.)**	**Sales Value (Rs.)**	**Post-split-off cost (Rs.)**	**Net Realisable Value (Rs.)**	**Joint Cost Apportioned (Rs.)**
Sodium hydroxide	24,030	100	24,03,000	-	24,03,000	17,16,429
Halogen (Vinyl after	10,012.50	150+250=400	40,05,000	8,01,000	32,04,000	22,88,571

further processing)						
Total					56,07,000	40,05,000

Apportioned joint cost = $\frac{\text{Total Joint Cost}}{\text{Total Net Realisable Value}}$ × Net Realisable Value of each product

For Sodium hydroxide = $\frac{\text{Rs.40,50,000}}{\text{Rs.56,07,000}}$ × 24, 03,000 = Rs.17, 16,429

For Halogen= $\frac{\text{Rs.40,50,000}}{\text{Rs.56,07,000}}$ × 32, 04,000 = Rs. 22, 88,571

(v) Considering that the decision relating to further processing Halogen is not approved, suggest whether this would be in favour of the management by calculating incremental revenue /loss from further processing Halogen into Vinyl.

A. Incremental loss would be Rs. 16, 02,000, thus the decision of not further processing Halogen is correct.

B. Incremental loss would be Rs. 8, 01,000, thus the decision of not further processing Halogen is correct.

C. Incremental revenue would be Rs. 8, 01,000, thus the decision relating to further processing Halogen needs to be approved.

D. Incremental revenue would be Rs. 16, 02,000, thus the decision relating to further processing Halogen needs to be approved.

Ans: (C) Incremental revenue would be Rs. 8, 01,000, thus the decision relating to further processing Halogen needs to be approved.

Particulars	**Amount (in Rs.)**

Revenue from sales of Vinyl if Halogen further processed (10,012.50 tonnes × Rs.400) (A)	40,05,000
Revenue from sales of Halogen if no further processing done (16,020 tonnes × Rs.150)(B)	24,03,000
Incremental revenue from further processing of Halogen into Vinyl (A-B)	16,02,000
Incremental cost of further processing Halogen into Vinyl	8,01,000
Incremental operating income from further processing	8,01,000

Incremental revenue would be Rs.8, 01,000, thus the decision relating to further processing Halogen needs to be approved.

Question 45

Knowing the hectic schedule of a student preparing for the examination, a homemaker managing work from home or a new parent busy in neonatal care, a freshly qualified professional (Mr. Rishi) entered into a start-up business of manufacturing frozen foods.

The process majorly involve washing and cutting the vegetables (Process I), blanching, cooling and mixing of ingredients with spices (Process II), forming, frying and freezing the final product (Process III).

In Accounts, Mr. Rishi normally transfers the output of one process to another process at cost but, being a young entrepreneur, he is interested in knowing the profit made at each and every process. Thus, it was decided to transfer the output of Process I and II to the next process at cost plus 25%. Further, the output of Process III is also transferred to finished stock at cost plus 33 1/3%.

Following information is extracted from the books of Mr. Rishi for the current year:

	Process I (Rs.)	Process II (Rs.)	Process III (Rs.)	Finished Stock (Rs.)
Opening stock	**8,02,500**	**14,44,500**	**21,40,000**	**24,07,500**
Direct materials	**42,80,000**	**34,77,500**	**26,75,000**	**--**
Direct wages	**66,87,500**	**57,78,000**	**49,22,000**	**--**
Factory overheads	**51,36,000**	**38,52,000**	**35,57,750**	**--**
Closing stock	**10,70,000**	**17,12,000**	**20,86,500**	**26,75,000**
Inter-process profit included in opening stock	**NIL**	**2,14,000**	**5,35,000**	**10,70,000**

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from Process III.

(RTP Jan 2025)

Mr. Rishi wants you to FIGURE OUT the following to analyse the profit generated at each process:

(i) What is the transfer price value at which the output of Process I is transferred to Process II?

(a) Rs.1, 97, 95,000

(b) Rs.39, 59,000

(c) Rs.1, 58, 36,000

(d) Rs.1, 69, 06,000

Ans: (a) Rs.1, 97, 95,000

(a) Process I Account

Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)	Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)
Opening Stock	8,02,500	–	8,02,500	Process II A/c (Transfer)*	1,58,36,000	39,59,000	1,97,95,000
Direct Material	42,80,000	–	42,80,000	Closing stock	10,70,000	–	10,70,000
Direct Wages	66,87,500	–	66,87,500				
Prime Cost	1,17,70,000	–	1,17,70,000				
Manufacturing Overheads	51,36,000	–	51,36,000				
Total cost	1,69,06,000	–	1,69,06,000				
Costing Profit and Loss A/c**		39,59,000	39,59,000				
	1,69,06,000	39,59,000	2,08,65,000		1,69,06,000	39,59,000	2,08,65,000

*Transfer price = (Total Cost - Closing Stock) (1 + 25%)

= (1, 69, 06,000 - 10, 70,000) x 1.25

= Rs.1, 97, 95,000

**Profit on transfer = (1, 69, 06,000 - 10, 70,000) x .25 = Rs.39, 59,000

(ii) What is the transfer price value at which the output of Process II is transferred to Process III?

(a) Rs.1, 20, 97, 476

(b) Rs.4, 07, 93,750

(c) Rs.2, 86, 96,274

(d) Rs.3, 43, 47,000

Ans: (b) Rs.4, 07, 93,750

Process II Account

Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)	Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)
Opening Stock	12,30,500	2,14,000	14,44,500	By Process III A/c (Transfer)**	2,86,96,274	1,20,97,476	4,07,93,750
Process I A/c	1,58,36,000	39,59,000	1,97,95,000	Closing stock*	14,77,726	2,34,274	17,12,000
Direct Material	34,77,500	-	34,77,500				
Direct Wages	57,78,000	-	57,78,000				
Prime Cost	2,63,22,000	41,73,000	3,04,95,000				
Manufacturing Overheads	38,52,000	-	38,52,000				
Total cost	3,01,74,000	41,73,000	3,43,47,000				

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Costing Profit and Loss A/c***	-	81,58,750	81,58,750				
	3,01,74,000	1,23,31,750	4,25,05,750		3,01,74,000	1,23,31,750	4,25,05,750

* Cost of Closing Stock = $\left(\frac{\text{Rs. } 2,63,22,000}{\text{Rs. } 3,04,95,000}\right)$ × Rs.17, 12,000 = Rs.14, 77,726

**Transfer price = (Total Cost - Closing Stock) (1 + 25%)

= (3, 43, 47,000 - 17, 12,000) x 1.25 = Rs.4, 07, 93,750

***Profit on transfer = (3, 43, 47,000 - 17, 12,000) x .25 = Rs.81, 58,750

(iii) What is the transfer price value at which the output of Process III is transferred to Finished Stock?

(a) Rs.5, 40, 88,500

(b) Rs.3, 98, 91,140

(c) Rs.2, 94, 44,860

(d) Rs.6, 93, 36,000

Ans: (d) Rs.6, 93, 36,000

Process III Account

Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)	Particulars	Cost (Rs.)	Profit (Rs.)	Total (Rs.)
Opening Stock	16,05,000	5,35,000	21,40,000	By Finished Stock A/c **(Transfer)	3,98,91,140	2,94,44,860	6,93,36,000
Process II A/c	2,86,96,274	1,20,97,476	4,07,93,750	Closing stock*	15,64,884	5,21,616	20,86,500

Direct Material	26,75,000	--	26,75,000				
Direct Wages	49,22,000	--	49,22,000				
Prime Cost	3,78,98,274	1,26,32,476	5,05,30,750				
Manufacturing Overheads	35,57,750	--	35,57,750				
Total cost	4,14,56,024	1,26,32,476	5,40,88,500				
Costing Profit and Loss A/c***	--	1,73,34,000	1,73,34,000				
	4,14,56,024	2,99,66,476	7,14,22,500		4,14,56,024	2,99,66,476	7,14,22,500

* Cost of Closing Stock = $\left(\frac{\text{Rs.3,78,98,274}}{\text{Rs. 5,05,30,750}}\right)$ x Rs.20, 86,500

= Rs.15, 64,884

**Transfer price = (Total Cost - Closing Stock) (1 + 33 1/3%)

= (5, 40, 88,500 - 20, 86,500) x (1 + 33 1/3%) = Rs.6, 93, 36,000

***Profit on transfer = (5, 40, 88,500 - 20, 86,500) x 33 1/3% = Rs.1, 73, 34,000

(iv) What is the cost value at which the output of Process III is transferred to Finished Stock?

(a) Rs.5, 40, 88,500

(b) Rs.3, 98, 91,140

(c) Rs.2, 94, 44,860

(d) Rs.6, 93, 36,000

Ans: (b) Refer part (iii) above.

(v) What is the cost value of closing stock of Process III A/c?

(a) Rs.20, 86,500

(b) Rs.15, 64,884

(c) Rs.3, 98, 91,140

(d) Rs.5, 21,616

Ans: (b) Refer part (iii) above.

Multiple Choice Questions (MCQ's)

Question 46

The type of process loss that should not be allowed to affect the cost of good units is:

(a) Abnormal loss

(b) Normal loss

(c) Seasonal loss

(d) Standard loss

(Study Material)

Ans: (a) Abnormal loss

Reason:

Abnormal loss refers to losses that occur beyond the expected or normal level in the production process, and these losses are not part of the regular production costs. Since

abnormal losses are unexpected, they should not be allowed to affect the cost of good units. The costs associated with abnormal losses are typically treated separately and are not included in the cost per unit of the good units produced.

- Normal loss is the expected or inherent loss during the production process, and its cost is absorbed into the cost of the good units.
- Seasonal loss and standard loss are not common terms in cost accounting, but they might refer to specific losses depending on the context or industry.

Question 47

100 units are processed at a total cost of Rs. 160, normal loss is 10%, & scrap units are sold @ Rs.0.25 each. If the output is 80 units, then the value of abnormal loss is:

(a) Rs.2.50

(b) Rs.16

(c) Rs.17.50

(d) Rs.17.75

(Study Material)

Ans: (c) Rs.17.50

Reason:

Normal loss = 10 units, expected output = 90 units.

Actual output = 80 units, so abnormal loss = 10 units.

Cost per unit = Rs.1.60 (Rs.160 / 100 units).

Cost of abnormal loss = 10 units * Rs.1.60 = Rs.16.

Scrap value = 10 units * Rs.0.25 = Rs.2.50.

Value of abnormal loss = Rs.16 (cost) - Rs.2.50 (scrap value) = Rs.17.50.

Question 48

When average method is used in process costing, the opening inventory costs are:

(a) Subtracted from the new costs

(b) Added to the new costs

(c) Kept separate from the costs of the new period

(d) Averaged with other costs to arrive at total cost

(Study Material)

Ans: (b) Added to the new costs

Reason:

Under the average method in process costing, the costs from the opening inventory (previous period) are combined with the costs incurred during the current period to calculate the total cost. This method averages the costs over the total units produced during the period, including those from the opening inventory. The opening inventory costs are added to the new costs to determine the total cost for the period, which is then allocated to both the completed and in-process units.

Question 49

Spoilage that occurs under inefficient operating conditions and is ordinarily controllable is called:

(a) Normal spoilage

(b) Abnormal spoilage

(c) Normal defectives

(d) None of the above

(Study Material)

Ans: (b) Abnormal spoilage

Reason:

Abnormal spoilage refers to spoilage that occurs under inefficient operating conditions and is typically controllable. It is not considered a normal part of the production process and goes beyond the expected or normal level of loss. Abnormal spoilage results from issues such as poor processes, defective machinery, or inadequate supervision, and is generally treated separately from the cost of good units.

- Normal spoilage is the expected or inherent loss in production, which is accounted for as part of the normal cost.
- Normal defectives are products that do not meet quality standards but are still considered part of the normal process.

Question 50

The cost of normal process loss is -

(a) Absorbed by good units produced and amount realised by the sale of loss units should be debited to the process account.

(b) Debited to costing profit and loss account.

(c) Absorbed by good units produced.

(d) Debited to costing profit and loss account and amount realised by the sale of loss units should be credited to the process account.

(Study Material)

Ans: (c) Absorbed by good units produced.

Reason:

Normal process loss is considered an inherent part of the production process, and its cost is absorbed by the good units produced. This means that the costs associated with normal spoilage or loss are distributed across the units that are successfully produced. Since normal losses are expected and unavoidable, the cost is spread out to maintain a realistic cost per unit for the good units.

- Option (a) refers to the treatment of abnormal loss, not normal loss.
- Option (b) and (d) would apply to abnormal losses, not normal losses.

Question 51

The value of abnormal loss is equal to:

(a) Total cost of materials

(b) Total process cost less realizable value of normal loss

(c) Total process cost less cost of scrap

(d) Total process cost less realizable value of normal loss less value of transferred out goods.

(Study Material)

Ans: (d) Total process cost less realizable value of normal loss less value of transferred out goods.

Reason:

The value of abnormal loss is calculated by taking the total process cost and subtracting both the realizable value of normal loss (from the sale of scrap or waste) and the cost of the good units transferred out. This gives the cost of the units that are lost due to abnormal circumstances, which are not part of the normal process.

- Total process cost includes the cost of materials, labor, and overheads incurred during the production process.
- Realizable value of normal loss is the value recovered from scrap or waste from the normal loss.
- Transferred out goods refer to the good units that have been completed and transferred to the next stage, and their cost is subtracted from the total cost.

Thus, the abnormal loss is the cost associated with the production loss that exceeds the expected (normal) loss.

Topic 4 Abnormal Gain

Question 52

Aditya Agro Ltd. mixes powdered ingredients in two different processes to produce one product. The output of Process- I becomes the input of Process -II and the output of Process-II is transferred to the Packing department.

From the information given below, you are required to PREPARE accounts for Process-I, Process-II and Abnormal loss/ gain A/c to record the transactions for the month of February 20X9.

Process-I

Input:	
Material A	**6,000 kilograms at Rs. 50 per kilogram**
Material B	**4,000 kilograms at Rs. 100 per kilogram**
Labour	**430 hours at Rs. 50 per hour**
Normal loss	**5% of inputs. Scrap are disposed off at Rs.16 per kilogram**

Output	**9,200 kilograms.**

There is no work- in- process at the beginning or end of the month.

Process-II

Input:	
Material C	**6,600 kilograms at Rs. 125 per kilogram**
Material D	**4,200 kilograms at Rs. 75 per kilogram**
Flavouring Essence	**Rs. 3,300**
Labour	**370 hours at Rs.50 per hour**
Normal loss	**5% of inputs with no disposal value**
Output	**18,000 kilograms.**

There is no work-in-process at the beginning of the month but 1,000 kilograms in process at the end of the month and estimated to be only 50% complete so far as labour and overhead were concerned. Overhead of Rs. 92, 000 incurred to be absorbed on the basis of labour hours.

(MTP March '19 & Sep '23)

Answer 52

Process-I A/c

Particulars	Qty. (kgs.)	Amount (Rs.)	Particulars	Qty. (kgs.)	Amount (Rs.)

To Material A	6,000	3,00,000	By Normal loss	500	8,000
To Material B	4,000	4,00,000	By Process-II A/c	9,200	7,38,857
To Labour	-	21,500	By Abnormal loss A/c	300	24,093
To Overhead $\frac{\text{Rs.92,000} \times 430 \text{ hrs}}{800 \text{ hrs}}$	-	49,450			
	10,000	7,70,950		10,000	7,70,950

$= \frac{\{(\text{Rs.3,00,000+Rs.4,00,000+Rs. 21,500+Rs.49450})-\text{Rs. 8,000})\}}{(10{,}000-500) \text{ units}} = \frac{\text{Rs. 7,70,950}-\text{Rs. 8,000}}{9{,}500 \text{ units}} = \text{Rs. } 80.3105$

Process-II A/c

Particulars	Qty. (kgs.)	Amount (Rs.)	Particulars	Qty. (kgs.)	Amount (Rs.)
To Process-I A/c	9,200	7,38,857	By Normal loss	1,000	--
To Material C	6,600	8,25,000	By Packing Dept. A/c (See the working notes)	18,000	18,42,496
To Material D	4,200	3,15,000	By WIP A/c (See the working notes)	1,000	1,00,711
To Flavouring essence	--	3,300			
To Labour	--	18,500			

To Overheads $\frac{Rs.92,000 \times 370\ hrs}{800\ hrs}$	--	42,550			
	20,000	19,43,207		20,000	19,43,207

Abnormal loss A/c

Particulars	Qty. (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
To Process-I A/c	300	24,093	By Bank	300	4,800
			By Costing Profit & Loss A/c	--	19,293
	300	24,093		300	24,093

Working Notes:

Calculation of Equivalent Production units

Input	Units	Output	Units	Process-I		Mat-C & D		Labour & OH	
				(%)	Units	(%)	Units	(%)	Units
	9,200	Transferred to Packing.	18,000	100	18,000	100	18,000	100	18,000
Mat-C	6,600	Closing WIP	1,000	100	1,000	100	1,000	50	500
Mat-D	4,200	Normal loss	1,000	--	--	--	--	--	--

	20,000		20,000		19,000		19,000		18,500

Calculation of Unit cost

Cost component	Amount (Rs.)	Equivalent units	Cost per unit (Rs.)
Transferred-in	7,38,857	19,000	38.8872
Material-C	8,25,000	19,000	43.4211
Material-D	3,15,000	19,000	16.5789
Flavouring essence	3,300	19,000	0.1737
Total Material Cost	18,82,157	19,000	99.0609
Labour	18,500	18,500	1.0000
Overheads	42,550	18,500	2.3000
Total Cost	19,43,207		102.3609

Value of Materials transferred to Packing Department

= 18,000 unit × Rs.102.3609 = 18, 42,496

Value of WIP:

For Materials- 1,000 units × Rs.99.0609 =Rs.99, 061

For Labour & Overheads 500 units × Rs.3.30 = Rs.1, 650

=Rs.1, 00,711

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MCQ

Question 53

200 units were introduced in a process in which 20 units is the normal loss. If the actual output is 150 units, then there is:

(a) No abnormal loss

(b) No abnormal gain

(c) Abnormal loss of 30 units

(d) Abnormal gain of 30 units

(Study Material)

Ans: (c) Abnormal loss of 30 units

Reason:

Units introduced = 200 units

Normal loss = 20 units

Expected output = 200 units - 20 units (normal loss) = 180 units

Actual output = 150 units

The expected output is 180 units, but the actual output is only 150 units. This results in an abnormal loss of:

Abnormal loss = Expected output - Actual output = 180 units - 150 units = 30 units

Since the actual output is lower than the expected output due to this abnormal loss, the answer is abnormal loss of 30 units.

Topic 5 Spoilage, Scrap, and Waste

Question 54

Lean Labs develops 55mm film using a four-step process that moves progressively through four departments. The company specializes in overnight service and has the largest drug store chain as its primary customer. Currently, direct labor, direct materials, and overhead are accumulated by departments.

The cost accumulation system that best describes the system Lean Labs is using is:

(Study Material)

(a) Operation costing.

(b) Activity-based costing.

(c) Job-order costing.

(d) Process costing.

Ans: (d) Process costing.

Reason:

Lean Labs is using a four-step process that moves progressively through four departments, which is characteristic of process costing. This method is typically used in industries where production is continuous and units are homogeneous, with costs accumulated by departments or processes. The company accumulates direct labor, direct materials, and overhead by departments, which aligns with the process costing system, where costs are tracked for each process or stage of production, and then allocated to all units produced during that stage.

- Operation costing is a hybrid system combining aspects of job-order and process costing, typically used in industries where products have some variations but are produced in large quantities.
- Activity-based costing (ABC) assigns costs based on activities performed, not by department or process.

- Job-order costing is used when products are custom-made or unique, and costs are accumulated for each individual job or order.

Question 55

When compared with normal spoilage, abnormal spoilage:

(Study Material)

(a) Arises more frequently from factors that are inherent in the manufacturing process.

(b) Is given the same accounting treatment as normal spoilage.

(c) Is generally thought to be more controllable by purchase department than production department.

(d) Is not typically influenced by the "tightness" of production standards.

Ans: (d) Is not typically influenced by the "tightness" of production standards.

Reason:

Abnormal spoilage refers to spoilage that occurs due to factors beyond the normal production process, often caused by inefficiencies or unusual circumstances. It is not typically influenced by the "tightness" of production standards because such spoilage is unexpected and occurs under abnormal or inefficient conditions. In contrast, normal spoilage is an inherent part of the process and is generally anticipated based on production standards.

(a) is incorrect because abnormal spoilage arises from factors outside normal manufacturing conditions, not from inherent process factors.

(b) is incorrect because abnormal spoilage is accounted for separately and is not treated the same way as normal spoilage.

(c) is incorrect because abnormal spoilage is more directly influenced by production issues rather than purchasing factors.

Question 56

Assume 550 units were worked on during a period in which a total of 500 good units were completed. Normal spoilage consisted of 30 units; abnormal spoilage, 20 units. Total production costs were Rs. 2,200. The company accounts for abnormal spoilage separately on the income statement as loss due to abnormal spoilage.

Normal spoilage is not accounted for separately. What is the cost of the good units produced?

(Study Material)

(a) Rs.2, 080

(b) Rs.2, 115

(c) Rs.2, 200

(d) Rs.2, 332

Ans: (b) Rs.2, 115

Reason:

The total production cost of Rs.2, 200 is for 550 units worked on.

Cost per unit = Rs.2, 200 ÷ 550 = Rs.4.

The cost for 500 good units = 500 × Rs.4 = Rs.2, 000.

The cost for normal spoilage (30 units) = 30 × Rs.4 = Rs.120.

Abnormal spoilage is accounted separately, so it's excluded from the good units' cost.

Total cost of good units = Rs.2,000 (good units) + Rs.120 (normal spoilage) = Rs.2,115.

Question 57

IC Limited uses process costing systems and inspects its goods post manufacturing. An engineer noticed on May 31st the following:

Good units completed	**15,000**
Normal spoilage (units)	**300**
Abnormal spoilage (units)	**100**

Unit costs were: Material Rs.2.50 and conversion costs (Labour & overheads) Rs.6.00. The number of units that company would transfer to its finished goods stock and the related cost of these units are:

(Study Material)

(a) 15,000 units transferred at a cost of Rs.127, 500

(b) 15,000 units transferred at a cost of Rs.130, 050

(c) 15,000 units transferred at a cost of Rs.135, 000

(d) 15,300 units transferred at a cost of Rs.130, 050

Ans-(b) 15,000 units transferred at a cost of Rs.130, 050

Reason:

15,000 good units are transferred to finished goods.

Total cost per unit = Rs. 2.50 (Material) + Rs. 6.00 (Conversion) = Rs. 8.50.

Total production cost is based on 15,300 units (15,000 good units + 300 normal spoilage).

Total cost of production = 15,300 units × Rs. 8.50 = Rs. 130,050.

15,000 good units are transferred at this total cost.

Topic 6 Equivalent Production

Question 58

A process account is debited by abnormal gain, the value is determined as:

(a) Equal to the value of normal loss

(b) Cost of good units less realizable value of normal loss

(c) Cost of good units less realizable value of actual loss

(d) Equal to the value of good units less closing stock

(Study Material)

Ans: (b) Cost of good units less realizable value of normal loss

Reason:

When there is an abnormal gain, it means that more good units were produced than expected (i.e., more than the normal units), and the process account is debited with the value of the abnormal gain.

The value of the abnormal gain is determined by:

- Cost of good units: This is the cost of the units that were actually completed and transferred.
- Realizable value of normal loss: The amount that can be recovered from the scrap or waste due to normal spoilage.

Therefore, the value of the abnormal gain is calculated as the cost of good units less the realizable value of normal loss. This reflects the cost savings or profit derived from producing more than the expected good units.

Topic 7 Valuation of Closing WIP

Question 59

The M-Tech Manufacturing Company is presently evaluating two possible processes for the manufacture of a toy. The following information is available:

Particulars	Process A (Rs.)	Process B(Rs.)
Variable cost per unit	12	14
Sales price per unit	20	20
Total fixed costs per year	30,00,000	21,00,000
Capacity (in units)	4,30,000	5,00,000
Anticipated sales (Next year, in units)	4,00,000	4,00,000

SUGGEST:

1. Which process should be chosen?

2. Would you change your Answer as given above, if you were informed that the capacities of the two processes are as follows.

A - 6, 00,000 units; B - 5, 00,000 units? STATE the reason?

(MTP Aug. '18)

Answer 59

(1) Comparative Profitability Statements

Particulars	Process- A (Rs.)	Process- B (Rs.)
Selling Price per unit	20.00	20.00

Less: Variable Cost per unit	12.00	14.00
Contribution per unit	8.00	6.00
Total Contribution	32,00,000 (Rs. 8 × 4,00,000)	24,00,000 (Rs. 6 × 4,00,000)
Less: Total fixed costs	30,00,000	21,00,000
Profit	2,00,000	3,00,000
*Capacity (units)	4,30,000	5,00,000
Total Contribution at full capacity	34,40,000 (Rs. 8 × 4,30,000)	30,00,000 (Rs. 6 × 5,00,000)
Fixed Cost	30,00,000	21,00,000
Profit	4,40,000	9,00,000

Process- B should be chosen as it gives more profit as compared to Process-A.

(2)		
Particulars	**Process- A (Rs.)**	**Process- B (Rs.)**
*Capacity (units)	6,00,000	5,00,000
Total contribution	48,00,000 (Rs. 8 × 6,00,000)	30,00,000 (Rs. 6 × 5,00,000)

Fixed Cost	30,00,000	21,00,000
Profit	18,00,000	9,00,000

If the capacity of the Process A and B is 6, 00,000 units and 5, 00,000 units respectively then Process-A is giving double profit than Process C. Thus Process A be chosen.

***Note:** It is assumed that capacity produced equals sales.

Topic 8 FIFO vs Weighted Average Method

Question 60

The following information relate to Process A:

(i) Opening Work-in-Process Degree of Completion:	**8,000 units at Rs.15,00,000**
Material	**100%**
Labour and Overhead	**60%**
(ii) Input 1,82,000 units at	**Rs.1,47,50,000**
(iii) Wages paid	**Rs.68,12,000**
(iv) Overheads paid	**Rs.34,06,000**
(v) Units scrapped	**14,000**
Degree of Completion: Material	**100%**

Wages and Overheads	**80%**
(vi) Closing Work - in- Process	**18,000 units**
Degree of Completion: Material	**100%**
Wages and Overheads	**70%**

(vii) Units completed and transferred to next process 1, 58,000 units

(viii) Normal loss 10% of total input including opening WIP

(ix) Scrap value is Rs.15 per unit to be adjusted out of direct material cost

You are required to COMPUTE on the basis of FIFO

(i) Equivalent Production

(ii) Cost per unit

(iii) Value of units transferred to next process.

(MTP Oct'18, RTP Nov 19) (Same concepts different figures MTP Apr'21)

Answer 60

(i) Statement of Equivalent Production (FIFO Method)

Input		**Output**		**Equivalent Production**			
Particulars	**Units**	**Particulars**	**Units**	**Material**		**Labour & Overheads**	
				(%)	**Units**	**(%)**	**Units**

Opening WIP	8,000	Transfer to next Process:					
Introduced	1,82,000	Opening WIP completed	8,000	--	--	40	3,200
		Introduced & completed	1,50,000	100	1,50,000	100	1,50,000
		Normal loss 10% (8,000 + 182,000)	19,000	--	--	--	--
		Abnormal gain	(5,000)	100	(5,000)	100	(5,000)
		Closing WIP	18,000	100	18,000	70	12,600
	1,90,000		1,90,000		1,63,000		1,60,800

(ii) Computation of Cost per unit

Particulars	**Materials (Rs.)**	**Labour (Rs.)**	**Overhead(Rs.)**
Input of Materials	1,47,50,000	--	--
Expenses	--	68,12,000	34,06,000

Total	1,47,50,000	68,12,000	34,06,000
Less: Sale of Scrap (19,000 units × Rs.15)	(2,85,000)	--	--
Net cost	1,44,65,000	68,12,000	34,06,000
Equivalent Units	1,63,000	1,60,800	1,60,800
Cost Per Unit	88.7423	42.3632	21.1816

Total cost per unit = Rs. (88.7423 + 42.3632 + 21.1816) = Rs. 152.2871

(iii) Value of units transferred to next process:

	Amount (Rs.)	**Amount (Rs.)**
Opening W-I-P	15,00,000.00	
Add: Labour (3,200 units × Rs. 42.3632)	1,35,562.24	
Overhead (3,200 units × Rs. 21.1816)	67,781.12	17,03,343.36
New introduced (1,50,000 units × Rs. 152.2871)		2,28,43,065.00
		2,45,46,408.36

Question 61

Under Weighted Average (Average) Method:

(a) The cost to complete the opening WIP is ignored.

(b) The cost to complete the opening WIP and other completed units are calculated separately.

(c) The cost of opening work-in-process and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units.

(d) Closing stock of work in process is valued at current cost.

(Study Material)

Ans: (c) The cost of opening work-in-process and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units.

Reason:

Under the Weighted Average Method in process costing, the costs of the opening work-in-process (WIP) and the current period are combined (aggregated). This aggregate cost is then averaged over the total units produced, including both completed units and ending WIP, to determine the cost per unit.

This method does not differentiate between the costs of the opening WIP and the costs incurred in the current period. Instead, it averages the costs, providing a simplified approach compared to the FIFO method, where opening WIP costs are handled separately.

Topic 9 Inter-Process Profit

Question 62

Inter-process profit is calculated, because:

(a) A process is a cost centres

(b) Each process has to report profit

(c) The efficiency of the process is measured

(d) The wages of employees are linked to the process profitability.

(Study Material)

Ans: (c) The efficiency of the process is measured

Reason:

Inter-process profit is calculated to measure the efficiency of a process. It reflects the profit that arises when one process transfers goods to the next process at a price higher than its cost. This helps in evaluating how efficiently each process is operating and managing its costs. The inter-process profit also provides insights into the value added at each stage of production.

(a) A process being a cost center does not directly explain the need to calculate inter-process profit; it is primarily for performance evaluation.

(b) Each process does not necessarily need to report a profit, but the calculation of inter-process profit is for efficiency analysis.

(d) While wages can be linked to productivity, they are not the primary reason for calculating inter-process profit.

Topic 10 Joint Products & By-Products

(No direct question found)

Topic 11 Case Studies / Practical Problems

Question 63

In a chemical manufacturing company, three products A, B and C emerge at a single split off stage in department P. Product A is further processed in department Q, product B in

department R and product C in department S. There is no loss in further Processing of any of the three products. The cost data for a month are as under:

Cost of raw materials introduced in department P	Rs. 12,68,800
Direct Wages Department	(Rs.)
P	3,84,000
Q	96,000
R	64,000
S	36,000

Factory overheads of Rs. 4, 64,000 are to be apportioned to the departments on direct wage basis.

During the month under reference, the company sold all three products after processing them further as under:

Products	A	B	C
Output sold (kg.)	44,000	40,000	20,000
Selling Price per kg. (Rs.)	32	24	16

There is no opening or closing stocks. If these products were sold at the split off stage, that is, without further processing, the selling prices would have been Rs. 20, Rs. 22 and Rs. 10 each per kg respectively for A, B and C.

Required:

(i) PREPARE a statement showing the apportionment of joint costs to joint products.

(ii) PRESENT a statement showing product-wise and total profit for the month under reference as per the company's current processing policy.

(iii) WHAT processing decision should have been taken to improve the profitability of the company?

(iv) CALCULATE the product-wise and total profit arising from your recommendation in (iii) above.

(MTP May 2025)

Answer 63

(i) Statement showing the apportionment of joint costs to joint products

	Products			
	A	**B**	**C**	**Total**
Output sold Kg.: (I)	44,000	40,000	20,000	
Selling price per kg. at split off (Rs.): (II)	20	22	10	
Sales value at split off (Rs.): (I) x (II)	8,80,000	8,80,000	2,00,000	19,60,000
Joint costs (costs incurred in department P (Rs.) (apportioned on the basis of sales value at the point of split off) i.e. (22:22:5) (Working Note 1)	8,80,000	8,80,000	2,00,000	19,60,000

(ii) Statement showing product-wise and total profit for the month under reference (as per the company's current processing policy)

	Products			
	A	**B**	**C**	**Total**
Output (kg.): (a)	44,000	40,000	20,000	
Selling price per kg. after further processing (Rs.): (b)	32	24	16	
Sales value after further processing (Rs.). :(c) = {(a) x (b)}	14,08,000	9,60,000	3,20,000	26,88,000
Joint costs (Rs.): (d)	8,80,000	8,80,000	2,00,000	19,60,000
Further processing costs (Rs.): (e) (Working Note 2)	1,72,800	1,15,200	64,800	3,52,800
Total costs (Rs.): (f) = [(d) + (e)}	10,52,800	9,95,200	2,64,800	23,12,800
Profit/ (Loss) (Rs.): [(c))– (f)}	3,55,200	(35,200)	55,200	3,75,200

(iii) Processing decision to improve the profitability of the company.

44,000 units of product A and 20,000 units of product C should be further processed because the incremental sales revenue generated after further processing is more than the further processing costs incurred. 40,000 units of product B should be sold at the point of-split off because the incremental revenue generated after further processing is less than the further processing costs.

(iv) The product wise and total profit arising from the recommendation in (iii) above is as follows:

Product	A	B	C	Total
Profit (Rs.)	3,55,200	-	55,200	4,10,400

Working Notes:

1. Statement of department-wise costs

	P	Q	R	S
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Raw materials	12,68,800			
Wages	3,84,000	96,000	64,000	36,000
Overheads (Apportioned on the basis of departmental direct wages i.e. 96:24:16:9)	3,07,200	76,800	51,200	28,800
Total Cost	19,60,000	1,72,800	1,15,200	64,800

2. Joint costs and further processing costs

(i) Costs incurred in the department P are joint costs of products A, B and C and are equal to Rs. 19, 60,000.

(ii) Costs incurred in the departments Q, R and S are further processing costs of products A, B and C respectively. Further processing costs of products A, B and C thus are Rs. 1, 72,800; Rs. 1, 15,200 and Rs. 64,800 respectively.

Question 64

A firm introduced 3,000 units of material in the manufacturing process. During the period 2,500 units were completed and transferred to next process. However, the degree of completion on remaining 500 units was 100%, 60%, and 30% for materials, labour and overheads respectively. Which one of the following is the equivalent complete units with regard to labour?

(a) 2,500

(b) 2,800

(c) 2,650

(d) 2,500

(Study Material)

Ans- (b) 2,800 units

Equivalent Units = Units Completed + (Units in Process x Degree of Completion)

Equivalent Units for Labour = 2,500 + (500 x 0.60)

= 2,800 units

Question 65

A product passes through three processes – A, B and C. The details of expenses incurred on the three processes during the year 2025 were as under:

Process	A	B	C

Units issued / introduced cost per unit Rs. 100		**10,000**	
	Rs.	**Rs.**	**Rs.**
Sundry Materials	**10,000**	**15,000**	**5,000**
Labour	**30,000**	**80,000**	**65,000**
Direct Expenses	**6,000**	**18,150**	**27,200**
Selling price per unit of output	**120**	**165**	**250**

Management expenses during the year were Rs. 80,000 and selling expenses were Rs. 50,000 these are not allocable to the processes.

Actual output of the three processes was:

A – 9,300 units, B-5,400 units and C-2,100 units. Two third of the output of Process A and one half of the output of Process B was passed on to the next process and the balance was sold. The entire output of process C was sold.

The normal loss of the three processes, calculated on the input of every process was:

Process A-5%; B-15% and C-20%

The Loss of Process A was sold at Rs.2 per unit, that of B at Rs.5 per unit and of Process C at Rs.10 per unit.

Prepare the Three Processes Accounts and the Profit and Loss Account.

(RTP Sep. 2025)

Answer 65

Process A Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Units brought in (Rs. 100 × 10,000)	10,000	10,00,000	By Normal Loss (5% of 10,000 units @ Rs. 2/- p.u.)	500	1,000
To Sundry Materials		10,000	By Abnormal loss (Working note 1)	200	22,000
To Labour		30,000	Process B A/c (Output to be transferred Rs. 110 × 6,200) (W. Note 1)	6,200	6,82,000
To Direct expenses		6,000	By Profit & Loss A/c (Rs. 110 × 3,100 units) (W. Note 1)	3,100	3,41,000
	10,000	10,46,000		10,000	10,46,000

Process B Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A A/c	6,200	6,82,000	By Normal Loss (15% of 6,200 Units = 930 units @ Rs. 5 p.u.)	930	4,650

To Sundry Materials		15,000	By Process C A/c (Output to be transferred) Rs. 150 × 2,700 (Working Note 2)	2,700	4,05,000
To Labour		80,000			
To Direct expenses		18,150			
To Abnormal gain (Working Note 2)	130	19,500	By Profit & Loss A/c (Rs. 150 × 2,700)	2,700	4,05,000
	6,330	8,14,650		6,330	8,14,650

Process C Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process B A/c	2,700	4,05,000	By Normal Loss (20% of 2,700 units = 540 units@ Rs. 10/- p.u.)	540	5,400
To Sundry Materials		5,000	By Abnormal Loss (Working Note 3)	60	13,800
To Labour		65,000	By Profit & Loss A/c (Rs. 230 × 2,100 units) (Working Note 3)	2,100	4,83,000

To Direct expenses		27,200			
	2,700	5,02,200		2,700	5,02,200

Profit & Loss Account

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process A A/c	3,100	3,41,000	By Sale (Process A's Output @ Rs. 120/- p.m.)	3,100	3,72,000
To Process B A/c	2,700	4,05,000	By Sale (Process B's Output@ Rs. 165/- p.u.)	2,700	4,45,500
To Process C A/c	2,100	4,83,000	By Sale (Process C's Output @ Rs. 250/- p.u.)	2,100	5,25,000
To Management Expenses		80,000	By Abnormal gain A/c (Working Note 5)		18,850
To Selling Expenses		50,000	By Net Loss		32,450
To Abnormal Loss A/c (Working Note 4)		34,800			

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	7,900	13,93,800		7,900	13,93,800

Working Notes

1. (i) Per unit cost of normal production under process A:

$= \frac{\text{Normal cost of normal output}}{\text{Normal production of output}} = \frac{\text{Rs.10,46,000} - \text{Rs.1,000}}{\text{9,500 units}}$ = Rs.110

(ii) Value of Abnormal loss under process A:

Abnormal loss units = Normal production – Actual production

= 9,500 – 9,300 = 200 units

Value of Abnormal Loss

= Per unit cost of normal production × Abnormal loss units

= Rs.110 × 200 – Rs.22, 000.

2. (i) Per unit cost of normal production under process B:

$= \frac{(\text{Rs.7,95,150} - \text{Rs.4,650}}{\text{5,270}} = \frac{\text{Rs.7,90,500}}{\text{5,270}}$ = Rs.150

(ii) Value of Abnormal gain under process B:

Abnormal gain units = Normal loss – Actual loss

= 930 – 800 = 130 units

= Per unit cost of normal production × Abnormal gain units

= Rs.150 × 130 units = Rs.19, 500.

3. (i) Per unit cost of normal production under process C:

$= \frac{(\text{Rs.5,02,200} - \text{Rs. 5,400}}{\text{2,160 units}} = \frac{\text{Rs.4,96,800}}{\text{2,160 units}}$ = Rs.230

(ii) Value of Abnormal loss under process C:

Abnormal loss units = Normal production – Actual production

= 2,160 units – 2,100 units = 60 units

= Rs.230 × 60 units = Rs.13, 800

4. Abnormal Loss Account

Particulars	Units	Cost p.u. Rs.	Amount Rs.	Particulars	Units	Cost p.u. Rs.	Amount Rs.
To Process A A/c	200	110	22,000	By Sale proceeds of Process A Loss	200	2	400
To Process C A/c	60	230	13,800	By Sale proceeds of Process C loss	60	10	600
				By Profit & Loss A/c			34,800
	260		35,800		260		35,800

5. Abnormal Gain Account

Particulars	Units	Cost p.u. Rs.	Amount Rs.	Particulars	Units	Cost p.u. Rs.	Amount Rs.

To Normal loss shortfall	130	5	650	By Process B	130	150	19,500
To Profit & Loss A/c			18,850				
			19,500				19,500

Chapter 11

Joint Product and By Product

Topic 1 Definition & Difference Between Joint & By-products

Question 1

Three products X,Y and Z along with a by-product B are obtained again in a crude state which require further processing at a cost of Rs. 5 for X; Rs. 4 for Y; and Rs. 2.50 for Z per unit before sale. The by-product is however saleable as such to a nearby factory. The selling prices for the three main products and by-product, assuming they should yield a net margin of 25 percent of cost, are fixed at Rs. 13.75 Rs. 8.75 and Rs. 7.50 and Re. 1.00 respectively – all per unit quantity sold.

During a period, the joint input cost including the material cost was Rs. 90,800 and the respective outputs were:

X 8,000 units

Y 6,000 units

Z 4,000 units

B 1,000 units

By product should be credited to the joint cost and only the net joint costs are to be allocated to the main products.

Calculate the joint cost per unit of each product and the margin available as a percentage on cost.

(MTP Aug. '18)

Answer 1

Working Notes:

(i) Computation of Allocation Ratio for Joint Costs

	Products		
	X (Rs.)	**Y (Rs.)**	**Z (Rs.)**
Selling Price	13.75	8.75	7.50
Less: Anticipated margin@ 25% on cost or 20% on sales	2.75	1.75	1.50
Cost of sales	11.00	7.00	6.00
Less: Post split off cost	5.00	4.00	2.50
Joint cost per unit	6.00	3.00	3.50
Output (units)	8,000	6,000	4,000
Total output cost	48,000	18,000	14,000
Allocation ratio for joint costs	24	9	7

(ii) Computation of net allocable joint costs

	Rs.	**Rs.**
Joint input cost including material cost		90,800
Less: Credit for realization from by-product B: Sales revenue (1,000 × Re. 1)	1,000	

Less: profit @ 25% on cost or 20% on sales	200	800
Net joint costs to be allocated		90,000

Determination of joint cost per unit of each product

Product	Net joint costs allocation Rs.	Output(units) (Rs.)	Joint cost per unit (Rs.)
X	54,000 (Note : 1)	8,000	6.75
Y	20,250	6,000	3.38
Z	15,750	4,000	3.94
	90,000		

Profit margin available on each product as a percentage on cost

Product	Joint Cost (Rs.)	Post spilt off cost (Rs.)	Total Co (Rs.)	Selling Price (Rs.)	Margin (Rs.)	Margin % on cost (Rs.)
X	6.75	5.00	11.75	13.75	2.00	17.02
Y	3.38	4.00	7.38	8.75	1.37	18.56
Z	3.94	2.50	6.44	7.50	1.06	16.46

Note: 1

X= $\frac{24}{40}$ × 90,000 =54,000

Y= $\frac{9}{40}$ × 90,000 =20,250

Z= $\frac{7}{40}$ × 90,000 =15,750

Total= 90000

Question 2

Mayura Chemicals Ltd buys a particular raw material at Rs. 8 per litre. At the end of the processing in Department- I, this raw material splits-off into products X, Y and Z. Product X is sold at the split-off point, with no further processing. Products Y and Z require further processing before they can be sold. Product Y is processed in Department-2, and Product Z is processed in Department-3. Following is a summary of the costs and other related data for the year 2019-20:

Particulars	Department		
	1	2	3
Cost of Raw Material	Rs. 4,80,000	-	-
Direct Labour	Rs. 70,000	Rs. 4,50,000	Rs. 6,50,000
Manufacturing Overhead	Rs. 48,000	Rs. 2,10,000	Rs. 4,50,000
	Products		
	X	Y	Z
Sales (litres)	10,000	15,000	22,500

Closing inventory (litres)	**5,000**	**-**	**7,500**
Sale price per litre (Rs.)	**30**	**64**	**50**

There were no opening and closing inventories of basic raw materials at the beginning as well as at the end of the year. All finished goods inventory in litres was complete as to processing. The company uses the Net-realizable value method of allocating joint costs.

You are required to prepare:

(i) Schedule showing the allocation of joint costs.

(ii) Calculate the Cost of goods sold of each product and the cost of each item in Inventory.

(iii) A comparative statement of Gross profit.

(PYP Jan 21)

Answer 2

(i) Statement of Joint Cost allocation of inventories of X, Y and Z

	Products			**Total (Rs.)**
	X (Rs.)	**Y (Rs.)**	**Z (Rs.)**	
Final sales value of total production (Working Note 1)	4,50,000 (15,000 x Rs. 30)	9,60,000 (15,000 x Rs. 64)	15,00,000 (30,000 x Rs. 50)	29,10,000
Less: Additional cost	--	6,60,000	11,00,000	17,60,000

Net realizable value (at split-off point)	4,50,000	3,00,000	4,00,000	11,50,000
Joint cost allocated (Working Note 2)	2,34,000	1,56,000	2,08,000	5,98,000

(ii) Calculation of Cost of goods sold and Closing inventory

	Products			**Total (Rs.)**
	X (Rs.)	**Y (Rs.)**	**Z (Rs.)**	
Allocated joint cost	2,34,000	1,56,000	2,08,000	5,98,000
Add: Additional costs	--	6,60,000	11,00,000	17,60,000
Cost of goods sold (COGS)	2,34,000	8,16,000	13,08,000	23,58,000
Less: Cost of closing inventory(Working Note 1)	78,000(COGS × 100/3%)	--	3, 27,000 (COGS × 25%)	4,05,000
Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000

(iii) Comparative Statement of Gross Profit

	Products			**Total (Rs.)**
	X (Rs.)	**Y (Rs.)**	**Z (Rs.)**	

Sales revenue	3,00,000 (10,000 x Rs. 30)	9,60,000 (15,000 x Rs. 64)	11,25,000 (22,500 x Rs. 50)	23,85,000
Less: Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000
Gross Profit	1,44,000	1,44,000	1,44,000	4,32,000

Working Notes:

1. Total production of three products for the year 2019-2020

Products	Quantity sold in litres	Quantity of closing inventory in litres	Total production	Closing inventory percentage (%)
(1)	**(2)**	**(3)**	**(4) = [(2) + (3)}**	**(5) = (3)/ (4)**
X	10,000	5,000	15,000	100/3
Y	15,000	--	15,000	--
Z	22,500	7,500	30,000	25

2. Joint cost apportioned to each product:

$= \frac{\text{Total Joint Cost}}{\text{Total net realisable value}} \times$ Net Realisable value of each product

Joint cost of product X = $\frac{\text{Rs. } 5,98,000}{\text{Rs. } 11,50,000} \times$ Rs. 4, 50,000 = Rs. 2, 34,000

Joint cost of product Y = $\frac{\text{Rs. } 5,98,000}{\text{Rs. } 11,50,000} \times$ Rs. 3, 00,000 = Rs. 1, 56,000

Joint cost of product Z = $\frac{\text{Rs. } 5,98,000}{\text{Rs. } 11,50,000} \times$ Rs. 4, 00,000 = Rs. 2, 08,000

Question 3

DISTINGUISH between Joint products and By-products.

(Study Material)

Answer 3

MEANING OF JOINT PRODUCTS AND BY PRODUCTS

Agricultural product industries, chemical process industries, sugar industries, and extractive industries are some of the industries where two or more products of equal or unequal importance are produced either simultaneously or in the course of processing operation of a main product.

In all such industries, the management is faced with the problems such as, valuation of inventory, pricing of product and income determination, problem of taking decision in matters of further processing of by-products and/or joint products after a certain stage etc. In fact, the various problems relate to

(i) apportionment of common costs incurred for various products and

(ii) Aspects other than mere apportionment of costs incurred up to the point of separation.

Before taking up the above problems, we first define the various necessary concepts.

(i) Joint Products - Joint products represent "two or more products separated in the course of the same processing operation usually requiring further processing, each product being in such proportion that no single product can be designated as a major product".

In other words, two or more products of equal importance, produced, simultaneously from the same process, with each having a significant relative sale value are known as joint products. For example, in the oil industry, gasoline, fuel oil, lubricants, paraffin, coal tar, asphalt and kerosene are all produced from crude petroleum. These are known as joint products.

(ii) By-Products - These are defined as "products recovered from material discarded in a main process, or from the production of some major products, where the material value is to be considered at the time of severance from the main product." So in a nutshell By product is a product which is recovered incidentally from the material used in the manufacture of main or desired products, such a by-product having either a net realizable value or a usable value which is relatively insignificant in comparison with the saleable value of the main or desired products. By-product may be further processed to increase their realizable value Thus by-products emerge as a result of processing operation of another product or they are produced from the scrap or waste of materials of a process. In short a by-product is a secondary or subsidiary product which emanates as a result of manufacture of the main product.

The point at which they are separated from the main product or products is known as split-off point. The expenses of processing are joint till the split –off point.

Split of Point – this is a point in a production process where joint products emerging from the process gets separately identifiable.

Split of Point has its importance in the joint product costing as joint cost incurred up to this point only and needs to be borne jointly by the products emerging from the common process.

Any cost incurred after Split of Point is a product specific cost and to be borne by the product concerned.

Examples of by-products are molasses in the manufacture of sugar, tar, ammonia and benzole obtained on carbonisation of coal and glycerin obtained in the manufacture of soap.

Distinction between Joint-Product and By-Product - The main points of distinction as apparent from the definitions of Joint Products and By-Products are:

(a) Joint products are of equal importance whereas by-products are of small economic value.

(b) Joint products are produced simultaneously but the by-products are produced incidentally in addition to the main products.

(iii) Co-Products - Joint products and co-products are used synonymously in common parlance, but strictly speaking a distinction can be made between two. Co-products may be

defined as two or more products which are contemporary but do not emerge necessarily from the same material in the same process. For instance, wheat and gram produced in two separate farms with separate processing of cultivation are the co-products. Similarly, timber boards made from different trees are co-products.

Question 4

DISCUSS the treatment of byproduct cost in Cost Accounting.

(Study Material)

Answer 4

TREATMENT OF BY-PRODUCT COST IN COST ACCOUNTING

By-product cost can be dealt in cost accounting in the following ways:

(a) When they are of small total value: When the by-products are of small total value, the amount realised from their sale may be dealt in any one the following two ways:

1. The sales value of the by-products may be credited to the Costing Profit and Loss Account and no credit be given in the Cost Accounts. The credit to the Costing Profit and Loss Account here is treated either as miscellaneous income or as additional sales revenue.

2. The sale proceeds of the by-product may be treated as deductions from the total costs. The sale proceeds in fact should be deducted either from the production cost or from the cost of sales.

(b) When the by-products are of considerable total value: Where by-products are of considerable total value, they may be regarded as joint products rather than as by-products. To determine exact cost of by-products the costs incurred up to the point of separation, should be apportioned over by-products and joint products by using a logical basis. In this case, the joint costs may be divided over joint products and by-products by using relative market values; physical output method (at the point of split off) or ultimate selling prices (if sold).

(c) Where they require further processing: In this case, the net realisable value of the by-product at the split-off point may be arrived at by subtracting the further processing cost from the realisable value of by-products.

If total sales value of by-products at split-off point is small, it may be treated as per the provisions discussed above under (a).

In the contrary case, the amount realised from the sale of by-products will be considerable and thus it may be treated as discussed under (b).

Question 5

Which of the following is an example of by-product

(a) Diesel and Petrol in an oil refinery

(b) Edible oils and oil cakes

(c) Curd and butter in a dairy

(d) Mustard seeds and mustard oil.

(Study Material)

Ans: (b) Edible oils and oil cakes

Reason:

A by-product is a secondary product generated in the production process of a primary product. In this case, edible oils are the primary product extracted from seeds, and oil cakes (a residue) are the by-product formed during the oil extraction process. The oil cakes are not the main objective of the process but are still produced as part of the oil extraction.

(a) Diesel and Petrol in an oil refinery: Both are primary products produced from crude oil.

(c) Curd and butter in a dairy: Both are primary products in dairy production.

(d) Mustard seeds and mustard oil: Mustard oil is the primary product, and mustard seeds are raw materials, not by-products.

Topic 2 Methods of Apportionment of Joint Costs

Question 6

How apportionment of joint costs up-to the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? DISCUSS.

(MTP Nov '21, RTP May '21)

Answer 6

Apportionment of Joint Cost amongst Joint Products using:

Market value at the point of separation: This method is used for apportionment of joint costs to joint products up to the split off point. It is difficult to apply if the market value of the product at the point of separation is not available. It is useful method where further processing costs are incurred disproportionately.

Net realizable value Method: From the sales value of joint products (at finished stage) the followings are deducted:

- Estimated profit margins
- Selling & distribution expenses, if any
- Post- split off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

Question 7

DESCRIBE briefly, how joint costs upto the point of separation may be apportioned amongst the joint products under the following methods:

(i) Average unit cost method

(ii) Contribution margin method

(iii) Market value at the point of separation

(iv) Market value after further processing

(v) Net realizable value method.

(Study Material)

Answer 7

METHODS OF APPORTIONMENT OF JOINT COST TO JOINT PRODUCTS

Proper apportionment of joint cost over the joint products is of considerable importance, as this affects (a) Valuation of closing inventory; (b) Pricing of products; and (c) Profit or loss on the sale of different products. As the relations between materials, processes and joint products are complex and unobservable, there is no way to determine the cost of the different production factors used in the processes for the production of each of the joint products. Therefore, the costs incurred in the manufacture of each of the joint products cannot be correctly identified. It can only be apportioned to the joint products by using some rational methods.

The commonly used methods for apportioning total process costs upto the point of separation over the joint products are as follows:

(i) Physical Units Method

(ii) Net Realisable Value at split-off point

(iii) Using Technical Estimates

Some other methods, which managers may also use for making decisions are:

(i) Market value at the point of separation

(ii) Market value after further processing

(iii) Average unit cost method

(iv) Contribution margin method

(i) Physical Unit Method: This method is based on the assumption that the joint products are capable of being measured in the same units. Accordingly, joint costs here are apportioned on the basis of some physical base, such as weight, numbers etc. In other words, the basis used for apportioning joint cost over the joint products is the physical volume the joint products at the point of separation. Any loss arises during the joint production process is also apportioned over the products on the same basis.. In situation where physical units are different, the joint products must be converted to a common unit of measurement. In case, the same cannot be converted to a common unit of measurement, this method cannot be applied. The main defect of this method is that it gives equal importance and value to all the joint products.

This method of apportioning is mostly followed when sale price of all the products is uniform.

(ii) Net Realisable Value at Split-off Point Method: To arrive at the sales value at the split-off point, following are deducted from the sales value of joint products at final stage i.e. after processing:

(i) Directly attributable Selling and distribution expenses like freight, royalty, commission, etc. and

(ii) Post split- off processing cost.

This method has advantage as relative sales value serves as a proxy for relative benefit received by each product from the joint cost. When selling prices for all products exist at split off, the sales value at split off method is the preferred technique. It is a relatively simple technique that depends on a common basis for cost allocation – revenues

The resultant figure so obtained is known as net realisable value of joint products. Joint costs are apportioned in the ratio of net realisable value.

The net realisable value at split-off point method is widely used in the industries.

This method is used when the realisable value of joint products at split –off is not known.

(iii) Using Technical Estimates: This method uses technical estimates to apportion the joint costs over the joint products. This method is used when the result obtained by the above methods does not match with the resources consumed by joint products or the realisable value of the joint products are not readily available.

Other Methods

The followings are the methods which are used by management for taking managerial decisions:

(i) Market value at the point of separation: This method is used for the apportionment of joint costs to joint products up to the split off point. It is difficult to apply this method if the market value of the products at the point of separation is not available. It is a useful method when the realisable value of joint products at split-off (point of separation) is known and where further processing costs are incurred disproportionately.

To determine the apportionment of joint costs over joint products, a factor known as multiplying factor is determined. This multiplying factor on multiplication with the sales values of each joint product gives rise to the proportion of joint cost.

Multiply in factor: $\frac{\text{Joint Cost}}{\text{Total Sales Revenue}}$x100

Total Sales Revenue is sum of production quantity multiplied by the market price for each of the joint products.

(ii) Market value after further processing: Here the basis of apportionment of joint cost is the total sales value of finished products and involves the same principle as discussed above.

The use of this method is unfair where further processing costs after the point of separation are disproportionate or when all the joint products are not subjected to further processing. The net realisable value method which is discussed as above overcomes the shortcoming of this method.

(iii) Average Unit Cost Method: Under this method, total process cost (upto the point of separation) is divided by total units of joint products produced. On division average cost per unit of production is obtained.

Average unit cost = Total process cost (upto the point of separation) ÷ Total units of joint product produced.

This is a simple method. The effect of application of this method is that all joint products will have uniform cost per unit. If this method is used as the basis for price fixation, then all the products may have more or less the same price. Under this method customers of high quality items are benefitted as they have to pay less price on their purchase.

(iv) Contribution Margin Method: According to this method, joint costs are segregated into two parts - variable and fixed. The variable costs are apportioned over the joint products on the basis of units produced (average method) or physical quantities. In case the products are further processed after the point of separation, then all variable cost incurred be added to the variable costs determined earlier. In this way total variable cost is arrived which is deducted from their respective sales values to ascertain their contribution. The fixed costs are then apportioned over the joint products on the basis of the contribution ratios.

Question 8

NN Manufacturing Company uses joint production process that produces three products at the split off point. Joint productions costs during September were Rs. 8, 40,000. Product information for September was as follows:

Particulars	Product A	Product B	Product C

Units produced	**1,500**	**3,000**	**4,500**
Units sold	**2,000**	**6,000**	**7,500**
Sales prices:			
At the split-off	**Rs. 100**		
After further processing	**Rs. 150**	**Rs. 175**	**Rs. 50**
Costs to process after split-off	**Rs. 1,50,000**	**Rs. 1,50,000**	**Rs. 1,50,000**

Assume that product C is treated as a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Assume also that Product B&C must be processed further before they can be sold. FIND OUT the total cost of Product A in September if joint cost allocation is based on net realizable values?

(Study Material)

Answer 8

Product A can be sold at the split-off point, because the question says that "Products B and C must be processed further before they can be sold." Since product A is not included in that, we know that Product A can be sold at the split-off point. Furthermore, the cost to process Product A after the split-off point is Rs.150, 000, whereas the additional revenue to be earned by processing it further is only Rs.75, 000 (Rs.50 increase in selling price per unit multiplied by the 1,500 units produced during September). Therefore, Product A will not be processed further, and we use the sales value at split-off for A for allocating the joint costs. The sales value at the split-off for A is Rs. 100 × 1,500 units, or Rs.1, 50,000.

Since Product B must be processed further, we use its net realizable value for the joint cost allocation. The net realizable value of Product B is Rs.3, 75,000 [(Rs.175 selling price after further processing × 3,000 units produced) – Rs.1, 50,000 in further processing costs].

Product C, the by-product, must also be processed further to be sold. The net realizable value of Product C is Rs. 75,000 [(Rs. 50 sales price after further processing × 4,500 units produced) – Rs. 1, 50,000 in further processing costs].

Joint production costs total Rs. 8, 40,000. Since the by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated are Rs. 7, 65,000 (Rs. 8, 40,000 minus the Rs. 75,000 NRV of Product C), to be allocated between Product A (sales value Rs. 1, 50,000) and Product B (net realizable value Rs. 3, 75,000). So, the total on which the allocation of the joint costs is based is Rs. 1, 50,000 + 3, 75,000 = Rs. 5, 25,000. Product A represents 28.571% of the total (Rs. 1, 50,000 ÷ Rs. 5, 25,000).

Since Product A has no further processing costs, the total cost of Product A is equal to its allocated joint costs, which are 28.571% of the net joint costs of Rs. 7, 65,000, or Rs. 2, 18,568.

Question 9

Method of apportioning joint costs on the basis of output of each joint product at the point of split off is:

(a) Sales value method

(b) Physical unit method

(c) Average cost method

(d) Marginal cost and contribution method

(Study Material)

Ans: (b) Physical unit method

Reason:

The Physical unit method is a method of apportioning joint costs based on the output of each joint product at the point of split-off. In this method, the total joint costs are allocated to the

joint products based on their physical quantities (e.g., weight, volume, or number of units) produced, without considering the sales value or profitability of each product.

(a) Sales value method: Allocates joint costs based on the relative sales value of each product at the point of split-off.

(c) Average cost method: This is not a common method in joint cost allocation. It typically refers to averaging total costs over units produced, not specifically for joint products.

(d) Marginal cost and contribution method: Focuses on assessing costs and profitability, but it is not directly related to joint cost apportionment at the point of split-off.

Question 10

In the Net realizable value method, for apportioning joint costs over the joint products, the basis of apportionment would be:

(a) Selling price per unit of each of the joint products

(b) Selling price multiplied by units sold of each of the joint products

(c) Sales value of each joint product less further processing costs of individual products

(d) Both (b) and (c)

(Study Material)

Ans: (d) Both (b) and (c)

Reason:

The Net realizable value (NRV) method for apportioning joint costs is based on the sales value of each joint product after subtracting any further processing costs incurred after the split-off point.

(b) Selling price multiplied by units sold: This is used in the NRV method to determine the total sales value of each joint product.

(c) Sales value of each joint product less further processing costs: This represents the actual net realizable value of each product after accounting for any additional costs beyond the split-off point.

Thus, the correct basis for apportioning joint costs is both (b) and (c). The method uses the net realizable value, which considers both the selling price and the costs required to bring the product to market.

Question 11

Under net realizable value method of apportioning joint costs to joint products, the selling & distribution cost is:

(a) Added to joint cost

(b) Deducted from further processing cost

(c) Deducted from sales value

(d) Ignored

(Study Material)

Ans: (c) Deducted from sales value

Reason:

Under the Net Realizable Value (NRV) method of apportioning joint costs, the selling and distribution costs are deducted from the sales value of each joint product. This is because these costs are incurred after the product reaches the market and are considered part of the expenses associated with realizing the value of the product. Only the net realizable value,

which is the selling price minus any further processing and selling/distribution costs, is used to allocate the joint costs.

Thus, selling and distribution costs are subtracted from the sales value to determine the NRV.

Question 12

Which of following method can be used when the joint products are of unequal quantity and used for captive consumption:

(a) Technical estimates, using market value of similar goods

(b) Net Realisable value method

(c) Physical Units method

(d) Market value at split-off method.

(Study Material)

Ans: (a) Technical estimates, using market value of similar goods

Reason:

When joint products are of unequal quantity and are used for captive consumption (i.e., not sold on the market), the Net Realizable Value (NRV) or other methods based on market sales value may not be applicable. In such cases, technical estimates based on the market value of similar goods can be used to allocate joint costs. This involves estimating the value of the products based on comparable goods in the market, even if the joint products aren't sold directly.

(b) Net Realizable Value method: This method is more suitable when products are sold and their sales value can be easily determined.

(c) Physical Units method: This method is used when products are homogeneous and measured in physical units, not applicable for unequal quantities.

(d) Market value at split-off method: This method applies when joint products are sold at the split-off point, which doesn't fit well when they are for captive consumption.

Thus, the most suitable method in this case is technical estimates based on market values of similar goods.

Question 13

Which of the following statement is not correct in relation to Co-products:

(a) Co-products may also have joint products

(b) Costing for co-products are done according to process costing method

(c) Co-products do not have any by-products

(d) Co-products are treated as a separate cost object for costing purpose.

(Study Material)

Ans: (c) Co-products do not have any by-products

Reason:

Co-products are products that are produced simultaneously in a joint production process, and they are considered main products with significant value. They are treated as separate cost objects for costing purposes.

(a) Co-products may have joint products, as joint products and co-products can be part of the same process but may have different levels of importance or cost allocation.

(b) The costing for co-products is generally done according to process costing, as they are produced through a continuous process and may require cost allocation to each product.

(d) Co-products are treated as separate cost objects for costing purposes, meaning they are individually costed and tracked, unlike by-products.

(c) is incorrect because co-products can indeed have by-products. By-products are secondary products that are produced incidentally in the process, and they may occur alongside co-products. By-products typically have lower value than co-products but are still produced and may require cost allocation.

Question 14

In a company's production process, two joint products, A and B, are created simultaneously. The company operates in the manufacturing sector, focusing on producing goods that require multiple stages of production, often resulting in the creation of joint products that share common production costs up until a certain split-off point. For the last month, the following information is provided relating to the inventory and sales:

Product	Sales (units)	Finished Goods (units)	
		Opening stock	Closing stock
A	1,14,000	1,900	5,700
B	76,000	7,600	3,800

Joint production costs for the last month amounted to Rs.20, 90,000. These costs were allocated between both the joint products, A and B, based on the number of units produced. This method of apportioning costs ensures that each product is fairly charged for its share of the overall production expenses.

CALCULATE the joint production costs apportioned to product A for last month?

(a) Rs.12, 12,200

(b) Rs.12, 54,000

(c) Rs.12, 95,800

(d) Rs.13, 58,500

(RTP Sep. 2025)

Ans: (c) Rs.12, 95,800

Product	**Sales (units)**	**Finished Goods (units)**		**Production (units) (D) = (A) + (C) - (B)**
	(A)	**Opening stock (B)**	**Closing stock (C)**	
A	1,14,000	1,900	5,700	1,17,800
B	76,000	7,600	3,800	72,200
Total				1,90,000

Apportioned to A = $\left(\frac{1,17,800 \text{ units}}{1,90,000 \text{ units}} \times \text{Rs. } 20,90,000\right)$ = 12, 95,800

Topic 3 Profitability & Decision Making (Sell at Split-off or Process Further)

Question 15

A factory produces two products, 'Ghee' and 'Cream' from a single process. The joint processing costs during a particular month are:

Direct Material	**Rs. 60000**

Direct Labour	**Rs. 19200**
Variable Overheads	**Rs. 24000**
Fixed Overheads	**Rs. 64000**

Sales: Ghee - 200 litre @ Rs. 600 per litre; Cream – 240 litre @ Rs. 200 per litre. REQUIRED:

I. Apportion joints costs on the basis of:

(i) Physical Quantity of each product.

(ii) Contribution Margin method, and

II. Determine Profit or Loss under both the methods.

(MTP Oct.'21, PYP Nov '19)

Answer 15

Total Joint Cost

Particulars	**Amount (Rs.)**
Direct Material	60,000
Direct Labour	19,200
Variable Overheads	24,000
Total Variable Cost	1,03,200
Fixed Overheads	64,000

Total joint cost	1,67,200

Apportionment of Joint Costs:

			Product-Ghee	**Product-Cream**
I.	(i)	Apportionment of Joint Cost on the basis of 'Physical Quantity'	Rs. 76,000 (Rs. 1,67, 200 /200+240 litre × 200)	Rs. 91,200 (Rs. 1,67,200 /200+240 litre× 240)
	(ii)	Apportionment of Joint Cost on the basis of 'Contribution Margin Method':		
		- Variable Costs (on basis of physical units)	Rs. 46,909 (Rs. 1,03,200 /200+240 litre × 200)	Rs. 56,291 (Rs. 1,03,200 /200+240 litre × 240)
		Contribution Margin	73,091(Rs.600×200– 46,909)	-8,291 (Rs.200×240 – 56,291)
		Fixed Costs*	Rs. 64,000	
		Total apportioned cost	Rs. 1,10,909	Rs. 56,291
II.	(iii)	Profit or Loss:		
	When Joint cost apportioned on basis of physical units			
	A.	Sales Value	Rs. 1,20,000	Rs. 48,000

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	B.	Apportioned joint cost on basis of 'Physical Quantity':	Rs. 76,000	Rs. 91,200
	A-B	Profit or (Loss)	44,000	(43,200)
	When Joint cost apportioned on basis of 'Contribution Margin Method'			
	C	Apportioned joint cost on basis of 'Contribution Margin Method'	Rs. 1,10,909	Rs. 56,291
	A-C	Profit or (Loss)	Rs. 9,091	Rs. (8,291)

* The fixed cost of Rs. 64,000 is to be apportioned over the joint products- Ghee and Cream in the ratio of their contribution margin but contribution margin of Product- Cream is Negative so fixed cost will be charged to Product- Ghee only.

Important Note:-

This was a numerical problem from the topic 'Joint products and by-products'. The question required apportionment of joint cost on the basis of physical quantity method and contribution margin method. Performance of the examinees was average.

Question 16

A company produces two joint products A and B from the same basic materials. The processing is completed in three departments. Materials are mixed in Department I. At the end of this process, A and B get separated. After separation, A is completed in the Department II and B in Department III. During a period, 4,00,000 kg of raw material was processed in Department I at a total cost of Rs. 17,50,000, and the resultant 50% becomes A and 40% becomes B and 10% normally lost in processing. In Department II, 1/5th of the

quantity received from Department I is lost in processing. A is further processed in Department II at a cost of Rs. 2, 60,000.

In Department III, further new material is added to the material received from Department I and weight mixture is doubled, there is no quantity loss in the department III. Further processing cost (with material cost) in Department III is Rs. 3, 00,000.

The details of sales during the said period are:

	Product A	Product B
Quantity sold (kg)	1,50,000	3,00,000
Sales price per kg (Rs.)	10	4

There were no opening stocks. If these products sold at split-off-point, the selling price of A and B would be Rs. 8 and Rs. 4 per kg respectively.

Required:

(i) PREPARE a statement showing the apportionment of joint cost to A and B in proportion of sales value at split off point.

(ii) PREPARE a statement showing the cost per kg of each product indicating joint cost, processing cost and total cost separately.

(iii) PREPARE a statement showing the product wise profit for the year.

(iv) On the basis of profits before and after further processing of product A and B, give your COMMENT that products should be further processed or not.

(RTP Nov '21)

Answer 16

(i) Calculation of quantity produced

	Dept. I (kg)	Dept. II (kg)	Dept. III (kg)
Input	4,00,000	2, 00,000 (50% of 4, 00,000 kg.)	1, 60,000 (40% of 4, 00,000 kg.)
Weight (lost) or added	(40,000) (10% of 4, 00,000 kg.)	(40,000) (1/5th of 2, 00,000kg.)	1,60,000
	3,60,000	1,60,000	3,20,000
Production of A	2,00,000	1,60,000	--
Production of B	1,60,000	--	3,20,000

(ii) Statement of apportionment of joint cost of dept. I

	Product A	Product B
Output (kg)	2,00,000	1,60,000
Selling price per kg (Rs.)	8	4
Sales value (Rs.)	16,00,000	6,40,000
Share in Joint cost (5:2)	12,50,000 (Rs. 17,50,000 × 5 ÷ 7)	5,00,000 (Rs. 17,50,000 × 2 ÷ 7)

(iii) Statement of cost per kg

	Product A	Product B

Output (kg)	1,60,000	3,20,000
Share in joint cost (Rs.)	12,50,000	5,00,000
Joint Cost per kg (Rs.) (A)	7.8125	1.5625
Further processing cost (Rs.)	2,60,000	3,00,000
Further processing cost per kg (Rs.) (B)	1.625	0.9375
Total cost per kg (Rs.) {(A)+(B)}	9.4375	2.5000

(iv) Statement of profit

	Product A	**Product B**
Output (kg)	1,60,000	3,20,000
Sales (kg)	(1,50,000)	(3,00,000)
Closing stock (kg)	10,000	20,000
	(Rs.)	(Rs.)
Sales	15,00,000 (1,50,000 kg × Rs. 10)	12,00,000(3,00,000 kg × Rs. 4)
Add: closing stock (at full cost)	94,375 (10,000 kg × Rs. 9.4375)	50,000 (20,000 kg × Rs. 2.5)
Value of production	15,94,375	12,50,000

Less: Share in joint cost	12,50,000	5,00,000
Further processing cost	2,60,000	3,00,000
Profit	84,375	4,50,000

(v) Profitability statement before and after processing

	Product A		**Product B**	
	Before (Rs.)	**After (Rs.)**	**Before (Rs.)**	**After (Rs.)**
Sales Value	16,00,000		6,40,000	
Share in joint costs	12,50,000		5,00,000	
Profit	3,50,000	84,375 (as per iii above)	1,40,000	4,50,000 (as per iii above)

Product A should be sold at split off point and product B after processing because of higher profitability.

Question 17

RST Limited produces three joint products X, Y and Z. The products are processed further. Preseparation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for the month of April, 2022.

Cost incurred up to separation point: Rs. 10,000

	Product X	**Product Y**	**Product Z**

	Rs.	Rs.	Rs.
Output (in Litre)	**100**	**70**	**80**
Cost incurred after separation point	**2,000**	**1,200**	**800**
Selling Price per Litre:			
After further processing	**50**	**80**	**60**
At pre-separation point (estimated)	**25**	**70**	**45**

You are required to:

Prepare a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.

Advise the management whether, on purely financial consideration, the three products are to be processed further or not.

(PYP May22)

Answer 17

Statement showing profit/loss by each product after further processing products

	Product X (in Rs.)	Product Y (in Rs.)	Product Z (in Rs.)
Sales value after further processing	5,000	5,600	4,800

Less: Further processing cost	2,000	1,200	800
Less: Joint Cost* (as apportioned)	4,000	2,800	3,200
Profit/(loss)	(1,000)	1,600	800

* Statement showing apportionment of joint cost on the basis of physical units

	Product X (in Rs.)	**Product Y (in Rs.)**	**Product Z (in Rs.)**	**Total (Rs.)**
Output (in litre)	100	70	80	250
Weight	0.4 (100/250)	0.28 (70/250)	0.32 (80/250)	
Joint cost apportioned	4,000	2,800	3,200	

(ii) Decision whether to process further or not

	Product X (in Rs.)	**Product Y (in Rs.)**	**Product Z (in Rs.)**
Incremental Revenue	2,500 [(50-25) × 100]	700 [(80-70) × 70]	1,200 [(60-45) × 80]
Less: Further processing cost	2,000	1,200	800
Incremental profit /(loss)	500	(500)	400

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	Product X (in Rs.)	Product Y (in Rs.)	Product Z (in Rs.)	Total
Sales	2500	4900	3600	11000
Pre separation costs	4000	2800	3200	10000
Profit/(Loss)	(1500)	2100	400	1000

It is advisable to further process only product X and Z and to sale product Y at the point of separation.

Question 18

ASR Ltd mainly produces Product 'L' and gets a by-Product 'M' out of a joint process. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main product. During the month of October 2022, company incurred joint production costs of Rs. 4, 00,000. The main Product 'L' is not marketable at the split off point. Thus, it has to be processed further. Details of company's operation are as under:

Particulars	Product L	By- Product M
Production (units)	10,000	200
Selling price per kg	Rs. 45	Rs. 5
Further processing cost	Rs. 1,01,000	-

You are required to find out:

(i) Profit earned from Product 'L'.

(ii) Selling price per kg of product 'L', if the company wishes to earn a profit of Rs. 1, 00,000 from the above production.

(PYP Nov 22)

Answer 18

(i) Calculation of profit on product 'L'

Particular	Rs.
Sales	4,50,000
Less: Further processing cost	(1,01,000)
	3,49,000
Less: Joint Production Cost*	(3,99,000)
loss	(50,000)

*Joint Production Cost = [4, 00,000 – (200 × 5)] = 3, 99,000

(ii) Calculation of desired selling price of product 'L'

Desired Selling Price = $\frac{\text{Desired Profit+Total cost}}{\text{Units Measured}}$

= $\frac{1,00,000+1,01,000+3,99,000}{10,000}$ = Rs. 60 per kg.

Question 19

Sun-moon Ltd. produces and sells the following products:

Products	Units	Selling price at split-off point (Rs.)	Selling price after further processing (Rs.)
A	2,00,000	17	25
B	30,000	13	17
C	25,000	8	12
D	20,000	10	-
E	75,000	14	20

Raw material costs Rs.35,90,000 and other manufacturing expenses cost Rs.5,47,000 in the manufacturing process which are absorbed on the products on the basis of their 'Net realizable value'. The further processing costs of A, B, C and E are Rs. 12, 50,000; Rs. 1, 50,000; Rs. 50,000 and Rs. 1, 50,000 respectively. Fixed costs are Rs. 4, 73,000.

You are required to PREPARE the following in respect of the coming year:

(a) Statement showing income forecast of the company assuming that none of its products are to be further processed.

(b) Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

Can you suggest any other production plan whereby the company can maximize its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

(Study Material)

Answer 19

Working Note: Apportionment of joint costs on the basis of Net Realizable Value method

Products	Sales Value (Rs.)	Post separation Cost (Rs.)	Net Realisable Value (Rs.)	Apportioned Cost (Rs.)
A	50,00,000 (2,00,000 units × Rs. 25)	12,50,000	37,50,000	26,25,000
B	5,10,000 (30,000 units × Rs.17)	1,50,000	3,60,000	2,52,000
C	3,00,000 (25,000 units × Rs. 12)	50,000	2,50,000	1,75,000
D	2,00,000 (20,000 units × Rs. 10)	—	2,00,000	1,40,000
E	15,00,000 (75,000 units × Rs. 20)	1,50,000	13,50,000	9,45,000
			59,10,000	41,37,000

Total joint cost = Raw material costs + Manufacturing expenses

= Rs.35, 90,000 + Rs.5, 47,000 = Rs. 41, 37,000

Apportioned joint cost

$$=\frac{\text{Total joint cost}}{\text{Total net realisable value}} \times \text{Net realizable value of each product}$$

Apportioned joint cost for Product A

$$=\frac{\text{Rs.41,37,000}}{\text{Rs.59,10,000}} \times \text{Rs. 37, 50,000} = \text{Rs.26, 25,000}$$

Similarly, the apportioned joint cost for products B, C, D and E are Rs.2, 52,000, Rs.1, 75,000, Rs.1, 40,000 and Rs.9, 45,000 respectively.

(a) Statement showing income forecast of the company assuming that none of its products are further processed

	Products					
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**	**Total (Rs.)**
Sales revenue	34,00,000 (Rs.17× 2,00,000)	3,90,000 (Rs.13 × 30,000)	2,00,000 (Rs.8 × 25,000)	2,00,000 (Rs.10 × 20,000)	10,50,000 (Rs.14 × 75,000)	52,40,000
Less: Apportioned Costs (Refer Working note)	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
	7,75,000	1,38,000	25,000	60,000	1,05,000	11,03,000
Less: Fixed Cost						4,73,000
Profit						6,30,000

(b) Statement showing income forecast of the company: assuming that products A, B, C and E are further processed (Refer to working note)

	Products					
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**	**Total (Rs.)**
A. Sales revenue	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000	75,10,000
B. Apportioned Costs	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000

C. Further processing cost	12,50,000	1,50,000	50,000	-	1,50,000	16,00,000
D. Total processing cost (B+ C)	38,75,000	4,02,000	2,25,000	1,40,000	10,95,000	57,37,000
E. Excess of sales revenue (A-D)	11,25,000	1,08,000	75,000	60,000	4,05,000	17,73,000
F. Fixed Cost						4,73,000
G. Profit (E - F)						13,00,000

Suggested production plan for maximising profits:

On comparing the figures of excess of revenue over cost of manufacturing in the above statements one observes that the concern is earning more after further processing of A, C and E products but is loosing a sum of Rs.30,000 in the case of product B (if it is processed further). Hence the best production plan will be to sell A, C and E after further processing and B and D at the point of split off. The profit statement based on this suggested production plan is as below:

Profit statement based on suggested production plan

	Products					
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**	**Total (Rs.)**

A. Sales revenue	50,00,000	3,90,000	3,00,000	2,00,000	15,00,000	73,90,000
B. Apportioned Costs	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
C. Further processing cost	12,50,000	-	50,000	-	1,50,000	14,50,000
D. Total processing cost (B+ C)	38,75,000	2,52,000	2,25,000	1,40,000	10,95,000	55,87,000
E. Excess of sales revenue (A-D)	11,25,000	1,38,000	75,000	60,000	4,05,000	18,03,000
F. Fixed Cost						4,73,000
G. Profit (E - F)						13,30,000

Hence the profit of the company has increased by Rs.30,000.

Question 20

'Buttery Butter' is engaged in the production of Buttermilk, Butter and Ghee. It purchases processed cream and let it through the process of churning until it separates into buttermilk and butter. For the month of January, 'Buttery Butter' purchased 50 Kiloliter processed cream @ Rs. 100 per 1000 ml. Conversion cost of Rs.1,00,000 were incurred up-to the split

off point, where two saleable products were produced i.e. buttermilk and butter. Butter can be further processed into Ghee.

The January production and sales information is as follows:

Products	Production (in Kilolitre/tonne)	Sales Quantity (in Kilolitre/tonne)	Selling price per Litre/Kg (Rs.)
Buttermilk	28	28	30
Butter	20	—	—
Ghee	16	16	480

All 20 tonne of butter were further processed at an incremental cost of Rs. 1, 20,000 to yield 16 Kilolitre of Ghee. There was no opening or closing inventories of buttermilk, butter or ghee in the month of January.

Required:

(i) SHOW how joint cost would be apportioned between Buttermilk and Butter under Estimated Net Realizable Value method.

(ii) 'Healthy Bones' offers to purchase 20 tonne of butter in February at Rs. 360 per kg. In case 'Buttery Butter' accepts this offer, no Ghee would be produced in February. SUGGEST whether 'Buttery Butter' shall accept the offer affecting its operating income or further process butter to make Ghee itself?

(Study Material)

Answer 20

(i) Estimated Net Realisable Value Method:

	Buttermilk Amount (Rs.)	Butter Amount (Rs.)

Sales Value	8,40,000 (Rs. 30 × 28 × 1000)	76, 80,000 (Rs. 480 × 16 × 1000)
Less: Post split-off cost (Further processing cost)	-	(1,20,000)
Net Realisable Value	8,40,000	75,60,000
Apportionment of Joint Cost of Rs. 51,00,000* in ratio of 1:9	5,10,000	45,90,000

* [(Rs. 100 × 50 × 1000) + Rs. 1, 00,000] = Rs. 51, 00,000

(ii) Incremental revenue from further processing of Butter into Ghee

(Rs. 480 × 16 × 1000 - Rs. 360 × 20 × 1000)	Rs. 4,80,000
Less: Incremental cost of further processing of Butter into Ghee	Rs. 1,20,000
Incremental operating income from further processing	Rs. 3,60,000

The operating income of 'Buttery Butter' will be reduced by Rs. 3,60,000 in February if it sells 20 tonne of Butter to 'Healthy Bones', instead of further processing of Butter into Ghee for sale. Thus, 'Buttery Butter' is advised not to accept the offer and further process butter to make Ghee itself.

Question 21

RST Limited produces three joint products X, Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for a particular month:

Cost incurred up to separation point: Rs. 10,000

	Product X	Product Y	Product Z
Output (in Litre)	**100**	**70**	**80**
	Rs.	**Rs.**	**Rs.**
Cost incurred after separation point	**2,000**	**1,200**	**800**
Selling Price per Litre:			
After further processing	**50**	**80**	**60**
At pre-separation point (estimated)	**25**	**70**	**45**

You are required to:

(i) PREPARE a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.

(ii) ADVISE the management whether, on purely financial consideration, the three products are to be processed further or not.

(Study Material)

Answer 21

(i) Statement showing profit/loss by each product after further processing products

	Product X (in Rs.)	Product Y (in Rs.)	Product Z (in Rs.)
Sales value after further processing	5,000	5,600	4,800

Less: Further processing cost	2,000	1,200	800
Less: Joint Cost* (as apportioned)	4,000	2,800	3,200
Profit/(loss)	(1,000)	1,600	800

* Statement showing apportionment of joint cost on the basis of physical units

	Product X (in Rs.)	**Product Y (in Rs.)**	**Product Z (in Rs.)**	**Total (Rs.)**
Output (in litre)	100	70	80	250
Weight	0.4 (100/250)	0.28 (70/250)	0.32 (80/250)	
Joint cost apportioned	4,000	2,800	3,200	

(ii) Decision whether to process further or not

	Product X (in Rs.)	**Product Y (in Rs.)**	**Product Z (in Rs.)**
Incremental Revenue	2,500 [(50-25) × 100]	700 [(80-70) × 70]	1,200 [(60-45) × 80]
Less: Further processing cost	2,000	1,200	800
Incremental profit /(loss)	**500**	**(500)**	**400**

	Product X (in Rs.)	Product Y (in Rs.)	Product Z (in Rs.)	Total
Sales	2500	4900	3600	11000
Pre separation costs	4000	2800	3200	10000
Profit/(Loss)	(1500)	2100	400	1000

It is advisable to further process only product X and Z and to sale product Y at the point of separation.

Question 22

OPR Ltd. purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the spilt-off point - S, P, N and A. Product 'A' is fully processed at the split-off point. Product S, P and N can be individually further refined into SK, PM, and NL respectively. The joint cost of purchasing the crude vegetable oil and processing it were Rs. 40,000 which is apportioned on the basis of Sales Value at split-off point. Other details are as follows:

Product	Further processing costs (Rs.)	Sales at split-off point (Rs.)	Sales after further processing (Rs.)
S	80,000	20,000	1,20,000
P	32,000	12,000	40,000
N	36,000	28,000	48,000
A	-	20,000	-

You are required to IDENTIFY the products which can be further processed for maximizing profits and make suitable suggestions.

Answer 22

Statement of Comparison of Profits before and after further processing

	S (Rs.)	P (Rs.)	N (Rs.)	A (Rs.)	Total (Rs.)
A. Sales at split off point	20,000	12,000	28,000	20,000	80,000
B. Apportioned Joint Costs (Refer Working Note)	**10,000**	**6,000**	**14,000**	**10,000**	40,000
C. **Profit at split-off point**	10,000	6,000	14,000	10,000	40,000
D. Sales after further processing	1,20,000	40,000	48,000	-	2,08,000
E. Further processing cost	80,000	32,000	36,000	-	1,48,000
F. Apportioned Joint Costs (Refer Working Note)	10,000	6,000	14,000	-	-
G. **Profit if further processing (D – E + F)**	**30000**	**2,000**	**(-) 2,000**	-	-
H. Increase/ decrease in profit after further processing (G-C)	20,000	- 4000	- 16,000	-	-

Suggested Product to be further processed for maximising profits:

On comparing the figures of "Profit if no further processing" and "Profits if further processing", one observes that OPR Ltd. is earning more after further processing of Product S only i.e. Rs. 20,000. Hence, for maximizing profits, only Product S should be further processed and Product P, N and A should be sold at split-off point.

Working Note:

Apportionment of joint costs on the basis of Sales Value at split-off point

Apportioned joint cost = $\frac{\text{Total Joint Cost}}{\text{Total Sales value at split} - \text{off point}}$ x Sales value of each product

Where,

Total Joint cost = Rs.40, 000

Total sales at split off point (S, P, N and A) = 20,000 + 12,000 + 28,000 + 20,000 = Rs. 80,000

Share of S in joint cost = $\frac{Rs.40,000}{Rs.80,000}$ × Rs.20,000= Rs.10,000

Share of P in joint cost = $\frac{Rs.40,000}{Rs.80,000}$ × Rs.12,000= Rs.6,000

Share of N in joint cost = $\frac{Rs.40,000}{Rs.80,000}$ × Rs.28,000= Rs.14,000

Share of A in joint cost = $\frac{Rs.40,000}{Rs.80,000}$ × Rs.20, 000= Rs.10, 000

Case Scenarios

Question 23

Pokémon Chocolates manufactures and distributes chocolate products. It purchases Cocoa beans and processes them into two intermediate products:

Chocolate powder liquor base

Milk-chocolate liquor base

These two intermediate products become separately identifiable at a single split off point. Every 500 pounds of cocoa beans yields 20 gallons of chocolate – powder liquor base and 30 gallons of milk-chocolate liquor base.

The chocolate powder liquor base is further processed into chocolate powder. Every 20 gallons of chocolate-powder liquor base yields 200 pounds of chocolate powder. The milk-

chocolate liquor base is further processed into milk-chocolate. Every 30 gallons of milk-chocolate liquor base yields 340 pounds of milk chocolate.

Production and sales data for October, 2023 are: Cocoa beans processed	**7,500 pounds**
Costs of processing Cocoa beans to split off point (including purchase of beans)	**Rs. 7,12,500**

	Production	**Sales**	**Selling price**
Chocolate powder	**3,000 pounds**	**3,000 pounds**	**Rs. 190 per pound**
Milk chocolate	**5,100 Pounds**	**5,100 Pounds**	**Rs. 237.50 per pound**

The October, 2023 separable costs of processing chocolate-powder liquor into chocolate powder are Rs. 3, 02,812.50. The October 2023 separable costs of processing milk-chocolate liquor base into milk-chocolate are Rs. 6, 23,437.50.

Pokémon full processes both of its intermediate products into chocolate powder or milk-chocolate. There is an active market for these intermediate products. In October, 2023, Pokemon could have sold the chocolate powder liquor base for Rs. 997.50 a gallon and the milk-chocolate liquor base for Rs. 1,235 a gallon. You are required to show how the joint cost of Rs. 7, 12,500 would be allocated between the chocolate powder and milk-chocolate liquor bases:

(Study Material)

(i) How much joint cost is allocated between the chocolate powder and milk-chocolate liquor bases respectively using Sales value at split off point?

(a) Rs.2, 22,656.25 and Rs.4, 89,843.75

(b) Rs.2, 49,375 and Rs.4, 63,125

(c) Rs.2, 21,587.50 and Rs.4, 90,912.50

(d) Rs.2, 85,000 and Rs.4, 27,500

Ans: (b) Rs.2,49,375 and Rs.4,63,125

Sales Value at Split-off Point Method

	Chocolate powder liquor base	**Milk chocolate liquor base**	**Total**
Sales value of products at split off	Rs.2,99,250*	Rs. 5,55,750**	Rs.8,55,000
Weights	0.35	0.65	1.00
Joint cost allocated	Rs. 2,49,375 (Rs.7,12,500 × 0.35)	Rs. 4,63,125 (Rs.7,12,500 × 0.65)	Rs. 7,12,500

*(3,000 lbs ÷ 200 lbs) × 20 gallon × Rs.997.50 = Rs. 2, 99,250

** (5,100 lbs ÷ 340 lbs) × 30 gallon × Rs.1, 235 = Rs. 5, 55,750

(ii) How much joint cost is allocated between the chocolate powder and milk-chocolate liquor bases respectively using Physical measure (gallons)?

(a) Rs. 2, 22,656.25 and Rs. 4, 89,843.75

(b) Rs. 2, 49,375 and Rs. 4, 63,125

(c) Rs. 2, 21,587.50 and Rs. 4, 90,912.50

(d) Rs. 2, 85,000 and Rs. 4, 27,500

Ans: (d) Rs. 2, 85,000 and Rs. 4, 27,500

Physical Measure Method

	Chocolate powder liquor base	**Milk chocolate liquor base**	**Total**
Output	300 gallon*	450 gallon**	750 gallons
Weight	300/750 = 0.40	450/750 = 0.60	1.00
Joint cost allocated	Rs. 2, 85,000 (Rs. 7,12,500 x 0.40)	Rs. 4, 27,500 (Rs. 7,12,500 x 0.60)	Rs. 7,12,500

*(3,000 lbs ÷ 200 lbs) × 20 gallon = 300 gallon

** (5,100 lbs ÷ 340 lbs) × 30 gallon = 450 gallon

(iii) How much joint cost is allocated between the chocolate powder and milk-chocolate liquor bases respectively using estimated net realizable value, (NRV)?

(a) Rs.2, 22,656.25 and Rs.4, 89,843.75

(b) Rs.2, 49,375 and Rs.4, 63,125

(c) Rs.2, 21,587.50 and Rs.4, 90,912.50

(d) Rs.2, 85,000 and Rs.4, 27,500

Ans: (a) Rs.2, 22,656.25 and Rs.4, 89,843.75

Net Realisable Value (NRV) Method

	Chocolate powder liquor base	**Milk chocolate liquor base**	**Total**

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Final sales value of production	Rs. 5,70,000 (3,000 lbs × Rs.190)	Rs. 12,11,250 (5,100 lbs × Rs. 237.50)	Rs.17,81,250
Less: Separable costs	Rs. 3,02,812.50	Rs. 6,23,437.50	Rs. 9,26,250
Net realisable value at split off point	Rs.2,67,187.50	Rs. 5,87,812.50	Rs. 8,55,000
Weight	0.3125 (2,67,187.50 ÷ 8,55,000)	0.6875 (5,87,812.5 ÷ 8,55,000)	1.00
Joint cost allocated	Rs. 2, 22,656.25 (Rs. 7,12,500 x 0.3125)	Rs. 4, 89,843.75 (Rs. 7,12,500 x 0.6875)	Rs. 7,12,500

(iv) What is the constant gross-margin percentage NRV?

(a) 8%

(b) 9%

(c) 12%

(d) 12.5%

Ans: (a) 8%

Final sales value of total production = Rs.17, 81,250

Less: Joint and separable cost = Rs. 16, 38,750 (Rs. 7, 12,500 + Rs. 9, 26,250)

Gross Margin = Rs. 1, 42,500

Gross margin (%) = $\frac{\text{Rs.1,42,500}}{\text{Rs.17,81,250}} \times 100 = 8\%$

(v) How much joint cost is allocated between the chocolate powder and milk-chocolate liquor bases respectively using Constant gross-margin percentage NRV?

(a) Rs.2, 22,656.25 and Rs.4, 89,843.75

(b) Rs.2, 49,375 and Rs.4, 63,125

(c) Rs.2, 21,587.50 and Rs.4, 90,912.50

(d) Rs.2, 85,000 and Rs.4, 27,500

Ans: (c) Rs.2, 21,587.50 and Rs.4, 90,912.50

Constant Gross Margin (%) NRV method

	Chocolate powder Liquor base	**Milk chocolate liquor Base**	**Total**
Final sales value of production	Rs. 5,70,000	Rs. 12,11,250	Rs. 17,81,250
Less: Gross margin* 8%	Rs. 45,600	Rs. 96,900	Rs. 1,42,500
Cost of goods available for sale	Rs. 5,24,400	Rs. 11,14,350	Rs. 16,38,750
Less: Separable costs	Rs. 3,02,812.50	Rs. 6,23,437.50	Rs. 9,26,250
Joint cost allocated	Rs. 2,21,587.50	Rs. 4,90,912.50	Rs. 7,12,500

Question 24

A company processes a raw material in its Department 1 to produce three products, viz. A, B and X at the same split-off stage. During a period 1, 80,000 kgs of raw materials were

processed in Department 1 at a total cost of Rs.12, 88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively. A and B were further processed in Department 2 at a cost of Rs.1,80,000 and Rs.1,50,000 respectively.

X was further processed in Department 3 at a cost of Rs.1, 08,000. There is no waste in further processing. The details of sales affected during the period were as under:

	A	B	X
Quantity Sold (kgs.)	17,000	5,000	44,000
Sales Value (Rs.)	12,24,000	2,50,000	7,92,000

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been Rs.50, Rs.40 and Rs.10 per kg respectively. Required:

(i) Prepare a statement showing the apportionment of joint costs to A, B and X.

(ii) Present a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.

(iii) Prepare a statement showing the product wise and total profit for the period.

(iv) State with supporting calculations as to whether any or all the products should be further processed or not

(RTP Sep. 2025)

Answer 24

(i) Statement showing the apportionment of joint costs to A, B and X

Products	A	B	X	Total
Output (kg)	18,000	10,000	54,000	

Sales value at the point of split off (Rs.)	9,00,000 (Rs. 50 x 18,000)	4,00,000 (Rs. 40 x 10,000)	5,40,000 (Rs. 10 x 54,000)	18,40,000
Joint cost apportionment on the basis of sales value at the point of split off (Rs.)	6,30,000 $\left(\frac{\text{Rs. } 12,88,000}{\text{Rs.}18,40,000} \times \text{Rs. } 9,00,000\right)$	2,80,000 $\left(\frac{\text{Rs. } 12,88,000}{\text{Rs.}18,40,000} \times \text{Rs. } 4,00,000\right)$	3,78,000$\left(\frac{\text{Rs. } 12,88,000}{\text{Rs.}18,40,000} \times \text{Rs. } 5,40,000\right)$	12,88,000

(ii) Statement showing the cost per kg. of each product (indicating joint cost; further processing cost and total cost separately)

Products	**A**	**B**	**X**
Joint costs apportioned (Rs.): (I)	6,30,000	2,80,000	3,78,000
Production (kg): (II)	18,000	10,000	54,000
Joint cost per kg (Rs.): (I ÷ II)	35	28	7
Further processing Cost per kg.(Rs.)	$10\left(\frac{Rs.1,80,000}{18,000\ kg}\right)$	$15\left(\frac{Rs.1,50,000}{10,000\ kg}\right)$	$2\left(\frac{Rs.1,08,000}{54,000\ kg}\right)$
Total cost per kg (Rs.)	45	43	9

(iii) Statement showing the product wise and total profit for the period

Products	**A**	**B**	**X**	**Total**
Sales value (Rs.)	12,24,000	2,50,000	7,92,000	

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Add: Closing stock value (Rs.) (Refer to Working note 2)	45,000	2,15,000	90,000	
Value of production (Rs.)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (Rs.)	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (Rs.)	1,80,000	1,50,000	1,08,000	
Total cost (Rs.)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (Rs.)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

Products	**A**	**B**	**X**
Sales value (Rs.)	12,24,000	2,50,000	7,92,000
Quantity sold (Kgs.)	17,000	5,000	44,000
Selling price Rs./kg	72 $\left(\frac{Rs.12,24,000}{17,000\ kg}\right)$	50 $\left(\frac{Rs.2,50,000}{5,000\ kg}\right)$	18 $\left(\frac{Rs.7,92,000}{44,000\ kg}\right)$

2. Valuation of closing stock:

Since the selling price per kg of products A, B and X is more than their total costs, therefore closing stock will be valued at cost.

Products	A	B	X	Total
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (Rs.)	45	43	9	
Closing stock value (Rs.)	45,000 (Rs. 45 x 1,000 kg)	2,15,000 (Rs. 43 x 5,000 kg)	90,000 (Rs. 9 x 10,000 kg)	3,50,000

(iv) Calculations for processing decision

Products	A	B	X
Selling price per kg at the point of split off (Rs.)	50	40	10
Selling price per kg after further processing (Rs.) (Refer to working Note 1)	72	50	18
Incremental selling price per kg (Rs.)	22	10	8
Less: Further processing cost per kg (Rs.)	(10)	(15)	(2)
Incremental profit (loss) per kg (Rs.)	12	(5)	6

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Product A and X has an incremental profit per unit after further processing, hence, these two products may be further processed. However, further processing of product B is not profitable hence, product B shall be sold at split off point.

Topic 4 Accounting Treatment of By-products

Question 25

DISCUSS the treatment of by-product cost in Cost Accounting when they are of small total value.

(RTP Nov '21)

Answer 25

When the by-products are of small total value, the amount realised from their sale may be dealt in any one the following two ways:

(i) The sales value of the by-products may be credited to the Costing Profit and Loss Account and no credit be given in the Cost Accounts. The credit to the Costing Profit and Loss Account here is treated either as miscellaneous income or as additional sales revenue.

(ii) The sale proceeds of the by-product may be treated as deductions from the total costs. The sale proceeds in fact should be deducted either from the production cost or from the cost of sales.

Question 26

A Factory is engaged in the production of chemical Bomex and in the course of its manufacture a by-product Cromex is produced which after further processing has a commercial value. For the month of April 2019 the following are the summarised cost data:

	Joint Expense (Rs.)	Separate Expenses (Rs.)	
		Bomex	Cromex
Materials	**1,00,000**	**6,000**	**4,000**
Labour	**50,000**	**20,000**	**18,000**
Overheads	**30,000**	**10,000**	**6,000**
Selling Price per unit		**100**	**40**
Estimated profit per unit on sale of Cromex			**5**
Number of units produced		**2,000 Units**	**2,000 Units**

The factory uses net realisable value method for apportionment of joint cost to by products.

You are required to prepare statements showing:

(i) Joint cost allocable to Cromex

(ii) Product wise and overall profitability of the factory for April 2019.

(PYP May '19)

Answer 26

(i) Statement Showing Joint Cost Allocation to 'Cromex'

Particulars	Cromex (Rs.)
Sales (Rs. 40 × 2,000 units)	80,000

Less: Post Split Off Costs (4,000 + 18,000 + 6,000)	(28,000)
Less: Estimated Profit (Rs. 5 × 2,000 units)	(10,000)
Joint cost allocable	42,000

(ii) Statement Showing Product Wise and Overall Profitability

Particulars	Bomex (Rs.)	Cromex (Rs.)	Total (Rs.)
Sales	2,00,000	80,000	2,80,000
Less: Share in Joint Expenses	(1,38,000)*	(42,000)	(1,80,000)
Less: Post Split Off Costs	(36,000)	(28,000)	(64,000)
Profit (*) 1,80,000 – 42,000	26,000	10,000	36,000

Important Note:-

In this numerical problem of 'By-products' examinees were asked to calculate joint cost allocation product wise and overall profitability. Many examinees failed to differentiate between main product and joint product and did not applied Net Realizable Value (NRV) method for joint cost allocation. Candidate performance was observed below average.

Question 27

A company's plant processes 6,750 units of a raw material in a month to produce two products 'M' and 'N'.

The process yield is as under:

Product M 80%

Product N 12%

Process Loss 8%

The cost of raw material is Rs. 80 per unit.

Processing cost is Rs.2, 25,000 of which labour cost is accounted for 66%. Labour is chargeable to products 'M' and 'N' in the ratio of 100:80.

Prepare a Comprehensive Cost Statement for each product showing:

(i) Apportionment of joint cost among products 'M' and 'N' and

(ii) Total cost of the products 'M' and 'N'.

(PYP Nov 20)

Answer 27

Comprehensive Cost Statement

Particulars	Total Cost (Rs.)	Product-M (Rs.)	Product-N (Rs.)
No. of units produced *		5,400 units	810 units
Cost of raw material (Rs. 80 × 6,750 units)	5,40,000		
Processing cost:			
- Labour cost (Rs. 2, 25,000 × 66%)	1,48,500		

- Other costs (Rs. 2,25,000 - 1,48,500)	76,500		
Total joint cost	7,65,000		
(i) Apportionment of joint costs between the joint products			
Labour cost in the ratio of 100:80	1,48,500	82,500 $\left(\frac{1,48,500 \times 100}{100}\right)$	66,000 $\left(\frac{1,48,500 \times 80}{100}\right)$
Other joint costs (including material) in the ratio of output (5,400:810)	6,16,500	5,36,087 $\left(\frac{6,16,500 \times 5,400}{6,210}\right)$	80,413 $\left(\frac{6,16,500 \times 810}{6,210}\right)$
(ii) Total product cost	7,65,000	6,18,587	1,46,413

* No. of units produced of Product M = 6750 units x 80% = 5400 units No. of units produced of Product N = 6750 units x 12% = 810 units

Question 28

Narrate the terms 'Joint Products' and 'By-Products' with an example of each term.

(PYP Dec'21)

Answer 28

(i) Joint Products - Joint products represent "two or more products separated in the course of the same processing operation usually requiring further processing, each product being in such proportion that no single product can be designated as a major product".

In other words, two or more products of equal importance, produced, simultaneously from the same process, with each having a significant relative sale value are known as joint products. For example, in the oil industry, gasoline, fuel oil, lubricants, paraffin, coal tar, asphalt and kerosene are all produced from crude petroleum. These are known as joint products.

(ii) By-Products - These are defined as "products recovered from material discarded in a main process, or from the production of some major products, where the material value is to be considered at the time of severance from the main product." Thus, by- products emerge as a result of processing operation of another product or they are produced from the scrap or waste of materials of a process. In short, a by-product is a secondary or subsidiary product which emanates as a result of manufacture of the main product.

The point at which they are separated from the main product or products is known as split-off point. The expenses of processing are joint till the split –off point.

Examples of by-products are molasses in the manufacture of sugar, tar, ammonia and benzole obtained on carbonisation of coal and glycerine obtained in the manufacture of soap.

Important Note:-

This theory question tested the basic knowledge of Joint product and by product with example. Most of the examinees answered it partially correct. Performance of the examinees was below average.

Question 29

When a by-product does not have any realizable value, the cost of by-product is:

(a) Transferred to Costing Profit & Loss A/c

(b) By-product cost is borne by the good units

(c) By-product cost is ignored

(d) By-product cost is determined taking value of similar goods

(Study Material)

Ans: (b) By-product cost is borne by the good units

Reason:

When a by-product does not have any realizable value, its cost is typically borne by the good units. This means the cost associated with the by-product is allocated to the main products or good units produced in the process. Since the by-product cannot be sold for value, its costs are absorbed by the main products, effectively increasing their total cost.

(a) Transferred to Costing Profit & Loss A/c: This would apply if there were any realizable value from the by-product, but it's not relevant when the by-product has no value.

(c) By-product cost is ignored: This would only be true if the by-product had no associated costs, which is generally not the case.

(d) By-product cost is determined using the value of similar goods: This method applies when the by-product has a realizable value, but it's not applicable when there is no value for the by-product.

Thus, (b) is the correct answer when the by-product has no realizable value.

Topic 5 MCQs Covering All Above Topics

Multiple Choice Questions (MCQ's)

Question 30

In sugar manufacturing industries molasses is also produced along with sugar. Molasses may be of smaller value as compared with the value of sugar and is known as:

(a) Common product

(b) By- product

(c) Joint product

(d) None of them

(Study Material)

Ans: (b) By- product

Reason:

In industries like sugar manufacturing, molasses is produced alongside the main product, sugar. Since molasses typically has a lower value than sugar, it is considered a by-product. A by-product is a secondary product that is produced during the manufacturing process of the main product and usually has a lower value compared to the main product.

(a) Common product: This term refers to products that are jointly produced but are of equal value and importance.

(c) Joint product: These are products that are produced simultaneously in the same process and are of similar value and importance, unlike by-products.

(d) None of them: This is not applicable, as molasses clearly fits the definition of a by -product.

Therefore, molasses is considered a by-product of the sugar manufacturing process.

Question 31

The main purpose of accounting of joint products and by- products is to:

(a) Determine the opportunity cost

(b) Determine the replacement cost

(c) Determine profit or loss on each product line

(d) None of the above

(Study Material)

Ans: (c) Determine profit or loss on each product line

Reason:

The main purpose of accounting for joint products and by-products is to determine the profit or loss on each product line. By accurately allocating the joint costs and tracking revenues and costs for each product, businesses can assess the profitability of each individual product or product line. This is important for decision-making, cost control, and pricing strategies.

(a) Determine the opportunity cost: Opportunity cost is related to the potential benefits lost when choosing one alternative over another, not directly related to joint or by-product accounting.

(b) Determine the replacement cost: Replacement cost refers to the cost of replacing an asset, which is not the focus of joint or by-product accounting.

(d) None of the above: Since option (c) is correct, this option is not applicable.

Thus, the primary purpose is to determine the profit or loss for each product line.

Question 32

Which of the following is a co-product:

(a) Diesel and Petrol in an oil refinery

(b) Edible oils and oil cakes

(c) Curd and butter in a dairy

(d) Mustard oil and Sunflower oil in an oil processing company.

Ans: (d) Mustard oil and Sunflower oil in an oil processing company.

Reason:

Co-products are two or more products that are produced simultaneously in a joint production process, and they usually have significant value. Both Mustard oil and Sunflower oil are primary products that are produced in an oil processing company, and they are considered co-products because they are of similar value and are produced together.

(a) Diesel and Petrol in an oil refinery: These are also co-products, but the most relevant example here is Mustard oil and Sunflower oil in an oil processing company, which is a better fit for co-products in the context of your study material.

(b) Edible oils and oil cakes: Oil cakes are by-products, not co-products, because they have a lower value than the primary product (edible oil).

(c) Curd and butter in a dairy: Curd and butter are not typically considered co-products; they are distinct products produced from milk but are not usually produced simultaneously in a way that they are jointly costed as co-products.

Thus, Mustard oil and Sunflower oil in an oil processing company are co-products because they are both produced simultaneously and have similar value.

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Question 33

SG Ltd manufactures two products from a joint milling process. The two products developed are Mine support (MS) and Commercial building (CB). A standard production run incurs joint costs of Rs. 1, 00,000 and results in 60,000 units of MS and 90,000 units of CB. Each MS sells for Rs. 200 per unit, and each CB sells for Rs. 450 per unit.

Assuming no further processing work is done after the split-off point, the amount of joint cost allocated to Commercial building (CB) on a physical quantity allocation basis would be:

(a) Rs. 60,000.

(b) Rs. 180,000.

(c) Rs. 225,000.

(d) Rs. 120,000.

(Study Material)

Ans: (a) Rs. 60,000.

Reason:

To allocate joint costs using the physical quantity allocation method, we distribute the total joint costs based on the physical output of each product.

- Total units produced = 60,000 units of MS + 90,000 units of CB = 150,000 units.
- The proportion of joint costs allocated to each product is based on the number of units produced.

1. Proportion of joint cost for CB = $\frac{\text{Units of CB}}{\text{Total Units Produced}} = \frac{90,000}{1,50,000} = 0.60$

2. Joint cost allocated to CB = 0.60 × Rs. 1, 00,000 = Rs. 60,000.

Thus, the joint cost allocated to Commercial building (CB) using the physical quantity method is Rs. 60,000.

Question 34

Kay Company manufactures two hair care lotions, Livi and Sili, out of a joint process. The joint (common) costs incurred are Rs. 6, 30,000 for a standard production run that generates 1, 80,000 gallons of Livi and 1, 20,000 gallons of Sili. Livi sells for Rs. 240 per gallon, and Sili sells for Rs. 390 per gallon.

If additional processing costs beyond the split-off point are Rs. 140 per gallon for Livi and Rs. 90 per gallon for Sili, the amount of joint cost of each production run allocated to Livi on a physical-quantity basis is:

(a) Rs. 340,000.

(b) Rs. 378,000.

(c) Rs. 232,000.

(d) Rs.580, 000.

(Study Material)

Ans: (b) Rs. 378,000.

Reason:

To allocate the joint costs on a physical-quantity basis, we distribute the total joint costs based on the number of units produced, without considering the selling price or further processing costs. Here's how we can calculate:

1. Total units produced = 1, 80,000 gallons of Livi + 1, 20,000 gallons of Sili = 3, 00,000 gallons.

2. Proportion of joint cost allocated to Livi = $\frac{\text{Units of Livi}}{\text{Total Units Produced}} = \frac{1,80,000}{3,00,000} = 0.60$

3. Joint cost allocated to Livi = 0.60 × Rs. 6, 30,000 = Rs. 3, 78,000.

Therefore, the amount of joint cost allocated to Livi on a physical-quantity basis is Rs. 3, 78,000.

Question 35

For the purpose of allocating joint costs to joint products, the sales price at point of sale, reduced by cost to complete after split-off, is assumed to be equal to the:

(a) Joint costs

(b) Sales price less a normal profit margin at point of sale

(c) Net sales value at split off

(d) Total costs.

(Study Material)

Ans: (c) Net sales value at split off

Reason:

When allocating joint costs, the net sales value at split-off is determined by subtracting the cost to complete each product after the split-off point from its sales price. This value is used to allocate joint costs because it represents the actual realizable value of the products once they are completed, providing a fair basis for apportioning the joint costs.

Topic 6 Numerical Problems (Comprehensive)

Question 36

A manufacturing process yields the following products out of the raw materials introduced in the process:

Main Product X 60% of Raw Materials

By-Product Y 15% of Raw Materials

By Product Z 20% of Raw Materials

Wastage 5% of Raw Materials

Other information is as follows:

a. Total Cost: Raw Materials 1,000 units of Rs. 9,200; Labour Rs. 8,200; Overheads Rs. 12,000

b. One unit of product z requires ½ the raw materials required for one unit of product Y, one unit of product X requires1½ times the raw materials required for product Y.

c. Product X required double the time needed for production of one unit of Y and one unit of Z.

d. Product Z requires ½ the time required for the production of one unit of product Y.

e. Overheads are to be apportioned in the ratio of 6:1:1.

You are required to CALCULATE the total and per unit of cost of each of the products.

(MTP Sep'22)

Answer 36

Statement of Distribution of Costs

Cost Elements	Basis	Total Cost	Main Product X (600 Units)		By-Product Y (150 Units)		By-Product Z (200 Units)	
			Total	Per Unit	Total	Per Unit	Total	Per Unit
Raw Materials	18:3:2	9,200	7,200	12	1,200	8	800	4
Labour	36:3:2	8,200	7,200	12	600	4	400	2
Overheads	6:1:1	12,000	9,000	15	1,500	10	1,500	7.50
Total		29,400	23,400	39	3,300	22	2,700	13.50

Working Notes:

1. Calculation of Units produced:

Main Product X	60% of Raw Materials	600 Units
By-Product Y	15% of Raw Materials	150 Units
By Product Z	20% of Raw Materials	200 Units
Wastage	5% of Raw Materials	50 Units 1000 Units

2. Cost Allocation Raw Materials

Let Product Z requires 1 unit of raw materials then, Product Y will require 2 units of raw materials and Product X will require 3 units of raw materials.

Product	X	Y	Z Individual Unit ratio
(a)	3 :	2 :	1
Units (b)	600 :	150 :	200
Ratio for Cost Allocation (a*b)	1800 :	300 :	200
Ratio	18 :	3 :	2

Labour:

Let Product Z requires 1 hour of Labour then, Product Y will require 2 hours of Labour and Product X will require 6 hours of Labour.

Product	X	Y	Z
Individual hour ratio (a)	6 :	2 :	1

Units (b)	600	150	200
Ratio for Cost Allocation (a*b)	3600 :	300 :	200
Ratio	36 :	3 :	2

Question 37

ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split off without further processing or any other additional costs. Product Z, however, is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2022-23, the selling prices of the items and the total amounts sold were:

X –186 tons sold for Rs.3,000 per ton Y –527 tons sold for Rs.2,250 per ton Z –736 tons sold for Rs.1,500 per ton

The total joint manufacturing costs for the year were Rs.12, 50,000. An additional Rs.6, 20,000 was spent to finish product Z.

There were no opening inventories of X, Y or Z at the end of the year. The following inventories of complete units were on hand:

X 180 tons

Y 60 Tons

Z 25 tons

There was no opening or closing work-in-progress.

Required:

COMPUTE the cost of inventories of X, Y and Z and cost of goods sold for year ended March 31, 2023, using Net realizable value (NRV) method of joint cost allocation.

(MTP April '23)(Same concepts different figures MTP Mar'23, RTP Nov'20)

Answer 37

Statement of Joint Cost allocation of inventories of X, Y and Z

(By using Net Realisable Value Method)

	Products			**Total**
	X	**Y**	**Z**	
	(Rs.)	**(Rs.)**	**(Rs.)**	**(Rs.)**
Final sales value of total production (Working Note 1)	10,98,000(366 ×Rs.3,000)	13,20,750(587 × Rs.2,250)	11,41,500(761 × Rs.1,500)	35,60,250
Less: Additional cost	--	--	(6,20,000)	(6,20,000)
Net realisable value (at split-off point)	10,98,000	13,20,750	5,21,500	29,40,250
Joint cost allocated (Working Note 2)	4,66,797	5,61,496	2,21,707	12,50,000

Cost of goods sold as on March 31, 2023 (By using Net Realisable Value Method)

	Products			Total
	X	Y	Z	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Allocated joint cost	4,66,797	5,61,496	2,21,707	12,50,000
Additional costs	--	--	6,20,000	6,20,000
Cost of goods available for sale (CGAS)	4,66,797	5,61,496	8,41,707	18,70,000
Less: Cost of ending inventory (Working Note 1)	2, 29,571 (CGAS×49.18%)	57,385 (CGAS × 10.22%)	27,692 (CGAS × 3.29%)	3,14,648
Cost of goods sold	2,37,226	5,04,111	8,14,015	15,55,352

Working Notes

1. Total production of three products for the year 2022-2023

Products	Quantity sold in tones	Quantity of ending inventory in tons	Total production	Ending inventory percentage (%)
(1)	**(2)**	**(3)**	**(4) = [(2) + (3)}**	**(5) = (3)/(4)**
X	186	180	366	49.18

Y	527	60	587	10.22
Z	736	25	761	3.29

2. Joint cost apportioned to each product:

$= \frac{\text{Total Joint Cost}}{\text{Total net realisable value}} \times$ Net Realizable Value of each Product

Total Cost of Product X= $\frac{\text{Rs.12,50,000}}{\text{Rs.29,40,250}}$ × Rs. 10, 98,000 = Rs. 4, 66,797

Total Cost of Product Y= $\frac{\text{Rs.12,50,000}}{\text{Rs.29,40,250}}$ × Rs. 13, 20,750= Rs. 5, 61,496

Total Cost of Product Z= $\frac{\text{Rs.12,50,000}}{\text{Rs.29,40,250}}$ × Rs. 5, 21,500 = Rs. 2, 21,707

Question 38

JP Ltd. uses joint production process that produces three products at the split -off point. Joint production costs during the month of July, 2022 were Rs. 33, 60,000. Product information for the month of July is as follows:

Particulars	Product A	Product B	Product C
Units produced	**3,000**	**6,000**	**9,000**
Sales prices:			
At the split-off	**Rs. 200**		
After further processing	**Rs. 300**	**Rs. 350**	**Rs. 100**
Costs to process after split-off	**Rs. 6,00,000**	**Rs. 6,00,000**	**Rs. 6,00,000**

1. Other information is as follows:

2. Product C is a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Further, Product B & C must be processed further before they can be sold. FIND

OUT the joint cost allocated to Product A in the month of July if joint cost allocation is based on Net

Realizable Value.

(RTP Nov'22)

Answer 38

Product A

As the Question says that "Products B and C must be processed further before they can be sold", it means Product A can be sold at the split-off point.

Cost to process Product A after the split-off point = Rs. 6, 00,000

Additional revenue to be earned by processing further = Rs. 3, 00,000

(Rs. 100 increase in selling price per unit x 3,000 units)

Therefore, Product A will not be processed further, and the sales value at split -off for A will be used for allocating the joint costs.

Sales value at the split-off for A = Rs. 6, 00,000 (Rs. 200 × 3,000 units)

Product B

Since Product B must be processed further, we use its net realizable value for the joint cost allocation.

Net realizable value of Product B = Rs. 15, 00,000

[(Rs. 350 × 6,000 units) – Rs. 6, 00,000 further processing costs]

Product C

Product C, the by-product, must also be processed further to be sold.

Net realizable value of Product C = Rs. 3, 00,000

[(Rs. 100 × 9,000 units) – Rs. 6, 00,000 in further processing costs]

Joint Cost Allocation

Joint production cost = Rs. 33, 60,000

Since, by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated

= Rs. 30, 60,000

(Rs. 33, 60,000 - Rs. 3, 00,000 NRV of Product C)

Allocation of joint costs between Product A and B will be on the basis of Rs. 6, 00,000: Rs. 15, 00,000

Joint Cost allocated to Product= Rs. 30, 60,000 × $\frac{Rs.6,00,000}{Rs.21000}$ = Rs. 8, 74,286

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Question 39

A factory producing article A also produces a by-product B which is further processed into finished product. The joint cost of manufacture is given below:

Material	**Rs. 5,000**
Labour	**Rs. 3,000**
Overhead	**Rs. 2,000**
	Rs. 10,000

Subsequent cost in Rs. are given below:

	A	B
Material	**3,000**	**1,500**
Labour	**1,400**	**1,000**
Overhead	**600**	**500**
	5,000	**3,000**

Selling prices are A Rs. 16,000

B Rs. 8,000

Estimated profit on selling prices is 25% for A and 20% for B.

Assume that selling and distribution expenses are in proportion of sales prices. Show how you would apportion joint costs of manufacture and prepare a statement showing cost of production of A and B.

(RTP Nov '23) (MTP Oct '23)

Answer 39

Apportionment of Joint Costs

Particulars	A (Rs.)	B (Rs.)
Selling Price	16,000	8,000
Less: Estimated profit	4,000 (25% of Rs.16,000)	1,600 (20% of Rs. 8,000)
Cost of sales	12,000	6,400

Less: Selling & Distribution exp. (Refer working note)	267 (Rs. 400 × 2/3)	133 (Rs. 400 × 1/3)
Less: Subsequent cost	5,000	3,000
Share of Joint cost	6,733	3,267

So, Joint cost of manufacture is to be distributed to A & B in the ratio of 6733: 3267

Statement showing Cost of Production of A and B

Elements of cost	**Joint Cost**		**Subsequent Cost**		**Total Cost**	
	A	**B**	**A**	**B**	**A**	**B**
Material	3,367	1,633	3,000	1,500	6,367	3,133
Labour	2,020	980	1,400	1,000	3,420	1,980
Overheads	1,346	654	600	500	1,946	1,154
Cost of production					11,733	6,267

Working Note:

Calculation of Selling and Distribution Expenses

Particulars	**(Rs.)**
Total Sales Revenue (Rs. 16,000 + Rs. 8,000)	24,000
Less: Estimated Profit (Rs. 4,000 + Rs. 1,600)	(5,600)

Cost of Sales	18,400
Less: Cost of production:	
- Joint Costs	(10,000)
- Subsequent costs (Rs. 5,000 + Rs. 3,000)	(8,000)
Selling and Distribution expenses (Balancing figure)	400

Question 40

ABC Company produces a Product 'X' that passes through three processes: R, S and T. Three types of raw materials, viz., J, K, and L are used in the ratio of 40:40:20 in process R. The output of each process is transferred to next process. Process loss is 10% of total input in each process. At the stage of output in process T, a by-product 'Z' is emerging and the ratio of the main product 'X' to the by-product 'Z' is 80:20. The selling price of product 'X' is Rs.60 per kg.

The company produced 14,580 kgs of product 'X'

Material price: Material J @ Rs. 15 per kg; Material K @ Rs. 9 per kg.

Material L@ Rs. 7 per kg Process costs are as follows:

Process	Variable cost per kg (Rs.)	Fixed cost of Input (Rs.)
R	**5.00**	**42,000**
S	**4.50**	**5,000**

T	**3.40**	**4,800**

The by-product 'Z' cannot be processed further and can be sold at Rs. 30 per kg at the split off stage. There is no realizable value of process losses at any stage.

Required:

Present a statement showing the apportionment of joint costs on the basis of the sales value of product 'X' and by-product 'Z' at the split- off point and the profitability of product 'X' and by-product 'Z.

(PYP May '23)

Answer 40

Working Notes:

1. Calculation of Input of Raw Material

Let assume total raw material in Process R be 100%

∴ Output of Process T will be equal to:

Input R		100%
	10% Normal Loss	Rs. 10
Input S		90%
	10% Normal loss	9
Input T		81%
	10% Normal loss	8.1

	Output of T	72.9

Actual output of X 14,580 units

Which is 80% of the total output

∴ Output of Process T

= $\frac{14,580}{80\%}$ = 18,225

∴ Input of Process R = $\frac{18,225}{72.9\%}$ = 25,000 kgs

Alternative presentation for Calculation of Input in Process R, S and T

Working notes:

Process T (Kg.)

To Input (Transfer from process S)	20,250	By Normal loss	2,025
		By Output Product X	14,580
		By output of by-product Z	3,645
	20,250		20,250

Process S (kg.)

To Input (Transfer from process S)	22,500	By Normal loss (10%)	2,250
		By Transfer to process T	20,250
	22,500		22,500

Process R (kg.)

To Input	25,000	By Normal loss (10%)	2,500
		By Transfer to process S	22,500
	25,000		25,000

2. Calculation of Joint Cost

Process	Inputs	Variable cost per kg	Variable cost	Fixed Cost	Total Cost
		Rs.	Rs.	Rs.	Rs.
R	25,000	5	1,25,000	42,000	1,67,000
S	22,500	4.5	1,01,250	5,000	1,06,250
T	20,250	3.4	68,850	4,800	73,650
					3,46,900
Raw material J10000 x 15					Rs. 1,50,000
K 10000 x 9					Rs. 90,000
L 5000 x 7					Rs. 35,000
					2,75,000
Add: Processing cost (as above)					Rs. 3,46,900

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Total Joint Cost		6,21,900

i) Statement showing apportionment of Joint Cost

Particulars	Product X	By-Product Z	Total
Units	14,580	3,645	
Selling price (Rs.)	60	30	
Sales Value (Rs.)	8,74,800	1,09,350	9,84,150
(Rs. 6,21,900 to apportioned in ratio of sales value at split off point)	5,52,800	69,100	6,21,900

ii) Statement of Profitability

Particulars	Product X	By-Product Z	Total
Sales Value	8,74,800	1,09,350	9,84,150
Joint Cost(As apportioned above)	(5,52,800)	(69,100)	(6,21,900)
Profit	3,22,000	40,250	3,62,250

Question 41

Smile company produces two main products and a by-product out of a joint process. The ratio of output quantities to input quantities of direct material used in the joint process remains consistent on yearly basis. Company has employed the physical volume method to allocate joint production costs to the main products. The net realizable value of the by-

product is used to reduce the joint production costs before the joint costs are allocated to the main products. Details of company's operation are given in the table below. During the month, company incurred joint production costs of Rs. 10, 00,000/- The main products are not marketable at the split off point and thus have to be processed further.

Particulars	Product-A	Product-B	By product
Monthly output in kg.	60,000	1,20,000	50,000
Selling price per kg.	Rs. 50	Rs. 30	Rs. 5
Process costs	Rs. 2,00,000	Rs. 3,00,000	

FIND OUT the amount of joint product cost that Smile Company would allocate to the product-B by using the physical volume method to allocate joint production costs?

(Study Material)

Answer 41

1. Calculation of Net joint costs to be allocated:

Particulars	Amount (Rs.)
Joint Costs	10,00,000
Less: Net Realizable value of by-product (50,000×5)	2,50,000
Net joint costs to be allocated	7,50,000

Therefore, amount of joint product cost that Smile company would allocate to the product-B by using the physical volume method to allocate joint production costs:

$$=\frac{\text{Physical quantityof Product}-\text{B}}{\text{Total Quantity}}\text{x Net joint costs to be allocated}$$

$$=\frac{1,20,000\text{units}}{1,80,000\text{units}}\text{x Rs. 7, 50,000 = Rs.5, 00,000}$$

Chapter 12

Service Costing

Topic 1 Introduction to Service Costing

Descriptive Question

Question 1

EXPLAIN briefly, what do you understand by Service Costing.

(Study Material)

Answer 1

INTRODUCTION

Service sector, being a fastest growing sector and having a significant contribution towards the GDP in India, is a very important sector where the role of the cost and management accounting is inevitable. The competitiveness of a service entity is very much dependent on a robust cost and management accounting system for competitive pricing and identification of value adding activities. Providers of services like transportation, hotels, financial services & banking, insurance, electricity generation, transmission and distribution etc. are very much cost conscious and thrive to provide services in a cost-effective manner. Irrespective of regulatory requirements to maintain cost records and get the records audited, service costing becomes integral and inseparable part of each service entity. In this chapter we will be discussing how costing is done in service sectors like Transportation, Toll roads, Electricity generation, transmission and distribution, Hospitals, Canteen & Restaurants, Hotels & Lodges, Educational institutes, Financial institutions, Insurance, Information Technology (IT) & Information Technology Enabled Services (ITES) etc.

Service costing is also known as operating costing.

Application of Service Costing

Internal: The service costing is required for in-house services provided by a service cost centre to other responsibility centres as support services. Examples of support services are Canteen

and hospital for staff, Boiler house for supplying steam to production departments, Captive Power generation unit, operation of fleet of vehicles for transport of raw material to factory or distribution of finished goods to the market outlets, IT department services used by other departments, research & development, quality assurance, laboratory etc.

External: When services are offered to outside customers as a profit centre in consonance with organisational objectives as an output like goods or passenger transport service provided by a transporter, hospitality services provided by a hotel, provision of services by financial institutions, insurance and IT companies etc.

In both the situation, all costs incurred are collected, accumulated for a certain period or volume, recorded in the cost accounting system and then expressed in terms of a cost unit of service.

Question 2

STATE the features of service costing.

(Study Material)

Answer 2

Features of Service Costing:

Intangibility of Output: Services are intangible and cannot be seen, touched, or stored like physical products. Therefore, there is no inventory of services, and costing is done for services actually rendered during a period.

Use of Composite Cost Units: Service costing often uses composite or two-part cost units (e.g., passenger-kilometre, tonne-kilometre, room-day) to measure the output and relate costs to services provided.

Higher Employee (Labour) Costs: In service costing, employee or labour costs form a significant portion of the total cost due to the labour-intensive nature of services, unlike manufacturing where material costs dominate.

Low Material Cost Component: Since services do not involve significant use of raw materials, the material cost is generally negligible or minimal compared to manufacturing industries.

Significance of Overheads: Indirect costs such as administration and support service overheads have a higher proportion in service sectors due to the reliance on human resources and infrastructure.

No Inventory Management: As services are perishable and consumed simultaneously with their production, there is no inventory management involved.

Internal and External Applications: Service costing is used for both internal support services (e.g., canteens, IT departments, captive power) and external customer-facing services (e.g., transport, hospitality, financial services).

Difficulty in Cost Traceability: Due to the shared nature of facilities and indirect nature of many service functions, it is often difficult or uneconomical to trace costs directly to individual services.

Question 3

SLS Infrastructure built and operates 110 k.m. highway on the basis of Built-Operate-Transfer (BOT) for a period of 25 years. A traffic assessment carried out to estimate the traffic flow per day shows the following figures:

Sl. No.	Type of vehicle	Daily traffic volume
1.	Two wheelers	44,500
2.	Car and SUVs	3,450
3.	Bus and LCV	1,800
4.	Heavy commercial vehicles	816

The following is the estimated cost of the project:

Sl. No.	Activities	Amount (Rs. in lakh)
1	Site clearance	170.70
2	Land development and filling work	9,080.35
3	Sub base and base courses	10,260.70
4	Bituminous work	35,070.80
5	Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc	29,055.60
6	Drainage and protection work	9,040.50
7	Traffic sign, marking and road appurtenance	8,405.00
8	Maintenance, repairing and rehabilitation	12,429.60
9	Environmental management	982.00
	Total Project cost	114,495.25

An estimated cost of Rs.1,120 lakh has to be incurred on administration and toll plaza operation.

On the basis of the vehicle specifications (i.e. weight, size, time saving etc.), the following weights has been assigned to the passing vehicles:

Sl. No.	Type of vehicle	
1.	Two wheelers	5%
2.	Car and SUVs	20%
3.	Bus and LCV	30%
4.	Heavy commercial vehicles	45%

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Required:

(i) CACULATE the total project cost per day of concession period.

(ii) COMPUTE toll fee to be charged for per vehicle of each type, if the company wants to earn a profit of 15% on total cost.

[Note: Concession period is a period for which an infrastructure is allowed to operate and recovers its investment]

(Study Material)

Answer 3

(i) Calculation of total project cost per day of concession period:

Activities	Amount (Rs. in lakh)
Site clearance	170.70
Land development and filling work	9,080.35
Sub base and base courses	10,260.70
Bituminous work	35,070.80
Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	29,055.60
Drainage and protection work	9,040.50
Traffic sign, marking and road appurtenance	8,405.00
Maintenance, repairing and rehabilitation	12,429.60
Environmental management	982.00
Total Project cost	114,495.25
Administration and toll plaza operation cost	1,120.00

Total Cost	115,615.25
Concession period in days (25 years × 365 days)	9,125
Cost per day of concession period (Rs. in lakh)	12.67

(ii) Computation of toll fee:

Cost to be recovered per day = Cost per day of concession period + 15% profit on cost

= Rs.12, 67,000 + Rs.1, 90,050

= Rs.14, 57,050

Cost per equivalent vehicle = $\frac{\text{Rs.14,57,050}}{\text{76,444units(Refer working note)}}$

= Rs.19.06 per equivalent vehicle

Vehicle type-wise toll fee:

Sl. No.	Type of vehicle	Equivalent cost [A]	Weight [B]	Toll fee per vehicle [A×B]
1.	Two wheelers	Rs.19.06	1	19.06
2.	Car and SUVs	Rs.19.06	4	76.24
3.	Bus and LCV	Rs.19.06	6	114.36
4.	Heavy commercial vehicles	Rs.19.06	9	171.54

Working Note:

The cost per day has to be recovered from the daily traffic. The each type of vehicle is to be converted into equivalent unit. Let's convert all vehicle types equivalent to Two-wheelers.

Sl. No.	Type of vehicle	Daily traffic volume [A]	Weight	Ratio [B]	Equivalent Two-wheeler [A×B]
1.	Two wheelers	44,500	0.05	1	44,500
2.	Car and SUVs	3,450	0.20	4	13,800
3.	Bus and LCV	1,800	0.30	6	10,800
4.	Heavy commercial vehicles	816	0.45	9	7,344
Total					76,444

Topic 2 Types of Costs in Service Costing

Descriptive Question

Question 4

EXPLAIN standing charges and running charges in the case of transport organizations. LIST three examples of both.

(MTP Oct '20)

Answer 4

Standing Charges: These are the fixed costs that remain constant irrespective of the distance travelled.

These costs include the following-

- Insurance
- License fees
- Salary to Driver, Conductor, Cleaners, etc. if paid on monthly basis
- Garage costs, including garage rent

- Depreciation (if related to efflux of time)
- Taxes Administration expenses, etc.

Running Charges: These costs are generally associated with the distance travelled. These costs include the following-

- Petrol and Diesel
- Lubricant oils,
- Wages to Driver, Conductor, Cleaners, etc. if it is related to operations
- Depreciation (if related to activity) Any other variable costs identified

Question 5

DIFFERENCIATE between Service costing and Product costing

(MTP March '21)

Answer 5

Service costing differs from product costing (such as job or process costing) in the following ways due to some basic and peculiar nature.

(i) Unlike products, services are intangible and cannot be stored, hence, there is no inventory for the services.

(ii) Use of Composite cost units for cost measurement and to express the volume of outputs.

(iii) Unlike a product manufacturing, employee (labour) cost constitutes a major cost element than material cost.

(iv) Indirect costs like administration overheads are generally have a significant proportion in total cost of a service as unlike manufacturing sector, service sector heavily depends on support services and traceability of costs to a service may not economically feasible.

Topic 3 Cost Units in Service Sector

Multiple Choice Questions (MCQs)

Question 6

Composite cost unit for a hospital is:

(a) Per patient

(b) Per patient-day

(c) Per day

(d) Per bed

(Study Material)

Ans: (b) Per patient-day

Reason

In a hospital, the composite cost unit typically refers to the costs associated with the services provided for one patient for a day. This includes all direct and indirect costs such as medical staff, equipment, food, and other overheads for the patient on that day.

(a) Per patient: This option is too general as it does not account for the duration of the stay, and hospital costs usually depend on the length of time a patient stays.

(c) Per day: This would be too broad and not specific to a patient's needs or services provided.

(d) Per bed: This is an incorrect approach, as costs are usually incurred per patient, not just per bed, which might be considered in capacity planning but not as a composite cost unit.

Thus, per patient-day is the correct and most commonly used composite cost unit in hospital cost accounting.

Question 7

Cost of diesel and lubricant is an example of:

(a) Operating cost

(b) Fixed charges

(c) Semi-variable cost

(d) None of the above

(Study Material)

Ans: (a) Operating cost

Reason

The cost of diesel and lubricant is considered an operating cost because it directly relates to the day-to-day functioning and operations of a business. These costs are incurred as part of the regular activities of the company, such as running machinery, vehicles, or equipment. They fluctuate with the level of operations, so they are classified as operating costs.

(b) Fixed charges: Fixed costs remain constant regardless of the level of output or activity, like rent or salaries. Diesel and lubricant costs vary with usage, so they are not fixed.

(c) Semi-variable cost: Semi-variable costs have both fixed and variable components. For example, if a fixed amount of lubricant is required regardless of usage, and additional costs are incurred based on the amount used, then part of the cost could be semi-variable. However, in general, costs like diesel and lubricant are typically considered operating costs.

(d) None of the above: This is incorrect because operating cost is the correct classification.

Thus, the cost of diesel and lubricant is best classified as an operating cost.

Question 8

Cost units used in power sector is:

(a) Kilo meter (K.M)

(b) Kilowatt-hour (kWh)

(c) Number of electric points

(d) Number of hours

(Study Material)

Ans: (b) Kilowatt-hour (kWh)

Reason

In the power sector, the most common cost unit used is kilowatt-hour (kWh), which measures the amount of energy consumed or produced. The kWh is a standard unit for billing, cost allocation, and performance measurement in the electricity industry.

(a) Kilometer (K.M): This is a unit of distance, not related to energy consumption or production.

(c) Number of electric points: This could be used for electrical installations or distribution points, but it's not a typical cost unit.

(d) Number of hours: This measures time, but does not directly represent energy consumption or cost.

Therefore, kilowatt-hour (kWh) is the appropriate cost unit in the power sector, as it directly reflects the amount of electricity used or generated**.**

Question 9

Absolute Tonne-km. is an example of:

(a) Composite units in power sector

(b) Composite unit of transport sector

(c) Composite unit for bus operation

(d) Composite unit for oil and natural gas

(Study Material)

Ans: (b) Composite unit of transport sector

Reason

Absolute tonne-km is a composite unit used in the transport sector to measure the total transportation effort. It combines the weight of the cargo (in tonnes) and the distance it is carried (in kilometers). This unit helps in understanding the overall load carried over a certain distance, making it a useful metric for efficiency and cost analysis in transportation.

(a) Composite units in power sector: This is incorrect because tonne-km is not a unit typically used in the power sector, which usually deals with energy consumption and production (like kWh).

(c) Composite unit for bus operation: While bus operations use distance and passenger measurements, the term "tonne-km" is more relevant to freight transport, not bus transport.

(d) Composite unit for oil and natural gas: This is incorrect as oil and natural gas are measured differently, typically in barrels, cubic feet, or liters, not in tonne-km.

Thus, absolute tonne-km is specifically a composite unit used in the transport sector to measure freight transport efficiency.

Question 10

A truck having a capacity of 5 tonnes of goods normally carries 80% of the load on the outward journey and 40% of the load on inward journey. The distance is 300 km for one side. It takes 2 days to complete the round trip. The truck is on the road for 310 days in a year. Which one of the following is the total tonne-km in a year?

(a) 3, 70,000

(b) 3, 20,000

(c) 2, 79,000

(d) 2, 50,000

(MTP May 2025)

Ans: (c) 2, 79,000

Tonne-Km for Outward Journey = 4 tonnes × 300 km = 1,200 tonne-km

Tonne-Km for Inward Journey = 2 tonnes × 300 km = 600 tonne-km

Total Tonne-Km per Round Trip = 1,200 + 600 = 1,800 tonne-km

Total Tonne-Km in a year = 1,800 × 155 = 2, 79,000 tonne-km

Topic 4 Composite Units and Equivalent Units

Descriptive Question

Question 11

PREPARE cost statement of Panipat Thermal Power Station showing the cost of electricity generated per kwh, from the following data.

Total units generated 16, 50,000 kWh

	(Rs.)
Operating labour	**21,75,000**
Repairs & maintenance	**7,25,000**
Lubricants, spares and stores	**5,80,000**

Plant supervision	**4,35,000**
Administration overheads	**29,00,000**
Insurance Charges	**15,00,000**
Fuel Charges	**8,00,000**

7 kWh. Of electricity generated per kg. Of coal consumed @ Rs.4.75 per kg. Depreciation charges @ 5% on capital cost of Rs.3, 10, 00,000.

(RTP May 23) (Same concept different figures Old & New SM)

Answer 11

Total units generated 16, 50,000 kWh.

Cost Statement of Panipat Thermal Power Station

	Per annum (Rs.)	**Per kWh. (Rs.)**
Fixed costs:		
Plant supervision	4,35,000	
Administration overheads	29,00,000	
Insurance Charges	15,00,000	
Depreciation (5% of Rs. 3, 10, 00,000 p.a.)	15,50,000	
Total fixed cost: (A)	63,85,000	3.87

Variable costs:		
Operating labour	21,75,000	
Fuel Charges	8,00,000	
Lubricants, spares and stores	5,80,000	
Repairs & maintenance	7,25,000	
Coal cost (Refer to working note)	11,19,643	
Total variable cost: (B)	53,99,643	3.27
Total cost [(A) + (B)]	1,17,84,643	7.14

Working Note:

Coal cost (16, 50,000 kWh. ÷ 7 kWh) × Rs.4.75 per kg. = Rs.11, 19,643

Question 12

Describe Composite Cost unit as used in Service Costing and discuss the ways of computing it.

(PYP Nov'19)

Answer 12

Composite Cost Unit: Sometime two measurement units are combined together to know the cost of service or operation. These are called composite cost units. For example, a public transportation undertaking would measure the operating cost per passenger per kilometre.

Examples of Composite units are Ton- km., Quintal- km, Passenger-km., Patient-day etc. Composite unit may be computed in two ways:

(i) Absolute (Weighted Average) basis.

(ii) Commercial (Simple Average) basis.

In both bases of computation of service cost unit, weightage is also given to qualitative factors rather quantitative (which are directly related with variable cost elements) factors alone.

(i) Weighted Average or Absolute basis – It is summation of the products of qualitative and quantitative factors. For example, to calculate absolute Ton-Km for a goods transport is calculated as follows.

$\sum$(Weight Carried × Distance)$_1$ U + (Weight Carried × Distance)$_2$ +…. + (Weight Carried × Distance)$_n$

Similarly, in case of Cinema theatres, price for various classes of seats are fixed differently. For example–First class seat may be provided with higher quality service and hence charged at a higher rate, whereas Second Class seat may be priced less. In this case, appropriate weight to be given effect for First Class seat and Second Class seat – to ensure proper cost per composite unit.

(ii) Simple Average or Commercial basis – It is the product of average qualitative and total quantitative factors. For example, in case of goods transport, Commercial Ton-Km is arrived at by multiplying total distance km., by average load quantity.

$$\sum(\text{Distance}_1 + \text{Distance}_2 + \cdots \& + \text{Distance}_n) \times \left(\frac{w_1 + w_2 + \ldots w_n}{n}\right)$$

In both the example, variable cost is dependent of distance and is a quantitative factor. Since, the weight carried does not affect the variable cost hence and is a qualitative factor.

Important Note:-

This was a theoretical question based on composite cost unit. Performance of the examinees was below average.

Question 13

X Ltd. distributes' its goods to a regional dealer using single lorry. The dealer premises are 40 kms. away by road. The capacity of the lorry is 10 tonnes. The lorry makes the journey twice a day fully loaded on the outward journey and empty on return journey. The following information is available:

Diesel Consumption	**8 km per litre**
Diesel Cost	**Rs. 60 per litre**
Engine Oil	**Rs. 200 per week**
Driver's Wages (fixed)	**Rs. 2,500 per week**
Repairs	**Rs. 600 per week**
Garage Rent	**Rs. 800 per week**
Cost of Lorry (excluding cost of tyres)	**Rs. 9,50,000**
Life of Lorry	**1,60,000 kms**
Insurance	**Rs. 18,200 per annum**
Cost of Tyres	**Rs. 52,500**
Life of Tyres	**25,000 kms**
Estimated sale value of the lorry at end of its life is	**Rs. 1,50,000**
Vehicle License Cost	**Rs. 7,800 per annum**

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Other Overhead Cost	**Rs. 41,600 per annum**

The lorry operates on a 5 day week.

Required:

(i) A statement to show the total cost of operating the vehicle for the four week period analysed into

Running cost and Fixed cost.

(ii) Calculate the vehicle operating cost per km and per tonne km. (Assume 52 weeks in a year)

(PYP May'19)

Answer 13

Working Notes:

Particulars	For 4 weeks	For 1 week (by dividing by 4)
Total distance travelled (40 k.m. × 2 × 2 trips × 5 days × 4 weeks)	3,200 km	800 km
Total tonne km (40 k.m × 10 tonnes × 2 × 5 days × 4 weeks)	16,000 tonne km	4,000 tonne km

(i) Statement showing Operating Cost

Particulars	For 4 weeks	For 1 week (by dividingby4)

A. Fixed Charges:		
Drivers' wages (Rs. 2,500 x 4 weeks)	10,000	2,500
Garage rent (Rs. 800 × 4 weeks)	3,200	800
Insurance {(Rs. 18,200 ÷ 52 weeks) × 4 weeks}	1,400	350
Vehicle license {(Rs. 7,800 ÷ 52 weeks) × 4 weeks}	600	150
Other overheads cost {(Rs.41,600 ÷52weeks) × 4 weeks}	3,200	800
Total (A)	18,400	4,600
B. Running Cost:		
Cost of diesel {(3,200 ÷ 8 kms) × Rs. 60}	24,000	6,000
Engine Oil (Rs. 200 × 4 weeks)*	800	200
Repairs (Rs. 600 × 4 weeks)*	2,400	600
Depreciation on vehicle	16,000	4,000
Depreciation on tyres (25,000km × 3,200km)	6,720	1,680
Total(B)	49,920	12,480
C. Total Cost(A +B)	68,320	17,080

*Cost of engine oil & repairs may also be treated as fixed cost, as the question relates these with time i.e. in weeks instead of running of vehicle.

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(ii) Calculation of vehicle operating cost :			
Operating cost per k.m.	Rs. 68,320 /3,200 kms	or	Rs. 17,080 /800 Kms =Rs. 21.35
Operating cost per Tonne-k.m.	Rs. 68,320 /16,000	or	Rs. 17,080 /4,000 = Rs. 4.27

Important Note:-

In this practical question on 'Service Costing' students were required to calculate operating cost per km and per tonne km by preparing operating cost statement with the segregation of cost items in running and fixed cost. Performance of the examinees in this sub part of the question is good.

Question 14

STATE how are composite units computed.

(Study Material)

Answer 14

Composite Cost Unit

Sometime two measurement units are combined together to know the cost of service or operation. These are called composite cost units. For example, a public transportation undertaking would measure the operating cost per passenger per kilometer.

Examples of Composite units are Tonne- km., Quintal- km, Passenger-km., Patient day etc. Composite unit may be computed in two ways.

(i) Absolute (Weighted Average) basis.

(ii) Commercial (Simple Average) basis.

In both bases of computation of service cost unit, weightage is also given to qualitative factors rather quantitative (which are directly related with variable cost elements) factors alone.

(i) Weighted Average or Absolute basis – It is a summation of the products of qualitative and quantitative factors. For example, to calculate absolute Tonne- Km for a goods transport is calculated as follows.:

Σ(Weight Carried × Distance)$_1$ + (Weight Carried × Distance)$_2$ +….+(Weight Carried × Distance)$_n$

Similarly, in case of Cinema theatres, price for various classes of seats is fixed differently. For example–

First class seat may be provided with higher quality service and hence charged at a higher rate, whereas Second Class seat may be priced less. In this case, appropriate weight to be given effect for First Class seat and Second Class seat – to ensure proper cost per composite unit.

(ii) Simple Average or Commercial Basis – It is the product of average qualitative and total quantitative factors. For example, in case of goods transport, Commercial Tonne-Km is arrived at by multiplying total distance km., by average load quantity.

$\Sigma(\text{Distance}_1 + \text{Distance}_2 + \ldots\ldots\ldots\ldots + \text{Distance}_n) \times \left(\frac{W_1 + W_2 + \ldots\ldots\ldots + W_n}{n}\right)$

In both the example, variable cost is dependent of distance and is a quantitative factor. Since, the weight carried does not affect the variable cost hence and is a qualitative factor.

To understand the concept of absolute tonne-km., and commercial tonne-km., the following illustration may be referred.

Question 15

EXPLAIN the Methods for ascertaining Service Cost Unit.

(MTP Jan 2025)

Answer 15

Methods for ascertaining Service Cost Unit

Composite Cost Unit

Sometime two measurement units are combined together to know the cost of service or operation. These are called composite cost units. For example, a public transportation undertaking would measure the operating cost per passenger per kilometer.

Examples of Composite units are Tonne- km., Quintal- km, Passenger-km., Patient-day etc. Composite unit may be computed in two ways.

(i) Absolute (Weighted Average) basis.

(ii) Commercial (Simple Average) basis.

In both bases of computation of service cost unit, weightage is also given to qualitative factors rather quantitative (which are directly related with variable cost elements) factors alone.

(i) Weighted Average or Absolute basis – It is a summation of the products of qualitative and quantitative factors. For example, to calculate absolute Tonne-Km for a goods transport is calculated as follows.

Σ (Weight Carried × Distance) 1 + (Weight Carried × Distance) 2 +…. + (Weight Carried × Distance) n

Similarly, in case of Cinema theatres, price for various classes of seats is fixed differently. For example–

First class seat may be provided with higher quality service and hence charged at a higher rate, whereas Second Class seat may be priced less. In this case, appropriate weight to be given effect for First Class seat and Second Class seat – to ensure proper cost per composite unit.

(ii) Simple Average or Commercial Basis – It is the product of average qualitative and total quantitative factors. For example, in case of goods transport, Commercial Tonne-Km is arrived at by multiplying total distance km., by average load quantity.

Σ (Distance1 + Distance2 + ……+ Distance n) $\times\left(\frac{W1+W2+\ldots+Wn}{n}\right)$

In both the example, variable cost is dependent of distance and is a quantitative factor. Since, the weight carried does not affect the variable cost hence and is a qualitative factor.

Equivalent Cost Unit/ Equivalent Service Unit:

To calculate cost or pricing of two more different grade of services which uses common resources, each grade of service is assigned a weight and converted into equivalent units. Converting services into equivalent units make different grade of services equivalent and comparable.

Question 16

S Travels has been promised a contract to run a tourist car on a 20 km. long route for a multinational firm. He buys a car costing Rs. 4, 50,000. The annual cost of insurance and taxes are Rs. 7,500 and Rs. 1,800 respectively. He has to pay Rs. 2,500 per month for a garage where he keeps the car when it is not in use. The annual repair costs are estimated at Rs. 12,000. The car is estimated to have a life of 10 years at the end of which the scrap value is likely to be Rs. 50,000.

He hires a driver who is to be paid Rs. 3,000 per month plus 10% of the takings as commission. Other incidental expenses are estimated at Rs. 2,000 per month.

Petrol and oil will cost Rs. 220 per 100 kms. The car will make 4 round trips each day. Assuming that a profit of 15% on takings is desired and that the car will be on the road for 25 days on an average per month, WHAT should he charge per round-trip?

(MTP May 2025)

Answer 16

	Per Annum (Rs.)	**Per Month (Rs.)**

Standing charges:		
Depreciation [(4,50,000- 50,000)/10]	40,000	3,333.33
Insurance	7,500	625.00
Taxes	1,800	150.00
Garage (Rs. 2,500 × 12)	30,000	2,500.00
Annual repairs	12,000	1,000.00
Driver's Salary (Rs. 3,000× 12)	36,000	3,000.00
Incidental expenses (Rs. 2,000 × 12)	24,000	2,000.00
	1,51,300	12,608.33
Variable expenses:		
Petrol and Oil $\left(4{,}000^{*} kms. \times \frac{1}{100}\ kms. \times Rs.\ 220\right)$		8,800.00
Total Cost (without commission)		21,408.33

[* 20 km. × 2 × 4 round trips × 25 days = 4,000 km.]

Let X be the total takings per month

Driver's Commission = 10% of X = $\frac{X}{10}$

Profit = 15% of X = $\frac{15}{100}$ X=$\frac{3X}{20}$

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Total takings per month = Total cost + Driver's Commission + Profit

Or X = Rs. 21,408.33 $+\frac{X}{10}+\frac{3X}{20}$

Or X-$\frac{3X}{20}-\frac{X}{10}$ = Rs. 21,408.33

Or $\frac{20X-3X-2X}{20}$ = Rs. 21,408.33

Or $\frac{15X}{20}$ = Rs. 21,408.33

Or X= $\frac{Rs.21,408.33 \times 4}{3}$

X = Rs. 28,544.44

Total number of round trips per month: 25 days × 4 round trips per day = 100 trips

Hence the charge per round trip= $\frac{Rs.28,544.44}{100}$ = Rs. 285.44

Topic 5 Operating Cost Sheet Preparation

Descriptive Question

Question 17

KR Resorts (P) Ltd. offers three types of rooms to its guests, viz deluxe room, super deluxe room and luxury suite. You are required to DETERMINE the tariff to be charged to the customers for different types of rooms on the basis of following information:

Types of Room	Number of Rooms	Occupancy
Deluxe Room	**100**	**90%**
Super Deluxe Room	**60**	**75%**
Luxury Suite	**40**	**60%**

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and that of 'luxury suite' is 3 times of 'deluxe room'. Annual expenses are as follows:

Particulars	Amount (Rs. lakhs)
Staff salaries	780.00
Lighting, Heating and Power	350.00
Repairs, Maintenance and Renovation	220.00
Linen	60.00
Laundry charges	34.00
Interior decoration	85.00
Sundries	36.28

An attendant for each room was provided when the room was occupied and he was paid Rs. 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on Rs. 900 lakhs, furniture and fixtures @ 10% on Rs. 90 lakhs and air conditioners @ 10% on Rs. 75 lakhs. Profit is to be provided @ 25% on total taking and assume 360 days in a year.

(MTP May 20) (MTP March '18,) (RTP Nov '23)

Answer 17

Total cost statement of KR Resort (P) Limited

Particulars	Cost per annum (Rs. in lakhs)

Staff Salaries	780.00
Room Attendant's Wages (Refer working note 3)	286.20
Lighting, Heating & Power	350.00
Repairs, Maintenance & Renovation	220.00
Linen	60.00
Laundry charges	34.00
Interior Decoration	85.00
Sundries	36.28
Depreciation: (Refer working note 4)	
- Building	45.00
- Furniture & Fixture	9.00
- Air Conditioners	7.50
Total cost for the year	1912.98

Computation of profit:

Let Rs. x be the rent for deluxe from.

Equivalent deluxe room days are 90,720 (Refer working note 2)

Total takings = Rs. 90,720x

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Profit is 25% of total takings.

Profit = 25% of Rs. 90,720x = Rs. 22,680x

Total takings= Total Cost + Profit

Rs. 90,720x = Rs. 19, 12, 98,000 + Rs. 22,680x Rs. 90,720x -Rs. 22,680x

= Rs. 19, 12, 98,000 Rs. 68,040x = Rs. 19, 12, 98,000

X= $\frac{Rs.\ 19,12,98,000}{Rs.\ 68040}$ = Rs. 2,811.55

Rent to be charged for deluxe room	Rs. 2,811.55
Rent to be charged for super deluxe room = Rent of deluxe room x 2 = Rs. 2,811.55 x 2	Rs. 5,623.10
Rent to be charged for luxury suite = Rent of Super Deluxe room x 1.5 = Rs. 5,623.10 x 1.5	Rs. 8,434.65

Working Notes:

(1) Computation of Room Occupancy

Type of Room	No. of rooms x no. of days x occupancy %	Room days
Deluxe Room	100 rooms x 360 days x 90% occupancy	32,400
Super Deluxe Room	60 rooms x 360 days x 75% occupancy	16,200
Luxury Suite	40 rooms x 360 days x 60% occupancy	8,640
	Total	57,240

(2) Computation of equivalent deluxe room days

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and luxury suite' is 3 times of 'deluxe room'. Therefore, equivalent room days would be:

Type of Room	Room days	Equivalent deluxe room days
Deluxe Room	32,400 x 1	32,400
Super Deluxe Room	16,200 x 2	32,400
Luxury Suite	8,640 x 3	25,920
	Total	90,720

(3) Computation of room attendant's wages

Room occupancy days @ Rs. 500 per day = 286.2 lakhs (i.e. 57,240 days ×Rs. 500)

(4) Computation of Depreciation per annum

Particulars	Cost (Rs.)	Rate of Depreciation	Depreciation (Rs.)
Building	9,00,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

Question 18

Royal Transport Company has been given a 50-kilometre-long route to run 6 buses. The cost of each bus is Rs. 75, 00,000. The buses will make 3 round trips per day carrying on an

average 75 percent passengers of their seating capacity. The seating capacity of each bus is 48 passengers. The buses will run on an average 25 days in a month. The other information for the year 2021-22 is given below:

Garage Rent	**Rs. 60,000 per month**
Annual Repairs & Maintenance	**Rs. 2,40,000 each bus**
Salaries of 6 drivers	**Rs. 20,000 each per month**
Wages of 6 conductors	**Rs. 16,000 each per month**
Wages of 6 cleaners	**Rs. 10,000 each per month**
Manager's salary	**Rs. 50,000 per month**
Road Tax, Permit fee, etc.	**Rs. 60,000 for a quarter**
Office expenses	**Rs. 25,000 per month**
Cost of diesel per litre	**Rs.92**
Kilometer run per litre for each bus	**6 kilometres**
Annual Depreciation	**20% of cost**
Annual Insurance	**4% of cost**
Engine oils & lubricants (for 1,000 kilometres)	**Rs. 20,000**

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You are required to calculate the bus fare to be charged from each passenger per kilometer (upto four decimal points), if the company wants to earn profit of 33 $\frac{1}{3}$ percent on taking (total receipts from passengers).

(MTP Oct'22)

Answer 18

Working Notes:

1. Total Kilometres to be run during the year 2021-22

= 50 km.× 2 sides × 3 trips × 25 days × 12 months × 6 buses = 5,40,000 Kilometres

2. Total passenger Kilometres

= 5, 40,000 km. × 48 passengers × 75% = 1, 94, 40,000 Passenger- km.

Operating Cost Sheet for the year 2021- 22

Particulars		Total Cost (Rs.)
A.	Fixed Charges:	
	Garage rent (Rs. 60,000 × 12 months)	7,20,000
	Salary of drivers (Rs. 20,000 × 6 drivers ×12 months)	14,40,000
	Wages of Conductors (Rs. 16,000 × 6 conductors × 12 months)	11,52,000
	Wages of Cleaners (Rs. 10,000 × 6 cleaners × 12 months)	7,20,000
	Manager's salary (Rs.50,000 × 12 months)	6,00,000
	Road Tax, Permit fee, etc. (Rs. 60,000 × 4 quarters)	2,40,000

	Office expenses (Rs. 25,000 × 12 months)	3,00,000
	Depreciation (Rs. 75, 00,000 × 6 buses × 20%)	90,00,000
	Insurance (Rs. 75, 00,000 × 6 buses × 4%)	18,00,000
	Total (A)	1,59,72,000
B.	Variable Charges:	
	Repairs and Maintenance (Rs. 2,40,000 × 6 buses)	14,40,000
	Diesel {(5,40,000 km. ÷ 6 km.) × Rs.92}	82,80,000
	Engine oils & lubricants {(Rs. 20,000. ÷ 1000 km.) × 5,40,000 km}	1,08,00,000
	Total (B)	2,05,20,000
	Total Cost (A+B)	3,64,92,000
	Add: 33 1/3 % Profit on takings or 50% on cost	1,82,46,000
C.	Total Takings (Total bus fare collection)	5,47,38,000
D.	Total Passenger-km. (Working Note 2)	1,94,40,000
E.	Bus fare to be charged from each passenger per km. (C ÷ D)	2.82

Question 19

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Secure lifeline Ltd. operates in life insurance business. It launched a new insurance policy 'Total secure'. The company has incurred the following expenditures during the last year for the policy:

	Rs.
Cost of marketing of the policy	74,58,000
Sales support expenses	18,89,250
Policy issuance cost	16,59,735
Claims management cost	2,07,240
Policy development cost	18,56,250
Postage and logistics	16,91,250
Facilities cost	25,14,600
Policy servicing cost	58,09,155
Employees cost	9,24,000
IT cost	1,22,62,800
Office administration cost	26,73,660

Number of policies sold- 844. Total insured value of policies - Rs. 1,640 crore.

Required:

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(i) CALCULATE total cost for Professionals Protection Plus' policy segregating the costs into four main activities namely (a) Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.

(ii) CALCULATE cost per policy.

(iii) CALCULATE cost per rupee of insured value.

(MTP March '23, Old & New SM, RTP Nov '18, PYP July '21)

Answer 19

(i) Calculation of total cost for 'Professionals Protection Plus' policy

	Particulars	Amount (Rs.)	Amount (Rs.)
1	Marketing and Sales support:		
	- Policy development cost	18,56,250	
	- Cost of marketing	74,58,000	
	- Sales support expenses	18,89,250	1,12,03,500
2	Operations:		
	- Policy issuance cost	16,59,735	
	- Policy servicing cost	58,09,155	
	- Claims management cost	2,07,240	76,76,130

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3	IT Cost		1,22,62,800
4	Support functions		
	- Postage and logistics	16,91,250	
	- Facilities cost	25,14,600	
	- Employees cost	9,24,000	
	- Office administration cost	26,73,660	78,03,510
	Total Cost		3,89,45,940

(ii) Calculation of Cost per policy = $\frac{\text{Total Cost}}{\text{Number of Policies}} = \frac{3,89,45,940}{844}$ = Rs. 46,144.48

(iii) Cost per rupee of insured value= $\frac{\text{Total Cost}}{\text{Total insured value}} = \frac{3,89,45,940}{1,640 \text{ crore}}$ = Rs. 0.0024

Important Note:-

This practical problem was based on service costing which required examinees to segregate costs of Insurance policy under four main activities and to calculate cost per policy. Most of the examinees could not segregate the costs correctly. Performance of the examinees was below average.

Question 20

VPS is a public school having 25 buses each plying in different directions for the transport of its school students. In view of large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The workload of the students has been so arranged that in the morning, the first trip picks up senior students and the second trip plying an hour later picks up junior

students. Similarly, in the afternoon, the first trip takes the junior students and an hour later the second trip takes the senior students home. The distance travelled by each bus, one way is 8 km. The school works 22 days in a month and remains closed for vacation in May and June. The bus fee, however, is payable by the students for all the 12 months in a year.

The details of expenses for a year are as under:

Driver's salary – payable for all the 12 in month's Rs. 12,000 per month per driver

Cleaner's salary payable for all the 12 months Rs. 8,000 per month per cleaner License fees, taxes etc. Rs. 8,400 per bus per annum

Insurance Premium Rs. 15,600 per bus per annum

Repairs and Maintenance Rs. 20,500 per bus per annum

Purchase price of the bus Rs. 20, 00,000 each

Life of the bus 16 years

Scrap value Rs. 1, 60,000

Diesel Cost Rs. 78.50 per litre

Each bus gives an average of 5 km. per litre of diesel. The seating capacity of each bus is 40 students. The school follows differential transportation fees based on distance travelled as under:

Students picked up and dropped within the range of distance from the school	Transportation fee	Percentage of students availing this facility
2 km.	25% of Full	15%
4 km.	50% of Full	30%

8 km.	Full	55%

Due to a pandemic, lockdown imposed on schools and the school remained closed from April 2020 to December 2020. Drivers and cleaners were paid 75% of their salary during the lockdown period.

Repairing cost reduced to 75% for the year 2020.

Ignore the interest cost.

Required:

(i) PREPARE a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

(ii) FIND OUT transportation fee per student per month in respect of:

(a) Students coming from a distance of upto 2 km. from the school.

(b) Students coming from a distance of upto 4 km. from the school; and

(c) Students coming from a distance of upto 8 km. from the school.

(iii) CALCULATE the minimum bus fare that has to be recovered from the students for the year 2020.

(RTP May '21, Old & New SM)

Answer 20

(i) Statement showing the expenses of operating a single bus and the fleet of 25 buses for a year

Particulars	Per bus per annum (Rs.)	Fleet of 25 buses per annum (Rs.)

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Running costs : (A)		
Diesel (Refer to working note 1)	2,21,056	55,26,400
Repairs & maintenance costs: (B)	20,500	5,12,500
Fixed charges:		
Driver's salary (Rs. 12,000 × 12 months)	1,44,000	36,00,000
Cleaners salary (Rs. 8,000 × 12 months)	96,000	24,00,000
Licence fee, taxes etc.	8,400	2,10,000
Insurance	15,600	3,90,000
Depreciation $\left(\frac{\text{Rs.20,00,000}-\text{Rs.1,60,000}}{\text{16 Years}}\right)$	1,15,000	28,75,000
Total fixed charges: (C)	3,79,000	94,75,000
Total expenses: (A+B+C)	6,20,556	1,55,13,900

(ii) Average cost per student per month in respect of students coming from a distance of:

(a) 2 km. from the school {Rs. 6,20,556 / (236 students × 12 months)} (Refer to Working Note 2)	Rs. 219.12
(b) 4 km. from the school (Rs. 219.12 × 2)	Rs. 438.24
(c) 8 km. from the school (Rs. 219.12 × 4)	Rs. 876.48

(iii) Calculation of minimum bus fare to be recovered from the students during the year 2020:

Statement showing the expenses of operating a single bus in year 2020

Particulars	Per bus per annum (Rs.)
Running costs : (A)	
Diesel (Refer to working note 3)	66,316.80
Repairs & maintenance costs: (B) (Rs. 20,500 x 0.75)	15,375
Fixed charges:	
Driver's salary {Rs. 12,000 × 3 months + (75% of Rs. 12,000 × 9 months)}	1,17,000
Cleaners salary {Rs. 8,000 × 3 months + (75% of Rs. 8,000 × 9 months)}	78,000
Licence fee, taxes etc.	8,400
Insurance	15,600
Depreciation $\frac{(\text{Rs.}20,00,000 - \text{Rs.}1,60,000)}{16 \text{ Years}}$	1,15,000
Total fixed charges: (C)	3,34,000
Total expenses: (A+B+C)	4,15,691.80

Minimum bus fare to be recovered:

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(a) 2 km. from the school {Rs. 4,15,691.8 / (236 students × 12 months)} (Refer to Working Note 2)	Rs. 146.78
(b) 4 km. from the school (Rs. 146.78 × 2)	Rs. 293.56
(c) 8 km. from the school (Rs.146.78 × 4)	Rs. 587.12

Working Notes:

1. Calculation of diesel cost per bus

No. of trips made by a bus each day	4
Distance travelled in one trip both ways (8 km. × 2 trips)	16 km.
Distance travelled per day by a bus (16 km. × 4 shifts)	64 km.
Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled per year (1,408 × 10 months)	14,080 km.
No. of litres of diesel required per bus per year (14,080 km. ÷ 5 km.)	2,816 litres
Cost of diesel per bus per year (2,816 litres × Rs. 78.50)	Rs. 2,21,056

2. Calculation of equivalent number of students per bus:

Bus capacity of 2 trips (40 students × 2 trips)	80 students
1/4th fare students (15% × 80 students)	12 students

½ fare students (30% × 80 students × 2) (equivalent to 1/4th fare students)	48 students
Full fare students (55% × 80 students × 4) (equivalent to 1/4th fare students)	176 students
Total students equivalent to 1/4th fare students	236 students

3. Calculation of diesel cost per bus in Year 2020:

Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled during the year 2020 (1,408 × 3 months)	4,224 km.
No. of litres of diesel required per bus per year (4,224 km. ÷ 5 km.)	844.8 litres
Cost of diesel per bus per year (844.8 litres × Rs. 78.50)	Rs. 66,316.80

Question 21

Mr.PS owns a bus which runs according to the following schedule:

(i)	**Delhi to Hisar and back, the same day**	
	Distance covered:	**160 km. one way**
	Number of days run each month:	**9**
	Seating capacity occupied	**90%.**

(ii)	Delhi to Aligarh and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	12
	Seating capacity occupied	95%
(iii)	Delhi to Alwar and back, the same day	
	Distance covered:	170 km. one way
	Number of days run each month:	6
	Seating capacity occupied	100%
(iv)	Following are the other details:	
	Cost of the bus	Rs. 15,00,000
	Salary of the Driver	Rs. 30,000 p.m.
	Salary of the Conductor	Rs. 26,000 p.m.
	Salary of the part-time Accountant	Rs. 7,000 p.m.
	Insurance of the bus	Rs. 6,000 p.a.
	Diesel consumption 5 km. per litre at	Rs. 90 per litre
	Road tax	Rs. 21,912 p.a.

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	Lubricant oil	**Rs. 30 per 100 km.**
	Permit fee	**Rs. 500 p.m.**
	Repairs and maintenance	**Rs. 5,000 p.m.**
	Depreciation of the bus	**@ 30% p.a.**
	Seating capacity of the bus	**50 persons**

Passenger tax is 20% of the total takings.

CALCULATE the bus fare to be charged from each passenger to earn a profit of 30% on total takings. The fares are to be indicated per passenger for the journeys: (i) Delhi to Hisar (ii) Delhi to Aligarh and (iii) Delhi to Alwar.

(RTP Nov '21)

Answer 21

Working Notes:

1. Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Hisar	160	2	9	2,880
Delhi to Aligarh	160	2	12	3,840
Delhi to Alwar	170	2	6	2,040
Total				8,760

2. Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger-Km. per month
		(%)	Seats		
Delhi to Hisar & Back	900 (50 seats X 2 trips X 9 days)	90	810	160	1, 29,600 (810 seats × 160 km.)
Delhi to Aligarh & Back	1,200 (50 seats X 2 trips X 12 days)	95	1,140	160	1, 82,400 (1,140 seats × 160 km.)
Delhi to Alwar & Back	600 (50 seats X 2 trips X 6 days)	100	600	170	1, 02,000 (600 seats × 170 km.)
Total					4,14,000

Monthly Operating Cost Statement

Particulars	(Rs.)	(Rs.)
(i) Running Costs		
Diesel {(8,760 km / 5 km) × Rs. 90}	1,57,680.00	
Lubricant oil {(8,760 km / 100) × Rs. 30}	2,628.00	1,60,308.00
(ii) Maintenance Costs		

Repairs & Maintenance		5,000.00
(iii) Standing charges		
Salary to driver	30,000.00	
Salary to conductor	26,000.00	
Salary of part-time accountant	7,000.00	
Insurance (Rs. 6,000 ÷12)	500.00	
Road tax (Rs. 21,912 ÷12)	1,826.00	
Permit fee	500.00	
Depreciation {(Rs. 15,00,000 × 30%) / 12}	37,500.00	1,03,326.00
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,68,634.00
Passenger Tax*		1,07,453.60
Total Cost		3,76,087.60
Add: Profit*		1,61,180.40
Total takings per month		5,37,268.00

*Let total takings be X then,

X = Total costs per month before passenger tax + 0.2 X (passenger tax) + 0.3 X (profit) X

= Rs. 2, 68,634 + 0.2 X + 0.3 X

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0.5 X = Rs. 2, 68,634 or, X = Rs. 5, 37,268

Passenger Tax = 20% of Rs. 5, 37,268 = Rs. 1, 07,453.60 Profit = 30% of Rs. 5, 37,268 = Rs. 1, 61,180.40

Calculation of Rate per passenger km. and fares to be charged for different routes

Rate per Passenger-Km. = Total takings per month / Total Passenger – Km. per month

= Rs. 5, 37,268 / 4, 14,000 Passenger –Km. = Rs. 1.30 (approx.)

Bus fare to be charged per passenger:

Delhi to Hisar	Rs. 1.30 × 160 km	Rs. 208.00
Delhi to Aligarh	Rs. 1.30 × 160 km	Rs. 208.00
Delhi to Alwar	Rs. 1.30 × 170 km	Rs. 221.00

Question 22

Royal Transport Services runs fleet of buses within the limits of Jaipur city. The following are the details which were incurred by the company during October, 2021:

	(Rs.)
Cost of each Bus	**24,00,000**
Garage Rent	**1,00,000**
Insurance	**25,000**
Road tax	**20,000**

Manager's Salary	**60,000**
Assistant's Salary (Two)	**32,000 each**
Supervisor's Salary (Three)	**24,000 each**
Driver's Salary (Twenty-Five)	**20,000 each**
Cleaner's Salary (Twenty)	**5,000 each**
Office Staff's Salary	**1,00,000**
Consumables	**1,20,000**
Repairs & Maintenance	**90,000**
Other Fixed Expenses	**72,000**
Diesel (10 Kms per Litre)	**80 per litre**
Oils & Lubricants	**1,45,000**

Tyres and tubes 35,000

Depreciation 10% p.a. on Cost other details are as below:

Capacity

Buses 60 Passengers

13Buses 50 Passengers

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Each bus makes 4 round trips a day covering a distance of 10 Kilometres in each trip (One Way) on an average. During the trips 80% of the seats are occupied. The annual records show that 5 buses are generally required to be kept away from roods each day for repairs.

You are required to CALCULATE cost per passenger-km. Cost sheet to be prepared on the basis of 25 buses.

(RTP Nov'22)

Answer 22

Operating Cost Sheet

Particulars	Amount (Rs.)	Amount (Rs.)
Standing Charges:		
Depreciation (Rs.24,00,000 X 10% X 1/12 X 25)	5,00,000	
Garage Rent	1,00,000	
Insurance Road Tax	25,000	
Manager's Salary	20,000	
Assistant's Salary (Rs. 32,000 X 2)	60,000	
Supervisor's Salary (Rs. 24,000 X 3)	64,000	
Driver's Salary (Rs. 20,000 X 25)	72,000	
Cleaner's Salary (Rs. 5,000 X 20)	5,00,000	

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Office Staff's Salary Consumables	1,00,000	
Consumables	1,00,000	
Repairs & Maintenance	1,20,000	
Other Fixed Expenses	90,000	
	72,000	
		18,23,000
Running Charges		
Diesel (49,600 Kms / 10 Kms X Rs. 80 per unit)	3,96,800	
Oils & Lubricants	1,45,000	
Tyres and tubes	35,000	5,76,800
Total Operating Cost		**23,99,800**

Cost per passenger-km= $\frac{\text{Total Operating Cost}}{\text{Passenger–kms}}$

$=\frac{23,99,800}{27,18,080}$ = 0.883

Working Note:

Calculation of Total Kilometres and Passenger Kilometres

Specification	Total Km.	Passenger–Km.

12 Buses (60 Passengers)	29,760 Kms (10 Kms × 4 X 2 trips × 31 days x 12 Buses)	14,28,480 (29760 Kms x 60 Pass. X 80%)
13 Buses (50 Passengers)	32,240 Kms (10 Kms × 4 X 2 trips × 31 days x 13 Buses)	12,89,600 (32240 Kms x 50 Pass. X 80%)
Total	62,000	27,18,080

Since 5 buses out of 25 buses are kept for repairs every day

Actual total Km. 62,000 × 20/25 = 49,600

Question 23

Mr. X owns a bus which runs according to the following schedule:

(i)	**Delhi to Chandigarh and back, the same day.**	
	Distance covered:	**250 km. one way.**
	Number of days run each month:	**8**
	Seating capacity occupied	**90%.**
(ii)	**Delhi to Agra and back, the same day.**	
	Distance covered:	**210 km. one way**
	Number of days run each month:	**10**
	Seating capacity occupied	**85%**
(iii)	**Delhi to Jaipur and back, the same day.**	
	Distance covered:	**270 km. one way**

	Number of days run each month:	**6**
	Seating capacity occupied	**100%**
(iv)	**Following are the other details:**	
	Cost of the bus	**Rs.12,00,000**
	Salary of the Driver	**Rs.24,000 p.m.**
	Salary of the Conductor	**Rs.21,000 p.m.**
	Salary of the part-time Accountant	**Rs.5,000 p.m.**
	Insurance of the bus	**Rs.4,800 p.a.**
	Diesel consumption 4 km. per litre at	**Rs.56 per litre**
	Road tax	**Rs.15,915 p.a.**
	Lubricant oil	**Rs.10 per 100 km.**
	Permit fee	**Rs.315 p.m.**
	Repairs and maintenance	**Rs.1,000 p.m.**
	Depreciation of the bus	**@ 20% p.a.**
	Seating capacity of the bus	**50 persons.**

Passenger tax is 20% of the total takings.

CALCULATE the bus fare to be charged from each passenger to earn a profit of 30% on total takings. The fares are to be indicated per passenger for the journeys:

(i) Delhi to Chandigarh (ii) Delhi to Agra and (iii) Delhi to Jaipur.

(Study Material)

Answer 23

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Working Notes:

Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Chandigarh	250	2	8	4,000
Delhi to Agra	210	2	10	4,200
Delhi to Jaipur	270	2	6	3,240
				11,440

Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger- Km. per month
		(%)	Seats		
Delhi to Chandigarh & Back	800 (50 seats ×2 trips × 8 days)	90	720	250	1,80,000 (720 seats × 250 km.)
Delhi to Agra & Back	1,000 (50 seats ×2 trips × 10 days)	85	850	210	1,78,500 (850 seats × 210 km.)
Delhi to Jaipur & Back	600 (50 seats × 2 trips × 6 days)	100	600	270	1,62,000 (600 seats × 270 km.)

Total		5,20,500

Monthly Operating Cost Statement

	(Rs.)	**(Rs.)**
(i) Running Costs		
Diesel {(11,440 km ÷ 4 km) × Rs.56}	1,60,160	
Lubricant oil {(11,440 km ÷ 100) × Rs.10}	1,144	1,61,304
(ii) Maintenance Costs		
Repairs & Maintenance		1,000
(iii) Standing charges		
Salary to driver	24,000	
Salary to conductor	21,000	
Salary of part-time accountant	5,000	
Insurance (Rs.4,800 ÷12)	400	
Road tax (Rs.15,915 ÷12)	1,326.25	
Permit fee	315	
Depreciation {(Rs.12,00,000 ×20%) ÷ 12}	20,000	72,041.25
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,34,345.25
Passenger Tax*		93,738.10
Total Cost		3,28,083.35

Add: Profit*		1,40,607.15
Total takings per month		4,68,690.50

*Let, total takings be X then

X = Total costs per month before passenger tax + 0.2 X (passenger tax) + 0.3

X (profit)

X = Rs.2, 34,345.25 + 0.2 X + 0.3 X

0.5 X = Rs.2, 34,345.25 or, X = Rs.4, 68,690.50

Passenger Tax = 20% of Rs.4, 68,690.50 = Rs.93, 738.10

Profit = 30% of Rs.4, 68,690.50 = Rs.1, 40,607.15

Calculation of Rate per passenger km. and fares to be charged for different routes

Rate per Passenger-Km. = $\frac{\text{Total takings per month}}{\text{Total Passenger} - \text{Km.per month}}$

= $\frac{\text{Rs.4,68,690.50}}{\text{5,20,500 Passenger} - \text{Km.}}$ = Rs.0.90

Bus fare to be charged per passenger.

Delhi to Chandigarh	= Rs.0.90 ×250 km	= Rs.225.00
Delhi to Agra	= Rs.0.90 × 210 km	= Rs.189.00
Delhi to Jaipur	= Rs.0.90 × 270 km	= Rs.243.00

Question 24

From the following data pertaining to the year 2022-23 PREPARE a cost statement showing the cost of electricity generated per kwh by Chambal Thermal Power Station.

Total units generated **10, 00,000 kWh**

	(Rs.)
Operating labour	**15,00,000**
Repairs & maintenance	**5,00,000**
Lubricants, spares and stores	**4,00,000**
Plant supervision	**3,00,000**
Administration overheads	**20,00,000**

5 kWh. of electricity generated per kg. of coal consumed @ Rs. 4.25 per kg. Depreciation charges @ 5% on capital cost of Rs. 2, 00, 00,000.

(Study Material)

Answer 24

Cost Statement of Chambal Thermal Power Station

Total units generated 10, 00,000 kWh.

	Per annum (Rs.)	**Per kWh. (Rs.)**
Fixed costs:		
Plant supervision	3,00,000	
Administration overheads	20,00,000	
Depreciation (5% of Rs. 2, 00, 00,000 p.a.)	10,00,000	
Total fixed cost: (A)	33,00,000	3.30

Variable costs:		
Operating labour	15,00,000	
Lubricants, spares and stores	4,00,000	
Repairs & maintenance	5,00,000	
Coal cost (Refer to working note)	8,50,000	
Total variable cost: (B)	32,50,000	3.25
Total cost [(A) + (B)]	65,50,000	6.55

Working Note:

Coal cost (10, 00,000 kWh. ÷ 5 kWh) × Rs. 4.25 per kg. = Rs.8, 50,000

Question 25

Roshan Travels provide bus facility to a College for carrying its students from home to College and dropping them back at home after study hours. The travel company runs a fleet of 6 buses for this purpose and park them in the college premises.

The information regarding bus running is as follows:

(I) The College operates in two shifts (one in the morning and one in the afternoon).

(II) The distance travelled by each bus one way is 20 kms.

(III) The students need to attend the college for 30 days in a month.

(IV) The seating capacity of each bus is 30 persons.

(V) The seating capacity is normally 80% occupied during the year.

The information regarding expenses incurred for a year is as follows:

Particulars	Amount

Driver and attendant salary	**Rs. 60,000 per person per month**
Cleaner's salary (One cleaner for 2 buses)	**Rs. 30,000 per cleaner per month**
Diesel (Avg. 8 kms per litre)	**Rs. 160 per litre**
Insurance charges (per annum)	**2% of Purchase Price**
License fees and taxes	**Rs. 10,160 per bus per month**
Parking charges paid	**Rs. 36,000 per month**
Repair & maintenance including engine oil and lubricants (for every 5,760 kms)	**Rs. 5,712 per bus**
Purchase Price of each bus	**Rs. 30,00,000**
Residual life of each bus	**8 Years**
Scrap value per bus at the end of residual life	**Rs. 6,00,000**

Students coming from a distance of beyond 10 kms away from the College are charged double the fare than that from students coming from a distance of up-to 10 kms. away from the College. 50% of students travelling in each trip are coming from a distance beyond 10 kms. from the College. The charges are to be based on average cost.

You are required to:

(i) PREPARE a statement showing expenses of operating a single bus for a year.

(ii) CALCULATE the average cost per student per month in respect of:

(a) Students coming from a distance up-to 10 kms. From the College.

(b) Students coming from a distance beyond 10 kms. From the College.

(RTP Jan 2025)

Answer 25

(i) Statement of Expenses of operating a single bus for a year

Particulars	Rate (Rs.)	Per Bus per annum (Rs.)
(A) Standing Charges:		
Driver and attendant salary	60,000 p.m.	7,20,000
Average Cleaner's salary (50%)	30,000 p.m.	1,80,000
Insurance charge	60,000 p.a.	60,000
License fee, taxes etc.	10,160 p.m.	121,920
Average Parking Charges	36,000 p.m.	72,000
Depreciation {(30,00,000 – 6,00,000) ÷ 8}	3,00,000 p.a.	3,00,000
(B) Maintenance Charges:		
Repairs & maintenance including engine oil and lubricants (Working Note 1)	5,7120 p.a.	5,7120
(C) Operating Charges:		
Diesel (Working Note 2)		11,52,000

Total Cost (A + B + C)		26,63,040
Cost per month		2,21,920

(ii) Average cost per students per month:

A. Student coming from distance of up-to 10 km

$= \frac{\text{Total cost per month}}{\text{Total no.of equivalent student}} = \frac{\text{Rs.2,21,920}}{72^*}$ = Rs.3, 082.22

B. Student coming from a distance beyond 10 km

= Rs. 3,082.22 × 2 = Rs. 6,164.44

*** Considering half fare students as a base**	
Full fare students (12 × 2)	24 students
Add: Half fare students (Working Note 3)	12 students
Total Equivalent number of students per month	36 students
Total Equivalent number of students per month (morning + afternoon shift)	72 students

Working Notes:

1. Calculation of Repairs and maintenance cost of a bus:

Distance travelled in a year:

(4 trips × 2 × 20 km. × 30 days × 12 months)

Distance travelled p.a.: 57,600 km.

Repairs and maintenance cost per Bus per annum:

$= \frac{57{,}600 \text{ Km.}}{5{,}760 \text{ Km.}}$ ×Rs. 5,712 per bus

= Rs. 57,120 per annum

2. Calculation of diesel cost per bus per annum:

Distance travelled in a year = 57,600 km

Diesel cost per Bus per annum:

$= \frac{57{,}600 \text{ Km.}}{8 \text{ Km.}}$ ×Rs. 160 = Rs. 11,52,000

3. Calculation of equivalent number of students per bus:	
Seating capacity of a bus	30 students
Occupancy (80% of capacity)	24 students
Half fare students (50% of 24 students)	12 students
Full fare students (50% of 24 students)	12 students

Case Scenarios

Question 26

A LMV Pvt. Ltd, operates cab/ car rental service in Delhi/NCR. It provides its service to the offices of Noida, Gurugram and Faridabad. At present it operates CNG fuelled cars but it is also considering to upgrade these into Electric vehicle (EV). The following details related with the owning of CNG & EV propelled cars are as tabulated below:

Particulars	CNG Car	EV Car
Car purchase price (Rs.)	9,20,000	15,20,000
Govt. subsidy on purchase of car (Rs.)	--	1,50,000
Life of the car	15 years	10 years
Residual value (Rs.)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (Rs.)	60	--
Power cost per Kwh (Rs.)	--	7.60
Annual Maintenance cost (Rs.)	8,000	5,200
Annual insurance cost (Rs.)	7,600	14,600
Tyre replacement cost in every 5 -year (Rs.)	16,000	16,000
Battery replacement cost in every 8- year (Rs.)	12,000	5,40,000

Apart from the above, the following are the additional information:

Particulars	
Average distance covered by a car in a month	**1,500 km**
Driver's salary (Rs.)	**20,000 p.m.**
Garage rent per car (Rs.)	**4,500 p.m.**
Share of Office & Administration cost per car (Rs.)	**1,500 p.m.**

You have been approached by the management of A LMV Pvt. Ltd. for consultation on the two options of operating the cab service. The expected questions that may be asked by the management are as follows:

(Study Material)

(i) What would be the depreciable value of EV Car?

(a) Rs.13, 50,000

(b) Rs.15, 20,000

(c) Rs.14, 40,000

(d) Rs.12, 00,000

Ans: (d) Rs.12, 00,000

Calculation of Depreciation per month:

Particulars		CNG Car	EV Car
A	Car purchase price (Rs.)	9,20,000	15,20,000
B	Less: Govt. subsidy (Rs.)	--	(1,50,000)

C	Less: Residual value (Rs.)	(95,000)	(1,70,000)
D	Depreciable value of car (Rs.) [A-B-C]	8,25,000	12,00,000
E	Life of the car	15 years	10 years
F	Annual depreciation (Rs.) [D÷E]	55,000	1,20,000
G	Depreciation per month (Rs.) [F÷12]	4,583.33	10,000

(ii) What would be the monthly cost of electricity for an EV car?

(a) Rs.1, 425

(b) Rs.1, 500

(c) Rs.1, 450

(d) Rs.1, 525

Ans: (a) Rs.1, 425

Fuel/ Electricity consumption cost per month:

Particulars		**CNG Car**	**EV Car**
A	Average distance covered in a month (KM)	1,500	1,500
B	Mileage (KM)	20	240
C	Qty. of CNG/ Full charge required [A÷B]	75 kg.	6.25

D	Electricity Consumption [C×30kwh]	-	187.5
E	Cost of CNG per kg (Rs.)	60	-
F	Power cost per Kwh (Rs.)	-	7.60
G	CNG Cost per month (Rs.) [C×E]	4,500	-
H	Power cost per month (Rs.) [D×F]	-	1,425

(iii) What would be the total cost to be incurred for replacement of tyres for EV car?

(a) Rs.32, 000

(b) Rs.24, 000

(c) Rs.12, 000

(d) Rs.16, 000

Ans: (d) Rs.16, 000

Amortised cost of Tyre replacement:

Particulars		**CNG Car**	**EV Car**
A	Life of vehicle	15 years	10 years
B	Replacement interval	5 years	5 years
C	No. of time replacement required	2 times	1 time
D	Cost of tyres for each replacement (Rs.)	16,000	16,000

E	Total replacement cost (Rs.) [C×D]	32,000	16,000
F	Amortised cost per year (Rs.) [E÷A]	2,133.33	1,600
E	Cost per month (Rs.) [F÷12]	177.78	133.33

(iv) Calculate the operating cost of vehicle per month per car for CNG options.

(a) Rs.36, 627.78

(b) Rs.24, 000.50

(c) Rs.43.708.33

(d) Rs.16, 605.55

Ans: (a) Rs.36, 627.78

(v) Calculate the operating cost of vehicle per month per car for EV options

(a) Rs.36, 627.78

(b) Rs.24, 000.50

(c) Rs.43.708.33

(d) Rs.16, 605.55

Ans: (c) Rs.43.708.33

Amortised cost of Battery replacement:

Particulars	CNG Car	EV Car

A	Life of vehicle	15 years	10 years
B	Replacement interval	8 years	8 years
C	No. of time replacement required	1 time	1 time
D	Cost of battery for each replacement (Rs.)	12,000	5,40,000
E	Total replacement cost (Rs.) [C×D]	12,000	5,40,000
F	Amortised cost per year (Rs.) [E÷A]	800	54,000
E	Cost per month (Rs.) [F÷12]	66.67	4,500

Calculation of Operating cost per month

	Particulars	**CNG Car (Rs.)**	**EV Car (Rs.)**
A	**Running cost:**		
	Fuel cost/ Power consumption cost [Refer WN-2]	4,500	1,425
B	**Maintenance cost:**		
	Annual Maintenance cost [Annual cost ÷12]	666.67	433.33
	Annual Insurance cost [Annual cost ÷12]	633.33	1,216.67
	Amortised cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortised cost of Battery replacement [Refer WN-4]	66.67	4,500

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		1,544.45	6,283.33
C	**Fixed cost:**		
	Depreciation [Refer WN-1]	4,583.33	10,000
	Driver's salary	20,000	20,000
	Garage rent	4,500	4,500
	Share of Office & Administration cost	1,500	1,500
		30,583.33	36,000
D	**Operating cost per month [A+B+C]**	**36,627.78**	**43,708.33**

Question 27

Due to frequent power cuts and inconsistent water supply from the Electricity Board, Anju Manufacturing Pvt. Ltd. — a mid-sized engineering goods manufacturer based in Pune — decided to set up its own captive power generation plant. The plant is critical for ensuring uninterrupted production across its two major units:

• Unit 1: Produces industrial machinery components (highly power-intensive operations)

• Unit 2: Manufactures agricultural equipment parts (moderate power load)

The factory operations heavily depend on continuous electric and water supply for running CNC machines, foundry operations, welding units, and assembly lines. Any electricity failure leads to major production delays, idle labour costs, and penalties from clients due to late deliveries.

After analysing the risk of depending entirely on the electricity board, the company's Board of Directors approved a proposal to invest in a dedicated steam boiler and power generation plant within the factory premises.

The following information has been taken from the records in connection with the generation of power during the month:

- Coal used 1,800 Tonnes @ Rs. 230 per tonne

- Freight and handling charges: 7% of the value of coal used.

- Oil: 15 Tonnes @ Rs. 4,500 per tonne

- Water: 80,000 litres Re. 0.07 per litre

- Steam boiler cost Rs. 50,00,000 with a residual value of Rs. 2 lakh after a life of 10 years.

- Salaries and wages of the boiler house:

• 15 skilled workers @ Rs. 1,300 per month each

• 30 semi-skilled workers @ 1100 per month each

• 50 unskilled workers @ Rs. 900 per month each

- Recovery on account of sale of ashes: 150 tonnes Rs. 60 per tonne.

- Salary and wages of generating station:

• 60 skilled workers @ Rs. 1,200 per month each

• 20 semi-skilled workers @ 1000 per month each

• 30 unskilled workers @ Rs. 850 per month each

- Repairs and maintenance of generating equipment: Rs. 30,000

- Depreciation of generating equipment: Rs. 75,000

- Insurance premium on generating plant: Rs. 15,000

- Fuel handling and storage expenses: Rs. 8,000

- Rent of generating station premises: Rs. 12,000

- Share of administration charges: Rs. 65,000

- Total number of units generated (before losses): 2,00,000 units

- Normal losses in the process: 3,000 units generated.

- Electricity purchased from grid to meet emergency requirements: 5,000 units @ Rs. 6 per unit.

- 10% of the effective units generated are used internally by the generator department itself

Additional Information:

• The purchased electricity units are not subject to any loss adjustment.

• Emergency purchase units should be added to the effective units available for use.

You are required to CALCULATE the total cost of electricity generated and the cost of generating electricity per unit.

(RTP Sep. 2025)

Answer 27

Operating Cost Sheet

Particulars		**Amount (Rs.)**
Boiler House Cost		
Coal consumed (1,800 tonnes @ Rs. 230)	4,14,000	

Freight, loading and unloading charges (7% of coal cost)	28,980	
Oil consumed (15 tonnes @ Rs. 4,500)	67,500	
Water consumed (80,000 litres @ Re. 0.07)	5,600	
Depreciation of steam boiler (50,00,000-2,00,00010 x 12)	40,000	
Salaries and wages of boiler house workers:		
Skilled workers (15 @ Rs. 1,300)	19,500	
Semi-skilled workers (30 @ 1,100)	33,000	
Unskilled workers (50 @ Rs. 900)	45,000	
Less: Recovery from sale of ash (150 tonnes @ Rs. 60)	(9,000)	
Total Cost (I)		6,44,580
Generating Station Costs		
Salaries and wages of generating station staff:		
Skilled workers (60 @ Rs. 1,200)	72,000	
Semi-skilled workers (20 @ 1,000)	20,000	
Unskilled workers (30 @ Rs. 850)	25,500	
Repairs and maintenance of generating equipment	30,000	

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Depreciation of generating equipment	75,000	
Insurance premium on generating plant	15,000	
Fuel handling and storage expenses	8,000	
Rent of generating station premises	12,000	
Share of administration and general expenses	65,000	
Total Cost (II)		3,22,500
Other Costs		
Electricity purchased from grid (5,000 units @ Rs. 6)	30,000	
Total Cost (III)		30,000
Total Cost of Electricity Generated and Purchased (I+II+III)		9,97,080
Units Available (W.N.)		1,81,800 units
Cost per unit		5.48 per unit

Working Note: Units Available

Particulars	Units
Total Units Generated	2,00,000

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Less: Normal loss in generation	(3,000)
Net Own Units Generated	1,97,000
Add: Units purchased from grid	5,000
Total Effective Units Available	2,02,000
Less: 10% Units used by generating department	(20,200)
Units Available for Factory Operations	1,81,800

Topic 6 Service Costing Methods and Applications

Question 28 (Illustration)

A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off- season (Winter) months in a year when numbers of visitor are limited. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March. [Assume a month to be of 30 days].

(i) Occupancy during the season is 80% while in the off- season it is 40% only.

(ii) Total investment in the home is Rs.200 lakhs of which 80% relate to buildings and balance for furniture and equipment.

(iii) Expenses:

- **Staff salary [Excluding room attendants]: Rs. 5,50,000**
- **Repairs to building : Rs. 2,61,000**
- **Laundry charges : Rs. 80, 000**

- **Interior : Rs. 1,75,000**
- **Miscellaneous expenses : Rs. 1,90,800**

(iv) Annual depreciation is to be provided for buildings @ 5% and on furniture and equipment @ 15% on straight-line basis.

(v) Room attendants are paid Rs. 10 per room day on the basis of occupancy of the rooms in a month.

(vi) Monthly lighting charges are Rs. 120 per room, except in four months in winter when it is Rs. 30 per room.

You are required to WORK OUT the room rent chargeable per day both during the season and the off-season months on the basis of the foregoing information.

(Old & New SM) (MTP Oct '21, PYP Nov '19)

Answer 28

Working Notes:

(i) Total Room days in a year

Season	**Occupancy (Room-days)**	**Equivalent Full Room charge days**
Season– 80% Occupancy	100 Rooms × 80% × 6 months × 30 days in a month = 14,400 Room Days	14,400 Room Days × 100% = 14,400
Off-season – 40% Occupancy	100 Rooms × 40% × 6 months × 30 days in a month = 7,200 Room Days	7,200 Room Days × 50% = 3,600
Total Room Days	14,400 + 7,200 = 21,600 Room Days	18,000 Full Room days

(ii) Lighting Charges:

It is given in the question that lighting charges for 8 months is Rs.120 per month and during winter season of 4 months it is Rs.30 per month. Further it is also given that peak season is 6 months and off season is 6 months.

It should be noted that – being Hill station, winter season is to be considered as part of Off season.

Hence, the non-winter season of 8 months include – Peak season of 6 months and Off season of 2 months.

Accordingly, the lighting charges are calculated as follows:

Season	Occupancy (Room-days)
Season & Non-winter – 80% Occupancy	100 Rooms × 80% × 6 months × Rs.120 per month = Rs.57,600
Off- season & Non-winter – 40% Occupancy (8 – 6 months)	100 Rooms × 40% × 2 months × Rs.120 per month = Rs.9,600
Off- season & -winter – 40% Occupancy months)	100 Rooms × 40% × 4 months × Rs. 30 per month = Rs. 4,800
Total Lighting charges	Rs. 57,600+ 9,600 + 4,800 = Rs. 72,000

Statement of total cost:

	(Rs.)
Staff salary	5,50,000
Repairs to building	2,61,000
Laundry & Linen	80,000

Interior	1,75,000
Sundries Expenses	1,90,800
Depreciation on Building (Rs. 200 Lakhs × 80% × 5%)	8,00,000
Depreciation on Furniture & Equipment (Rs. 200 Lakhs × 20% × 15%)	6,00,000
Room attendant's wages (Rs. 10 per Room Day for 21,600 Room Days)	2,16,000
Lighting charges	72,000
Total cost	29,44,800
Add: Profit Margin (20% on Room rent or 25% on Cost)	7,36,200
Total Rent to be charged	36,81,000

Calculation of Room Rent per day:

Total Cost / Equivalent Full Room days = Rs. 36, 81,000/ 18,000 = Rs.204.50 Room Rent during Season –Rs.204.50

Room Rent during Off season = Rs.204.50 × 50% = Rs. 102.25

Important Note:-

This was a numerical question relating to the topic 'Costing of Service Sector'. Examinees were required to calculate hotel room rent chargeable per day. Most of the examinees could not compute the total cost correctly and hence could not work out room rent chargeable per day during season and off-season. Performance of the examinees was below average.

Question 29 (Illustration)

ABC Hospital runs a Critical Care Unit (CCU) in a hired building. CCU consists of 35 beds and 5 more beds can be added, if required.

Rent per month - Rs. 75,000

Supervisors – 2 persons – Rs. 25,000 per month – each

Nurses – 4 persons – Rs. 20,000 per month – each

Ward Boys – 4 persons – Rs. 5,000 per month – each

Doctors paid Rs. 2, 50,000 per month – paid on the basis of number of patients attended and the time spent by them

Other expenses for the year are as follows:

Repairs (Fixed) – Rs. 81,000

Food to Patients (Variable) – Rs. 8, 80,000

Other services to patients (Variable) – Rs. 3, 00,000

Laundry charges (Variable) – Rs. 6, 00,000

Medicines (Variable) – Rs. 7, 50,000

Other fixed expenses – Rs. 10, 80, 000

Administration expenses allocated – Rs. 10, 00,000

It was estimated that for 150 days in a year 35 beds are occupied and for 80 days only 25 beds are occupied.

The hospital hired 750 beds at a charge of Rs. 100 per bed per day, to accommodate the flow of patients. However, this does not exceed more than 5 extra beds over and above the normal capacity of

35 beds on any day.

You are required to –

(1) CALCULATE contribution per Patient day, if the hospital recovers on an average Rs. 2,000 per day from each patient.

(2) FIND OUT Breakeven point for the hospital.

(Old & New SM) (MTP Oct '23)

Answer 29

Working Notes:

1) Calculation of number of Patient days

35 Beds × 150 days	=5,250
25 Beds × 80 days	= 2,000
Extra beds	=750
Total	=8,000

Statement of Profitability

Particulars	Amount	Amount
Income for the year (Rs. 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (Rs. 2,50,000 per month × 12)	30,00,000	

Food to Patients (Variable)	8,80,000	
Other services to patients (Variable)	3,00,000	
Laundry charges (Variable) – (Rs.)	6,00,000	
Medicines (Variable) – (Rs.)	7,50,000	
Bed Hire Charges (Rs.100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (Rs. 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × Rs.25,000 ×12)	6,00,000	
Nurses (4 persons × Rs. 20,000 × 12)	9,60,000	
Ward Boys (4 persons × Rs. 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses – (Rs.)	10,80,000	
Administration expenses allocated – (Rs.)	10,00,000	
Total Fixed Costs		48,61,000

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Profit		55,34,000

(1) Calculation of Contribution per Patient day

Total Contribution – Rs. 1, 03, 95,000 Total Patient days – 8,000

Contribution per Patient day – Rs. 1, 03, 95,000 / 8,000 = Rs. 1,299.375

(2) Breakeven Point = Fixed Cost / Contribution per Patient day

= Rs. 48, 61,000 / Rs.1, 299.375

= 3,741 patient days

Question 30

DKG Airlines owns single passenger aircraft and operates between Melbourne and Delhi only. Flight leaves Melbourne on Monday and Thursday and departs from Delhi on Wednesday and Saturday. DKG Airlines cannot afford any more flight between Melbourne and Delhi. Only economical class seats are available on its flight and all tickets are booked by travel agents. The following information are collected.

Seating capacity per plane	**360**
Average passengers per flight	**250**
Flights per week	**4**
Flights per year	**208**
Average one-way fare	**Rs.50,000**
Variable fuel cost	**Rs.28,00,000 per flight**

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Food service to passengers (not charged to Passengers)	**Rs.2,600 per passenger**
Commission to travel agents	**15% of fare**
Fixed annual lease cost allocated to each flight	**Rs. 15,30,000 per flight**
Fixed ground services (maintenance, check in, Baggage handling cost) allocated to each flight	**Rs.1,70,000 per flight**
Fixed salaries of flight crew allocated to each flight	**Rs.6,50,000 per flight**

For the sake of simplicity assume that fuel cost is unaffected by the actual number of passengers on a flight.

Required:

(i) Calculate the operating income that DKG Airlines makes on each way flight between Melbourne and Delhi?

(ii) The market research department of DKG Airlines indicates that lowering the average one-way fare to Rs. 48,000 and increase in agents' commission to 17.5% will increase the average number of passenger per flight to 275. DECIDE whether DKG Airlines should lower its fare or not?

(MTP Oct '18)

Answer 30

(i) Statement of operating income of DKG Airlines for Melbourne-Delhi flight (one way)

Particulars	Amount (Rs.)	Amount (Rs.)

Fare received (per flight): 250 passengers × Rs. 50,000		1,25,00,000
Variable costs (per flight):		
- Fuel cost	28,00,000	
- Food (250 × Rs. 2,600)	6,50,000	
- Commission to Travel Agents (15% of Rs. 1,25,00,000)	18,75,000	(53,25,000)
Contribution per flight		71,75,000
Fixed cost (per flight): Annual lease cost	15,30,000	
Fixed ground service costs	1,70,000	
Salaries of flight crew	6,50,000	(23,50,000)
Operating income per flight		48,25,000
(ii) Operating income of DKG Airlines per Melbourne-Delhi flight (one way) after reduction in fare		
Fare received (per flight): 275 passengers × Rs. 48,000 Variable costs (per flight):		1,32,00,000
Fuel cost	28,00,000	

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Food (275 × Rs. 2,600)	7,15,000	
Commission to Travel Agents (17.5% of Rs. 1,32,00,000)	23,10,000	(58,25,000)
Contribution per flight		73,75,000

Excess contribution due to lowering of fare (Rs. 73, 75,000 – Rs. 71, 75,000) = Rs. 2, 00,000.

DKG Airlines should lower its fare as it would increase its contribution by Rs. 2, 00,000.

Question 31

Harry Transport Service is a Delhi based national goods transport service provider, owning five trucks for this purpose. The cost of running and maintaining these trucks are as follows:

Particulars	Amount
Diesel cost	**Rs.15 per km.**
Engine oil	**Rs. 4,200 for every 14,000 km.**
Repair and maintenance	**Rs.12,000 for every 10,000 km.**
Driver's salary	**Rs. 20,000 per truck per month**
Cleaner's salary	**Rs. 7,000 per truck per month**
Supervision and other general expenses	**Rs.15,000 per month**
Cost of loading of goods	**Rs. 200 per Metric Ton (MT)**

Each truck was purchased for Rs. 20 lakhs with an estimated life of 7, 20,000 km. During the next month, it is expecting 6 bookings, the details of which are as follows:

Sl. No.	Journey	Distance (in km)	Weight – Up (in MT)	Weight – Down (in MT)
1.	Delhi to Kochi	2,700	15	7
2.	Delhi to Guwahati	1,890	13	0
3.	Delhi to Vijayawada	1,840	16	0
4.	Delhi to Varanasi	815	11	0
5.	Delhi to Asansol	1,280	13	5
6.	Delhi to Chennai	2,185	11	9
	Total	10,710	79	21

Required:

(i) CALCULATE the total absolute Ton-km for the next month.

(ii) CALCULATE the cost per ton-km.

(MTP April.'21)

Answer 31

(i) Calculation of Absolute Ton-km for the next month:

Journey	Distance (in km)	Weight-Up (in MT)	Ton-km	Weight - Down (in MT)	Ton-km	Total
	(a)	(b)	(c) = (a)×(b)	(d)	(e) = (a)×(d)	(f) =(c)+(e)
Delhi to Kochi	2,700	15	40,500	7	18,900	59,400
Delhi to Guwahati	1,890	13	24,570	0	0	24,570
Delhi to Vijayawada	1,840	16	29,440	0	0	29,440
Delhi to Varanasi	815	11	8,965	0	0	8,965
Delhi to Asansol	1,280	13	16,640	5	6,400	23,040
Delhi to Chennai	2,185	11	24,035	9	19,665	43,700
Total	10,710	79	1,44,150	21	44,965	1,89,115

Total absolute Ton-Km = 1, 89,115 ton-km

(ii) Calculation of cost per ton-km:

Particulars	Amount (Rs.)	Amount (Rs.)
A. Running cost:		
- Diesel Cost {Rs.15 × (10,710 × 2)}	3,21,300	

- Engine oil cost (Rs.4,200 / 14,000 km× 21,420 km)	6,426	
- Cost of loading of goods {Rs.200 × (79 + 21)}	20,000	
- Depreciation (Rs. 20,00,000/7,20,000 km × 21,420km)	59,500	4,07,226
B. Repair & Maintenance Cost $\left(\frac{\text{Rs. } 12{,}000}{10{,}000 \text{ km}} \times 21{,}420\text{km}\right)$		25,704
C. Standing Charges		
- Drivers' salary (Rs.20,000 × 5 trucks)	1,00,000	
- Cleaners' salary (Rs.7,000 × 5 trucks)	35,000	
- Supervision and other general expenses	15,000	1,50,000
Total Cost (A + B + C)		5,82,930
Total absolute ton-km		1,89,115
Cost per ton-km		3.08

Question 32

AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

	Amount (Rs.)
Teachers' salary (15 teachers × Rs. 35,000 × 12 months)	63,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × Rs. 15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × Rs. 10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

Other information:

(i)

	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840

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Lab classes in a year	0	0	144	156
No. of examinations in a year	2	2	2	2
Time spent at library per student per year	180 hours	120 hours	240 hours	60 hours
Time spent by principal for administration	208 hours	312 hours	480 hours	1,400 hours
Teachers for 11 & 12 standard	4	5	6	-

(ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.

(iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.

(iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section.

(v) All school students irrespective of section and age participate in annual functions and sports activities.

Requirement:

(a) CALCULATE cost per student per annum for all three streams.

(b) If the management decides to take uniform fee of Rs. 1,000 per month from all higher secondary students, CALCULATE stream wise profitability.

(c) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively.

Answer 32

Calculation of Cost per annum

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
R-apportionment of Economics & Mathematics teachers' salary (W.N- 2)	(84,000)	1,45,091	(61,091)	-
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600
Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200
Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administration expenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000

Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

(i) Calculation of cost per student per annum

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student per annum	17,397	9,533	19,238	13,610

(ii) Calculation of profitability

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Fees per annum	12,000	12,000	12,000	
Cost per student per annum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

(iii) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)
Cost per student per annum	17,397	9,533	19,238
Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764

Working Notes:

(1) Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (Rs.)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

(2) Re-apportionment of Economics and Mathematics teachers' salary

	Economics		Mathematics	
Particulars	**Arts**	**Commerce**	**Science**	**Commerce**
No. of classes	832	208	940	160
Salary re-apportionment (Rs.)	(84,000)	84,000	(61,091)	61,091

	$\left(\frac{\text{Rs. } 4,20,000}{1,040} \times 208\right)$	$\left(\frac{\text{Rs. } 4,20,000}{1,100} \times 160\right)$

(3) Principal's salary has been apportioned on the basis of time spent by him for administration of classes.

(4) Lab attendants' salary has been apportioned on the basis of lab classes attended by the students.

(5) Salary of library staffs are apportioned on the basis of time spent by the students in library.

(6) Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

	Amount (Rs.)
Peon dedicated for higher secondary(1 peon × Rs.10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × Rs.10,000 × 12 months)}	54,000
	1,74,000

(7) Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.

(8) Examination Expenses has been apportion taking number of students and number examinations into account.

Question 33

A group of 'Health Care Services' has decided to establish a Critical Care Unit in a metro city with an investment of Rs. 85 lakhs in hospital equipment's. The unit's capacity shall be of

50 beds and 10 more beds, if required, can be added. Other information for a year are as under:

	(Rs.)
Building Rent	**2, 25,000 per month**
Manager Salary (Number of Manager-03)	**50,000 per month to each one Nurses**
Salary (Number of Nurses-24)	**18,000 per month to each**
Nurse Ward boy's Salary (Number of ward boys' -24) 9,000 per month per person Doctor's payment (Paid on the basis of number 5,50,000 per month of patients attended and time spent by them)	
Food and laundry services (variable)	**39, 53,000**
Medicines to patients (variable)	**22, 75,000 per year**
Administrative Overheads	**28, 00,000 per year**
Depreciation on equipment's	**15% per annum on original cost**

It was reported that for 200 days in a year 50 beds were occupied, for 105 days 30 beds were occupied and for 60 days 20 beds were occupied. The hospital hired 250 beds at a charge of Rs. 950 per bed to accommodate the flow of patients. However, this never exceeded the normal capacity of 50 beds on any day. Find out: (i) Profit per patient day, if hospital charges on an average Rs. 2,500 per day from each patient. (ii) Break-even point per patient day (Make calculation on annual basis)

[PYP May'18)

Answer 33

Number of Patient Days = (200x50) + (105x30) + (60x20) =14,350 patient days + 250 = 14,600

Statement Showing Profit

Elements of Cost and Revenue	Total (Rs.)
A. Revenue (14,600 x Rs. 2,500)	3,65,00,000
B. Variable Costs	
Food and Laundry Service	39,53,000
Medicines to Patients	22,75,000
Doctor's Payment	66,00,000
Hire Charges of Bed (250 x Rs. 950)	2,37,500
Total Variable Cost	1,30,65,500
C. Fixed Costs	
Building Rent	27,00,000
Manager's Salary (Rs. 50,000 x 3 x 12)	18,00,000
Nurse's Salary (Rs. 18,000 x 12 x 24)	51,84,000
Ward boy's Salary (Rs. 9,000 x 12 x 24)	25,92,000
Administrative Overheads	28,00,000
Depreciation on Equipment's	12,75,000
	1,63,51,000

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D.	**Total Cost (B+C)**	**2,94,16,500**
E.	**Profit (A-D)**	**70,83,500**

Profit per patient day = Rs.70, 83,500/14,600 = Rs. 485.17

(i) Contribution (per patient day) = (Rs. 3, 65, 00,000 – Rs. 1, 30, 65,500)/ 14,600

= Rs. 1,605.10 BEP = 1, 63, 51,000/1,605.10 = 10,186.90 or say 10,187 patient days

Notes:

1. Higher Charges for extra beds are a semi variable cost; still, for the sake of convenience it has been considered a variable cost.

2. Assumed, the hospital hired 250 beds at a charge of Rs. 950 per bed to accommodate the flow of patients. However, this never exceeded the 10 beds above the normal capacity of 50 beds on any day.

3. The fees were paid based on the number of patients attended to and the time spent by them, which on an average worked out to Rs. 5,50,000 p.m.

Question 34

ABC Bank is having a branch which is engaged in processing of 'Vehicle Loan' and 'Education Loan' applications in addition to other services to customers. 30% of the overhead costs for the branch are estimated to be applicable to the processing of 'Vehicle Loan' applications and 'Education Loan' applications each.

Branch is having four employees at a monthly salary of Rs. 50,000 each, exclusively for processing of Vehicle Loan applications and two employees at a monthly salary of Rs. 70,000 each, exclusively for processing of Education Loan applications.

In addition to above, following expense are incurred by the Branch:

- **Branch Manager who supervises all the activities of branch, is paid at Rs. 90,000 per month.**
- **Legal charges, Printing & stationery and Advertising Expenses are incurred at Rs. 30,000, Rs. 12,000 and Rs. 18,000 respectively for a month.**

Other expenses are Rs. 10,000 per month. You are required to:

(i) Compute the cost of processing a Vehicle Loan application on the assumption that 496 Vehicle Loan applications are processed each month.

(ii) Find out the number of Education Loan Applications processed, if the total processing cost per Education Loan Application is same as in the Vehicle Loan Application as computed in (i) above.

(PYP Nov 22)

Answer 34

Particulars	**Vehicle loan Applications(Rs.)**	**Education loan Application (Rs.)**	**Total (Rs.)**
Employee Cost	2,00,000 (Rs. 50,000 × 4)	1,40,000 (Rs. 70,000 × 2)	3,40,000
Apportionment of Branch manager's salary	27,000	27,000	54,000
Legal charges, Printing & stationery, and Advertising expenses	18,000	18,000	36,000
Other expenses	3,000	3,000	6,000
Total cost	2,48,000	1,88,000	4,36,000

(i) Computation of cost of processing a vehicle loan application:

Total Cost ÷ No. of applications

Rs. 2, 48,000 ÷ 496 = Rs. 500

(ii) Computation of no. of Education loan Processed

Total Cost = No. of applications × Processing cost per application

Rs. 1, 88,000 = No. of applications × Rs. 500

No. of education loan applications = Rs.1, 88,000 ÷ Rs.500 = 376 applications

Question 35

Mr. Intell newly sets up a Home Stay in Hanle, Ladakh offering two types of room, single and double. The expected occupancy percentage for the rooms is provided below:

Type of rooms	Number	Occupancy percentage
Single	20	100%
Double	10	80%

The details of the expenses as forecasted are provided below:

Particulars	(Rs.)
Staff salaries	30,20,000
Food and beverage costs	20,16,000
Lighting and power	8,60,000

Repairs and renovation	**4,94,000**
Laundry charges	**3,22,000**
Building rent	**14,40,000**
Miscellaneous expenses	**6,12,000**

Room attendants to be paid @ Rs. 125 per room day.

Mr. Intell knowing about the power cut during nights at Hanle to preserve the natural light for astronomical research, sets up emergency power backup, being charged from the customers separately @ Rs. 200 per room, if requested.

The rent of the double room is to be fixed at 1.5 times the single room.

In the month of June, Mr. Matrix along with his family visited Hanle Dark Sky Reserve to experience the breathtaking view of the stars. For one night stay at the place, he approached Mr. Intell to book a double bedroom and also requested for emergency power backup at night.

You are required to CALCULATE the rent to be charged from Mr.Matrix, considering the profit @ 25% on total taking.

(Assume 360 days in a year for calculation purpose.)

(RTP May 2025)

Answer 35

Working Notes:

Total equivalent single rooms

Nature of room	Occupancy (Room-days)	Equivalent single rooms (Room-days)
Single room	7,200 (20 rooms × 360 days × 100%)	7,200 (7,200 × 1)
Double rooms	2,880 (10 rooms × 360 days × 80%)	4,320 (2,880 × 1.5)
	10,080	11,520

Statement of total cost

Particulars	(Rs.)
Staff salaries	30,20,000
Room attendant's wages (Rs. 125 per Room Day for 10,080 Room Days)	12,60,000
Food and beverage costs	20,16,000
Lighting and power	8,60,000
Repairs and renovation	4,94,000
Laundry charges	3,22,000
Building rent	14,40,000
Miscellaneous expenses	6,12,000

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Total cost	1,00,24,000

Profit is 25% on total taking

∴ Total taking = Rs. 1, 00, 24,000 + 25% of total taking

Let R be rent for single room

Then 11,520 R = 1, 00, 24,000 + (0.25 × 11,520 R)

Or, 8,640 R = 1, 00, 24,000

Or, R = Rs. 1,160 (approx.)

Rent to be charged for single room = Rs. 1,160

Rent for double room Rs. 1,160 × 1.5 = Rs. 1,740

Rent to be charged from Mr. Matrix

Double room rent	Rs. 1,740
Add: Power backup charges	Rs. 200
	Rs. 1,940

Question 36

ABC Transport Services Pvt. Ltd. is a private bus company renowned for providing reliable and comfortable intercity passenger services. The company operates a fleet of buses that connect two major cities, Mumbai and Pune, which are 150 kilometers apart. By ensuring timely and efficient services, ABC Transport Services has become a preferred choice for travelers commuting between these two bustling cities.

Fleet and Operations

The company operates a total of 10 buses, each designed for optimal comfort and safety. Every bus in the fleet has a seating capacity of 50 passengers, equipped with modern amenities to enhance the travel experience. The buses adhere to strict maintenance schedules to ensure safety and reliability on the road. The company operates multiple trips daily to accommodate the high demand for travel between Mumbai and Pune. The buses normally operate at 80% capacity.

Cost Data:

Cost Category	Amount (Rs.)
Fixed Costs (per month)	
Insurance	**2,00,000**
License Fees	**50,000**
Salaries to Driver and Conductor	**5,00,000**
Garage Rent	**1,00,000**
Depreciation	**3,00,000**
Administration Expenses	**1,50,000**
Variable Costs (per kilometer)	
Fuel	**Rs. 35 per km**
Lubricants and Oils	**Rs. 5 per km**
Wages per bus (additional per trip)	**Rs. 10,000 per trip**

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Operational Data	
Number of round trips per bus in this month	**20 trips**
Average occupancy rate	**80%**

Additional Info:

In the past few months, the repairs and maintenance costs for ABC Transport Services Pvt. Ltd. have shown some variability due to fluctuating operational conditions. For instance, in April, the total repairs & maintenance costs amounted to Rs. 1, 40,000, with the company reporting 18 trips per bus. In May, these costs increased to Rs. 1, 60,000 due to additional maintenance activities and 22 trips per bus.

(MTP May 2025)

You are required to answer the following requirements (MCQs 6 to 10)

1. Calculate the cost per trip per bus.

(a) Rs. 21,750

(b) Rs. 29,250

(c) Rs. 23,450

(d) Rs. 28,250

Ans: (b) Rs. 29,250

Fixed Costs per Trip per Bus = $\frac{\text{Total Fixed Costs}}{\text{Number of Buses x Number of Trips}}$

= Rs. 13, 00,000 / (10 x 20) = Rs. 6,500

Semi-Variable Costs (Repairs & Maintenance) per Trip per Bus

$$= \frac{\text{Total SemiVariable Costs}}{\text{Number of Buses x Number of Trips}}$$

= Rs. 1, 50,000 / (10 x 20) = Rs. 750

Variable Costs per Trip per Bus

= (Fuel + Lubricants and Oils) x Distance per Trip + Wages

= (Rs. 35 + Rs. 5) x (150 kms x 2) + Rs. 10,000 = Rs. 22,000

Total Cost per Trip per Bus = Rs. 6,500 + Rs. 750 + Rs. 22,000 = Rs. 29,250

Total Fixed Costs:

- Insurance: Rs. 2, 00,000
- License Fees: Rs. 50,000
- Salaries to Driver and Conductor: Rs. 5, 00,000
- Garage Rent: Rs. 1, 00,000
- Depreciation: Rs. 3, 00,000
- Administration Expenses: Rs. 1, 50,000
- Total Fixed Costs: Rs. 13, 00,000

Repairs & Maintenance calculation

- Let x be the fixed portion of the semi-variable costs.
- Let y be the variable cost per trip.

Formulate Equations from Given Data:

- April: x + 18y = 1, 40,000
- May: x + 22y = 1, 60,000

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Solve for y:

● Subtract the April equation from the May equation:

● (x+22y) − (x+18y) = 1, 60,000 – 1, 40,000

● y = 5,000

● Using the April equation:

● x + 18 x (5,000) = 1, 40,000

● x = 50,000

Calculate Semi-Variable Costs for 20 Trips:

● Semi-variable costs = x + 20y

● Semi-variable costs = 50,000 + 20 x 5,000 = 1, 50,000

2. Determine the total cost of operating one bus for a month.

(a) Rs. 5,20,000

(b) Rs. 4,45,000

(c) Rs. 6,10,000

(d) Rs. 5,85,000

Ans: (d) Rs. 5,85,000

Fixed Costs per Bus per Month = Rs. 13,00,000 / 10 = Rs. 1,30,000

Semi-Variable Costs per Bus per Month = Rs. 1,50,000 / 10 = Rs. 15,000

Variable Costs per Trip = (Fuel + Lubricants and Oils) x Distance per Trip + Wages

= (Rs. 35 + Rs. 5) x 300 + Rs. 10,000 = Rs. 22,000

Variable Costs for 20 trips = Rs. 4,40,000

Total Cost per Bus per Month = Rs. 1,30,000 + Rs. 15,000 + Rs. 4,40,000 = Rs. 5,85,000

3. What is the monthly revenue if each ticket is priced at Rs.1,000 per trip?

(a) Rs. 90,00,000

(b) Rs. 1,00,00,000

(c) Rs. 80,00,000

(d) Rs. 75,00,000

Ans: (c) Rs. 80,00,000

Monthly Revenue = Number of Buses x Number of Trips x Average Occupancy Rate x Ticket Price= 10 x 20 x 50 x 80% x Rs. 1,000 = Rs. 80,00,000

4. Calculate the break-even number of passengers per trip if the ticket price is Rs.635.

(a) 44 passengers

(b) 49 passengers

(c) 47 passengers

(d) 50 passengers

Ans: (c) 47 passengers

No. of Passengers per trip to recover total cost = Total Cost per Trip / Ticket Price

= Rs. 29,250 / Rs. 635 = 46.03 passengers per trip ≈ 47 passengers per trip

5. Calculate the cost per passenger-kilometer.

(a) Rs. 2.438

(b) Rs. 4.88

(c) Rs. 3.75

(d) Rs. 5.25

Ans: (a) Rs. 2.438

Total Passenger-Kilometers = 10 buses x 20 trips x 40 passengers (50 x 80%) x 150 km x 2

= 24, 00,000 passenger-kms

Cost per Passenger-Kilometer = Total Monthly Cost / Total Passenger-Kilometers

= Rs. 29,250 x (10x20) / 24, 00,000

= Rs. 58, 50,000/24, 00,000

= Rs. 2.438 per passenger-kilometer

Topic 7 Classification of Costs

Descriptive Question

Question 37

Health Wealth Hospital is interested in estimating the cost for each patient stay. The hospital offers general health care facility i.e. only basic services.

You are required to:

(i) CLASSIFY each of the following costs as either direct or indirect with respect to each patient.

(ii) CLASSIFY each of the following costs as either fixed or variable with respect to hospital costs per day.

	Direct	Indirect	Fixed	Variable
Electronic monitoring				
Meals for patients				
Nurses' salaries	_			
Parking maintenance				
Security				

(RTP Nov'22)

Answer 37

a)

Item	Direct	Indirect	Fixed	Variable
Electronic monitoring	YES			YES
Meals for patients	YES			YES
Nurses' salaries		YES	YES	
Parking maintenance		YES	YES	
Security		YES	YES	

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Topic 8 Pricing and Profitability Decisions

Question 38

PG Ferry services Pvt Ltd. provide ferry services between two towns. Distance one way is 18.52 nautical miles. Seating capacity of a ferry is 125 passengers. Actual passengers carried in each trip is 80% of seating capacity. Ferry run on all days of month (30 days). Ferry makes a round trips in a day. Company is expecting a monthly revenue of Rs. 55, 56,000. Calculate fare to be charged from a passenger for round trip.

(a) 100

(b) 926

(c) 1852

(d) 50.95

(MTP May 2025)

Ans: (c) 1852

Calculation of fare per passenger nautical mile:

$= \frac{55,56,000}{18.52 \times 100 \times 2 \times 30}$ = 50 per passenger nautical mile

Fare for round trip = 50 x 18.52 x 2 = 1,852

Topic 9 Case Studies and Practical Problems

Question 39

A transport company has a fleet of four trucks of 10 tonne capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	One way Distance Km	No. of trips per day	Load carried per trip / day tonnes
1	48	4	6
2	120	1	9
3	90	2	8
4	60	4	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under

Year	Total distance travelled	Maintenance Cost Rs.
1	1,60,200	1,38,150
2	1,56,700	1,35,525

The following are the details of expenses for the year under review:

Diesel	Rs. 60 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	Rs. 22,000 per truck per month
Licence and taxes	Rs. 15,000 per annum per truck
Insurance	Rs. 80,000 per annum for all the four trucks

Purchase Price per truck	**Rs.30, 00,000, Life 10 years. Scrap value at the end of life is Rs.1, 00,000.**
Oil and sundries	**Rs. 525 per 100 km run.**
General Overhead	**Rs. 1,10,840 per annum**

The trucks operate 24 days per month on an average.

Required

(i) PREPARE an Annual Cost Statement covering the fleet of four trucks

(ii) CALCULATE the cost per km. run.

(iii) DETERMINE the freight rate per tonne km. to yield a profit of 30% on freight.

(RTP Nov'19) (Same concept different figures MTP March '19 & Sep '23)

Answer 39

(i) Annual Cost Statement of four vehicles

	(Rs.)
Diesel {(4,21,632 km. ÷ 4 km) × Rs. 60) (Refer to Working Note 1)	63,24,480
Oil & sundries {(4,21,632 km. ÷ 100 km.) × Rs. 525}	22,13,568
Maintenance {(4,21,632 km. × Rs. 0.75) + ' 18,000}(Refer to Working Note 2)	3,34,224
Drivers' salary {(Rs. 22,000 × 12 months) × 4 trucks}	10,56,000

Licence and taxes (Rs. 15,000 × 4 trucks)	60,000
Insurance	80,000
Depreciation {(Rs. 29,00,000 ÷ 10 years) × 4 trucks}	11,60,000
General overhead	1,10,840
Total annual cost	1,13,39,112

(ii) Cost per km. run

Cost per Kilometre run = $\frac{\text{Total annual cost of vehicles}}{\text{Total kilometre travelled annually}}$ (Refer to working Note 1)

= $\frac{\text{Rs.1,13,39,112}}{\text{4,21,632 kms}}$ = Rs. 26.89

(iii) Freight rate per tonne km (to yield a profit of 30% on freight)

Cost per Kilometre run = $\frac{\text{Total annual cost of three vehicles}}{\text{Total effective tonnes kms per annum}}$ (Refer to working Note 1)

= $\frac{\text{Rs.1,13,39,112}}{\text{16,10,496 kms}}$ = Rs. 7.04

Freight rate per tonne km. $\left(\frac{Rs.7.04}{0.7}\right) \times 1 =$ Rs. 10.06

Working Notes:

1. Total kilometre travelled and tonnes kilometre (load carried) by four trucks in one year

Truck number	One way distance in kms	No. of trips	Total distance covered in km per day	Load carried per trip/ day in tonnes	Total effective tonnes km
1	48	4	384	6	1,152

2	120	1	240	9	1,080
3	90	2	360	8	1,440
4	60	4	480	8	1,920
Total			1,464		5,592

Total kilometre travelled by four trucks in one year (1,464 km. × 24 days × 12 months) = 4, 21,632

Total effective tonnes kilometre of load carried by four trucks during one year (5,592 tonnes km. × 24 days × 12 months) = 16, 10,496

2. Fixed and variable component of maintenance cost:

Variable maintenance cost per km = $\frac{\text{Difference in maintence cost}}{\text{Difference in distance travelled}}$

= $\frac{\text{Rs.1,38,150} - \text{Rs.1,35,525}}{\text{1,60,200kms} - \text{1,56,700kms}}$ = Rs. 0.75

Fixed maintenance cost = Total maintenance cost–Variable maintenance cost

= Rs. 1, 38,150 – 1, 60,200 kms × Rs. 0.75 = Rs. 18,000

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Chapter 13

Standard Costing

Topic 1 Introduction to Standard Costing

Question 1

XYZ Manufacturing Ltd. is a mid-sized enterprise that has established a strong reputation in the field of precision engineering. The company specializes in producing high-quality engineering components that meet the stringent requirements of various industries including automotive, aerospace, medical devices, and industrial machinery. With a commitment to precision and excellence, XYZ Manufacturing Ltd. has positioned itself as a reliable supplier of critical components that demand the highest levels of accuracy and durability.

To maintain stringent control over its production costs and enhance cost efficiency, XYZ Manufacturing Ltd. operates under a standard costing system. This system plays a pivotal role in the company's financial and operational management. Standard costing involves setting predetermined costs for each production element, including materials, labor, and overheads. These predetermined costs, known as standard costs, serve as benchmarks against which actual production costs are measured.

Particulars	Budgeted Data	Actual Data
Units Produced	10,000 units	9,500 units
Fixed Overheads	Rs.20,00,000	Rs.19,50,000 + Rs.1,00,000 (additional quality control cost for 1,000 units chosen on sample basis)

Hours Worked	**15,000 hours**	**14,250 hours**
Variable Overhead Rate	**Rs.50 per hour**	**Rs.50 per hour (first 10,000 hours)** **Rs.60 per hour (additional hours**

(MTP Jan 2025)

Based on the given information, you are being required to answer the following questions:

1. What is the Fixed Overhead Cost Variance for XYZ Manufacturing Ltd. in May 2024?

(a) Rs.50, 000 (A)

(b) Rs.1, 00,000 (A)

(c) Rs.1, 50,000 (A)

(d) Rs.2, 00,000 (A)

Ans: (c) Rs.1, 50,000 (A)

Fixed Overhead Cost Variance = Absorbed Fixed Overheads - Actual Fixed Overheads

Absorbed Fixed Overheads = (Budgeted Fixed Overheads / Budgeted Production) x Actual Production = (Rs.20, 00,000 / 10,000 units) x 9,500 units = Rs.19, 00,000

Adjusted Actual Fixed Overheads = Rs.19, 50,000 + Rs.1, 00,000 = Rs.20, 50,000

Fixed Overhead Cost Variance = Rs.19, 00,000 - Rs.20, 50,000 = Rs.1, 50,000 (Adverse)

2. What is the Fixed Overhead Volume Variance for XYZ Manufacturing Ltd. in May 2024?

(a) Rs.50, 000 (F)

(b) Rs.50, 000 (A)

(c) Rs.1, 00,000 (F)

(d) Rs.1, 00,000 (A)

Ans: (d) Rs.1, 00,000 (A)

Fixed Overhead Volume Variance = (Actual Production - Budgeted Production) x Standard Fixed Overhead Rate per Unit

Standard Fixed Overhead Rate per Unit = Rs.20, 00,000 / 10,000 units = Rs.200 per unit

Fixed Overhead Volume Variance = (9,500 units - 10,000 units) x Rs.200

= 500 units x Rs.200

= Rs.1, 00,000 (Adverse)

3. What is the Variable Overhead Efficiency Variance for XYZ Manufacturing Ltd. in May 2024?

(a) Rs.37, 500 (A)

(b) Rs.42, 500 (A)

(c) Rs.0

(d) Rs.25, 000 (A)

Ans: (c) 0

Variable Overhead Efficiency Variance = (Standard Hours for Actual Production - Actual Hours Worked) x Standard Variable Overhead Rate

Standard Hours for Actual Production = 9,500 units x 1.5 hours/unit = 14,250 hours

Variable Overhead Efficiency Variance = (14,250 – 14,250) x Rs. 50 = 0

4. What is the Variable Overhead Expenditure Variance for XYZ Manufacturing Ltd. in May 2024?

(a) Rs.40, 000 (A)

(b) Rs.42, 500 (A)

(c) Rs.45, 000 (A)

(d) Rs.45, 030 (A)

Ans: (b) Rs.42, 500 (A)

Variable Overhead Expenditure Variance = (Standard Rate - Actual Rate) x Actual Hours Worked

Total Variable Overhead for Actual Hours: (10,000 x Rs.50) + (4,250 x Rs.60) = Rs.5, 00,000 + Rs.2, 55,000 = Rs.7, 55,000

Variable Overhead Expenditure Variance = (Rs.50 x 14,250 hours) - Rs.7, 55,000

= Rs.42, 500 (Adverse)

5. What is the Fixed Overhead Expenditure Variance for XYZ Manufacturing Ltd. in May 2024?

(a) Rs.50, 000 (F)

(b) Rs.50, 000 (A)

(c) Rs.1, 00,000 (F)

(d) Rs.1, 00,000 (A)

Ans: (b) Rs.50, 000 (A)

Fixed Overhead Expenditure Variance = Budgeted Fixed Overheads - Actual Fixed Overheads

= Rs.20, 00,000 - Rs.20, 50,000

= Rs.50, 000 (Adverse)

Multiple Choice Questions (MCQs)

Question 2

Under standard cost system the cost of the product determined at the beginning of production is its:

(a) Direct cost

(b) Pre-determined cost

(c) Historical cost

(d) Actual cost

(Study Material)

Ans: (b) Pre-determined cost

Reason

Under the standard cost system, the cost of the product that is determined at the beginning of production is called the pre-determined cost. This is an estimate of the expected costs of producing the product, which includes:

Direct materials

Direct labor

Overhead costs (both variable and fixed)

These costs are set in advance based on historical data, industry standards, or anticipated future conditions and are used for comparison with actual costs incurred during production.

The pre-determined cost helps in evaluating performance by comparing it with the actual costs incurred, highlighting variances.

Thus, the correct answer is (b) Pre-determined cost.

Question 3

The deviations between actual and standard cost is known as:

(a) Multiple analysis

(b) Variable cost analysis

(c) Variance analysis

(d) Linear trend analysis

(Study Material)

Ans: (c) Variance analysis

Reason

Variance analysis is the process of comparing actual costs with standard costs to determine the deviations, also known as variances. The goal is to understand why these differences exist and how they can be managed to improve efficiency and cost control.

Standard costs are the expected costs set in advance for materials, labor, and overhead.

Actual costs are the costs incurred during the production process.

By analyzing these variances (the difference between actual and standard costs), management can assess performance, identify areas that require attention, and make informed decisions for future production.

Thus, the correct answer is (c) Variance analysis.

Question 4

The standard which is attainable under favourable conditions is:

(a) Theoretical standard

(b) Expected standard

(c) Normal standard

(d) Basic standard

(Study Material)

Ans: (a) Theoretical standard

Reason

The theoretical standard represents the ideal or perfect conditions for production, assuming that there are no inefficiencies or disruptions. It is the standard that can be achieved under favorable conditions with no waste, maximum efficiency, and optimal usage of resources.

Theoretical standards are difficult to achieve in practice due to real-world constraints like machine breakdowns, human error, and other operational inefficiencies.

In contrast:

Expected standard is based on normal conditions, including some allowances for inefficiency.

Normal standard is a realistic standard based on past performance and expected conditions.

Basic standard refers to a long-term, unchanging standard that may be used for historical comparisons.

Thus, the correct answer is (a) Theoretical standard, as it represents the standard achievable under ideal or favorable conditions.

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Question 5

The standard most suitable from cost control point of view is:

(a) Normal standard

(b) Theoretical standard

(c) Expected standard

(d) Basic standard

(Study Material)

Ans: (c) Expected standard

Reason

The expected standard is the most suitable from a cost control point of view because it reflects the costs that are anticipated under normal operating conditions, accounting for both ideal performance and expected inefficiencies (such as machine downtime, material wastage, and labor inefficiencies).

This standard is based on realistic expectations, making it a practical benchmark for evaluating performance. It allows for effective cost control by comparing actual performance with an achievable and realistic target, while still highlighting areas where improvements can be made.

In contrast:

Normal standard assumes the average performance over time, but doesn't always incorporate specific expected variations or factors.

Theoretical standard represents perfect conditions and is not practical for everyday cost control.

Basic standard is more of a long-term reference and doesn't adapt to changing conditions as effectively as the expected standard.

Therefore, (c) Expected standard is the most appropriate for cost control purposes.

Question 6

Basic standards are:

(a) Those standards, which require high degree of efficiency and performance.

(b) Average standards and are useful in long term planning.

(c) Standards, which can be attained or achieved

(d) Assuming to remain unchanged for a long time.

(Study Material)

Ans: (d) Assuming to remain unchanged for a long time.

Reason

Basic standards are established to provide a long-term benchmark for performance. These standards typically reflect the average conditions and do not change frequently. They are used primarily for historical comparisons and provide a stable reference point over time.

Basic standards are meant to remain relatively unchanged over long periods, offering a consistent basis for comparison.

They help in setting a foundation for long-term planning, even though they might not reflect the day-to-day fluctuations or improvements in efficiency that would be captured by other types of standards (like expected or normal standards).

Thus, the correct answer is (d) Assuming to remain unchanged for a long time.

Topic 2 Types of Standards

Descriptive Question

Question 7

Discuss the types of standards.

(Study Material)

Answer 7

Types of standards are as below:

(i) Ideal Standards: These represent the level of performance attainable when prices for material and labour are most favourable, when the highest output is achieved with the best equipment and layout and when the maximum efficiency in utilisation of resources results in maximum output with minimum cost.

These types of standards are criticised on three grounds:

(a) Since such standards would be unattainable, no one would take these seriously.

(b) The variances disclosed would be variances from the ideal standards. These would not, therefore, indicate the extent to which they could have been reasonably and practically avoided.

(c) There would be no logical method of disposing of these variances.

(ii) Normal Standards: These are standards that may be achieved under normal operating conditions. The normal activity has been defined as "the number of standard hours which will produce at normal efficiency sufficient good to meet the average sales demand over a term of years".

These standards are, however, difficult to set because they require a degree of forecasting. The variances thrown out under this system are deviations from normal efficiency, normal sales volume, or normal production volume.

If the actual performance is found to be abnormal, large variances may result and necessitate revision of standards.

(iii) Basic or Bogey Standards: These standards are used only when they are likely to remain constant or unaltered over a long period. According to this standard, a base year is chosen for comparison purposes in the same way as statisticians use price indices. Since basic standards do not represent what should be attained in the present period, current standards should also be prepared if basic standards are used. Basic standards are, however, well suited to businesses having a small range of products and long production runs. Basic standards are set, on a long-term basis and are seldom revised. When basic standards are in use, variances are not calculated. Instead, the actual cost is expressed as a percentage of basic cost. The current cost is also similarly expressed and the two percentages are compared to find out how much the actual cost has deviated from the current standard. The percentages are next compared with those of the previous periods to establish the trend of actual and current standard from basic cost.

(iv) Current Standards: These standards reflect the management's anticipation of what actual costs will be for the current period. These are the costs which the business will incur if the anticipated prices are paid for the goods and services and the usage corresponds to that believed to be necessary to produce the planned output.

The variances arising from expected standards represent the degree of efficiency in usage of the factors of production, variation in prices paid for materials and services and difference in the volume of production.

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Question 8

How material usage standard is set

(Study Material)

Answer 8

It measures variance in material cost due to usage/ consumption of materials. It is computed as below:

Material Usage Variance = [Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity*]

Or

Std. Price (SP) × {Std. Quantity (SQ) - Actual Quantity (AQ)} **Or** [(SQ × SP) – (AQ × SP)]

(The difference between the Standard Quantity specified for actual production and the Actual Quantity used, at Standard Price)

*Here actual quantity means actual quantity of material used.

Responsibility for material usage variance: Material usage is the responsibility of production department and it is held responsible for adverse usage variance.

Reasons for variance: Actual material consumption may differ from the standard quantity either due to difference in proportion used from standard proportion or due to difference in actual yield from standard yield.

Material usage variance is divided into two parts (a) Material usage mix variance and (b) Material yield variance.

(a) Material Mix Variance

Variance in material consumption may arise due to difference in proportion actually used from the standard mix/ proportion. It only arises when two or more inputs are used to produce a product. Mathematically,

Material Mix Variance = [Standard Cost of Actual Quantity in Standard Proportion – Standard Cost of Actual Quantity]

Or

Std. Price (SP) × {Revised Std. Quantity (RSQ) – Actual Quantity (AQ)} **Or** [(RSQ × SP) – (AQ × SP)]

(The difference between the Actual Quantity in standard proportion and Actual Quantity in actual proportion, at Standard Price)

(b) Material Yield Variance (Material Sub-usage Variance)

Variance in material consumption which arises due to yield or productivity of the inputs. It may arise due to use of sub- standard quality of materials, inefficiency of workers or due to wrong processing.

Material Yield Variance = [Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity in standard proportion]

Or

Std. Price (SP) × {Std. Quantity (SQ) – Revised Standard Quantity (RSQ)} **Or** [(SQ × SP) – (RSQ × SP)]

(The difference between the Standard Quantity specified for actual production and Actual Quantity in standard proportion, at Standard Purchase Price)

Verification of the formulae:

Material Cost Variance= Material Usage Variance + Material Price Variance*

Or, Material Cost Variance= (Material Mix Variance + Material Revised usage Variance) + Material price variance

*If material purchased quantity and material consumed quantity is same

Meaning of the terms used in the formulae:

Term	Meaning
Standard Quantity (SQ)	Quantity of inputs to be used to produce actual output.

Actual Quantity (AQ)	Quantity of inputs actually used to produce actual output.
Revised Standard Quantity (RSQ)	If Actual total quantity of inputs were used in standard proportion.

Topic 3 Variance Analysis – Introduction

Question 9

Overhead cost variances is:

(a) The difference between overheads recovered on actual output - actual overhead incurred.

(b) The difference between budgeted overhead cost and actual overhead cost.

(c) Obtained by multiplying standard overhead absorption rate with the difference between standard hours for actual output and actual hours worked.

(d) None of the above

(Study Material)

Ans: (a) The difference between overheads recovered on actual output - actual overhead incurred.

Reason

Overhead cost variances represent the difference between the overhead costs absorbed based on actual output and the actual overheads incurred during production.

Overheads recovered on actual output refers to the overhead costs that were allocated or absorbed based on the actual output produced, using a predetermined overhead absorption rate.

Actual overhead incurred is the actual cost of overheads that were spent in the production process.

The overhead cost variance is calculated by comparing these two figures. If the overhead absorbed is greater than the actual overhead incurred, it results in a favorable variance. If it is less, it results in an unfavorable variance.

In contrast:

Option (b) refers to a variance between budgeted and actual overheads, which is the total overhead variance, not the overhead cost variance.

Option (c) describes the volume variance related to the difference in standard hours for actual output versus actual hours worked.

Thus, the correct answer is (a) The difference between overheads recovered on actual output - actual overhead incurred.

Question 10

Which of the following variance arises when more than one material is used in the manufacture of a product:

(a) Material price variance

(b) Material usage variance

(c) Material yield variance

(d) Material mix variance

(Study Material)

Ans: (d) Material mix variance

Reason

The material mix variance arises when more than one material is used in the production of a product. It measures the effect of changes in the proportions (mix) of different materials used in production, compared to the standard or expected mix. This variance reflects how the actual mix of materials affects the overall cost, considering each material has its own cost.

Material price variance measures the difference between the actual price paid for materials and the standard price.

Material usage variance measures the difference between the actual quantity of material used and the standard quantity, based on the standard price.

Material yield variance is concerned with the efficiency or output derived from the materials used, comparing the actual yield with the standard yield.

Since the question refers to the use of more than one material, the correct variance is material mix variance.

Thus, the correct answer is (d) Material mix variance.

Question 11

Idle time variance is obtained by multiplying:

(a) The difference between standard and actual hours by the actual rate of labour per hour

(b) The difference between actual labour hours paid and actual labour hours worked by the standard rate

(c) The difference between standard and actual hours by the standard rate of labour per hour

(d) None of the above.

(Study Material)

Ans: (b) The difference between actual labour hours paid and actual labour hours worked by the standard rate

Reason

Idle time variance measures the cost impact of time when workers are paid but not engaged in productive work (idle time). It arises when the actual labor hours paid (the time the workers are paid for) exceeds the actual labor hours worked (the time spent on productive activities).

To calculate the idle time variance, we multiply the difference between the actual labor hours paid and the actual labor hours worked by the standard rate of labor per hour. This reflects the additional cost incurred due to idle time.

In contrast:

Option (a) is more related to calculating labour efficiency variances.

Option (c) refers to the labour rate variance, not idle time variance.

Option (d) is incorrect as option (b) is the correct formula.

Thus, the correct answer is (b) The difference between actual labour hours paid and actual labour hours worked by the standard rate.

Question 12

Standard costs, marginal costs are some of the types of cost which helps the management in decision making. DISCUSS any five types of costs categorised based on its use in Managerial Decision Making.

(MTP May 2025)

Answer 12

Type of costs categorised based on its use in Managerial Decision Making:

(i) Pre-determined Cost - A cost which is computed in advance before production or operations start, on the basis of specification of all the factors affecting cost, is known as a pre-determined cost.

(ii) Standard Cost - A pre-determined cost, which is calculated from managements 'expected standard of efficient operation' and the relevant necessary expenditure. It may be used as a basis for price fixation and for cost control through variance analysis.

(iii) Marginal Cost - The amount at any given volume of output by which aggregate costs increases if the volume of output is increased or decreased by one unit.

(iv) Estimated Cost - Kohler defines estimated cost as "the expected cost of manufacture, or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase". Estimated costs are prospective costs since they refer to prediction of costs.

(v) Differential Cost - (Incremental and decremental costs). It represents the change (increase or decrease) in total cost (variable as well as fixed) due to change in activity level, technology, process or method of production, etc. For example, if any change is proposed in the existing level or in the existing method of production, the increase or decrease in total cost or in specific elements of cost as a result of this decision will be known as incremental cost or decremental cost.

(vi) Imputed Costs - These costs are notional costs which do not involve any cash outlay. Interest on capital, the payment for which is not actually made, is an example of imputed cost. These costs are similar to opportunity costs.

(vii) Capitalized Costs -These are costs which are initially recorded as assets and subsequently treated as expenses. Example, installation expenses on the erection of a machine are added to the cost of a machine.

(viii) Product Costs - These are the costs which are associated with the purchase and sale of goods (in the case of merchandise inventory). In the production scenario, such costs are associated with the acquisition and conversion of materials and all other manufacturing inputs into finished product for sale. Hence, under marginal costing, variable manufacturing costs and under absorption costing, total manufacturing costs (variable and fixed) constitute inventoriable or product costs.

(ix) Opportunity Cost - This cost refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action. For example, a firm financing its expansion plan by withdrawing money from its bank deposits. In such a case the loss of interest on the bank deposit is the opportunity cost for carrying out the expansion plan.

(x) Out-of-pocket Cost - It is that portion of total cost, which involves cash outflow. This cost concept is a short-run concept and is used in decisions relating to fixation of selling price in recession, make or buy, etc. Out–of–pocket costs can be avoided or saved if a particular proposal under consideration is not accepted.

(xi) Shut down Costs - Those costs, which continue to be, incurred even when a plant is temporarily shut-down e.g. rent, rates, depreciation, etc. These costs cannot be eliminated with the closure of the plant. In other words, all fixed costs, which cannot be avoided during the temporary closure of a plant, will be known as shut down costs.

(xii) Sunk Costs - Historical costs incurred in the past are known as sunk costs. They play no role in decision making in the current period. For example, in the case of a decision relating to the replacement of a machine, the written down value of the existing machine is a sunk cost and therefore, not considered.

(xiii) Absolute Cost - These costs refer to the cost of any product, process or unit in its totality. When costs are presented in a statement form, various cost components may be shown in absolute amount or as a percentage of total cost or as per unit cost or all together. Here the costs depicted in absolute amount may be called absolute costs and are base costs on which further analysis and decisions are made.

(xiv) Discretionary Costs – Such costs are not tied to a clear cause and effect relationship between inputs and outputs. They usually arise from periodic decisions regarding the maximum outlay to be incurred. Examples include advertising, public relations, executive training etc.

(xv) Period Costs - These are the costs, which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred. All non-

manufacturing costs such as general & administrative expenses, selling and distribution expenses are recognised as period costs.

(xvi) Engineered Costs - These are costs that result specifically from a clear cause and effect relationship between inputs and outputs. The relationship is usually personally observable. Examples of inputs are direct material costs, direct labour costs etc. Examples of output are cars, computers etc.

(xvii) Explicit Costs - These costs are also known as out-of-pocket costs and refer to costs involving immediate payment of cash. salaries, wages, postage and telegram, printing and stationery, interest on loan etc. are some examples of explicit costs involving immediate cash payment.

(xviii) Implicit Costs - These costs do not involve any immediate cash payment. They are not recorded in the books of account. They are also known as economic costs.

Topic 4 Material Variances

Descriptive Question

Question 13

The details corresponding to the manufacture of a product X is as follows:

Materials 20 units @ Rs. 3 per unit – Rs. 60

Wages 10 hours @ 16 per hour – Rs. 160

Production OH 10 hours @ 20 – Rs. 200

Actual Material cost amounts to Rs. 25,740 and labour cost amounts to Rs. 65,368.

The variances have been analysed and the following information is being made available:

1. Material Price Variance - 1170A

2. Material Usage Variance - 750F

3. Wages Rate Variance - 1352F

4. Wages Efficiency - 800A

5. POH Expenditure - 900F

6. POH Volume Variance - 1400F

From the above DETERMINE:

i. Actual output in Units

ii. Actual price of material per unit

iii. Actual quantity of materials consumed

iv. Actual wage rate

v. Actual hours worked and Standard Hours

vi. Amount of overhead absorbed

vii. Amount of Overhead incurred

viii. Production Overhead capacity variance

ix. Production Overhead efficiency variance

x. Budgeted output in units.

(MTP May 2025)

Answer 13

Actual Cost of Material (Actual Quantity x Actual Price) = 25,740

Material Cost Variance = Price Variance + Usage Variance

= 1,170A + 750F = 420A

Standard Cost of Materials (Standard Quantity x Standard Price)

= Actual cost + Cost variance

= 25,740 – 1170 + 750 = 25,320

SQ x SP = 25,320, SP = 3 per unit

Hence SQ = 8,440

AQ x SP = (SQ x SP) + Usage Variance = 25,320 – 750 = 24,570

Hence AQ of Material = 8,190

AQ x AP = 25,740

Hence AP of Material = Rs. 3.142

Actual Wages paid (AH x AR) = 65,368

Wage cost variance = Wage efficiency variance + Wage rate variance

= 1352 F – 800 A = 552 F

SH x SR = Actual Wages paid + Wage cost variance

= 65,368 + 552 = 65,920

SH = 4,120 hours

AH x SR = SH x SR + Efficiency variance = 66,720

AH thereon = 4,170 hours

AH x AR = 65,368

AR = 15.676

SH x SR (Absorbed Overheads) = 4,120 x 20 = 82,400

Actual Output = 4,120/10 = 412 units

OH Cost variance = Volume Variance + Expenditure Variance

= 1,400 F + 900 F = 2,300 F

Actual FOH = 82,400 – 2,300 = 80,100

Budgeted FOH = Actual FOH + Expenditure Variance

Budgeted FOH = 80,100 + 900 = 81,000

BO x SR = BFOH = 81,000/200 = 405 units

Budgeted Units = 405 units

(SH x SR – AH x SR) = 82,400 – (4,170 x 20) = 1,000A

OH Efficiency Variance = 1,000A

AH x SR – BFOH = 83,400 – 81,000

OH Capacity Variance = 2,400 F

Question 14

A manufacturing concern has provided following information related to fixed overheads:

	Standard	**Actual**
Output in a month	**5000 units**	**4800 units**
Working days in a month	**25 days**	**23 days**
Fixed overheads	**Rs. 5,00,000**	**Rs. 4,90,000**

Compute:

i. Fixed overhead variance

ii. Fixed overhead expenditure variance

iii. Fixed overhead volume variance

iv. Fixed overhead efficiency variance

(PYP Nov '18)

Answer 14

Calculation of Variances:

(i) Fixed Overhead Variance: Standard fixed overhead – Actual fixed overhead

= Rs. [(5,00,000÷5000) ×4800] – Rs. 4,90,000 = Rs. 10,000 (A)

(ii) Fixed Overhead Expenditure Variances: Budgeted fixed overhead – Actual fixed overhead

= Rs. 5,00, 000 – Rs. 4,90, 000 = Rs. 10,000 (F)

(iii) Fixed Overhead Volume Variance: Standard fixed overhead – Budgeted fixed overhead

= Rs. 4,80, 000 – Rs. 5,00, 000 = Rs. 20,000 (A)

(iv) Fixed Overhead efficiency Variance: Standard fixed overhead – Budgeted fixed overhead for Actual days

= Rs. 4,80, 000 – [(Rs. 5,00, 000÷25) ×23] = Rs. 20,000 (F)

Important Note:-

In this numerical problem of standard costing to calculate Fixed Overhead variances, average performance was observed. Some examinees failed to understand the concept of Standard Cost for actual output.

Question 15

The standard labour component and the actual labour component engaged in a week for a job are as follows:

	Skilled	Semi-skilled	Un-Skilled
	Workers	Workers	workers
Standard number of workers in the gang	32	12	6
Standard wage rate per hour (Rs.)	30	20	10
Actual number of workers employed in the gang			
during the week	28	18	4
Actual wages rate per hour (Rs.)	34	23	12

During the 40 hours working week the gang produced 1,800 standard labour hours of work.

CALCULATE:

(i) Total labour cost variance;

(ii) Labour yield variance;

(iii) Labour mix variance; and

(iv) Labour wage rate variance.

(MTP March '18)

Answer 15

Work produced by the gang 1,800 standard labour hours, i.e.,

1, 800 / 32+ 12+6 or 36 gang hours

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Standard hours of Skilled Labour	(36 x 32)	1,152	hours
Standard hours of Semi-skilled Labour	(36 x 12)	432	hours
Standard hours of Un-skilled Labour	(36 x 6)	216	hours
Total		**1,800**	**hours**
Actual hours of Skilled Labour	(40 x 28)	1,120	hours
Actual hours of Semi-skilled Labour	(40 x 18)	720	hours
Actual hours of Un-skilled Labour	(40 x 4)	160	hours
Total		**2,000**	**hours**

Revised Standard hours (actual hours worked expressed in standard ratio)

Skilled Labour = $\frac{1,152}{1,800}$ × 2,000 = 1,280 hours

Semi-skilled Labour = $\frac{432}{1,800}$ × 2,000 = 480 hours

Unskilled Labour = $\frac{216}{1,800}$ × 2,000 = 240 hours

	Rs.
Skilled Labour 1,152 hours @ Rs. 30	34,560
Semi-skilled Labour 432 hours @ Rs. 20	8,640
Unskilled Labour 216 hours @ Rs. 10	2,160

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1,800 hours	**45,360**

Actual Cost:	**Rs.**
Skilled Labour 1,120 hours @ Rs. 34	38,080
Semi-skilled Labour 720 hours @ Rs. 23	16,560
Unskilled Labour 160 hours @ Rs. 12	1,920
2,000 hours	**56,560**

(i) Total Labour Cost Variance = Standard Cost- Actual Cost

Rs. 45,360 - Rs. 56,560 = 11,200 (A)

(ii) Labour Yield Variance:

(Standard hours for Actual Output - Revised Standard hours) x Standard Rate		
Skilled (1,152 - 1,280) x Rs. 30	3,840 (A)	
Semi -skilled (432 - 480) x Rs. 20	960 (A)	
Un-skilled (216 - 240) x Rs. 10	240 (A)	5,040 (A)

(iii) Labour Mix Variance:

(Revised Standard Hours - Actual Hours) x Standard	**Rate**	

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Skilled (1,280 - 1,120) x Rs. 30	4,800 (F)	
Semi-skilled (480-720) x Rs. 20	4,800 (A)	
Un-skilled (240-160) x Rs. 10 800	800 (F)	800 (F)

(iv) Labour Wage Rate Variance:

(Standard Rate - Actual Rate) x Actual Hours		
Skilled (Rs. 30 - Rs. 34) x 1,120	4,480 (A)	
Semi-skilled (Rs. 20 - Rs. 23) x 720	2,160 (A)	
Un-skilled (Rs. 10 - Rs. 12) x 160	320 (A)	6,960 (A)

Check: Total Labour Cost Variance = Yield + Mix + Rate 11,200 (A)

Question 16

Y Lid manufactures "Product M" which requires three types of raw materials - "A", "B" & "C". Following information related to 1st quarter of the F.Y. 2022-23 has been collected from its books of accounts. The standard material input required for 1,000 kg of finished product 'M' are as under:

Material	Quantity (Kg.)	Std. Rate per Kg. (Rs.)
A	**500**	**25**
B	**350**	**45**

C	250	55
	1100	
Standard Loss	100	
Standard Output	1000	

During the period, the company produced 20,000 kg of product "M" for which the actual quantity of materials consumed and purchase prices are as under:

Material	Quantity (Kg.)	Purchase price per Kg. (Rs.)
A	11,000	23
B	7,500	48
C	4,500	60

You are required to calculate:

(i) Material Cost Variance

(ii) Material Price Variance for each raw material and Product 'M'

(iii) Material Usage Variance for each raw material and Product 'M'

(iv) Material Yield Variance

Note: Indicate the nature of variance i.e. Favourable or Adverse.

(PYP Nov 22)

Answer 16

Basic Calculations:

	Standard for 20,000 kg.			Actual for 20,000 kg.		
	Qty. Kg.	**Rate (Rs.)**	**Amount (Rs.)**	**Qty. Kg.**	**Rate (Rs.)**	**Amount (Rs.)**
A	10,000	25	2,50,000	11,000	23	2,53,000
B	7,000	45	3,15,000	7,500	48	3,60,000
C	5,000	55	2,75,000	4,500	60	2,70,000
Total	**22,000**		**8,40,000**	**23,000**		**8,83,000**

Calculation of Variances:

(i) Material Cost Variance = Std. Cost for actual output–Actual cost

MCV=8, 40,000– 8, 83,000 = Rs. 43,000(A)

(ii) Material Price Variance = (SP–AP) × AQ

A = (25 - 23) x 11,000	= 22,000 (F)
B = (45 – 48) x 7,500	= 22,500 (A)
C = (55 – 60) x 4,500	= 22,500 (A)
	= 23000 (A)

(iii) Material Usages Variance = (SQ–AQ) × SP

A = (10,000 – 11,000) x 25	= 25,000 (A)
B = (7,000 –7,500) x 45	= 22,500 (A)
C = (5,000 – 4,500) x 55	=27,500 (F)
	=20,000 (A)

(iv) Material Yield Variance = (SQ–RSQ*) × SP

A = (10000 – 10454.54) x 25	= 11363.5(A)
B = (7000 – 7318.18) x 45	= 14318.1(A)
C = (5000 – 5227.27) x 55	= 12500(A)
	=38181.6(A)

***Revised Standard Quantity (RSQ)**

A = $\frac{10,000}{22,000}$ × 23,000 = 10,454.54

B = $\frac{7,000}{22,000}$ × 23,000 = 7,318.18

C = $\frac{5,000}{22,000}$ × 23,000 = 5,227.17

Material Yield Variance can also be calculated as below

Material yield variance = Standard cost per unit (Actual yield – Standard yield)

Standard Cost per unit = $\frac{\text{Rs.}8,40,000}{20,000}$ = Rs. 42

New Standard Yield = $\frac{Rs.20,000}{22,000}$ X 23,000 = 20,909

Material yield variance = Rs. 42 (20,000 – 20,909)

= Rs. 38,178 (A)

Question 17

GAP Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. Following are the details.

Budgeted data:

Material	Qty	Price	(Rs.)	Amount (Rs.)
A	60	20		1200
B	40	30		1200
Inputs	100			2400
Normal loss	20			
Output	80			2400
Actual data:				
Actual output	80 units.			
Material	Qty	Price	(Rs.)	Amount (Rs.)
A	70	?		?
B	?	30		?

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Material Price Variance (A) Rs. 105A

Material cost variance Rs. 275A

You are required to CALCULATE:

(i) Actual Price of material A

(ii) Actual Quantity of material B

(iii) Material Price Variance

(iv) Material Usage Variance

(v) Material Mix Variance

(vi) Material Sub Usage Variance

(Study Material)

Answer 17

(i) Actual Price of Material A

Let Actual Price of Material A be 'X'

Material Price Variance (A) = Rs. 105 (A)

Material Price Variance = (SP – AP) × AQ

(20 – X) × 70 = 105 (A)

1,400 – 70X = -105

X = 1,505 ÷ 70 = 21.5

Therefore X (Actual Price) = Rs. 21.5

(ii) Actual Quantity of Material B

Let Actual Quantity of Material B be 'X '

Material Cost Variance = (SQ× SP) – (AQ× AP)

Material Cost Variance = 275 (A)

{(60 × 20) – (70 × 21.5)} + {(40 × 30) – ('X' × 30)} = 275 (A)

{(1,200 – 1,505) + (1,200 – 30X)} = -275

(895 – 30X) = -275

X = 1,170 ÷ 30 = 39 units

(iii) Material Price Variance = (SP – AP) × AQ

Material A = (20 – 21.5) × 70 = Rs. 105 (A)

Material B = (30 – 30) × 39 = Rs. 0

Total = Rs. 105 (A)

(iv) Material Usage Variance = (SQ– AQ) × SP

Material A = (60 – 70) × 20 = Rs. 200 (A)

Material B = (40 – 39) × 30 = Rs. 30 (F)

Total = Rs. 170 (A)

(v) Material Mix Variance = (RSQ– AQ) × SP

Material A = $\left(\frac{109}{100} \times 60 - 70\right)$× 20 = Rs. 92 (A)

Material B = $\left(\frac{109}{100} \times 40 - 39\right)$× 30 = Rs. 138 (F)

Total = Rs. 46 (F)

(vi) Material Yield Variance = (SQ – RSQ) × SP

Material A = $\left(60 - \frac{109}{100} \times 60\right)$× 20 = Rs. 108 (A)

Material B = $\left(40 - \frac{109}{100} \times 40\right) \times 30$ = Rs. 108 (A)

Total = Rs. 216 (A)

Question 18

One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June 2023:

(a) Standard mix for chemical A is 50% and chemical B is 50%.

(b) Standard price kilogram of chemical A is Rs. 12 and chemical B is Rs. 15.

(c) Actual input of chemical B is 70 kilograms.

(d) Actual price per kilogram of chemical A is Rs. 15

(c) Standard normal loss is 10% of total input

(d) Total Material cost variance is Rs. 650 adverse.

(e) Total Material yield variance is Rs. 135 adverse.

You are required to CALCULATE:

(i) Total Material mix variance

(ii) Total Material usage variance

(iii) Total Material price variance

(iv) Actual loss of actual input

(v) Actual input of chemical A

(vi) Actual price per kg. of chemical B

Answer 18

Working Notes:

(1) Calculation of standard mix of input (assuming Standard input as 100 kg)

	Qty. (Kg)	Price (Rs.)	Amount (Rs.)
Chemical A	50	12	600
Chemical B	50	15	750
	100	13.50	1,350
Normal Loss (10%)	(10)		
	90		1,350

(2) Let the actual input of chemical A be X kg. and the actual price of chemical B be Rs. Y.

Given,

Material yield variance = (Total standard input – Total Actual input) x

Standard cost per unit of input

= [100 – (70 + X)] x 13.5 = 135 (A)

Therefore, X = 40 kg.

Also, Material cost variance= (Standard quantity x Standard price) – (Actual quantity x Actual price)

= 1,350 – {(40 x 15) + (70 x Y)} = 650 (A)

= 1,350 – 600 – 70Y = 650A

Therefore, Y = Rs. 20

(i) Material mix variance = (Revised Std. Quantity* – Actual quantity) x Standard Price

Chemical A = (55 – 40) x 12 = 180 (F)

Chemical B = (55 - 70) x 15 = 225 (A)

= Rs. 45 (A)

*Revised Std. Quantity:

Chemical A = (70 + 40) x 50% = 55

Chemical B = (70 + 40) x 50% = 55

(ii) Material usage variance = (Std. qty. – Actual qty.) × Std. price

Chemical A = (50 – 40) × 12 = 120 (F)

Chemical B = (50 – 70) × 15 = 300 (A)

= Rs. 180 (A)

(iii) Material price variance = (Std. price – Actual price) × Actual qty.

Chemical A = (12 – 15) × 40 = 120 (A)

Chemical B = (15 – 20) × 70 = 350 (A)

= Rs. 470 (A)

(iv) Actual loss of actual input

Actual total input = 110 kg.

Less: Actual output = 90 kg.

Actual loss = 20 kg.

(v) Actual input of chemical A = 40 kg. [As calculated in working note (2)].

(vi) Actual price per kg. of chemical B = Rs. 20 [As calculated in Working note (2)].

Question 19

XYZ Ltd. has furnished you the following information for the month of August:

	Budget	Actual
Output (units)	**30,000**	**32,500**
Hours	**30,000**	**33,000**
Fixed overhead	**Rs. 45,000**	**50,000**
Variable overhead	**Rs. 60,000**	**68,000**
Working days	**25**	**26**

CALCULATE overhead variances.

(Study Material)

Answer 19

Basic Calculations:

Standard hours per unit = $\frac{\text{Budgeted hours}}{\text{Budgeted units}} = \frac{30,000}{30,000}$ = 1 hour

Std. hrs. for actual output = 32,500 units × 1 hr = 32,500

Standard overhead rate per hour = $\frac{\text{Budgeted overheads}}{\text{Budgeted hours}}$

For fixed overhead = $\frac{45,000}{30,000}$ = Rs.1.50 per hour

For variable overhead = $\frac{60,000}{30,000}$ = Rs.2 per hour

Std. F.O. rate per day = Rs.45,000 ÷ 25 days = Rs.1,800

Recovered overhead = Std. hrs. for actual output × St. rate

For fixed overhead = 32,500 hrs. × Rs.1.50 = Rs.48,750

For variable overhead = 32,500 hrs. × Rs.2 = Rs.65,000

Standard overhead = Actual hours × Std. rate

For fixed overhead = 33,000 × 1.50 = Rs.49, 500

For variable overhead = 33,000 × 2 = Rs.66, 000

Revised budget hours = $\frac{\text{Budgeted hours}}{\text{Budgeted days}}$ × Actual days

= $\frac{30,000}{25,000}$ × 26 = 31,200 hours

Revised budgeted overhead (for fixed overhead) = 31,200 × 1.50 = Rs.46,800

Calculation of variances

Fixed Overhead Variances:

(i) F.O. cost Variance = Recovered Overhead – Actual Overhead

= 48,750 – 50,000

= Rs.1,250 (A)

(ii) F.O. Expenditure Variance = Budgeted Overhead – Actual Overhead

= 45,000 – 50,000

= Rs. 5,000 (A)

(iii) F.O. Volume Variance = Recovered Overhead – Budgeted Overhead

= 48,750 – 45,000

= Rs. 3,750 (F)

(iv) F.O. Efficiency Variance = Recovered Overhead – Standard Overhead

= 48,750 – 49,500 = Rs.750 (A)

(v) F.O. Capacity Variance = Standard Overhead- Revised Budgeted

Overhead

= 49,500-46800 =Rs. 2,700 (F)

(v) Calendar Variance = (Actual Days - Budget Days) × St. rate per day.

= (26 – 25) × 1,800 = Rs.1,800 (F)

Variable Overhead Variances

(i) V.O. Cost variance = Recovered Overhead – Actual Overhead

= 65,000 – 68,000 = Rs. 3,000 (A)

(ii) V.O. Expenditure Variance= Standard Overhead – Actual Overhead

= 66,000 – 68,000 = Rs. 2,000 (A)

(iii) V.O. Efficiency Variance = Recovered Overhead – Standard Overhead

= 65,000 – 66,000 = Rs.1,000 (A)

Check

(i) F.O. Cost Variance = Expenditure variance + Volume variance

1,250 (A) = 5,000 (A) + 3,750 (F)

(ii) F.O. Volume Variance = Variance Efficiency + Variance Capacity + Variance Calendar

3,750 (F) = 750 (A) + 2,700 (F) + 1,800 (F)

(iii) V.O. Cost Variance = Expenditure Variance + Efficiency Variance

3,000 (A) = 2,000 (A) + 1,000 (A).

Question 20

S.V. Ltd. has furnished the following data:

Budget		Actual (for the month of July)
No. of working days	**25**	**27**
Production in units	**20,000**	**22,000**
Fixed overheads	**Rs. 30,000**	**Rs. 31,000**

Budgeted fixed overhead rate is Rs. 1.00 per hour. In July, the actual hours worked were 31,500.

CALCULATE the following variances:

(i) Expenditure variance.

(ii) Volume variance.

(iii) Total overhead variance.

(Study Material)

Answer 20

For Fixed Overhead Variances

Actual fixed overhead incurred	Rs. 31,000

Budgeted fixed overhead for the period	Rs.30,000
Standard fixed overhead for production (Rs. 30,000 ÷ 20,000 units) × 22,000	Rs.33,000

Computation of Variances:
(i) Fixed overhead expenditure variance:
= Budgeted fixed overhead – Actual fixed overhead
= Rs. 30,000 – Rs. 31,000 = Rs. 1,000 (A)
(ii) Fixed overhead volume variance:
= Standard fixed overhead – Budgeted fixed overhead
= Rs. 33,000 – Rs. 30,000 = Rs. 3,000 (F)
(iii) Fixed overhead variance:
= Standard fixed overhead – Actual fixed overhead
= Rs. 33,000 – Rs. 31,000 = Rs. 2,000 (F)

Question 21

The following data for Pijee Ltd. is given:

	Budget	Actual
Production (in units)	**400**	**360**
Man hours to produce above	**8,000**	**7,000**
Variable overheads (in Rs.)	**10,000**	**9,150**

CALCULATE relevant Variable overhead variances.

(Study Material)

Answer 21

1. Calculation of standard variable overhead per unit

$= \frac{\text{Budgeted variable overhead}}{\text{Budgeted production}} = \frac{10,000}{400}$ = Rs.25 per unit

2. Calculation of standard variable overhead per hour

$= \frac{\text{Budgeted variable overhead}}{\text{Budgeted man hours}} = \frac{10,000}{8,000}$ = Rs.1.25 per unit

3. Calculation of Std. variable overhead for actual output

= Actual output × Std. variable overhead per unit

= 360 units × Rs. 25 = Rs. 9,000

4. Calculation of Budgeted variable overhead based on actual hours worked

= Actual hours worked × Std. variable overhead per hour

= 7,000 × 1.25 = Rs. 8,750

5. Calculation of standard hours for actual output

= Actual output × Std. hours per unit

= 360 units × 20 hours = 7,200 hours

(i) Variable overhead cost variance

= Std. variable overhead for actual output – Actual Variable Overheads

= 9,000 – 9,150 = Rs. 150 (A)

(ii) Variable overhead expenditure variance

= Std. overhead for Actual hours – Actual Overhead

= 8,750 – 9,150 = Rs. 400 (A)

(iii) Variable overhead efficiency variance

= (Std. hours for actual output – Actual hours) × Std. rate per hour

= (7,200 – 7,000) × 1.25 = Rs. 250 (F)

Question 22

The following data has been collected from the cost records of a unit for computing the various fixed overhead variances for a period:

Number of budgeted working days	**25**
Budgeted man-hours per day	**6,000**
Output (budgeted) per man-hour (in units)	**1**
Fixed overhead cost as budgeted	**Rs. 1,50,000**
Actual number of working days	**27**

Actual man-hours per day	**6,300**
Actual output per man-hour (in-units)	**0.9**
Actual fixed overhead incurred	**Rs. 1,56,000**

CALCULATE fixed overhead variances:

(i) Expenditure Variance

(ii) Volume Variance,

(iii) Fixed Cost Variance.

(Study Material)

Answer 22

For Fixed overheads Variances:

Actual fixed overhead incurred = Rs. 1, 56,000

Budgeted fixed overhead for the period = 1, 50,000

Standard fixed overhead for production (Standard output for actual time × Standard Fixed Overhead per unit)

(6,300 hrs. × 27 days × 0.9) × (Rs. 1, 50,000 ÷ 1, 50,000 units) = Rs. 1, 53,090

(a) Fixed Overhead Expenditure Variance	= Budgeted fixed overhead – Actual fixed overhead = Rs.1,50,000 – Rs.1,56,000 = Rs. 6,000 (A)
(b) Fixed Overhead Volume Variance	= Standard fixed overhead – Budgeted fixed overhead = Rs.1,53,090 – Rs. 1,50,000 = Rs. 3,090 (F)

(c) Fixed Overhead Variance	= Standard fixed overhead – Actual fixed overhead = Rs.1,53,090 – Rs. 1,56,000 = Rs. 2,910 (A)

Question 23

J.K. Ltd. manufactures NXE by mixing three raw materials. For every batch of 100 kg. Of NXE, 125 kg. of raw materials are used. In the month of April, 60 batches were prepared to produce an output of 5,600 kg. Of NXE. The standard and actual particulars for the month of April, are as follows:

Raw Materials	Standard		Actual		Quantity of Raw Materials Purchased
	Mix	Price per kg.	Mix	Price per Kg.	
	(%)	(Rs.)	(%)	(Rs.)	(Kg.)
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

You are required to CALCULATE:

(i) Material Price variance

(ii) Material Usage Variance

(Study Material)

Answer 23

Actual material used = 125 kg × 60 = 7,500 kg.

Actual cost of actual material used (AQ × AR)			**(Rs.)**
A	(60%)	4,500 kg × Rs.21 =	94,500
B	(20%)	1,500 kg × Rs. 8 =	12,000
C	(20%)	1,500 kg × Rs. 6 =	9,000
		7,500	1,15,500

Standard cost of actual material used (AQ × SR)		**(Rs.)**
A	4,500 kg × Rs.20 =	90,000
B	1,500 kg × Rs.10 =	15,000
C	1,500 kg × Rs. 5 =	7,500
	7,500	1,12,500

Standard cost of material, if it had been used in standard proportion (Standard Proportion ×Standard Rate)

			(Rs.)
A	(50%)	3,750 kg × Rs.20 =	75,000
B	(30%)	2,250 kg × Rs.10 =	22,500

C	(20%)	1,500 kg × Rs. 5 =	7,500
		7,500	1,05,000

Standard cost of production (SQ for actual production × SR)

Standard cost of output for 100 kg:		**(Rs.)**
A	62.50 kg × Rs.20 =	1,250
B	37.50 kg × Rs.10 =	375
C	25.00 kg × Rs. 5 =	125
125.00	1,750	

Standard cost for output of 5,600 kg.

$= \frac{1,750}{100}$ kg × 5,600 kg. = Rs. 98,000

Material Price Variance = Standard cost of actual material used – Actual cost of actual material used = Rs. 1, 12,500 – Rs. 1, 15,500 = Rs. 3,000 (A)

Material Usage Variance = Standard cost of production – Standard cost of actual material used = Rs. 98,000 – Rs.1, 12,500 = Rs. 14,500 (A)

Note: Material Price Variance can be calculated at the time of purchase as well. In that case, material variance will be as follows:

Actual cost of material purchased		
A	5,000 kg × Rs. 21 =	Rs. 1,05,000

B	2,000 kg × Rs. 8 =	Rs. 16,000
C	1,200 kg × Rs. 6 =	Rs. 7,200
		Rs. 1,28,200

Standard cost of material purchased		
A	5,000 kg × Rs. 20 =	Rs. 1,00,000
B	2,000 kg × Rs. 10 =	Rs. 20,000
C	1,200 kg × Rs. 5 =	Rs. 6,000
		Rs. 1,26,000

Material Price variance (if calculated at the time of purchase)

= Standard cost of actual material used – Actual cost of actual material used

= Rs. 1, 26,000 – Rs. 1, 28,200 = Rs. 2,200 (A)

Question 24

COMPUTE the missing data indicated by the question marks from the following:

Particulars	**A**	**B**
Standard Price/ unit	**Rs. 12**	**Rs. 15**

Actual Price/ unit	**Rs. 15**	**Rs. 20**
Standard Input (kgs.)	**50**	**?**
Actual Input (kgs.)	**?**	**70**
Material Price Variance	**?**	**?**
Material Usage Variance	**?**	**Rs. 300 Adverse**
Material Cost Variance	**?**	**?**

Material mix variance for both products together was Rs. 45 Adverse.

(RTP May 2025)

Answer 24

(i) Standard input (kgs.) of Material- B:

Material usage variance = Std. Rate (Std. Quantity – Actual Quantity)

Rs. 300 Adverse = Rs. 15 (SQ – 70)

Or, -300 = 15 SQ – 1,050

Or, SQ = 50 kgs.

(ii) Actual Input (kgs) of Material- A:

Let the actual input in for Material-A is X kgs.

Material Mix Variance = Std. Price (Actual Quantity in Std. mix – Actual Quantity)

Or, Material Mix Variance (A+B) = Material Mix Variance for Material - A + Material Mix Variance for Material –B

Or, - 45 = $\left[\text{Rs. } 12\left\{\left(\frac{X+70}{2}\right)-X\right\}\right]+\left[\text{Rs. } 15\left\{\left(\frac{X+70}{2}\right)-70\right\}\right]$

Or, - 45 = $\left[\text{Rs. } 12\left\{\left(\frac{X+70-2X}{2}\right)\right\}\right]+\left[\text{Rs. } 15\left\{\left(\frac{X+70-140}{2}\right)\right\}\right]$

Or, - 45 = $\left[\text{Rs. } 12\left\{\left(\frac{70-X}{2}\right)\right\}\right]+\left[\text{Rs. } 15\left\{\left(\frac{X-70}{2}\right)\right\}\right]$

Or, - 45 = $[-6X+420]+\left[\frac{15X-1,050}{2}\right]$

Or, - 45 = $\left[\frac{-12X+840+15X-1,050}{2}\right]$

Or, - 90 = 3X-210

Or, X = $\frac{120}{3}$ =40 kgs.

(iii) (a) Material Price Variance of A = Actual Quantity (Std. Rate – Actual Rate)

= 40 kg. (12–15) = Rs. 120 Adverse

(b) Material Price Variance of B = 70 kg. (15 – 20) = Rs. 350 Adverse

(iv) Material usage variance of A = Std. Rate (Std. Quantity – Actual Quantity)

= 12 (50 – 40) = Rs. 120 Favourable

(v) (a) Material Cost variance of A = Std. Cost – Actual Cost

= (50 kgs. @ Rs. 12) – (40 kgs. @ Rs. 15)

= 600 – 600 = Nil

(b) Material Cost variance of B = (50 kgs. @ Rs. 15) – (70 kgs. @ Rs. 20)

= 750 – 1,400 = Rs. 650 Adverse

Question 25

Banku manufacturing Ltd. is engaged in producing a item named 'ABC'. It produces 'ABC' in a batch of 100 kgs. Standard material inputs required for 100 kgs. of 'ABC' are as below:

Material	Quantity (in kgs.)	Rate per kg. (in Rs.)
A	50	110
B	30	320
C	30	460

During the month of April, 2024, actual production was 50,000 kgs. of 'ABC' for which the actual quantities of material used for a batch and the prices paid thereof are as under:

Material	Quantity (in kgs.)	Rate per kg. (in Rs.)
A	60	115
B	25	330
C	20	405

You are required to CALCULATE the following variances based on the above given information for the month of April, 2024 for Banku manufacturing Ltd.:

(i) Material Cost Variance;

(ii) Material Price Variance;

(iii) Material Usage Variance;

(iv) Material Mix Variance;

(v) Material Yield Variance.

Answer 25

(i)

Material	SQ* × SP (Rs.)	AQ** × SP (Rs.)	AQ** × AP (Rs.)	RSQ*** × SP (Rs.)
A	27, 50,000 (25,000 kg. × Rs. 110)	33, 00,000 (30,000 kg. × Rs. 110)	34, 50,000 (30,000 kg. × Rs. 115)	26, 24,600 (23,860 kg. × Rs. 110)
B	48, 00,000 (15,000 kg. × Rs. 320)	40, 00,000 (12,500 kg. × Rs. 320)	41, 25,000 (12,500 kg. × Rs. 320)	45, 82,400 (14,320 kg. × Rs. 320)
C	69, 00,000 (15,000 kg. × Rs. 460)	46, 00,000 (10,000 kg. × Rs. 460)	40, 50,000 (10,000 kg. × Rs. 405)	65, 87,200 (14,320 kg. × Rs. 460)
Total	1,44,50,000	1,19,00,000	1,16,25,000	1,37,94,200

*** Standard Quantity of materials for actual output:**

A	$=\frac{50 \text{ kgs.}}{100 \text{ kgs}}$×50,000 kgs. =25,000 kgs.
B	$=\frac{30 \text{ kgs.}}{100 \text{ kgs}}$×50,000 kgs. =15,000 kgs.
C	$=\frac{30 \text{ kgs.}}{100 \text{ kgs}}$×50,000 kgs. =15,000 kgs.

**** Actual Quantity of Material used for actual output:**

A	$=\frac{60\text{ kgs.}}{100\text{ kgs}}$×50,000 kgs. =30,000 kgs.
B	$=\frac{25\text{ kgs.}}{100\text{ kgs}}$×50,000 kgs. =12,500 kgs.
C	$=\frac{20\text{ kgs.}}{100\text{ kgs}}$×50,000 kgs. =10,000 kgs.

*****Revised Standard Quantity (RSQ):**

A	$=\frac{50\text{ kgs.}}{110\text{ kgs}}$×52,500 kgs. =23,860 kgs.
B	$=\frac{30\text{ kgs.}}{110\text{ kgs}}$×52,500 kgs. =14,320 kgs.
C	$=\frac{30\text{ kgs.}}{110\text{ kgs}}$×52,500 kgs. =14,320 kgs.

(i) Material Cost Variance = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)

Or = (SQ × SP) – (AQ × AP)

A	= Rs. 27,50,000 - Rs. 34,50,000	= Rs. 7,00,000 (A)
B	= Rs. 48,00,000 - Rs. 41,25,000	= Rs. 6,75,000 (F)
C	= Rs. 69,00,000 - Rs. 40,50,000	= Rs. 28,50,000 (F)
		= Rs. 28,25,000 (F)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

= (AQ × SP) – (AQ × AP)

A	= Rs. 33,00,000 - Rs. 34,50,000	= Rs. 1,50,000 (A)
B	= Rs. 40,00,000 - Rs. 41,25,000	= Rs. 1,25,000 (A)
C	= Rs. 46,00,000 - Rs. 40,50,000	= Rs. 5,50,000 (F)
		= Rs. 2,75,000 (F)

(iii) Material Usage Variance = Std. Price (Std. Qty. – Actual Qty.)

Or = (SQ × SP) – (AQ × SP)

A	= Rs. 27,50,000 - Rs. 33,00,000	= Rs. 5,50,000 (A)
B	= Rs. 48,00,000 - Rs. 40,00,000	= Rs. 8,00,000 (F)
C	= Rs. 69,00,000 - Rs. 46,00,000	= Rs. 23,00,000 (F)
		= Rs. 25,50,000 (F)

(iv) Material Mix Variance = Std. Price (Revised Std. Qty. – Actual Qty.)

Or = (RSQ × SP) – (AQ × SP)

A	= Rs. 26,24,600 - Rs. 33,00,000	= Rs. 6,75,400 (A)
B	= Rs. 45,82,400 - Rs. 40,00,000	= Rs. 5,82,400 (F)
C	= Rs. 65,87,200 - Rs. 46,00,000	= Rs. 19,87,200 (F)
		= Rs. 18,94,200 (F)

(v) Material Yield Variance = Std. Price (Std. Qty. – Revised Std. Qty.)

Or = (SQ × SP) – (RSQ × SP)

A	= Rs. 27,50,000 - Rs. 26,24,600	= Rs. 1,25,400 (F)
B	= Rs. 48,00,000 - Rs. 45,82,400	= Rs. 2,17,600 (F)
C	= Rs. 69,00,000 - Rs. 65,87,200	= Rs. 3,12,800 (F)
		= Rs. 6,55,800 (F)

Case Scenarios

Question 26

K Ltd. is a manufacturer of a single product A. 8,000 units of the product A has been produced in the month of March 2024. At the beginning of the year a total 1, 20,000 units of the product-A has been planned for production. The cost department has provided the following estimates of overheads:

Fixed	**Rs. 12,00,000**	**Variable**	**Rs. 6,00,000**
Semi-Variable	**Rs. 1,80,000**		

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable nature.

The records of the production department shows that the company could have operated for 20 days but there was a festival holiday during the month.

The actual cost data for the month of March 2024 are as follows:

Fixed	**Rs. 1,19,000**	**Variable**	**Rs. 48,000**

Semi-Variable	**Rs. 19,200**		

The cost department of the company is now preparing a cost variance report for managerial information and action. You being an accounts officer of the company are asked to calculate the following information for preparation of the variance report:

(Study Material)

i. What is the amount of variable overhead cost variance for the month of March 2024:

(a) Rs. 10,200 (A)

(b) Rs. 10,400 (A)

(c) Rs. 10,800 (A)

(d) Rs. 10,880 (A)

Ans: (d) Rs. 10,880 (A)

Variable Overhead Cost = Standard Variable Overheads for Variance Production – Actual Variable Overheads

= Rs. 44,800 – Rs. 55,680

= Rs. 10,880 (A)

ii. What is the amount of fixed overhead volume variance for the month of March 2024:

(a) Rs. 9,000 (F)

(b) Rs. 9,000 (A)

(c) Rs. 21,800 (A)

(d) Rs. 11,000 (A)

Ans: (c) Rs. 21,800 (A)

Fixed Overhead Volume = Absorbed Fixed Overheads – Variance Budgeted Fixed Overheads

= Rs. 87,200 – Rs. 1, 09,000

=Rs. 21,800 (A)

iii. What is the amount of fixed overhead expenditure variance for the month of March 2024:

(a) Rs. 21,520 (A)

(b) Rs. 21,500 (A)

(c) Rs. 21,400 (A)

(d) Rs. 21,480 (A)

Ans: (a) Rs. 21,520 (A)

Fixed Overhead Expenditure = Budgeted Fixed Overheads – Variance Actual Fixed Overheads

= Rs. 10.9 × 10,000 units – Rs. 1, 30,520

= Rs. 21,520 (A)

iv. What is the amount of fixed overhead calendar variance for the month of March 2024:

(a) Rs. 5,400 (A)

(b) Rs. 5,450 (A)

(c) Rs. 5,480 (A)

(d) Rs. 5.420 (A)

Ans: (b) Rs. 5,450 (A)

Calendar Variance = Possible Fixed Overheads – Budgeted Fixed Overheads

= Rs. 1, 03,550 – Rs. 1, 09,000

= Rs. 5,450 (A)

v. What is the amount of fixed overhead cost variance for the month of March 2024:

(a) Rs. 43,320 (A)

(b) Rs. 43,300 (A)

(c) Rs. 43,200 (A)

(d) Rs. 43,380 (A)

Ans: (a) Rs. 43,320 (A)

Fixed Overhead Cost Variance = Absorbed Fixed Overheads – Actual Fixed Overheads

= Rs. 87,200 – Rs. 1, 30,520

= Rs. 43,320 (A)

WORKING NOTE:-

Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}}$ = 12,00,000÷1,20,000	Rs. 10.00
Fixed Overheads element in Semi-Variable Overheads i.e. 60% of Rs. 1,80,000	Rs. 1,08,000
Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}}$ = Rs. 1,08,000/120,000	Rs. 0.90

Standard Rate of Absorption of Fixed Overheads per unit (Rs. 10.00 + Rs. 0.90)	Rs. 10.90
Fixed Overheads Absorbed on 8,000 units @ Rs.10.90	Rs. 87,200
Budgeted Variable Overheads	Rs. 6,00,000
Add: Variable element in Semi-Variable Overheads 40% of Rs. 1,80,000	Rs. 72,000
Total Budgeted Variable Overheads	Rs. 6,72,000
Standard Variable Cost per unit = $\frac{\text{Budgeted Variable Overheads}}{\text{Budgeted Output}}$	Rs.5.60
Standard Variable Overheads for 8,000 units @ Rs.5.60	Rs. 44,800
Budgeted Annual Fixed Overheads (Rs. 12,00,000 + 60% of Rs. 1,80,000)	Rs. 13,08,000
Possible Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Days}}$ × Actual Days = 1,09,000/20 days ×19 days	Rs. 1,03,550
Actual Fixed Overheads (Rs. 1,19,000 + 60% of Rs. 19,200)	Rs. 1,30,520
Actual Variable Overheads (Rs. 48,000 + 40% of Rs. 19,200)	Rs. 55,680

Descriptive Question

Question 27

LM Limited produces a product 'SX4' which is sold in a 10 Kg. packet. The standard cost card per packet of 'SX4' is as follows:

	(Rs.)
Direct materials 10 kg @ Rs. 90 per kg	900
Direct labour 8 hours @ Rs. 80 per hour	640
Variable Overhead 8 hours @ Rs. 20 per hour	160
Fixed Overhead	250
	1,950

Budgeted output for a quarter of a year was 10,000 Kg. Actual output is 9,000 Kg. Actual costs for this quarter are as follows:

	(Rs.)
Direct Materials 8,900 Kg @ Rs. 92 per Kg.	8,18,800
Direct Labour 7,000 hours @ Rs. 84 per hour	5,88,000
Variable Overhead incurred	1,40,000
Fixed Overhead incurred	2,60,000

You are required to CALCULATE:

(i) Material Usage Variance

(ii) Material Price Variance

(iii) Material Cost Variance

(iv) Labour Efficiency Variance

(v) Labour Rate Variance

(vi) Labour Cost Variance

(vii) Variable Overhead Cost Variance

(viii) Fixed Overhead Cost Variance

(RTP May '21) (Same concept but different figures RTP Nov'20)

Answer 27

(i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)

= Rs. 90 (9,000 kg. – 8,900 kg.)

= Rs. 9,000 (Favorable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

= 8,900 kg. (Rs. 90 – Rs. 92) = Rs. 17,800 (Adverse)

(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost

= (SQ × SP) – (AQ × AP)

= (9,000 kg. × Rs. 90) – (8,900 kg. × Rs. 92)

= Rs. 8,10,000 – Rs. 8,18,800

= Rs. 8,800 (Adverse)

(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)

= Rs. 80 (9,000/10 × 8 hours)

= Rs. 80 (7,200 hrs. – 7,000 hrs.)

= Rs. 16,000 (Favorable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= 7,000 hrs. (Rs. 80 – Rs. 84)

= Rs. 28,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost

= (SH × SR) – (AH × AR)

= (7,200 hrs. × Rs. 80) – (7,000 hrs. × Rs. 84)

= Rs. 5,76,000 – Rs. 5,88,000

= Rs. 12,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost

= (7,200 hrs. × Rs. 20) – Rs. 1,40,000

= Rs. 4,000 (Adverse)

(viii) Fixed Overhead Cost Variance= Absorbed Fixed Overhead – Actual Fixed Overhead

$\frac{\text{Rs.250}}{\text{10 kgs.}}$ × 9000kgs. - Rs. 2,60,000

= Rs. 2,25,000 – Rs. 2,60,000 = Rs. 35,000 (Adverse)

Question 28

For making 10 kg. of CEMCO, the standard material requirements is:

Material	Quantity	Rate per kg. (Rs.)

A	**8 kg**	**6.00**
B	**4 kg**	**4.00**

During April, 1,000 kg of CEMCO were produced. The actual consumption of materials is as under:

Material	Quantity (Kg.)	Rate per kg. (Rs.)
A	**750**	**7.00**
B	**500**	**5.00**

CALCULATE (A) Material Cost Variance; (b) Material Price Variance; (c) Material usage Variance.

(Study Material)

Answer 28

1. Basic Calculations

	Standard for 1,000 kg.			Actual for 1,000 kg.		
	Qty.	**Rate**	**Amount**	**Qty.**	**Rate**	**Amount**
	Kg.	**(Rs.)**	**(Rs.)**	**Kg.**	**(Rs.)**	**(Rs.)**
A	800*	6	4,800	750	7	5,250
B	400*	4	1,600	500	5	2,500

Total	1,200		6,400	1,250		7,750

(* A- 8÷10 ×1000 = 800 B- 4÷10 × 1000 = 400)

Calculation of Variances:

(a) Material Cost Variance = Std. cost for actual output – Actual cost

MCV = 6,400 – 7,750 = Rs.1, 350 (A)

(b) Material Price Variance = (SP – AP) × AQ

A = (6 – 7) × 750 = Rs. 750 (A)

B = (4 – 5) × 500 = Rs. 500 (A)

MPV = Rs.1,250 (A)

(c) Material Usages Variance = (SQ – AQ) × SP

A = (800 – 750) × 6 = Rs. 300 (F)

B = (400 – 500) × 4 = Rs. 400 (A)

MUV = Rs. 100 (A)

Check

MCV = MPV + MUV

1,350 (A) = 1,250 (A) + 100 (A)

Question 29

The standard mix to produce one unit of a product is as follows:

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Material X	**60 units @ Rs. 15 per unit**	**900**
Material Y	**80 units @ Rs. 20 per unit**	**1,600**
Material Z	**100 units @ Rs. 25 per unit**	**2,500**
	240 units	**5,000**

During the month of April, 10 units were actually produced and consumption was as follows:

Material X	**640 units @ Rs. 17.50 per unit**	**11,200**
Material Y	**950 units @ Rs. 18.00 per unit**	**17,100**
Material Z	**870 units @ Rs. 27.50 per unit**	**23,925**

Calculate all material variances.

(Study Material)

Answer 29

Material	**Standard for 10 units**			**Actual for 10 units**		
	Qty. Units	**Rate (Rs.)**	**Amount (Rs.)**	**Qty. units**	**Rate (Rs.)**	**Amount (Rs.)**
X	600	15	9,000	640	17.50	11,200
Y	800	20	16,000	950	18.00	17,100

Z	1,000	25	25,000	870	27.50	23,925
Total	2,400		50,000	2,460		52,225

1. Material Cost Variance = Standard cost – Actual cost

= Rs. 50,000 – Rs. 52,225

MCV = Rs. 2,225 (A)

2. Material Price Variance = (Std. Price – Actual Price) × Actual Qty.

Material X = (15 – 17.50) × 640 = Rs. 1,600 (A)

Material Y = (20 – 18) × 950 = Rs. 1,900 (F)

Material Z = (25 – 27.50) × 870 = Rs. 2,175 (A)

MPV = Rs. 1,875 (A)

3. Material Usage Variance = (Std. Qty. – Actual Qty.) × Std. Price

Material X = (600 – 640) × 15 = Rs. 600 (A)

Material Y = (800 – 950) × 20 = Rs. 3,000 (A)

Material Z = (1,000 – 870) × 25 = Rs. 3,250 (F)

MUV = Rs. 350 (A)

Check MCV = MPV + MUV

Rs. 2,225 (A) = Rs. 1,875 (A) + Rs. 350 (A)

4. Material Mix Variance = (Revised Std. Qty. – Actual Qty.) × Std. Price

Material X = (615* – 640) × 15 = Rs. 375 (A)

Material Y = (820* – 950) × 20 = Rs.2, 600 (A)

Material Z = (1,025 – 870) × 25 = Rs.3, 875 (F)

MMV = Rs. 900 (F)

***Revised Standard Quantity (RSQ) is calculated as follows:**

Material X = $\frac{2460}{2400}$ × 600 = 615 units

Material Y = $\frac{2460}{2400}$ × 800 = 820 units

Material Z = $\frac{2460}{2400}$ × 1000 = 1,025 units

5. Material Yield Variance = (Std. Qty. - Revised Std. Qty.) × Std. Price

Material X = (600 - 615) × 15 = Rs.225 (A)

Material Y = (800 - 820) × 20 = Rs.400 (A)

Material Z = (1,000 - 1,025) × 25 = Rs.625 (A)

MYV = Rs.1, 250 (A)

Check

MUV = MMV + MYV (Or MRUV)

Rs.350 (A) = Rs.900 (F) + Rs.1, 250 (A)

Or

MCV = MPV + MMV + MYV (Or MRUV)

Rs. 2,225 (A) = Rs. 1,875 (A) + Rs.900 (F) + Rs. 1,250 (A)

Question 30

BBC Ltd. manufactures Ordinary Portland Cement (OPC). The standard data for the raw materials that are used to manufacture OPC are as follows:

Material	Composition (%)	Rate per Metric Ton (Rs.)
Limestone	65	565
Silica	20	4,800
Alumina	5	32,100
Iron ore	5	1,800
Others	5	2,400

During the month of February 20X8, A Ltd. produced 500 MT OPC. Actual data related with the consumption and costs are as follows:

Raw Material	Quantity (MT)	Total Cost (Rs.)
Limestone	340	1,90,400
Silica	105	5,09,250
Alumina	25	8,12,500
Iron ore	30	53,400
Others	23	51,750

You are required to COMPUTE the following variances related with the production of OPC for the month of February 20X8:

(i) Material Price Variance

(ii) Material Mix Variance

(iii) Material Yield Variance

(iv) Material Cost Variance.

(MTP Apr 19)

Answer 30

(i) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

Limestone	= 340 $\left(\text{Rs. } 565 - \frac{Rs.1,90,400}{340}\right)$	
	= 340 (Rs. 565 - Rs. 560)	= 1,700 (F)
Silica	= 105 $\left(\text{Rs. } 4,800 - \frac{Rs.5,09,250}{105}\right)$	
	= 105 (Rs. 4,800 - Rs. 4,850)	= 5,250 (A)
Alumina	= 25 $\left(\text{Rs. } 32,100 - \frac{Rs.8,12,500}{25}\right)$	
	= 25 (Rs. 32,100 - Rs. 32,500)	= 10,000 (A)
Iron ore	= 30 $\left(\text{Rs. } 1,800 - \frac{\text{Rs.}53,400}{30}\right)$	
	= 30 (Rs. 1,800 - Rs. 1,780)	= 600 (F)
Others	= 23 $\left(\text{Rs. } 2,400 - \frac{\text{Rs.}51,750}{23}\right)$	
	= 23 (Rs. 2,400 - Rs. 2,250)	= 3,450 (F)

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		9,500 (A)

(ii) Material Mix Variance = Std. Price (Revised Std. Quantity – Actual Quantity)

Limestone	Rs. 565 (523 × 65% - 340)	
	Rs. 565 (339.95 - 340)	= 28.25 (A)
Silica	Rs. 4,800 (523 × 20% - 105)	
	Rs. 4,800 (104.6 - 105)	= 1,920 (A)
Alumina	Rs. 32,100 (523 × 5% - 25)	
	Rs. 32,100 (26.15 - 25)	= 36,915 (F)
Iron ore	Rs. 1,800 (523 × 5% - 30)	
	Rs. 1,800 (26.15 - 30)	= 6,930 (A)
Others	Rs. 2,400 (523 × 5% - 23)	
	Rs. 2,400 (26.15 - 23)	= 7,560 (F)
		35,596.75 (F)

(iii) Material Yield Variance = Std. Price (Standard Quantity – Revised Std. Quantity)

Limestone	Rs. 565 (500 × 65% - 523 × 65%)	
	Rs. 565 (325 - 339.95)	= 8,446.75 (A)

Silica	Rs. 4,800 (500 × 20% - 523 × 20%)	
	Rs. 4,800 (100 - 104.6)	= 22,080 (A)
Alumina	Rs. 32,100 (500 × 5% - 523 × 5%)	
	Rs. 32,100 (25 - 26.15)	= 36,915 (A)
Iron ore	Rs. 1,800 (500 × 5% - 523 × 5%)	
	Rs. 1,800 (25 - 26.15)	= 2,070 (A)
Others	Rs. 2,400 (500 × 5% - 523 × 5%)	
	Rs. 2,400 (25 - 26.15)	= 2,760 (A)
		72,271.75 (A)

(iv) Material Cost Variance = (Std. Quantity × Std. Price) – (Actual Quantity × Actual Price)

Limestone	Rs. 565 × (500 × 65%) - Rs. 1,90,400	
	Rs. 1,83,625 - Rs. 1,90,400	= 6,775 (A)
Silica	Rs. 4,800 × (500 × 20%) - Rs. 5,09,250	
	Rs. 4,80,000 – Rs. 5,09,250	= 29,250 (A)
Alumina	Rs. 32,100 (500 × 5%) – Rs.8,12,500	
	Rs. 8,02,500 – Rs. 8,12,500	= 10,000 (A)
Iron ore	Rs. 1,800 (500 × 5%) – Rs. 53,400	

	Rs. 45,000 – Rs. 53,400	= 8,400 (A)
Others	Rs. 2,400 (500 × 5%) – Rs. 51,750	
	Rs. 60,000 – Rs. 51,750	= 8,250 (F)
		46,175 (A)

Question 31

Following are the details given:

Budgeted Days	**25**
Budgeted Fixed Overheads	**1,00,000**
Budgeted Production	**800 units per day**
Actual Production	**21,000 units**
Fixed Overheads are absorbed @ Rs. 10 per hour.	
Fixed overheads efficiency variance	**10,000A**
Fixed overheads calendar variance	**8,000F**
Fixed overheads cost variance	**15,000A**

You are required to CALCULATE:

(a) Actual Fixed Overheads

(b) Actual Days

(c) Actual Hours

(d) Fixed overheads Expenditure variance

(e) Fixed overheads volume variance

(f) Fixed overheads capacity variance

(MTP March '22)

Answer 31

(i) Fixed Overhead Cost Variance = (Std Fixed Overheads – Actual Fixed Overheads)

= (1, 00,000 / 20,000 X 21,000 units – Actual Fixed Overheads) = 15,000A

= (1, 05,000 - Actual Fixed Overheads) = 15,000A

=> Actual Fixed Overheads = 1, 20,000

(ii) Fixed Overhead Calendar Variance = (Actual Days – Budgeted Days) x Budgeted rate per day = (Actual Days – 25) × $\frac{1,00,000}{25}$ = 8,000 F

= (Actual Days -25) =2

=> Actual Days = 27

(iii) Fixed Overhead Efficiency Variance = (Standard Hours for Actual Production – Actual Hours) x Budgeted rate per hour

$\left(\frac{10,000}{20,000} \times 21,000 - \text{Actual Hours}\right)$

= (10,500 – Actual Hours) = -1,000

=> Actual Hours = 11,500

(iv) Fixed overheads Expenditure variance = (Budgeted Fixed Overheads – Actual Fixed Overheads)

= (1, 00,000 – 1, 20,000) = 20,000A

(v) Fixed overheads volume variance = (Budgeted units – Actual Units) x Budgeted Rate per unit

= (20,000 – 21,000) × $\frac{1,00,000}{20,000}$ = 5,000F

(vi) Fixed overheads capacity variance = (Budgeted Hours for Actual Days – Actual Hours) x Budgeted Rate per Hour

= $\left(\frac{10,000}{25} \times 27 - 11,500\right)$ × 10 = 7,000F

Question 32

The standard cost of a chemical mixture is as follows: 60% of Material A @ Rs. 50 per kg 40% Material B @ Rs. 60 per kg.

A standard loss of 25% on output is expected in production. The cost records for a period has shown the following usage.

540 kg of Material A @ Rs. 60 per kg 260 kg of Material B @ Rs. 50 per kg

The quantity processed was 680 kilograms of good product. From the above given information

Calculate:

(i) Material Cost Variance (ii) Material Price Variance

(iii) Material Usage Variance (iv) Material Mix Variance

(v) Material Yield Variance

(PYP Nov'19) (Same concept different figures Old & New SM)

Answer 32

Basic Calculation

Material	Standard for 640 kg. output			Actual for 680 kg. output		
	Qty.	Rate	Amount	Qty.	Rate	Amount
	Kg.	(Rs.)	(Rs.)	Kg.	(Rs.)	(Rs.)
A	480	50	24,000	540	60	32,400
B	320	60	19,200	260	50	13,000
Total	800	43,200	800	45,400		
Less: Loss	160	-	-	120	-	-
	640		43,200	680		45,400

Std. cost of actual output = Rs. 43,200 × 680/640 = Rs. 45,900 Calculation of Variances

(i) Material Cost Variance = (Std. cost of actual output – Actual cost)

= (45,900– 45,400)

= Rs. 500 (F)

(ii) Material Price Variance = (SP – AP) × AQ

Material A = (50 – 60) × 540 = Rs. 5400 (A)

Material B = (60 – 50)) × 260 =

Rs. 2600 (F) MPV =

Rs. 2800 (A)

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(iii) Material Usage Variance (MUV) = (Std. Quantity for actual output – Actual Quantity) × Std. Price

Material A = $\left(\frac{480\times680}{640} - 540\right)$ × 50 = Rs.1, 500(A)

Material B = $\left(\frac{320\times680}{640} - 540\right)$ × 60 = Rs.4, 800(F)

MUV = Rs. 3,300 (F)

(iv) Material Mix Variance = SP × (RAQ – AQ)

A = Rs. 50× (480 Kg – 540 Kg) = Rs. 3,000 (A)

B = Rs. 60 × (320 Kg. – 260 Kg.) = Rs. 3,600 (F)

Total = Rs. 3,000 (A) + Rs.3, 600 (F) = Rs. 600 (F)

(v) Material Yield Variance = SP × (SQ – RAQ)

A = Rs. 50 × (510 Kg. – 480 Kg) = Rs. 1,500 (F)

B = Rs. 60 × (340 Kg. – 320 Kg.) = Rs. 1,200 (F)

Total = Rs. 1,500 (F) + Rs. 1,200 (F) = Rs. 2,700 (F)

Important Note:-

This was a numerical question relating to the topic 'Standard Costing'. The question required calculation of material variances. Performance of the examinees was average.

Topic 5 Labour Variances

Multiple Choice Questions (MCQs)

Question 33

If standard hours for 100 units of output are 400 @ Rs. 2 per hour and actual hours take are 380 @ Rs. 2.25 per, then the labour rate variance is:

(a) Rs. 95 (adverse)

(b) Rs. 100 (adverse)

(c) Rs. 25 (favourable)

(d) Rs. 120 (adverse)

(Study Material)

Ans: (a) Rs. 95 (adverse)

Reason

The labour rate variance is calculated using the formula:

Labour Rate Variance = (Actual Rate−Standard Rate) × Actual Hours

Given:

Standard Rate = Rs. 2 per hour

Actual Rate = Rs. 2.25 per hour

Actual Hours = 380 hours

Now, calculating the labour rate variance:

Labour Rate Variance = (2.25−2)×380=0.25×380=95

Since the actual rate is higher than the standard rate, this variance is adverse (indicating that the company paid more per hour than expected).

Therefore, the correct answer is (a) Rs. 95 (adverse).

Question 34

Controllable variances are best disposed-off by transferring to:

(a) Cost of goods sold

(b) Cost of goods sold and inventories

(c) Inventories of work–in–progress and finished goods

(d) Costing profit and loss account

(Study Material)

Ans: (d) Costing profit and loss account

Reason

Controllable variances are those variances that can be directly influenced or controlled by the manager or the department responsible for the production process. These variances reflect the efficiency or inefficiency in controlling costs, such as labor, materials, and overheads.

Controllable variances are best disposed of by transferring them to the costing profit and loss account. This is because they represent the impact of decisions made within the period, and their resolution affects the overall profitability of the organization. By transferring them to the profit and loss account, the company reflects the actual performance against the expected or standard costs for the period.

In contrast:

Option (a) and (b) relate to accounting for costs that are part of the cost of goods sold or inventories, which is not the best way to address variances.

Option (c) is incorrect because variances are typically recognized in the profit and loss account, not directly in inventories of work-in-progress or finished goods.

Thus, the correct answer is (d) Costing profit and loss account.

Descriptive Question

Question 35

Baby Moon Ltd. uses standard costing system in manufacturing one of its product 'Baby Cap'. The details are as follows:

Direct Material 1 Meter @ Rs. 60 per meter	**Rs. 60**
Direct Labour 2 hour @ Rs. 20 per hour	**Rs. 40**
Variable overhead 2 hour @ Rs. 10 per hour	**Rs. 20**
Total	**Rs. 120**

During the month of August, 10,000 units of 'Baby Cap' were manufactured. Details are as follows:

Direct material consumed		**11,400 meters @**			**Rs. 58 per meter**
Direct labour Hours	**?**	**@**	**?**		**Rs. 4,48,800**
Variable overhead incurred					**Rs. 2,24,400**

Variable overhead efficiency variance is Rs. 4,000 A. Variable overheads are based on Direct Labour Hours.

You are required to CALCULATE the following Variances:

(a) Material Variances- Material Cost Variance, Material Price Variance and Material Usage Variance.

(b) Variable Overheads variances- Variable overhead Cost Variance, Variable overhead Efficiency Variance and Variable overhead Expenditure Variance.

(c) Labour variances- Labour Cost Variance, Labour Rate Variance and Labour Efficiency Variance.

(RTP Nov '21) (Same concept different figures MTP Aug'18, Old & New SM)

Answer 35

(i) Material Variances

Budget			Std. for actual			Actual		
Quantity (Meter)	**Price (Rs.)**	**Amount (Rs.)**	**Quantity (Meter)**	**Price (Rs.)**	**Amount (Rs.)**	**Quantity (Meter)**	**Price (Rs.)**	**Amount (Rs.)**
1	60	60	10,000	60	6,00,000	11,400	58	6,61,200

Material Cost Variance = (SQ × SP – AQ × AP)

= 6, 00,000 – 6, 61,200 = Rs. 61,200 (A)

Material Price Variance = (SP – AP) AQ

= (60 - 58) 11,400 = Rs. 22,800 (F)

Material Usage Variance = (SQ – AQ) SP

= (10,000 – 11,400) 60 = Rs. 84,000 (A)

(ii) Variable Overheads Variances Variable overhead cost Variance

= Standard variable overhead – Actual Variable Overhead

= (10,000 units × 2 hours × Rs. 10) – 2, 24,400 = Rs. 24,400 (A)

Variable overhead Efficiency Variance

= (Standard Hours – Actual Hours) × Standard Rate per Hour

Let Actual Hours be 'X', then:

(20,000 – X) × 10 = 4,000 (A)

2, 00,000 – 10X = - 4,000

X = 2, 04,000 ÷ 10

Therefore, Actual Hours (X) = 20,400

Variable overhead Expenditure Variance = Variable Overhead at Actual Hours - Actual Variable Overheads

= 20,400 × Rs. 10 – 2, 24,400 = Rs. 20,400 (A)

(iii) Labour variances

Budget			**Std. for actual**			**Actual**		
Hours	**Rate (Rs.)**	**Amount (Rs.)**	**Hours**	**Rate (Rs.)**	**Amount (Rs.)**	**Hours**	**Rate (Rs.)**	**Amount (Rs.)**
2	20	40	20,000	20	4,00,000	20,400	22*	4,48,800

***Actual Rate =** Rs. 4, 48,800 ÷ 20,400 hours = Rs. 22

Labour Cost Variance = (SH × SR) – (AH × AR)

= 4, 00,000 – 4, 48,800 = Rs. 48,800 (A)

Labour Rate Variance = (SR – AR) × AH

= (20 – 22) × 20,400 = Rs. 40,800 (A)

Labour Efficiency Variance = (SH – AH) × SR

= (20,000 – 20,400) × 20 = Rs. 8,000 (A)

Question 36

Ahaan Limited operates a system of standard costing in respect of one of its products 'AH1' which is manufactured within a single cost centre. Details of standard per unit are as follows:

- **The standard material input is 20 kilograms at a standard price of Rs. 24 per kilogram.**
- **The standard wage rate is Rs. 72 per hour and 5 hours are allowed to produce one unit.**
- **Fixed production overhead is absorbed at the rate of 100% of wages cost.**

During the month of April 2022, the following was incurred:

- **Actual price paid for material purchased @ Rs. 22 per kilogram.**
- **Total direct wages cost was Rs. 43,92,000**

Fixed production overhead cost incurred was Rs. 45, 00,000 Analysis of variances was as follows:

Variances	Favourable	Adverse
Direct material price	Rs. 4,80,000	-
Direct material usage	Rs. 48,000	
Direct labour rate	-	Rs. 69,120
Direct labour efficiency	Rs. 33,120	-
Fixed production overhead expenditure		Rs. 1,80,000

You are required to CALCULATE the following for the month of April, 2022

(i) Material cost variance

(ii) Budgeted output (in units)

(iii) Quantity of raw materials purchased (in kilograms)

(iv) Actual output (in units)

(v) Actual hours worked

(vi) Actual wage rate per labour hour

(vii) Labour cost variance

(viii) Production overhead cost variance

(RTP Nov'22)

Answer 36

i. Direct Material Cost Variance = Direct Material Price Variance + Direct Material Usage Variance

= Rs. 4, 80,000 F + Rs. 48,000 F = Rs. 5, 28,000 F

ii. Budgeted Output (units) Fixed Production Overhead Expenditure Variance

= Budgeted Fixed Overhead - Actual Fixed Overheads

= Budgeted Output x Standard Overhead Rate - Actual Fixed Overheads

Rs. 1, 80,000 A = Budgeted Output x Rs. 360 (5 hrs @Rs. 72) - Rs. 45, 00,000

Budgeted Output = $\frac{\text{Rs.45,00,000}-\text{Rs.1,80,000}}{\text{Rs.360}}$ = 12,000 units

iii. Quantity of Materials purchased (in kilograms) Material Price Variance = Actual Usage (Standard Price per kg - Actual price per kg)

Rs. 4, 80,000 F = Actual Usage (Rs. 24 -Rs. 22)

Actual usage in kgs. = $\frac{\text{Rs.}4,80,000-\text{Rs.}1,80,000}{2}$ = 2, 40,000 kgs.

Actual Output (units)

Actual Direct Wages	Rs. 43,92,000
Direct labour rate variance	Rs. 69,120 A
Direct labour efficiency variance	Rs. 33,120 F
Standard labour cost for actual output	Rs. 43,56,000

Actual Output= $\frac{\text{Standard labour cost for actual output}}{\text{Standard wage rate per unit}}$

= $\frac{\text{Rs.}43,56,000}{\text{Rs.}360\ (72\times5)}$ = 12,100 units

Alternatively, let X be the actual quantity of output

Then, Standard Quantity of input for actual output 'X'

20X = SQ

Material cost variance = (SQ x SP) - (AQ x AP)

Rs. 5, 28,000 = (20 X × Rs. 24) - (2, 40,000 kgs x Rs. 22)

480X = Rs. 52, 80,000 + Rs. 5, 28,000

480X = Rs. 58, 08,000

X = $\frac{Rs.58,08,000}{480}$ = 12,100 units

iv. Actual hours worked Labour Efficiency Variance = Standard Labour Rate (Standard time for actual output - Actual time)

Rs. 33,120 F = Rs. 72 (5 hours x 12100 units - Actual time)

460 hours = 60,500 hours - Actual time

Actual time = 60,500 - 460 = 60,040 hours

v. Actual wage rate per hour

Actual Wages paid = Rs. 43, 92,000

Actual hours worked = 60,040 hours

Actual Wage rate per hour = $\frac{Rs.43,92,000}{60,040\ hours}$ = Rs. 73.15 per hour

vi. Production Overhead Cost Variance

= Actual Output x Standard overhead rate - Actual Overheads Incurred

= 12,100 units x Rs.360 - Rs. 45, 00,000

= Rs. 43, 56,000 - Rs. 45, 00,000

= Rs. 1, 44,000 A

Question 37

Discuss the process of setting standards.

(Study Material)

Answer 37

Standard cost is set on the basis of management's estimation. Cost is estimated on the basis of technical specification provided by the engineering department or other expert such as production engineer. Generally, while setting standards, consideration is given to historical data, current production plan and expected conditions of future. For the sake of detailed analysis and control, standard cost is set for each element of cost i.e. material, labour, variable overheads and fixed overheads. Standard are also set for the sales quantity and sales value; this is generally known as budgeted sales.

Standards are set in both quantity (units or hours) and in cost (price or rate). It is thus measure in quantities, hours and value of the factors of production.

Standard costs are divided into three main cost components, such as

(a) Direct Material Cost

(b) Direct Employee (Labour) Cost and

(c) Overheads

Standards are set in both physical and monetary terms for each cost components.

Topic 6 Overhead Variances

Question 38

Following data is extracted from the books of XYZ Ltd. for the month of January:

(i) Estimation-

Particulars	Quantity (kg.)	Price (Rs.)	Amount (Rs.)
Material-A	800	?	--
Material-B	600	30.00	18,000
			--

Normal loss was expected to be 10% of total input materials.

(ii) Actuals-

1480 kg of output produced.

Particulars	Quantity (kg.)	Price (Rs.)	Amount (Rs.)
Material-A	**900**	**?**	**--**
Material-B	**?**	**32.50**	**--**
			59,825

(iii) Other Information-

Material Cost Variance = Rs. 3,625 (F)

Material Price Variance = Rs. 175 (F)

You are required to CALCULATE:

(i) Standard Price of Material-A;

(ii) Actual Quantity of Material-B;

(iii) Actual Price of Material-A;

(iv) Revised standard quantity of Material-A and Material-B; and

(v) Material Mix Variance.

(Study Material)

Answer 38

(i) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}

Rs.3, 625 = (SQ × SP) – Rs.59, 825

(SQ × SP) = Rs.63, 450

$(SQ_A \times SP_A) + (SQ_B \times SP_B)$ = Rs.63, 450

(940 kg × SPA) + (705 kg ×Rs.30) = Rs.63, 450

(940 kg × SPA) + Rs.21, 150 = Rs.63, 450

(940 kg × SPA) = Rs.42, 300

$SP_A = \frac{Rs.42,300}{940\ kg}$

Standard Price of Material-A = Rs.45

Working Note:

SQ i.e. quantity of inputs to be used to produce actual output

$= \frac{1480\ kg}{90\%}$ = 1,645 kg

$SQ_A = \frac{800\ kg}{(800+600)} \times 1645\ kg = 940\ kg$

$SQ_B = \frac{600\ kg}{(800+600)} \times 1645\ kg = 705\ kg$

(ii) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)}

Rs.175 = (AQ × SP) – Rs.59, 825

(AQ × SP) = Rs.60, 000

$(AQ_A \times SP_A) + (AQ_B \times SP_B)$ = Rs.60, 000

[900 kg × Rs.45 (from (i) above)] + $(AQ_B \times$ Rs.30) = Rs.60, 000

Rs.40, 500 + $(AQ_B \times$ Rs.30) = Rs.60, 000

$(AQ_B \times$ Rs.30) = Rs.19, 500

$AQ_B = \frac{19,500}{30}$ =650 kg.

(iii) (AQ × AP) = Rs.59, 825

$(AQ_A \times AP_A) + (AQ_B \times AP_B)$ = Rs.59, 825

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(900 kg ×AP_A) + (650 kg (from (ii) above) × Rs.32.5) = Rs.59, 825

(900 kg ×AP_A) + Rs.21, 125 = Rs.59, 825

(900 kg ×AP_A) = Rs.38, 700

$AP_A = \frac{38,700}{900}$ 43

Actual Price of Material-A = Rs.43

(iv) Total Actual Quantity of Material-A and Material-B

= AQ_A + AQ_B = 900 kg + 650 kg (from (ii) above)

= 1,550 kg

Now, RevisedSQ_A = $\frac{800\text{ kg}}{(800+600)}$ × 1550 kg = 886 kg

RevisedSQ_B = $\frac{600\text{ kg}}{(800+600)}$ × 1550 kg = 664 kg

(v) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}

= {(RSQ_A × SP_A) + (RSQ_B × SP_B) – 60,000}

= (886 kg (from (iv) above) × Rs.45 (from

(i) above)) + (664 kg (from (iv) above) × Rs.30) - Rs.60, 000

= (39,870+19,920)–60,000= Rs.210 (A)

Question 39

Paras Synthetics uses Standard costing system in manufacturing of its product 'Star 95 Mask'. The details are as follows;

Direct Material 0.50 Meter @ Rs.60 per meter Rs.30

Direct Labour 1 hour @ Rs.20 per hour Rs.20

Variable overhead 1 hour @ Rs.10 per hour Rs.10

Total Rs.60

During the month of August, 10,000 units of 'Star 95 Mask' were manufactured.

Details are as follows:

Direct material consumed 5700 meters @ Rs.58 per meter

Direct labour Hours? @ ? Rs.2, 24,400

Variable overhead incurred Rs.1, 12,200

Variable overhead efficiency variance is Rs.2, 000 A. Variable overheads are based on Direct Labour Hours.

You are required to calculate the missing data and all the relevant Variances.

(Study Material)

Answer 39

(i) Material Variances

	Budget			**Std. for actual**			**Actual**		
	Quantity	**Price (Rs.)**	**Amount (Rs.)**	**Quantity**	**Price (Rs.)**	**Amount (Rs.)**	**Quantity**	**Price (Rs.)**	**Amount (Rs.)**
Material	0.5	60	30	5,000	60	3,00,000	5,700	58	3,30,600

Material Cost Variance = (SQ×SP – AQ ×AP)

3, 00,000 – 3, 30,600 = Rs.30, 600(A)

Material Price Variance = (SP – AP) AQ

(60 -58) 5,700 = Rs. 11,400 (F)

Material Usage Variance = (SQ – AQ) SP

(5,000 – 5,700) 60 = Rs.42, 000 (A)

(ii) Variable Overheads variances

Variable overhead cost Variance = (Standard variable overhead – Actual Variable Overhead)

Standard Variable Overheads: 10,000 units × 10 = 1, 00,000

(1, 00,000 – 1, 12,200) = Rs. 12,200(A)

Variable overhead Efficiency Variance = (Standard Hours – Actual Hours) × Standard Rate per Hour

Let Actual Hours be 'X'

(10,000 – X) × 10 = 2,000 (A)

1, 00,000 – 10X = -2,000

X = 1, 02,000 ÷ 10

Therefore, Actual Hours (X) = 10,200

Variable overhead Expenditure Variance = (Variable Overhead at Actual Hours - Actual Variable Overheads)

10,200 × 10 – 1, 12,200 = Rs. 10,200 (A)

(iii) Labour variances

	Budget	**Std. for actual**	**Actual**

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	Hours	Rate (Rs.)	Amount (Rs.)	Hours	Rate (Rs.)	Amount (Rs.)	Hours	Rate (Rs.)	Amount (Rs.)
Labour	1	20	20	10,000	20	2,00,000	10,200	22	2,24,400

Actual Rate = Rs. 2, 24,400÷10,200 hours = Rs.22

Labour Cost Variance = (SH × SR) – (AH × AR)

10,000× 20 – 10,200 × 22 = Rs. 24,400 (A)

Labour Rate Variance = (SR – AR) × AH

(20 – 22) × 10,200 = Rs. 20,400 (A)

Labour Efficiency Variance = (SH – AH) × SR

(10,000 – 10,200) × 20 = Rs. 4,000 (A)

Question 40

Following standards have been set for manufacturing a product 'XYZ':

Direct Material:	**(Rs.)**
4 units of X @ Rs. 8 per unit	**32.00**
6 units of Y @ Rs. 6 per unit	**36.00**
30 units of Z @ Rs. 2 per unit	**60.00**
	128.00

Direct Labour:	
6 hrs @ Rs. 16 per hour	**96.00**
Total standard prime cost	**224.00**

The company actually manufactured and sold 12,000 units of the product 'XYZ' during the year.

Direct material costs were as follows:

50,000 units of X at Rs. 8.80 per unit

72,000 units of Y at Rs. 5.60 per unit

354,000 units of Z at Rs. 2.40 per unit

The company worked 70,000 direct labour hours during the year. For 10,000 of these hours, the company paid at Rs. 24 per hour while for the remaining, the wages were paid at standard rate.

You are required to CALCULATE the following:

(i) Material Price Variance

(ii) Material Usage Variance

(iii) Labour Rate Variance

(iv) Labour Efficiency Variance

(MTP Jan 2025)

Answer 40

For Material Cost Variances:

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	SQ × SP	AQ × AP	AQ × SP
X	12,000 x 4 x Rs. 8 = Rs. 3,84,000	50,000 x Rs. 8.80 = Rs. 4,40,000	50,000 x Rs. 8 = Rs. 4,00,000
Y	12,000 x 6 x Rs. 6 = Rs. 4,32,000	72,000 x Rs. 5.60 = Rs. 4,03,200	72,000 x Rs. 6 = Rs. 4,32,000
Z	12,000 x 30 x Rs. 2 = Rs. 7,20,000	3,54,000 x Rs. 2.40 = Rs. 8,49,600	3,54,000 x Rs. 2 = Rs. 7,08,000
Total	Rs. 15,36,000	Rs. 16,92,800	Rs. 15,40,000

Material Price Variance = Actual quantity (Std. price – Actual price)

= (AQ x SP) – (AQ x AP)

= Rs. 15, 40,000 – Rs. 16, 92,800 = Rs. 1, 52,800 (A)

Material Usage Variance = Standard Price (Std. Quantity – Actual Quantity)

= (SP x SQ) – (SP x AQ)

= Rs. 15, 36,000 – Rs. 15, 40,000 = Rs. 4,000 (A)

For Labour Cost Variance:

	SH × SR	AH × AR	AH × SR
Labour	(12,000 x 6) x Rs. 16 = Rs. 11,52,000	10,000 x Rs. 24 = Rs. 2,40,000 60,000 x Rs. 16 = Rs. 9,60,000	70,000 x Rs. 16 = Rs. 11,20,000

Total	Rs. 11,52,000	Rs. 12,00,000	Rs. 11,20,000

Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= (AH x SR) – (AH x AR)

= Rs. 11, 20,000 – Rs. 12, 00,000 = Rs. 80,000 (A)

Labour Efficiency Variance = Standard Rate (Std. Hours – Actual Hours)

= (SR x SH) – (SR x AH)

= Rs. 11, 52,000 – Rs. 11, 20,000 = Rs. 32,000 (F)

Question 41

"Calculation of variances in standard costing is not an end in itself, but a means to an end." DISCUSS.

(MTP Jan 2025)

Answer 41

The crux of standard costing lies in variance analysis. Standard costing is the technique whereby standard costs are predetermined and subsequently compared with the recorded actual costs. It is a technique of cost ascertainment and cost control. It establishes predetermined estimates of the cost of products and services based on management's standards of efficient operation. It thus lays emphasis on "what the cost should be". These should be costs are when compared with the actual costs. The difference between standard cost and actual cost of actual output is defined as the variance.

The variance in other words in the difference between the actual performance and the standard performance. The calculations of variances are simple. A variance may be favourable or unfavourable. If the actual cost is less than the standard cost, the variance is favourable but if the actual cost is more than the standard cost, the variance will be unfavourable. They

are easily expressible and do not provide detailed analysis to enable management of exercise control over them. It is not enough to know the figures of these variances from month to month. We in fact are required to trace their origin and causes of occurrence for taking necessary remedial steps to reduce / eliminate them.

A detailed probe into the variance particularly the controllable variances helps the management to ascertain:

(i) The amount of variance

(ii) The factors or causes of their occurrence

(iii) The responsibility to be laid on executives and departments and

(iv) Corrective actions which should be taken to obviate or reduce the variances.

Mere calculation and analysis of variances is of no use. The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. In fact variance gives information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end. In other words, the calculation of variances in standard costing is not an end in itself, but a means to an end.

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Question 42

Discuss the various types of fixed overhead variances.

(Study Material)

Answer 42

Fixed Overhead Cost Variance

The recovery of the fixed components of the estimated overheads depends upon capacity utilization. In case a company produces less than the projected utilization it shall not be able

to recover all the budgeted fixed overheads. This unrecovered portion is known as production volume variance.

The other variance is because of variations in actual spending when compared with both estimated fixed and estimated variable overheads. Such a variance is known as Overhead expenses variance.

The following detailed discussion shall help you have a clear understanding of these two variances.

(1) Production Volume Variance: The term fixed overheads implies that the element of cost does not vary directly in proportion to the output. In other words, fixed overheads do not change within a given range of activity.

However, the unit cost changes even though the fixed overheads are constant in total within the given range of output. So, higher the level of activity, the lower will be the unit cost or vice versa.

The management is, therefore, faced with a costing difficulty because it requires a representative rate for charging fixed overheads irrespective of changes in volume of output.

(2) Overhead Expenses Variance: As discussed above, the Production Volume Variance analyses the unrecovered fixed overheads. Apart from this, there can be variations in the actual spending of both fixed and variable overheads when compared to what was established as a standard. Such variations can be accounted for by analyzing an overhead expenses variance.

The analysis of overhead variances is different from that of material and labour variances. As overhead is the aggregate of indirect materials, indirect labour and indirect expenses, this variance is considered to be a difficult part of variance analysis. It is important to understand that overhead variance is nothing but under or over-absorption of overhead.

Topic 7 Comprehensive Problems (Mixed Variances)

Question 43

ALZO Toys Ltd. is an exciting new player in the toy manufacturing industry, founded with a passion for creating high-quality, engaging, and educational toys. The company aims to make a positive impact on the industry and also on the development of young minds through imaginative play.

The following statement provides a comprehensive analysis of the various cost variances for a particular period, outlining the differences between the expected costs and the actual expenditures incurred.

Cost variances	(Rs.)
Direct material price	25,000F
Direct material usage	3,750A
Direct labour rate	5,000A
Direct labour efficiency	3,750A
Variable overhead expenditure	15,000A
Variable overhead efficiency	1,875A
Fixed overhead expenditure	62,500F

The budget for the same period reflected the following data:

Production volume	7,500 units

Direct materials purchased	**3,750kg**
Direct materials used	**3,750kg**
Direct material cost	**Rs. 1,12,500**
Direct labour hours	**5,625 hours**
Direct labour cost	**Rs. 1,12,500**
Variable overhead cost	**Rs. 56,250**
Fixed overhead cost	**Rs. 1,12,500**

Some other information relating to the same period is provided below:

(i) Stocks of raw materials and finished goods are valued at a predetermined standard cost for easier cost comparison and reporting.

(ii) The actual number of units produced was 7,750.

(iii) The direct materials purchased were 5,000 kg.

From the information given above, you are required to FIGURE OUT the following in actual:

(RTP Sep. 2025)

(i) Quantity of materials used and direct material cost-

(a) 3,875 kg and Rs.1, 50,000

(b) 3,875 kg and Rs.1, 25,000

(c) 4,000 kg and Rs.1, 25,000

(d) 4,000 kg and Rs.1, 50,000

Ans: (c) 4,000 kg and Rs.1, 25,000

Calculation of actual quantity of materials used:

Standard quantity of material used per units of output = $\left(\frac{\text{budgeted usage}}{\text{budgeted production}}\right)$

= $\left(\frac{3,750\text{ kg}}{7,500\text{ units}}\right)$ =0.5 kg

Standard price =$\left(\frac{\text{budgeted material cost}}{\text{budgeted usage}}\right)$

= $\left(\frac{\text{Rs.1,12,500}}{3,750\text{ kg}}\right)$ = Rs.30

Material usage variance = (Std. qty. for actual output - Actual qty.) × Std. price

Rs.3, 750A = [(7,750 x 0.5kg) - AQ] x Rs.30

- Rs.3, 750 = Rs.1, 16,250 - 30AQ

30AQ = Rs.1, 20,000

AQ = 4,000 kg

Actual quantity of materials used = 4,000 kg

Calculation of actual direct material cost:

Material Price Variance = Actual Quantity purchased (AQ) x {Std. Price (SP) – Actual Price (AP)}

Rs.25, 000F = 5,000 kg x (Rs.30 - AP)

Rs.25, 000 = Rs.1, 50,000 - 5,000 AP

5,000 AP = Rs.1, 25,000

AP = Rs.25

Actual direct material cost = 5,000 kg x Rs.25 = Rs.1, 25, 000

(ii) Direct labour hours-

(a) 7,937.50 hours

(b) 6,000 hours

(c) 5,812.50 hours

(d) 5,000 hours

Ans: (b) 6,000 hours

Standard hours per unit of output $=\left(\frac{\text{Budgeted hours}}{\text{Budgeted output}}\right)$

$=\left(\frac{5{,}625 \text{ hours}}{7{,}500 \text{ units}}\right)$ = 0.75 hours

Standard wage rate = $\left(\frac{\text{Budgeted labour cost}}{\text{Budgeted hours}}\right)$

$=\left(\frac{\text{Rs.}1{,}12{,}500}{5{,}625 \text{ hours}}\right)$ = Rs.20

Labour Efficiency Variance = Std. Rate (SR) x {Std. Hours (SH) – Actual Hours (AH)}

Rs.3, 750A = Rs.20 x [(7,750 x 0.75 hours) - AH]

- Rs.3, 750 = Rs.1, 16,250 - 20AH

20AH = Rs.1, 20,000

AH = 6,000

Actual Hours = 6,000

(iii) Direct labour cost-

(a) Rs.1, 16,250

(b) Rs.1, 25,000

(c) Rs.1, 55,000

(d) Rs.1, 63,750

Ans: (b) Rs.1, 25,000

Labour Cost Variance = [Standard Labour Cost – Actual Labour Cost]

Labour Rate Variance + Labour Efficiency Variance = [Standard Labour Cost – Actual Labour Cost]

Rs.5, 000A + Rs.3, 750A = (7,750 x 0.75 hours x Rs.20) - Actual Labour Cost

- Rs.5, 000 - Rs.3, 750 = Rs.1, 16,250 - Actual Cost

Actual Labour Cost = Rs.1, 16,250 + Rs.8, 750

Actual Labour Cost = Rs.1, 25,000

(iv) Variable overhead cost-

(a) Rs.75, 000

(b) Rs.73, 125

(c) Rs.60, 000

(d) Rs.58, 125

Ans: (a) Rs.75, 000

Standard variable overhead per unit = $\left(\frac{\text{Budgeted variable overheads cost}}{\text{Budgeted output}}\right)$

= $\left(\frac{\text{Rs.56,250}}{\text{7,500 units}}\right)$ = Rs.7.50

Total Variable Overhead Variance = [Standard Variable Overhead – Actual Variable Overhead]

Variable Overhead Expenditure Variance + Variable Overhead Efficiency Variance = [Standard Variable Overhead – Actual Variable Overhead]

Rs.15, 000A + Rs.1, 875A = (7,750 x Rs.7.50) - Actual Variable Overhead

- Rs.15, 000 - Rs.1, 875 = Rs.58, 125 - Actual Variable Overhead

Actual Variable Overhead = Rs.58, 125 + Rs.16, 875

Actual Variable Overhead = Rs.75, 000

(v) Fixed overhead cost-

(a) Rs.1, 75,000

(b) Rs.1, 12,500

(c) Rs.62, 500

(d) Rs.50, 000

Ans: (d) Rs.50, 000

Fixed Overhead Expenditure Variance = Budgeted Fixed Overheads - Actual Fixed Overheads

Rs.62, 500 F = Rs.1, 12,500 - Actual Fixed Overheads

Actual Fixed Overheads = Rs.50, 000

Topic 8 Controllable vs Uncontrollable Variances

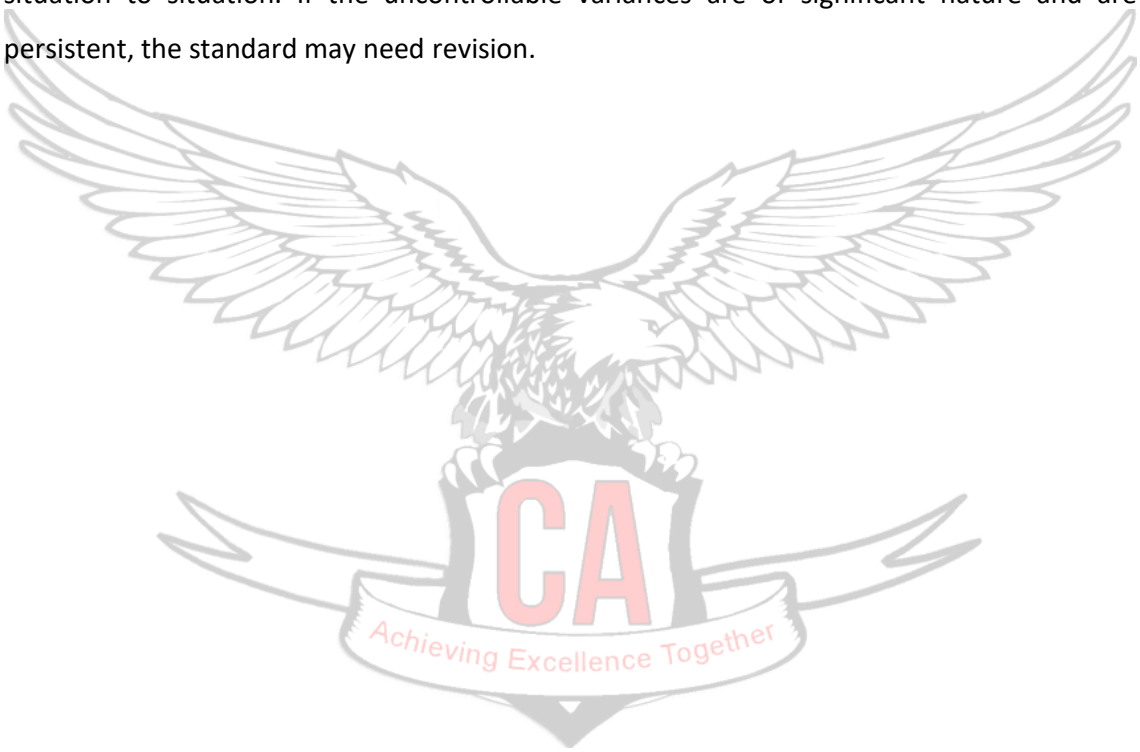
Question 44

DISCUSS the Controllable and un-controllable variances

(MTP March '21)

Answer 44

Controllable and un-controllable variances: The purpose of the standard costing reports is to investigate the reasons for significant variances so as to identify the problems and take corrective action. Variances are broadly of two types, namely, controllable and uncontrollable. Controllable variances are those which can be controlled by the departmental heads whereas uncontrollable variances are those which are beyond their control. Responsibility centers are Answerable for all adverse variances which are controllable and are appreciated for favourable variances. Controllability is a subjective matter and varies from situation to situation. If the uncontrollable variances are of significant nature and are persistent, the standard may need revision.



Chapter 14

Marginal Costing

Topic 1 Introduction to Marginal Costing

Case Scenarios

Question 1

A meeting of the heads of departments of the Arnav Ltd. has been called to review the operating performance of the company in the last financial year. The head of the production department appraised that during the last year the company could operate at 70% capacity level but in the coming financial year 95% capacity level can be achieved if an additional amount of Rs.100 Crore on capex and working capital is incurred.

The head of the finance department has presented that during the last financial year the company had a P/V ratio of 40%, margin of safety and the break-even were Rs.50 crore and Rs.200 crore respectively.

To the reply to the proposal of increasing the production capacity level to 95%, the head of the finance department has informed that this could be achieved if the selling price and variable cost are reduced by 8% and 5% of sales respectively. Fixed cost will also increase by Rs.20 crore due to increased depreciation on additional assets. The additional capital will be arranged at a cost of 15% p.a. from a bank.

In the coming financial year, it has been aimed to achieve an additional profit of Rs.10 crore over and above the last year's profit after adjusting the interest cost on the additional capital.

The following points is required to be calculated on urgent basis to put the same in the meeting. You being an assistant to the head of finance, has been asked the followings:

(Study Material)

i. What will be the revised sales for the coming financial year?

(a) Rs. 322.22 Crore

(b) Rs. 311.11 Crore

(c) Rs. 300.00 Crore

(d) Rs. 324.24 Crore

Ans. a) Revised Sale $= \frac{\text{Revised Fixed Cost+Expected Profit}}{\text{P/V Ratio}}$

= {Rs.115 + (20+10)} ÷ 45% = Rs. 322.22 crores

ii. What will be the revised break-even point for the coming financial year?

(a) Rs. 222.22 Crore

(b) Rs. 252.22 Crore

(c) Rs. 244.44 Crore

(d) Rs. 255.56 Crore

Ans. d) Revised Break – even Point $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

= Rs.115 Crore ÷ 45% = Rs.255.56 Crore (Refer working notes)

iii. What will be the revised margin of safety for the coming financial year?

(a) Rs. 100 Crore

(b) Rs. 58.89 Crore

(c) Rs. 55.56 Crore

(d) Rs. 66.66 Crore

Ans. d) Revised Margin of Safety = Revised Sales – Revised Break– even Sales

= Rs. 322.22Crores – Rs. 255.56Crores = Rs. 66.66 Crores.

iv. The profit of the last year and for the coming year are:

(a) Rs. 50 Crore & Rs.95 Crore respectively

(b) Rs. 20 Crore & Rs. 65 Crore respectively

(c) Rs. 20 Crore & Rs. 30 Crore respectively

(d) Rs. 45 Crore & Rs. 66.66 Crore respectively

Ans. c) Rs. 20 Crore & Rs.30 Crore respectively (Refer working note)

v. The total cost of the last year and for the coming year are:

(a) Rs. 230 Crore & Rs.292.22

(b) Rs. 230 Crore & Rs.275 Crore

(c) Rs. 220 Crore & Rs.282.22 Crore

(d) Rs. 220 Crore & Rs.292.22 Crore

Ans. a) Total cost in last year = Rs.230 Crore

Total cost in coming year = Variable Cost + Fixed Cost

Revised sales × 55% + 115 Crore

= Rs. 322.22 Crore × 55% + Rs. 115 Crore = Rs. 292.22 Crore

Working Note

Present Sales and Profit

Total Sales = Break – even Sales + Margin of Safety

= Rs. 200 Crores + Rs. 50 Crores

= Rs. 250 Crores

P/V Ratio = 40%

Variable Cost = 60% of Sales

= Rs. 250 Crores × 60%

= Rs. 150 Crores

Fixed Cost = Break – even Sales × P/V Ratio

= Rs. 200 Crores × 40%

= Rs. 80 Crores

Total Cost = Rs. 150 Crores + Rs. 80 Crores

= Rs. 230 Crores

Profit = Total Sales – Total Cost

= Rs. 250 Crores – Rs. 230 Crores

= Rs. 20 Cores

Revised Sales	**(Rs. in Crores)**
Present Fixed Cost	80.00
Increase in Fixed Cost	20.00

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Interest at 15 per cent on Additional Capital (Rs.100Crores × 15%)	15.00
Total Revised Fixed Cost (in crore)	115.00
Assuming that the Present Selling Price is 100 Rs.	
Revised Selling Price will be (8% Less)	92.00
New Variable Cost (Reduced from 60% to 55%) of Sales (92 × 55%) Rs.	50.60
Contribution (92.00 – 50.60) Rs. Rs.	41.40

New P / V Ratio = $\frac{Rs.\ 41.40}{Rs.92.00} \times 100 = 45\%$

Question 2

A garment manufacturer has been producing and selling T-shirts exclusively for Indian market. His T-shirts are made of a specific material which is eco-friendly. It means that T-shirts are bio-degradable in soil after it becomes unsuitable for use.

This invention has been applauded throughout the country. Owner, Vikas, registered for the patent rights for his invention so that no one else could use it.

Vikas feels that this invention will also be liked in foreign markets, and thus plans to expand his business outside India. He feels that US market is the first foreign market he should tap into.

Current cost structure (each T-shirt):

Direct material	**90**

Direct labour	**60**
Special service	**80**
(Used in T-shirt making, 50% fixed)	
Fixed overhead	**50**
Administration overhead (fixed)	**20**
Total cost per T-shirt	**300**
(+) Profit margin	**200**
Selling price in India	**500**

There is no limitation of any resources in India. Vikas is able to sell 80,000 T-shirts each year. He is currently working at 80% of his total capacity.

After searching for potential customers in US, Vikas received an inquiry for 30,000 units from a wholesale distributor in California. As per the inquiry, order will be placed if price per T-shirt is reasonable and the order has to be satisfied in full.

Vikas decided to send a quote and the order was placed by the foreign client, on the same day. Vikas, without a second thought accepted the order, but did not feel the need to extend the manufacturing capacity; therefore he decided forgo a few Indian clients.

This foreign order also required special packaging. It is spent at 20% of the total prime cost per T-shirt. The production was done quickly and foreign consignment was transported to custom port via services from a carriage agency. It charged Rs.80, 000 for 1 truck, whose capacity was 500 kg, to transport whole of the consignment. Truck was 20% vacant after loading the consignment.

Bill of lading was filed and a professional fee of Rs.25, 000 for filing this was paid to a Chartered accountant. Custom port also charged Rs.80 per kg per day to handle the material, storing it in warehouse, and for loading the goods on ship.

The shipping company, which was booked by Vikas for taking the consignment to US, got delayed due to bad weather. Stock was held at port for 5 days and on 6th day it was loaded on ship. Shipping company charged Rs.2, 800/ 10kg of goods. Insurance was charged flat at Rs.1, 11,000. There is no custom duty on such exports.

(MTP Jan 2025)

Answer the following questions:

1. Vikas had sufficient funds in his hands but he still raised a short-term working capital loan @ 6.5% p.a. for the satisfaction of this foreign order because he found a one time investment opportunity which was giving him 9.25% returns. Foreign order was accepted on 1st June and loan was taken on the same day. Repayment of the loan will be made on 1st September. Calculate net cash outflow due to this export order. Which of the following is correct?

(a) Rs.73, 91,000

(b) Rs.75, 47,750

(c) Rs.74, 76,500

(d) Rs.71, 06,000

Ans: (b) Rs.75, 47,750

Funds required for foreign order:

Costs	Amounts
Direct material per unit	90

Add: Direct labour per unit	60
Add: special services per unit	40
	190
Add: packaging per unit (20% x prime cost, 20% x (90 + 60 + 80))	46
Variable cost per unit	236
Total variable cost (236x30,000)	70,80,000
Add: freight	80,000
Add: professional fees	25,000
Add: custom charges (500kg x 80% x 80 x 6)	1,92,000
	73,77,000
Add: shipping ((500x80%/10) x 2,800)	1,12,000
Add: insurance	1,11,000
Funds required	76,00,000

Net amount of interest earned (interest earned in 9.25% and paid is 6.50% for 3 months) = 76, 00,000 x (9.25% - 6.50%) x 3/12 = 52,250

So, net cash outflow due to export order = 76, 00,000 - 52,250 = 75, 47,750

2. What would have been the minimum price that Vikas could have quoted per T-shirt in US dollars? (Exchange rate on 1st June, $1 = Rs.83.86)

(a) $ 4.23

(b) $ 4.20

(c) $ 4.17

(d) $4.05

Ans: (a) $ 4.23

Minimum price:-

Variable cost (net)	75,47,750
Add: fixed cost recovery (110 x 10,000 units)	11,00,000
Add: loss of profit (200 x 10,000 units)	20,00,000
Minimum price	1,06,47,750
Minimum price per unit 1,06,47,750/30,000	Rs.354.925
Minimum price is $ ($1 = Rs.83.864)	$4.23

3. Payment from foreign client was received on 8th October when exchange rate was Rs. 86 for each US $. Calculate the profit earned from this export order if actual quoted price was $4.90 per T-shirt. Select the correct amongst following:

(a) Rs.40, 65, 500

(b) Rs.41, 51,000

(c) Rs.39, 94,250

(d) Rs.44, 36,000

Ans: (c) Rs.39, 94,250

PROFIT EARNED:

SALES ($4.90 x 30,000 x RS. 86)	Rs.1,26,42,000
(-) Variable cost (net)	(75,47,750)
(-) allotted fixed cost (10,000 units x110)	(11,00,000)
PROFIT	Rs.39,94,250

4. What is the net cash Inflow from this export order?

(a) Rs.55, 36,000

(b) Rs.51, 65,500

(c) Rs.52, 51,000

(d) Rs.50, 94,250

Ans: (d) Rs.50, 94,250

CASH INFLOW:

SALES ($4.90 x 30,000 x RS. 86)	Rs.1,26,42,000

(-) Variable cost (net)	(75,47,750)
CASH INFLOW	Rs.50,94,250

5. What is the Incremental benefit from this export order?

(a) Rs.19, 94,250

(b) Rs.21, 51,000

(c) Rs.20, 65,500

(d) Rs.24, 36,000

Ans: (a) Rs.19, 94,250

Incremental benefits:

SALES ($4.90 x 30,000 x RS. 86)	Rs.1,26,42,000
(-) Variable cost (net)	(75,47,750)
(-) allotted fixed cost (10,000 units x110)	(11,00,000)
(-) loss of profit (10,000x200)	(20,00,000)
Incremental benefits	19,94,250

Question 3

Company Rontomax maintains its accounts in Delhi head office. All the records of Rontomax are safely kept in this office only. In the 2nd quarter Delhi office went under repair. Thus,

for the 2nd quarter records were maintained in Gurugram branch office. This branch's main work is to bring business to the company and thus generally no records are maintained in this branch office.

So for 2nd quarter all the records were recorded and maintained in this Gurugram office only. At the end of 2nd quarter, fire broke out in this branch and unfortunately all the records were burned.

In the beginning of 3rd quarter a board meeting was going to be conducted and performance of 2nd quarter were to be discussed. Company secretary, Mr. Manoj, was responsible for preparing a report of performance to be presented to the board. Now he is under immense pressure as the records were burned and thus he was not able to prepare a performance report.

Manoj contacted the Delhi head office and received a copy of 1st quarter records. He also got some information through emails shared between head office and branch office. He somehow got a lot of information but this information doesn't make any sense as it is in parts and pieces. He called out for help of Finance and cost head, Miss Bharti, who is also a Chartered accountant.

Now both of them are at task to work out this information and be able to present a summary performance report to be presented to the board in the board meeting. Data that Manoj was able to gather was:

• Rontomax garnered revenue of Rs. 80, 00,000 in 1st quarter of 2023. Its tax provision expense was Rs. 4, 50,000 calculated on earning before tax in the same period.

• Cost of Goods Sold (COGS) and Operating expenses in 1st quarter were Rs, 38, 00,000 and Rs. 12, 50,000 respectively.

• Quarterly interest expense was Rs. 1, 50,000.

• Non-operating expense other than interest was Rs. 13, 00,000 in the 1st quarter.

• Selling price was reduced by 8% & no. of units sold increased by 25% from 1st quarter to 2nd quarter.

• Variable cost per unit for maintaining the day-to-day business operations is 30% of variable cost per unit of producing the goods.

• EBIT per unit for 2nd quarter is Rs. 38.857 which has gone down by Rs. 8.285 from 1st quarter.

Manoj tells Bharti about the general format of questions that board asks from him, every quarter. So, they decide to find out the answers of such questions before-hand so that meeting can be conducted smoothly.

Following are those questions that they are seeking for solutions. Consider yourself as their assistant trainee and help to find these answers.

(MTP May 2025)

1. Find out the sales amount of Quarter 2. Select the correct answer.

(a) Rs. 76, 50,000

(b) Rs. 86, 00,000

(c) Rs. 92, 00,000

(d) Rs. 96, 50,000

Ans: (c) Rs. 92, 00,000

Quarter 1:

	Amount (Rs.)
Sales	80,00,000
(-) COGS	(38,00,000)
(-) Operating expenses	(12,50,000)

(-) Non-operating expenses	(13,00,000)
EBIT of 1ST Quarter	16,50,000

Let's assume no. of units sold in 1st quarter = X

EBIT per unit of 1st quarter = 38.857 + 8.285 = Rs. 47.142

Then, 16, 50,000/X = 47.142

X = 35,000 units

Number of units sold in 2nd Qtr. = 35,000 + 35,000x0.25 = 43,750 units

Selling price in Qtr. 1 = 80, 00,000/35,000 = Rs. 228.571

Selling price in Qtr. 2 = Rs. 210.285

Sales in Qtr. 2 = 210.285 x 43,750 = Rs. 92, 00,000

2. What is the total variable cost & fixed cost in quarter 1 as per marginal costing income statement, respectively?

(a) Rs. 49, 40,000 & Rs. 1, 10,000

(b) Rs. 3, 26,000 & Rs. 17, 90,000

(c) Rs. 17, 90,000 & Rs. 3, 26,000

(d) Rs. 4, 94,000 & Rs. 11, 10,000

Ans: (a) Rs. 49, 40,000 & Rs. 1, 10,000

COGS is 100% variable

VC per unit of operating expenses = 30% of COGS per unit

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COGS per unit = 38, 00,000/35,000 = Rs. 108.571

VC per unit of operating expenses = 30% x 108.571 = Rs. 32.571

VC in operating expenses = 32.571 x 35,000 = 11, 40,000

Fixed cost in operating expenses = 12, 50,000 – 11, 40,000 = Rs. 1, 10,000

Total Variable Cost = 11, 40,000 + 38, 00,000 = Rs. 49, 40,000

Total fixed cost = Rs. 1, 10,000

3. If Fixed cost & total variable cost as per marginal costing doesn't change, what is the cost change in 2nd quarter?

(a) Operating expenses increased by Rs. 11, 50,000

(b) Non-operating expense decreased by Rs. 11, 50,000

(c) Operating expenses decreased by Rs. 11, 50,000

(d) Non-operating expenses increased by Rs. 11, 50,000

Ans: (d) Non-operating expenses increased by Rs. 11, 50,000

EBIT in Qtr. 2 = 38.857 x 43,750 = Rs. 17, 00,000

Non-operating expenses in 2nd Qtr. = Revenue – VC – FC - EBIT

= 92, 00,000 – 49, 40,000 – 1, 10,000 – 17, 00,000

= Rs. 24, 50,000

Non-operating expenses in 1st Qtr. = Rs. 13, 00,000

NOE increased by 11, 50,000

4. If operating fixed cost, total variable cost, & interest cost remains same in quarter 2, what is the tax provision for 2nd quarter?

(a) Rs. 4, 65,000

(b) Rs. 4, 75,000

(c) Rs. 4, 85,000

(d) Rs. 4, 45,000

Ans: (a) Rs. 4, 65,000

EBIT of 1ST Qtr. = Rs. 16, 50,000

EBT of 1ST Qtr. = EBIT – Int = 16, 50,000 – 1, 50,000 = Rs. 15, 00,000

Tax Provision for 1st Qtr. = Rs. 4, 50,000

Tax rate = 4, 50,000/15, 00,000 = 30%

EBT for 2nd Qtr. = 17, 00,000 – 1, 50,000 = Rs. 15, 50,000

Tax provision for 2nd Qtr. = 15, 50,000 x 30% = Rs. 4, 65,000

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5. What is the amount of profit excluding non-operating expenses in quarter 2?

(a) Rs. 38, 50,000

(b) Rs. 36, 50,000

(c) Rs. 41, 50,000

(d) Rs. 29, 50,000

Ans: (c) Rs. 41, 50,000

Profit in 2nd Qtr. as per Marginal Costing

= Sales – VC – FC

= 92, 00,000 - 49, 40,000 - 1, 10,000 = Rs. 41, 50,000

Question 4

Popular company produces various articles for student purposes. It has been in industry since last 25 years. Company had a very humble start but gained popularity over the years due to excellent quality products which were sold at very competitive prices. Company has huge reserves and feel that it is also obligated to give back to the society from which it has grown.

Last year management decided to produce and supply special quality school bags, water bottles, & geometry boxes to NGOs, at no price, as asocial responsibility. These articles were simple looking but were more durable, that would not have wore-off easily and could have been used for long-term.

This year management wants to add another dimension to this social work. It approached charitable schools and government run schools and offered them the supply of the same articles, at cost. This will help students in these schools to get these things at a very low price compared to market.

The variable costs are Rs. 100, Rs. 80, and Rs. 40 for school bags, water bottles, and geometry boxes, respectively. These articles are made using a single machine. 0.20 hours of machine operation is required for manufacturing 1 unit of school bag. Similarly, machine hours required for each units of water bottle and geometry box is 0.15 hours and 0.10 hours, respectively. Fixed overhead related to machine is Rs. 7, 40,000 per year. Machine can operate for 8,000 hours in a year.

Company has decided to sell its 80% capacity production in markets. Rest is divided amongst the 2 undergoing social works, equally.

All Schools requests these items in the ratio of 2:3:5, as per their demand by the school students.

Company wants to set a price for these articles to be offered to the schools. Management has few questions they need the answers to. They assigned the task to their team. Team made rough calculations but as there were too many people on the team, each came up with different answers. As a Chartered accountant, you have been approached. Understand the case closely, find the correct answers and help management to set a price.

Answer the following:

(i) What is allocated fixed cost per unit of School bags, water bottles, and geometry boxes?

(a) 18.5, 13.875, 9.75

(b) 18.5, 13.875, 9.25

(c) 18.5, 13.785, 9.25

(d) 18.5, 13.785, 9.50

Ans: (b) 18.5, 13.875, 9.25

Fixed overhead = 740000

Total machine hours = 8000 hours

Fixed OH per hour= Rs. 92.5

Fixed OH per unit of:

• School bag = 0.20 x 92.5 = Rs. 18.5

• Water bottle = 0.15 x 92.5 = Rs. 13.875

• Geometry box = 0.10 x 92.5 = Rs. 9.25

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(ii) If the prices were Rs. 200, Rs. 160, and Rs. 100, what would be the overall break-even point in units in relation to fixed cost allocated to these supplies?

(a) 308.33 units

(b) 500 units

(c) 508.33 units

(d) 1,000 units

Ans: (d) 1,000 units

Hours allocated = 8000 x 10% = 800 hours

Fixed overhead allocated = 800 x 92.5 = Rs. 74,000

Contribution:

• Bag = 200-100 = 100

• Bottle = 160-80=80

• Geometry = 100- 40 = 60

Composite contribution = 100 x 2/10 + 80 x 3 / 10 + 60 x 5/10 = Rs. 74

Overall breakeven point for this assignment is = fixed cost allocated/composite contribution = 74,000/74 = 1,000 units

(iii) Find out the maximum number of units of each article that can be given at the prices given in Part (ii).

(a) 61, 92, 154

(b) 200, 300, 500

(c) 101, 152, 254

(d) 100, 150, 250

Ans: (b) 200, 300, 500

1000 units are to be distributed in the ratio of 2:3:5

Bag = 200 units, bottle = 300 units, geometry = 500 units

(iv) What will be the maximum units that can be supplied to the schools of each article?

(a) 1103, 1645, 2726

(b) 1093, 1655, 2748

(c) 1185, 1777, 2962

(d) 1133, 1675, 2958

Ans: (c) 1185, 1777, 2962

Total hours = 800 hours

Let total no of units = X

Supply: bag 2/10 × X; bottle 3/10 × X; geometry 5/10 × X

Hours: (2X/10) x 0.20 + (3X/10) x 0.15 + (5X/10) x 0.10 = 800 hours

X = 5925

Units of:

- Bag = 2/10 x 5925 = 1185
- Bottle = 3/10 x 5925 = 1777.5 or 1777
- Geometry = 5/10 x 5925 = 2962.5 or 2962

(v) What should be the correct price for each item as per the management's decision?

(a) 118.50, 93.875, 49.75

(b) 118.50, 93.785, 49.25

(c) 118.50, 93.785, 49.50

(d) 118.50, 93.875, 49.25

Ans: (d) 118.50, 93.875, 49.25

Correct price is AT COST.

COST = Marginal Cost Per Unit + Fixed Overhead Cost Allocated Per Unit

	Bag	Bottle	Geometry
Variable cost per unit	100	80	40
Fixed cost per unit	18.5	13.875	9.25
Total	118.5	93.875	49.25

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Multiple Choice Questions (MCQs)

Question 5

Under marginal costing the cost of product includes:

(a) Prime costs only.

(b) Prime costs and variable overheads.

(c) Prime costs and fixed overheads.

(d) Prime costs and factory overheads.

(Study material)

Ans: (b) Prime costs and variable overheads.

Reason

Under marginal costing, the cost of a product includes only the variable costs that are directly incurred in the production process. These include:

Prime costs, which consist of direct materials and direct labor.

Variable overheads, which are the overhead costs that vary with the level of production.

Marginal costing excludes fixed overheads because these do not change with the level of production and are considered period costs rather than product costs. Therefore, the correct option is (b).

Question 6

Reporting under marginal costing is accomplished by:

(a) Treating all costs as period costs.

(b) Eliminating the work-in-progress inventory account.

(c) Matching variable costs against revenue and treating fixed costs as period costs.

(d) Including only variable costs in income statement.

(Study material)

Ans: (c) Matching variable costs against revenue and treating fixed costs as period costs.

Reason

Under marginal costing, the focus is on separating costs into variable and fixed categories. The key principles are:

Variable costs are directly matched with the revenue generated, meaning they are included in the cost of goods sold and are used to calculate the contribution margin.

Fixed costs are treated as period costs and are not allocated to individual products. Instead, they are expensed in the period in which they are incurred.

This approach allows for a clearer understanding of the contribution margin (sales revenue minus variable costs), which helps in decision-making and profitability analysis. Therefore, option (c) is the correct choice.

Question 7

Period costs are:

(a) Variable costs.

(b) Fixed costs.

(c) Prime costs.

(d) Overheads costs.

(Study material)

Ans: (b) Fixed costs.

Reason

Period costs are costs that are not directly tied to the production of goods or services, and instead are expensed in the period in which they are incurred. These costs do not vary with production levels and are typically fixed in nature.

Fixed costs are considered period costs because they remain constant regardless of the level of production (e.g., rent, salaries, insurance).

Variable costs are typically product costs because they change with the level of production and are directly attributable to the manufacturing process.

Thus, fixed costs (option b) are the correct classification for period costs.

Topic 2 Features & Assumptions of Marginal Costing

Question 8

When sales and production (in units) are same then profit under:

(a) Marginal costing is higher than that of absorption costing.

(b) Marginal costing is lower than that of absorption costing.

(c) Marginal costing is equal to that of absorption costing.

(d) None of the above.

(Study material)

Ans: (c) Marginal costing is equal to that of absorption costing.

Reason

When sales and production (in units) are the same, there is no opening or closing inventory. In such a case, all costs incurred (both variable and fixed) are fully charged to the period, and there are no inventory adjustments needed.

Under marginal costing, only variable costs are considered as product costs, while fixed costs are treated as period costs and charged directly to the profit and loss statement.

Under absorption costing, both variable and fixed production costs are included in the cost of goods sold, and the fixed costs are absorbed into the cost of the units produced.

Since there is no inventory (no stock to be carried over), both marginal costing and absorption costing will result in the same total cost for the period. Therefore, the profit under both methods will be the same, making option (c) the correct answer.

Question 9

When sales exceed production (in units) then profit under:

(a) Marginal costing is higher than that of absorption costing.

(b) Marginal costing is lower than that of absorption costing.

(c) Marginal costing is equal than that of absorption costing.

(d) None of above.

(Study material)

Ans: (a) Marginal costing is higher than that of absorption costing.

Reason

When sales exceed production (in units), the following occurs:

Under absorption costing, fixed production costs are allocated to the units produced. If more units are sold than produced, some of the fixed costs that were previously allocated to inventory (unsold units) will be recognized as part of the cost of goods sold. This means fewer fixed costs are left in the inventory, and a higher proportion of fixed costs are charged to the profit and loss account in the period.

Under marginal costing, fixed costs are treated as period costs and are charged directly to the profit and loss account. These costs do not get absorbed into inventory.

Thus, when sales exceed production, marginal costing results in a higher profit than absorption costing because, in absorption costing, more fixed costs are recognized in the

period due to the lower closing inventory, while in marginal costing, fixed costs remain constant as period costs. Therefore, option (a) is correct.

Question 10

The main difference between marginal costing and absorption costing is regarding the treatment of:

(a) Prime cost.

(b) Fixed overheads.

(c) Direct materials.

(d) Variable overheads.

(Study material)

Ans: (b) Fixed overheads.

Reason

The main difference between marginal costing and absorption costing lies in the treatment of fixed overheads:

Under marginal costing, fixed overheads are treated as period costs. This means they are charged directly to the profit and loss account for the period in which they are incurred, regardless of the level of production or sales.

Under absorption costing, fixed overheads are treated as product costs. These costs are allocated to the units produced and are included in the cost of goods sold. The fixed overheads are absorbed into the cost of production based on a predetermined rate (e.g., per unit of production), and any unsold inventory will carry a portion of these fixed costs.

Therefore, fixed overheads are the key difference between the two costing methods, making option (b) the correct answer.

Question 11

Under profit volume ratio, the term profit:

(a) Means the sales proceeds in excess of total costs.

(b) Means the same thing as is generally understood.

(c) Is a misnomer, it in fact refers to contribution i.e. (sales revenue-variable costs).

(d) None of the above.

(Study material)

Ans: (c) Is a misnomer, it in fact refers to contribution i.e. (sales revenue-variable costs).

Reason

In the context of Profit Volume (PV) Ratio, the term "profit" is actually a misnomer. The term "profit" in this ratio does not refer to the actual profit as commonly understood (i.e., sales minus all costs including fixed costs). Instead, it refers to the contribution, which is calculated as:

Contribution = Sales Revenue - Variable Costs

The Profit Volume ratio (P/V ratio) is a measure used in marginal costing to analyze the relationship between the contribution and sales, which helps to determine how much of the sales revenue contributes to covering fixed costs and generating profit.

Therefore, option (c) is the correct answer as it correctly identifies that the "profit" in the P/V ratio refers to the contribution.

Question 12

Factors which can change the break-even point:

(a) Change in fixed costs.

(b) Change in variable costs.

(c) Change in the selling price.

(d) All of the above.

(Study material)

Ans: (d) All of the above.

Reason

The break-even point (BEP) is the level of sales at which total revenue equals total costs, resulting in zero profit. The break-even point can be influenced by several factors:

Change in fixed costs: If fixed costs increase or decrease (such as rent, salaries, etc.), the break-even point will also change. An increase in fixed costs raises the BEP, while a decrease lowers it.

Change in variable costs: If variable costs per unit (such as direct materials or labor) increase or decrease, the BEP will change. Higher variable costs per unit increase the BEP, and lower variable costs decrease the BEP.

Change in the selling price: If the selling price of the product increases or decreases, the contribution margin per unit (selling price minus variable costs) changes. An increase in selling price lowers the BEP, while a decrease raises it.

Thus, all of these factors can influence the break-even point, making option (d) the correct choice.

Question 13

If P/V ratio is 40% of sales then what about the remaining 60% of sales:

(a) Profit.

(b) Fixed cost.

(c) Variable cost.

(d) Margin of safety.

(Study material)

Ans: (c) Variable cost.

Reason

The Profit/Volume (P/V) ratio represents the contribution margin as a percentage of sales. The contribution margin is calculated as:

Contribution margin = Sales - Variable costs

If the P/V ratio is 40%, it means that 40% of the sales revenue contributes to covering fixed costs and generating profit, i.e., the contribution margin.

Since 100% of sales includes both the contribution margin and the variable costs, the remaining 60% of sales would represent the variable costs (the costs that change in direct proportion to the level of production or sales).

Therefore, the remaining 60% of sales is allocated to variable costs, making option (c) the correct answer.

Question 14

The P/V ratio of a product is 0.6 and profit is Rs. 9,000. The margin of safety is:

(a) Rs. 5,400

(b) Rs. 15,000

(c) Rs. 22,500

(d) Rs. 3,600

(Study material)

Ans: (b) Rs. 15,000

Reason

To calculate the Margin of Safety, we can use the following formula:

Margin of Safety= $\frac{\textbf{Profit}}{\frac{\textbf{P}}{\textbf{V}}\textbf{ratio}}$

Given:

P/V ratio = 0.6

Profit = Rs. 9,000

Now, applying the formula:

Margin of Safety= $\frac{9,0000}{0.6} = 15000$

Thus, the margin of safety is Rs. 15,000, making option (b) the correct answer.

Question 15

Mefttal Ltd. is currently operating at 60% of its total capacity which is 1.5 times than the previous year. The total capacity of the company is 2, 00,000 units.

Other information relating to the production is provided below:

(i) The total cost of production for the current year is Rs.59, 28,000, and for the previous year, it was Rs.44, 72,000.

(iii) No changes are anticipated in the cost structure for the upcoming years.

Selling price is Rs.52 per unit and is expected to remain the same in the coming years.

You are required to CALCULATE Break-Even Point (in units).

(a) 1,20,000 units

(b) 40,000 units

(c) 80,000 units

(d) 1, 00,000 units

(MTP Jan 2025)

Ans: (d) 1, 00,000 units

Current Year production = 60% of 2, 00,000 units

= 1, 20,000 units

Previous Year production = $\left(\frac{1,20,000 \text{ units}}{1.5 \text{ times}}\right) = 80,000 \text{ units}$

Particulars	Previous Year	Current Year	Difference
Sales (Units)	80,000	1,20,000	40,000
Total Cost (Rs.)	44,72,000	59,28,000	14,56,000

Variable Cost per unit = $\left(\frac{\text{Change in Total Cost}}{\text{Change in sales Volume}}\right)$

= $\left(\frac{\text{Rs.14,56,000}}{\text{40,000 units}}\right)$ = Rs.36.40 per unit

Total Fixed Cost (Rs.) = Rs.59, 28,000-(1, 20,000 units × Rs. 36.40) = Rs.15, 60,000

Break- even point (in units) = $\left(\frac{\text{Fixed Cost}}{\text{Contribution per Unit}}\right)$

= $\left(\frac{\text{Rs.15,60,000}}{\text{Rs.52}-\text{Rs.36.40}}\right)$ = 1, 00,000 units

Topic 3 Contribution & P/V Ratio

Question 16

Top-tech a manufacturing company is presently evaluating two possible machines for the manufacture of superior Pen-drives. The following information is available:

Particulars	Machine A	Machine B
Selling price per unit	Rs. 400.00	Rs. 400.00
Variable cost per unit	Rs. 240.00	Rs. 260.00
Total fixed costs per year	Rs. 350 lakhs	Rs. 200 lakhs
Capacity (in units)	8,00,000	10,00,000

Required:

(i) Recommend which machine should be chosen?

(ii) Would you change your Answer, if you were informed that in near future demand will be unlimited and the capacities of the two machines are as follows?

Machine A - 12, 00,000 units Machine B - 12, 00,000 units Why?

(PYP May'22)

Answer 16

		Machine-A	Machine-B	Total
A	Selling price per unit (Rs.)	400	400	
B	Variable cost per cost (Rs.)	240	260	
C	Contribution per unit (Rs.) [A-B]	160	140	
D	Units	8,00,000	10,00,000	
E	Total contribution (Rs. [C×D]	12,80,00,000	14,00,00,000	26,80,00,000
F	Fixed Cost (Rs.)	3,50,00,000	2,00,00,000	5,50,00,000
G	Profit [E-F] (Rs.)	9,30,00,000	12,00,00,000	21,30,00,000
H	Profit per unit [G÷D] (Rs.)	116.25	120.00	

(i) Machine B has the higher profit of Rs.2, 70, 00, 000 than the Machine-A. Further, Machine-B's fixed cost is less than the fixed cost of Machine-A and higher capacity. Hence, Machine B be recommended.

Note: This Question can also be solved as below:

Indifferent point = Difference in fixed cost / difference in variable cost per unit

= 1, 50, 00,000 / 20 = 7, 50,000 units

At the level of demand 7, 50,000 units both machine options equally profitable. If demand below 7, 50,000 units, select machine B (with lower FC).

If demand above 7, 50,000 units, select machine A (with lower VC).

(ii) When the capacities of both the machines are same and demand for the product is unlimited, calculation of profit will be as follows:

	Machine-A	**Machine-B**	**Total**
Contribution per unit (Rs.)	160	140	
Units	12,00,000	12,00,000	
Total contribution (Rs.) [A×B]	19,20,00,000	16,80,00,000	36,00,00,000
Fixed Cost (Rs.)	3,50,00,000	2,00,00,000	5,50,00,000
Profit [C-E] (Rs.)	15,70,00,000	14,80,00,000	30,50,00,000
Profit per unit [E÷B] (Rs.)	130.83	123.33	

Yes, the preference for the machine would change because now, Machine A is having higher contribution and higher profit, hence recommended.

Question 17

The following information is given by Star Ltd.:

Margin of Safety **Rs. 1, 87,500**

Total Cost **Rs. 1, 93,750**

Margin of Safety **3,750 units**

Break-even Sales **1,250 units**

Required:

CALCULATE Profit, P/V Ratio, BEP Sales (in Rs.) and Fixed Cost.

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Answer 17

Margin of Safety (%) = $\frac{3,750 \text{ Units}}{3,750 \text{ Units} + 1,250 \text{ Units}}$ = 75%

Total Sales = $\frac{\text{Rs.}1,87,500}{0.75}$ = Rs. 2, 50,000

Profit = Total Sales – Total Cost

= Rs. 2, 50,000 – Rs. 1, 93,750 = Rs. 56,250

P/V Ratio = $\frac{\text{Profit}}{\text{Margin of Safety}} \times 100 = \frac{\text{Rs.}56,250}{\text{Rs.}1,87,500} \times 100$ = 30%

Break-even Sales = Total Sales × [100 – Margin of Safety %]

= Rs. 2, 50,000 × 0.25 = Rs. 62,500

Fixed Cost = Sales × P/V Ratio – Profit

= Rs. 2, 50,000 × 0.30 – Rs. 56,250 = Rs. 18,750

Question 18

(a) You are given the following data for the coming year for a factory.

Budgeted output	**8, 00,000 units**
Fixed expenses	**Rs.40, 00,000**
Variable expenses per unit	**Rs.100**
Selling price per unit	**Rs.200**

DRAW a break-even chart showing the break-even point.

(b) If price is reduced to Rs.180, what will be the new break-even point?

Answer 18

(a) Contribution = S – V = Rs. 200 – Rs. 100 = Rs. 100 per unit.

B.E. Point = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$ = $\frac{40,00,000}{Rs.100}$ = 40,000 unit

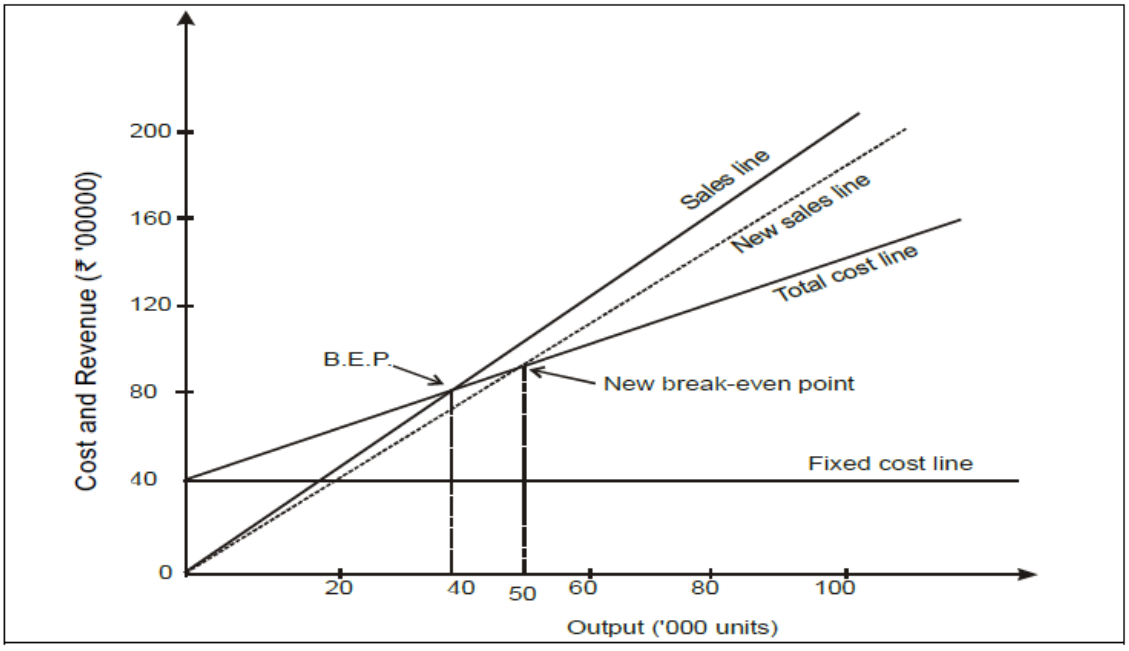
(b) When selling price is reduced

New selling price = Rs. 180

New Contribution = Rs. 180 – Rs. 100 = Rs. 80 per unit.

New B.E. Point = = $\frac{\text{Rs.}40,00,000}{\text{Rs.}80}$ = 50,000 unit

The break-even chart is shown below:



Question 19

DISCUSS advantages of Marginal Costing.

(RTP Jan 2025)

Answer 19

Advantages of Marginal Costing:

1. Simplified Pricing Policy: The marginal cost remains constant per unit of output whereas the fixed cost remains constant in total. Since marginal cost per unit is constant from period to period within a short span of time, firm decisions on pricing policy can be taken.

2. Proper recovery of Overheads: Overheads are recovered in costing on the basis of pre-determined rates. If fixed overheads are included on the basis of pre-determined rates, there will be under- recovery of overheads if production is less or if overheads are more. There will be over- recovery of overheads if production is more than the budget or actual expenses are less than the estimate. This creates the problem of treatment of such under or over-recovery of overheads. Marginal costing avoids such under or over recovery of overheads.

3. Shows Realistic Profit: Advocates of marginal costing argues that under the marginal costing technique, the stock of finished goods and work-in-progress are carried on marginal cost basis and the fixed expenses are written off to profit and loss account as period cost. This shows the true profit of the period.

4. How much to produce: Marginal costing helps in the preparation of break-even analysis which shows the effect of increasing or decreasing production activity on the profitability of the company.

5. More control over expenditure: Segregation of expenses as fixed and variable helps the management to exercise control over expenditure. The management can compare the actual variable expenses with the budgeted variable expenses and take corrective action through analysis of variances.

6. Helps in Decision Making: Marginal costing helps the management in taking a number of business decisions like make or buy, discontinuance of a particular product, replacement of machines, etc.

7. Short term profit planning: It helps in short term profit planning by B.E.P charts.

Question 20

Due to sudden rise in demand of the product, the sales of Arrow Ltd. for current year enhanced to 3 times the average of last 4 years. The Break-even point and the variable cost of the company for the current year is Rs.1, 17, 00,000 and 93, 60,000 respectively.

The sales data relating to past years is given below:

Year	Sales (Rs.)
Year 1 (latest)	**62,00,000**
Year 2	**50,00,000**
Year 3	**52,00,000**
Year 4	**44,00,000**
Year 5	**66,00,000**

CALCULATE the fixed cost to the company for the current year.

A. Rs.64, 35,000

B. Rs.48, 12,453

C. Rs.65, 34,340

D. Rs.46, 80,000

(MTP Jan 2025)

Ans: (D) Rs.46, 80,000

Sales for current year = $3\times\left(\frac{62,00,000 + 50,00,000 + 52,00,000 + 44,00,000}{4}\right) = Rs.1,56,00,000$

P/V ratio= $\frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} = \frac{\text{Rs.}1,56,00,000 - 93,60,000}{\text{Rs.}1,56,00,000}$ = 40%

Now, Break-even point = $\frac{\text{Fixed Cost}}{\text{P/V ratio}}$

Therefore, Fixed Cost = Break-even point x P/V ratio

= Rs.1, 17, 00,000 x 40%

= Rs.46, 80,000

Question 21

A manufacturing firm is presently producing and selling 10,000 units of a product at Rs. 500 per unit in the domestic market. The fixed cost per unit at the current level of operation is Rs. 150 and variable cost is Rs. 300 per unit. The firm has received an export order for supply of 5,000 units of the product at Rs. 400 per unit. After meeting the domestic demand, if the firm accepts the export offer, the profit of the firm is expected to:

(a) Decrease by Rs. 5,00,000.

(b) Increase by Rs. 2,00,000.

(c) Decrease by Rs. 3,00,000.

(d) Increase by Rs. 5,00,000.

(MTP May 2025)

Ans: (d) Increase by Rs. 5, 00,000.

Total Revenue (Domestic) = 10,000 × 500 = 50, 00,000

Total Cost (Domestic) = Fixed Cost + Variable Cost

= (10,000 × 150) + (10,000 × 300) = 15, 00,000+30, 00,000 = 45, 00,000

Profit (Domestic) =Total Revenue−Total Cost = 50, 00,000−45, 00,000 = 5, 00,000

Contribution per Unit (Export) = Export Price−Variable Cost = 400−300 = 100

Total Contribution from Export = 100 × 5,000 = 5, 00,000

Topic 4 Break-even Analysis (BEP)

Question 22

The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

	A Manual (Rs.)	B Semi- Automatic (Rs.)	C Fully- Automatic (Rs.)
Monthly fixed costs:			
Occupancy	**15,000**	**15,000**	**15,000**
Maintenance contract	**---**	**5,000**	**10,000**
Equipment lease	**---**	**25,000**	**1,00,000**
Unit variable costs (per report):			
Supplies	**40**	**80**	**20**
Labour	**Rs.200**	**Rs.60**	**Rs.20**

	(5 hrs. × Rs.40)	**(1 hr. × Rs.60)**	**(0.25 hr. × Rs.80)**

Required:

(i) CALCULATE cost indifference points. Interpret your results.

(ii) If the present case load is 600 cases and it is expected to go up to 850 cases in near future, SELECT most appropriate on cost considerations?

(Study Material)

Answer 22

(i) Cost Indifference Point

	A and B	**A and C**	**B and C**
	(Rs.)	**(Rs.)**	**(Rs.)**
Differential Fixed Cost (I)	Rs.30,000	Rs.1,10,000	Rs.80,000
(Rs.45,000 – Rs.15,000)		(Rs.1,25,000 – Rs.15,000)	(Rs.1,25,000 – Rs.45,000)
Differential Variable Costs (II)	Rs.100	Rs.200	Rs.100
(Rs.240 – Rs.140)		(Rs.240 – Rs.40)	(Rs.140 – Rs.40)
Cost Indifference Point (I/II)	300	550	800
(Differential Fixed Cost / Differential Variable Costs per case)	Cases	Cases	Cases

Interpretation of Results

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

(ii) Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go upto 850 cases, alternative C is most appropriate.

Question 23

XY Ltd. makes two products X and Y, whose respective fixed costs are F1 and F2. You are given that the unit contribution of Y is one fifth less than the unit contribution of X, that the total of F 1 and F2 is Rs. 1, 50,000, that the BEP of X is 1,800 units (for BEP of X, F2 is not considered) and that 3,000 units is the indifference point between X and Y.(i.e. X and Y make equal profits at 3,000 unit volume, considering their respective fixed costs). There is no inventory build-up as whatever is produced is sold.

Required

FIND OUT the values F1 and F2 and units contributions of X and Y.

(Study Material)

Answer 23

Let Cx be the Contribution per unit of Product X.

Therefore, Contribution per unit of Product Y =CY=4/5Cx = 0.8Cx

Given F1 + F2 = 1, 50,000,

F1 = 1,800Cx (Break even Volume × Contribution per unit)

Therefore, F2 = 1, 50,000 – 1,800Cx.

3,000Cx –F1 =3,000 × 0.8Cx – F2 or 3,000Cx – F1 =2,400 Cx-F2 (Indifference Point)

i.e., 3,000Cx – 1,800Cx = 2,400Cx – 1, 50,000 + 1,800Cx

i.e., 3,000Cx = 1, 50,000, Therefore, Cx = Rs. 50/- (1, 50,000 / 3,000)

Therefore, Contribution per unit of X = Rs. 50

Fixed Cost of X = F1 = Rs. 90,000 (1,800 × 50)

Therefore, Contribution per unit of Y is Rs. 50 × 0.8 = Rs. 40 and

Fixed Cost of Y = F2 = Rs. 60,000 (1, 50,000 – 90,000)

The Value of F1 = Rs. 90,000, F2 = Rs. 60,000 and X = Rs. 50 and Y = Rs. 40

Question 24

Prisha Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	A	**B**	**C**
Sales Mix	**40%**	**35%**	**25%**
Selling Price	**Rs. 300**	**Rs. 400**	**Rs. 200**
Variable Cost	**Rs. 150**	**Rs. 200**	**Rs. 120**
Total Fixed Costs			**Rs. 18,00,000**
Total Sales			**Rs. 60,00,000**

The company has currently under discussion, a proposal to discontinue the manufacture of Product C and replace it with Product E, when the following results are anticipated:

	Products		
	A	B	C
Sales Mix	45%	30%	25%
Selling Price	Rs. 300	Rs. 400	Rs. 300
Variable Cost	Rs. 150	Rs. 200	Rs. 150
Total Fixed Costs			Rs. 18,00,000
Total Sales			Rs. 64,00,000

Required:

(i) CALCULATE the total contribution to sales ratio and present break-even sales at existing sales mix.

(ii) CALCULATE the total contribution to sales ratio and present break-even sales at proposed sales mix.

(iii) STATE whether the proposed sales mix is accepted or not?

(Study Material)

Answer 24

(i) Calculation of Contribution to sales ratio at existing sales mix:

	Products			Total
	A	B	C	

Selling Price (Rs.)	300	400	200	
Less: Variable Cost (Rs.)	150	200	120	
Contribution per unit (Rs.)	150	200	80	
P/V Ratio	50%	50%	40%	
Sales Mix	40%	35%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	20%	17.5%	10%	47.5%
Present Total Contribution (Rs. 60, 00,000 × 47.5%)				Rs. 28,50,000
Less: Fixed Costs				Rs. 18,00,000
Present Profit				Rs. 10,50,000
Present Break-Even Sales (Rs. 18,00,000/0.475)				Rs. 37,89,473.68

(ii) Calculation of Contribution to sales ratio at proposed sales mix:

	Products			**Total**
	A	**B**	**C**	
Selling Price (Rs.)	300	400	300	

Less: Variable Cost (Rs.)	150	200	150	
Contribution per unit (Rs.)	150	200	150	
P/V Ratio	50%	50%	50%	
Sales Mix	45%	30%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	22.5%	15%	12.5%	50%
Proposed Total Contribution (Rs. 64, 00,000 × 50%)				Rs. 32,00,000
Less: Fixed Costs				Rs. 18,00,000
Proposed Profit				Rs. 14,00,000
Proposed Break-Even Sales (Rs. 18,00,000/0.50)				Rs. 36,00,000

(iii) The proposed sales mix increases the total contribution to sales ratio from 47.5% to 50% and the total profit from Rs. 10, 50,000 to Rs. 14, 00,000.

Thus, the proposed sales mix should be accepted.

Question 25

A Korean beverage company plans to set up a subsidiary in India to manufacture fruit juice. Based on projected annual sales of 40,000 bottles, cost analysis has provided the following estimates for the Indian subsidiary:

	Total Annual Costs (Rs.)	Percentage of Total Annual Cost which is Variable
Material	**3,15,000**	**100%**
Labour	**1,40,000**	**75%**
Factory Overheads	**1,35,000**	**50%**
Administrative Overheads	**50,000**	**35%**

The fruit juice produced in India will be sold through manufacturer's representatives, who will earn a commission of 10% of the sales price.

Expenses from the Korean office will not be allocated to the Indian subsidiary.

Required

(i) COMPUTE the sale price per bottle to enable the management to realise an estimated 10% profit on sale proceeds in India.

(ii) CALCULATE the break-even point in Rupee sales and also in number of bottles for the Indian subsidiary on the assumption that the sale price is Rs. 19 per bottle.

(MTP Jan 2025)

Answer 25

(i) Computation of Sale Price per Bottle

Output: 40,000 Bottles

	(Rs.)
Variable Cost:	

Material	3,15,000
Labour (Rs.1, 40,000 × 75%)	1,05,000
Factory Overheads (Rs.1, 35,000 × 50%)	67,500
Administrative Overheads (Rs.50, 000 × 35%)	17,500
Commission (10% on Rs.8,00,000) (W.N.-1)	80,000
Fixed Cost:	
Labour (Rs.1, 40,000 × 25%)	35,000
Factory Overheads (Rs.1, 35,000 × 50%)	67,500
Administrative Overheads (Rs.50,000 × 65%)	32,500
Total Cost	7,20,000
Profit (W.N.-1)	80,000
Sales Proceeds (W.N.-1)	8,00,000
Sales Price per bottle$\left(\frac{\text{Rs.8,00,000}}{\text{40,000 Bottles}}\right)$	20

ii) Calculation of Break-even Point

Sales Price per Bottle = Rs.19

Variable Cost per Bottle = $\frac{\text{Rs.5,85,000(W.N.}-2)}{\text{40,000 Bottles}}$ = Rs.14.625

Contribution per Bottle = Rs.19 − Rs.14.625 = Rs.4.375

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Break -even Point (in number of Bottles) = $\frac{\text{Fixed Costs}}{\text{Contribution per Bottle}}$

= $\frac{\text{Rs.1,35,000}}{\text{Rs.4,375}}$ = 30,857 Bottles

Break- even Point (in Sales Value) = 30,857 Bottles × Rs.19 = Rs.5, 86,285/-

Working Note

W.N.-1

Let the Sales Price be 'x'

Commission = $\frac{10x}{100}$

Profit = $\frac{10x}{100}$

x = 6, 40,000+$\frac{10x}{100} + \frac{10x}{100}$

100x - 10x - 10x = 6, 40, 00,000

80x = 6, 40, 00,000

x = 6, 40, 00,000 / 80

= Rs.8, 00,000

W.N.-2

Total Variable Cost

	(Rs.)
Material	3,15,000
Labour	1,05,000

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Factory Overheads	67,500
Administrative Overheads	17,500
Commission [(40,000 Bottles x Rs.20) x 10%]	80,000
Total	5,85,000

Question 26

XYZ Ltd. is a company involved in production and construction specialised equipment and machines on the demand of customers. The company received an order for construction of a specialised machine, it had nearly completed this job relating to construction of a specialised machine, when it discovered that the customer had gone out of business. At this stage, the position of the job was as under:

	(Rs.)
Original cost estimate	**27,50,000**
Costs incurred so far	**24,80,000**
Costs to be incurred	**3,70,000**
Progress payment received from original customer	**15,50,000**

After searches, a new customer for the machine has been found. He is interested to take the machine, if certain modifications are carried out. The new customer wanted the machine in its original condition, but without its AI device and with certain other modifications. The costs of these additions and modifications are estimated as under:

Direct Materials (at cost)	**Rs. 1,05,000**
Direct Wages Dept.: X	**35 men days**
Dept.: Y	**55 men days**
Variable Overheads	**30% of Direct Wages in each Dept.**
Delivery Costs	**Rs. 15,500**

Fixed overheads will be absorbed at 50% of direct wages in each department.

The following additional information is available:

(1) The direct materials required for the modification are in stock and if not used for modification of this order, they will be used in another job in place of materials that will now cost Rs.1, 50,000.

(2) Department X is working normally and hence any engagement of labour will have to be paid at the direct wage rate of Rs. 1,000 per man day.

(3) Department Y is extremely busy. Its direct wages rate is Rs. 1,200 per man day and it is currently yielding a contribution of Rs. 3 per rupee of direct wages.

(4) Additional supervisory required for the modification cost Rs. 80,000.

(5) The cost of the AI device that the new customer does not require is Rs. 1, 35,000. If it is taken out, it can be used in another job in place of a different mechanism. The latter mechanism has otherwise to be bought for Rs. 1, 05,000. The dismantling and removal of the control mechanism will take 5 man day in department X.

(6) If the conversion is not carried out, some of the materials in the original machine can be used in another contract in place of materials that would have cost Rs. 2, 00,000. It would have taken 5 men days of work in department X to make them suitable for this purpose.

The remaining materials will realize Rs. 1, 50,000 as scrap. The drawings, which are included as part for the job can he sold for Rs. 45,000.

You are required to CALCULATE the minimum price, which the company can afford to quote for the new customer as staled above.

(RTP Jan 2025)

Answer 26

Statement of Minimum Price Which the Company Can Afford to Quote for the New Customer

	(Rs.)	**(Rs.)**
Cost to be incurred to bring the machine in its original condition		3,70,000
Direct Material (Replacement Value)		1,50,000
Direct Wages		
Dept. X: (35 men days × Rs. 1,000)	35,000	
Dept. Y: (55 men days × Rs. 1,200)	66,000	
Opportunity Cost of Contribution Lost by Dept. Y (Rs.66,000 × Rs.3)	1,98,000	2,99,000
Variable Overheads [30%×(Rs.35,000+Rs. 66,000)]		30,300
Delivery Costs		15,500
Additional Supervisory required for modification		80,000

Saving Due to Alternative Use of AI Device		
Bought Out Price	1,05,000	
Less: Dismantling & Removal Cost (5 men day × Rs.1,000)	5,000	
Less: Variable Cost (30% × Rs. 5,000)	1,500	(98,500)
Net Loss on Material Cost Savings (W.N.)		1,93,500
Opportunity Cost of Remaining Materials which can be sold as scrap		1,50,000
Opportunity Cost of Sale of Drawings		45,000
Total Minimum Price which may be quoted		12,34,800

Working Note

	(Rs.)
Loss on Material Cost Saving of Machine	2,00,000
Less: Conversion Cost (5 men days × Rs.1,000)	5,000
Less: Variable Cost (30% × Rs.5,000)	1,500
Net Loss on Material Cost Saving of Machine	1,93,500

Question 27

Gourmet Food Products is a new entrant in the market for chocolates. It has introduced a new product—Sweetee. This is a small rectangular chocolate bar. The bars are wrapped in aluminium foil and packed in attractive cartons containing 50 bars. A carton, is therefore, considered the basic sales unit. Although management had made detailed estimates of costs and volumes prior to undertaking this venture, new projections based on actual cost experience are now required.

Income Statements for the last two quarters are each thought to be representative of the costs and productive efficiency we can expected in the next few quarter. There were virtually no inventories on hand at the end of each quarter. The income statements reveal the following:–

	First Quarter (Rs.)	Second Quarter (Rs.)
Sales :		
50,000 × Rs. 24	12,00,000	—
70,000 × Rs. 24	—	16,80,000
Less: Cost of Goods Sold	7,00,000	8,80,000
Gross Margin	5,00,000	8,00,000
Less: Selling and Administration	6,50,000	6,90,000
Net Income / (Loss) before Taxes	(1,50,000)	1,10,000
Less: Tax	(60,000)	44,000
Net Income / (Loss)	(90,000)	66,000

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The firm's overall marginal and average income tax rate is 40%. This 40% figure has been used to estimate the tax liability arising from the chocolate operations.

REQUIRED:

(a) Management would like to know the breakeven point in terms of quarterly carton sales for the chocolates.

(b) Management estimates that there is an investment of Rs. 30, 00,000 in this product line. What quarterly carton sales and total revenue are required in each quarter to earn an after tax return of 20% per annum on investment?

(c) The firm's marketing people predict that if the selling price is reduced by Rs. 1.50 per carton (Rs. 0.03 off per chocolate bar) and a Rs. 1, 50,000 advertising campaign among school children is mounted, sales will increase by 20% over the second quarter sales. Should the plan be implemented?

(RTP May 2025)

Answer 27

(a) Estimation of the Fixed and Variable Costs.

Variable Manufacturing Cost per carton:

$$= \frac{\text{Change in Costs}}{\text{Change in Activity}}$$

$$= \frac{\text{Rs.8,80,000} - \text{Rs.7,00,000}}{70{,}000 - 50{,}000} = \frac{\text{Rs.1,80,000}}{20{,}000} = \text{Rs. 9 per carton}$$

Fixed Manufacturing Costs:

Costs of Goods Sold = Fixed Manufacturing Cost + Variable Manufacturing Cost

Rs. 7, 00,000 = Fixed Manufacturing Cost + (50,000 Cartons × Rs.9)

Fixed Manufacturing Cost = Rs.7, 00,000 – Rs.4, 50,000 = Rs.2, 50,000

Variable Selling and Administration Cost per unit:

$= \frac{Rs.6,90,000 - Rs.6,50,000}{70,000 - 50,000} = \frac{Rs.40,000}{20,000}$ = Rs. 2 per unit

Fixed Selling & Administration Costs:

Total Selling & Admn. Costs = Fixed Selling & Admn. Cost + Variable Selling & Admn. Costs

Rs.6, 50,000 = Fixed Selling & Admn. Costs + (50,000 Cartons × Rs. 2)

Fixed Selling & Admn. Cost = Rs.6, 50,000 – Rs.1, 00,000 = Rs.5, 50,000

So the Total Variable Costs per unit are Rs. 11 per unit (Rs. 9 + Rs. 2).

Total Fixed Costs are Rs.8, 00,000 per quarter (Rs. 2, 50,000 + Rs. 5, 50,000).

Given Sale Price of Rs.24 per carton and Variable Costs of Rs. 11 per carton, the Contribution per carton is Rs. 13 (Rs. 24 – Rs. 11).

Breakeven Point (in terms of carton units)

$= \frac{Fixed cost (per quarter)}{Contribution\ per\ Carton} = \frac{Rs.8,00,000}{Rs.13}$ = = 61,539 Cartons

(b) To earn an After Tax Return of 20% on Rs.30,00,000, the Desired Annual After Tax Net Income is Rs.6,00,000 (Rs.30,00,000 × 20%). The Quarterly after Tax Net Income will be Rs.1, 50,000. Given the Tax Rate of 40%, the Pre-tax Return will be Rs. 2, 50,000 (Rs. 1, 50,000 × 100/60).

Quarterly Sales (units) == $\frac{Fixed\ cost + Desired\ Return}{Contribution\ per\ unit}$

$= \frac{Rs.8,00,000 + 25,000}{Rs.13} = \frac{Rs.10,50,000}{Rs.13}$ = 80,769 Cartons

Quarterly Sales Revenue = Rs.19, 38,456 (80,769 Cartons × Rs. 24)

(c) The proposal involves reducing Selling Price from Rs.24 per carton to Rs. 22.50 per carton. Hence the Contribution per carton will be Rs. 11.50 (Rs.22.50 – Rs.11.00).

The increase in Advertising Costs will push Fixed Costs up by Rs.1, 50,000 to Rs.9,50,000.

A 20% increase over second quarter's Sales would increase Sales form 70,000 cartons to 84,000 cartons.

The Expected Earnings Before Taxes will be Rs. 16,000 [(84,000 Cartons × Rs. 11.50) – Rs. 9, 50,000].

After deducting Tax at 40%, the Net Income will be Rs.9,600 (Rs. 16,000 – Rs. 6,400).

Earning has reduced from Rs. 66,000 to Rs. 9,600, accordingly this plan should not be implemented.

Question 28

Ms. Gauri has the business of selling pens. She has setup this pen retailing for over 10 years with good profit volume ratio. Her average cost from the retailing is Rs. 11.25 per unit if she sells 16,000 units and is Rs. 11 per unit if she sells 20,000 units.

For the current month, she also charged Rs. 5,000 towards depreciation and the rental payment due.

The excess of sales revenue over the variable costs is Rs. 3.333 per unit.

You are required to CALCULATE Break-even Point (in units), Cash Break-even Point (in units) and Profit Volume Ratio.

(a) Break-even Point- 6,000 units, Cash Break-even Point- 6,000 units and Profit Volume Ratio- 33.33%

(b) Break-even Point- 6,000 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 25%

(c) Break-even Point- 4,500 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 33.33%

(d) Break-even Point- 4,500 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 25%

Ans: (b) Break-even Point- 6,000 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 25%

Variable cost per unit = $\frac{\text{Change in Total Cost}}{\text{Change in units}}$

= $\left(\frac{(\text{Rs.}11 \times 20{,}000 \text{ units}) - (\text{Rs.}11.25 \times 16{,}000 \text{ units})}{20{,}000 \text{ units} - 16{,}000 \text{ units}}\right)$

= $\left(\frac{\text{Rs.}2{,}20{,}000 - \text{Rs.}1{,}80{,}000}{4{,}000 \text{ units}}\right)$ = Rs.10

Fixed cost = Total Cost – Variable cost (at 20,000 units level)

= (Rs. 11 x 20,000 units) – (Rs. 10 x 20,000 units)

= Rs. 20,000

(i) Break-even Point (in units) = $\left(\frac{\text{Fixed Costs}}{\text{Contribution per unit}*}\right)$

= $\left(\frac{\text{Rs.}20{,}000}{\text{Rs.}3.333}\right)$ = 6,000 units

* Contribution is the excess of sales revenue over the variable costs.

(ii) Cash Break-even Point (in units) =$\left(\frac{\text{Cash Fixed Costs}**}{\text{Contribution per unit}}\right)$

=$\left(\frac{\text{Rs.}20{,}000 - \text{Rs.}5{,}000}{\text{Rs.}3.333}\right)$ = 4,500 units

** Depreciation and other non-cash fixed costs are excluded from the fixed costs to compute cash break-even point.

(ii) P/V Ratio = $\left(\frac{\text{Contribution per unit}}{\text{Sale Price per unit}}\right)$

= $\left(\frac{\text{Rs.}3.333}{\text{Rs.}10 + \text{Rs.}3.333}\right)$ =25%

Question 29

PR Ltd. sells two types of pen, ball pen and gel pen. Currently, the company is expecting to sell 6,000 units of ball pen along with 3,600 units of gel pen in the coming month. Other information as forecasted is provided below:

Particulars	Ball pen	Gel pen
Selling price (per unit)	**Rs. 150**	**Rs. 100**
Variable cost (per unit)	**Rs. 90**	**Rs. 60**
Contribution (per unit)	**Rs. 60**	**Rs. 40**
Fixed Costs		**Rs. 3,36,000**

You are required to CALCULATE the Composite Break-even Batch and individual break-even of the pens (in units).

(a) Composite Break-even Batch- 6,400 batches, Break-even units of Ball pen- 4,000 units, Break-even units of Gel pen- 2,400 units.

(b) Composite Break-even Batch- 800 batches, Break-even units of Ball pen- 500 units, Break-even units of Gel pen- 300 units.

(c) Composite Break-even Batch- 800 batches, Break-even units of Ball pen- 4,000 units, Break-even units of Gel pen- 2,400 units.

(d) Composite Break-even Batch- 6,400 batches, Break-even units of Ball pen- 500 units, Break-even units of Gel pen- 300 units.

(RTP May 2025)

Ans: (c) Composite Break-even Batch- 800 batches, Break-even units of Ball pen- 4,000 units, Break-even units of Gel pen- 2,400 units.

PR Ltd. is expecting to sell 6,000 units of ball pen along with 3,600 units of gel pen, resulting in a sales mix of 5:3 per batch.

Thus, composite contribution per batch = (Rs. 60 x 5 ball pens) + (Rs. 40 x 3 gel pens) = Rs. 420

Composite Break-even Batch = $\left(\frac{\text{Commom fixed costs}}{\text{Composite contribution per batch}}\right)$

$=\left(\frac{\text{Rs.3,36,000}}{\text{Rs.420}}\right)$ = 800 batches

Break-even units of Ball pen = 800 x 5= 4,000 units

Break-even units of Gel pen = 800 x 3= 2,400 units

Question 30

A company's sales could decrease by 50% before it starts incurring losses. And, for every Re. 1 of sales, it can contribute 40 paise towards fixed costs and generating profit. For the current year, the company's fixed cost amounts to Rs.5, 00,000.

CALCULATE the Projected sales.

(a) Rs.10, 00,000

(b) Rs.12, 50,000

(c) Rs.20, 83,333

(d) Rs.25, 00,000

(RTP Sep. 2025)

Ans: (d) Rs.25, 00,000

Margin of Safety = 50%

P/V ratio = 40%

Fixed Cost = Rs. 5,00,000

Break-even Sales (BES) $= \frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{\text{Rs.5,00,000}}{0.40}$

BES = Rs. 12,50,000

Margin of Safety = Projected sales(S) – Break Even Sales(BES)

S = BES + Margin of Safety

S = Rs.12, 50,000 + (0.50 x S)

Or, S – 0.50S = Rs.12, 50,000

Or, S = Rs.25, 00,000

Topic 5 Margin of Safety (MOS)

Question 31

WRITE a short note on Margin of Safety.

(Study Material)

Answer 31

MARGIN OF SAFETY

The margin of safety can be defined as the difference between the expected level of sale and the breakeven sales. The larger the margin of safety, the higher is the chances of making profits. In the Example-3 if the forecast sale is 1,700 units per month, the margin of safety can be calculated as follows,

Margin of Safety = Projected sales – Breakeven sales

= 1,700 units – 1,000 units

= 700 units or 41% of sales.

The Margin of Safety can also be calculated by identifying the difference between the projected sales and breakeven sales in units multiplied by the contribution per unit. This is possible because, at the breakeven point all the fixed costs are recovered and any further contribution goes into the making of profits. It also can be calculated as:

Margin of Safety = $\frac{\text{Profit}}{\frac{\text{P}}{\text{V}}\text{ Ratio}}$

Question 32

A single product company sells its product at Rs. 60 per unit. In 2021-22, the company operated at a margin of safety of 40%. The fixed costs amounted to Rs. 3, 60,000 and the variable cost ratio to sales was 80%.

In 2022-23, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

(i) FIND the selling price required to be fixed in 2022-23 to earn the same P/V ratio as in 2021-22.

(ii) Assuming the same selling price of Rs. 60 per unit in 2022-23, FIND the number of units required to be produced and sold to earn the same profit as in 2021-22.

(Study Material)

Answer 32

(i) Profit earned in 2021-22:

Particulars	**(Rs.)**

Total contribution (50,000 × Rs. 12)	6,00,000
Less: Fixed cost	3,60,000
Profit	2,40,000
Selling price to be fixed in 2022-23:	
Revised variable cost (Rs. 48 × 1.10)	52.80
Revised fixed cost (3,60,000 × 1.05)	3,78,000
P/V Ratio (Same as of 2021-22)	20%
Variable cost ratio to selling price	80%

Therefore, revised selling price per unit = Rs. 52.80 ÷ 80% = Rs. 66

(ii) No. of units to be produced and sold in 2022-23 to earn the same profit:

We know that Fixed Cost plus profit = Contribution

	(Rs.)
Profit in 2021-22	2,40,000
Fixed cost in 2022-23	3,78,000
Desired contribution in 2022-23	6,18,000

Contribution per unit = Selling price per unit – Variable cost per unit.

= Rs. 60 – Rs. 52.80 = Rs. 7.20.

No. of units to be produced in 2022-23 = Rs. 6, 18,000 ÷ Rs. 7.20 = 85,834 units.

Workings:

1. PV Ratio in 2021-22

	(Rs.)
Selling price per unit	60
Variable cost (80% of Selling Price)	48
Contribution	12
P/V Ratio	20%

2. No. of units sold in 2021-22

Break-even point = Fixed cost ÷ Contribution per unit

= Rs. 3, 60,000 ÷ Rs. 12 = 30,000 units.

Margin of safety is 40%. Therefore, break-even sales will be 60% of units sold.

No. of units sold = Break-even point in units ÷ 60%

= 30,000 ÷ 60% = 50,000 units.

Topic 6 Application in Decision Making

Question 33

M/s Gaurav Private Limited is manufacturing and selling two products: 'BLACK' and 'WHITE' at selling price of Rs. 20 and Rs. 30 respectively. The following sales strategy has been outlined for the financial year 2019-20:

(i) Sales planned for the year will be Rs. 81, 00,000 in the case of 'BLACK' and Rs. 54, 00,000 in the case of 'WHITE'.

(ii) The selling price of 'BLACK' will be reduced by 10% and that of 'WHITE' by 20%.

(iii) Break-even is planned at 70% of the total sales of each product.

(iv) Profit for the year to be maintained at Rs. 8,26,200 in the case of 'BLACK' and Rs. 7,45,200 in the case of 'WHITE'. This would be possible by reducing the present annual fixed cost of Rs. 42,00,000 allocated as Rs. 22,00,000 to 'BLACK' and Rs. 20,00,000 to 'WHITE'

You are required to calculate:

(i) Number of units to be sold of 'BLACK' and 'WHITE' to Break even during the financial year 2019- 20.

(ii) Amount of reduction in fixed cost product-wise to achieve desired profit mentioned at (iv)above.

(PYP May '19)

Answer 33

(i) Statement showing Break Even Sales		
Particulars	**Black**	**White**
Sales Planned	81,00,000	54,00,000
Selling Price (Rs.)	18	24
Number of Units to be sold	4,50,000	2,25,000
Break Even sales (in Units),70% of total sales	3,15,000	1,57,500

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Or		
Break even sales(in Rs.),70%oftotalsales	56,70,000	37,80,000
(ii) Statement Showing Fixed Cost Reduction		
Profit to be maintained (Rs.)	8,26,200	7,45,200
Margin of Safety (70% of Sales) (Rs.)	24,30,000	16,20,000
PVR (Profit/ Margin of Safety) x 100	34%	46%
Contribution (Sales x 34% or 46%) (Rs.)	27,54,000	24,84,000
Less: Profit (Rs.)	8,26,200	7,45,200
Revised Fixed Cost (Rs.)	19,27,800	17,38,800
Present Fixed Cost (Rs.)	22,00,000	20,00,000
Reduction in Fixed Cost	2,72,200	2,61,200

Important Note:-

This was a numerical question on 'Marginal Costing'. Examinees easily calculated the BEP, but failed to calculate the reduction in fixed cost, due to lack of conceptual clarity on this topic. The performance in this sub part the question was below Average.

Question 34

Differentiate between "Marginal and Absorption Costing".

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(PYP Nov 20)

Answer 34

Difference between Marginal costing and Absorption costing

S.No.	Marginal costing	Absorption costing
1.	Only variable costs are considered for product costing and inventory valuation.	Both fixed and variable costs are considered for product costing and inventory valuation.
2.	Fixed costs are regarded as period costs. The Profitability of different products is judged by their P/V ratio.	Fixed costs are charged to the cost of production. Each product bears a reasonable share of fixed cost and thus the profitability of a product is influenced by the apportionment of fixed costs.
3.	Cost data presented highlight the total contribution of each product.	Cost data are presented in conventional pattern. Net profit of each product is determined after subtracting fixed cost along with their variable costs.
4.	The difference in the magnitude of opening stock and closing stock does not affect the unit cost of production.	The difference in the magnitude of opening stock and closing stock affects the unit cost of production due to the impact of related fixed cost.
5.	In case of marginal costing the cost per unit remains the same, irrespective of the production as it is valued at variable cost.	In case of absorption costing the cost per unit reduces, as the production increases as it is fixed cost which reduces, whereas, the variable cost remains the same per unit.

Question 35

UV Limited started a manufacturing unit from 1st October 2021. It produces designer lamps and sells its lamps at Rs. 450 per unit. During the quarter ending on 31st December, 2021, it produced and sold 12,000 units and suffered a loss of Rs. 35 per unit. During the quarter ending on 31st March, 2022, it produced and sold 30,000 units and earned a profit of Rs. 40 per unit.

You are required to calculate:

(i) Total fixed cost incurred by UV ltd. per quarter.

(ii) Break Even sales value (in rupees)

Calculate Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30th June, 2022).

(PYP May'22)

Answer 35

	Quarter ending 31st December, 2021 (Rs.)	Quarter ending 31st March, 2022(Rs.)
Sales (No. of units sold x Rs. 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000)	12,00,000
	[12,000 × 35]	[30,000 × 40]

P/V Ratio=$\frac{\text{Change in Profit}}{\text{Change in Sales}}$ × 100

$\therefore \frac{16,20,000}{81,00,000}$ × 100=20%

(i) Fixed Cost = Sales × P/V ratio – profit

= Rs. 1, 35, 00,000 × 20% – 12, 00,000

= Rs. 15, 00,000

Alternative Presentation for the calculation of Fixed cost

	Quarter ending 31stDecember, 2021(Rs.)	Quarter ending 31st March, 2022(Rs.)
Sales (No. of units sold x Rs. 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000) [12,000 × 35]	12,00,000 [30,000 × 40]
Total cost	58,20,000	1,23,00,000

VC per unit = (1, 23, 00,000 – 58, 20,000) / (30,000 – 12,000)

= 64, 80,000 / 18,000 =Rs. 360 per unit

Fixed cost = TC – VC, 58, 20,000 (360 x12, 000 units) Rs.15, 00,000

$= \frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\ Ratio} \times 100 = \frac{15,00,000}{20\%}$ =Rs.75, 00,000

(i) Profit, if sales reach 50,000 units for the quarter ending 30th June, 2022

	(Rs.)
Sales (50,000 × Rs. 450)	2,25,00,000
Less: Variable cost	1,80,00,000

Contribution	45,00,000
Less: Fixed cost	15,00,000
Profit	30,00,000

Question 36

MNP Company Limited produces two products 'A' and 'B'. The relevant cost and sales data per unit of output is as follows.

Particulars	**Product A**	**Product B**
	(Rs.)	**(Rs.)**
Direct material	**55**	**60**
Direct labour	**35**	**45**
Variable factory overheads	**40**	**20**
Selling Price	**180**	**175**

The availability of machine hours is limited to 55,000 hours for the month. The monthly demand for product 'A' and product 'B' is 5,000 units and 6,000 units, respectively. The fixed expenses of the company are Rs.1, 40,000 per month. Variable factory overheads are Rs. 4 per machine hour. The company can produce both products according to the market demand.

Required:

Calculate the product mix that generates maximum profit for the company in the situation and also calculate profit of the company.

(PYP, May '23)

Answer 36

Particulars	**Product A**	**Product B**
	Rs.	**Rs.**
Selling Price Variable cost: Direct Material	180	175
Variable cost:		
Direct Material	55	60
Direct labour	35	45
Variable factory overheads	40	20
	130	125
Contribution	50	50
Machine hour (p.u.)	10	5
Contribution per hour	5	10
Rank	II	I

Calculation of Product Mix

Hours available	55,000
Product B (6000 x 5)	30,000
Balance Hours	25,000
Product A (2500 x 10)	25,000
Balance Hours	0

Calculation of Profit

		Rs.
Contribution		
A	2500 units x 50	
B	6000 units x 50	4,25,000
Less:	Fixed cost	(1,40,000)
	Profit	2,85,000

Theoretical Questions

Question 37

EXPLAIN and ILLUSTRATE break-even point with the help of break-even chart.

(Study Material)

Answer 37

Break-even Point

The word contribution has been given its name because of the fact that it literally contributes towards the recovery of fixed costs and the making of profits. The contribution grows along with the sales revenue till the time it just covers the fixed cost. This is the point where neither profits nor losses have been made is known as a break-even point. This implies that in order to break even the amount of contribution generated should be exactly equal to the fixed costs incurred. Hence, if we know how much contribution is generated from each unit sold, we shall have sufficient information for computing the number of units to be sold in order to break even. Mathematically,

$$\text{Break-even point in units} = \frac{\text{Fixed Costs}}{\text{Contribution per Unit}}$$

ILLUSTRATE: ABC Ltd. manufacturing a single product, incurring variable costs of Rs. 300 per unit and fixed costs of Rs. 2, 00,000 per month. If the product sells for Rs. 500 per unit, the breakeven point shall be calculated as follows;

$$\text{Break- even point in units} = \frac{\text{Fixed Costs}}{\text{Contribution per Unit}} = \frac{\text{Rs.2,00,000}}{\text{Rs.200}} = 1{,}000 \text{ units}$$

$$\text{Break- even points (in Value)} = \frac{\text{Total Fixed Costs}}{\text{Contribution}} \times \text{Sales}$$

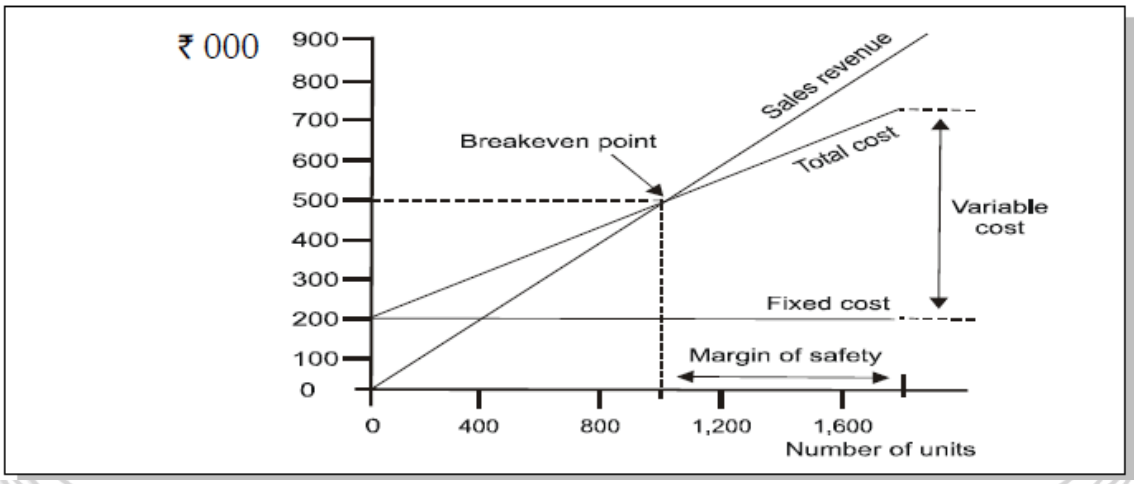
$$\text{Break- even point (in Value)} = \frac{\text{Total Fixed Costs}}{\text{P/V Ratio}}$$

Break-even Chart

A breakeven chart records costs and revenues on the vertical axis and the level of activity on the horizontal axis. The making of the breakeven chart would require you to select appropriate axes. Subsequently, you will need to mark costs/revenues on the Y axis whereas the level of activity shall be traced on the X axis. Lines representing (i) Fixed costs (horizontal line at Rs. 2, 00,000 for ABC Ltd), (ii) Total costs at maximum level of activity (joined to the Y-axis where the Fixed cost of Rs. 2, 00,000 is marked) and (iii) Revenue at maximum level of activity (joined to the origin) shall be drawn next.

The breakeven point is that point where the sales revenue line intersects the total cost line. Other measures like the margin of safety and profit can also be measured from the chart.

The breakeven chart for ABC Ltd (ILLUSTRATE) is drawn below



Question 38

WRITE a short note on Angle of Incidence.

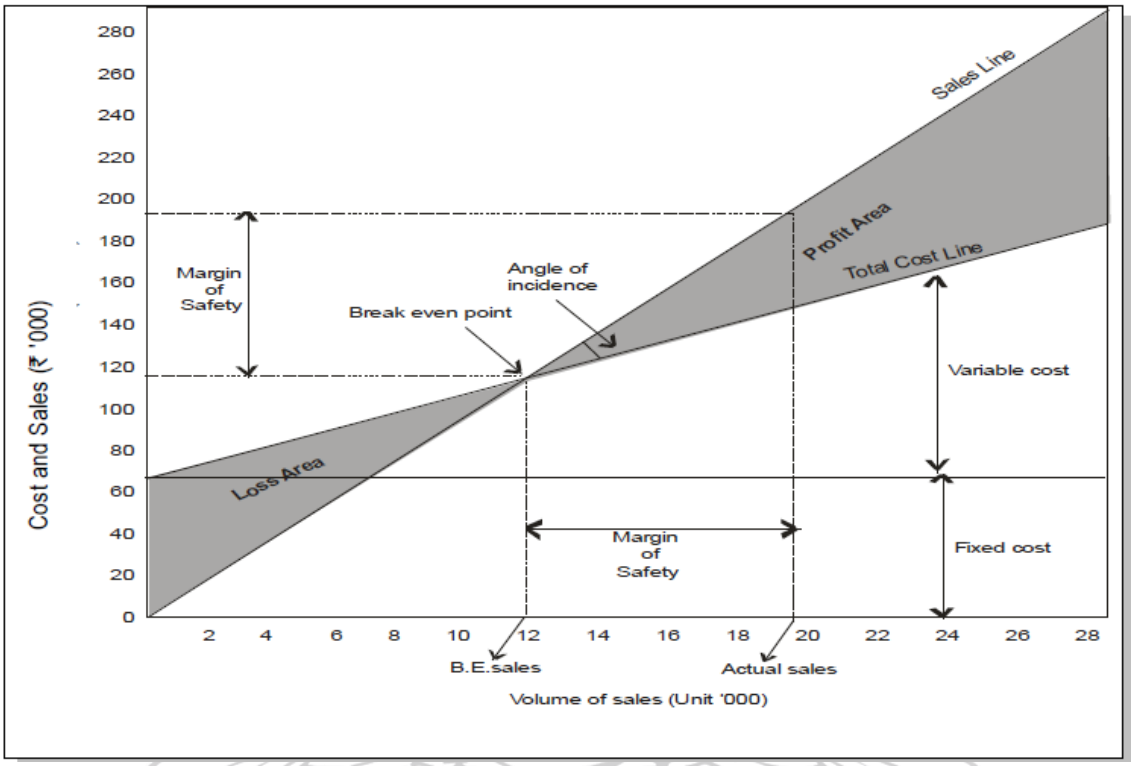
(Study Material)

Answer 38

ANGLE OF INCIDENCE

This angle is formed by the intersection of sales line and total cost line at the break-even point. This angle shows the rate at which profit is earned once the break-even point is reached. The wider the angle the greater is the rate of earning profits. A large angle of incidence with a high margin of safety indicates extremely favourable position.

The shaded area in the graph given below is representing the angle of incidence. The angle above and below the break-even point shows the rate of earning profitability (loss). Wider angle denotes higher rate of earnings and vice-versa.



Question 39

DISCUSS basic assumptions of Cost Volume Profit analysis.

(Study Material)

Answer 39

Meaning: It is a managerial tool showing the relationship between various ingredients of profit planning viz., cost, selling price and volume of activity. As the name suggests, cost volume profit (CVP) analysis is the analysis of three variables, cost, volume and profit. Such an analysis explores the relationship between costs, revenue, activity levels and the resulting profit. It aims at measuring variations in cost and volume.

Assumptions:

1. Changes in the levels of revenues and costs arise only because of changes in the number of product (or service) units produced and sold – for example, the number of television sets

produced and sold by Sony Corporation or the number of packages delivered by Overnight Express. The number of output units is the only revenue driver and the only cost driver. Just as a cost driver is any factor that affects costs, a revenue driver is a variable, such as volume, that causally affects revenues.

2. Total costs can be separated into two components; a fixed component that does not vary with output level and a variable component that changes with respect to output level. Furthermore, variable costs include both direct variable costs and indirect variable costs of a product. Similarly, fixed costs include both direct fixed costs and indirect fixed costs of a product

3. When represented graphically, the behaviours of total revenues and total costs are linear (meaning they can be represented as a straight line) in relation to output level within a relevant range (and time period).

4. Selling price, variable cost per unit, and total fixed costs (within a relevant range and time period) are known and constant.

5. The analysis either covers a single product or assumes that the proportion of different products when multiple products are sold will remain constant as the level of total units sold changes.

6. All revenues and costs can be added, subtracted, and compared without taking into account the time value of money. (Refer to the FM study material for a clear understanding of time value of money).

Question 40

DISCUSS the practical application of Marginal Costing.

(Study Material)

Answer 40

Practical Application of Marginal Costing.

Not a distinct method: Marginal costing is not a distinct method of costing like job costing, process costing, operating costing, etc., but a special technique used for managerial decision making. Marginal costing is used to provide a basis for the interpretation of cost data to measure the profitability of different products, processes and cost centres in the course of decision making. It can, therefore, be used in conjunction with the different methods of costing such as job costing, process costing, etc., or even with other techniques such as standard costing or budgetary control.

Cost Ascertainment: In marginal costing, cost ascertainment is made on the basis of the nature of cost. It gives consideration to behaviour of costs. In other words, the technique has developed from a particular conception and expression of the nature and behaviour of costs and their effect upon the profitability of an undertaking.

Decision Making: According to traditional or total cost method, as opposed to marginal costing, the classification of costs is based on functional basis. Under this method the total cost is the sum total of the cost of direct material, direct labour, direct expenses, manufacturing overheads, administration overheads, selling and distribution overheads. In this system, other things being equal, the total cost per unit will remain constant only when the level of output or mixture is the same from period to period. Since these factors are continually fluctuating, the actual total cost will vary from one period to another. Thus, it is possible for the costing department to say one day that an item cost Rs.20 and the next day it costs Rs.18. This situation arises because of changes in volume of output and the peculiar behavior of fixed expenses included in the total cost. Such fluctuating manufacturing activity, and consequently the variations in the total cost from period to period or even from day to day, poses a serious problem to the management in taking sound decisions. Hence, the application of marginal costing has been given wide recognition in the field of decision making.

Question 41

DISCUSS the points of difference between Absorption Costing and Marginal Costing.

Answer 41

Difference between Absorption Costing and Marginal Costing

	Marginal costing	Absorption costing
1.	Only variable costs are considered for product costing and inventory valuation.	Both fixed and variable costs are considered for product costing and inventory valuation.
2.	Fixed costs are regarded as period costs. The Profitability of different products is judged by their P/V ratio.	Fixed costs are charged to the cost of production. Each product bears a reasonable share of fixed cost and thus the profitability of a product is influenced by the apportionment of fixed costs.
3.	Cost data presented highlight the total contribution of each product.	Cost data are presented in conventional pattern. Net profit of each product is determined after subtracting fixed cost along with their variable costs.
4.	The difference in the magnitude of opening stock and closing stock does not affect the unit cost of production.	The difference in the magnitude of opening stock and closing stock affects the unit cost of production due to the impact of related fixed cost.
5.	In case of marginal costing the cost per unit remains the same, irrespective of the production as it is valued at variable cost.	In case of absorption costing the cost per unit reduces, as the production increases as it is fixed cost which reduces, whereas, the variable cost remains the same per unit.

Practical Problems

Question 42

If P/V ratio is 60% and the Marginal cost of the product is Rs. 20. CALCULATE the selling price?

(Study Material)

Answer 42

Variable Cost = 100 – P/V Ratio

= 100 – 60 = 40

If Variable cost is 40, then selling price = 100

If Variable cost is 20, then selling price = (100/40) × 20 = Rs. 50

Question 43

The ratio of variable cost to sales is 70%. The break-even point occurs at 60% of the capacity sales. Find the capacity sales when fixed costs are Rs. 90,000. Also COMPUTE profit at 75% of the capacity sales.

(Study Material)

Answer 43

Variable cost to sales = 70%, Contribution to sales = 30%,

Or P/V Ratio 30%

We know that: BES × P/V Ratio = Fixed Cost

BES × 0.30 = Rs. 90,000

Or BES = Rs. 3, 00,000

It is given that break-even occurs at 60% capacity.

Capacity sales = Rs. 3, 00,000 ÷ 0.60 = Rs. 5, 00,000

Computation of profit of 75% Capacity

75% of capacity sales (i.e. Rs. 5,00,000 × 0.75)	Rs. 3,75,000
Less: Variable cost (i.e. Rs. 3,75,000 × 0.70)	Rs. 2,62,500
	Rs. 1,12,500
Less: Fixed Cost	Rs. 90,000
Profit	Rs. 22,500

Question 44

You are required to-

	(Rs.)
(i) DETERMINE profit, when sales	**2,00,000**
Fixed Cost	**40,000**
BEP	**1,60,000**
(ii) DETERMINE sales, when fixed cost	**20,000**
Profit	**10,000**

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BEP	**40,000**

(Study Material)

Answer 44

(i) We know that: B.E. Sales × P/V Ratio = Fixed Cost

Or Rs. 1, 60,000 × P/V ratio = Rs. 40,000

P/V ratio = 25%

We also know that Sales × P/V Ratio = Fixed Cost + Profit

Or Rs. 2, 00,000 × 0.25 = Rs. 40,000 + Profit

Or Profit = Rs. 10,000

(ii) Again B.E. Sales × P/V ratio = Fixed Cost

Or Rs. 40,000 × P/V Ratio = Rs. 20,000

Or P/V ratio = 50%

We also know that: Sales × P/V ratio = Fixed Cost + Profit

Or Sales × 0.50 = Rs. 20,000 + Rs. 10,000

Or Sales = Rs. 60,000.

Question 45

A company hamade a profit of Rs. 50,000 during the year. If the selling price and marginal cost of the product are Rs. 15 and Rs. 12 per unit respectively, FIND OUT the amount of margin of safety.

(Study Material)

Answer 45

P/V Ratio=$\frac{\text{Contribution}}{\text{Sales}}$ × 100

= [(15 – 12)/15] × 100

= (3/15) x 100 = 20%

Marginal of Safety = Profit ÷ P/V Ratio

= 50,000 ÷ 20% = Rs. 2, 50,000

Question 46

(a) If margin of safety is Rs. 2, 40,000 (40% of sales) and P/V ratio is 30% of AB Ltd, CALCULATE its (1) Break even sales, and (2) Amount of profit on sales of Rs. 9, 00,000.

(b) X Ltd. has earned a contribution of Rs. 2, 00,000 and net profit of Rs.1, 50,000 of sales of Rs. 8, 00,000. What is its margin of safety?

(Study Material)

Answer 46

(a) Total Sales = 2, 40,000 × $\frac{100}{40}$ = Rs. 6, 00,000

Contribution = 6, 00,000 × 30% = Rs. 1, 80,000

Profit = M/S × P/V ratio = 2, 40,000 × 30% = Rs. 72,000

Fixed cost = Contribution – Profit

= 1, 80,000 – 72,000 = Rs. 1, 08,000

(1) Break-even Sales = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{Ratio}}$ == $\frac{1,08,000}{30\%}$ =Rs. 3, 60,000

(2) Profit = (Sales × P/V ratio) – Fixed cost

= (9, 00,000 × 30%) – 1, 08,000 = Rs. 1, 62,000

(b) P/V ratio = $\frac{\text{Contribution}}{\text{Sales}} = \frac{2,00,000}{8,00,000}$ =25%

Margin of safety = $\frac{\text{Profit}}{\frac{\text{P}}{\text{V}}\text{ Ratio}} = \frac{1,50,000}{25\%}$ = Rs. 6, 00,000

Alternatively:

Fixed cost = Contribution – Profit

= Rs. 2, 00,000 – Rs.1, 50,000 = Rs. 50,000

B.E. Point = Rs. 50,000 ÷ 25% = Rs. 2, 00,000

Margin of Safety = Actual sales – B.E. sales

= 8, 00,000 – 2, 00,000 = 6, 00,000

Question 47

A company sells its product at Rs. 15 per unit. In a period, if it produces and sells 8,000 units, it incurs a loss of Rs. 5 per unit. If the volume is raised to 20,000 units, it earns a profit of Rs. 4 per unit. CALCULATE break-even point both in terms of Value as well as in units.

(Study Material)

Answer 47

We know that S – V = F + P

∴ Suppose variable cost = x, Fixed Cost = y

In first situation:

15 × 8,000 - 8,000 x = y – 40,000 (1)

In second situation:

15 × 20,000 - 20,000 x = y + 80,000 (2)

Or, 1, 20,000 – 8,000 x = y – 40,000 (3)

3, 00,000 – 20,000 x = y + 80,000 (4)

From (3) & (4) we get x = Rs. 5, Variable cost per unit = Rs. 5

Putting this value in 3rd equation:

1, 20,000 – (8,000 × 5) = y – 40,000

Or, y = Rs. 1, 20,000

Fixed Cost = Rs. 1, 20,000

P/V ratio = $\frac{S-V}{S} = \frac{15-5}{15} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%$

Suppose break-even sales = x

15x – 5x = 1, 20,000 (at BEP, contribution will be equal to fixed cost)

x = 12,000 units.

Or, Break-even sales in units = 12,000, Break-even sales in Value

= 12,000 × 15 = Rs.1, 80,000.

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Question 48

You are given the following data:

	Sales	**Profit**
Year 2021-22	**Rs. 1,20,000**	**8,000**

Year 2022-23	**Rs. 1,40,000**	**13,000**

FIND OUT –

(i) P/V ratio,

(ii) B.E. Point,

(iii) Profit when sales are Rs. 1, 80,000,

(iv) Sales required earn a profit of Rs. 12,000,

(v) Margin of safety in year 2022-23.

(Study Material)

Answer 48

	Sales	**Profit**
Year 2021-22	Rs. 1,20,000	8,000
Year 2022-23	Rs. 1,40,000	13,000
Difference	Rs. 20,000	5,000

(i) P/V Ratio = $\frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{5,000}{20,000} \times 100 = 25\%$

	(Rs.)
Contribution in 2021-22 (1, 20,000 × 25%)	30,000
Less: Profit	8,000
Fixed Cost*	22,000

*Contribution = Fixed cost + Profit

∴ Fixed cost = Contribution - Profit

(ii) Break-even point = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{22,000}{25\%}$ =Rs. 88,000

(iii) Profit when sales are Rs.1,80,000	(Rs.)
Contribution (Rs.1, 80,000 × 25%)	45,000
Less: Fixed Cost	22,000
Profit	23,000

(iv) Sales to earn a profit of Rs.12, 000

$=\frac{\text{Fixed Cost+Desired Profit}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{22,000+12,000}{25\%}$ = Rs.1, 36,000

(v) Margin of safety in 2022-23

Margin of safety = Actual sales – Break-even sales

= 1, 40,000 – 88,000 = Rs. 52,000.

Question 49

The product mix of a Gama Ltd. is as under:

	Products	
	M	**N**
Units	**54,000**	**18,000**

Selling price	**Rs. 7.50**	**Rs. 15.00**
Variable cost	**Rs. 6.00**	**Rs. 4.50**

FIND the break-even points in units, if the company discontinues product 'M' and replace with product 'O'. The quantity of product 'O' is 9,000 units and its selling price and variable costs respectively are Rs. 18 and Rs. 9. Fixed Cost is Rs. 15,000.

(Study Material)

Answer 49

N = 18,000 units

O = 9,000 units

Ratio (N: O) = 2:1

Let

t = No. of units of 'O' for BEP

2t = No. of units of 'N' for BEP

Contribution of 'N' = Rs. 10.5 per unit

Contribution of 'O' = Rs. 9 per unit

At Break Even Point:

10.5 x (2t) + 9 x t -15,000 = 0

30t = 15,000

t = 500 units

BEP of 'N' = 2t

= 1,000 units

BEP of 'O' = t = 500 units

Question 50

Mr. X has Rs. 2, 00,000 investments in his business firm. He wants a 15 per cent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 per cent of sales, his fixed costs are Rs. 80,000 per year. Show COMPUTATIONS to answer the following questions:

(i) What sales volume must be obtained to break even?

(ii) What sales volume must be obtained to get 15 per cent return on investment?

(iii) Mr. X estimates that even if he closed the doors of his business, he would incur Rs. 25,000 as expenses per year. At what sales would he be better off by locking his business up?

(Study Material)

Answer 50

Particulars	**(Rs.)**
Suppose sales	100
Variable cost	60
Contribution	40
P/V ratio	40%
Fixed cost	= Rs. 80,000

(i) Break-even point = Fixed Cost ÷ P/V ratio =80,000 ÷ 40% or Rs. 2,00,000	
(ii) 15% return on Rs. 2,00,000	30,000
Fixed Cost	80,000
Contribution required	1,10,000
Sales volume required = Rs. 1,10,000 ÷ 40% or Rs. 2,75,000	
(iii) Avoidable fixed cost if business is locked up = Rs. 80,000 - Rs. 25,000 = Rs. 55,000	
Minimum sales required to meet this cost: Rs. 55,000 ÷ 40% or Rs. 1,37,500	

Mr. X will be better off by locking his business up, if the sale is less than Rs. 1, 37,500

Question 51

A company had incurred fixed expenses of Rs. 4, 50,000, with sales of Rs. 15, 00,000 and earned a profit of Rs. 3, 00,000 during the first half year. In the second half, it suffered a loss of Rs. 1, 50,000.

CALCULATE:

(i) The profit-volume ratio, break-even point and margin of safety for the first half year.

(ii) Expected sales volume for the second half year assuming that selling price and fixed expenses remained unchanged during the second half year.

(iii) The break-even point and margin of safety for the whole year.

(Study Material)

Answer 51

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(i) In the First half year:

Contribution = Fixed cost + Profit

= 4, 50,000 + 3, 00,000 = Rs. 7, 50,000

P/V ratio = $\frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{7,50,000}{15,00,000} \times 100 = 50\%$

Break-even point = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{4,50,000}{50\%} \times 100$ = Rs. 9, 00,000

Margin of safety = Actual sales – Break-even point

= 15, 00,000 – 9, 00,000 = Rs. 6, 00,000

(ii) In the second half year:

Contribution = Fixed cost – Loss

= 4, 50,000 – 1, 50,000 = Rs. 3, 00,000

Expected sales volume = $\frac{\text{Fixed Cost} - \text{Loss}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{3,00,000}{50\%}$ =Rs. 6, 00,000

(iii) For the whole year:

B.E. point = = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{4,50,000 \times 2}{50\%}$ = Rs.18, 00,000

Margin of safety = = $\frac{\text{Profit}}{\frac{\text{P}}{\text{V}}\text{Ratio}} = \frac{3,00,000 - 1,50,000}{50\%}$ =Rs. 3, 00,000

Question 52

A company has three factories situated in north, east and south with its Head Office in Mumbai. The management has received the following summary report on the operations of each factory for a period:

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	Sales		Profit	
	Actual	**Over/(Under) Budget**	**Actual**	**Over/(Under) Budget**
North	**1,100**	**(400)**	**135**	**(180)**
East	**1,450**	**150**	**210**	**90**
South	**1,200**	**(200)**	**330**	**(110)**

CALCULATE for each factory and for the company as a whole for the period:

(i) The fixed costs. (ii) Break-even sales.

(Study Material)

Answer 52

Calculation of P/V Ratio

(Rs.' 000)

	Sales	**Profit**
North : Actual	1,100	135
Add : Under budgeted	400	180
Budgeted	1,500	315

$$\text{P/V ratio} = \frac{\text{Difference in Profit}}{\text{Difference in sales}} = \frac{315-135}{1,500-1,100} \times 100 = \frac{180}{400} \times 100 = 45\%$$

(Rs. '000)

	Sales	Profit
East : Actual	1,450	210
Less : Over budgeted	(150)	(90)
Budgeted	1,300	120

P/V ratio = $\frac{90}{150}$ × 100 = 60%

(Rs. '000)

	Sales	Profit
South : Actual	1,200	330
Add: Under budgeted	200	110
Budgeted	1,400	440

P/V ratio = $\frac{110}{200}$ × 100 = 55%

(i) Calculation of fixed cost

Fixed Cost = (Actual sales × P/V ratio) – Profit

North = (1,100 × 45%) – 135 = 360

East = (1,450 × 60%) – 210 = 660

South = (1,200 × 55%) – 330 = 330

Total Fixed Cost 1,350

ii) Calculation of break-even sales (in Rs.' 000)

B.E. Sales = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{Ratio}}$

North =	$\frac{360}{45\%}$ =	800
East =	$\frac{660}{60\%}$ =	1,100
South =	$\frac{330}{55\%}$ =	600
Total		2,500

Question 53

An automobile manufacturing company produces different models of Cars. The budget in respect of model 007 for the month of March is as under:

Budgeted Output		**40,000 Units**
	Rs. In lakhs	**Rs. In lakhs**
Net Realisation		**2,10,000**
Variable Costs:		
Materials	**79,200**	
Labour	**15,600**	
Direct expenses	**37,200**	**1,32,000**
Specific Fixed Costs	**27,000**	
Allocated Fixed Costs	**33,750**	**60,750**

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Total Costs		**1,92,750**
Profit		**17,250**
Sales		**2,10,000**

CALCULATE:

(i) Profit with 10 percent increase in selling price with a 10 percent reduction in sales volume.

(ii) Volume to be achieved to maintain the original profit after a 10 percent rise in material costs, at the originally budgeted selling price per unit.

(Study Material)

Answer 53

(i) Budgeted selling price = 2, 10,000 lakhs/ 40,000 units = Rs.5, 25,000 per unit.

Budgeted variable cost = 1, 32,000 lakhs/ 40,000 units = Rs. 3, 30,000 per unit.

Increased selling price = Rs.5, 25,000 + 10% = Rs. 5, 77,500 per unit

New volume 40,000 – 10% = 36,000 units

Statement of Calculation of Profit:

	(Rs. In lakhs)
Sales 36,000 units at Rs. 5,77,500 =	2,07,900
Less: Variable cost: 36,000 × Rs.3,30,000 =	1,18,800
Contribution	89,100

Less: fixed costs	60,750
Profit	28,350

(ii) Budgeted Material Cost = 79,200 Lakhs/ 40,000 Units = Rs.1, 98,000 per Unit

Increased material cost = Rs.1,98,000×110% =	2,17,800
Labour cost 15,600 lakhs/ 40,000 units =	39,000
Direct expenses, 37,200 lakhs/ 40,000 units =	93,000
Variable cost per unit	3,49,800
Budgeted selling price per unit	5,25,000
Contribution per unit (5,25,000 – 3,49,800)	1,75,200

Sales volume = $\frac{\text{Fixed Costs+Profit}}{\text{Contribution per Unit}} = \frac{60{,}750 \text{ lakhs}+17{,}250 \text{ lakhs}}{\text{Rs.}1.752 \text{ lakhs}}$

= 44,521 units are to be sold to maintain the original profit of Rs. 17,250 lakhs.

Question 54

An Indian soft drink company is planning to establish a subsidiary company in Bhutan to produce mineral water. Based on the estimated annual sales of 40,000 bottles of the mineral water, cost studies produced the following estimates for the Bhutanese subsidiary:

	Total annual costs	**Percent of Total Annual Cost which is variable**

Material	**2,10,000**	**100%**
Labour	**1,50,000**	**80%**
Factory Overheads	**92,000**	**60%**
Administration Expenses	**40,000**	**35%**

The Bhutanese production will be sold by manufacturer's representatives who will receive a commission of 8% of the sale price. No portion of the Indian office expenses is to be allocated to the Bhutanese subsidiary. You are required to

(i) COMPUTE the sale price per bottle to enable the management to realize an estimated 10% profit on sale proceeds in Bhutan.

(ii) CALCULATE the break-even point in rupees sales as also in number of bottles for the Bhutanese subsidiary on the assumption that the sale price is Rs. 14 per bottle.

(Study Material)

Answer 54

(i) Computation of Sale Price Per Bottle

Particulars	**(Rs.)**
Variable Cost:	
Material	2,10,000
Labour (Rs.1, 50,000 × 80%)	1,20,000
Factory Overheads (Rs.92, 000 × 60%)	55,200

Administrative Overheads (Rs.40, 000 × 35%)	14,000
Commission (8% on Rs.6,00,000) (W.N.-1)	48,000
Fixed Cost:	
Labour (Rs.1, 50,000 × 20%)	30,000
Factory Overheads (Rs.92, 000 × 40%)	36,800
Administrative Overheads (Rs.40, 000 × 65%)	26,000
Total Cost	5,40,000
Profit (W.N.-1)	60,000
Sales Proceeds (W.N.-1)	6,00,000
Sales Price per bottle $\left(\frac{\text{Rs.6,00,000}}{\text{40,000 Bottels}}\right)$	15

(ii) Calculation of Break-even Point

Sales Price per Bottle = Rs.14

Variable Cost per Bottle = $\frac{\text{Rs.4,44,000 (W.N.}-2)}{\text{40,000 Bottels}}$ = Rs.11.10

Contribution per Bottle = Rs.14 − Rs.11.10 = Rs.2.90

Break -even Point: (in number of Bottles)

= $\frac{\text{Fixed Costs}}{\text{Contribution per Bottle}}$ = $\frac{\text{Rs.92,800}}{\text{Rs.2.90}}$ = 32,000 Bottles

(In Sales Value) = 32,000 Bottles × Rs.14 = Rs.4, 48,000

Working Note

W.N.-1

Let the Sales Price be 'x'

Commission = $\frac{8\ X}{100}$

Profit = $\frac{10\ X}{100}$

x = 4, 92,000 + $\frac{8\ X}{100} + \frac{10\ X}{100}$

100x - 8x - 10x = 4, 92, 00,000

82x = 4, 92, 00,000

x = 4, 92, 00,000 / 82 = Rs.6, 00,000

W.N.-2

Total Variable Cost	**(Rs.)**
Material	2,10,000
Labour	1,20,000
Factory Overheads	55,200
Administrative Overheads	14,000
Commission [(40,000 Bottles × Rs.14) × 8%]	44,800
	4,44,000

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Question 55

XYZ Ltd. has a production capacity of 2, 00,000 units per year. Normal capacity utilisation is reckoned as 90%. Standard variable production costs are Rs. 11 per unit. The fixed costs are Rs.3, 60,000 per year. Variable selling costs are Rs. 3 per unit and fixed selling costs are Rs.2, 70,000 per year. The unit selling price is Rs. 20.

In the year just ended on 31st March, the production was 1, 60,000 units and sales were 1, 50,000 units. The closing inventory on 31st March was 20,000 units. The actual variable production costs for the year were Rs. 35,000 higher than the standard.

(i) CALCULATE the profit for the year

(a) By absorption costing method and

(b) By marginal costing method.

(ii) EXPLAIN the difference in the profits.

(Study Material)

Answer 55

Income Statement (Absorption Costing) for the year ending 31st March

	(Rs.)	**(Rs.)**
Sales (1,50,000 units @ Rs.20)		30,00,000
Production Costs:		
Variable (1,60,000 units @ Rs.11)	17,60,000	
Add: Increase	35,000	17,95,000
Fixed (1,60,000 units @ Rs.2*)		3,20,000

Cost of Goods Produced		21,15,000
Add: Opening stock (10,000 units @ Rs.13)*		1,30,000
		22,45,000
Less: Closing stock $\left(\frac{\text{Rs.21,15,000}}{\text{1,60,000 Units}} \times \text{20,000 Units}\right)$		2,64,375
Cost of Goods Sold		19,80,625
Add: Under absorbed fixed production overhead (3,60,000 – 3,20,000)		40,000
		20,20,625
Add: Non-production costs:		
Variable selling costs (1,50,000 units @ Rs.3)		4,50,000
Fixed selling costs		2,70,000
Total cost		27,40,625
Profit (Sales – Total Cost)		2,59,375

*** Working Notes:**

1. Fixed production overhead is absorbed at a pre-determined rate based on normal capacity, i.e. Rs.3, 60,000 ÷ 1, 80,000 units = Rs. 2.

2. Opening stock is 10,000 units, i.e., 1, 50,000 units + 20,000 units – 1, 60,000 units. It is valued at Rs.13 per unit, i.e., Rs.11 + Rs.2 (Variable + fixed).

Income Statement (Marginal Costing) for the year ended 31st March

	(Rs.)	(Rs.)
Sales (1,50,000 units @ Rs.20)		30,00,000
Variable production cost (1,60,000 units @ Rs.11 + Rs.35,000)		17,95,000
Variable selling cost (1,50,000 units @ Rs.3)		4,50,000
		22,45,000
Add: Opening Stock (10,000 units @ Rs.11)		1,10,000
		23,55,000
Less: Closing stock $\left(\frac{\text{Rs.17,95,000}}{\text{1,60,000 Units}} \times \text{20,000 Units}\right)$		2,24,375
Variable cost of goods sold		21,30,625
Contribution (Sales – Variable cost of goods sold)		8,69,375
Less: Fixed cost – Production	3,60,000	
– Selling	2,70,000	6,30,000
Profit		2,39,375

Reasons for Difference in Profit:	**(Rs.)**

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Profit as per absorption costing	2,59,375
Add: Op. stock under –valued in marginal costing (Rs.1,30,000 – 1,10,000)	20,000
	2,79,375
Less: Cl. Stock under –valued in marginal closing (Rs.2,64,375 – 2,24,375)	40,000
Profit as per marginal costing	2,39,375

Topic 7 Practical Numerical Problems (Mixed Concepts)

Question 56

N.P. Ltd. produces two products P and Q. The draft budget for the next month is as under:

	P	**Q**
Budgeted Production and Sales (units)	**40,000**	**80,000**
Selling Price Rs. / unit	**25**	**50**
Total Costs Rs. / unit	**20**	**40**
Machine Hours / unit	**2**	**1**
Maximum Sales Potential (units)	**60,000**	**1,00,000**

The fixed expenses are estimated at Rs.9, 60,000 per month. The company absorbs fixed overheads on the basis of machine hours which are fully utilised by the budgeted production and cannot be further increased.

When the budget was discussed, the Managing Director stated that the product mix should be altered to yield optimum profit.

The Marketing Director suggested that he would introduce a new Product-C, each unit of which will take 1.5 machine hours. However, a new machine involving a capital outlay of Rs.2, 00,000 is to be installed for processing Product-C. The additional fixed overheads relating to the new machine was estimated at Rs.60, 000 per month. The variable cost of Product- C was estimated at Rs.21 per Unit.

Required:

(i) Calculate the profit as per draft budget for the next month.

(ii) Revise the product mix based on data given for P and Q to yield optimum profit.

(iii) The company decides to discontinue either Product- P or Q whichever is giving lower profit and proposes to substitute Product- C instead. Fix the selling price of product- C in such a way as to yield 15% return on additional capital employed besides maintaining the same overall profit as envisaged in (ii) above.

(RTP Sep. 2025)

Answer 56

(i) Profit as per Draft Budget for the Next Month:

	Products		
	P	**Q**	**Total**

Budgeted Production and Sales	40,000 units		80,000 units		1,20,000 units
	Per Unit (Rs.)	**Total (Rs.)**	**Per unit (Rs.)**	**Total (Rs.)**	**(Rs.)**
Sales	25	10,00,000	50	40,00,000	50,00,000
Less: Total Costs	20	8,00,000	40	32,00,000	40,00,000
Profit	5	2,00,000	10	8,00,000	10,00,000

(ii) Basic Calculations:

(a)	Machine Hrs.	P: 40,000 units x 2 hrs. Q: 80,000 units x 1 hr.	1, 60,000 hrs.
(b)	Fixed Overhead Rate per machine hr.	Rs. 9, 60,000 / 1, 60,000 hrs.	Rs. 6
(c)	Fixed Overhead per unit	P: 2 hrs. x Rs. 6 Q: 1 hr. x Rs. 6	Rs. 12 Rs. 6
(d)	Contribution per unit	P: Rs. 12 + Rs. 5 Q: Rs. 6 + Rs. 10	Rs. 17 Rs. 16
(e)	Product-wise Contribution per machine hr.	P: Rs. 17/2hrs. Q: Rs. 16/1 hr.	Rs. 8.50 Rs. 16.00

Revised Product Mix to Yield Optimum Profit:

Product Q has higher contribution per machine hour. Since machine hour is a limiting factor hence maximum units of product Q should be produced. However, maximum sales potentiality of Product Q is 1, 00,000 units. This will take 1, 00,000 machine hour. The balance 60,000 hours should be used to produce 30,000 units of P.

The Revised Product Mix to Yield Optimum Profit will be as follows:

Product Q	(1,00,000 units × Rs. 16)	Rs. 16,00,000
Product P	(30,000 units × Rs. 17)	Rs. 5,10,000
Total Contribution		Rs. 21,10,000
Less: Fixed Expenses		Rs. 9,60,000
Profit		Rs. 11,50,000

(iii) Product - P gives lower contribution per machine hour, hence, it will be discontinued and Product - C will be manufactured in its place. The discontinuance of Product - P will make available 60,000 machine hours to produce 40,000 units of Product - C.

The computation of selling price of Product - C can be done as follows:

Computation of Selling Price of Product- C

Variable Cost (40,000 units × Rs. 21)	8,40,000
Additional Fixed Cost per month	60,000
Return on Capital (Rs. 2, 00,000 × 1.25%)	2,500
Present Contribution from Product P	5,10,000

Total Sales Value to be recovered	14,12,500
Selling Price per unit of C (Rs. 14,12,500/40,000 units)	35.31

Chapter 15

Budget & Budgetary Control

Topic 1 Introduction to Budgetary Control System

Question 1

What is 'Budgetary Control System' and discuss the components of the same.

(PYP Dec '21, Old & New SM)

Answer 1

Budgetary Control System: It is the system of management control and accounting in which all the operations are forecasted and planned in advance to the extent possible and the actual results compared with the forecasted and planned results.

Components of Budgetary Control System: The policy of a business for a defined period is represented by the master budget, the detailed components of which are given in a number of individual budgets called functional budgets. These functional budgets are broadly grouped under the following heads:

1. Physical budgets: Those budgets which contain information in quantitative terms such as the physical units of sales, production etc. This may include quantity of sales, quantity of production, inventories, and manpower budgets are physical budgets.

2. Cost budgets: Budgets which provides cost information in respect of manufacturing, administration, selling and distribution, etc. for example, manufacturing costs, selling costs, administration cost, and research and development cost budgets are cost budgets.

3. Profit budgets: A budget which enables the ascertainment of profit. For example, sales budget, profit and loss budget, etc.

4. Financial budgets: A budget which facilitates in ascertaining the financial position of a concern, for example, cash budgets, capital expenditure budget, budgeted balance sheet etc.

Important Notes:-

This theory question on Budgetary Control and its components. Majority of the examinees had not answered in the correct line. Performance of the examinees was below average.

Question 2

DISCUSS the components of budgetary control system.

(Study Material)

Answer 2

The policy of a business for a defined period is represented by the master budget, the detailed components of which are given in a number of individual budgets called functional budgets. These functional budgets are broadly grouped under the following heads:

1. Physical budgets: Those budgets which contain information in quantitative terms such as the physical units of sales, production etc. This may include quantity of sales, quantity of production, inventories, and manpower budgets are physical budgets.

2. Cost budgets: Budgets which provides cost information in respect of manufacturing, administration, selling and distribution, etc. for example, manufacturing costs, selling costs, administration cost, and research and development cost budgets are cost budgets.

3. Profit budgets: A budget which enables the ascertainment of profit. For example, sales budget, profit and loss budget, etc.

4. Financial budgets: A budget which facilitates in ascertaining the financial position of a concern, for example, cash budgets, capital expenditure budget, budgeted balance sheet etc.

Question 3

A budget report is prepared on the principle of exception and thus-

(a) Only unfavourable variances should be shown

(b) Only favourable variance should be shown

(c) Both favourable and unfavourable variances should be shown

(d) None of the above

(Study Material)

Ans: (c) Both favourable and unfavourable variances should be shown

Reason

A budget report is prepared using the principle of management by exception, which means management focuses only on significant deviations from the budgeted figures—whether favourable or unfavourable.

Unfavourable variances may indicate inefficiency, wastage, or overspending.

Favourable variances, though positive, must also be examined to understand if targets were set too low or if there were any unusual factors.

Therefore, to ensure effective decision-making and control, both types of variances should be reported and analysed.

Hence, option (c) is correct.

Question 4

Which of the following is usually a short-term budget:

(a) Capital expenditure budget

(b) Research and development budget

(c) Cash budget

(d) Sales budget

(Study Material)

Ans: (c) Cash budget

Reason

A cash budget is a short-term financial plan that estimates cash inflows and outflows over a short period—typically weekly, monthly, or quarterly. It helps ensure that the business has enough liquidity to meet its obligations, avoid cash shortages, and plan for surplus utilization.

In contrast:

Capital expenditure budget involves long-term investments in fixed assets.

Research and development budget often spans over a long period due to the uncertain nature of R&D.

Sales budget, while sometimes prepared monthly, is often used for medium or long-term planning.

Therefore, option (c) Cash budget is the most typical example of a short-term budget.

Topic 2 Types of Budgets

Question 5

What are the cases when a flexible budget is found suitable?

(PYP May '19)

Answer 5

Flexible budgeting may be resorted to under following situations:

(i) In the case of new business venture due to its typical nature it may be difficult to forecast the demand of a product accurately.

(ii) Where the business is dependent upon the mercy of nature e.g., a person dealing in wool trade may have enough market if temperature goes below the freezing point.

(iii) In the case of labour-intensive industry where the production of the concern is dependent upon the availability of labour.

Suitability for flexible budget:

1. Seasonal fluctuations in sales and/or production, for example in soft drinks industry;

2. A company which keeps on introducing new products or makes changes in the design of its products frequently;

3. Industries engaged in make-to-order business like ship building;

4. An industry which is influenced by changes in fashion; and

5. General changes in sales.

Important Notes:-

In this theoretical question on suitability of 'Flexible Budget', most of the examinees didn't understand area and conditions where the flexible budget is applicable. Poor performance of the examinees was observed.

Question 6

Why 'Zero Base Budgeting' (ZBB) is considered superior to 'Traditional Budgeting'? Explain.

(PYP May '18)

Answer 6

Zero based budgeting is superior to traditional budgeting: Zero based budgeting is superior to traditional budgeting in the following manner:

- It provides a systematic approach for evaluation of different activities.
- It ensures that the function undertaken are critical for the achievement of the objectives.
- It provides an opportunity for management to allocate resources to various activities after a thorough – cost benefit analysis.
- It helps in the identification of wasteful expenditure and then their elimination. If facilitates the close linkage of departmental budgets with corporate objectives.
- It helps in the introduction of a system of Management by Objectives

Question 7

The classification of fixed and variable cost is useful for the preparation of:

(a) Master budget

(b) Flexible budget

(c) Cash budget

(d) Capital budget

(Study Material)

Ans: (b) Flexible budget

Reason

A flexible budget adjusts budgeted costs based on the actual level of activity. To prepare such a budget, it is essential to classify costs into fixed and variable components:

Fixed costs remain constant regardless of activity levels.

Variable costs change proportionately with activity levels.

This classification allows the flexible budget to recalculate total costs at different activity levels, making it a valuable tool for performance evaluation and cost control.

Therefore, the correct answer is (b) Flexible budget**.**

Question 8

The budget control organization is usually headed by a top executive who is known as:

(a) General manager

(b) Budget director/budget controller

(c) Accountant of the organization

(d) None of the above

(Study Material)

Ans: (b) Budget director/budget controller

Correct Answer: (b) Budget director/budget controller

Reason

In a well-structured budgetary control system, the budget control organization is typically headed by a Budget Director or Budget Controller. This individual is responsible for:

Coordinating the preparation of various functional budgets

Ensuring compliance with budgeting procedures

Collecting, reviewing, and analyzing budget reports

Reporting to top management for decision-making

While the General Manager oversees overall operations, and the Accountant maintains financial records, it is the Budget Director/Controller who specifically oversees the budgeting function.

Hence, the correct answer is (b) Budget director/budget controller.

Question 9

Purchases budget and materials budget are same:

(a) Purchases budget is a budget which includes only the details of all materials purchased

(b) Purchases budget is a wider concept and thus includes not only purchases of materials but also other item's as well

(c) Purchases budget is different from materials budget; it includes purchases of other items only

(d) None of the above

(Study Material)

Ans: (b) Purchases budget is a wider concept and thus includes not only purchases of materials but also other item's as well

Reason

A materials budget specifically focuses on the raw materials required for production, detailing quantities and costs.

In contrast, a purchases budget is a broader concept that not only covers the purchase of raw materials but may also include procurement of consumables, supplies, spare parts, packaging materials, and even non-inventory items depending on organizational needs.

Therefore, while the materials budget is a part of the purchases budget, the purchases budget has a wider scope.

Hence, the correct answer is (b).

Question 10

Efficiency ratio is:

(a) The extent of actual working days avoided during the budget period

(b) Activity ratio/ capacity ratio

(c) Whether the actual activity is more or less than budgeted activity

(d) None of the above

(Study Material)

Ans: (b) Activity ratio/ capacity ratio

Reason:

The Efficiency Ratio measures the efficiency of resource utilization, particularly labour or machine hours, in achieving the actual level of activity. It is calculated as:

Where:

Efficiency Ratio=$\frac{\textbf{Activity Ratio}}{\boldsymbol{Capacity\ Eatio}} \times \mathbf{100}$

Activity Ratio compares actual production to budgeted production.

Capacity Ratio compares actual hours worked to budgeted available hours.

This ratio indicates how efficiently resources were used in achieving the actual level of output relative to the capacity utilized.

Hence, the correct answer is (b) Activity ratio / Capacity ratio.

Question 11

Activity Ratio depicts:

(a) Whether actual capacity utilized exceeds or falls short of the budgeted capacity

(b) Whether the actual hours used for actual production were more or less than the standard hours

(c) Whether actual activity was more or less than the budgeted capacity

(d) None of the above

(Study Material)

Ans: (c) Whether actual activity was more or less than the budgeted capacity

Reason

The Activity Ratio measures the level of activity achieved during a period in comparison to the budgeted level of activity. It is calculated as:

$$\textbf{Activity Ratio} = \frac{\textbf{Standard Hours for Actual Production}}{\textbf{Budgeted Hours}} \times 100$$

This ratio indicates whether the actual production (in terms of standard hours) was more or less than what was planned (budgeted capacity).

If the ratio is more than 100%, it means the actual activity exceeded budgeted activity.

If less than 100%, it means actual activity was below the expected level.

Therefore, the correct answer is (c) Whether actual activity was more or less than the budgeted capacity.

Question 12

Fixed Budget does not change with actual volume of activity achieved, however, Flexible Budget can be re-casted on the basis of activity level to be achieved. DISCUSS other differences between these two type of budget classified based on their capacity.

(RTP Sep. 2025)

Answer 12

Difference between Fixed and Flexible Budgets:

Sl. No.	Fixed Budget	Flexible Budget
1.	It operates on one level of activity and under one set of conditions. It assumes that there will be no change in the prevailing conditions, which is unrealistic.	It consists of various budgets for different levels of activity.
2.	Here as all costs like - fixed, variable and semi-variable are related to only one level of activity so variance analysis does not give useful information.	Here analysis of variance provides useful information as each cost is analysed according to its behaviour.
3.	If the budgeted and actual activity levels differ significantly, then the aspects like cost ascertainment and price fixation do not give a correct picture.	Flexible budgeting at different levels of activity facilitates the ascertainment of cost, fixation of selling price and tendering of quotations.
4.	Comparison of actual performance with budgeted targets will be meaningless specially when there is a	It provides a meaningful basis of comparison of the actual performance with the budgeted targets.

	difference between the two activity levels.	

Topic 3 Functional Budgets (Sales, Production, Purchase, etc.)

Question 13

Following data is available for ABC Ltd.:

Standard working hours	**8 hours per day of 5 days per week**
Maximum Capacity	**60 employees**
Actual working	**50 employees**
Actual hours expected to be worked per four week	**8,000 hours**
Standard hours expected to be earned per four week	**9,600 hours**
Actual hours worked in the four week period	**7,500 hours**
Standard hours earned in the four week period	**8,800 hours**

The related period is of four weeks. Calculate the following Ratios:

(i) Efficiency Ratio

(ii) Activity Ratio

(iii) Standard Capacity Usage Ratio

(iv) Actual Capacity Usage Ratio

(v) Actual Usage of Budgeted Capacity Ratio

(PYP May '19)

Answer 13

(i) Efficiency Ratio = $\frac{\text{Standard Hrs}}{\text{Actual Hours}} \times 100$

$= \frac{8{,}800 \text{ hours}}{7{,}500 \text{ hours}} \times 100 = 117.33\%$

(ii) Activity Ratio = $\frac{\text{Standard hrs}}{\textbf{Budgeted hrs}} \times 100$

$= \frac{8{,}800 \text{ hours}}{8{,}000 \text{ hours}} \times 100 = 110\%$

(iii) Standard Capacity Usage Ratio = $\frac{\text{Budgeted hours}}{\text{Max.possible hours in the budgeted period}} \times 100$

$= \frac{8{,}800 \text{ hours}}{9{,}600 \text{ hours}} \times 100 = 83.33\%$

(iv) Actual Capacity Usage Ratio = $\frac{\text{Actual Hours worked}}{\text{Max.possible workings hours in the period}} \times 100$

$= \frac{7{,}500 \text{ hours}}{9{,}600 \text{ hours}} \times 100 = 78.125\%$

(v) Actual Usage of Budgeted Capacity Ratio = $\frac{\text{Actual working hours}}{\text{Budgeted hours}} \times 100$

$= \frac{7{,}500 \text{ hours}}{8{,}000 \text{ hours}} \times 100 = 93.75\%$

Working Notes:

1. Maximum Capacity in a budget period

= 60 Employees × 8 Hrs. × 5 Days × 4 Weeks = 9,600 Hrs.

2. Budgeted Hours (Hrs)

= 50 Employees × 8 Hrs. × 5 Days × 4 Weeks = 8,000 Hrs.

3. Actual Hrs. = 7,500 Hrs. (given)

4. Standard Hrs. for Actual Output = 8,800 Hrs.

Question 14

Soya B Limited is presently operating at 50% capacity and producing 50,000 units. The entire output is sold at a price of Rs. 180 per unit. The cost structure at the 50% level of activity is as under:

	(Rs)
Direct Material	**60 per unit**
Direct Wages	**20 per unit**
Variable Overheads	**20 per unit**
Direct Expenses	**12 per unit**
Factory Expenses (30% fixed)	**16 per unit**
Selling and Distribution Exp. (85% variable)	**10 per unit**
Office and Administrative Exp. (100% fixed)	**6 per unit**

The company anticipates that the variable costs will go up by 20% and fixed costs will go up by 10%. You are required to prepare an Expense budget, based on marginal cost for the company at 50%, 75% and 100% level of activity and find out the profits at respective levels.

(MTP March '23, March '18) (Same concepts different figures MTP May'20)

Answer 14

Expense Budget of Soya B Ltd. for the period

	Per unit (Rs)	50,000 units	75,000 units	1,00,000 units
		Amount (Rs)	Amount (Rs)	Amount (Rs)
Sales (A)	180	90,00,000	1,35,00,000	1,80,00,000
Less: Variable Costs:				
- Direct Material	72	36,00,000	54,00,000	72,00,000
- Direct Wages	24	12,00,000	18,00,000	24,00,000
- Variable Overheads	24	12,00,000	18,00,000	24,00,000
- Direct Expenses	14.4	7,20,000	10,80,000	14,40,000
- Variable factory expenses	13.44	6,72,000	10,08,000	13,44,000
(70% of Rs 16 p.u.)x 120%				
- Variable Selling & Dist. exp.	10.2	5,10,000	7,65,000	10,20,000
(85% of Rs 10 p.u.)x120%				
Total Variable Cost (B)	158.04	79,02,000	1,18,53,000	1,58,04,000
Contribution (C) = (A – B)	21.96	10,98,000	16,47,000	21,96,000
Less: Fixed Costs:				

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- Office and Admin. exp. (100%)	--	3,30,000	3,30,000	3,30,000
- Fixed factory exp. (30%)	--	2,64,000	2,64,000	2,64,000
- Fixed Selling & Dist. exp. (15%)	--	82,500	82,500	82,500
Total Fixed Costs (**D**)	--	6,76,500	6,76,500	6,76,500
Profit (C – D)	**--**	**4,21,500**	**9,70,500**	**15,19,500**

Question 15

Nakata Ltd a Vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

Month	No. of vehicles
October	**40,000**
November	**35,000**
December	**45,000**
January	**60,000**
February	**65,000**

To manufacture a vehicle a standard cost of Rs.5,71,400 is incurred and sold through dealers at a uniform selling price of Rs.8,57,100 to customers. Dealers are paid 15% commission on selling price on sale of a vehicle. Apart from other materials four units of Part - X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part-X at

the end of each month to cover 40% of next month's production. 48,000 units of Part-X are in stock as on 1st October.

There are 9,500 nos. of completed vehicles are in stock as on 1st October and it is policy to have stocks at the end of each month to cover 20% of the next month's sales.

You are required to

(i) PREPARE Production budget (in nos.) for the month of October, November, December and January.

(ii) PREPARE a Purchase budget for Part-X (in units) for the months of October, November and December.

(iii) CALCULATE the budgeted gross profit for the quarter October to December.

(MTP April '19, MTP Oct'22 & Oct '23, RTP May '20)

Answer 15

(i) Preparation of Production Budget (in units)

	October	November	December	January
Demand for the month (Nos.)	40,000	35,000	45,000	60,000
Add: 20% of next month's demand	7,000	9,000	12,000	13,000
Less: Opening Stock	(9,500)	(7,000)	(9,000)	(12,000)
Vehicles to be produced	37,500	37,000	48,000	61,000

(ii) Preparation of Purchase budget for Part-X

	October	November	December

Production for the month (Nos.)	37,500	37,000	48,000
Add: 40% of next month's production	14,800 (40% of 37,000)	19,200 (40% of 48,000)	24,400 (40% of 61,000)
	52,300	56,200	72,400
No. of units required for production	2,09,200 (52300 × 4 units)	2,24,800 (56200 × 4 units)	2,89,600 (72,400 × 4 units)
Less: Opening Stock	(48,000)	(59,200) (14800 × 4 units)	(76,800) (19200 × 4 units)
No. of units to be purchased	1,61,200	1,65,600	2,12,800

(ii) Budgeted Gross Profit for the Quarter October to December

	October	**November**	**December**	**Total**
Sales in nos.	40,000	35,000	45,000	1,20,000
Net Selling Price per unit*	7,28,535	7,28,535	7,28,535	
Sales Revenue (Rs. in lakh)	2,91,414	2,54,987.25	3,27,840.75	8,74,242
Less: Cost of Sales (Rs. in lakh)	2,28,560	1,99,990.00	2,57,130.00	6,85,680
(Sales unit × Cost per unit)				
Gross Profit (Rs. in lakh)	62,854	54,997.25	70,710.75	1,88,562

* Net Selling price unit = Rs. 8,57,100 – 15% commission on Rs. 8,57,100 = Rs.7,28,535.

Question 16

A firm has a total capacity of producing 1,00,000 units of an item. The budgeted expenses at this level of activity are as under:

	Per unit (Rs)
Direct Materials	**650**
Direct Wages	**325**
Direct Expenses	**125**
Variable overheads	**50**
Fixed Production Overheads	**25**
Selling and Distribution Overheads (20% fixed)	**25**
Administrative Expenses (100% fixed)	**60**
Total	**1,260**

The selling price is Rs 1,750 per unit and is anticipated to remain constant.

You are required to PREPARE a flexible budget, on the basis of marginal costing, for 60,000 and 75,000 units of output level showing the profit and P/V Ratio.

(MTP Sep'22)

Answer 16

Workings -

1. Fixed Production overheads (given) = Rs 25 per unit

So, at 1,00,000 units capacity, it will be Rs 25,00,000 (1,00,000 units x Rs 25)

2. Selling and distribution overheads:

Given (1,00,000 units x Rs 25) = Rs 25,00,000

So, Fixed component = Rs 25,00,000 x 20% = Rs 5,00,000

Hence, variable component = Rs 25,00,000 - Rs 5,00,000 = Rs 20,00,000

Variable per unit = Rs 20,00,000/1,00,000 units= Rs 20 per unit

Flexible Budget

Particulars	**Per unit (Rs)**	**Output Level**	
		60,000 units (Rs)	**75,000 units (Rs)**
Sales (A)	1,750	10,50,00,000	13,12,50,000
Variable costs:			
Direct Material	650	3,90,00,000	4,87,50,000
Direct Wages	325	1,95,00,000	2,43,75,000
Direct expenses	125	75,00,000	93,75,000
Variable overheads	50	30,00,000	37,50,000

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Selling and distribution overheads	20	12,00,000	15,00,000
Total Variable cost (B)	1,170	7,02,00,000	8,77,50,000
Contribution (C = A - B)		3,48,00,000	4,35,00,000
Fixed costs:			
Production overheads		25,00,000	25,00,000
Administrative overheads		60,00,000	60,00,000
Selling and distribution overheads		5,00,000	5,00,000
Total Fixed cost (D)		90,00,000	90,00,000
Profit (C-D)		**2,58,00,000**	**3,45,00,000**

P/V Ratio = (Rs 3,48,00,000/Rs 10,50,00,000) x 100 = 33.143%

OR

P/V Ratio = (Rs 4,35,00,000/Rs 13,12,50,000) x 100 = 33.143%

Question 17

G Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ Rs. 36 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following information has been extracted from departmental estimates for the year ended 31st March 2018 (the budget period):

	Product M	Product N
Sales (units)	28,000	13,000
Finished goods stock increase by year-end	320	160
Post-production rejection rate (%)	4	6
Material Z usage(per completed unit, net of wastage)	5 kg	6 kg
Material Z wastage (%)	10	5

Additional information:

- Usage of raw material Z is expected to be at a constant rate over the period.

- Annual cost of holding one unit of raw material in stock is 11% of the material cost.

- The cost of placing an orders is Rs. 320 per order.

- The management of G Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

Required:

(i) PREPARE functional budgets for the year ended 31st March 2018 under the following headings:

(a) Production budget for Products M and N (in units).

(b) Purchases budget for Material Z (in kgs and value).

(ii) CALCULATE the Economic Order Quantity for Material Z (in kgs).

(iii) If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration, CALCULATE the maximum number of units of Product M and N that could be produced.

Answer 17

(i) (a) Production Budget (in units) for the year ended 31st March 2016

	Product M	**Product N**
Budgeted sales (units)	28,000	13,000
Add: Increase in closing stock	320	160
No. good units to be produced	28,320	13,160
Post production rejection rate	4%	6%
No. of units to be produced	29,500	14,000
	(28,320/0.96)	(13,160/0.94)

(a) Purchase budget (in kgs and value) for Material Z

	Product M	**Product N**	
No. of units to be produced	29,500	14,000	
Usage of Material Z per unit of production	5 kg.	6 kg.	
Material needed for production	1,47,500 kg.	84,000 kg	

Materials to be purchased	1,63,889 kg. $\left(\frac{1,47,500}{0.90}\right)$	88,421 kg $\left(\frac{84,000}{0.95}\right)$	
Total quantity to be purchased			2,52,310 kg.
Rate per kg. of Material Z			Rs. 36
Total purchase price			**Rs. 90,83,160**

(ii) Calculation of Economic Order Quantity for Material Z

EOQ = $\sqrt{\frac{2\times 2,52,310 \text{ kg.} \times \text{Rs.}320}{\text{Rs.}36\times 11\%}} = \sqrt{\frac{16,74,78,000}{\text{Rs.}3.96}}$ = 6,385.72 kg.

(iii) Since, the maximum number of order per year cannot be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of Material Z that can be available for production:

= 4,000 kg. × 40 orders = 1,60,000 kg.

	Product M	**Product N**
Material needed for production to maintain the same production mix	1,03,929 kg. $\left(160,000 \times \frac{1,63,889}{2,52,310}\right)$	56,071 kg. $\left(160,000 \times \frac{88,421}{2,52,310}\right)$
Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for 10,393 kg. 2,804 kg. production	93,536 kg.	53,267 kg.

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Units to be produced	18,707 units (93,536 kg. / 5kg.)	8,878 units (53,267 kg. / 6kg.)

Question 18

What are the important points an organization should consider if it wants to adopt Performance Budgeting?"

(PYP Nov 20)

Answer 18

For an enterprise that wants to adopt Performance Budgeting, it is thus imperative that:

- The objectives of the enterprise are spelt out in concrete terms.
- The objectives are then translated into specific functions, programmes, activities and tasks for different levels of management within the realities of fiscal constraints.
- Realistic and acceptable norms, yardsticks or standards and performance indicators should be evolved and expressed in quantifiable physical units.

A style of management based upon decentralised responsibility structure should be adopted, and an accounting and reporting system should be developed to facilities monitoring, analysis and review of actual performance in relation to budgets

Question 19

PSV Ltd. manufactures and sells a single product and estimated the following related information for the period November, 2020 to March, 2021.

Particulars	November, 2020	December, 2020	January, 2021	February, 2021	March, 2021

Opening Stock of Finished Goods (in Units)	**7,500**	**3,000**	**9,000**	**8,000**	**6,000**
Sales (in Units)	**30,000**	**35,000**	**38,000**	**25,000**	**40,000**
Selling Price per unit (in Rs.)	**10**	**12**	**15**	**15**	**20**

Additional Information:

- **Closing stock of finished goods at the end of March, 2021 is 10,000 units.**
- **Each unit of finished output requires 2 kg of Raw Material 'A' and 3 kg of Raw Material 'B'.**

You are required to prepare the following budgets for the period November, 2020 to March, 2021 on monthly basis:

(i) Sales Budget (in Rs.)

(ii) Production budget (in units) and

(iii) Raw material Budget for Raw material 'A' and 'B' separately (in units)

(PYP July 21)

Answer 19

i. Sales Budget

						(in Rs.)
Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Sales (in Units)	30,000	35,000	38,000	25,000	40,000	1,68,000

Selling Price per unit (Rs.)	10	12	15	15	20	-
Total Sales (Rs.)	3,00,000	4,20,000	5,70,000	3,75,000	8,00,000	24,65,000

ii. Production Budget

						(in units)
Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Sales	30,000	35,000	38,000	25,000	40,000	1,68,000
Add: Closing stock of finished goods	3,000	9,000	8,000	6,000	10,000	36,000
Total quantity required	33,000	44,000	46,000	31,000	50,000	2,04,000
Less: Opening stock of finished goods	7,500	3,000	9,000	8,000	6,000	33,500
Units to be produced	**25,500**	**41,000**	**37,000**	**23,000**	**44,000**	**1,70,500**

iii. Raw material budget For

Raw material 'A'

Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500

Raw material consumption p.u. (kg.): (b)	2	2	2	2	2	-
Total raw material consumption (Kg.): (a ×b)	**51,000**	**82,000**	**74,000**	**46,000**	**88,000**	**3,41,000**

For Raw material 'B'

Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500
Raw material consumption p.u. (kg.): (b)	3	3	3	3	3	-
Total raw material consumption (Kg.): (a× b)	**76,500**	**1,23,000**	**1,11,000**	**69,000**	**1,32,000**	**5,11,500**

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Question 20

The Accountant of KPMR Ltd. has prepared the following budget for the coming year 2022 for its two products 'AYE' and 'ZYE':

Particulars	**Product 'AYE'**	**Product 'ZYE'**
Production and Sales (in Units)	**4,000**	**3,000**
	Amount (in Rs.)	**Amount (in Rs.)**

Selling Price per unit	**200**	**180**
Direct Material per unit	**80**	**70**
Direct Labour per unit	**40**	**35**
Variable Overhead per unit	**20**	**25**
Fixed Overhead per unit	**10**	**10**

After reviewing the above budget, the management has called the marketing team for suggesting some measures for increasing the sales. The marketing team has suggested that by promoting the products on social media, the sales quantity of both the products can be increased by 5%. Also, the selling price per unit will go up by 10%. But this will result in increase in expenditure on variable overhead and fixed overhead by 20% and 5% respectively for both the products. You are required to prepare flexible budget for both the products:

(i) Before promotion on social media,

(ii) After promotion on social media.

(PYP Dec '21)

Answer 20

(i) Flexible Budget (before promotion)

	Particulars	**Product 'AYE'**	**Product 'ZYE'**	**Total**
	Production & Sales (units)	4,000	3,000	
		Amount (Rs.)	**Amount (Rs.)**	**Amount (Rs.)**

A.	Sales Value	8,00,000 (Rs. 200×4,000)	5,40,000 (Rs. 180×3,000)	13,40,000
B.	Direct Materials	3,20,000 (Rs. 80 × 4,000)	2,10,000 (Rs.70 × 3,000)	5,30,000
C.	Direct labour	1,60,000 (Rs. 40 × 4,000)	1,05,000 (Rs. 35 × 3,000)	2,65,000
D.	Variable Overheads	80,000 (Rs. 20 × 4,000)	75,000 (Rs. 25 × 3,000)	1,55,000
E.	Total Variable Cost (B+C+D)	5,60,000	3,90,000	9,50,000
F.	Contribution (A-E)	2,40,000	1,50,000	3,90,000
G.	Fixed Overhead	40,000 (Rs.10 × 4,000)	30,000 (Rs.10 × 3,000)	70,000
H.	Profit (F-G)	2,00,000	1,20,000	3,20,000
	Profit per unit	50	40	

(ii) Flexible Budget (after promotion)

	Particulars	**Product 'AYE'**	**Product 'ZYE'**	**Total**
	Production & Sales (units)	4,200 (4,000 ×105%)	3,150 (3,000 ×105%)	
		Amount (Rs.)	**Amount (Rs.)**	**Amount (Rs.)**

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A.	Sales Value	9,24,000 (Rs. 220 × 4,200)	6,23,700 (Rs. 198 × 3,150)	15,47,700
B.	Direct Materials	3,36,000 (Rs. 80 × 4,200)	2,20,500 (Rs. 70 × 3,150)	5,56,500
C.	Direct labour	1,68,000 (Rs. 40 × 4,200)	1,10,250 (Rs. 35 × 3,150)	2,78,250
D.	Variable Overheads	1,00,800 (Rs. 24 × 4,200)	94,500 (Rs. 30 × 3,150)	1,95,300
E.	Total Variable Cost (B+C+D)	6,04,800	4,25,250	10,30,050
F.	Contribution (A-E)	3,19,200	1,98,450	5,17,650
G.	Fixed Overhead	42,000 (Rs. 40,000 ×105%)	31,500 (Rs. 30,000 × 105%)	73,500
H.	Profit (F-G)	2,77,200	1,66,950	4,44,150
	Profit per unit	**66**	**53**	

Important Note:-

This Numerical question on Flexible Budget by segregating cost into fixed and variable. Many examinees faced hardship to understand the concept of fixed cost when the level of production changed; hence fixed overheads cost was not calculated correctly in the second part of the question. Performance of the examinees was average.

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Question 21

B Ltd manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2022-23:

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	800 units at Rs.18	1,200 units at Rs.18	1,000 units at Rs.18	1,400 units at Rs.18
Y	600 units at Rs.42	1,000 units at Rs.42	400 units at Rs.42	800 units at Rs.42

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by Rs. 2, it will, find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by Rs. 2 it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

Percentage increase in sales over budgeted sales

Product	East Division	West Division
X	+ 12.5%	+ 7.5%
Y	+ 22.5%	+ 12.5%

With the help of intensive advertisement campaign, following additional sales (over and above the above-mentioned estimated sales by Divisional Mangers) are possible:

Product	East Division	West Division
X	120 units	140 units
Y	80 units	100 units

You are required to PREPARE Sales Budget for 2022-23 after incorporating above estimates and also SHOW the Budgeted Sales and Actual Sales of 2021-22.

(Study Material)

Answer 21

Statement Showing Sales Budget for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (Rs.)	Amt. (Rs.)	Qty.	Rate (Rs.)	Amt. (Rs.)	Amt. (Rs.)
East	1,0201	20	20,400	8153	40	32,600	53,000
West	1,4302	20	28,600	1,2254	40	49,000	77,600
Total	1,200		49,000	1,000		81,600	1,30,600

Workings

1. 800 × 112.5% +120 = 1,020 units

2. 1,200 × 107.5% + 140 = 1,430 units

3. 600 × 122.5% + 80 = 815 units

4. 1,000 × 112.5% + 100 = 1,225 units

Statement Showing Sales Budget for 2021-22

Division	Product X			Product Y			Total
	Qty.	Rate (Rs.)	Amt. (Rs.)	Qty.	Rate (Rs.)	Amt. (Rs.)	Amt. (Rs.)
East	800	18	14,400	600	42	25,200	39,600
West	1,200	18	21,600	1,000	42	42,000	63,600
Total	2,000		36,000	1,600		67,200	1,03,200

Statement Showing Actual Sales for 2021-22

Division	Product X			Product Y			Total
	Qty.	Rate (Rs.)	Amt. (Rs.)	Qty.	Rate (Rs.)	Amt. (Rs.)	Amt. (Rs.)
East	1,000	18	18,000	400	42	16,800	34,800
West	1,400	18	25,200	800	42	33,600	58,800
Total	2,400		43,200	1,200		50,400	93,600

Question 22

K Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2022-23.

The following information are made available for this purpose:

(i) It expects to sell 1,50,000 bags of 'X' during the second quarter of 2022-23 at the selling price of Rs. 1,200 per bag.

(ii) Each bag of 'X' requires 2.5 mtr. of raw – material 'Y' and 7.5 mtr. of raw – material 'Z'.

(iii) Stock levels are planned as follows:

Particulars	Beginning of Quarter	End of Quarter
Finished Bags of 'X' (Nos.)	45,000	33,000
Raw – Material 'Y' (mtr)	96,000	78,000
Raw – Material 'Z' (mtr)	1,71,000	1,41,000
Empty Bag (Nos.)	1,11,000	84,000

(iv) 'Y' cost Rs.160 per mtr., 'Z' costs Rs.30 per mtr. and 'Empty Bag' costs Rs.110 each.

(v) It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is Rs. 70 per hour.

(vi) Variable manufacturing costs are Rs. 60 per bag. Fixed manufacturing costs Rs. 40,00,000 per quarter.

(vii) Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are Rs. 3,75,000 per quarter.

Required

(i) PREPARE a production budget for the said quarter in quantity.

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(ii) PREPARE a raw – material purchase budget for 'Y', 'Z' and 'Empty Bags' for the said quarter in quantity as well as in rupees.

(iii) COMPUTE the budgeted variable cost to produce one bag of 'X'.

(Study Material)

Answer 22

(i) Production Budget of 'X' for the Second Quarter

Particulars	Bags (Nos.)
Budgeted Sales	1,50,000
Add: Desired Closing stock	33,000
Total Requirements	1,83,000
Less: Opening stock	(45,000)
Required Production	1,38,000

(ii) Raw–Materials Purchase Budget in Quantity as well as in Rs. for 1,38,000 Bags of 'X'

Particulars	'Y'	'Z'	Empty Bags
	Mtr.	Mtr.	Nos.
Production Requirements Per bag of 'X'	2.5	7.5	1.0

Requirement for Production	3,45,000 (1,38,000 × 2.5)	10,35,000 (1,38,000 × 7.5)	1,38,000 (1,38,000 × 1)
Add: Desired Closing Stock	78,000	1,41,000	84,000
Total Requirements	4,23,000	11,76,000	2,22,000
Less: Opening Stock	(96,000)	(1,71,000)	(1,11,000)
Quantity to be purchased	3,27,000	10,05,000	1,11,000
Cost per mtr./Bag	Rs.160	Rs.30	Rs.110
Cost of Purchase (Rs.)	5,23,20,000	3,01,50,000	1,22,10,000

(iii) Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'

Particulars	**(Rs.)**
Raw – Material	
Y 2.5 mtr @160	400.00
Z 7.5 mtr @30	225.00
Empty Bag	110.00
Direct Labour (Rs.70× 9 minutes / 60 minutes)	10.50
Variable Manufacturing Overheads	60.00

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Variable Cost of Production per bag	805.50

Question 23

Concorde Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

	Product- A	Product- B
Budgeted sales (in units)	**2,400**	**3,600**
Budgeted material consumption per unit (in kg):		
Material-X	**5**	**3**
Material-Y	**4**	**6**
Standard labour hours allowed per unit of product	**3**	**5**

Material-X and Material-Y cost Rs. 4 and Rs. 6 per kg and labours are paid Rs. 25 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 180 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%. In addition the non-productive down-time is budgeted at 20% of the productive hours worked.

There are four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A	**400 units**
Product-B	**200 units**
Material-X	**1,000 kg.**
Material-Y	**500 kg.**

The anticipated closing stocks for budget period are as below:

Product-A	**4 days sales**
Product-B	**5 days sales**
Material-X	**10 days consumption**
Material-Y	**6 days consumption**

Required:

CALCULATE the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month.

(Study Material)

Answer 23

Number of days in budget period = 4 weeks × 5 days = 20 days

Number of units to be produced

	Product-A (units)	**Product-B (units)**

Budgeted Sales	2,400	3,600
Add: Closing stock $\left(\frac{2,400 \text{ unit}}{20 \text{ days}} \times 4 \text{ days}\right)$ $\left(\frac{3,600 \text{ units}}{20 \text{ days}} \times 5 \text{ days}\right)$	480	900
Less: Opening stock	400	200
	2,480	4,300

(i) Material Purchase Budget

	Material-X (Kg.)	**Material-Y (Kg.)**
Material required: Product-A	12,400 (2,480 units × 5 kg.)	9,920 (2,480 units × 4 kg.)
Product-B	12,900 (4,300 units × 3 kg.)	25,800 (4,300 units × 6 kg.)
Add: Closing stock		
$\left(\frac{25,300 \text{ kgs.}}{20 \text{ days}} \times 10 \text{ days}\right)$	25,300	35,720
$\left(\frac{35,720 \text{ kgs.}}{20 \text{ days}} \times 6 \text{ days}\right)$	12,650	10,716
Less: Opening stock	1,000	500
Quantity to be purchased	36,950	45,936
Rate per kg. of Material	Rs. 4	Rs. 6
Total Cost	Rs. 1,47,800	Rs. 2,75,616

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(ii) Wages Budget

	Product-A (Hours)	Product-B (Hours)
Units to be produced	2,480 units	4,300 units
Standard hours allowed per unit	3	5
Total Standard Hours allowed	7,440	21,500
Productive hours required for production	$\frac{7,440 \text{ hours}}{80\%}$ = 9,300	$\frac{21,500 \text{ hours}}{80\%}$ = 26,875
Add: Non-Productive down time	1,860 hours. (20% of 9,300 hours)	5,375 hours. (20% of 26,875 hours)
Hours to be paid	11,160	32,250

Total Hours to be paid = 43,410 hours (11,160 + 32,250)

Hours to be paid at normal rate = 4 weeks × 40 hours × 180 workers

= 28,800 hours

Hours to be paid at premium rate = 43,410 hours – 28,800 hours = 14,610 hours

Total wages to be paid

= 28,800 hours × Rs. 25 + 14,610 hours × Rs. 37.5

= Rs. 7, 20, 000 + Rs. 5, 47,875

= Rs. 12, 67,875

Question 24

X Ltd. has carefully analyzed market trends and consumer behaviour to project its sales figures for the upcoming year as follows:

Quarter	Sales (Units)
I	45,000
II	56,250
III	61,875
IV	67,500

Information regarding production and finished goods stock is as follows:	
Opening Stock of Finished Goods	**11,250 Units**
Expected Closing Stock of Finished Goods at the end of the year	**18,375 Units**
Production Pattern	**75% of Current Quarter Sales**
Plus 25% of Next Quarter Sales	
Closing Stock of current quarter to be maintained	**25% of Next Quarter Sales**
Further information regarding stock of raw materials is as follows:	

Opening Stock of Raw Materials	**15,000 Units**
Required Closing Stock of Raw Materials at the end of the year	**7,500 Units**

Each unit of finished output requires 4 kg. of raw materials.

The company plans to acquire its total annual requirement of raw materials during the first three quarters, in the specified proportions and at the prices detailed below:

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per kg. (Rs.)
I	25%	12
II	50%	13
III	25%	14

You are required to PREPARE the following for the next year, quarter wise:

(i) Production budget (in units).

(ii) Raw material consumption budget (in quantity).

(iii) Raw material purchase budget (in quantity).

(iv) Raw material purchase budget (in value).

(RTP Sep. 2025)

Answer 24

Working Note:

Calculation of total annual production

Particulars	(Units)
Sales in 4 quarters	2,30,625
Add: Closing balance	18,375
	2,49,000
Less: Opening balance	(11,250)
Total number of units to be produced in the next year	2,37,750

(i) Production Budget (in units)

Quarters	I (Units)	II (Units)	III (Units)	IV (Units)	Total (Units)
Sales	45,000	56,250	61,875	67,500	2,30,625
Production in current quarter (75% of the sale of current quarter)	33,750	42,188	46,406	50,625	
Production for next quarter (25% of the sale of next quarter)	14,063	15,469	16,875	18,375	
Total production	47,813	57,656	63,281	69,000	2,37,750

(ii) Raw material consumption budget in quantity

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Quarters	I	II	III	IV	Total
Units to be produced in each quarter: (A)	47,813	57,656	63,281	69,000	2,37,750
Raw material consumption p.u. (kg.): (B)	4	4	4	4	
Total raw material consumption (Kg.) : (A × B)	1,91,250	2,30,625	2,53,125	2,76,000	9,51,000

(iii) Raw material purchase budget (in quantity)

Particulars	Qty. (kg.)
Raw material required for production	9,51,000
Add: Closing balance of raw material	7,500
	9,58,500
Less: Opening balance	(15,000)
Material to be purchased	9,43,500

(iv) Raw material purchase budget (in value)

Quarters	% of annual requirement	Qty. of material	Rate per kg. (Rs.)	Amount (Rs.)
(1)	(2)	(3)	(4)	(5) = (3×4)

I	25	2, 35,875 (9, 43,500 kg. x 25%)	12	28,30,500
II	50	4, 71,750 (9, 43,500 kg. x 50%)	13	61,32,750
III	25	2, 35,875 (9, 43,500 kg. x 25%)	14	33,02,250
Total		9,43,500		1,22,65,500

Topic 4 Ratios in Budgeting

Question 25

CALCULATE (i) Efficiency ratio (ii) Activity Ratio (iii) Capacity Ratio. The relevant data is as below: Budgeted Production 1,44,000 units Standard Hours per unit 12 Actual Production 1,20,000 units Actual Working Hours 12,00,000

(MTP March '23, Aug '18)(Same concept different figures MTP Oct '19)

Answer 25

(i) Efficiency Ratio = $\frac{\text{Standard hour (for actual Production)}}{\text{Actual hours work}} \times 100$

$= \frac{1,20,000 \text{ units} \times 12 \text{ hrs.}}{12,00,000 \text{ hrs.}} \times 100 = 120\%$

(ii) Activity Ratio = $\frac{\text{Standard hour (for actual Production)}}{\text{Budgeted hours}} \times 100$

$= \frac{14,40,0000}{1,44,000 \text{ Units} \times 12 \text{ hours}} \times 100 = 83.34\%$

(iii) Capacity Ratio = $\frac{\text{Actual hours (Worked)}}{\text{Budgeted hours}} \times 100$

$$\frac{12,00,0000}{1,44,000 \text{ Units} \times 12 \text{ hours}} \times 100 = 69.45\%$$

Topic 5 Budget Manual & Budget Organization

Question 26

Define Budget Manual. What are the salient features of Budget Manual?

(PYP Nov 22) (RTP May '21 & Nov '19, MTP Nov'21, Old & New SM)

Answer 26

Budget Manual: The budget manual is a booklet specifying the objectives of an organisation in relation to its strategy. The budget is made to decide how much an organisation would earn and spend and in what manner. In the budget, the organisation sets its priorities too.

Effective budgetary planning relies on the provision of adequate information to the individuals involved in the planning process. Many of these information needs are contained in the budget manual. A budget manual is a collection of documents that contains key information for those involved in the planning process.

CIMA London defines budget manual as, 'A document which sets out the responsibilities of the persons engaged in, the routines of, and the forms and records required for, budgetary control'.

Contents of a budget manual: Typical budget manual may include the following:

(i) A statement regarding the objectives of the organisation and how they can be achieved through budgetary control;

(ii) A statement about the functions and responsibilities of each executive, both regarding preparation and execution of budgets;

(iii) Procedures to be followed for obtaining the necessary approval of budgets. The authority of granting approval should be stated in explicit terms. Whether, one two or more signatures are required on each document should be clearly stated;

(iv) A form of organisation chart to show who are responsible for the preparation of each functional budget and the way in which the budgets are interrelated.

(v) A timetable for the preparation of each budget.

(vi) The manner of scrutiny and the personnel to carry it out;

(vii) Reports, statements, forms and other record to be maintained.

Question 27

DESCRIBE the salient features of budget manual.

(Study Material)

Answer 27

Budget Manual: The budget manual is a booklet specifying the objectives of an organisation in relation to its strategy. The budget is made to decide how much an organisation would earn and spend and in what manner. In the budget, the organisation sets its priorities too.

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(v) A timetable for the preparation of each budget.

(vi) The manner of scrutiny and the personnel to carry it out;

(vii) Reports, statements, forms and other record to be maintained;

(viii) The accounts classification to be employed. It is necessary that the framework within which the costs, revenue and other financial accounts are classified must be identical both in the accounts and budget department;

(ix) The reporting of the remedial action;

(x) The manner in which budgets, after acceptance and issuance, are to be revised or the matter amended these are included in budgets and on which action can be taken only with the approval of top management

(xi) This will prevent the formation of a 'bottleneck' with the late preparation of one budget holding up the preparation of all others.

(xii) Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion.

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(xiii) A list of the organization's account codes, with full explanations of how to use them.

(xiv) Information concerning key assumptions to be made by managers in their budgets, for example the rate of inflation, key exchange rates, etc.

Question 28

Budget manual is a document:

(a) Which contains different type of budgets to be formulated only.

(b) Which contains the details about standard cost of the products to be made.

(c) Setting out the budget organization and procedures for preparing a budget including fixation of responsibilities, formats and records required for the purpose of preparing a budget and for exercising budgetary control system.

(d) None of the above

(Study Material)

Ans: (c)

Reason

A budget manual is a comprehensive written document that serves as a guide for all aspects of budgeting within an organization. It typically includes:

The budgeting procedures to be followed

The roles and responsibilities of different personnel involved in budgeting

The formats and forms to be used

Instructions for budget preparation, review, and control mechanisms

Its main purpose is to ensure a systematic and coordinated approach to budgeting and effective implementation of budgetary control.

Thus, the correct answer is (c).

Topic 6 Zero-Based Budgeting (ZBB)

Question 29

EXPLAIN the stages in Zero-based budgeting

(MTP May 2020)

Answer 29

Zero-based budgeting (ZBB) involves the following stages:

(i) Identification and description of Decision packages

(ii) Evaluation of Decision packages

(iii) Ranking (Prioritisation) of the Decision packages

(iv) Allocation of resources

(v) Identification and description of Decision packages: Decision packages are the programmes or activities for which decision is required to be taken. The programmes or activities are described for technical specifications, financial impact in the form of cost benefit analysis and other issues like environmental, regulatory, social etc.

(vi) Evaluation of Decision packages: Once Decision packages are identified and described, it is evaluated against factors like synchronisation with organisational objectives, availability of funds, regulatory requirement etc.

(vii) Ranking (Prioritisation) of the Decision packages: After evaluation of the decision packages, it is ranked on the basis priority of the activities. Because of this prioritization feature ZBB is also known as Priority-based Budgeting.

(viii) Allocation of resources: After ranking of the decision packages, resources are allocated for decision packages. Budgets are prepared like it is done first time without taking reference to previous budgets

Question 30

T Ltd manufactures and sells a single product and has estimated sales revenue of Rs 1,51,20,000 during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are Rs30 per unit sold and fixed selling & distribution overheads are estimated to be Rs 34,56,000.

The other relevant details are as under:

Purchase Price:	**Material A**	**Rs 80 per kg**	
	Materials B	**Rs 50 per kg**	
Labour Rate:	**Machine Shop**	**Rs 70 per hour**	
	Assembly Shop	**Rs 35 per hour**	
	Finished Stock	**Material A**	**Material B**
Opening Stock	**2,500 units**	**7,500 kg**	**4,000 kg**
Closing Stock	**3,000 units**	**8,000 kg**	**5,500 kg**

Required

(i) CALCULATE number of units of product proposed to be sold and selling price per unit,

(ii) PREPARE Production Budget in units and

(iii) PREPARE Material Purchase Budget in units.

(MTP Nov '21) (RTP May '21)

Answer 30

Workings

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (Rs)
Estimated Sales Revenue	1,51,20,000
Less: Desired Profit Margin on Sale @ 20%	30,24,000
Estimated Total Cost	1,20,96,000
Less: Fixed Selling and Distribution Overheads	34,56,000
Total Variable Cost	86,40,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (Rs)
Direct Materials:	480

B: 3 Kg. @ Rs50 per kg.	150
Labour Cost:	
Machine Shop: 4 hrs. @ Rs70 per hour	280
Assembly Shop: 2 hrs. @ Rs35 per hour	70
Factory Overheads: 20% of (Rs280 + Rs70)	70
Variable Selling & Distribution Expenses	30
Total Variable Cost per unit	1,080

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold = Total Variable Cost / Variable Cost per unit

= Rs 86,40,000 / Rs 1,080

= 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold

= Rs 1,51,20,000 / 8,000 units

= Rs 1,890

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000

Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material (A)	Material (B)
Requirement for Production	51,000 (8,500 units × 6 Kg.)	25,500 (8,500 units × 3 Kg.)
Add: Desired Closing Stock	8,000	5,500
Total Requirements	59,000	31,000
Less: Opening Stock	(7,500)	(4,000)
Quantity to be purchased	51,500	27,000

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Topic 7 Flexible Budget Numericals

Question 31

KLM Limited has prepared its expense budget for 50,000 units in its factory for the year 2019-20 as detailed below:

	('per unit)
Direct Materials	**125**

Direct Labour	**50**
Variable Overhead	**40**
Direct Expenses	**15**
Selling Expenses (20% fixed)	**25**
Factory Expenses (100% fixed)	**15**
Administration expenses (100% fixed)	**8**
Distribution expenses (85% variable)	**20**
Total	**298**

PREPARE an expense budget for the production of 35,000 units and 70,000 units.

(RTP Nov'19)

Answer 31

Expense Budget of KLM Ltd.

Particulars	**50,000 Units(Rs)**	**35,000 Units(Rs)**	**70,000 Units (Rs)**
Direct Material	62,50,000 (50,000 x 125)	43,75,000 (35,000 x 125)	87,50,000 (70,000 x 125)
Direct Labour	25,00,000 (50,000x50)	17,50,000 (35,000x50)	35,00,000 (70,000x50)

Variable Overhead	20,00,000 (50,000x40)	14,00,000 (35,000x40)	28,00,000 (70,000x 40)
Direct Expenses	7,50,000 (50,000x15)	5,25,000 (35,000x15)	10,50,000 (70,000x15)
Selling Expenses (Variable)*	10,00,000 (50,000 x20)	7,00,000 (35,000x20)	14,00,000 (70,000x20)
Selling Expenses (Fixed)*(5 x 50,000)	2,50,000	2,50,000	2,50,000
Factory Expenses (Fixed)(15 x 50,000)	7,50,000	7,50,000	7,50,000
Administration Expenses (Fixed)(8 x 50,000)	4,00,000	4,00,000	4,00,000
Distribution Expenses (Variable)**	8,50,000 (17x 50,000)	5,95,000 (17x 35,000)	11,90,000 (17x 70,000)
Distribution Expenses (Fixed)**(3x 50,000)	1,50,000	1,50,000	1,50,000
	1,49,00,000	**1,08,95,000**	**2,02,40,000**

*Selling Expenses: Fixed cost per unit = Rs. 25 x 20% = Rs. 5

Fixed Cost = Rs. 5 x 50,000 units = Rs. 2,50,000

Variable Cost Per unit = Rs. 25 – Rs. 5 = Rs. 20

**Distribution Expenses: Fixed cost per unit = Rs. 20 x 15% = Rs. 3

Fixed Cost = Rs. 3 x 50,000 units = Rs. 1,50,000

Variable cost per unit = Rs. 20 – Rs. 3 = Rs. 17

Topic 8 Case Studies / Mixed Concept Problem

Question 32

SP Ltd. has prepared budget for the coming year for its two products A and B.

	Product A (Rs)	Product B (Rs)
Production & Sales unit	6,000 units	9,000 units
Raw material cost per unit	60.00	42.00
Direct labour cost per unit	30.00	18.00
Variable overhead per unit	12.00	6.00
Fixed overhead per unit	8.00	4.00
Selling price per unit	120.00	78.00

After some marketing efforts, the sales quantity of the Product A & B can be increased by 1,500 units and 500 units respectively but for this purpose the variable overhead and fixed overhead will be increased by 10% and 5% respectively for the both products.

You are required to PREPARE flexible budget for both the products:

(i) Before marketing efforts

(ii) After marketing efforts

(MTP April '23 & March '19, RTP May '19)

Answer 32

(i) Flexible Budget before marketing efforts:

	Product A (Rs)		Product B (Rs)	
	6,000 units		9,000units	
	Per unit	Total	Per unit	Total
Sales	120.00	7,20,000	78.00	7,02,000
Raw material cost	60.00	3,60,000	42.00	3,78,000
Direct labour cost per unit	30.00	1,80,000	18.00	1,62,000
Variable overhead per unit	12.00	72,000	6.00	54,000
Fixed overhead per unit	8.00	48,000	4.00	36,000
Total cost	110.00	6,60,000	70.00	6,30,000
Profit	10.00	60,000	8.00	72,000

(ii) Flexible Budget after marketing efforts:

	Product A (Rs)		Product B (Rs)	
	7,500 units		9,500 units	
	Per unit	Total	Per unit	Total
Sales	120.00	9,00,000	78.00	7,41,000

Raw material cost	60.00	4,50,000	42.00	3,99,000
Direct labour cost per unit	30.00	2,25,000	18.00	1,71,000
Variable overhead per unit	13.20	99,000	6.60	62,700
Fixed overhead per unit	6.72	50,400	3.98	37,800
Total cost	109.92	8,24,400	70.58	6,70,500
Profit	10.08	75,600	7.42	70,500

Question 33

(Includes concepts of Cost Sheet)

The information of Z Ltd. for the year ended 31st March 2021 is as below:

	Amount (Rs.)
Direct materials	**17,50,000**
Direct wages	**12,50,000**
Variable factory overhead	**9,50,000**
Fixed factory overhead	**12,00,000**
Other variable costs	**6,00,000**
Other fixed costs	**4,00,000**

Profit	**8,50,000**
Sales	**70,00,000**

During the year, the company manufactured two products, X and Y, and the output and cost were:

	X	**Y**
Output (units)	**8,000**	**4,000**
Selling price per unit (Rs.)	**600**	**550**
Direct material per unit (Rs.)	**140**	**157.50**
Direct wages per unit (Rs.)	**90**	**132.50**

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as:

Product X – Rs. 40 per unit and Product Y- Rs. 70 per unit.

For the FY 2021-22, it is expected that demand for product X and Y will fall by 20% & 10% respectively. It is also expected that direct wages cost will raise by 20% and other fixed costs by 10%. Products will be required to be sold at a discount of 20%.

You are required to:

(i) Prepare profitability statement for the FY 2020-21 and PREPARE a budget for the FY 2021-22.

(MTP March ’21) (RTP Nov ’20)

Answer 33

(i) Product-wise Profitability Statement for the FY 2020-21:

Particulars	Product-X (Rs.)	Product-Y (Rs.)	Total (Rs.)
Output (units)	8,000	4,000	
Selling price per unit	600	550	
Sales value	48,00,000	22,00,000	70,00,000
Direct material	11,20,000 (Rs.140 × 8,000 units)	6,30,000 (Rs.157.50 × 4,000 units)	17,50,000
Direct wages	7,20,000 (Rs.90 × 8,000 units)	5,30,000 (Rs.132.5 × 4,000 units)	12,50,000
Variable factory overheads	5,47,200 (76% of Rs. 7,20,000)	4,02,800 (76% of Rs. 5,30,000)	9,50,000
Other variable costs	3,20,000 (Rs.40 × 8,000 units)	2,80,000 (Rs.70 × 4,000 units)	6,00,000
Contribution	20,92,800	3,57,200	24,50,000
Fixed factory overheads	-	-	12,00,000
Other fixed costs	-	-	4,00,000
Profit			**8,50,000**

* Percentage absorption of variable factory overhead on the basis of direct wages

$\frac{9,50,000}{12,50,000} \times 100 = 76\%$

Preparation of Budget for the FY 2021-22:

Particulars	Product-X (Rs.)	Product-Y (Rs.)	Total (Rs.)
Output (units)	6,400 (8,000 units × 80%)	3,600 (4,000 units × 90%)	
Selling price per unit	480 (Rs.600 × 80%)	440 (Rs.550 × 80%)	
Sales value	30,72,000	15,84,000	46,56,000
Direct material	8,96,000 (Rs.140 × 6,400 units)	5,67,000 (Rs.157.50 × 3,600 units)	14,63,000
Direct wages per unit	6,91,200 (Rs.108 × 6,400 units)	5,72,400 (Rs.159 × 3,600 units)	12,63,600
Variable factory overheads	5,25,312 (76% of Rs.6,91,200)	4,35,024 (76% of Rs.5,72,400)	9,60,336
Other variable costs	2,56,000 (Rs.40 × 6,400 units)	2,52,000 (Rs.70 × 3,600 units)	5,08,000
Contribution	7,03,488	(2,42,424)	4,61,064
Fixed factory overheads	-	-	12,00,000

Other fixed costs (110% of Rs.4,00,000)	-	-	4,40,000
Profit/ (Loss)			**(11,78,936)**

Question 34

The accountant of manufacturing company provides you the following details for year 2019-20:

Particulars	(Rs.)
Direct materials	**28,00,000**
Direct Wages	**16,00,000**
Fixed factory overheads	**16,00,000**
Variable factory overheads	**16,00,000**
Other variable costs	**12,80,000**
Other fixed costs	**12,80,000**
Profit	**18,40,000**
Sales	**1,20,00,000**

During the year, the company manufactured two products A and B and the output and costs were:

Particulars	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	Rs. 32.00	Rs. 56.00
Direct materials per unit	Rs. 8.00	Rs. 12.00
Direct wages per unit	Rs. 4.00	Rs. 8.00

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A Rs. 4.00 per unit; and B Rs. 4.80 per unit.

During 2020-21, it is expected that the demand for product A will fall by 25% and for B by 50%. It is decided to manufacture a new product C, the cost for which is estimated as follows:

Particulars	Product C
Output (units)	2,00,000
Selling price per unit	Rs. 28.00
Direct materials per unit	Rs. 6.40
Direct wages per unit	Rs. 4.00

It is anticipated that the other variable costs per unit of Product C will be same as for product A.

Prepare a budget to present to the management, showing the current position and the position for 2020-21. Comment on the comparative results.

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Answer 34

Budget Showing Current Position and Position for 2020-21

	Position for 2019-20			Position for 2020-21			
	A	B	Total (A+B)	A	B	C	Total (A+B+C)
Sales (units)	2,00,000	1,00,000	–	1,50,000	50,000	2,00,000	–
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Sales Direct Material	64,00,000	56,00,000	1,20,00,000	48,00,000	28,00,000	56,00,000	1,32,00,000
Direct Material	16,00,000	12,00,000	28,00,000	12,00,000	6,00,000	12,80,000	30,80,000
Direct wages	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Factory overhead variable	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Other variable costs	800,000	4,80,000	12,80,000	6,00,000	240,000	8,00,000	16,40,000
(B) Marginal Cost	40,00,000	32,80,000	72,80,000	30,00,000	16,40,000	36,80,000	83,20,000
(C) Contribution (A- B)	24,00,000	23,20,000	47,20,000	18,00,000	11,60,000	19,20,000	48,80,000
Fixed cost							
- Factory			16,00,000				16,00,000
- Others			12,80,000				12,80,000

(D) Total fixed cost			28,80,000				28,80,000
Profit (C - D)			**18,40,000**				**20,00,000**

Comments: Introduction of Product C is likely to increase profit by Rs. 1,60,000 (i.e. from Rs. 18,40,000 to Rs. 20,00,000) in 2020-21 as compared to 2019-20 even if the demand for Product A & B falls. Therefore, introduction of product C is recommended.

Question 35

PQR Limited manufactures three products - Product X, Product Y and Product Z. The output for the current year is 2,50,000 units of Product X, 2,80,000 units of Product Y and 3,20,000 units of Product Z respectively.

Selling price of Product X is 1.25 times of Product Z whereas Product Y can be sold at double the price at which product Z can be sold. Product Z can be sold at a profit of 20% on its marginal cost.

Other information are as follows:

	Product X	Product Y	Product Z
Direct Material Cost (Per unit)	**Rs. 20**	**Rs. 20**	**Rs. 20**
Direct Wages Cost (per unit)	**Rs. 16**	**Rs. 24**	**Rs. 16**

Raw material used for manufacturing all the three products is the same. Direct Wages are paid @ Rs. 4 per labour hour,

Total overhead cost of the company is Rs. 52,80,000 for the year, out of which Rs. 1 per labour hour is variable and the rest is fixed.

In the next year it is expected that sales of product X and product Z will increase by 12% and 15% respectively and sale of product Y will decline by 5%. The total overhead cost of the

company for the next year is estimated at Rs. 55,08,000. The variable cost of Rs. 1 per labour hour remains unchanged.

It is anticipated that all other costs will remain same for the next year and there is opening and closing stock. Selling Price per unit of each product will remain unchanged in the next year.

Required:

Prepare a budget showing the current position and the position for the next year clearly indicating the total product-wise contribution and profit for the company as a whole.

(PYP May '23)

Answer 35

i) Budget showing current position of total product wise contribution and profitability

	Particulars	Product X (Rs.)	Product Y (Rs.)	Product Z (Rs.)	Total (Rs.)
A	Direct material cost (per unit)	20	20	20	
B	Direct wages cost (per unit)	16	24	16	
C	Variable overhead per unit (Refer WN-1)	4	6	4	
D	Total variable cost/ Marginal cost per unit [A+B+C]	40	50	40	
E	Add: Profit [20% of D]	-	-	8	
F	Selling price unit [D+E]	-	-	48	

G	Price weight	1.25	2	1	
H	Selling price per unit [Selling price of Product Z × G]	60	96	48	
I	Contribution per unit [H-D]	20	46	8	
J	Quantity to be sold	2,50,000	2,80,000	3,20,000	
K	Total Contribution [J×I]	50,00,000	1,28,80,000	25,60,000	2,04,40,000
L	Fixed Overheads [Refer WN-1]				13,20,000
M	Profit				1,91,20,000

Working Notes:

1. Segregation of Overheads into variable and fixed in current year

	Particulars	Product X (Rs.)	Product Y (Rs.)	Product Z (Rs.)	Total (Rs.)
A	Total overhead cost	-	-	-	52,80,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,50,000	2,80,000	3,20,000	
D	Total variable overhead cost [B×C]	10,00,000	16,80,000	12,80,000	39,60,000
E	Fixed overhead cost [A-D]				13,20,000

(ii) Budget showing next year's position of total product wise contribution and profitability

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	Particulars	Product X (Rs.)	Product Y (Rs.)	Product Z (Rs.)	Total (Rs.)
A	Selling price per unit	60	96	48	
B	Contribution per unit	20	46	8	
C	Quantity to be sold	2,80,000 [112% of 2,50,000]	2,66,000 [95% of 2,80,000]	3,68,000 [115% of 3,20,000]	
D	Total Contribution [B×C]	56,00,000	1,22,36,000	29,44,000	2,07,80,000
	Fixed Overheads [Refer WN- 2]				13,20,000
	Profit				**1,94,60,000**

Working Notes:

2. Segregation of Overheads into variable and fixed in next year

	Particulars	Product X (Rs.)	Product Y (Rs.)	Product Z (Rs.)	Total (Rs.)
A	Total overhead cost	-	-	-	55,08,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	

C	Quantity produced	2,80,000	2,66,000	3,68,000	
D	Total variable overhead cost [B×C]	11,20,000	15,96,000	14,72,000	41,88,000
E	Fixed overhead cost [A-D]				13,20,000

Other Questions

Question 1

X Ltd. provides the following cost details for calculating the selling price of Job No. X2X:

Particulars	Per unit (Rs.)
Materials	1,330
Direct wages 18 hours @ Rs. 47.50 (Deptt. X: 8 hours; Deptt. Y: 6 hours; Deptt. Z: 4 hours)	855
Chargeable expenses	95
	2,280
Add: 1/3rd for expenses cost	760
	3,040

Analysis of the Profit/Loss Account (for the current financial year)

			(Rs.)		(Rs.)
Materials used			28,50,000	Sales	47,50,000
Direct wages:					
	Deptt. X	1,90,000			
	Deptt. Y	2,28,000			
	Deptt. Z	1,52,000	5,70,000		

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Special stores items			**76,000**		
Overheads:					
	Deptt. X	**95,000**			
	Deptt. Y	**1,71,000**			
	Deptt. Z	**38,000**	**3,04,000**		
Works cost			**38,00,000**		
Gross profit c/d			**9,50,000**		
			47,50,000		**47,50,000**
Selling expenses			**3,80,000**	**Gross profit b/d**	**9,50,000**
Net profit			**5,70,000**		
			9,50,00		**9,50,00**

It is also noted that average hourly rates for the three Departments X, Y and Z are similar.

You are required to prepare a job cost sheet to DETERMINE the selling price by calculating the entire revised cost using above figures as the base and adding 20% to the total cost.

(RTP May 2025)

Answer 1

Job cost Sheet

Particulars	Amount (Rs.)
Direct materials	1,330.00

Direct wages:	
Deptt. X Rs. 47.50 × 8 hrs. = Rs. 380	
Deptt. Y Rs. 47.50 × 6 hrs. = Rs. 285	
Deptt. Z Rs. 47.50 × 4 hrs. = Rs. 190	855.00
Chargeable expenses	95.00
Prime cost	2,280.00
Overheads:	
Deptt. X =$\left(\frac{\text{Rs.95,000}}{\text{Rs.1,90,000}} \times 100\right)$ = 50% of Rs. 380 = Rs. 190.00	
Deptt. Y =$\left(\frac{\text{Rs.1,71,000}}{\text{Rs.2,28,000}} \times 100\right)$ = 75% of Rs. 285 = Rs. 213.75	
Deptt. Z =$\left(\frac{\text{Rs.38,000}}{\text{Rs.1,52,000}} \times 100\right)$ = 25% of Rs.190 = Rs. 47.50	451.25
Works cost	2,731.25
Selling expenses= $\left(\frac{\text{Rs.3,80,000}}{\text{Rs.38,00,000}} \times 100\right)$	273.13
Total cost	3,004.38
Profit(20% of total cost)	600.88
Selling price	3,605.26

Question 2

DEFINE Product costs. Describe three different purposes for computing product costs.

(RTP May 2025)

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Answer 2

Definition of product costs: Product costs are inventoriable costs. These are the costs, which are assigned to the product. Under marginal costing variable manufacturing costs and under absorption costing, total manufacturing costs constitute product costs.

Purposes for computing product costs:

The three different purposes for computing product costs are as follows:

(i) Preparation of financial statements: Here focus is on inventoriable costs.

(ii) Product pricing: It is an important purpose for which product costs are used. For this purpose, the cost of the areas along with the value chain should be included to make the product available to the customer.

(iii) Contracting with government agencies: For this purpose government agencies may not allow the contractors to recover research and development and marketing costs under cost plus contracts.

Question 3

WHAT do you understand by Operating Costs? DESCRIBE its essential features and state where it can be usefully implemented?

(RTP May 2025)

Answer 3

Operating Costs or Service Costing are the costs incurred by undertakings which do not manufacture any product but provide a service. Such undertakings for example are — Transport concerns, Gas agencies; Electricity Undertakings; Hospitals; Theatres etc. Because of the varied nature of activities carried out by the service undertakings, the cost system used is obviously different from that followed in manufacturing concerns.

The essential features of operating costs are as follows:

(1) The operating costs can be classified under three categories. For example in the case of transport undertaking these three categories are as follows:

(a) Operating and running charges: It includes expenses of variable nature. For example expenses on petrol, diesel, lubricating oil, and grease etc.

(b) Maintenance charges: These expenses are of semi-variable nature and includes the cost of tyres and tubes, repairs and maintenance, spares and accessories, overhaul, etc.

(c) Fixed or standing charges: These includes garage rent, insurance, road licence, depreciation, interest on capital, salary of operating manager, etc.

(2) The cost unit used is composite like passenger-mile; Kilowatt-hour, etc.

It can be implemented in all firms of transport, airlines, bus-service, etc., and by all firms of distribution undertakings.

Question 4

EXPLAIN:

(i) Pre-production Costs

(ii) Research and Development Costs

(iii) Training Costs

(RTP May 2025)

Answer 4

(i) Pre-production Costs: These costs forms the part of development cost, incurred in making a trial production run, preliminary to formal production. These costs are incurred when a new factory is in the process of establishment or a new project is undertaken or a new product

line or product is taken up, but there is no established or formal production to which such costs may be charged.

(ii) Research and Development Costs: Research costs are the costs incurred for the original and planned investigation undertaken with a prospect of gaining new scientific or technical knowledge and understanding. Development costs are the cost incurred in applying research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services prior to the commencement of commercial production or use.

(iii) Training Costs: Costs which are incurred in and in relation to providing training to the workers, apprentices, executives etc. Training cost consists of wages and salaries paid to new trainees, fees paid to trainers, cost of materials and properties used to train the trainees, costs associated with training centre, loss suffered due to lower production and extra spoilage etc. The total cost of training section is thereafter apportioned to production centers.

Question 5

Pinku Confectioners (PC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. PC use to bake at least 50 units of any item at a time. A customer has given an order for 600 cakes. To process a batch of 50 cakes, the following cost would be incurred:

Direct materials	**Rs.5,000**
Direct wages	**Rs.500**
Oven set up cost	**Rs.750**

PC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads.

PC requires a profit margin of 25% of sales value.

Required:

(i) Determine the price to be charged for 600 cakes.

(ii) Calculate cost and selling price per cake.

(iii) What would be selling price per unit If the order is for 605 cakes.

(RTP Sep. 2025)

Answer 5

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

Particulars	Cost per batch (Rs.)	Total Cost (Rs.)
Direct Material Cost	5,000.00	60,000
Direct Wages	500.00	6,000
Oven set-up cost	750.00	9,000
Add: Production Overheads (20% of Direct wages)	100.00	1,200
Total Production cost	6,350.00	76,200
Add: S&D and Administration overheads (10% of Total production cost)	635.00	7,620
Total Cost	6,985.00	83,820
Add: Profit (1/3rd of total cost)	2,328.33	27,940
(i) Sales price	9,313.33	1,11,760
No. of units in batch	50 units	
(ii) Cost per unit (Rs.6,985 ÷ 50 units)	139.70	

Selling price per unit (9,313.33 ÷ 50 units)	186.27	

(iii) If the order is for 605 cakes, then selling price per cake would be as below:

Particulars	Total Cost (Rs.)
Direct Material Cost	60,500
Direct Wages	6,050
Oven set-up cost	9,750
Add: Production Overheads (20% of Direct wages)	1,210
Total Production cost	77,510
Add: S&D and Administration overheads (10% of Total production cost)	7,751
Total Cost	85,261
Add: Profit (1/3rd of total cost)	28,420
Sales price	1,13,681
No. of units	605 units
Selling price per unit (Rs. 1,13,681 ÷ 605 units)	187.90

Case Scenario

Question 6

A truck driver, named Raju, owns a truck which can carry 5 tonne of material at a time. Raju has no other truck and he has listed himself with various carriage services agencies, to offer his services. He gets his work from these agencies and they pay him as per the load and the

distance. Raju has one condition that he must be paid for at least 75% of his total capacity. Raju charges freight at Rs.10 per tonne-km.

He received a work contract, from one of these agencies, where he has to take 4 tonne from Delhi in the morning and drop it off at Chandigarh. After that he will move to Ludhiana, where he again loads 3 tonne and come back to Delhi by evening. This contract is for nearly 3 months.

Raju is excited to accept the order but it is not physically possible for Raju to complete this project alone. He decides to hire a helper cum driver who will assist him in this work contract and will also drive in turns with Raju. Thus, such a long contract will be managed comfortably. This helper will take Rs.15, 000 per month.

The contract will start from 15th June, 2024 and will run till 14th September, 2024. Throughout this time period there are only 2 days holidays, both falling in August (1 for Independence Day and 1 for Raksha Bandhan).

Some information about the Truck and its associated costs:

- **Truck was purchased on 1st April, 2021 by taking a loan of Rs. 20, 00,000 @ 10% p.a. from Punjab national bank for 5 years. Raju mortgaged jewellery of his wife to get this loan.**
- **Every year-end he has to pay Rs. 5, 27,595 as instalment.**
- **Scrap value after 10 years is expected to be Rs. 500,000.**
- **Depreciation is charged on straight-line method.**
- **Services and maintenance charges each month is Rs. 80,000.**
- **Truck runs on diesel and its running average is 8kms/ litre.**
- **Diesel cost per litre:**

June	**80.30**
July	**80.50**

August	**81.25**
September	**80.90**

Yearly interest amount of loan and yearly depreciation is charged to a work contract on the basis of days worked in a year in the contract.

Distance between these places:

(1) Delhi to Chandigarh = 250 kms

(2) Chandigarh to Ludhiana = 100 kms

(3) Ludhiana to Delhi = 150 kms

(MTP Jan 2025)

Answer the following questions (MCQs 1 to 5):

1. What would be the amount of profit Raju would have earned if he had no minimum charges limit of 75% of total capacity on absolute Tonne-km basis? (If the vehicle runs empty then he would only charge for Diesel expenses).

A. 3, 34,249

B. 4, 43,249

C. 5, 96,977

D. 4, 34,249

Ans: (C) 5, 96,977

Profit if no minimum charges are there, on absolute tonne basis, but he will charge for diesel petrol when running empty

Absolute tonne-kms: (250 kms x 4 tonnes + 150 kms x 3 tonnes) x 90 days

= 1, 30,500 tonne-kms

Vacant moving (Chandigarh to Ludhiana) = 100kms x 90 days = 9,000 kms

Charges for vacant running:

	(Rs.)
June (80.30 x 16 x 100)/8	16,060
July (80.50 x 31 x 100) /8	31,194
August (81.25 x 29 x 100) /8	29,453
September (80.90 x 14 x 100) /8	14,158
Total Charges	90,864

	(Rs.)
Total revenue (1,30,500 x 10)	13,05,000
Add: diesel recovery for vacant running	90,864
Less: service & maintenance (80,000 x 3)	(2,40,000)
Less: salary (15,000 x 3)	(45,000)
Less: diesel cost	(4,54,323)
Less: interest	(22,578)
Less: depreciation	(36,986)
Profit	5,96,977

Bifurcation of principal and interest

Years	**Calculation of interest (Rs.)**	**Interest (Rs.)**	**Principal repayment (Rs.)**	**Loan balance (Rs.)**

0	-	-	-	20,00,000
1	20,00,000 x 10%	2,00,000	3,27,595	16,72,405
2	16,72,405 x 10%	1,67,241	3,60,354	13,12,051
3	13,12,051 x 10%	1,31,205	3,96,390	9,15,661
4	9,15,661 x 10%	91,566	4,36,029	4,79,632
5	4,79,632 x 10%	47,963	4,79,632	-

Interest allocated to this job = 91,566 x 90 / 365 = 22,578

Depreciation = $\frac{20,00,000-5,00,000}{10} \times \frac{90}{365}$ =36,986

Diesel expenses:

	(Rs.)
June (80.30 x 16 x 500)/8	80,300
July (80.50 x 31 x 500)/8	1,55,969
August (81.25 x 29 x 500)/8	1,47,266
September (80.90 x 14 x 500)/8	70,788
Total diesel expenses	4,54,322

2. If payment was made on commercial Tonne-km basis and Raju had no minimum charges limit of 75%, how much he would have lost due to no minimum requirement?

A. Rs. 6, 37,500

B. Rs. 5, 93,750

C. Rs. 4, 92,438

D. Rs. 3, 91,126

Ans: (A) Rs. 6, 37,500

	With minimum limit (Rs.)	**Without minimum limit (Rs.)**
Commercial tonne kms	3.75 x 500 x 90 = 1,68,750	((4+0+3)/3) x 500 x 90 = 1,05,000
revenue	1,68,750 x 10 = 16,87,500	1,05,000 x 10 = 10,50,000
Less: costs	(7,98,887)	(7,98,887)
Profit/(loss)	8,88,613	2,51,113

Loss arising due to no minimum limit = 8, 88,613-2, 51,113 = 6, 37,500

3. What should be the minimum amount charged on basis of absolute Tonne-km if Raju wants to earn Rs. 2, 70,000?

A. Rs. 4.58

B. Rs. 6.13

C. Rs. 8.39

D. Rs. 3.21

Ans: (B) Rs. 6.13

Total Revenue = Cost + Profit = 7, 98,887+ 2, 70,000 = Rs. 10, 68,887

Absolute Tonne-Kms = 1, 74,375

Rate = 10, 68,887/1, 74,375 = Rs. 6.13

4. Choose the correct amount of depreciation and interest that should be charged to this work contract.

A. 56,983 & 22,588

B. 36,986 & 22,578

C. 63,963 & 12,568

D. 63,953 & 12,558

Ans: (B) 36,986 & 22,578

5. What is the profit as per current rate charged by Raju? (Use absolute Tonne-Km).

A. 7, 34,249

B. 9, 44,863

C. 5, 96,977

D. 4, 34,249

Ans: (B) 9, 44,863

Profit at current rate (based on minimum charges of 75%)

Absolute tonne-kms: (250 kms x 4 tonnes + 100 kms x 3.75 tonnes + 150 kms x 3.75 tonnes) x 90 days = 1, 74,375 tonne-kms

	(Rs.)
Total revenue (1,74,375 x 10)	17,43,750
Less: service & maintenance (80,000 x 3)	(2,40,000)
Less: salary (15,000 x 3)	(45,000)

Less: diesel cost	(4,54,323)
Less: interest	(22,578)
Less: depreciation	(36,986)
Profit	9,44,863

Question 7

Rinku Ltd is a manufacturing company which is producing bags of different varieties. The company is planning to establish a new plant in the neighboring country to produce the bags. New plant has a production capacity of 2, 00,000 units per year. As per the studies, normal capacity utilization is 90% of the production capacity. The company will be able to sell the whole production after making price adjustments.

The following are the annual cost data on the basis of cost studies for the new plant in the neighboring country:

Material Cost = Rs. 42, 00,000 (100% variable)

Labour = Rs. 40, 00,000 (70% variable)

Factory Overheads = Rs. 35, 00,000 (60% variable)

Administrative Overheads = Rs. 10, 00,000 (30% variable)

Bags are being produced and sold on steady basis. It is estimated that it costs Rs. 1 as inventory holding cost per bag per month and that the set up cost per run of bag manufacture is Rs. 1,000.

The production of the new plant will be sold only the sales agent in the neighboring country who will receive Rs. 5 per bag. There is no other selling expenses other than commission. Fixed cost are calculated on the basis of normal capacity utilization of the plant.

Assume 365 days in a year.

Being a cost manager of the company, you are required answer the following questions being asked by the management of the company:

(MTP May 2025)

1. What is the total variable cost of the bags being produced?

(a) Rs. 80, 00,000

(b) Rs. 93, 00,000

(c) Rs. 1, 03, 00,000

(d) Rs. 33, 00,000

Ans: (c) Rs. 1, 03, 00,000

2. What is the total fixed cost of the bags being produced?

(a) Rs. 40, 00,000

(b) Rs. 35, 00,000

(c) Rs. 53, 00,000

(d) Rs. 33, 00,000

Ans: (d) Rs. 33, 00,000

Working note

Particulars	Rs.
Variable Cost:	

Material	42,00,000
Labour (40, 00,000 x 70%)	28,00,000
Factory Overheads (35, 00,000 x 60%)	21,00,000
Administrative Overheads (10, 00,000 x 30%)	3,00,000
Commission (1,80,000 x 5)	9,00,000
Total Variable cost	1,03,00,000
Fixed Cost:	
Labour (40, 00,000 x 30%)	12,00,000
Factory Overheads (35, 00,000 x 40%)	14,00,000
Administrative Overheads (10, 00,000 x 70%)	7,00,000
Total Fixed Cost	33,00,000

3. Calculate the break-even point if the sales price is Rs.100 per bag?

(a) 65,159 bags

(b) 77,139 bags

(c) 93,000 bags

(d) 86,503 bags

Ans: (b) 77,139 bags

Variable cost per bag = Rs. 1, 03, 00,000/1, 80,000 = Rs. 57.22

Contribution per bag = Rs. 100 – Rs. 57.22 = Rs. 42.78

Break-even point (in number of bags)

= Fixed cost/Contribution per bag = Rs.33, 00,000/Rs.42.78 = 77,139 bags

4. Calculate the optimum run size and number of runs for bag manufacturing?

(a) 7,746 bags and 24 runs

(b) 8,000 bags and 23 runs

(c) 6,503 bags and 28 runs

(d) 5,478 bags and 33 runs

Ans: (d) 5,478 bags and 33 runs

EBQ = $\sqrt{\frac{2DS}{C}}$

Where,

D = no. of bags to be produced annually

S = Set up cost per production run

C = Carrying cost per unit per annum

EBQ = $\sqrt{\frac{2\times1,80,000\times1,000}{1\times12}}$ = 5,478 bags

No. of optimum runs = 1, 80,000/5,478

= 32.86 or 33 runs

5. What is the interval between two consecutive runs?

(a) 11 days

(b) 10 days

(c) 15 days

(d) 19 days

Ans: (a) 11 days

Interval between 2 runs (in days) = 365 days/33 = 11 days

Question 8

Mr. Linde is a German national, who came to India again on 1st April, 2024. He represents his company and wants to start business in India as well. His company expertise in the manufacturing of Industrial machines. Recently launched "Make in India" movement has motivated Mr. Linde thinks that this might be the perfect opportunity for his company to establish his company in India.

Last, Mr. Linde came to India on 1st April, 2012. He purchased a land for Rs. 50, 00,000 and constructed a building by spending Rs. 16, 00,000. After that he opened a Private limited company in that building. He spent another Rs. 2, 80,000 for this. He also employed 3 people for survey and to understand the need of Indian customers and spent Rs. 1, 50,000 in salaries.

He was disappointed in the response of market, who were importing everything from China back then. He closed the office & went back to Germany. All these years the office was closed and only an amount of Rs. 12,500 per month was paid to a guard and property tax was also paid. Property tax was paid on an average of Rs. 18,000 per year.

Now when Mr. Linde is back, he opens the office and starts to plan on how this time he will capture the Indian market.

Expenses started to incur as soon as the office opened:

- **Salaries of staff Rs. 2, 50,000 per month.**

• Electricity, water, & maintenance of office at Rs. 50,000 per month.

• Security staff at Rs. 15,000 per month.

Linde plans to purchase a land in Manesar which will be used for the factory. After a search he found an appropriate land and purchased a land for Rs. 1.50 crores. He handed over the land to a SPV company of a REIT to build a state of the art facility for their factory. Factory will be built in 2 years. They will spend Rs. 85 lacs each year for this construction.

Linde, back in the Noida office, made 3 departments:

(1) Office and administration

(2) Sales and marketing

(3) Account and Finance

Expenses for these departments (except for salaries) are expected to be:-

• Office and administration = Rs. 95,000 per year

• Sales and marketing = Rs. 1, 12,000 per year

• Accounts and Finance = Rs. 88,000 per year

Office overheads are to be bifurcated in these departments on the basis of their individual spending ratio.

Technology is developed in Germany but at present its execution is not required. Therefore, they do not require any expert as of now and also because the factory is not ready.

Mr. Linde, being the only person representing his company and lone German in the Indian office feels difficult to manage everything as he finds Indian corporate environment very challenging. He asked his company to deploy another German manager to India. This will cost the company additional two million Indian national rupee per year to relocate this additional manager in India. The German management is divided on this decision. The ones who disagree say “Mr. Linde is competent enough to run a small extension of our company

in India. We will allocate more resources to Indian subsidiary when actual operations will start, till then everything can be managed by Mr. Linde alone. Right Indian Company is itself a cost centre and we are already paying him 3.5 million INR annually, therefore we are not ready to invest until it starts generating revenue".

Linde has another opportunity to relocate the head office, also, to Manesar, where the factory building is being constructed. The distance between head office and factory will reduce greatly, which will be highly beneficial when the factory will become operative. He will have to sale the old office in Noida, which will be sold at Rs. 2.50 crores and purchase a ready-made building in Manesar for Rs. 3.75 crores. This new building will have larger space that can accommodate the future needs for space, when company will grow. It seems to be like perfect investment opportunity to Linde.

Expenses in this new building are expected to be:-

- **Salaries of staff Rs. 3, 00,000 per month**
- **Electricity, water, & maintenance of office at Rs. 80,000 per month.**
- **Security at Rs. 30,000 per month.**

Indexed cost of building in Noida is Rs. 2.25 crores and tax on long-term capital gain is 12.5%.

(RTP May 2025)

On the basis of above information, answer the following 5 MCQs:

i. Find out an avoidable cost till the factory becomes operative. What is its value?

(a) 20, 00,000

(b) 49, 20,000

(c) 98, 40,000

(d) 40, 00,000

Ans: (d) 40, 00,000

Only avoidable cost is a new managers salary for 2 years

= Rs. 20, 00,000 x 2 = Rs. 40, 00,000

ii. Find out the total of Sunk and shut down cost in the given case study. Select the correct option from below.

(a) 4, 30,000

(b) 70, 30,000

(c) 24, 46,000

(d) 90, 46,000

Ans: (d) 90, 46,000

Shut down cost is the cost spent when the company was shut down for 12 years in India

= 12,500 x 12 x 12 + 18,000 x 12 = Rs. 20, 16,000

Sunk cost are all the costs that was spent in 2012

= 50, 00,000+16, 00,000+2, 80,000+1, 50,000

= Rs. 70, 30,000

Total = Rs. 90, 46,000

iii. What is total out-of-pocket cost for the company in Noida branch, after factory land in Manesar is purchased, till the factory operation begins?

(a) 3, 21, 50, 000

(b) 1, 51, 50,000

(c) 81, 50,000

(d) 40, 75,000

Ans: (a) 3, 21, 50, 000

Calculation

Particulars		**Amount (Rs.)**
Salary	2,50,000 x 12 x 2	60,00,000
Electricity, etc.	50,000 x 12 x 2	12,00,000
Security	15,000 x 12months x 2 years	3,60,000
O&A	95,000 x 2 years	1,90,000
Sales	1,12,000 x 2 years	2,24,000
Accounts	88,000 x 2 years	1,76,000
Salary of linde	35,00,000 x 2	70,00,000
Construction	85,00,000 x 2	1,70,00,000
Total		3,21,50,000

iv. What will be out of pocket expenses incurred in relocation of Head office to Manesar?

(a) 3, 75, 00,000

(b) 1, 28, 12,500

(c) 1, 25, 00,000

(d) 4, 24, 20,000

Ans: (b) 1, 28, 12,500

Cost of new office = Rs. 3, 75, 00,000

Money received from sale of Noida office

= 2, 50, 00,000 – (2, 50, 00,000 – 2, 25, 00,000) x 12.5% = Rs. 2, 46, 87,500

Out of pocket expenses for relocation of head office

= 3, 75, 00,000 – 2, 46, 87,500 = Rs. 1, 28, 12,500

v. How much is the unexpired cost of the Noida office as on 1st October, 2024, if salaries to all the employees are paid till 31st March, 2025?

(a) 33, 40,000

(b) 30, 00,000

(c) 15, 90,000

(d) 15, 00,000

Ans: (a) 33, 40,000

Unexpired cost = advance salary paid till March of next year

= (2, 50,000+15,000) x 6months + 35, 00,000/2 = Rs. 33, 40,000

Multiple Choice Questions (MCQ's)

1. Mr. Ben is paid higher wages than Mr. Akon. Though their normal wage rate is same, Mr. Ben gets higher payment as under Halsey system than that to Mr. Akon as under Rowan System.

The total time allowed to make the same product is 75 hours, however, Mr. Ben takes 60 hours while Mr. Akon takes 45 hours.

The production of the product also involve other costs that are not traced directly to the product like salary to quality assurance manager, factory rent, supplies, salary to production supervisor, electricity consumed, etc. which comes to Rs. 2,26,800 leading to factory overhead rate being Rs. 120 per man-hour actually worked.

The total factory cost for the product produced by Mr. Akon comes to Rs. 1,25,640 and by Mr. Ben comes to Rs. 1,29,600.

From the information given above, COMPUTE the normal wage rate along with the cost of material.

(MTP Jan 2025)

A. Normal wage rate- Rs. 63 per hour and cost of material- Rs. 1, 20,240

B. Normal wage rate- Rs. 67.5 per hour and cost of material- Rs. 1, 22,400

C. Normal wage rate- Rs. 480 per hour and cost of material- Rs. 90,000

D. Normal wage rate- Rs. 450 per hour and cost of material- Rs. 87,840

Ans: (C) Normal wage rate- Rs. 480 per hour and cost of material- Rs. 90,000

Let X be the cost of material and Y be the normal rate of wages per hour.

Factory Cost of Mr. Akon (Rowan System) = X + 45Y + $\frac{45}{75} \times (75 - 45)\, Y + (45\ x\ Rs.120)$

Rs. 1, 25,640 = X + 63Y + Rs. 5,400

X + 63Y = Rs. 1, 20,240 … (i)

Factory Cost of Mr. Ben (Halsey System) = X + 60Y + 50% (75 - 60) Y + (60 x Rs. 120)

Rs. 1, 29,600 = X + 67.5Y + Rs. 7,200

X + 67.5Y = Rs. 1, 22,400 … (ii)

From subtracting (i) from (ii), we get,

4.5Y = Rs. 2,160

Y = Rs. 480 per hour

Or, **normal wage rate = Rs. 480 per hour**

Therefore, X = Rs. 1, 20,240 - 63Y

X = Rs. 1, 20,240 - (63 x Rs. 480)

X = Rs. 90,000

Or, **cost of material = Rs. 90,000**

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