CA INTER COST

DIVYA JADI BOOTI

CA SATISH JALAN

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jay Bohra	3	Nov-18	Vedant Vaish	33	Nov-19
Yogesh Agarwal	5	Nov-18	Anil Choudhary	34	Nov-18
Ayush Kejariwal	6	Jan-21	Keshav Modi	34	May-22
Ashish Goyal	6	Jan-21	Pratik Garg	34	Jan-21
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Aayush Agarwal	8	Nov-20	Ritesh Dangaich	36	Nov-19
Gargi Kedawat	9	Nov-18	Ashish Agarwal	36	July-21
Shantanu Jain	10	May-18	Chirag Singhania	37	Jan-21
Praveen Sancheti	11	Nov-18	Ishan Sharma	38	Nov-18
Anand Choudhury	11	Dec-21	Ankur Agarwal	38	May-19
Karan Chhabra	12	July-21	Sonali Mundra	40	May-18
Rahul Goenka	15	Dec-21	Rishi Kapoor	40	Nov-18
Anuj Poddar	16	Jan-21	Sahil Jain	40	May-19
Mayank Santhalia	17	Nov-18	Harsh Thacker	41	Nov-19
Suprateek Bose	18	Nov-18	Yash Singhal	41	Nov-20
Avni Jain	18	May-19	Akanksha Modi	41	Jan-21
Vatsal Karnani	18	Jan-21	Piyush Bajaj	41	July-21
Yashika Tibrewal	18	July-21	Vignesh Gupta	43	Nov-18
Anwesha Das	20	May-19	Sirish Gururaj Rao	44	Nov-19
Anoop Kumar Gupta	20	Jan-21	Deepak Sharma	44	Jan-21
Kishan Agarwal	21	Jan 21	Neha Agarwal	44	Jan-21
Charu Goyal	22	July-21	Shubham Kedia	46	Nov-18
Shivangi Gupta	23	May-19	Gaurav Jain	47	Nov-18
Sancheet Pasari	23	Jan-21	Akshay Goel	47	Nov-19
Ayushi Jain	26	Nov-19	Shivani Singh	47	May-22
Payel Rajpal	27	May-19	Manthan Jalan	48	Jan-21
Sourav Bhagat	28	Nov-19	Prachi Budawanwala	49	May-19
Himalay Bothra	28	Jan-21	Sweta Gupta	49	Nov-19
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Pratistha Jaiswal	6	Dec-17	Madhavi Tripathi	27	Dec-19
Vinay Kumar Singh	8	Dec-18	Narayan Bajaj	28	Jun-22
Gourav Sanghai	9	Jun-22	Sumeet Kumar Saha	28	Jun-17
Chandra Prakash Y	15	Jun-22	Krishna Dwivedi	32	Jun-17
Hrithik Sony	16	Dec-17	Hardik Punatar	32	Dec-18
Pratham Sharma	17	Jun-22	Pratik Panchal	34	Dec-21
Harikiran M	18	Jun-22	Niket Bhushan	37	Dec-19
Rangesh Badrinath	19	Dec-21	Rajeev Ranjan Prasad	37	Dec-20
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Palash Das	24	Dec-18	Priya Prasad	44	Dec-21
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All India Ranker's List: CMA - Inter

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Cost and Management Accounting
Divya Jadi Booti

For CA - Inter

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(This book is updated till May'22 and MTP Nov'22)

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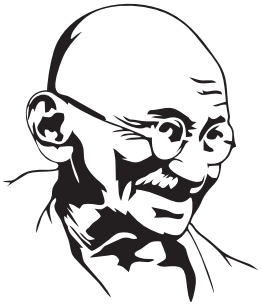
Mahatma Gandhi



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Edition - October 2022

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Nothing in this book, claims that the ICAI will be rewarding marks to the candidates, exactly based on these presentations.

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Cost and Management Accounting
Divya Jadi Booti

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BIRD's EYE VIEW

OF CHAPTERS ASKED IN PAST EXAMINATIONS

Chapter No.	Chapter Name	Terms							
		May'18	Nov'18	May'19	Nov'19	Nov'20	Jan'21	Dec'21	May'22
1	Basics of Cost Accounting	7.5	5	10	-	5	5	10	5
2	Material Cost	17.5	10	10	10	10	5	10	10
3	Employee Cost	15	5	5	10	10	10	10	10
4	Overheads								
	Overheads: Analysis of Semi-Variable cost	-	-	-	-	-	10	-	
	Overheads: Absorption Costing	-	-	-	10	-	5	10	10
	Overhead: Primary and Secondary Distribution	-	10	-	-	10	-	-	
	Overhead: Machine Hour Rate	-	-	5	-	-	5		
5	Activity Based Costing	10	15	10	10	10	10	10	10
6	Cost Sheet	10	10	10	20	10	10	10	10
7	Cost Accounting Systems								
	Control Accounts	-	10	5	5	5	-	-	5
	Reconciliation	5	-	5	-	-	-	5	
8	Unit, Job and Batch Costing	5	10	-	10	5	10	-	10
9	Contract costing	10	5	10	-	5	-	10	5
10	Process Costing and WIP Valuation	10	5	10	10	10	5	5	10
11	Joint Products & By Products	-	5	5	5	5	10	5	5
12	Service Costing	10	10	10	15	10	10	10	5
13	Standard Costing	5	5	10	10	10	10	10	10
14	Marginal Costing	15	10	10	5	10	15	10	10
15	Budget and Budgetary Control	5	10	10	5	10	5	10	10
	Total Marks	**125**	**125**	**125**	**125**	**125**	**125**	**125**	**125**

Contents from A – Z

SJC Institute

ICAI Mat wise Contents

Chapter 1

Basics of Cost Accounting

Q1 RTP May'18; RTP May'20

DISCUSS on (a) Discretionary Cost Centre and (b) Investment Centre

Reference	What's New
Discretionary Cost Centre and Investment Centre	

Answer

(a) **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 corelated with cost incurred on inputs.

(b) **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.

Q2 RTP May'18; RTP Nov'20

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

Reference	What's New
Operation Costing with examples	

Answer

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.

Q3 MTP Mar'18

Discuss cost classification based on variability.

Reference	What's New
Cost classification based on variability	

Answer

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.

Q4 MTP Mar'18

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

Reference | What's **New**

Methods of costing

Answer

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.

Q5 May'18

Why are cost and management accounting information are required by the staff at operational level? Describe.

Reference | What's **New**

Uses of Cost and Management Accounting information

Answer

Operational level staffs - The operational level staffs like supervisors, foreman, team leaders are requiring 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.

Q6 May'18

Explain Opportunity Cost

Reference	What's New
Opportunity cost	

Answer

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.

Q7 RTP Nov'18; MTP Oct'19

Discuss the essential features of a good cost accounting system.

Reference	What's New
Feature of good Cost Accounting System	

Answer

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

(i) **Informative and simple:** Cost and management 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 meticulous and unnecessary details.

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

(iii) **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.

(iv) **Integrated and inclusive:** The cost and management 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.

(v) **Flexible and adaptive:** The cost and management accounting system should be flexible enough to make necessary amendments and modification in the system to incorporate changes in technological, reporting, regulatory and other requirements.

(vi) **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.

Q 8 RTP Nov'18; MTP Aug'18; RTP May'19; MTP April'19; May'19; MTP May'21

Distinguish between Cost Control and Cost Reduction.

Reference — What's **New**

Difference between Cost Control and Cost Reduction

Answer

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 better 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**.

Q9 RTP Nov'18; MTP Mar'19

Explain the difference between controllable & uncontrollable costs?

Reference — What's **New**

Difference between Controllable and Uncontrollable Cost

Answer

Controllable costs and Uncontrollable 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.

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.

Q10 MTP Aug'18

Discuss the prerequisite of installing cost accounting system.

Reference — What's **New**

Prerequisites of installing cost acounting system

Answer

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) **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.

(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 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.

(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).

Q11 MTP Oct'18

State the limitations of cost and management accounting.

Reference	What's New
Limitations of Cost and management accounting	

Answer

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.

Q12 Nov'18

Mention and **explain** types of responsibility centres.

Reference	What's New
Responsibility centres	

Answer

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.

Q13 RTP May'19; RTP May'21

DISCUSS cost classification based on variability and controllability.

Reference	What's New
Cost Classification based on Variability & Controllability	

Answer

Cost classification based on variability

(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 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.

Cost classification based on controllability

(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 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.

(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 to be controlled by the machine shop foreman.

Q14 MTP Mar'19; RTP May'20; Jan'21

Discuss the impact of Information Technology in Cost Accounting.

Reference	What's New
Impact of Information Technology on Cost Accounting System	

Answer

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

(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 organisation 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 utilisation 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 mobilisation**. 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 centre or cost object is ascertained with **accuracy** in **timely** manner. Each cost centre and cost object is **codified** and all related costs are **assigned** to the cost object or cost centre. This process **automates the cost accumulation and ascertainment process**. The cost information can be customised as per the requirement. For example, when an entity manufacture or provide services, it can know information job-wise, batch-wise, process-wise, cost centre 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**.

Q15 MTP Apr'19

State Direct Expenses with examples.

Reference	What's New
Direct expense with examples	

Answer

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.

Q16 MTP Apr'19

Explain the difference between product cost and period cost.

Reference	What's New
Difference between Product cost and Period cost.	

Answer

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.

Q17 May'19

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

Reference	What's New
Direct expenses and their treatment in cost accounting	

Answer

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 amortised 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.

Q18 RTP Nov'19; RTP May'20; Nov'20

Differentiate between Cost Accounting and Management Accounting.

Reference	What's New
Difference between Cost Accounting & Management Accounting	

Answer

	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.

Q19 MTP Nov'20

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

Reference	What's New
Steps to control cost	

Answer

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.

Q20 MTP May'21

Differentiate between Service costing and Product costing.

Reference	What's New
Service Costing and Product Costing	

Answer

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.

Q21 MTP May'21

Discuss the Controllable and un-controllable variances.

Reference	What's New
Controllable and un-controllable variances	

Answer

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 centres 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.

Q22 MTP May'21

Discuss the Standard and Discretionary Cost Centres.

Reference	What's New
Standard and Discretionary Cost Centres	

Answer

(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 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.

Q23 MTP May'21

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:

(i)	Office and administration cost	₹ 6,00,000
(ii)	Product blueprint cost for job A	₹ 2,80,000
(iii)	Hire charges paid for machinery used in job work B	₹ 80,000
(iv)	Salary to office attendants	₹ 1,00,000
(v)	One time license fee paid for software used to make computerised graphics for job C	₹ 1,00,000
(vi)	Salary paid to marketing manager	₹ 2,40,000

Required:

Calculate direct expenses attributable to each job.

Reference — What's New

Direct Expenses | **Allocation to jobs**

Answer

Calculation of Direct expenses

Particulars	Job A (₹)	Job B (₹)	Job C (₹)
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

Q 24 July'21

Specify the types of Responsibility centres under the following situations : [5]

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

(ii) Ticket counter in a Railway station.

(iii) Decentralized branches of an organization.

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

(v) Sales Department of an organization.

Reference | What's **New**

Types of Responsibility Centres

Answer

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

Q 25 MTP Oct'21

How do you deal with the following in cost accounts? [5]

(i) Fringe benefits

(ii) Bad debts.

Reference | What's **New**

Treatment of items in Cost Accounts

Answer

(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 organisation. 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.

Q26 Dec'21

Briefly **explain** the 'techniques of costing'. [5]

Reference | What's **New**

Techniques of Costing

Answer

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.

Techniques	Description
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 standardised 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.

Q 27 MTP May'22

Some of the items of PR Company, a manufacturer of corporate office furniture, are provided below. As the company is in the process of developing a formal cost accounting system, you are required to **CLASSIFY** the items into three categories namely: (i) Cost tracing (ii) Cost allocation (iii) Non- manufacturing item. [5]

Reference | What's **New**

Classification of items

Answer

Item	Cost Tracing	Cost Allocation	Non-manufacturing
Carpenter wages	√		
Depreciation - office building			√
Glue for assembly		√	

Lathe department supervisor		√	
Metal brackets for drawers	√		
Factory washroom supplies		√	
Lumber	√		
Samples for trade shows			√
Lathe depreciation		√	
Lathe operator wages		√	

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Chapter 2

Cost Sheet

Q1 ICAI Mat

The following information has been obtained from the records of ABC Corporation for the period from June 1 to June 30, 20X8.

	On June 1, 20X8 (₹)	On June 30, 20X8 (₹)
Cost of raw materials	60,000	50,000
Cost of work-in-process	12,000	15,000
Cost of stock of finished goods	90,000	1,10,000
Purchase of raw materials during June' 20X8		4,80,000
Wages paid		2,40,000
Factory overheads		1,00,000
Administration overheads (related to production)		50,000
Selling & distribution overheads		25,000
Sales		10,00,000

PREPARE a statement giving the following information:

(a) Raw materials consumed;

(b) Prime cost;

(c) Factory cost;

(d) Cost of goods sold; and

(e) Net profit.

Reference

Sub division of Cost

What's **New**

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Answer

Statement of Cost & Profit
(for the month of June 20X8)

		Amount (₹)
	Opening stock of raw materials	60,000
	Add: Purchase of raw materials during June' 20X8	4,80,000
	Less: Closing stock of raw materials	(50,000)
(a)	**Raw materials consumed**	4,90,000
	Add: Direct wages	2,40,000
(b)	**Prime cost**	7,30,000
	Add: Factory overheads	1,00,000
	Works cost	8,30,000
	Add: Opening work-in-process	12,000
	Less: Closing work-in-process	(15,000)
(c)	**Factory cost**	8,27,000
	Add: Administration overheads	50,000
	Cost of production	8,77,000
	Add: Opening stock of finished goods	90,000
	Less: Closing stock of finished goods	(1,10,000)
(d)	**Cost of goods sold**	8,57,000
	Add: Selling & distribution overheads	25,000
	Cost of sales	8,82,000
(e)	**Net Profit**	1,18,000
	Sales	10,00,000

Q2 ICAI Mat

The books of Adarsh Manufacturing Company present the following data for the month of April, 20X9:

Direct labour cost ₹ 17,500 being 175% of works overheads.

Cost of goods sold excluding administrative expenses ₹ 56,000.

Inventory accounts showed the following opening and closing balances:

	April 1 (₹)	April 30 (₹)
Raw materials	8,000	10,600
Work-in-progress	10,500	14,500
Finished goods	17,600	19,000

Other data are:

	(₹)
Selling expenses	3,500
General and administration expenses	2,500
Sales for the month	75,000

You are **required** to:

(i) COMPUTE the value of materials purchased.

(ii) PREPARE a cost statement showing the various elements of cost and also the profit earned.

Reference — What's **New**

Value of Materials Purchased and Cost Statement

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Answer

(i) **Computation of the value of materials purchased**

	(₹)
Cost of goods sold	56,000
Add: Closing stock of finished goods	19,000
Less: Opening stock of finished goods	(17,600)
Cost of goods manufactured	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: [$\frac{100}{175}$ of Direct labour cost]	(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**

	(₹)
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 goods manufactured	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 ₹ 75,000 – ₹ 62,000)	13,000
Sales	75,000

Q3 ICAI Mat; MTP Nov'20

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 (₹)
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 ₹ 1,50,000 and fixed marketing expenses amount to ₹ 2,50,000 per month respectively. The variable distribution cost amounts to ₹ 30 per unit.

It can sell 100% of its output at ₹ 500 per unit provided it incurs the following further expenditure:

(a) It gives gift items costing ₹ 30 per unit of sale;

(b) It has lucky draws every month giving the first prize of ₹ 50,000; 2nd prize of ₹ 25,000, 3rd prize of ₹ 10,000 and three consolation prizes of ₹ 5,000 each to customers buying the product.

(c) It spends ₹ 1,00,000 on refreshments served every month to its customers;

(d) It sponsors a television programme every week at a cost of ₹ 20,00,000 per month.

It can market 30% of its output at ₹ 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.

Reference | What's **New**

Cost Sheet at different Capacity Levels

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Answer

Cost Sheet (For the month)

Level of Capacity	30%		100%	
	30,000 units		1,00,000 units	
	Per unit (₹)	Total (₹)	Per unit (₹)	Total (₹)
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: Fixedmarketing 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

***Customers' prize cost:**

	Amount (₹)
1st Prize	50,000
2nd Prize	25,000
3rd Prize	10,000
Consolation Prizes (3 × ₹5,000)	15,000
Total	1,00,000

Q4 ICAI Mat

The following figures are extracted from the Trial Balance of Go-getter Co. on 30th September, 20X8:

	Dr. (₹)	Cr. (₹)
Inventories:		
Finished Stock	80,000	
Raw Materials	1,40,000	
Work-in-Process	2,00,000	
Office Appliances	17,400	
Plant & Machinery	4,60,500	
Building	2,00,000	
Sales		7,68,000
Sales Return and Rebates	14,000	
Materials Purchased	3,20,000	
Freight incurred on Materials	16,000	
Purchase Returns		4,800
Direct employee cost	1,60,000	
Indirect employee cost	18,000	
Factory Supervision	10,000	
Repairs and Upkeep Factory	14,000	
Heat, Light and Power	65,000	
Rates and Taxes	6,300	
Miscellaneous Factory Expenses	18,700	
Sales Commission	33,600	
Sales Travelling	11,000	
Sales Promotion	22,500	
Distribution Deptt.—Salaries and Expenses	18,000	
Office Salaries and Expenses	8,600	
Interest on Borrowed Funds	2,000	

Further details are available as follows:

(i)	**Closing Inventories:**	
	Finished Goods	1,15,000
	Raw Materials	1,80,000
	Work-in-Process	1,92,000

(ii)	**Accrued expenses on:**	
	Direct employee cost	8,000
	Indirect employee cost	1,200
	Interest on Borrowed Funds	2,000
(iii)	**Depreciation to be provided on:**	
	Office Appliances	5%
	Plant and Machinery	10%
	Buildings	4%
(iv)	**Distribution of the following costs:**	
	Heat, Light and Power to Factory, Office and Distribution in the ratio 8 : 1 : 1.	
	Rates and Taxes two-thirds to Factory and one-third to Office.	
	Depreciation on Buildings to Factory, Office and Selling in the ratio 8 : 1 : 1.	

With the help of the above information, you are required to **PREPARE** a condensed Profit and Loss Statement of Go-getter Co. for the year ended 30th September, 20X8 along with supporting schedules of:

(i) Cost of Sales.

(ii) Selling and Distribution Expenses.

(iii) Administration Expenses.

Reference What's **New**

Apportionment of costs

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Answer

Profit and Loss Statement of Go-getter Company
for the year ended 30th September, 20X8

	(₹)	(₹)
Gross Sales	7,68,000	
Less: Returns	(14,000)	7,54,000
Less: Cost of Sales [Refer to Schedule (i)]		(7,14,020)
Net Operating Profit		39,980
Less: Interest on borrowed funds		(4,000)
Net Profit		35,980

(i) **Schedule of Cost of Sales**

	(₹)	(₹)
Raw Material (Inventory opening balance)		1,40,000
Add: Material Purchased	3,20,000	
Add: Freight on Material	16,000	
Less: Purchase Returns	(4,800)	3,31,200
		4,71,200
Less: Closing Raw Material Inventory		(1,80,000)
Materials consumed in Production		2,91,200
Direct employee cost (₹1,60,000 + ₹8,000)		1,68,000
Prime Cost		4,59,200
Factory Overheads:		
Indirect employee cost (₹18,000 + ₹1,200)	19,200	
Factory Supervision	10,000	
Repairs and Factory Upkeep	14,000	
Heat, Light and Power (₹65,000 × 8/10)	52,000	
Rates and Taxes (₹6,300 × 2/3rd)	4,200	
Miscellaneous Factory Expenses	18,700	
Depreciation of Plant (10% of ₹4,60,500)	46,050	
Depreciation of Buildings (4% of ₹2,00,000 × 8/10)	6,400	1,70,550
Gross Works Cost		6,29,750
Add: Opening Work-in-Process inventory		2,00,000
Less: Closing Work-in-Process inventory		(1,92,000)
Cost of production		6,37,750
Add: Opening Finished Goods inventory		80,000
Less: Closing Finished Goods inventory		(1,15,000)
Cost of Goods Sold		6,02,750
Add: Administration Expenses [See Schedule (iii)]		18,870
Add: Selling and Distribution Expenses [See Schedule (ii)]		92,400
Cost of Sales		7,14,020

(ii) **Schedule of Selling and Distribution Expenses**

	(₹)
Sales Commission	33,600
Sales Travelling	11,000
Sales Promotion	22,500
Distribution Deptt.—Salaries and Expenses	18,000

Heat, Light and Power	6,500
Depreciation of Buildings	800
	92,400

(iii) **Schedule of Administration Expenses**

	(₹)
Office Salaries and Expenses	8,600
Depreciation of Office Appliances	870
Depreciation of Buildings	800
Heat, Light and Power	6,500
Rates and Taxes	2,100
	18,870

Q5 RTP May'18; MTP Mar'19; MTP May'20

From the following figures, **CALCULATE** cost of production and profit for the month of March 2018.

	Amount (₹)		Amount (₹)
Stock on 1st March, 2018		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, 2018		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, 2018	12,56,000		
- On 31st March, 2018	14,22,000		

Reference

Cost of Production and Profit

What's **New**

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Answer

Calculation of Cost of Production and Profit for the month ended April 2018:

Particulars	Amount (₹)	Amount (₹)
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)
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

Q6 May'18; RTP May'19

Following information relate to a manufacturing concern for the year ended 31st March, 2018:

	(₹)
Raw Material (opening)	2,28,000
Raw Material (closing)	3,05,000
Purchases of Raw Material	42,25,000
Freight Inwards	1,00,000
Direct wages paid	12,56,000
Direct wages-outstanding at the end of the year	1,50,000
Factory Overheads	20% of prime cost

Work-in-progress (opening)	1,92,500
Work-in-progress (closing)	1,40,700
Administrative Overheads (related to production)	1,73,000
Distribution Expenses	₹ 16 per unit
Finished Stock (opening)-1217 Units	6,08,500
Sale of scrap of material	8,000

The firm produced 14000 units of output during the year. The stock of finished goods at the end of the year is valued at cost of production. The firm sold 14,153 units at a price of ₹ 618 per unit during the year.

Prepare cost sheet of the firm. (10 Marks)

Reference | What's **New**

Cost Sheet with stock valuation - effect of scrap

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Answer

Cost sheet for the year ended 31st March, 2018.

Units produced - 14,000 units

Units sold - 14,153 units

Particulars	Amount (₹)
Raw materials purchased	42,25,000
Add: Freight Inward	1,00,000
Add: Opening value of raw materials	2,28,000
Less: Closing value of raw materials	(3,05,000)
	42,48,000
Less: Sale of scrap of material	(8,000)
Materials consumed	42,40,000
Direct Wages (12,56,000 + 1,50,000)	14,06,000
Prime Cost	56,46,000
Factory overheads (20% of ₹ Prime Cost)	11,29,200
Add: Opening value of W-I-P	1,92,500
Less: Closing value of W-I-P	(1,40,700)
Factory Cost	68,27,000
Add: Administrative overheads	1,73,000
Cost of Production	70,00,000
Add: Value of opening finished stock	6,08,500

Less: Value of closing finished stock [₹ 500(70,00,000/14,000) × 1,064] (1,217+ 14,000 – 14,153 = 1,064 units)	(5,32,000)
Cost of Goods Sold	70,76,500
Distribution expenses (₹ 16 × 14,153 units)	2,26,448
Cost of Sales	73,02,948
Profit (Balancing figure)	14,43,606
Sales (₹ 618 × 14,153 units)	87,46,554

Q7 RTP Nov'18; MTP Oct'19; RTP May'20

From the following data of Arnav Metallic Ltd., **CALCULATE** Cost of production:

		Amount (₹)
(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

Reference

Cost of Production - Quality Control Cost and R & D Cost

What's **New**

Salary to technical director

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Answer

Calculation of Cost of Production of Arnav Metallic for the period…..

Particulars	Amount (₹)
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
	96,64,500
Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	94,68,400
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	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

Notes:

(i) Other administrative overhead does not form part of cost of production.

(ii) Salary paid to Director (Technical) is an administrative cost.

Q8 MTP Oct'18

State the advantages of Cost Sheets

Reference — What's **New**

Advantages of Cost sheet

Watch **Video**

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Answer

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**.

Q 9 Nov'18

Following details are provided by M/s ZIA Private Limited for the quarter ending 30 September, 2018:

(i)	Direct expenses	₹ 1,80,000
(ii)	Direct wages being 175% of factory overheads	₹ 2,57,250
(iii)	Cost of goods sold	₹ 18,75,000
(iv)	Selling & distribution overheads	₹ 60,000
(v)	Sales	₹ 22,10,000
(vi)	Administration overheads are 10% of factory overheads	

Stock details as per Stock Register:

Particulars	30.06.2018 (₹)	30.09.2018 (₹)
Raw material	2,45,600	2,08,000
Work-in-progress	1,70,800	1,90,000
Finished goods	3,10,000	2,75,000

You are **required** to prepare a cost sheet showing:

(i) Raw material consumed

(ii) Prime cost

(iii) Factory cost

(iv) Cost of goods sold

(v) Cost of sales and profit (10 Marks)

Reference — What's **New**

Simple cost sheet

Watch **Video** — Scan Me

Answer

Cost Sheet
(for the quarter ending 30 September 2018)

		Amount (₹)
(i)	**Raw materials consumed**	
	Opening stock of raw materials	2,45,600
	Add: Purchase of materials	12,22,650*
	Less: Closing stock of raw materials	(2,08,000)
	Raw materials consumed	12,60,250
	Add: Direct wages (1,47,000×175%)	2,57,250
	Direct Expenses	1,80,000
(ii)	**Prime cost**	16,97,500
	Add: Factory overheads (2,57,250/175%)	1,47,000
	Gross Factory cost	18,44,500
	Add: Opening work-in-process	1,70,800
	Less: Closing work-in-process	(1,90,000)
(iii)	**Factory cost**	18,25,300
	Add: Administration overheads (10% of factory overheads)	14,700
	Add: Opening stock of finished goods	3,10,000
	Less: Closing stock of finished goods	(2,75,000)
(iv)	**Cost of goods sold**	18,75,000
	Add: Selling & distribution overheads	60,000
	Cost of sales	19,35,000
(v)	**Net Profit**	2,75,000
	Sales	22,10,000

*(18,75,000 + 2,75,000 – 3,10,000 – (1,47,000 × 10%) + 1,90,000 – 1,70,800 – (2,57,250 × 100/175%) - 1,80,000 – 2,57,250 + 2,08,000 – 2,45,600) = 12,22,650

Working notes

Purchase of raw materials = Raw material consumed + Closing stock - Opening stock of raw material

Raw material consumed = Prime cost - Direct wages - Direct expenses

Factory Overheads = 2,57,250*100/175

Prime cost = Factory cost + Closing WIP – Opening WIP – Factory overheads

Factory Cost = Cost of Production goods sold + Closing stock of Finished goods – Opening stock of finished goods – Administrative overheads

Net Profit = Sales - Cost of Sales

Alternative solution

Cost Sheet
(for the quarter ending 30 September 2018)

		Amount (₹)
(i)	**Raw materials consumed**	
	Opening stock of raw materials	2,45,600
	Add: Purchase of materials	12,37,350*
	Less: Closing stock of raw materials	(2,08,000)
	Raw Material consumed	12,74,950
	Add: Direct wages (1,47,000×175%)	2,57,250
	Direct Expenses	1,80,000
(ii)	**Prime cost**	17,12,,200
	Add: Factory overheads (2,57,250/175%)	1,47,000
	Gross Factory cost	18,59,200
	Add: Opening work-in-process	1,70,800
	Less: Closing work-in-process	(1,90,000)
(iii)	**Factory cost/works cost/cost of production**	18,40,000
	Add: Opening stock of finished goods	3,10,000
	Less: Closing stock of finished goods	(2,75,000)
(iv)	**Cost of goods sold**	18,75,000
	Add: Administration overheads (10% of factory overheads)	14,700
	Add: Selling & distribution overheads	60,000
	Cost of sales	19,49,700
(v)	**Net Profit**	2,60,300
	Sales	22,10,000

*(18,75,000 + 2,75,000 – 3,10,000 + 1,90,000 –1,70,800 – 1,47,500 - 1,80,000 – 2,57,250 + 2,08,000 – 2,45,600) = 12,37,350

Working notes

Purchase of raw materials = Raw material consumed + Closing stock - Opening stock of raw material

Raw material consumed = Prime cost - Direct wages - Direct expenses

Factory Overheads = 2,57,250*100/175

Prime cost = Factory cost + Closing WIP – Opening WIP – Factory overheads

Factory Cost = Cost of Production goods sold + Closing stock of Finished goods – Opening stock of finished goods

Net Profit = Sales - Cost of Sales

Q10 May'19

M/s Areeba Private Limited has a normal production capacity of 36,000 units of toys per annum. The estimated costs of production are as under:

(i) Direct Material ₹ 40 per unit

(ii) Direct Labour ₹ 30 per unit (subject to a minimum of ₹ 48,000 p.m.)

(iii) Factory Overheads:

- (a) Fixed ₹ 3,60,000 per annum
- (b) Variable ₹ 10 per unit
- (c) Semi-variable ₹ 1,08,000 per annum up to 50% capacity and additional ₹ 46,800 for every 20% increase in capacity or any part thereof.

(iv) Administrative Overheads ₹ 5,18,400 per annum (fixed)

(v) Selling overheads are incurred at ₹ 8 per unit.

(vi) Each unit of raw material yields scrap which is sold at the rate of ₹ 5 per unit.

(vii) In year 2019, the factory worked at 50% capacity for the first three months but it was expected that it would work at 80% capacity for the remaining nine months.

(viii) During the first three months, the selling price per unit was ₹ 145.

You are **required** to:

(i) Prepare a cost sheet showing Prime Cost, Works Cost, Cost of Production and Cost of Sales.

(ii) Calculate the selling price per unit for remaining nine months to achieve the total annual profit of ₹ 8,76,600. (10 Marks)

Reference | What's **New**

Cost Sheet - with effect of Semi Variable Overheads

Watch **Video**

Scan Me

Answer

(i) **Cost Sheet of M/s Areeba Pvt. Ltd. for the year 2019.**

Normal Capacity: 36,000 units p.a.

Particulars	3 Months (4,500 Units)		9 Months (21,600 units)	
	Amount (₹)	Cost per unit (₹)	Amount (₹)	Cost per unit (₹)
Direct material	1,80,000		8,64,000	
Less: Scrap	(22,500)		(1,08,000)	

Materials consumed	1,57,500	35	7,56,000	35
Direct Wages	1,44,000	32	6,48,000	30
Prime Cost	3,01,500	67	14,04,000	65
Factory overheads:				
- Fixed	90,000		2,70,000	
- Variable	45,000		2,16,000	
- Semi variable	27,000	36	1,51,200	29.50
Works Cost	4,63,500	103	20,41,200	94.50
Add: Administrative overheads	1,29,600	28.80	3,88,800	18
Cost of Production	5,93,100	131.80	24,30,000	112.5
Selling Overheads	36,000	8	1,72,800	8
Cost of Sales	6,29,100	139.80	26,02,800	120.5

Working Notes:

Calculation of Costs

Particulars	4,500 units Amount (₹)	21,600 units Amount (₹)
Material	1,80,000 (₹ 40 × 4,500 units)	8,64,000 (₹40 × 21,600 units)
Wages	1,44,000 (Max. of ₹ 30 × 4,500 units = ₹1,35,000 and ₹ 48,000 × 3 months = ₹1,44,000)	6,48,000 (21600 Units×30)
Variable Cost	45,000 (₹10 × 4,500 units)	2,16,000 (₹10 × 21,600 units)
Semi-variable Cost	27,000 $\left(\frac{₹1,08,000}{12\text{ months}} \times 3\text{ months}\right)$	1,51,200 $\left(\frac{₹1,08,000}{12\text{ months}} \times 9\text{ months}\right)$ + 46,800 (for 20 % increase) +23,400 (for 10% increase)
Selling Overhead	36,000 (₹8 × 4,500 units)	1,72,800(₹ 8 × 21,600 units)

Notes:

1. Alternatively scrap of raw material can also be reduced from Work cost.
2. Administrative overhead may be treated alternatively as a part of general overhead. In that case, Works Cost as well as Cost of Production will be same i.e. ₹ 4,63,500 and Cost of Sales will remain same as ₹ 6,29,100.

(ii) **Calculation of Selling price for nine months period**

Particulars	Amount (₹)
Total Cost of sales ₹ (6,29,100+26,02,800)	32,31,900
Add: Desired profit	8,76,600

Total sales value	41,08,500
Less: Sales value realised in first three months (₹145 × 4,500 units)	(6,52,500)
Sales Value to be realised in next nine months	34,56,000
No. of units to be sold in next nine months	21,600
Selling price per unit (₹ 34,56,000 ÷ 21,600 units)	160

Q11 RTP Nov'19

DFG Ltd. manufactures leather bags for office and school purpose. The following information is related with the production of leather bags for the month of September 2019.

(i) Leather sheets and cotton cloths are the main inputs, and the estimated requirement per bag is two meters of leather sheets and one meter of cotton cloth. 2,000 meter of leather sheets and 1,000 meter of cotton cloths are purchased at ₹3,20,000 and ₹15,000 respectively. Freight paid on purchases is ₹8,500.

(ii) Stitching and finishing need 2,000 man hours at ₹80 per hour.

(iii) Other direct cost of ₹10 per labour hour is incurred.

(iv) DFG has 4 machines at a total cost of ₹22,00,000. Machine has a life of 10 years with a scrape value of 10% of the original cost. Depreciation is charged on straight line method.

(v) The monthly cost of administrative and sales office staffs are ₹45,000 and ₹72,000 respectively. DFG pays ₹1,20,000 per month as rent for a 2400 sq.feet factory premises. The administrative and sales office occupies 240 sq. feet and 200 sq. feet respectively of factory space.

(vi) Freight paid on delivery of finished bags is ₹18,000.

(vii) During the month 35 kg. of leather and cotton cuttings are sold at ₹150 per kg.

(viii) There is no opening and closing stocks for input materials. There is 100 bags in stock at the end of the month.

Required:

PREPARE a cost sheet following functional classification for the month of September 2019.

Reference

Cost sheet with classification.

What's **New**

Watch **Video**

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Answer

No. of bags manufactured = 1,000 units

Cost sheet for the month of September 2019

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	- Leather sheets	3,20,000	320.00
	- Cotton cloths	15,000	15.00
	Add: Freight paid on purchase	8,500	8.50
2.	Direct wages (₹80 × 2,000 hours)	1,60,000	160.00
3.	Direct expenses (₹10 × 2,000 hours)	20,000	20.00
4.	**Prime Cost**	5,23,500	523.50
5.	Factory Overheads: Depreciation on machines {(₹22,00,000×90%)÷120 months}	16,500	16.50
	Apportion cost of factory rent	98,000	98.00
6.	**Works/ Factory Cost**	6,38,000	638.00
7.	Less: Realisable value of cuttings (₹150×35 kg.)	(5,250)	(5.25)
8.	**Cost of Production**	6,32,750	632.75
9.	Add: Opening stock of bags	0	
10.	Less: Closing stock of bags (100 bags × ₹632.75)	(63,275)	
11.	**Cost of Goods Sold**	5,69,475	632.75
12.	Add: Administrative Overheads:		
	- Staff salary	45,000	45.00
	- Apportioned rent for administrative office	12,000	12.00
13.	Add: Selling and Distribution Overheads		
	- Staff salary	72,000	80.00
	- Apportioned rent for sales office	10,000	11.11
	- Freight paid on delivery of bags	18,000	20.00
14.	**Cost of Sales (11+12+13)**	7,26,475	800.86

Apportionment of Factory rent:

To factory building {(₹1,20,000 ÷ 2400 sq.feet) × 1,960 sq. feet} = ₹98,000

To administrative office {(₹1,20,000 ÷ 2400 sq.feet) × 240 sq. feet} = ₹12,000

To sale office {(₹1,20,000 ÷ 2400 sq.feet) × 200 sq. feet} = ₹10,000

Q12 Nov'19

XYZ a manufacturing firm, has revealed following information for September ,2019:

	1st September (₹)	30th September (₹)
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 :

	(₹)
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 ₹ 61 per unit.

Closing stock is valued at cost of production (excluding administrative expenses)

Cost of goods sold, excluding administrative expenses amounts to ₹ 78,26,000.

Direct employees cost is 1/2 of the cost of material consumed.

Selling price of the output is ₹ 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. (10 Marks)

Reference

Value of material purchased and Cost Sheet

What's New

Defective output

Watch **Video**

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Answer

Workings:

1. **Calculation of Sales Quantity:**

Particulars	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**

Particulars	Amount (₹)
Cost of Goods sold (given)	78,26,000
Add: Value of Closing finished goods $\left(\frac{₹\ 78,26,000}{91,000\ \text{units}} \times 5,000\ \text{units}\right)$	4,30,000
Cost of Production	82,56,000

3. **Calculation of Factory Cost**

Particulars	Amount (₹)
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% × ₹ 61)	2,44,000
Factory Cost	80,50,000

4. **Calculation of Gross Factory Cost**

Particulars	Amount (₹)
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**

Particulars	Amount (₹)
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

= 52,00,000

Therefore, Cost of Material Consumed = ₹ 52,00,000 and

Labour Cost = ₹ 26,00,000

(i) **Calculation of Value of Materials Purchased**

Particulars	Amount (₹)
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 (₹)
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	-
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@ ₹ 110 per unit)**	1,00,10,000

Q13 Nov'19

PJ Ltd manufactures hockey sticks. It sells the products at ₹ 500 each and makes a profit of ₹ 125 on each stick. The Company is producing 5,000 sticks annually by using 50% of its machinery capacity.

The cost of each stick is as under:

Direct Material	₹ 150
Direct Wages	₹ 50
Works Overhead	₹ 125 (50% fixed)
Selling Expenses	₹ 50 (25% variable)
The anticipation for the next year is that cost will go up as under:	
Fixed Charges	10%
Direct Wages	20%
Direct Material	5%

There will not be any change in selling price.

There is an additional order for 2,000 sticks in the next year.

Calculate the lowest price that can be quoted so that the Company can earn the same profit as it has earned in the current year? (10 Marks)

Reference — What's New

Price after increase in costs

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Answer

Selling Price = ₹ 500

Profit = ₹ 125

No of Sticks = 5,000

Particulars	Current Year (₹)	Next Year (₹)
Direct Material	150	157.50 (150 + 5%)
Direct Wages	50	60 (50+20%)
Works Overheads	62.50 (125 × 50%)	62.5
Selling Expenses	12.50 (50 × 25%)	12.5
Total Variable Cost	275	292.50
Fixed Cost (62.5 × 5,000) = 3,12,500; (37.5 × 5,000) = 1,87,500	5,00,000	5,50,000

Let: Lowest Price Quoted = K

Now, Sales = Target Profit (5,000 units × ₹ 125) + Variable Cost + Fixed Cost

Or, = (5,000 × 500) + (2,000 × K) = 6,25,000 + 20,47,500 + 5,50,000

Or, K = ₹ 361.25

So, Lowest Price that can be quoted to earn the profit of ₹ 6,25,000 (same as current year) is ₹ 361.25

Q14 RTP Nov'20

The following details are available from the books of R Ltd. for the year ending 31st March 2020:

Particulars	Amount (₹)
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

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.

Reference — What's **New**

Classification of Cost

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Answer

Statement of Cost of R Ltd. for the year ended 31st March, 2020:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(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
	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
(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.

Q15 Nov'20

X Ltd. manufactures two types of pens 'Super Pen' and 'Normal Pen'. The cost data for the year ended 30th September, 2019 is as follows :

	(₹)
Direct Materials	8,00,000
Direct Wages	4,48,000
Production Overhead	1,92,000
Total	14,40,000

It is further ascertained that:

(1) Direct materials cost in Super Pen was twice as much of direct material in Normal Pen.

(2) Direct wages for Normal Pen were 60% of those for Super Pen.

(3) Production overhead per unit was at same rate for both the types.

(4) Administration overhead was 200% of direct labour for each.

(5) Selling cost was ₹ 1 per Super pen.

(6) Production and sales during the year were as follow :

Production		Sales	
	No. of units		No. of units
Super Pen	40,000	Super Pen	36,000
Normal Pen	1,20,000		

(7) Selling price was ₹ 30 per unit for Super Pen.

Prepare a Cost Sheet for 'Super Pen' showing : [10 Marks]

(i) Cost per unit and Total Cost

(ii) Profit per unit and Total Profit

Reference — What's **New**

Use of Total Cost Ratio

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Answer

Preparation of Cost Sheet for Super Pen

No. of units produced = 40,000 units

No. of units sold = 36,000 units

Particulars	Per unit (₹)	Total (₹)
Direct materials (Working note- (i))	8.00	3,20,000
Direct wages (Working note- (ii))	4.00	1,60,000
Prime cost	12.00	4,80,000
Production overhead (Working note- (iii))	1.20	48,000
Factory Cost	13.20	5,28,000
Administration Overhead* (200% of direct wages)	8.00	3,20,000
Cost of production	21.20	8,48,000
Less: Closing stock (40,000 units – 36,000 units)	–	(84,800)
Cost of goods sold i.e. 36,000 units	21.20	7,63,200
Selling cost	1.00	36,000
Cost of sales/ Total cost	22.20	7,99,200
Profit	7.80	2,80,800
Sales value (₹ 30 × 36,000 units)	30.00	10,80,000

Working Notes:

(i) Direct material cost per unit of Normal pen = M

Direct material cost per unit of Super pen = 2M

Total Direct Material cost = 2M × 40,000 units + M × 1,20,000 units

Or, ₹ 8,00,000 = 80,000 M + 1,20,000 M

Or, $M = \frac{₹\ 8,00,000}{2,00,000} = ₹\ 4$

Therefore, Direct material Cost per unit of Super pen = 2 × ₹ 4 = ₹ 8

(ii) Direct wages per unit for Super pen = W

Direct wages per unit for Normal Pen = 0.6W

So, (W x 40,000) + (0.6W x 1,20,000) = ₹ 4,48,000

W = ₹ 4 per unit

(iii) Production overhead per unit = $\frac{₹\ 1,92,000}{(40,000 + 1,20,000)} = ₹\ 1.20$

Production overhead for Super pen = ₹ 1.20 × 40,000 units = ₹ 48,000

* 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.

Assumption: It is assumed that in point (1) and (2) of the Question, direct materials cost and direct wages respectively is related to per unit only.

Note: Direct Material and Direct wages can be calculated in alternative ways.

Q16 Jan'21

The following data are available from the books and records of Q Ltd. for the month of April 2020 :

Direct Labour Cost = ₹ 1,20,000 (120% of Factory Overheads)

Cost of Sales = ₹ 4,00,000

Sales = ₹ 5,00,000

Accounts show the following figures:

	1st April, 2020 (₹)	30th April, 2020 (₹)
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 : [10 Marks]

(i) Prime Cost

(ii) Works Cost

(iii) Cost of Production

(iv) Cost of Goods sold

(v) Cost of Sales and Profit earned.

Reference | What's **New**

Simple Cost Sheet

Watch **Video**

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Answer

Cost Sheet for the Month of April 2020

Particulars	(₹)
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 (₹ 5,00,000 – ₹ 4,00,000)}	1,00,000
Sales	5,00,000

*General and administration expenses have been assumed as not relating to the production activity.

Working Note:

1. **Computation of the raw material consumed**

Particulars	(₹)
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 $\left(\frac{₹\,1,20,000}{120}\times 100\right)$	(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	(₹)
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

Q17 RTP May'21; MTP May'21

RTA Ltd. has the following expenditures for the year ended 31st December, 2020:

Sl. No.		Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	Freight inward		9,20,600

(iii)	Wages paid to factory workers		25,20,000
(iv)	Royalty paid for production		1,80,000
(v)	Amount paid for power & fuel		3,50,000
(vi)	Job charges paid to job workers		3,10,000
(vii)	Stores and spares consumed		1,10,000
(viii)	Depreciation on office building		50,000
(ix)	Repairs & Maintenance paid for:		
	- Plant & Machinery	40,000	
	- Sales office building	20,000	60,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	28,200	
	- Factory building	18,800	47,000
(xi)	Expenses paid for quality control check activities		18,000
(xii)	Research & development cost paid for improvement in production process		20,000
(xiii)	Expenses paid for pollution control and engineering & maintenance		36,000
(xiv)	Salary paid to Sales & Marketing mangers		5,60,000
(xv)	Salary paid to General Manager		6,40,000
(xvi)	Packing cost paid for:		
	- Primary packing necessary to maintain quality	46,000	
	- For re-distribution of finished goods	80,000	1,26,000
(xvii)	Fee paid to independent directors		1,20,000
(xviii)	Performance bonus paid to sales staffs		1,20,000
(xix)	Value of stock as on 1stJanuary, 2020:		
	- Raw materials	10,00,000	
	- Work-in-process	8,60,000	
	- Finished goods	12,00,000	30,60,000
(xx)	Value of stock as on 31stDecember, 2020:		
	- Raw materials	8,40,000	
	- Work-in-process	6,60,000	
	- Finished goods	10,50,000	25,50,000

Amount realized by selling of scrap and waste generated during manufacturing process – ₹ 48,000/-

From the above data you are requested to **PREPARE** Statement of Cost for RTA Ltd. for the year ended 31st December, 2020, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

Reference | What's **New**

Cost Sheet with classification of cost

Watch **Video**

Scan Me

Answer

Statement of Cost of RTA Ltd. for the year ended 31st December, 2020:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	- Raw materials purchased	5,00,00,000	
	- Freight inward	9,20,600	
	Add: Opening stock of raw materials	10,00,000	
	Less: Closing stock of raw materials	(8,40,000)	5,10,80,600
(ii)	Direct employee (labour) cost:		
	- Wages paid to factory workers		25,20,000
(iii)	Direct expenses:		
	- Royalty paid for production	1,80,000	
	- Amount paid for power & fuel	3,50,000	
	- Job charges paid to job workers	3,10,000	8,40,000
	Prime Cost		5,44,40,600
(iv)	Works/ Factory overheads:		
	- Stores and spares consumed	1,10,000	
	- Repairs & Maintenance paid for plant & machinery	40,000	
	- Insurance premium paid for plant & machinery	28,200	
	- Insurance premium paid for factory building	18,800	
	- Expenses paid for pollution control and engineering & maintenance	36,000	2,33,000
	Gross factory cost		5,46,73,600
	Add: Opening value of W-I-P		8,60,000
	Less: Closing value of W-I-P		(6,60,000)
	Factory Cost		5,48,73,600
(v)	Quality control cost:		
	- Expenses paid for quality control check activities		18,000
(vi)	Research & development cost paid for improvement in production process		20,000
(vii)	Less: Realisable value on sale of scrap and waste		(48,000)

(viii)	Add: Primary packing cost		46,000
	Cost of Production		5,49,09,600
	Add: Opening stock of finished goods		12,00,000
	Less: Closing stock of finished goods		(10,50,000)
	Cost of Goods Sold		5,50,59,600
(ix)	Administrative overheads:		
	- Depreciation on office building	50,000	
	- Salary paid to General Manager	6,40,000	
	- Fee paid to independent directors	1,20,000	8,10,000
(x)	Selling overheads:		
	- Repairs & Maintenance paid for sales office building	20,000	
	- Salary paid to Manager- Sales & Marketing	5,60,000	
	- Performance bonus paid to sales staffs	1,20,000	7,00,000
(xi)	Distribution overheads:		
	- Packing cost paid for re-distribution of finished goods		80,000
	Cost of Sales		5,66,49,600

Q18 RTP Nov'21

Impact Ltd. provides you the following details of its expenditures for the year ended 31st March, 2021:

S. No.	Particulars	Amount (₹)	Amount (₹)
(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
(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
(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 – ₹ 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.

Reference — What's **New**

Cost Sheet with classification of cost

Watch **Video**

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Answer

Statement of Cost of Impact Ltd. for the year ended 31st March, 2021:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(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
(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	
	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

* GST paid under Composition scheme would be included under cost of material as it is not eligible for input tax credit.

Q19 ICAI Mat

The following data relates to the manufacture of a standard product during the month of April, 2020:

Particulars	(Amount)
Raw materials	₹ 1,80,000
Direct wages	₹ 90,000
Machine hours worked (hours)	10,000
Machine hour rate (per hour)	₹ 8
Administration overheads (general)	₹ 35,000
Selling overheads (per unit)	₹ 5
Units produced	4,000
Units sold	3,600
Selling price per unit	₹ 125

You are **required** to PREPARE a cost sheet in respect of the above showing:

(i) Cost per unit

(ii) Profit for the month

Reference | What's **New**

Per unit cost and Statement of Profit

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Answer

(i) **Cost Sheet** **Output: 4,000 units**

Particulars	Total Cost (₹)	Cost per (unit) (₹)
Raw materials	1,80,000	45.00
Direct wages	90,000	22.50
Prime cost	2,70,000	67.50
Add: Factory overheads (10,000 hrs × ₹ 8 per hour)	80,000	20.00
Cost of Production	3,50,000	87.50
Less: Closing Stock of finished goods (4,000 – 3,600 units)	(35,000)	--
Cost of Goods Sold	3,15,000	87.50
Add: Administration overheads (general)	35,000	9.72
Add: Selling Overheads (3,600 units × ₹ 5 unit)	18,000	5.00
Cost of sales (total Cost)	3,68,000	102.22

(ii) **Statement of Profit**

Particulars	Total Cost (₹)
Sales revenue (3,600 units @ ₹ 125)	4,50,000
Less: Cost of sales	3,68,000
Profit	82,000

Q20 ICAI Mat

Arnav Inspat Udyog Ltd. has the following expenditures for the year ended 31st March, 2020:

Sl. No.		Amount (₹)	Amount (₹)
(i)	Raw materials purchased		10,00,00,000
(ii)	GST paid on the above purchases @18% (eligible for input tax credit)		1,80,00,000
(iii)	Freight inwards		11,20,600
(iv)	Wages paid to factory workers		29,20,000
(v)	Contribution made towards employees' PF & ESIS		3,60,000
(vi)	Production bonus paid to factory workers		2,90,000
(vii)	Royalty paid for production		1,72,600
(viii)	Amount paid for power & fuel		4,62,000
(ix)	Amount paid for purchase of moulds and patterns (life is equivalent to two years production)		8,96,000
(x)	Job charges paid to job workers		8,12,000
(xi)	Stores and spares consumed		1,12,000
(xii)	Depreciation on:		
	Factory building	84,000	
	Office building	56,000	
	Plant & Machinery	1,26,000	
	Delivery vehicles	86,000	3,52,000
(xiii)	Salary paid to supervisors		1,26,000
(xiv)	Repairs & Maintenance paid for:		
	Plant & Machinery	48,000	
	Sales office building	18,000	
	Vehicles used by directors	19,600	85,600
(xv)	Insurance premium paid for:		
	Plant & Machinery	31,200	

	Factory building	18,100	
	Stock of raw materials & WIP	36,000	85,300
(xvi)	Expenses paid for quality control check activities		19,600
(xvii)	Salary paid to quality control staffs		96,200
(xviii)	Research & development cost paid for improvement in production process		18,200
(xix)	Expenses paid for pollution control and engineering & maintenance		26,600
(xx)	Expenses paid for administration of factory work		1,18,600
(xxi)	Salary paid to functional mangers :		
	Production control	9,60,000	
	Finance & Accounts	9,18,000	
	Sales & Marketing	10,12,000	28,90,000
(xxii)	Salary paid to General Manager		12,56,000
(xxiii)	Packing cost paid for:		
	Primary packing necessary to maintain quality	96,000	
	For re-distribution of finished goods	1,12,000	2,08,000
(xxiv)	Interest and finance charges paid (for usage of non-equity fund)		7,20,000
(xxv)	Fee paid to auditors		1,80,000
(xxvi)	Fee paid to legal advisors		1,20,000
(xxvii)	Fee paid to independent directors		2,20,000
(xxviii)	Performance bonus paid to sales staffs		1,80,000
(xxix)	Value of stock as on 1st April, 2019:		
	Raw materials	18,00,000	
	Work-in-process	9,20,000	
	Finished goods	11,00,000	38,20,000
(xxx)	Value of stock as on 31st March, 2020:		
	Raw materials	9,60,000	
	Work-in-process	8,70,000	
	Finished goods	18,00,000	36,30,000

Amount realized by selling of scrap and waste generated during manufacturing process – ₹ 86,000/-

From the above data you are required to **PREPARE** Statement of cost for Arnav Ispat Udyog Ltd. for the year ended 31st March, 2020, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

Reference | What's New

Subdivision of Cost

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Answer

Statement of Cost of Arnav Ispat Udyog Ltd. for the year ended 31st March, 2020:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	Raw materials purchased	10,00,00,000	
	Freight inwards	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	
	Contribution made towards employees' PF & ESIS	3,60,000	
	Production bonus paid to factory workers	2,90,000	35,70,000
(iii)	Direct expenses:		
	Royalty paid for production	1,72,600	
	Amount paid for power & fuel	4,62,000	
	Amortised cost of moulds and patterns	4,48,000	
	Job charges paid to job workers	8,12,000	18,94,600
	Prime Cost		10,74,25,200
(iv)	Works/ Factory overheads:		
	Stores and spares consumed	1,12,000	
	Depreciation on factory building	84,000	
	Depreciation on plant & machinery	1,26,000	
	Repairs & Maintenance paid for plant & machinery	48,000	
	Insurance premium paid for plant & machinery	31,200	
	Insurance premium paid for factory building	18,100	
	Insurance premium paid for stock of raw materials & WIP	36,000	
	Salary paid to supervisors	1,26,000	
	Expenses paid for pollution control and engineering & maintenance	26,600	6,07,900
	Gross factory cost		10,80,33,100
	Add: Opening value of W-I-P		9,20,000

	Less: Closing value of W-I-P		(8,70,000)
	Factory Cost		10,80,83,100
(v)	Quality control cost:		
	Expenses paid for quality control check activities	19,600	
	Salary paid to quality control staffs	96,200	1,15,800
(vi)	Research & development cost paid for improvement in production process		18,200
(vii)	Administration cost related with production:		
	- Expenses paid for administration of factory work	1,18,600	
	- Salary paid to Production control manager	9,60,000	10,78,600
(viii)	Less: Realisable value on sale of scrap and waste		(86,000)
(ix)	Add: Primary packing cost		96,000
	Cost of Production		10,93,05,700
	Add: Opening stock of finished goods		11,00,000
	Less: Closing stock of finished goods		(18,00,000)
	Cost of Goods Sold		10,86,05,700
(x)	Administrative overheads:		
	Depreciation on office building	56,000	
	Repairs & Maintenance paid for vehicles used by directors	19,600	
	Salary paid to Manager- Finance & Accounts	9,18,000	
	Salary paid to General Manager	12,56,000	
	Fee paid to auditors	1,80,000	
	Fee paid to legal advisors	1,20,000	
	Fee paid to independent directors	2,20,000	27,69,600
(xi)	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
(xii)	Distribution overheads:		
	Depreciation on delivery vehicles	86,000	
(xiii)	Packing cost paid for re-distribution of finished goods	1,12,000	1,98,000
(xiv)	Interest and finance charges paid		7,20,000
	Cost of Sales		11,35,03,300

Note:

GST paid on purchase of raw materials would not be part of cost of materials as it is eligible for input tax credit.

Q21 ICAI Mat

From the following particulars, you are required to **PREPARE** monthly cost sheet of Aditya Industries:

	Amount (₹)
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- ₹ 8.00 per hour

Units sold- 1,60,000

Units produced- 1,94,000

Desired profit- 15% on sales

Reference | What's **New**

Cost Sheet

Watch **Video**

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Answer

Cost sheet of Aditya Industries for month of……

Units produced- 1,94,000

Units sold- 1,60,000

Particulars	Amount (₹)	Cost per unit (₹)
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 (₹ 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	
Less: Value of closing finished stock (₹ 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

Q22 July'21

The following data relates to manufacturing of a standard product during the month of March, 2021 :

Particulars	Amount (in ₹)
Stock of Raw material as on 01-03-2021	80,000
Work in Progress as on 01-03-2021	50,000
Purchase of Raw material	2,00,000
Carriage Inwards	20,000

Direct Wages	1,20,000
Cost of special drawing	30,000
Hire charges paid for Plant	24,000
Return of Raw Material	40,000
Carriage on return	6,000
Expenses for participation in Industrial exhibition	8,000
Legal charges	2,500
Salary to office staff	25,000
Maintenance of office building	2,000
Depreciation on Delivery van	6,000
Warehousing charges	1,500
Stock of Raw material as on 31-03-2021	30,000
Stock of Work in Progress as on 31-03-2021	24,000

- 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 ₹ 5,000 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 8000 units during the month.

You are **required** to prepare a Cost Sheet for the above period showing the: [10]

(i) Cost of Raw Material consumed

(ii) Prime Cost

(iii) Work Cost

(iv) Cost of Production

(v) Cost of Sales

Reference | What's **New**

Rejection and Defects

Watch **Video**

Scan Me

Answer

Statement of Cost for the month of March, 2021

	Particulars	Amount (₹)	Amount (₹)
(i)	**Cost of Material Consumed:**		
	Raw materials purchased (₹ 2,00,000 – ₹ 40,000)	1,60,000	
	Carriage inwards	20,000	
	Add: Opening stock of raw materials	80,000	
	Less: Closing stock of raw materials	(30,000)	2,30,000
	Direct Wages		1,20,000
	Direct expenses:		
	Cost of special drawing	30,000	
	Hire charges paid for Plant	24,000	54,000
(ii)	**Prime Cost**		4,04,000
	Carriage on return	6,000	
	Store overheads (10% of material consumed)	23,000	
	Factory overheads (20% of Prime cost)	80,800	
	Additional expenditure for rectification of defective products (refer working note)	2,160	1,11,960
	Gross factory cost		5,15,960
	Add: Opening value of W-I-P		50,000
	Less: Closing value of W-I-P		(24,000)
(iii)	**Works/ Factory Cost**		5,41,960
	Less: Realisable value on sale of scrap		(5,000)
(iv)	**Cost of Production**		5,36,960
	Add: Opening stock of finished goods		-
	Less: Closing stock of finished goods		-
	Cost of Goods Sold		5,36,960
	Administrative overheads:		
	Maintenance of office building	2,000	
	Salary paid to Office staff	25,000	
	Legal Charges	2,500	29,500
	Selling overheads:		
	Expenses for participation in Industrial exhibition	8,000	8,000
	Distribution overheads:		
	Depreciation on delivery van	6,000	
	Warehousing charges	1,500	7,500
(v)	**Cost of Sales**		5,81,960

Alternative Solution

(considering Hire charges paid for Plant as indirect expenses)

Statement of Cost for the month of March, 2021

Particulars	Amount (₹)	Amount (₹)
Cost of Material Consumed:		
Raw materials purchased (₹ 2,00,000 – ₹ 40,000)	1,60,000	
Carriage inwards	20,000	
Add: Opening stock of raw materials	80,000	
Less: Closing stock of raw materials	(30,000)	2,30,000
Direct Wages		1,20,000
Direct expenses:		
Cost of special drawing	30,000	30,000
Prime Cost		3,80,000
Hire charges paid for Plant	24,000	
Carriage on return	6,000	
Store overheads (10% of material consumed)	23,000	
Factory overheads (20% of Prime cost)	76,000	
Additional expenditure for rectification of defective products (refer working note)	2,160	1,31,160
Gross factory cost		5,11,160
Add: Opening value of W-I-P		50,000
Less: Closing value of W-I-P		(24,000)
Works/ Factory Cost		5,37,160
Less: Realisable value on sale of scrap		(5,000)
Cost of Production		5,32,160
Add: Opening stock of finished goods		-
Less: Closing stock of finished goods		-
Cost of Goods Sold		5,32,160
Administrative overheads:		
Maintenance of office building	2,000	
Salary paid to Office staff	25,000	
Legal Charges	2,500	29,500
Selling overheads:		
Expenses for participation in Industrial exhibition	8,000	8,000
Distribution overheads:		
Depreciation on delivery van	6,000	
Warehousing charges	1,500	7,500
Cost of Sales		5,77,160

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 × (₹ 1,20,000/8,000) × 720

   = ₹ 2,160

Q23 MTP Oct'21

Xim Ltd. manufactures two types of boxes 'Super' and 'Normal'. The cost data for the year ended 31st March, 2021 is as follows:

	(₹)
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 ₹ 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 ₹ 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 ₹ 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 [10]

Reference — What's **New**

Use of Total Cost Ratio

Watch **Video** — Scan Me

Answer

Cost Sheet of 'Super'

Particulars	Per unit (₹)	Total (₹)
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 (₹ 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, ₹ 12,00,000 = 1,20,000 M + 1,80,000 M

Or, M $= \frac{₹\,12,00,000}{3,00,000} = ₹\,4$

Therefore, Direct material Cost per unit of 'Super' = 2 × ₹ 4 = ₹ 8

(ii) Direct wages per unit for 'Super' = W

Direct wages per unit for 'Normal' = 0.6W

So, (W × 60,000) + (0.6W × 1,80,000) = ₹ 6,72,000

W = ₹ 4 per unit

(iii) Production overhead per unit = $\frac{₹\ 2,88,000}{(60,000+1,80,000)}$ = ₹ 1.20

Production overhead for 'Super' = ₹ 1.20 × 60,000 units = ₹ 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.

Q24 MTP May'22

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. [10]

Direct materials: 40 sq. m. per unit @ ₹ 10.60 per sq. m.

Direct wages: Bonding department 48 hours per unit @ ₹ 25 per hour

Finishing department 30 hours per unit @ ₹ 19 per hour

Budgeted costs and hours per annum- Variable overhead:

	(₹)	Total hours
Bonding department	15,00,000	10,00,000
Finishing department	6,00,000	6,00,000

Fixed overhead-

	(₹)
Production	15,68,000
Selling and distribution	7,84,000
Administration (General)	3,92,000

Reference — What's New

Selling Price

Watch Video — Scan Me

Answer

Decision making Cost Sheet (per unit)

Particulars	Amount (₹)	Amount (₹)
Direct materials 40 m2 at ₹ 10.60 per m2		424
Direct wages:		
Bonding department- 48 hours at ₹ 25 per hour	1,200	
Finishing department- 30 hours at ₹ 19 per hour	570	1,770
Prime Cost		2,194
Variable overhead:*		
Bonding department- 48 hours at ₹ 1.50 per hour	72	
Finishing department- 30 hours at ₹ 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 = ₹ 2,436 × $\frac{100}{75}$ = ₹ 3,248

Working Notes:

* Variable overhead rates-

Bonding: $\frac{15,00,000}{10,00,000 \text{ hours}}$ = ₹ 1.50

Finishing: $\frac{6,00,000}{6,00,000 \text{ hours}}$ = ₹ 1.00

Fixed production overhead rate per unit of output = $\frac{15,68,000}{19,600 \text{ units}}$ = ₹ 80

$ Selling and production cost per unit of output = $\frac{7,84,000}{19,600 \text{ units}}$ = ₹ 40

Administration cost per unit of output = $\frac{3,92,000}{19,600 \text{ units}}$ = ₹ 20

Q25 RTP May'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 ₹ 15,00,000

(ii) Power consumed 13,000 Kwh @ ₹ 7 per Kwh

(iii) Diesels consumed 1,000 litres @ ₹ 93 per litre

(iv) Wages & salary paid – ₹ 64,00,000

(v) Gratuity & leave encashment paid – ₹ 44,20,000

(vi) Hiring charges paid for HEMM- ₹ 13,00,000

(vii) Hiring charges paid for cars used for official purpose – ₹ 80,000

(viii) Reimbursement of diesel cost for the cars – ₹ 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) – ₹ 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 ₹ 6,000 and ₹ 18,000 per month respectively.

(xii) TA/ DA and hotel bill paid for sales manager- ₹ 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 manshift (EMS) and Output per manshift (OMS) for the month of December 2021.

Reference

Cost Sheet

What's New

Earning Per Manshift & Output Per Manshift

Watch **Video**

Scan Me

Answer

(a) **Cost Sheet of A Ltd. for the month of December 2021**

Particulars	Amount (₹)	Amount (₹)
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 × ₹ 7)	91,000	
Diesel cost (1,000 ltr × ₹ 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

(b) Manshift = 180 employees × 26 days = 4,680 manshifts

Computation of earnings per manshift (EMS):

$$EMS = \frac{\text{Total employee benefits paid}}{\text{Man shift}}$$

$$= \frac{₹\ 1,08,20,000}{4,680} = ₹\ 2,312$$

Computation of Output per manshift (OMS):

$$OMS = \frac{\text{Total Output/ Production}}{\text{Man shift}}$$

$$= \frac{14,560\ \text{Tonne}}{4,680} = 3.11\ \text{tonne}$$

NOTES

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Submit Your Query

Chapter 3

Material Cost

Q1 ICAI Mat

An invoice in respect of a consignment of chemicals A and B provides the following information:

	(₹)
Chemical A: 10,000 kgs. at ₹ 10 per kg.	1,00,000
Chemical B: 8,000 kgs. at ₹ 13 per kg.	1,04,000
Basic custom duty @ 10% (Credit is not allowed)	20,400
Railway freight	3,840
Total cost	2,28,240

A shortage of 500 kgs. in chemical A and 320 kgs. in chemical B is noticed due to normal breakages.

You are **required** to compute the rate per kg. of each chemical, assuming a provision of 2% for further deterioration.

Reference

Landed Cost of Materials

What's New

Customs duty and provision for loss

Watch **Video**

Scan Me

Answer

Working:

Computation of effective quantity of each chemical available for use

	Chemical A (kg.)	Chemical B (kg.)
Quantity purchased	10,000	8,000
Less: Shortage due to normal breakages	500	320
	9,500	7,680
Less: Provision for deterioration 2%	190	153.6
Quantity available	**9,310**	**7,526.4**

Statement showing the computation of rate per kg. of each chemical

	Chemical A (₹)	Chemical B (₹)
Purchase price	1,00,000	1,04,000
	1,00,000	1,04,000
Add: Basic Custom Duty @10%	10,000	10,400
Add: Railway freight (in the ratio of quantity purchased i.e., 5:4)	2,133	1,707
Total cost (A)	**1,12,133**	**1,16,107**
Effective Quantity (see working) (B)	9,310 kg.	7,526.4 kg.
Rate per kg. (A ÷ B)	**12.04**	**15.43**

Q2 ICAI Mat

At **what** price per unit would Part No. A 32 be entered in the Stores Ledger, if the following invoice was received from a supplier:

Invoice	(₹)
200 units Part No. A 32 @ ₹ 5	1,000.00
Less: 20% discount	(200.00)
	800.00
Add: IGST @ 12%	96.00
	896.00
Add: Packing charges (5 non-returnable boxes)	50.00
	946.00

(i) A 2 per cent cash discount will be given if payment is made in 30 days.

(ii) Documents substantiating payment of IGST is enclosed for claiming Input credit.

Reference

Landed Cost of Materials

What's **New**

Input credit and Cash discount

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Answer

Computation of cost per unit

	(₹)
Net purchase Price	800.00
Add: Packing charges (5 non-returnable boxes)	50.00
	850.00

No. of units purchased	200 units
Cost per unit	4.25

Note:

(i) Cash discount is treated as interest and finance charges hence, it is not considered for valuation of material.

(ii) Input credit is available for IGST paid; hence it will not be added to purchase cost.

Q3 ICAI Mat

CALCULATE the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials per annum :	10,000 kg.
Order placing cost per order :	₹ 50
Cost per kg. of raw materials :	₹ 2
Storage costs :	8% on average inventory

Reference | What's **New**

EOQ and No. of Orders

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Answer

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

A = Units consumed during year

O = Ordering cost per order

C = Inventory carrying cost per unit per annum.

$$EOQ = \sqrt{\frac{2 \times 10,000 \times 50}{\frac{2 \times 8}{100}}} = \sqrt{\frac{2 \times 10,000 \times 50 \times 25}{4}} = 2,500 \text{ kg.}$$

$$\textbf{No. of orders to be placed in a year} = \frac{\text{Total consumption of materials per annum}}{EOQ}$$

$$= \frac{10,000 \text{ kg.}}{2,500 \text{ kg.}} = 4 \text{ orders per year}$$

Q4 ICAI Mat

(i) **COMPUTE** E.O.Q. and the total variable cost for the following:

Annual Demand	5,000 units
Unit price	₹ 20.00
Order cost	₹ 16.00
Storage rate	2% per annum
Interest rate	12% per annum
Obsolescence rate	6% per annum

(ii) **DETERMINE** the total cost that would result for the items if an incorrect price of ₹ 12.80 is used.

Reference | What's **New**

EOQ and Total Cost | **Extra cost due to incorrect price**

Watch **Video** Scan Me

Answer

(i) Carrying cost (C) = Storage rate = 2%
Interest Rate = 12%
Obsolescence Rate = 6%
Total = 20% per annum
C = 20% of ₹ 20 = ₹ 4 per unit per annum.

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 5,000 \times 16}{4}} = \sqrt{40,000} = 200 \text{ units}$$

Total cost:

Purchase price of 5,000 units @ ₹ 20.00 per unit	₹ 1,00,000
Ordering cost $= \frac{5,000}{200}$ =25 orders @ ₹ 16	₹ 400
Carrying cost of average Inventory $= \frac{200}{2}$ =100 units @ ₹ 4	₹ 400
Total cost	₹ 1,00,800

(ii) If an incorrect price of ₹ 12.80 is used:

C = 20% of 12.80 = ₹ 2.56 per unit per annum.

$$EOQ = \sqrt{\frac{2 \times 5,000 \times 16}{2.56}} = 250 \text{ units}$$

Total cost:

Purchase price of 5,000 units @ ₹ 12.80 per unit	₹ 64,000
Ordering cost $= \frac{5,000}{250} = 20$ orders @ ₹ 16	₹ 320
Carrying cost (of average inventory) $= \frac{250}{2} = 125$ units @ ₹ 2.56	₹ 320
Total variable cost	₹ 64,640

Q5 ICAI Mat

Two components, A and B are used as follows:

Normal usage	50 per week each
Maximum usage	75 per week each
Minimum usage	25 per week each
Re-order quantity A:	300; B: 500
Re-order period A:	4 to 6 weeks
B:	2 to 4 weeks

CALCULATE for each component (a) Re-ordering level, (b) Minimum level, (c) Maximum level, (d) Average stock level.

Reference — What's **New**

Stock Levels

Watch **Video**

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Answer

(a) **Re-ordering level:**

Maximum usage per week × Maximum delivery period.

Re-ordering level for component A = 75 units × 6 weeks = 450 units

Re-ordering level for component B = 75 units × 4 weeks = 300 units

(b) **Minimum level:**

Re-order level – (Normal usage × Average period)

Minimum level for component A = 450 units – (50 units × 5 weeks) = 200 units

Minimum level for component B = 300 units – (50 units × 3 weeks) = 150 units

(c) **Maximum level:**

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

Maximum level for component A = (450 units + 300 units) – (25 units × 4 weeks) = 650 units

Maximum level for component B = (300 units + 500 units) – (25 units × 2 weeks) = 750 units

(d) **Average stock level:**

½ (Minimum + Maximum) stock level

Average stock level for component A = ½ (200 units + 650 units) =425 units.

Average stock level for component B = ½ (150 units + 750 units) =450 units.

Q6 ICAI Mat

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 ₹ 20

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

Purchase price per unit inclusive of transportation cost is ₹ 50

Annual cost of storage per units is ₹ 5.

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

Rate of consumption : Average: 15 units per day,
Maximum: 20 units per day.

Reference | What's New

Stock Levels | **Danger Level**

Watch **Video** Scan Me

Answer

Basic Data:

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

O (Ordering cost per order) = ₹ 20

C (Annual cost of storage per unit) = ₹ 5

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

Computations:

(i) **Re-ordering level (ROL)** = Maximum usage per period × Maximum lead time
= 20 units per day × 15 days = 300 units

(ii) **Maximum level** = ROL + ROQ – [Min. rate of consumption × Min. lead time]
(Refer to working notes1 and 2)
= 300 units + 200 units – [10 units per day × 5 days]
= 450 units

(iii) **Minimum level** = ROL – Average rate of consumption × Average re- order-period
= 300 units – (15 units per day × 10 days) =150 units

(iv) **Danger level** = Average consumption × Lead time for emergency purchases
= 15 units per day × 4 days = 60 units

Working Notes:

1. Minimum rate of consumption per day

$$\text{Av. rate of consumption} = \frac{\text{Minimum rate of consumption} + \text{Minimum rate of consumption}}{2}$$

$$15 \text{ units per day} = \frac{X \text{ units/day} + 20 \text{ units per day}}{2}$$

or, $X = 10$ units per day

2. Re-order Quantity (ROQ) $= \sqrt{\frac{2 \times 5{,}000 \text{ units} \times ₹\ 20}{5}} = 200$ units

Q7 ICAI Mat

M/s Tyrotubes trades in four wheeler tyres and tubes. It stocks sufficient quantity of tyres of almost every vehicle. In year end 20X8-X9, the report of sales manager revealed that M/s Tyrotubes experienced stock-out of tyres.

The stock-out data is as follows:

Stock-out of Tyres	No. of times
100	2
80	5
50	10
20	20
10	30
0	33

M/s Tyrotubes loses ₹ 150 per unit due to stock-out and spends ₹ 50 per unit on carrying of inventory.

DETERMINE optimum safest stock level.

Reference — What's New

Reference	What's New
Stock Out Quantity	**Optimum Safety Stock Levels**

Watch Video

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Answer

Computation of Stock-out and Inventory carrying cost

Safety Stock Level (units) (1)	Stock-out (units) (2)	Probability (3)	Stock-out cost (₹) (4) = (2)× ₹150	Expected stock-out cost (₹) (5)=(3)x(4)	Inventory carrying cost (₹) (6) =(1)× ₹50	Total cost (₹) (7) = (5)+(6)
100	0	0.33	0	0	5,000	5,000
80	20	0.02	3,000	60	4,000	4,060
50	50	0.02	7,500	150		
	30	0.05	4,500	225		
			12,000	375	2,500	2,875
20	80	0.02	12,000	240		
	60	0.05	9,000	450		
	30	0.10	4,500	450		
			25,500	1,140	1,000	2,140
10	90	0.02	13,500	270		
	70	0.05	10,500	525		
	40	0.10	6,000	600		
	10	0.20	1,500	300		
			31,500	1,695	500	2,195
0	100	0.02	15,000	300		2,700
	80	0.05	12,000	600		
	50	0.10	7,500	750		
	20	0.20	3,000	600		
	10	0.30	1,500	450		
			39,000	2,700	0	2,700

At safety stock level of 20 units, total cost is least i.e. ₹ 2,140.

Working Note:

Computation of Probability of Stock-out

Stock-out (units)	100	80	50	20	10	0	Total
No. of times	2	5	10	20	30	33	100
Probability	0.02	0.05	0.10	0.20	0.30	0.33	1.00

Explanation:

Stock-out means the demand of an item that could not be fulfilled because of insufficient stock level.

Safety stock is the level of stock of any item which is maintained in excess of lead time consumption. It is kept as cushion against any unexpected demand for that item.

Safety stock level	Impact
100 units	Any unexpected demand upto 100 units can be met.
80 units	Stock out will only arise if unexpected demand will be for 100 units. In this case 20 units will remain unsatisfied. The probability of any unexpected demand for 100 units is 0.02.
50 units	Any unexpected demand beyond 50 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02) 50 units will be unsatisfied. Similarly, if unexpected demand for 80 units arises (probability is 0.05), 30 units will be unsatisfied.
20 units	Any unexpected demand beyond 20 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02), 80 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 60 units will remain unsatisfied. Similarly, when unexpected demand for 50 units arises (probability is 0.10), 30 units will remain unsatisfied.
10 units	Any unexpected demand beyond 10 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02), 90 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 70 units will remain unsatisfied. If unexpected demand for 50 units arises (probability is 0.10), 40 units will remain unsatisfied. Similarly, when unexpected demand for 20 units arises (probability is 0.20), 10 units will remain unsatisfied.
0 unit	When no safety stock level is maintained, any unexpected demand cannot be satisfied. If unexpected demand for 100 units arises (probability is 0.02), 100 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 80 units will remain unsatisfied. If unexpected demand for 50 units arises (probability is 0.10), 50 units will remain unsatisfied. If unexpected demand for 20 units arises (probability is 0.20), 20 units will remain unsatisfied. Similarly, unexpected demand for 10 units (probability is 0.30), 10 units will remain unsatisfied.

Q8 ICAI Mat

From the following details, **DRAW** a plan of ABC selective control:

Item	Units	Unit cost (₹)
1	7,000	5.00
2	24,000	3.00
3	1,500	10.00
4	600	22.00
5	38,000	1.50
6	40,000	0.50
7	60,000	0.20
8	3,000	3.50
9	300	8.00
10	29,000	0.40
11	11,500	7.10
12	4,100	6.20

Reference

ABC Analysis

What's New

Watch **Video**

Scan Me

Answer

Statement of Total Cost and Ranking

Item	Units	% of Total units	Unit cost (₹)	Total cost (₹)	% of Total cost	Ranking
1	7,000	3.1963	5.00	35,000	9.8378	4
2	24,000	10.9589	3.00	72,000	20.2378	2
3	1,500	0.6849	10.00	15,000	4.2162	7
4	600	0.2740	22.00	13,200	3.7103	8
5	38,000	17.3516	1.50	57,000	16.0216	3
6	40,000	18.2648	0.50	20,000	5.6216	6
7	60,000	27.3973	0.20	12,000	3.3730	9
8	3,000	1.3699	3.50	10,500	2.9513	11
9	300	0.1370	8.00	2,400	0.6746	12
10	29,000	13.2420	0.40	11,600	3.2605	10
11	11,500	5.2512	7.10	81,650	22.9502	1

12	4,100	1.8721	6.20	25,420	7.1451	5
	2,19,000	**100**		**3,55,770**	**100**	

Basis for selective control (Assumed)

₹ 50,000 & above -- 'A' items

₹ 15,000 to 50000 -- 'B' items

Below ₹ 15,000 -- 'C' items

On this basis, a plan of A B C selective control is given below:

Ranking	Item Nos.	% of Total units	Cost (₹)	% of Total Cost	Category
1	11	5.2512	81,650	22.9502	
2	2	10.9589	72,000	20.2378	
3	5	17.3516	57,000	16.0216	
Total	**3**	**33.5617**	**2,10,650**	**59.2096**	**A**
4	1	3.1963	35,000	9.8378	
5	12	1.8721	25,420	7.1451	
6	6	18.2648	20,000	5.6216	
7	3	0.6849	15,000	4.2162	
Total	**4**	**24.0181**	**95,420**	**26.8207**	**B**
8	4	0.2740	13,200	3.7103	
9	7	27.3973	12,000	3.3730	
10	10	13.2420	11,600	3.2605	
11	8	1.3699	10,500	2.9513	
12	9	0.1370	2,400	0.6746	
Total	**5**	**42.4202**	**49,700**	**13.9697**	**C**
Grand Total	12	100	3,55,770	100	

Q9 ICAI Mat

A factory uses 4,000 varieties of inventory. In terms of inventory holding and inventory usage, the following information is compiled:

No. of varieties of inventory	%	% value of inventory holding (average)	% of inventory usage (in end-product)
3,875	96.875	20	5
110	2.750	30	10
15	0.375	50	85
4,000	100.00	100	100

CLASSIFY the items of inventory as per ABC analysis with reasons.

Reference | What's New

ABC Analysis

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Answer

Classification of the items of inventory as per ABC analysis

1. 15 number of varieties of inventory items should be classified as 'A' category items because of the following reasons:
   (i) Constitute 0.375% of total number of varieties of inventory handled by stores of factory, which is minimum as per given classification in the table.
   (ii) 50% of total use value of inventory holding (average) which is maximum according to the given table.
   (iii) Highest in consumption about 85% of inventory usage (in end-product).
2. 110 number of varieties of inventory items should be classified as 'B' category items because of the following reasons:
   (i) Constitute 2.750% of total number of varieties of inventory items handled by stores of factory.
   (ii) Requires moderate investment of about 30% of total use value of inventory holding (average).
   (iii) Moderate in consumption about 10% of inventory usage (in end–product).
3. 3,875 number of varieties of inventory items should be classified as 'C' category items because of the following reasons:
   (i) Constitute 96.875% of total varieties of inventory items handled by stores of factory.
   (ii) Requires about 20% of total use value of inventory holding (average).
   (iii) Minimum inventory consumption i.e. about 5% of inventory usage (in end-product).

Q10 ICAI Mat

The following data are available in respect of material X for the year ended 31st March, 20X9.

	(₹)
Opening stock	90,000
Purchases during the year	2,70,000
Closing stock	1,10,000

CALCULATE:

(i) Inventory turnover ratio, and

(ii) The number of days for which the average inventory is held.

Reference — What's **New**

Inventory Control Ratios

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Answer

Inventory turnover ratio

$$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}} \text{ (Refer to W.N.)}$$

$$= \frac{₹\ 2,50,000}{₹\ 1,00,000} = 2.5$$

Average number of days for which the average inventory is held

$$= \frac{365}{\text{Inventory turnover ratio}} = \frac{365 \text{ days}}{2.5}$$

= 146 days

Working Note:

	(₹)
Opening stock of raw material	90,000
Add: Material purchases during the year	2,70,000
Less: Closing stock of raw material	1,10,000
Cost of stock of raw material consumed	2,50,000

Q11 ICAI Mat

From the following data for the year ended 31st December, 20X9, **CALCULATE** the inventory turnover ratio of the two items and put forward your comments on them.

	Material A (₹)	Material B (₹)
Opening stock 1.1.20X9	10,000	9,000
Purchase during the year	52,000	27,000
Closing stock 31.12.20X9	6,000	11,000

Reference | What's New

Inventory Control Ratios	Comments

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Answer

Cost of materials consumed	Material A (₹)	Material B (₹)
Opening stock	10,000	9,000
Add: Purchases	52,000	27,000
	62,000	36,000
Less: Closing stock	(6,000)	(11,000)
Materials consumed	56,000	25,000
Average inventory: (Opening Stock + Closing Stock) ÷ 2	8,000	10,000
Inventory Turnover ratio: (Consumption ÷ Average inventory)	7 times	2.5 times
Inventory Turnover (Number of Days in a year/IT ratio)	52 days	146 days

Comments: Material A is moving faster than Material B.

Q12 ICAI Mat

The following transactions in respect of material Y occurred during the six months ended 30th June, 20X8:

Month	Purchase (units)	Price per unit (₹)	Issued Units
January	200	25	Nil
February	300	24	250
March	425	26	300
April	475	23	550
May	500	25	800
June	600	20	400

Required:

(a) The Chief Accountant argues that the value of closing stock remains the same no matter which method of pricing of material issues is used. Do you agree? Why or why not? **EXPLAIN**. Detailed stores ledgers are not required.

(b) **STATE** when and why would you recommend the LIFO method of pricing material issues?

Reference	What's New	Watch Video
Store Ledger Card	**Valuation will be same**	Scan Me

Answer

(a) The Closing Stock at the end of six months' period i.e., on 30th June, 20X8 will be 200 units, whereas up to the end of May 20X8, total purchases coincide with the total issues i.e., 1,900 units. It means that at the end of May 20X8, there was no closing stock. In the month of June 20X8, 600 units were purchased out of which 400 units were issued. Since there was only one purchase and one issue in the month of June, 20X8 and there was no opening stock on 1st June 20X8, the Closing Stock of 200 units is to be valued at ₹ 20 per unit.

In view of this, the argument of the Chief Accountant appears to be correct. Where there is only one purchase and one issue in a month with no opening stock, the method of pricing of material issues becomes irrelevant. Therefore, in the given case one should agree with the argument of the Chief Accountant that the value of Closing Stock remains the same no matter which method of pricing the issue is used.

It may, however, be noted that the argument of Chief Accountant would not stand if one finds the value of the Closing Stock at the end of each month.

(b) LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:

(i) The cost of the materials issued will be either nearer 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.

(ii) 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.

(iii) 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.

(iv) During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

Q13 ICAI Mat

The following information is provided by Sunrise Industries for the fortnight of April, 20X9:

Material Exe:

Stock on 1-4-20X9 100 units at ₹ 5 per unit.

Purchases

5-4-20X9, 300 units at ₹ 6

8-4-20X9, 500 units at ₹ 7

12-4-20X9, 600 units at ₹ 8

Issues

6-4-20X9, 250 units

10-4-20X9,400 units

14-4-20X9,500 units

Required:

(A) **CALCULATE** using FIFO and LIFO methods of pricing issues:

(a) the value of materials consumed during the period

(b) the value of stock of materials on 15-4-20X9.

(B) **EXPLAIN** why the figures in (a) and (b) in part A of this question are different under the two methods of pricing of material issues used. You need not draw up the Stores Ledgers.

Reference | **What's New**

Store Ledger Card | **FIFO and LIFO**

Watch **Video** Scan Me

Answer

(A) (a) **Value of Material Exe consumed during the period 1-4-20X9 to 15-4-20X9 by using FIFO method.**

Date	Description Units	Qty. (Units)	Rate (₹)	Amount (₹)
1-4-20X9	Opening balance	100	5	500
5-4-20X9	Purchased	300	6	1,800
6-4-20X9	Issued	100 150	5 6	 1,400
8-4-20X9	Purchased	500	7	3,500
10-4-20X9	Issued	150 250	6 7	 2,650

12-4-20X9	Purchased	600	8	4,800
14-4-20X9	Issued	250 250	7 8	 3,750
15-4-20X9	Balance	350	8	2,800

Total value of material Exe consumed during the period under FIFO method comes to (₹ 1,400 + ₹ 2,650 + ₹ 3,750) ₹ 7,800 and balance on 15-4-20X9 is of ₹ 2,800.

Value of material Exe consumed during the period 01-4-20X9 to 15-4-20X9 by using LIFO method

Date	Description	Qty. (Units)	Rate (₹)	Amount (₹)
1-4-20X9	Opening balance	100	5	500
5-4-20X9	Purchased	300	6	1,800
6-4-20X9	Issued	250	6	1,500
8-4-20X9	Purchased	500	7	3,500
10-4-20X9	Issued	400	7	2,800
12-4-20X9	Purchased	600	8	4,800
14-4-20X9	Issued	500	8	4,000
15-4-20X9	Balance	350	—	2,300*

Total value of material Exe issued under LIFO method comes to (₹ 1,500 + ₹ 2,800 + ₹ 4,000) ₹ 8,300.

*The balance 350 units on 15-4-20X9 of ₹ 2,300, relates to opening balance on 1-4-20X9 and purchases made on 5-4-20X9, 8-4-20X9 and 12-4-20X9. (100 units @ ₹ 5, 50 units @ ₹ 6, 100 units @ ₹ 7 and 100 units @ ₹ 8).

(b) As shown in (a) above, the value of stock of materials on 15-4-20X9:

Under FIFO method ₹ 2,800

Under LIFO method ₹ 2,300

(B) Total value of material Exe issued to production under FIFO and LIFO methods comes to ₹ 7,800 and ₹ 8,300 respectively. The value of closing stock of material Exe on 15-4-20X9 under FIFO and LIFO methods comes to ₹ 2,800 and ₹ 2,300 respectively.

The reasons for the difference of ₹ 500 (₹ 8,300 – ₹ 7,800) as shown by the following table in the value of material Exe, issued to production under FIFO and LIFO are as follows:

Date	Quantity Issued (Units)	FIFO		LIFO	
		Value (₹)	Total (₹)	Value (₹)	Total (₹)
6 - 4-20X9	250	1,400		1,500	
10-4-20X9	400	2,650		2,800	
14-4-20X9	500	3,750	7,800	4,000	8,300

1. On 6-4-20X9, 250 units were issued to production. Under FIFO their value comes to ₹ 1,400 (100 units × ₹ 5 + 150 units × ₹ 6) and under LIFO ₹ 1,500 (250 × ₹ 6). Hence, ₹ 100 was more charged to production under LIFO.

2. On 10-4-20X9, 400 units were issued to production. Under FIFO their value comes to ₹ 2,650 (150 × ₹ 6 + 250 × ₹ 7) and under LIFO ₹ 2,800 (400 × ₹ 7). Hence, ₹ 150 was more charged to production under LIFO.
3. On 14-4-20X9, 500 units were issued to production. Under FIFO their value comes to ₹ 3,750 (250 × ₹ 7 + 250 × ₹ 8) and under LIFO ₹ 4,000 (500 × ₹ 8). Hence, ₹ 250 was more charged to production under LIFO.

Thus the total excess amount charged to production under LIFO comes to ₹ 500.

The reasons for the difference of ₹ 500 (₹ 2,800 – ₹ 2,300) in the value of 350 units of Closing Stock of material Exe under FIFO and LIFO are as follows:

1. In the case of FIFO, all the 350 units of the closing stock belongs to the purchase of material made on 12-4-20X9, whereas under LIFO these units were from opening balance and purchases made on 5-4-20X9, 8-4-20X9 and 12-4-20X9.
2. Due to different purchase price paid by the concern on different days of purchase, the value of closing stock differed under FIFO and LIFO. Under FIFO 350 units of closing stock were valued @ ₹ 8 p.u. Whereas under LIFO first 100 units were valued @ ₹ 5 p.u., next 50 units @ ₹ 6 p.u., next 100 units @ ₹ 7 p.u. and last 100 units @ ₹ 8 p.u.

Thus under FIFO, the value of closing stock increased by ₹ 500.

Q14 ICAI Mat

During the month of April, a company has made five purchases as follows:

1st April, 200 units @ ₹10 each;

5th April, 150 units @ ₹12 each;

14th April, 210 units @ ₹12 each;

21st April, 50 units @ ₹15 each and

28th April, 140 units @ ₹11 each.

Reference | What's **New**

Store Ledger Card | **Simple Average Method**

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Answer

The issue price under Simple Average Price Method would be calculated as below:

$$\frac{₹10 + ₹12 + ₹12 + ₹15 + ₹11}{5 \text{ lots}} = ₹12 \text{ each}$$

Q15 ICAI Mat

During the month of April, a company has made five purchases as follows:

1st April, 200 units @ ₹10 each;

5th April, 150 units @ ₹12 each;

14th April, 210 units @ ₹12 each;

21st April, 50 units @ ₹15 each and

28th April, 140 units @ ₹11 each.

Reference | What's **New**

Valuation of Material Issues
Average Price Methods
Weighted Average Price Method

Weighted Average Method

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Answer

The issue price under Weightage Average Price Method would be calculated as below:

$$\frac{\{(₹10\times 200\text{ units})+(₹12\times 150\text{ units})+(₹12\times 210\text{ units})+(₹15\times 50\text{ units})+(₹11\times 140\text{ units})\}}{(200+150+210+50+140)\text{ units}}$$

$$=\frac{₹8,610}{750\text{ units}}\ ₹11.48\text{ each}$$

This method is useful in case when quantity purchased under each lot is different and price fluctuates frequently.

Q16 ICAI Mat

Anil & Company buys its annual requirement of 36,000 units in 6 instalments. Each unit costs ₹ 1 and the ordering cost is ₹ 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?

Reference | What's **New**

EOQ

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Answer

(a) **Total Annual Cost in Existing Inventory Policy**

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

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

$$EOQ = \sqrt{\frac{2 \times 36,000 \times 25}{₹1 \times 20\%}} = 3,000 \text{ units}$$

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

Note: As the units purchase cost of ₹ 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.

Q17 ICAI Mat

A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 20X1:

(i) Annual demand of Alpha 8,000 units

(ii) Cost of placing an order ₹ 200 per order

(iii) Cost per unit of Alpha ₹ 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.

Reference	What's New	Watch Video
EOQ	Supplier's offer	Scan Me

Answer

(i) **Calculation of Economic Order Quantity**

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 8,000 \text{ units} \times ₹200}{₹400 \times 20/100}} = 200 \text{ units}$$

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

(a) **When EOQ is ordered**

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

(b) **When Quantity Discount is accepted**

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

Advise – The total cost of inventory is lower if EOQ is adopted. Hence, the company is advised not to accept the quantity discount.

Q18 ICAI Mat

The complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer. Super Grow and Nature's Own. The following information is collected:

	FERTILIZER	
	Super Grow	Nature's Own
Annual demand	2,000 bags	1,280 bags
Relevant ordering cost per purchase order	₹ 1,200	₹ 1,400
Annual relevant carrying cost per bag	₹ 480	₹ 560

Required:

(i) **COMPUTE** EOQ for Super Grow and Nature's own.

(ii) For the EOQ, **WHAT** is the sum of the total annual relevant ordering costs and total annual relevant carrying costs for Super Grow and Nature's own?

(iii) For the EOQ, **COMPUTE** the number of deliveries per year for Super Grow and Nature's own.

Reference	What's New
EOQ	**Total Relevant costs**

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Answer

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

Where,

A = Annual Demand

O = Ordering cost per order

C = Inventory carrying cost per unit per annum

(i) **Calculation of EOQ**

Super Grow	Nature's Own
$EOQ = \sqrt{\frac{2 \times 2,000 \times 1,200}{480}}$ $= \sqrt{10,000}$ or 100 bags	$EOQ = \sqrt{\frac{2 \times 1,280 \times 1,400}{560}}$ $= \sqrt{6,400}$ or 80 bags

(ii) **Total annual relevant cost** = Total annual relevant ordering costs + Total annual relevant carrying cost

Super Grow	Nature's Own
= (2,000/100 × ₹1,200) + (½ × 100 bags × ₹ 480)	= (1,280/80 × ₹1,400) + (½ × 80 bags × ₹ 560)
= ₹ 24,000 + ₹ 24,000 = ₹ 48,000	= ₹ 22,400 + ₹ 22,400 = ₹ 44,800

(iii) **Number of deliveries** for Super Grow and Nature's own fertilizer per year

$$= \frac{\text{Annual demand for fertilizer bags}}{EOQ}$$

Super Grow	Nature's Own
$= \frac{2,000 \text{ bags}}{100 \text{ bags}} = 20$ orders	$= \frac{1,280 \text{ bags}}{80 \text{ bags}} = 16$ orders

Q19 ICAI Mat

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.

Reference

Stock Levels

What's **New**

Rate of Usage

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Answer

(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 stock 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

$$\frac{\text{Minimum stock level of A} + \text{Maximum stock level of A}}{2}$$ (Refer to working note)

$$\frac{4,000 + 16,250}{2} = 10,125 \text{ kgs.}$$

Working note:

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

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

Q20 ICAI Mat

EXE Limited has received an offer of quantity discounts on its order of materials as under:

Price per ton (₹)	Ton (Nos.)
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tons. The ordering cost per order is ₹ 1,200 and the stock holding cost is estimated at 20% of material cost per annum.

(a) You are **required** to COMPUTE the most economical purchase level.

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

Reference — What's **New**

EOQ with different price level

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Answer

(a)

Total annual requirement (A)	Order size (Ton) (q)	No. of orders A/q	Cost of inventory A × Per ton cost (₹)	Ordering cost A/q × ₹1200 (₹)	Carrying cost p.t. p.a ½× q × 20% of cost p.t. (₹)	Total Cost (4+5+6) (₹)
1	2	3	4	5	6	7
5,000 Ton	400	12.5	60,00,000 (5,000×₹1200)	15,000	48,000 (200 × ₹ 240)	60,63,000
	500	10	59,00,000 (5,000 × ₹ 1180)	12,000	59,000 (250 × ₹ 236)	59,71000
	1,000	5	58,00,000 (5,000× ₹ 1160)	6,000	1,16,000 (500 × ₹ 232)	59,22,000
	2,000	2.5	57,00,000 (5,000×₹ 1140)	3,000	2,28,000 (1,000×₹228)	59,31,000
	3,000	1.666	56,00,000 (5,000×₹ 1120)	2,000	3,36,000 (1,500×₹224)	59,38,000

The above table shows that the total cost of 5,000 units including ordering and carrying cost is minimum (₹ 59,22,000) when the order size is 1,000 units. Hence the most economical purchase level is 1,000 units.

(b) If there 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 is the annual inventory requirement,

O is the ordering cost per order and

C is the carrying cost per unit per annum.

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

Q 21 ICAI Mat

G. Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at ₹ 20. For every finished product, one unit of component is required. The ordering cost is ₹ 120 per order and the holding cost is 10% p.a.

You are **required** to CALCULATE:

(i) Economic order quantity.

(ii) If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur?

(iii) What is the minimum carrying cost, the company has to incur?

Reference | What's **New**

EOQ	**Minimum carrying cost**

Watch **Video** Scan Me

Answer

(i) **Economic order quantity:**

A (Annual requirement or Component 'X') = 4,000 units per month × 12 months
= 48,000 units

C (Purchase cost p.u.) = ₹ 20

O (Ordering cost per order) = ₹ 120

i (Holding cost) = 10% per annum

$$EOQ = \sqrt{\frac{2AO}{C_i}} = \sqrt{\frac{2 \times 48{,}000 \text{ units} \times ₹120}{10\% \times ₹20}} = 2{,}400 \text{ units}$$

(ii) **Extra cost incurred by the company:**

A.Total cost when order size is equal 4,000 units:

Total cost = Total ordering cost + Total carrying cost

$$= \frac{A}{Q} \times O + \frac{1}{2} Q(C_i)$$

$$= \left(\frac{48{,}000 \text{ units}}{4{,}000 \text{ units}} \times ₹120\right) + \left(\frac{1}{2} \times 4{,}000 \text{ units} \times 10\% \times ₹20\right)$$

= ₹ 1,440 + ₹ 4,000 = ₹ 5,440

B.Total cost when order size is equal EOQ i.e. 2,400 units:

$$\text{Total cost} = \left(\frac{48{,}000 \text{ units}}{2{,}400 \text{ units}} \times ₹120\right) + \left(\frac{1}{2} \times 2{,}400 \text{ units} \times 10\% \times ₹20\right)$$

= ₹ 2,400 + ₹ 2,400 = ₹ 4,800

Extra cost that the company has to incur = (A) – (B) = ₹ 5,440 – ₹ 4,800 = ₹ 640

(iii) **Minimum carrying cost:** Carrying cost depends upon the sizeof the order. It will be minimum on the least order size. (In thispart of the question the two order sizes are 2,400 units and4,000 units. Here 2,400 units is the least of the two order sizes.At this order size carrying cost will be minimum.)

The minimum carrying cost in this case can be computed as under:

$$\text{Minimum carrying cost} = \frac{1}{2} \times 2{,}400 \text{ units} \times 10\% \times ₹\ 20 = ₹\ 2{,}400$$

Q22 ICAI Mat

'AT' Ltd. furnishes the following store transactions for September, 20X8 :

1-9-X8	Opening balance	25 units value ₹ 162.50
4-9- X8	Issues Req. No. 85	8 units
6-9- X8	Receipts from B & Co. GRN No. 26	50 units @ ₹ 5.75 per unit
7-9- X8	Issues Req. No. 97	12 units
10-9- X8	Return to B & Co.	10 units
12-9- X8	Issues Req. No. 108	15 units
13-9- X8	Issues Req. No. 110	20 units
15-9- X8	Receipts from M & Co. GRN. No. 33	25 units @ ₹ 6.10 per unit
17-9- X8	Issues Req. No. 121	10 units
19-9- X8	Received replacement from B & Co. GRN No. 38	10 units
20-9- X8	Returned from department, material of M & Co. MRR No. 4	5 units
22-9- X8	Transfer from Job 182 to Job 187 in the dept. MTR 6	5 units
26-9- X8	Issues Req. No. 146	10 units
29-9- X8	Transfer from Dept. "A" to Dept. "B" MTR 10	5 units
30-9- X8	Shortage in stock taking	2 units

PREPARE the priced stores ledger on FIFO method and **STATE** how would you treat the shortage in stock taking.

Reference — What's **New**

Inventory Control Ratios

Watch **Video**

Scan Me

Answer

Working Notes:

1. The material received as replacement from vendor is treated as fresh supply.
2. In the absence of information, the price of the material returned from a user department on 20-9-X8 has been taken as the price of the latest issue made on 17-9-X8. In FIFO method physical flow of the material is irrelevant for pricing the issues.
3. The issue of material on 26-9-X8 is made out of the material received from a user department on 20-9-X8.
4. The entries for transfer of materials from one job and department to another on 22-9-X8 and 29-9-X8 respectively do not affect the store ledger. Adjustment entries to calculation of cost of respective jobs and departments are made in cost accounts.
5. The material found short as a result of stock taking has been written off.

Stores Ledger of AT Ltd. for the month of September, 20X8 (FIFO Method)

Date	RECEIPT				ISSUE				BALANCE		
	GRN No MRR No.	Qty. Units	Rate (₹)	Amt. (₹)	Requisition No	Qty. Units	Rate (₹)	Amt (₹)	Qty. Units	Rate (₹)	Amt (₹)
1	2	3	4	5	6	7	8	9	10	11	12
1-9-X8	—	—	—	—	—	—	—	—	25	6.50	162.50
4-9-X8	—	—	—	—	85	8	6.50	52	17	6.50	110.50
6-9-X8	26	50	5.75	287.50	—	—	—	—	17 50	6.50 5.75	398.00
7-9-X8	—	—	—	—	97	12	6.50	78	5 50	6.50 5.75	320.00
10-9-X8	—	—	—	—	Nil	10	5.75	57.50	5 40	6.50 5.75	262.50
12-9-X8	—	—	—	—	108	5 10	6.50 5.75	90	30	5.75	172.50
13-9-X8	—	—	—	—	110	20	5.75	115	10	5.75	57.50
15-9-X8	33	25	6.10	152.50	—	—	—	—	10 25	5.75 6.10	210.00
17-9-X8	—	—	—	—	121	10	5.75	57.50	25	6.10	152.50
19-9-X8	38	10	5.75	57.50	—	—	—	—	25 10	6.10 5.75	210.00
20-9-X8	4	5	5.75	28.75	—	—	—	—	5 25 10	5.75 6.10 5.75	238.75

26-9-X8	—	—	—	—	146	5 5	5.75 6.10	59.25	20 10	6.10 5.75	179.50
30-9-X8	—	—	—	—	Shortage	2	6.10	12.20	18 10	6.10 5.75	167.30

Q23

ICAI Mat

The following information is extracted from the Stores Ledger:

Material X

Opening Stock Nil

Purchases:

Jan. 1 100 @ ₹ 1 per unit

Jan. 20 100 @ ₹ 2 per unit

Issues:

Jan. 22 60 for Job W 16

Jan. 23 60 for Job W 17

Complete the receipts and issues valuation by adopting the First-In-First-Out, Last-In-First-Out and the Weighted Average Method.

TABULATE the values allocated to Job W 16, Job W 17 and the closing stock under the methods aforesaid and discuss from different points of view which method you would prefer.

Reference

Store Ledger Card - FIFO

What's **New**

Treatment of shortage

Watch **Video**

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Answer

From the point of view of cost of material charged to each job, it is minimum under FIFO and maximum under LIFO (Refer to Tables). During the period of rising prices, the use of FIFO give rise to high profits and that of LIFO low profits. In the case of weighted average there is no significant adverse or favourable effect on the cost of material as well as on profits.

From the point of view of valuation of closing stock it is apparent from the above statement that it is maximum under FIFO, moderate under weighte daverage and minimum under LIFO.

It is clear from the Tables that the use of weighted average evens out the fluctuations in the prices. Under this method, the cost of materials issued to the jobs and the cost of material in hands reflects greater uniformity than under FIFO and LIFO. Thus from different points of view, weighted average method is preferred over LIFO and FIFO.

Statement of receipts and issues by adopting First-in-First-Out Method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)
Jan. 1	Purchase	100	1	100	—	—	—	100	1	100
Jan. 20	Purchase	100	2	200	—	—	—	100 100	1 2	100 200
Jan. 22	Issue to Job W 16	—	—	—	60	1	60	40 100	1 2	40 200
Jan. 23	Issue to Job W 17	—	—	—	40 20	1 2	40 80	80	2	160

Statement of receipts and issues by adopting Last-In-First-Out method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)
Jan. 1	Purchase	100	1	100	—	—	—	100	1	100
Jan. 20	Purchase	100	2	200	—	—	—	100 100	1 2	100 200
Jan. 22	Issue to Job W 16	—	—	—	60	2	120	100 40	1 2	100 80
Jan. 23	Issue to Job W 17	—	—	—	40 20	2 1	80 20	80	1	80

Statement of Receipt and Issues by adopting Weighted Average method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)
Jan. 1	Purchase	100	1	100	—	—	—	100	1	100
Jan. 20	Purchase	100	2	200	—	—	—	200	1.50	300
Jan. 22	Issue to Job W 16	—	—	—	60	1.50	90	140	1.50	210
Jan. 23	Issue to Job W 17	—	—	—	60	1.50	90	80	1.50	120

Statement of Material Values allocated to Job W 16, Job W 17 and Closing Stock, under aforesaid methods

	FIFO (₹)	LIFO (₹)	Weighted Average (₹)
Material for Job W 16	60	120	90
Material for Job W 17	80	100	90
Closing Stock	160	80	120
	300	300	300

Q24 RTP May'18

Aditya Brothers supplies surgical gloves to nursing homes and polyclinics in the city. These surgical gloves are sold in pack of 10 pairs at price of ₹ 250 per pack.

For the month of April 2018, it has been anticipated that a demand for 60,000 packs of surgical gloves will arise. Aditya Brothers purchases these gloves from the manufacturer at ₹ 228 per pack within a 4 to 6 days lead time. The ordering and related cost is ₹ 240 per order. The storage cost is 10% p.a. of average inventory investment.

Required:

(i) **CALCULATE** the Economic Order Quantity (EOQ)

(ii) **CALCULATE** the number of orders needed every year

(iii) **CALCULATE** the total cost of ordering and storage of the surgical gloves.

(iv) **DETERMINE** when should the next order to be placed. (Assuming that the company does maintain a safety stock and that the present inventory level is 10,033 packs with a year of 360 working days).

Reference — What's **New**

EOQ

Watch **Video**

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Answer

(i) **Calculation of Economic Order Quantity:**

$$EOQ = \sqrt{\frac{2 \times A \times O}{Ci}} = \sqrt{\frac{2 \times (60{,}000 \text{ packs} \times 12 \text{ months}) \times ₹\,240}{₹\,228 \times 10\%}}$$

= 3,893.3 packs or 3,893 packs.

(ii) **Number of orders per year**

$$\frac{\text{Annual requirements}}{\text{E.O.Q}} = \frac{7{,}20{,}00 \text{ packs}}{3{,}893 \text{ packs}} = 184.9 \text{ or } 185 \text{ orders a year}$$

(iii) **Ordering and storage costs**

	(₹)
Ordering costs :– 185 orders × ₹ 240	44,400.00
Storage cost :– ½ (3,893 packs × 10% of ₹228)	44,380.20
Total cost of ordering & storage	88,780.20

(iv) **Timing of next order**

(a) **Day's requirement served by each order.**

$$\text{No. of days requirement} = \frac{\text{No. of working days}}{\text{No. of order in a year}} = \frac{360 \text{ days}}{185 \text{ orders}} = 1.94 \text{ days supply.}$$

This implies that each order of 3,893 packs supplies for requirements of 1.94 days only.

(b) **Days requirement covered by inventory**

$$= \frac{\text{Units in inventory}}{\text{Economic order quantity}} \times \text{(Day's requirement served by an order)}$$

$$\therefore \frac{10{,}033 \text{ packs}}{3{,}893 \text{ packs}} \times 1.94 \text{ days} = 5 \text{ days requirement}$$

(c) **Time interval for placing next order**

Inventory left for day's requirement – Average lead time of delivery

5 days – 5 days = 0 days

This means that next order for the replenishment of supplies has to be placed immediately.

Q25 ICAI Mat; MTP Mar'18

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

Item	Units	Unit cost (₹)
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. (10 Marks)

Reference

ABC Analysis

What's New

Watch Video

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Answer

Statement of Total Cost and Ranking

Item	Units	% of Total units	Unit cost (₹)	Total cost (₹)	% 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 (₹)	% 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**
	12	100%	27,74,750	100%	

Q26 ICAI Mat; May'18; MTP Nov'20

M/s. X Private Limited is manufacturing a special product which requires a component "SKY BLUE". The following particulars are available for the year ended 31st March, 2018:

Annual demand of "SKY BLUE"	12000 Units
Cost of placing an order	₹ 1,800
Cost per unit of "SKY BLUE	₹ 640
Carrying cost per annum	18.75%

The company has been offered a quantity discount of 5 on the purchases of "SKY BLUE" provided the order size is 3000 components at a time.

You are **required** to:

(i) Compute the Economic Order Quantity.

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

Reference | What's **New**

Economic order quantity and Analysis of quantity Discount

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Answer

(i) **Calculation of Economic Order Quantity**

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 12,000 \text{ units} \times ₹ 1,800}{₹ 640 \times 18.75/100}} = 600 \text{ units}$$

Evaluation of Profitability of Different Options of Order Quantity

When EOQ is ordered

	(₹)
Purchase Cost (12,000 units × ₹ 640)	76,80,000
Ordering Cost $\left[\frac{A}{Q} \times O - (12,000 \text{ units}/ 600 \text{ units}) \times ₹ 1,800\right]$	36,000

Carrying Cost $\left[\frac{Q}{2}\times C\times i - 600 \text{ units}\times ₹\ 640\times\frac{1}{2}\times\frac{18.75}{100}\right]$	36,000
Total Cost	77,52,000

(ii) **When Quantity Discount is accepted**

	(₹)
Purchase Cost (12,000 units × ₹ 608) 72,96,000	
Ordering Cost $\left[\frac{A}{Q}\times O \quad (12,000 \text{ units}/3,000 \text{ units})\times ₹\ 1,800\right]$	7,200
Carrying Cost $\left[\frac{Q}{C}\times C\times i \quad \left(3,000 \text{ units}\times ₹\ 608\times\frac{1}{2}\times\frac{18.75}{100}\right)\right]$	1,71,000
Total Cost	74,74,200

Advise – The total cost of inventory is higher if EOQ is adopted. If M/s. X Private Limited gets a discount of 5% on the purchases of "SKY BLUE" (if order size is 3,000 components at a time), there will be financial benefit of ₹ 2,77,800 (77,52,000 – 74,74,200). However, order size of big quantity will increase volume of average inventory to 5 times. There may be risk of shrinkage, pilferage and obsolescence etc, of inventory due to increase in the average volume of inventory holding. This aspect also has to be taken into consideration before opting the discount offer and taking final decision.

Q 27 May'18; Dec'21

The following details are provided by M/s. SKU Enterprises for the year ended 31st March, 2018:

Particulars	Material-M (₹)	Material-N (₹)
Stock as on 01-04-2017	6,00,000	10,00,000
Stock as on 31-03-2018	4,50,000	7,25,000
Purchases during the year	9,50,000	18,40,000

You are **required** to:

(i) **Calculate** Turnover Ratio of both the materials.

(ii) **Advise** which of the two materials is fast moving. (Assume 360 days in a year). (5 Marks)

Reference — What's **New**

Inventory Turnover Ratio and comments on fast moving

Watch **Video**

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Answer

(i)

Material M	Material N
Turnover ratio	**Turnover ratio**
$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}}$	$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}}$
$= \frac{₹\ 6,00,000 + ₹\ 9,50,000 - ₹\ 4,50,000}{(6,00,000 + 4,50,000)/2}$ $= 2.09$	$= \frac{₹\ 10,00,000 + ₹\ 18,40,000 - ₹\ 7,25,000}{(10,00,000 + 7,25,000)/2}$ $= 2.45$
Average number of days for which the average inventory is held	**Average number of days for which the average inventory is held**
$= \frac{360}{\text{Inventory Turnover Ratio}}$	$= \frac{360}{\text{Inventory Turnover Ratio}}$
$= \frac{360 \text{ days}}{2.09}$	$= \frac{360 \text{ days}}{2.45}$
= 172.25 days	= 146.94 days

(ii) **Advice**

Comparatively Material M is slower than Material N since Inventory holding period of 'M' is 172.25 days in Comparison to 'N' i.e. 146.94 days. Infact, both materials have slow inventory turnover. Though, different business has their own expected rates for inventory turnover like food shops have fast inventory turnover, shop selling furniture etc. will have slower inventory turnover while manufacturers of large items of plant will have very long inventory turnover.

If it is not as per the Industry Standard, then a slow turnover may indicate that excessive inventory is held and risk of obsolete or spoiled inventory will increase. Large quantity of slow moving material means that capital is locked up in business and not earning revenue. **It is advisable to make proper investigations into slow moving materials and take steps to minimize the loss arises therefrom as it may impact overall financial health of the organisation.**

Q 28 May'18

Explain 'Just In Time' (JIT) approach of inventory management.

Reference | What's **New**

Just in time

Watch **Video** Scan Me

Answer

Just in Time (JIT) Inventory Management

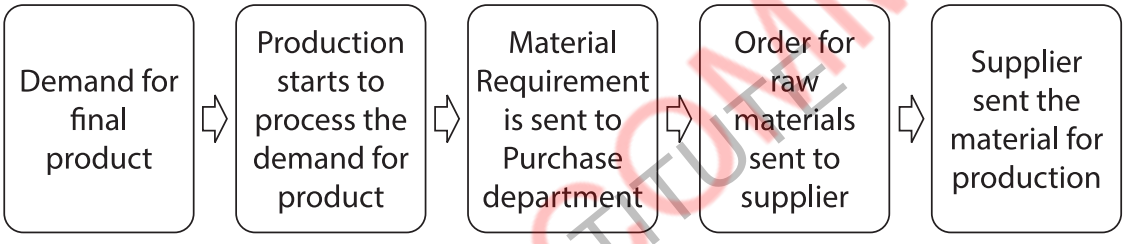
JIT is a system of inventory management with an approach to have a zero inventories in stores. According to this approach material should only be purchased when it is actually required for production.

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.

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. This can be understood with the help of the following diagram:



Q29 May'18

Explain 'FIFO and LIFO method of stores issue.

Reference — What's **New**

FIFO and LIFO method

Watch **Video**

Scan Me

Answer

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.

Q30 RTP Nov'18

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	₹ 1,000 per order
Inventory carrying cost	20% per annum
Cost of Part	₹ 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:

(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.

Reference | What's **New**

EOQ, Re order Level, Maximum and Minimum level of stock.

Watch **Video**

Scan Me

Answer

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

= 2,000 monitors × 4 parts × 12 months = 96,000 units

O = Ordering cost per order = ₹ 1,000/- per order

C_1 = Cost per part =₹ 350/-

$_iC_1$ = Inventory carrying cost per unit per annum

= 20% × ₹ 350 = ₹ 70/- per unit, per annum

Economic order quantity (EOQ):

$$E.O.Q = \sqrt{\frac{2AO}{{}_iC_1}} = \sqrt{\frac{2 \times 96,000 \text{ units} \times ₹ 1,000}{₹ 70}}$$

= 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 ₹350 – 5% of 350 = ₹332.5

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

= Cost of 96,000 units + Ordering cost + Carrying cost.

$$= (96,000 \text{ units} \times ₹ 332.50) + \left(\frac{96,000 \text{ units}}{30,000 \text{ units}} \times ₹ 1,000\right) + \frac{1}{2} (30,000 \text{ units} \times 20\% \times ₹ 332.50)$$

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

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

$$= (96,000 \text{ units} \times ₹350) + \left(\frac{96,000 \text{ units}}{1,656 \text{ units}} \times ₹ 1,000\right) + \frac{1}{2} (1,656 \text{ units} \times 20\% \times ₹350)$$

= ₹3,36,00,000 + ₹57,970* + ₹57,960 = ₹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.

(2) **Reorder level**

= Maximum consumption × Maximum re-order period

= 710 units × 5 weeks = 3,550 units

(3) **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.

(4) **Minimum level of stock**

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

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

Q 31 MTP Aug'18

The annual demand for an item of raw material is 4,000 units and the purchase price is expected to be ₹ 90 per unit. The incremental cost of processing an order is ₹ 135 and the annual cost of storage is estimated to be ₹ 12 per unit.

COMPUTE the optimal order quantity and total relevant cost of this order quantity?

Suppose that ₹ 135 as estimated to be the incremental cost of processing an order is incorrect and should have been ₹ 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 ₹ 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 ₹ 135 for placing an order for the economic batch is correct.

ANALYSE, should the order be accepted? (10 Marks)

Reference | What's **New**

EOQ and analysis of cost due to error in ordering cost

Watch **Video**

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Answer

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

$$= \sqrt{\frac{2 \times 4,000 \times 135}{12}} = \sqrt{90,000} = 300 \text{ units}$$

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

(ii) **Revised EOQ** = $\sqrt{\frac{2 \times 4,000 \times 80}{12}}$ = 231 units

Ordering cost = $\frac{4,000}{231}$ = 17.32 say 18 orders at ₹ 80	1,440
Carrying cost = $\frac{1}{2} \times 231 \times 12$	1,386
	2,826

Difference in cost on account of this error = 3,690 – 2,826 = ₹ 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 ₹ 90 per unit		Supplier offered at ₹ 86 per unit	
	₹		₹
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 $\left(\frac{1}{2}\times 4,000\times 12\right)$	24,000
Total cost	3,63,690		3,68,000

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

Q 32 MTP Oct'18; MTP May'20

A company manufactures a product from a raw material, which is purchased at ₹ 54 per kg. The company incurs a handling cost of ₹1,500 plus freight of ₹4,000 per order. The incremental carrying cost of inventory of raw material is ₹1.50 per kg per month. In addition, the cost of working capital finance on the investment in inventory of raw material is ₹8 per kg per annum. The annual production of the product is 96,000 units and 4 units are obtained from one kg of raw material.

Required:

(i) **CALCULATE** the economic order quantity of raw materials.

(ii) **ADVISE**, how frequently orders should be placed for procurement.

(iii) If the company proposes to rationalize placement of orders on quarterly basis, **DETERMINE** what percentage of discount in the price of raw materials should be negotiated?

Reference | What's **New**

Economic order quantity - Rationalisation of supplier's offer

Watch **Video**

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Answer

(i) $EOQ = \sqrt{\frac{2AO}{C}}$

A = Annual consumption = $\frac{96,000 \text{ units}\times 1\text{kg}}{4 \text{ units}}$ = 24,000kgs.

O = Cost of placing order = Handling cost + Freight = ₹ 1,500 +₹4,000 = ₹5,500

C = Carrying cost per kg. per annum

Carrying cost (₹1.50 × 12) = ₹ 18

Finance charges on investment in inventory = ₹ 8

₹ 26

$$EOQ = \sqrt{\frac{2 \times 24,000 \text{ kgs.} \times ₹ 5,500}{₹ 26}} = 3,186.5 \text{ kgs.}$$

(ii) Number of orders = 24,000 kgs./ 3,186.5 kgs. = 7.53 or 8 orders

Frequency in placing orders = 365 days / 8 orders = 45.63 or 46 days

(iii) If company places orders on quarterly basis, percentage of discount in price of raw material to be negotiated:

Cost under EOQ:

Ordering cost (8 orders × ₹ 5,500)	44,000.00
Carrying cost (3,186.5kgs. × ½ × ₹ 26)	41,424.50
Total	85,424.50

Cost under Ordering on Quarterly Basis:

Ordering cost (4 orders × ₹5,500)	22,000.00
Carrying cost [(24,000 kgs./ 4 orders) × ½ × ₹ 26]	78,000.00
Total	1,00,000.00

Incremental cost if orders are placed on quarterly basis = ₹1,00,000– ₹ 85,424.50

= ₹ 14,575.50

Reduction in purchase price to be negotiated = ₹ 14,575.50 ÷ 24,000 kgs. = ₹ 0.61 per kg.

Percentage of discount to be negotiated 0.61 ÷ 54 × 100 = 1.13%

Q 33 Nov'18; MTP May'21

M/s. SJ Private Limited manufactures 20000 units of a product per month. The cost of placing an order is ₹ 1,500. The purchase price of the raw material is ₹ 100 per kg. The re-order period is 5 to 7 weeks. The consumption of raw materials varies from 200 kg to 300 kg per week, the average consumption being 250 kg. The carrying cost of inventory is 9.75% per annum.

You are **required** to calculate:

(i) Re-order quantity

(ii) Re-order level

(iii) Maximum level

(iv) Minimum level

(v) Average stock level

Reference | **What's New**

ROQ and Stock Levels

Watch **Video**

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Answer

Annual consumption 250 kg × 52 weeks = 13,000 kg.

(i) **Re-order Quantity or EOQ** = $\sqrt{\frac{2 \times A \times O}{c \times i}}$

A = Annual Consumption = 13,000 kg

O = Ordering Cost = ₹ 1,500

C = Cost per kg = ₹ 100

i = carrying cost rate = 9.75%

Carrying cost per kg per annum (c× i) = 100 × 9.75% = ₹ 9.75

$\therefore EOQ = \sqrt{\frac{2 \times 13,000 \times 1,500}{9.75}}$

$= \sqrt{\frac{390,00,000}{9.75}} = 2,000 \text{ kg.}$

(ii) **Re-order level** = Max. re-order period × Max, Consumption

= 7 weeks × 300 kg = 2,100 kg

(iii) **Maximum level** = Re-order level + Re-order Qty – (Min re-order Period × Min. Consumption)

= 2100 kg + 2000 kg – (5 × 200) kg = 3100 kg.

(iv) **Minimum level** = Re-order level – (Avg. re-order period × Avg. Consumption)

= 2,100 kg – (6 × 250) kg = 600 kg.

(v) **Avg. stock level** = $\frac{1}{2}$ (Max. level +Min.level)

= $\frac{1}{2}$ (13100 + 600) = 1850 kg

OR

Minimum level + $\frac{1}{2}$ ROQ

= 600 kg. + $\frac{1}{2}$ × 2000 kg. = 1600 kg.

Q 34 Nov'18

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

Reference | What's **New**

Obsolescence and its treatment

Watch **Video**

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Answer

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**.

Q 35 RTP May'19; MTP Apr'19; RTP May'21

Ananya Ltd. produces a product 'Exe' using a raw material Dee. To produce one unit of Exe, 2 kg of Dee is required. As per the sales forecast conducted by the company, it will able to sale 10,000 units of Exe in the coming year. The following is the information regarding the raw material Dee:

(i) The Re-order quantity is 200 kg. less than the Economic Order Quantity (EOQ).

(ii) Maximum consumption per day is 20 kg. more than the average consumption per day.

(iii) There is an opening stock of 1,000 kg.

(iv) Time required to get the raw materials from the suppliers is 4 to 8 days.

(v) The purchase price is ₹125 per kg.

There is an opening stock of 900 units of the finished product Exe.

The rate of interest charged by bank on Cash Credit facility is 13.76%.

To place an order company has to incur ₹ 720 on paper and documentation work.

From the above information **FIND OUT** the followings in relation to raw material Dee:

(a) Re-order Quantity

(b) Maximum Stock level

(c) Minimum Stock level

(d) CALCULATE the impact on the profitability of the company by not ordering the EOQ.

[Take 364 days for a year]

Reference — What's **New**

EOQ, Stock Levels and Impact on profitability - with Opening Stock effect

Watch **Video**

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Answer

Working Notes:

(i) **Computation of Annual consumption & Annual Demand for raw material 'Dee':**

Sales forecast of the product 'Exe'	10,000 units
Less: Opening stock of 'Exe'	900 units
Fresh units of 'Exe' to be produced	9,100 units
Raw material required to produce 9,100 units of 'Exe' (9,100 units × 2 kg.)	18,200 kg.
Less: Opening Stock of 'Dee'	1,000 kg.
Annual demand for raw material 'Dee'	17,200 kg.

(ii) **Computation of Economic Order Quantity (EOQ):**

$$EOQ = \sqrt{\frac{2 \times \text{Annual demand of 'Dee'} \times \text{Ordering Cost}}{\text{Carrying cost per unit per annum}}}$$

$$= \sqrt{\frac{2 \times 17,200 \text{ kg.} \times ₹ 720}{₹ 125 \times 13.76\%}} = \sqrt{\frac{2 \times 17,200 \text{ kg.} \times ₹ 720}{₹ 17.2}} = 1,200 \text{ kg.}$$

(iii) **Re-Order level:**

= (Maximum consumption per day × Maximum lead time)

$$= \left\{\left(\frac{\text{Annual consumption of 'Dee'}}{364 \text{ days}} + 20 \text{ kg.}\right) \times 8 \text{ days}\right\}$$

$$= \left\{\left(\frac{18,200 \text{ kg.}}{364 \text{ days}} + 20 \text{ kg.}\right) \times 8 \text{ days}\right\} = 560 \text{ kg.}$$

(iv) **Minimum consumption per day of raw material 'Dee':**

Average Consumption per day = 50 Kg.

Hence, Maximum Consumption per day = 50 kg. + 20 kg. = 70 kg.

So Minimum consumption per day will be

$$\text{Average Consumption} = \frac{\text{Min. consumption} + \text{Max. consumption}}{2}$$

$$\text{Or, 50 kg.} = \frac{\text{Min. consumption} + 70 \text{ kg.}}{2}$$

Or, Min. consumption = 100 kg – 70 kg. = 30 kg.

(a) **Re-order Quantity :**

EOQ – 200 kg. = 1,200 kg. – 200 kg. = 1,000 kg.

(b) **Maximum Stock level:**

= Re-order level + Re-order Quantity – (Min. consumption per day × Min. lead time)

= 560 kg. + 1,000 kg. – (30 kg. × 4 days)

= 1,560 kg. – 120 kg. = 1,440 kg.

(c) **Minimum Stock level:**

= Re-order level – (Average consumption per day × Average lead time)

= 560 kg. – (50 kg. × 6 days) = 260 kg.

(d) **Impact on the profitability of the company by not ordering the EOQ.**

		When purchasing the ROQ	When purchasing the EOQ
I	Order quantity	1,000 kg.	1,200 kg.
II	No. of orders a year	$\frac{17,200 \text{ kg.}}{1,000 \text{ kg.}}$ = 17.2 or 18 orders	$\frac{17,200 \text{ kg.}}{1,200 \text{ kg.}}$ = 14.33 or 15 orders
III	Ordering Cost	18 orders × ₹ 720 = ₹12,960	15 orders × ₹ 720 = ₹10,800
IV	Average Inventory	$\frac{1,000 \text{ kg.}}{2}$ = 500 kg.	$\frac{1,200 \text{ kg.}}{2}$ = 600 kg.
V	Carrying Cost	500 kg. × ₹ 17.2 = ₹ 8,600	600 kg. × ₹ 17.2 = ₹ 10,320
VI	Total Cost	₹ 21,560	₹ 21,120

Extra Cost incurred due to not ordering EOQ = ₹ 21,560 - ₹ 21,120 = ₹ 440

Q 36 May'19

The following are the details of receipt and issue of material 'CXE' in a manufacturing Co. during the month of April 2019:

Date	Particulars	Quantity (kg)	Rate per kg
April 4	Purchase	3,000	₹ 16
April 8	Issue	1,000	
April15	Purchase	1,500	₹ 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	₹ 17

Opening stock as on 01-04-2019 is 1,000 kg @ ₹ 15 per kg.

On 30th April, 2019 it was found that 50 kg of material 'CXE' 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 30-04-2019 as per these two methods? (10 Marks)

Reference | What's **New**

Store ledger – WAM and LIFO, Material consumed and Closing stock Value

Watch **Video**

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Answer

(i) (a) **Stores Ledger Account for the month of April, 2019 (Weighted Average Method)**

Date	Receipt			Issue			Balance		
	Qty Units	Rate (₹)	Amt (₹)	Qty Units	Rate (₹)	Amt (₹)	Qty Units	Rate (₹)	Amt (₹)
1-4-19	–	–	–	–	–	–	1,000	15.00	15,000
4-4-19	3,000	16.00	48,000	–	–	–	4,000	15.75	63,000
8-4-19	–	–	–	1,000	15.75	15,750	3,000	15.75	47,250
15-4-19	1,500	18.00	27,000	–	–	–	4,500	16.50	74,250
20-4-19	–	–	–	1,200	16.50	19,800	3,300	16.50	54,450

25-4-19	–	–	–	300	18.00	5,400	3,000	16.35	49,050
26-4-19	–	–	–	1,000	16.35	16,350	2,000	16.35	32,700
28-4-19	500	17.00	8,500	–	–	–	2,500	16.48	41,200
30-4-19	–	–	–	50	16.48	824	2,450	16.48	40,376

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

Date	Receipt			Issue			Balance		
	Qty Units	Rate (₹)	Amt (₹)	Qty Units	Rate (₹)	Amt (₹)	Qty Units	Rate (₹)	Amt (₹)
1-4-19	–	–	–	–	–	–	1,000	15	15,000
4-4-19	3,000	16	48,000	_	_	_	1,000	15	15,000
							3,000	16	48,000
8-4-19	_	_	_	1,000	16	16,000	1,000	15	15,000
							2,000	16	32,000
15-4-19	1,500	18	27,000	_	_	_	1,000	15	15,000
							2,000	16	32,000
							1,500	18	27,000
20-4-19	_	_	_	1,200	18	21,600	1,000	15	15,000
							2,000	16	32,000
							300	18	5,400
25-4-19	_	_	_	300	18	5,400	1,000	15	15,000
							2,000	16	32,000
26-4-19	_	_	_	1,000	16	16,000	1,000	15	15,000
							1,000	16	16,000
28-4-19	500	17	8,500	–	–	–	1,000	15	15,000
							1,000	16	16,000
							500	17	8,500
30-4-19	_	_	_	50	17	850	1,000	15	15,000
							1,000	16	16,000
							450	17	7,650

(ii) **Value of Material Consumed and Closing Stock**

	Weighted Average method (₹)	LIFO method (₹)
Opening stock as on 01-04-2019	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 30-04-2019	40,376	38,650
Value of Material Consumed	51,900	53,600

Q 37 RTP Nov'19

HBL Limited produces product 'M' which has a quarterly demand of 20,000 units. Each product requires 3 kg. and 4 kg. of material X and Y respectively. Material X is supplied by a local supplier and can be procured at factory stores at any time, hence, no need to keep inventory for material X. The material Y is not locally available, it requires to be purchased from other states in a specially designed truck container with a capacity of 10 tons.

The cost and other information related with the materials are as follows:

Particulars	Material –X	Material-Y
Purchase price per kg. (excluding GST)	₹140	₹640
Rate of GST	18%	18%
Freight per trip (fixed, irrespective of quantity)	-	₹28,000
Loss of materials in transit*	-	2%
Loss in process*	4%	5%

*On purchased quantity

Other information:

- The company has to pay 15% p.a. to bank for cash credit facility.
- Input credit is available on GST paid on materials.

Required:

(i) **CALCULATE** cost per kg. of material X and Y

(ii) **CALCULATE** the Economic Order quantity for both the materials.

Reference — What's **New**

Landed Cost of material and EOQ

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Answer

Working Note

Annual purchase quantity for material X and Y:

Annual demand for product M- 20,000 units × 4 = 80,000 units

Particulars	Mat-X	Mat-Y
Quantity required for per unit of product M	3 kg.	4 kg.
Net quantity for materials required	2,40,000 kg.	3,20,000 kg.
Add: Loss in transit	-	6,881 kg.
Add: Loss in process	10,000 kg.	17,204 kg
Purchase quantity	2,50,000 kg.	3,44,085 kg.

Note - Input credit on GST paid is available; hence, it will not be included in cost of material.

(i) **Calculation of cost per kg. of material X and Y:**

Particulars	Mat-X	Mat-Y
Purchase quantity	2,50,000 kg.	3,44,085 kg.
Rate per kg.	₹140	₹640
Purchase price	₹3,50,00,000	₹22,02,14,400
Add: Freight	0	₹9,80,000*
Total cost	₹3,50,00,000	₹22,11,94,400
Net Quantity	2,40,000 kg.	3,20,000 kg
Cost per kg.	₹145.83	₹691.23

*No. of trucks $= \frac{3,44,085\ kg}{10\ ton \times 1,000} = 34.40$ trucks or 35 trucks

Therefore, total freight = 35 trucks × ₹28,000 = ₹9,80,000

(ii) **Calculation of Economic Order Quantity (EOQ) for Mat.-X and Y:**

$$EOQ = \sqrt{\frac{2 \times Annual\ Requirement \times Order\ Cost}{Carrying\ cost\ per\ unit\ p.a.}}$$

Particulars	Mat-X	Mat-Y
Annual Requirement	2,50,000 kg.	3,44,085 kg.
Ordering cost	0	₹28,000
Cost per unit	₹145.83	₹691.23
Carrying cost	15%	15%
Carrying cost per unit p.a.	0*	₹103.68
EOQ	0	13,632.62 kg.

Q38 MTP Oct'19

A Ltd. manufactures a product X which requires two raw materials A and B in a ratio of 1:4. The sales department has estimated a demand of 5,00,000 units for the product for the year. To produce one unit of finished product, 4 units of material A is required.

Stock position at the beginning of the year is as below:

Product- X : 12,000 units

Material A : 24,000 units

Material B : 52,000 units

To place an order the company has to spend ₹15,000. The company is financing its working capital using a bank cash credit @13% p.a.

Product X is sold at ₹1,040 per unit. Material A and B are purchased at ₹150 and ₹200 respectively.

Required:

COMPUTE Economic Order Quantity (EOQ):

(i) If purchase order for the both materials is placed separately.

(ii) If purchase order for the both materials is not placed separately. [5 Marks]

Reference | What's **New**

EOQ - with effect of opening stock

Watch **Video**

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Answer

Workings:

Annual production of Product X = Annual demand – Opening stock

= 5,00,000 – 12,000 = 4,88,000 units

Annual requirement for raw materials = Annual production × Material per unit – Opening stock of material

Material A = 4,88,000 × 4 units – 24,000 units = 19,28,000 units

Material B = 4,88,000 × 16 units – 52,000 units = 77,56,000 units

(i) **Computation of EOQ when purchase order for the both materials is placed separately**

$$EOQ = \sqrt{\frac{2 \times \text{Annual requirement for material} \times \text{Ordering Cost}}{\text{Carrying cost per unit per annum}}}$$

$$\text{Material A} = \sqrt{\frac{2 \times 19,28,000 \text{ units} \times ₹ 15,000}{13\% \text{ of } ₹ 150}} = \sqrt{\frac{38,56,000 \times ₹ 15,000}{₹ 19.5}}$$

= 54,462 units

$$\text{Material B} = \sqrt{\frac{2 \times 77,56,000 \text{ units} \times ₹ 15,000}{13\% \text{ of } ₹ 200}} = \sqrt{\frac{1,55,12,000 \times ₹ 15,000}{₹ 26}}$$

= 94,600 units

(ii) **Computation of EOQ when purchase order for the both materials is not placed separately**

$$\text{Material A \& B} = \sqrt{\frac{2 \times (19,28,000 + 77,56,000) \text{ units} \times ₹ 15,000}{13\% \text{ of } ₹ 190^*}}$$

$$= \sqrt{\frac{1,93,68,000 \times ₹ 15,000}{₹ 24.7}} = 1,08,452 \text{ units}$$

$$\text{Material A} = \frac{1,08,452 \times 19,28,000}{96,84,000} = 21,592 \text{ units}$$

$$\text{Material A} = \frac{1,08,452 \times 77,56,000}{96,84,000} = 86,860 \text{ units}$$

$$* = \frac{(₹150 \times 19,28,000) + (₹200 \times 77,56,000)}{(19,28,000 + 77,56,000)} = ₹190$$

Q 39 MTP Oct'19; MTP Nov'20

Distinguish between Bill of Materials and Material Requisition Note.

Reference | What's **New**

Difference between Bill of Material and Material Requisition Note

Watch **Video**

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Answer

Bills of Material	Material Requisition Note
1. It is document or list of materials prepared by the engineering/ drawing department.	1. 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.	2. 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 particular job i.e. it can replace stores requisition.	3. It cannot replace a bill of material.
4. It can be used for the purpose of quotation.	4. It is useful in arriving historical cost only.
5. It helps in keeping a quantitative control on materials drawn through Stores Requisition.	5. It shows the material actually drawn from stores.

Q40 Nov'19

Surekha Limited produces 4,000 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 ₹ 40 and the purchasing price of raw material is ₹ 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. [5 Marks]

Reference | What's **New**

EOQ with Lead time

Watch **Video**

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Answer

Working:

Calculation of Annual demand of raw material

= 4,000 Litres (per quarter) x 4 (No. of Quarter in a year) × 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 ₹ 50 = ₹ 4 per unit per annum

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

$= \sqrt{\frac{2 \times 32,000\ \text{kg} \times ₹\ 40}{₹\ 4}} = 800\ \text{kg}$

(ii) **Total Annual Inventory Cost**

Purchasing cost of 32,000 kg @ ₹ 50 per kg	₹ 16,00,000
Ordering Cost $\left(\frac{32,000\ \text{kg}}{800\ \text{kg}} \times ₹\ 40\right)$	₹ 1,600
Carrying Cost of Inventory $\left(\frac{15\ \text{days}}{30\ \text{days}} \times 800\ \text{kg} \times ₹\ 4\right)$	₹ 1,600
	₹ 16,03,200

Q 41 Nov'19

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

Reference | What's **New**

Inventory control and its objectives

Watch **Video**

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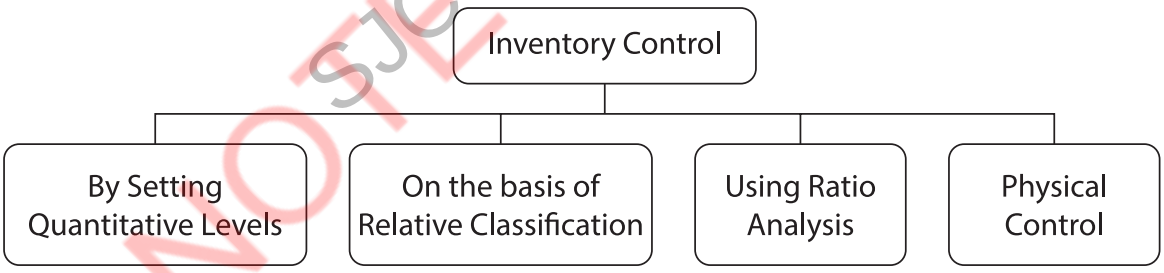
Answer

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:



Q 42 ICAI Mat; RTP May'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 (₹)
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	-
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.

Reference

ROL, Maximum Level, Minimum Level, Store ledger card (WAM), Consumption and Inventory Turnover Ratio

What's **New**

Rate of usage and Lead time Calculation

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Answer

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 ₹	Amt. (₹'000)	MRN/ MR	Units	Rate ₹	Amt. (₹'000)	Units	Rate ₹	Amt. (₹'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
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	97,800	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	97,500	-	-	-	-	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) = ₹1,39,001

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

Sum of material requisitions 011 to 016 ('000)

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

(vi) **Inventory Turnover Ratio**

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

$$= \frac{₹1,81,061}{₹(1,39,001+34,335)/2} = \frac{₹1,81,061}{₹86,668} = 2.09$$

Q43 RTP Nov'20; MTP May'21

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. (₹)	Delivery period (in weeks)			Re-order 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?

Reference | What's **New**

Stock Levels

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Answer

(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**

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

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

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 units × 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.

Q44 Nov'20

An automobile company purchases 27,000 spare parts for its annual requirements. The cost per order is ₹ 240 and the annual carrying cost of average inventory is 12.5%. Each spare part costs ₹ 50.

At present, the order size is 3,000 spare parts.

(Assume that number of days in a year = 360 days)

Find out: [10 Marks]

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

Reference

EOQ with Lead time

What's **New**

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Answer

Working Notes:

Annual requirement (A) = 27,000 units

Cost per order (O) = ₹ 240

Inventory carrying cost (i) = 12.5%

Cost per unit of spare (c) = ₹ 50

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

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

$= \sqrt{\frac{2 \times 27,000 \times 240}{6.25}} = 1440$ 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 (₹)	2,160 (₹ 240 × 9)	4,500 $\left\{₹ 240 \times \left(\frac{27,000}{1,440}\right)\right\}$
B. Carrying cost (₹)	9,375 $\left(\frac{3,000 \times ₹ 6.25}{2}\right)$	4,500 $\left(\frac{1,440 \times ₹ 6.25}{2}\right)$
Total cost (A+B) (₹)	11,535	9,000

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

(ii) **Re-order point under EOQ:**

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

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

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

(iii) **Frequency of Orders (in days):**

$$\frac{360 \text{ days}}{\text{No. of orders a year}} = \frac{360 \text{ days}}{19} = 18.95 \text{ days or } 19 \text{ days}$$

Q45 Jan'21

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.

Reference — What's **New**

Treatment of different items

Watch **Video** Scan Me

Answer

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.

Q46 MTP May'21

Explain the advantages that would accrue in using the LIFO method of pricing for the valuation of raw material stock. (5 Marks)

Reference | What's **New**

LIFO Method

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Answer

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.

Q 47 ICAI Mat; RTP Nov'21

The following data are available in respect of material X for the year ended 31st March, 2021:

	(₹)
Opening stock	9,00,000
Purchases during the year	1,70,00,000
Closing stock	11,00,000

(i) **CALCULATE:**

(a) Inventory turnover ratio, and

(b) The number of days for which the average inventory is held.

(ii) **INTERPRET** the ratio calculated as above if the industry inventory turnover rate is 10.

Reference | What's **New**

Inventory Control Ratios

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Answer

(i) (a) **Inventory turnover ratio (Refer to working note)**

$$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}}$$

$$= \frac{₹\ 1,68,00,000}{₹\ 10,00,000} = 16.8$$

(b) **Average number of days for which the average inventory is held**

$$= \frac{365}{\text{Inventory turnover ratio}} = \frac{365 \text{ days}}{16.8} = 21.73 \text{ days}$$

Particulars	(₹)
Opening stock of raw material	9,00,000
Add: Material purchases during the year	1,70,00,000
Less: Closing stock of raw material	11,00,000
	1,68,00,000

(ii) The Inventory turnover ratio for material X is 16.8 which mean an inventory item takes only 21.73 or 22 days to issue from stores for production process. The rate is better than the industry rate which is 10 time or 36.5 days. This inventory turnover ratio indicates better inventory management system and good demand for the final product in market.

Q48 July'21

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

Item Code Number	Units	Unit Cost (₹)
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 : [5]

(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.

Reference — What's **New**

ABC Analysis

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Answer

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

Item code no.	Units	% of Total units	Unit cost (₹)	Total Inventory cost (₹)	% of Total Inventory cost	Ranking
101	25	3.33	50	1,250	16.67	2
102	300	40.00	1	300	4.00	6
103	50	6.67	80	4,000	53.33	1
104	75	10.00	8	600	8.00	4
105	225	30.00	2	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 (₹)	% 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	

Q 49 July'21

Write a short note on VED analysis of Inventory Control. [5]

Reference | What's New

Ved Analysis of Inventory Control

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Answer

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 standardisation 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**.

Q 50 ICAI Mat

SKD Company Ltd., not registered under GST, purchased material P from a company which is registered under GST. The following information is available for the one lot of 1,000 units of material purchased:

Listed price of one lot	₹ 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.)	
Freight and Insurance	₹ 3,400
Toll Tax paid	₹ 1,000
Demurrage	₹ 1,000
Commission and brokerage on purchases	₹ 2,000
Amount deposited for returnable containers	₹ 6,000
Amount of refund on returning the container	₹ 4,000
Other Expenses	@ 2% of total cost

20% of material shortage is due to normal reasons.

The payment to the supplier was made within 20 days of the purchases.

You are **required** to calculate cost per unit of material purchased to SKD Company Ltd.

Reference — What's **New**

Cost per unit

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Answer

Computation of Total cost of material purchased of SKD Manufacturing Company

Particulars	Units	(₹)
Listed Price of Materials	1,000	50,000
Less: Trade discount @ 10% on invoice price		(5,000)
		45,000
Add: CGST @ 6% of ₹ 45,000		2,700
Add: SGST @ 6% of ₹ 45,000		2,700
		50,400
Add: Toll Tax		1,000
Freight and Insurance		3,400

	Commission and Brokerage Paid		2,000
Add:	Cost of returnable containers:		
	Amount deposited	₹ 6,000	
Less:	Amount refunded	(₹ 4,000)	2,000
			58,800
Add:	Other Expenses @ 2% of Total Cost $\left(\frac{₹\ 58,800}{98}\times 2\right)$		1,200
Total cost of material			60,000
Less: Shortage due to Normal Loss @ 20%		200	-
Total cost of material of good units		800	60,000
Cost per unit (₹ 60,000/800 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 offloading 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.

Q 51 ICAI Mat

IPL Limited uses a small casting in one of its finished products. The castings are purchased from a foundry. IPL Limited purchases 54,000 castings per year at a cost of ₹ 800 per casting.

The castings are used evenly throughout the year in the production process on a 360- days-per-year basis. The company estimates that it costs ₹ 9,000 to place a single purchase order and about ₹ 300 to carry one casting in inventory for a year. The high carrying costs result from the need to keep the castings in carefully controlled temperature and humidity conditions, and from the high cost of insurance.

Delivery from the foundry generally takes 6 days, but it can take as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the following tabulation:

Delivery time (days) :	6	7	8	9	10
Percentage of occurrence :	75	10	5	5	5

Required:

(i) **Compute** the economic order quantity (EOQ).

(ii) Assume the company is willing to assume a 15% risk of being out of stock. **What** would be the safety stock? The re-order point?

(iii) Assume the company is willing to assume a 5% risk of being out of stock. **What** would be the safety stock? The re-order point?

(iv) Assume 5% stock-out risk. **What** would be the total cost of ordering and carrying inventory for one year?

(v) Refer to the original data. Assume that using process re-engineering the company reduces its cost of placing a purchase order to only ₹ 600. In addition, company estimates that when the waste and inefficiency caused by inventories are considered, the true cost of carrying a unit in stock is ₹ 720 per year.

(a) **Compute** the new EOQ.

(b) **How** frequently would the company be placing an order, as compared to the old purchasing policy?

Reference — What's **New**

EOQ and Re-order Point

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Answer

(i) **Computation of Economic Order Quantity (EOQ)**

Annual requirement (A)	= 54,000 castings
Cost per casting (C)	= ₹ 800
Ordering cost (O)	= ₹ 9,000 per order
Carrying cost per casting p.a. (C × i)	= ₹ 300

$$EOQ = \sqrt{\frac{2AO}{c \times i}} = \sqrt{\frac{2 \times 54,000 \text{ units} \times 9,000}{₹\ 300}}$$ = 1,800 castings

(ii) **Safety stock** (Assuming a 15% risk of being out of stock)

From the probability table given in the question, we can see that 85% certainty in delivery time is achieved when delivery period is 7 days i.e. at 15% risk level of being out of stock, the maximum delivery period should not exceed 7 days.

Safety stock $= \frac{\text{Annual Demand}}{360 \text{ days}} \times (\text{Max. lead time} - \text{Avg. lead time})$

$= \frac{54,000 \text{ units}}{360 \text{ days}} \times (7 \text{ days} - 6 \text{ days})$

= 150 castings

Re-order point (level) = Safety Stock + Average lead time consumption

= 150 units + (6 days × 150 units) = 1,050 castings.

(iii) **Safety stocks** (Assuming a 5% risk of being out of stock)

From the probability table given in the question, we can see that 95% certainty in delivery time is achieved when delivery period is 9 days i.e. at 5% risk level of being out of stock, the maximum delivery period should not exceed 9 days.

$$\text{Safety stock} = \frac{\text{Annual Demand}}{360 \text{ days}} \times (\text{Max. lead time} - \text{Avg. lead time})$$

$$= \frac{54{,}000 \text{ units}}{360 \text{ days}} \times (7 \text{ days} - 6 \text{ days})$$

Re-order point (level) = Safety Stock + Average lead time consumption

= 450 units + (6 days × 150 units) = 1,350 castings.

(iv) **At 5% stock-out risk the total cost of ordering and carrying cost is as follows:**

$$\text{Total cost of ordering} = \frac{\text{Annual demand}}{\text{EOQ}} \times \text{Cost per order}$$

$$= \frac{54{,}000 \text{ units}}{1{,}800 \text{ units}} \times ₹\ 9{,}000 = ₹\ 2{,}70{,}000$$

Total cost of carrying = (Safety Stock + ½ EOQ) × Carrying cost per unit p.a.

= (450 units + ½ × 1,800 units) × ₹ 300 = ₹ 4,05,000

(v) (a) **Computation of new EOQ:**

$$\text{EOQ} = \sqrt{\frac{2 \times 54{,}000 \text{ units} \times 600}{₹\ 720}} = 300 \text{ castings}$$

(b) **Total number of orders to be placed in a year are** $\frac{54{,}000 \text{ units}}{300 \text{ units}} = 180$ times

Under new purchasing policy IPL Ltd. has to place order in every 2nd day, however under the old purchasing policy it was every 12th day.

Q 52 ICAI Mat

Imbrios India Ltd. is recently incorporated start-up company back in the year 2019. It is engaged in creating Embedded products and Internet of Things (IoT) solutions for the Industrial market. It is focused on innovation, design, research and development of products and services. One of its embedded products is Log Max, a system on module (SoM) Carrier board for industrial use. It is a small, flexible and embedded computer designed as per industry specifications. In the beginning of the month of September 2021, company entered into a job agreement of providing 4800 LogMax to NIT, Mandi. Following details w.r.t. issues, receipts, returns of Store Department handling Microcontroller, a component used in the designated assembling process have been extracted for the month of September, 2021:

Sep. 1	Opening stock of 6,000 units @ ₹ 285 per unit
Sep. 8	Issued 4875 units to mechanical division vide material requisition no. Mech 009/20
Sep. 9	Received 17,500 units @ ₹ 276 per unit vide purchase order no. 159/2020
Sep. 10	Issued 12,000 units to technical division vide material requisition no. Tech 012/20
Sep. 12	Returned to stores 2375 units by technical division against material requisition no. Tech 012/20.
Sep. 15	Received 9,000 units @ ₹ 288 per units vide purchase order no. 160/ 2020
Sep. 17	Returned to supplier 700 units out of quantity received vide purchase order no. 160/2020.
Sep. 20	Issued 9,500 units to technical division vide material requisition no. Tech 165/20

On 25th September, 2021, the stock manager of the company expressed his need to leave for his hometown due to certain contingency and immediately left the job same day. Later, he also switched his phone off.

As the company has the tendency of stock-taking every end of the month to check and report for the loss due to rusting of the components, the new stock manager, on 30th September, 2021, found that 900 units of Micro-controllers were missing which was apparently misappropriated by the former stock manager. He, further, reported loss of 300 units due to rusting of the components.

From the above information you are **REQUIRED** to prepare the Stock Ledger account using 'Weighted Average' method of valuing the issues.

Reference

Store Ledger Card

What's New

Weighted Average Method

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Answer

Store Ledger of Imbrios India Ltd. (Weighted Average Method)

Date	Receipts			Issues			Balance of Stock		
Sep.	Qty (kg.)	Rate (₹)	Amount (₹)	Qty (kg.)	Rate (₹)	Amount (₹)	Qty (kg.)	Rate (₹)	Amount (₹)
1	-	-	-	-	-	-	6,000	285.00	17,10,000
8	-	-	-	4,875	285.00	13,89,375	1,125	285.00	3,20,625
9	17,500	276.00	48,30,000	-	-	-	18,625	276.54	51,50,625
10	-	-	-	12,000	276.54	33,18,480	6,625	276.54	18,32,145
12	2,375	276.54	6,56,783	-	-	-	9,000	276.54	24,88,928
15	9,000	288.00	25,92,000	-	-	-	18,000	282.27	50,80,928
17	-	-	-	700	288.00	2,01,600	17,300	282.04	48,79,328

20	-	-	-	9,500	282.04	26,79,380	7,800	282.04	21,99,948
30	-	-	-	900*	282.04	2,53,836	6,900	282.04	19,46,112
30	-	-	-	300**	-	-	6,600	294.87	19,46,112

* 900 units is abnormal loss, hence it will be transferred to Costing Profit & Loss A/c.

** 300 units is normal loss, hence it will be absorbed by good units.

Q53 MTP Oct'21

The yearly production of a company's product which has a steady market is 40,000 units. Each unit of a product requires 1 kg. of raw material. The cost of placing one order for raw material is ₹ 1,000 and the inventory carrying cost is ₹ 20 per annum. The lead time for procurement of raw material is 36 days and a safety stock of 1,000 kg. of raw materials is maintained by the company. The company has been able to negotiate the following discount structure with the raw material supplier:

Order quantity (kg.)	Discount (₹)
Upto 6,000	NIL
6,001 – 8,000	4,000
8,001 – 16,000	20,000
16,001 – 30,000	32,000
30,001 – 45,000	4,0000

You are **REQUIRED** to: [10]

(i) **Calculate** the re-order point considering 30 days in a month.

(ii) **Prepare** a statement showing the total cost of procurement and storage of raw material after considering the discount of the company elects to place one, two, four or five orders in the year.

(iii) **State** the number of orders which the company should place to minimize the costs after taking EOQ also into consideration.

Reference | What's **New**

Re-order point, Total Cost at different level and No. of orders

Watch **Video**

Scan Me

Answer

Working notes

1. Annual production = 40,000 units
2. Raw material required for 40,000 units (40,000 units × 1 kg.) = 40,000 kg.

3. $EOQ = \sqrt{\frac{2 \times 40,000 \text{ kgs.} \times ₹ 1,000}{₹ 20}} = 2,000 \text{ kgs.}$

4. Total cost of procurement and storage when the order size is equal to EOQ or 2,000 kg.

No. of orders (40,000 kg. ÷ 2,000 kg.)	= 20 times
Ordering cost (20 orders × ₹ 1,000)	= ₹ 20,000
Carrying cost (₹) (½ × 2,000 kg. × ₹ 20)	= ₹ 20,000
Total cost	₹ 40,000

(i) **Re-order point** = Safety stock + Lead time consumption

$$= 1,000 \text{ kg.} + \frac{40,000 \text{ kg.}}{360 \text{ days}} \times 36 \text{ days}$$

= 1,000 kg. + 4,000 kg. = 5,000 kg.

(ii) **Statement showing the total cost of procurement and storage of raw materials** (after considering the discount)

Order size	No. of orders	Total cost of procurement	Average stock	Total cost of storage of raw materials	Discount	Total cost
Kg.		(₹)	Kg.	(₹)	(₹)	(₹)
(1)	(2)	(3)=(2)×₹ 1,000	(4) = ½×(1)	(5)=(4)×₹ 20	(6)	(7)=[(3)+(5)– (6)
40,000	1	1,000	20,000	4,00,000	40,000	3,61,000
20,000	2	2,000	10,000	2,00,000	32,000	1,70,000
10,000	4	4,000	5,000	1,00,000	20,000	84,000
8,000	5	5,000	4,000	80,000	4,000	81,000

(iii) Number of orders which the company should place to minimize the costs after taking EOQ also into consideration is 20 orders each of size 2,000 kg. The total cost of procurement and storage in this case comes to ₹ 40,000, which is minimum. (Refer to working notes 3 and 4)

Q 54 Dec'21

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 [5]

Reference | What's New

Bill of Material

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Answer

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.

Q55 MTP May'22

DISTINGUISH clearly between Bin cards and Stores Ledger. [5]

Reference | What's New

Bin Cards and Stores Ledger - Differences

Watch Video

Scan Me

Answer

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.

Q56 MTP May'22

M/s SE Traders is a distributor of an electronic items. A periodic inventory of electronic items on hand is taken when books are closed at the end of each quarter. The following information is available for the quarter ended on 30th September, 2021:

Sales	₹ 2,19,30,000
Opening Stock	12,500 units @ ₹ 600 per unit
Administrative Expenses	₹ 5,62,500 Purchases (including freight inward):
- July 1, 2021	25,000 units @ ₹ 573 per unit
- September 30, 2021	12,500 units @ ₹ 630 per unit
Closing stock- September 30, 2021	16,000 units

You are required to **COMPUTE** the following by WAM (Weighted Average Method), FIFO method and LIFO method assuming issue/ consumption pattern was even throughout the quarter:

(i) Value of Inventory on 30th September, 2021.

(ii) Profit or loss for the quarter ended 30th September, 2021. [10]

Reference | What's **New**

Value of Inventory & P/L , WAM, FIFO & LIFO Method

Watch **Video**

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Answer

(i) **Computation of Value of Inventory as on 30th September 2021:**

Date	Particulars	Units	WAM (₹)	FIFO (₹)	LIFO (₹)
01-07-21	Opening Stock	12,500	75,00,000 (₹ 600×12,500)	75,00,000 (₹ 600×12,500)	75,00,000 (₹ 600×12,500)
01-07-21	Purchases	25,000	1,43,25,000 (₹ 573×25,000)	1,43,25,000 (₹ 573×25,000)	1,43,25,000 (₹ 573×25,000)
30-09-21	Purchases	12,500	78,75,000 (₹ 630×12,500)	78,75,000 (₹ 630×12,500)	78,75,000 (₹ 630×12,500)

01-07-21 to 30-09-21	Issues/ Consumption (Balancing figure)	34,000	2,01,96,000*	1,98,19,500**	2,01,94,500***
30-09-21	Closing Stock	16,000	95,04,000	98,80,500	95,05,500

Weighted average rate = $\frac{₹\ 75,00,000 + ₹\ 1,43,25,000 + ₹\ 78,75,000}{(12,500 + 25,000 + 12,500)\ \text{units}} = ₹\ 594$

* ₹ 594 x 34,000 = ₹ 2,01,96,000

** ₹ 600 × 12,500 + ₹ 573 × 21,500 = ₹ 1,98,19,500

*** ₹ 630 × 12,500 + ₹ 573 × 21,500 = ₹ 2,01,94,500

(ii) **Computation of Profit or Loss for the Quarter ended 30th September 2021**

Particulars	WAM (₹)	FIFO (₹)	LIFO (₹)
Sales	2,19,30,000	2,19,30,000	2,19,30,000
Less: Consumption	2,01,96,000	1,98,19,500	2,01,94,500
Less: Administrative Exp.	5,62,500	5,62,500	5,62,500
Profit or Loss	11,71,500	15,48,000	11,73,000

Q 57 MTP May'22

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 ₹ 150, ₹ 90 and ₹ 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 ₹ 0.50 and ₹ 1,000 per litre respectively.

(iii) 20 direct workers are required. The workers are paid ₹ 880 for 8 hours shift of work.

(iv) The average packing cost per bottle is ₹ 3

(v) Power cost is ₹ 7 per Kilowatt-hour (Kwh)

(vi) Other variable cost is ₹ 30,000 per batch.

(vii) Fixed cost (Administration and marketing) is ₹ 4,90,00,000.

(viii) The holding cost is ₹ 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 organisation and also **COMPUTE** Economic Batch Quantity (EBQ). [10]

Reference | What's **New**

Economic Batch Quantity

Watch **Video**

Scan Me

Answer

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	
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 manshift [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 (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 × 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 (₹)	150	90	50	
C	**Sales value (₹) [A×B]**	4,50,00,000	6,75,00,000	10,00,00,000	21,25,00,000
	Direct Material cost:				
E	Material-W (₹) [Qty in WN-3 × ₹ 0.50]	63,00,000	78,75,000	84,00,000	2,25,75,000
F	Material-C (₹) [Qty in WN-3 × ₹ 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 (₹) [Man-shift in WN-4 × ₹ 880]	7,92,000	10,03,200	10,56,000	28,51,200
I	Packing cost (₹) [A × ₹ 3]	9,00,000	22,50,000	60,00,000	91,50,000
	Power cost (₹)				
J	For processing (₹) [WN-5 × ₹ 7]	1,98,450	2,48,062.5	2,64,600	7,11,112.5
K	For set-up time (₹) [WN-5 × ₹ 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 (₹) [No. of batch in WN-2 × ₹ 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-uptime (₹) [Consumption per batch in WN-5 × ₹ 7]	31.50	31.50	31.50
C	Other variable cost (₹)	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

Q 58 RTP Nov'22

M/s Tanishka Materials Private Limited produces a product which names "ESS". The consumption of raw material for the production of "ESS" is 210 Kgs to 350 Kgs per week. Other information is as follows:

Procurement Time:	5 to 9 Days
Purchase price of Raw Materials:	₹ 100 per kg
Ordering Cost per Order:	₹ 200
Storage Cost:	1% per month plus ₹ 2 per unit per annum

Consider 365 days a year.

You are required to **CALCULATE**:

(a) Economic Order Quantity

(b) Re-Order Level (ROL)

(c) Maximum Stock Level

(d) Minimum Stock Level

(e) Average Stock Level

(f) Number of Orders to be placed per year

(g) Total Inventory Cost

(h) If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders, **whether** offer is acceptable?

(i) If the answer is no, **what** should be the counteroffer w.r.t. percentage of discount?

Reference | What's **New**

EOQ, ROL, Maximum Stock Level, Minimum Stock Level, Avg Stock Level | **Counter offer**

Watch **Video** Scan Me

Answer

As procurement time is given in days, consumption should also be calculated in days:

Maximum Consumption per Day: $\frac{350}{7} = 50$ Kgs

Minimum Consumption per Day: $\frac{210}{7} = 30$ Kgs.

Average Consumption per Day: $\frac{(50+30)}{2} = 40$ Kgs

(a) **Calculation of Economic Order Quantity (EOQ)**

Annual consumption of Raw Materials (A): 40 Kgs × 365 days = 14,600 Kgs Storage or Carrying Cost per unit per annum (C):(₹ 100 × 1% × 12 months) + ₹ 2 = ₹ 14

Ordering Cost (O): ₹ 200 per Order

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

$$= \sqrt{\frac{2 \times 14,600 \times 200}{14}} = 646 \text{ Kgs.}$$

(b) **Re-Order Level (ROL)** = (Maximum consumption Rate × Maximum Procurement Time)

= 50 kgs per day × 9 days

= 450 kgs

(c) **Maximum Stock Level** = Recorder Level + Recorder Quantity – (Minimum Consumption Rate × Minimum Procurement Time)

= 450 kgs + 646 kgs – (30 kgs × 5 days)

= 946 kgs

(d) **Minimum Stock Level** = Recorder Level – (Average consumption Rate × Average Procurement Time)

= 450 kgs – (40 kgs × 7 days)

= 170 kgs

(e) **Average Stock Level** $= \frac{\text{Maximum Stock Level + Minimum Stock Level}}{2}$

$= \frac{946 \text{ kgs} + 170 \text{ kgs}}{2}$

= 558 kgs

(f) **Number of Orders to be placed per year**

$$= \frac{\text{Annual Consumption of Raw Materials}}{\text{EOQ}}$$

$$= \frac{14{,}600 \text{ kgs}}{646 \text{ kgs}}$$

= 22.60 Orders or 23 Orders

(g) **Total Inventory Cost**

Cost of Materials (A × Purchase Price) (14600 kgs × ₹ 100) =	₹ 14,60,000
Total Ordering Cost (No. of Orders × O) (23 Orders × 200) =	₹ 4,600
Total Carrying Cost (EOQ / 2 × C) (646 kgs / 2 × ₹ 14) =	₹ 4,522
Total Inventory Cost	₹ 14,69,122

(h) **If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders:**

Offer Price = ₹ 100 × 99%	= ₹ 99
Revised Carrying Cost = (₹ 99 × 1% × 12 months) + ₹2	= ₹ 13.88
Revised Order Quantity = 14600 kgs / 2 Orders	= 7300 kgs
Total Inventory Cost at Offer Price	
Cost of Materials (A × Purchase Price) (14600 kgs × ₹ 99)	= ₹ 14,45,400
Total Ordering Cost (No. of Orders × O) (2 Orders × 200)	= ₹ 400
Total Carrying Cost (EOQ / 2 × C) (7300 kgs / 2 × ₹13.88)	= ₹ 50,662
Total Inventory Cost	₹ 14,96,462

Advice: As total inventory cost at offer price is ₹ 27,340 (14,96,462 – 14,69,122) higher, offer should not be accepted.

(i) **Counter-offer:**

Let Discount Rate = z%

Counter-Offer Price = ₹ 100 – z% = ₹ 100 – z

Revised Carrying Cost = [(₹ 100 – z) × 1% × 12 months] + ₹ 2 = ₹ 12 – 0.12z + ₹ 2

= ₹ 14 – 0.12z

Total Inventory Cost at Counter-Offer Price

Cost of Materials (A × Purchase Price) [14600 kgs × (₹ 100 – z)] = ₹ 14,60,000 – 14,600z

Total Ordering Cost (No. of Orders × O) (2 Orders × 200) = ₹ 400

Total Carrying Cost (EOQ / 2 × C) [7300 kgs / 2 × (₹ 14 – 0.12z)] = ₹ 51,100 – 438z

Total Inventory Cost ₹ 15,11,500 – 15038z

₹ 14,69,122 = ₹ 15,11,500 – 15038z

Or 15038z = 42,378

Or z = 2.82

Therefore, discount should be at least 2.82% in offer price.

Q59 MTP Nov'22

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	₹ 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 ₹ 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. [5]

Reference | What's **New**

EOQ & Maximum Stock Level | **Material Perishable in nature**

Watch **Video** Scan Me

Answer

(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 $= \sqrt{\frac{2 \times (\text{Annual demand} \times \text{cost per order})}{\text{Annual holding cost per unit}}}$

$$\text{EOQ} = \sqrt{\frac{2 \times 5{,}000\ \text{kgs} \times 12 \times 375}{12\%\ \text{of}\ ₹\ 150}} = 5{,}000\ \text{kgs}$$

(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 × minimum lead time)

Where, reorder quantity = 7,500 kgs

Reorder level = maximum consumption* × maximum lead time

= 50,000/ 25 × 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.)

Q60 MTP Nov'22

BRIEF the treatment of following while calculating purchase cost of material: Trade Discount, Cash Discount, Penalty, Insurance charges, Commission paid. [5]

Reference — What's New

Purchase Cost of material

Watch **Video** — Scan Me

Answer

Trade Discount	Trade discount is **deducted** from the purchase price if it is not shown as deduction in the invoice.
Cash Discount	Cash discount is **not deducted** from the purchase price. It is treated as interest and finance charges. It is ignored.
Penalty	Penalty of any type is **not included** with the cost of purchase
Insurance charges	Insurance charges are paid for protecting goods during transit. It is **added** with the cost of purchase.
Commission paid	Commission or brokerage paid is **added** with the cost of purchase.

Q61 MTP Nov'22

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. (₹)
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 ₹ 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. [10]

Reference

Store Ledger Account

What's **New**

Shortage of Material

Watch **Video**

Scan Me

Answer

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

Date	Receipts				Issues				Balance		Rate for further Issue (₹)
	GRN No.	Qty. (Kg.)	Rates (₹)	Amounts	MR No.	Qty. (Kg.)	Rates (₹)	Amt. (₹)	Qty. (Kg.)	Amt. (₹)	
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	99,200 / 2,000 = 49.60
April 20		2,400	49.00	1,17,600					4,400	216,800	2,16,800 / 2,000 = 49.30
April 24						1,600	49.30	78,880	2,800	137,920	1,37,920 / 2,800 = 49.30
May 5		1,000	51.00	51,000					3,800	188,920	1,88,920 / 3,800 = 49.70
May 10						1,500	49.70	74,550	2,300	114,370	1,14,370 / 2,300 = 49.70
May 17		1,100	52.00	57,200					3,400	171,570	1,71,570 / 3,400 = 50.50
May 25		800	52.50	42,000					4,200	213,570	2,13,570 / 4,200 = 50.90
May 26						1,700	50.90	86,530	2,500	127,040	1,27,040 / 2,500 = 50.90

May 31					Shortage	80			2,420	127,040	1,27,040 / 2,420 = 52.50
June 11		900	54.00	48,600					3,320	175,640	1,75,640 / 3,320 = 52.90
June 15						1,500	52.90	79,350	1,820	96,290	96,290 / 1,820 = 52.90
June 21						1,200	52.90	63,480	620	32,810	32,810 / 620 = 52.90
June 24		1,400	55.00	77,000					2,020	109,810	1,09,810 / 2,020 = 54.40
June 30					Shortage	60			1,960	109,810	1,09,810 / 1,960 = 56.00

NOTES

IF YOU HAVE ANY DOUBT WHILE STUDYING FROM THIS BOOK,

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Submit Your Query

Chapter 4

Employee Cost

Q1 ICAI Mat

'X' an employee of ABC Co. gets the following emoluments and benefits:

(a) Basic pay ₹ 10,000 p.m.

(b) Dearness allowance ₹ 2,000 p.m.

(c) Bonus 20% of salary and D.A.

(d) Other allowances ₹ 2,500 p.m.

(e) Employer's contribution to P.F. 10% of salary and D.A.

'X' works for 2,400 hours per annum, out of which 400 hours are non-productive and treated as normal idle time.

You are required to **COMPUTE** the effective hourly cost of employee 'X'.

Reference | What's **New**

Labour Cost Calculation | **Effective hourly cost**

Watch **Video**

Scan Me

Answer

Statement showing computation of effective hourly cost of employee 'X'

	Per month (₹)	Per annum (₹)
(A) Earning of Employee 'X':		
Basic pay	10,000	1,20,000
Dearness Allowance	2,000	24,000
Bonus	2,400	28,800
Employer's contribution to provident fund	1,200	14,400
Other allowances	2,500	30,000
	18,100	2,17,200
(B) Effective working hours (refer workings)		2,000 hours
(C) Effective hourly cost {(A) ÷ (B)}		₹108.60

Workings:

Calculation of effective working hours:

Annual working hours less Normal idle time = 2,400 hours – 400 hours = 2,000 hours.

Q2 ICAI Mat

In a factory working six days in a week and eight hours each day, a worker is paid at the rate of ₹ 100 per day basic plus D.A. @ 120% of basic. He is allowed to take 30 minutes off during his hours shift for meals-break and a 10 minutes recess for rest. During a week, his card showed that his time was chargeable to :

Job X 15 hrs.

Job Y 12 hrs.

Job Z 13 hrs.

The time not booked was wasted while waiting for a job. In Cost Accounting, **STATE** how would you allocate the wages of the workers for the week?

Reference

Labour Cost Calculation

What's **New**

Allocation to jobs - Abnormal Idle Time

Watch **Video**

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Answer

Working notes:

(i) **Total effective hours in a week:**

[(8 hrs. – (30 mts. + 10 mts.)] × 6 days = 44 hours

(ii) **Total wages for a week:**

(₹ 100 + 120% of ₹ 100) × 6 days = ₹ 1,320

(iii) **Wage rate per hour** = ₹ 30

(iv) **Time wasted waiting for job (Abnormal idle time):**

44 hrs. – (15 hrs. + 12 hrs. + 13 hrs.) = 4 hrs.

Allocation of wages in Cost Accounting

	(₹)
Allocated to Job X : 15 hours × ₹ 30	450
Allocated to Job Y : 12 hours × ₹ 30	360
Allocated to Job Z : 13 hours × ₹ 30	390
Charged to Costing Profit & Loss A/c : 4 hours × ₹ 30	120
Total	1,320

Q3 ICAI Mat

CALCULATE the earnings of A and B from the following particulars for a month and allocate the employee cost to each Job X, Y and Z:

	A	B
(i) Basic Wages (₹)	10,000	16,000
(ii) Dearness Allowance	50%	50%
(iii) Contribution to provident Fund (on basic wages)	8%	8%
(iv) Contribution to Employee's State Insurance (on basic wages)	2%	2%
(v) Overtime (Hours)	10	--

The normal working hours for the month are 200. 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. The two workers were employed on Jobs X, Y and Z in the following proportions:

Jobs	X	Y	Z
Worker A	40%	30%	30%
Worker B	50%	20%	30%

Overtime was done on Job Y.

Reference

Labour Cost Calculation

What's New

Overtime cost allocation

Watch **Video**

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Answer

Statement showing Earnings of Workers A and B

	A (₹)	B (₹)
Basic wages	10,000	16,000
Dearness Allowance (50% of Basic Wages)	5,000	8,000
Overtime wages (Refer to Working Note 1)	1,500	--
Gross wages earned	16,500	24,000
Less: Contribution to Provident fund	(800)	(1,280)
Less: Contribution to ESI	(200)	(320)
Net wages earned	15,500	22,400

Statement of Employee Cost

	A (₹)	B (₹)
Gross Wages (excluding overtime)	15,000	24,000
Add: Employer's contribution to PF	800	1,280
Add: Employer's contribution to ESI	200	320
Gross wages earned	16,000	25,600
Normal working hours	200	200
Ordinary wages rate per hour	80	128

Statement Showing Allocation of Wages to Jobs

	Total Wages (₹)	Jobs		
		X (₹)	Y (₹)	Z (₹)
Worker A:				
- Ordinary Wages (4: 3 : 3)	16,000	6,400	4,800	4,800
- Overtime	1,500	--	1,500	--
Worker B:				
- Ordinary Wages (5 : 2 : 3)	25,600	12,800	5,120	7,680
	43,100	19,200	11,420	12,480

Working Notes

Normal Wages are considered as basic wages

$$\text{Over time} = \frac{2 \times (\text{Basic wage} + \text{DA}) \times 10 \text{ hours}}{200}$$

$$= 2 \times \left(\frac{₹15,000}{200} \right) \times 10 \text{ hours} = ₹150 \times 10 \text{ hours} = ₹1,500$$

Q4 ICAI Mat

It is seen from the job card for repair of the customer's equipment that a total of 154 labour hours have been put in as detailed below:

	Worker 'A' paid at ₹ 200 per day of 8 hours	Worker 'B' paid at ₹ 100 per day of 8 hours	Worker 'C' paid at ₹ 300 per day of 8 hours
Monday (hours)	10.5	8.0	10.5
Tuesday (hours)	8.0	8.0	8.0
Wednesday (hours)	10.5	8.0	10.5
Thursday (hours)	9.5	8.0	9.5
Friday (hours)	10.5	8.0	10.5
Saturday (hours)	--	8.0	8.0
Total (hours)	49.0	48.0	57.0

In terms of an award in an employee conciliation, the workers are to be paid dearness allowance on the basis of cost of living index figures relating to each month which works out @ ₹ 968 for the relevant month. The dearness allowance is payable to all workers irrespective of wages rate if they are present or are on leave with wages on all working days.

Sunday is a weekly holiday and each worker has to work for 8 hours on all week days and 4 hours on Saturdays; the workers are however paid full wages for Saturday (8 hours for 4 hours worked).

Workers are paid overtime according to the Factories Act, 1948. Excluding holidays, the total number of hours works out to 176 in the relevant month. The company's contribution to Provident Fund and Employees State Insurance Premium are absorbed into overheads.

CALCULATE the wages payable to each worker.

Reference | What's **New**

Overtime Calculation | **Factories Act**

Watch **Video**

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Answer

Calculation of hours to be paid for Worker A :

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
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	--	--	--	--	--
Total	40	4	5	10	54

Calculation of hours to be paid for Worker B :

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	---	---	---	8
Tuesday	8	---	---	---	8
Wednesday	8	---	---	---	8
Thursday	8	---	---	---	8
Friday	8	---	---	---	8
Saturday	4	4*	---	---	8
Total	44	4	---	---	48

(*Worker-B has neither worked more than 9 hours in any day nor more than 48 hours in the week)

Calculation of hours to be paid for Worker C :

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
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	4	---	4*	8	12
Total	44	4	9	18	66

(*Worker-C has worked more than 48 hours in the week)

Wages payable:

	A	B	C
Basic Wages per hour (₹)	25.00	12.50	37.50
Dearness allowance per hour (₹)	5.50	5.50	5.50
Hourly rate (₹)	30.50	18.00	43.00
Total normal hours	54.00	48.00	66.00
Total Wages payable (₹)	1,647.00	864.00	2,838.00

As per May 22 Edition, the solution has been revised by ICAI as below :

Calculation of hours to be paid for worker C:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
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	4	4*	---	---	8
Total	44	8	5	10	62

(*Worker-C will be paid for equivalent 8 hours, though 4 hours of working is required on Saturday. Further, no overtime will be paid for working beyond 4 hours since it is paid for working beyond 9 hours.)

Wages payable:

	A	B	C
Basic Wages per hour (₹)	25.00	12.50	37.50
Dearness allowance per hour (₹)	5.50	5.50	5.50
Hourly rate (₹)	30.50	18.00	43.00
Total normal hours	54.00	48.00	62.00
Total Wages payable (₹)	1,647.00	864.00	2,666.00

Q5 ICAI Mat; MTP Nov'20

In a factory, the basic wage rate is ₹ 100 per hour and overtime rates are as follows:

Before and after normal working hours	175% of basic wage rate
Sundays and holidays	225% of basic wage rate
During the previous year, the following hours were worked	
- Normal time	1,00,000 hours
- Overtime before and after working hours	20,000 hours
Overtime on Sundays and holidays	5,000 hours
Total	1,25,000 hours

The following hours have been worked on job 'Z'

Normal	1,000 hours
Overtime before and after working hrs.	100 hours.
Sundays and holidays	25 hours.
Total	1,125 hours

You are required to **calculate** the labour cost chargeable to job 'Z' and overhead in each of the following instances:

(a) Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.

(b) Where overtime is worked irregularly to meet the requirements of production.

(c) Where overtime is worked at the request of the customer to expedite the job.

Reference

Overtime Calculation

What's **New**

Treatment of premium

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Answer

Workings

Basic wage rate	₹ 100 per hour
Overtime wage rate before and after working hours : (₹ 100 × 175%)	₹ 175 per hour
Overtime wage rate for Sundays and holidays : (₹ 100 × 225%)	₹ 225 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	Amount (₹)
Annual wages for the previous year for normal time (1,00,000 hrs. × ₹100)	1,00,00,000
Wages for overtime before and after working hours (20,000 hrs. × ₹ 175)	35,00,000
Wages for overtime on Sundays and holidays (5,000 hrs. × ₹ 225)	11,25,000
Total wages for 1,25,000 hrs.	1,46,25,000

$$\text{Average inflated wage rate} = \frac{₹\,1,46,25,000}{1,25,000\ \text{hours}} = ₹117$$

(a) **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 Z

= Total hours × Inflated wage rate = 1,125 hrs. × ₹ 117 = ₹ 1,31,625

(b) **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 Z: 1,125 hours @ ₹100 per hour = ₹ 1,12,500

Factory overhead: {100 hrs. × ₹ (175 – 100)} + {25 hrs. × ₹ (225 – 100)} = {₹ 7,500 + ₹ 3,125}
= ₹ 10,625

(c) **Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under:**

	(₹)
Job Z Employee cost (1,125 hrs. @ ₹ 100)	1,12,500
Overtime premium [100 hrs. @ ₹ (175 – 100)]	7,500
[25 hrs. @ ₹ (225 – 100)]	3,125
Total	1,23,125

Q6 ICAI Mat

CALCULATE the earnings of a worker under Halsey System. The relevant data is as below:

Time Rate (per hour)	₹ 60
Time allowed	8 hours
Time taken	6 hours
Time saved	2 hours

Reference	What's New
Bonus Scheme	**Halsey scheme**

Watch Video

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Answer

Calculation of total earnings:

= Time taken × Time rate + 50% (Time Allowed – Time Taken) × Time rate

= 6 hrs. × ₹ 60 + 1/2 × (2 hrs. × ₹ 60) or ₹ 360 + ₹ 60 = ₹ 420

Of his total earnings, ₹ 360 is on account of the time worked and ₹ 60 is on account of his share of the premium bonus.

Q7 ICAI Mat

CALCULATE the earnings of a worker under Rowan System. The relevant data is given as below:

Time Rate (per hour)	₹ 60
Time allowed	8 hours
Time taken	6 hours
Time saved	2 hours

Reference	What's New
Bonus Scheme - Rowan and Halsey	**Rowan Scheme**

Watch Video

Scan Me

Answer

Calculation of total earnings:

$$=\text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

$$= 6 \text{ hours} \times ₹60 + \frac{2 \text{ hours}}{8 \text{ hours}} \times 6 \text{ hours} \times ₹60 = ₹\,360 + ₹90 = ₹\,450$$

Q8 ICAI Mat; MTP Mar'18

Two workmen, 'A' and 'B', produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to the Rowan system, while 'B' is paid bonus according to the Halsey system. The time allowed to make the product is 50 hours. 'A' takes 30 hours while 'B' takes 40 hours to complete the product. The factory overhead rate is ₹ 5 per man-hour actually worked. The factory cost for the product for 'A' is ₹ 3,490 and for 'B' it is ₹ 3,600.

Required:

(a) **COMPUTE** the normal rate of wages;

(b) **COMPUTE** the cost of materials;

(c) **PREPARE** a statement comparing the factory cost of the products as made by the two workmen.

Reference	What's New	Watch Video
Bonus Scheme - Rowan and Halsey	**Factory Cost comparison - Simultaneous Equation**	Scan Me

Answer

Step 1 : Let X be the cost of material and Y be the normal rate of wages per hour.

Step 2 : Factory Cost of Workman 'A'

	(₹)
A. Material Cost	X
B. Wages	30 Y
C. Bonus $= \frac{30}{50} \times (50-30) \times Y$	12 Y
D. Overheads (30 × ₹5)	150
E. Factory Cost	3,490
Or, X + 42 Y = ₹3,490 (Given) – ₹150 = ₹3,340.....equation (i)	

Step 3 : Factory Cost of Workman 'B'

	(₹)
A. Material Cost	X
B. Wages	40 Y
C. Bonus = 50% of (SH - AH) × R	5 Y
= 50% of (50 - 40) × R	
D. Overheads (40 × ₹5)	200
E. Factory Cost	3,600
Or, X + 45 Y = ₹3,600 (Given) – ₹200 = ₹3,400.....equation (ii)	

Step 4 : Subtracting equation (i) from equation (ii)

3Y = ₹60

Y = ₹ 60/3 = ₹ 20 per hour.

(a) The normal rate of wages: ₹ 20 per hour

(b) The cost of material: X + 45 × ₹ 20 = ₹ 3,400 or, X = ₹ 3,400 – ₹ 900 = ₹ 2,500

(c) **Comparative Statement of the Factory Cost of the product made by the two workmen.**

	A (₹)	B (₹)
Material cost	2,500	2,500
Direct Wages	600 (30 × ₹ 20)	800 (40 × ₹ 20)
Bonus	240 (12 × ₹ 20)	100 (5 × ₹ 20)
Factory Overhead	150	200
Factory Cost	3,490	3,600

Q9 ICAI Mat

(a) Bonus paid under the Halsey Plan with bonus at 50% for the time saved equals the bonus paid under the Rowan System. **When** will this statement hold good? (Your answer should contain the proof).

(b) The time allowed for a job is 8 hours. The hourly rate is ₹ 8. **PREPARE** a statement showing:

i. The bonus earned

ii. The total earnings of employee and

iii. Hourly earnings.

Under the Halsey System with 50% bonus for time saved and Rowan System for each hour saved progressively.

Reference | **What's New**

Bonus Scheme - Rowan and Halsey | **For each hour saved progressively**

Watch **Video**

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Answer

(a) Bonus under Halsey Plan $= \frac{50}{100} \times (SH - AH) \times R$ (i)

Bonus under Rowan Plan : $= \frac{AH}{SH} \times (SH - AH) \times R$ (ii)

Bonus under Halsey Plan will be equal to the bonus under Rowan Plan when the following condition holds good:

$$\frac{50}{100} \times (SH - AH) \times R = \frac{AH}{SH} \times (SH - AH) \times R$$

$$\frac{50}{100} = \frac{AH}{SH}$$

Hence, when the actual time taken (AH) is 50% of the time allowed (SH), the bonus under Halsey and Rowan Plans is equal.

(b) Statement of Bonus, total earnings of Employee and hourly earnings under Halsey and Rowan Systems.

SH	AH	Time saved	Basic wages (AH × ₹ 8) (B × ₹8)	Bonus under Halsey System $\left[\frac{50}{100} \times C \times 8\right]$	Bonus under Rowan system $\left[\frac{B}{A} \times C \times 8\right]$	Total Earnings under Halsey System D+E	Total Earnings under Rowan System D+F	Hourly Earnings under Halsey System G/B	Hourly Earnings under Rowan System H/B
A Hours	B hours	C (A-B) hours	D (₹)	E (₹)	F (₹)	G (₹)	H (₹)	I (₹)	J (₹)
8	8	-	64	-	-	64	64	8.00	8.00
8	7	1	56	4	7	60	63	8.57	9.00
8	6	2	48	8	12	56	60	9.33	10.00
8	5	3	40	12	15	52	55	10.40	11.00
8	4	4	32	16	16	48	48	12.00	12.00
8	3	5	24	20	15	44	39	14.67	13.00
8	2	6	16	24	12	40	28	20.00	14.00
8	1	7	8	28	7	36	15	36.00	15.00

Q10 ICAI Mat

A skilled worker in XYZ Ltd. is paid a guaranteed wage rate of ₹ 30 per hour. The standard time per unit for a particular product is 4 hours. Mr. P, a machine man, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of ₹ 37.50 on the manufacture of that particular product.

STATE what could have been his total earnings and effective hourly rate, had he been put on Halsey Incentive Scheme (50%)?

Reference	What's New	Watch Video
Bonus Scheme - Rowan and Halsey	**Effective wage rate - back calculation**	Scan Me

Answer

Total earnings (under 50% Halsey Scheme) = (Hours worked × Rate per hour) + (½ × time saved × Rate per hour)

= (3 hours × ₹ 30) + (½ × 1 hour × ₹30)

= ₹ 105

Effective hourly rate $= \frac{\text{Total earnings}}{\text{Hours taken}} = \frac{₹\,105}{3\text{ hours}} = ₹\,35$

Working Note:

Let T hours be the total time worked in hours by the skilled workers (machine man P), ₹ 30 is the rate per hour; standard time is 4 hours per unit and effective hourly earnings rate is ₹ 37.50 then

Earning (under Rowan plan) = (Hours worked × Rate per hr) + $\left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hr.}\right)$

₹ 37.5 T $= (T \times ₹\,30) + \left(\frac{(4-T)}{4} \times T \times ₹\,30\right)$

(both sides are divided by T)

₹ 37.5 = ₹ 30 + (4 – T) × ₹ 7.5

₹ 37.5 = ₹ 30 + ₹30 - 7.5T

or, ₹ 7.5 T = ₹60 – ₹37.5

or, ₹ 7.5 T = ₹ 22.5

or, T = 3 hours.

Q11 ICAI Mat

A factory having the latest sophisticated machines wants to introduce an incentive scheme for its workers, keeping in view the following:

(i) The entire gains of improved production should not go to the workers.

(ii) In the name of speed, quality should not suffer.

(iii) The rate setting department being newly established are liable to commit mistakes.

You are **required** to PREPARE a suitable incentive scheme and DEMONSTRATE by an illustrative numerical example how your scheme answers to all the requirements of the management.

Reference	What's New	Watch Video
Bonus Scheme - Rowan and Halsey	**Analysis of Halsey and Rowan Scheme**	Scan Me

Answer

Rowan Scheme of premium bonus (variable sharing plan) is a suitable incentive scheme for the workers of the factory. If this scheme is adopted, the entire gains due to time saved by a worker will not pass to him.

Another feature of this scheme is that a worker cannot increase his earnings or bonus by merely increasing its work speed. The reason for this is that the 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.

Lastly, Rowan System provides a safeguard in the case of any loose fixation of the standards by the rate-setting department. It may be observed from the following illustration that in the Rowan Scheme the bonus paid will be low due to any loose fixation of standards. Workers cannot take undue advantage of such a situation. The above three features of Rowan Plan can be discussed with the help of the following illustration:

(i) Time allowed = 4 hours

Time taken = 3 hours

Time saved = 1 hour

Rate = ₹ 5 per hour

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$$

$$= \frac{3 \text{ hours}}{4 \text{ hours}} \times 1 \text{ hour} \times ₹ 5 = ₹ 3.75$$

In the above illustration time saved is 1 hour and, therefore, total gain is ₹ 5. Out of ₹ 5 according to Rowan Plan only ₹ 3.75 is given to the worker in the form of bonus and the remaining ₹ 1.25 remains with the management. In other words, a worker is entitled for 75 percent of the time saved in the form of bonus.

(ii) The figures of bonus in the above illustration when the time taken is 2 hours and 1 hour respectively are as below:

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$$

$$= \frac{2\text{ hours}}{4\text{ hours}} \times 2\text{ hours} \times ₹\,5 = ₹\,5$$

$$= \frac{1\text{ hour}}{4\text{ hours}} \times 3\text{ hours} \times ₹\,5 = ₹\,3.75$$

The above figures of bonus clearly show that when time taken is half of the time allowed, the bonus is maximum. When the time taken is reduced from 2 to 1 hour, the bonus figure fell by ₹ 1.25. Hence, it is quite apparent to workers that it is of no use to increase speed of work. This feature of Rowan Plan thus protects the quality of output.

(iii) If the rate-setting department erroneously sets the time allowed as 10 hours instead of 4 hours, in the above illustration; then the bonus paid will be as follows:

$$\text{Bonus} = \frac{3\text{ hours}}{10\text{ hours}} \times 7\text{ hours} \times ₹\,5 = ₹\,10.50$$

The bonus paid for saving 7 hours thus is ₹ 10.50 which is approximately equal to the wages of 2 hours. In other words, the bonus paid to the workers is low. Hence workers cannot take undue advantage of any mistake committed by the time setting department of the concern.

Q12 ICAI Mat

A worker is paid ₹10,000 per month and a dearness allowance of ₹ 2,000 p.m. Worker Contribution to provident fund is @ 10% and employer also contributes the same amount as the employee. The Employees State Insurance Corporation premium is 6.5% of wages of which 1.75% is paid by the employees. It is the firm's practice to pay 2 months' wages as bonus each year.

The number of working days in a year are 300 of 8 hours each. Out of these the worker is entitled to 15 days leave on full pay.

CALCULATE the wage rate per hour for costing purposes.

Reference

Labour Cost Calculation

What's **New**

Effective wage rate

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Answer

	(₹)
Wages paid to worker during the year {(₹ 10,000 +2,000) × 12}	1,44,000
Add: Employer Contribution to:	
Provident Fund @ 10%	14,400
E.S.I. Premium @ 4.75% (6.5 – 1.75)	6,840
Bonus at 2 months' wages (Basic + DA)	24,000
Total	1,89,240

Effective hours per year: 285 days × 8 hours = 2,280 hours

Wage-rate per hour (for costing purpose): ₹ 1,89,240/2,280 hours = ₹ 83

Q13 ICAI Mat

Basic pay	₹ 10,000 p.m.
D.A.	₹ 3,000 p.m.
Fringe benefits	₹ 1,000 p.m.

Number of working days in a year 300. 20 days are availed off as holidays on full pay in a year. Assume a day of 8 hours.

CALCULATE the Employee hour rate of a worker X from the above data:

Reference | What's **New**

Labour Cost Calculation | **Leave wages**

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Answer

(i)	Effective working days in a year	300
	Less: Leave days on full pay	20
	Effective working days	280 days
	Total effective working hours (280 days × 8 hours)	2,240
(ii)	Total wages paid in a year	(₹)
	Basic pay	1,20,000
	D.A.	36,000
	Fringe benefits	12,000
		1,68,000
(iii)	Hourly rate : ₹ 1,68,000/2,240 hours	₹ 75.00

Q14 ICAI Mat; MTP Oct'18; MTP May'21

The Accountant of Y Ltd. has computed employee turnover rates for the quarter ended 31st March, 20X1 as 10%, 5% and 3% respectively under 'Flux method', 'Replacement method' and 'Separation method' respectively. If the number of workers replaced during that quarter is 30,

FIND OUT the number of workers for the quarter

(i) Recruited and joined and (ii) Left and discharged and (iii) Equivalent employee turnover rates for the year.

Reference	What's New
Labour Turnover Rates	**Different methods - Back calculation**

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Answer

Working Note:

Average number of workers on roll (for the quarter):

$$\text{Employee Turnover rate using Replacement method} = \frac{\text{No. of replacements}}{\text{Average number of workers on roll}} \times 100$$

$$\text{Or, } \frac{5}{100} = \frac{30}{\text{Average number of workers on roll}}$$

$$\text{Or, Average number of workers on roll} = \frac{30 \times 100}{5} = 600$$

(i) **Number of workers recruited and joined:**

Employee turnover rate (Flux method)

$$= \frac{\text{No. of Separations*}(S) + \text{No. of Accessions}(A)}{\text{Average number of workers on roll}}$$

$$\text{Or, } \frac{10}{100} = \frac{18^* + A}{600} \qquad \text{Or, } A = \left[\frac{6,000}{100} - 18\right] = 42$$

No. of workers recruited and joined 42.

(ii) **Number of workers left and discharged:**

Employee turnover rate (Separation method)

$$= \frac{\text{No. of Separations}(S)}{\text{Average number of workers on roll}} \times 100 = \frac{3}{100} = \frac{S}{600} \qquad \text{Or, } S^* = 18$$

Hence, number of workers left and discharged comes to 18

(iii) **Calculation of Equivalent employee turnover rates:**

$$= \frac{\text{Employee Turnover rate for the quarter (s)}}{\text{Number of quarter (s)}} \times 4 \text{ quarters}$$

Using Flux method $= \frac{10\%}{1} \times 4 = 40\%$

Using Replacement method $= \frac{5\%}{1} \times 4 = 20\%$

Using Separation method $= \frac{3\%}{1} \times 4 = 12\%$

Q15 ICAI Mat

The management of B.R Ltd. is worried about their increasing employee turnover in the factory and before analyzing the causes and taking remedial steps, it wants to have an idea of the profit foregone as a result of employee turnover in the last year.

Last year sales amounted to ₹ 83,03,300 and P/V ratio was 20 per cent. The total number of actual hours worked by the direct employee force was 4.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to employee turnover, 1,00,000 potentially productive hours were lost. The actual direct employee hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive.

The costs incurred consequent on employee turnover revealed, on analysis, the following:

Settlement cost due to leaving	₹ 43,820
Recruitment costs	₹ 26,740
Selection costs	₹ 12,750
Training costs	₹ 30,490

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.

Reference — What's New

Profit lost due to labour turnover

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Answer

Workings:

Computation of productive hours and contribution foregone

Actual hours worked (given)	4,45,000
Less: Unproductive training hours	(15,000)
Actual productive hours	4,30,000

The potentially productive hours lost are 1,15,000

$$\text{Sales lost for 1,15,000 hours} = \frac{₹\,83,03,300}{4,30,000\ \text{hrs}} \times 1,15,000\ \text{hours} = ₹\,22,20,650$$

$$\text{Contribution lost for 1,15,000 hours} = \frac{₹\,22,20,650}{100} \times 20 = ₹\,4,44,130$$

Computation of profit forgone on account of employee turnover

	(₹)
Contribution foregone (as calculated above)	4,44,130
Settlement cost due to leaving	43,820
Recruitment cost	26,740
Selection cost	12,750
Training costs	30,490
Profit foregone	5,57,930

Q16 ICAI Mat

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)	₹ 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.

Reference | What's **New**

Bonus Schemes - Rowan and Halsey	**Time Saved and Savings per unit**

Watch **Video**

Scan Me

Answer

Working Notes:

1. **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. × ₹ 40 × 10 workers = ₹ 80,000

2. **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

3. **Bonus under Halsey scheme to be paid to 10 workers:**

   Bonus = (50% of time saved) × hourly rate of wages

   = 50/100 × 500 hours × ₹ 40 = ₹ 10,000

   Total wages to be paid to 10 workers are (₹ 80,000 + ₹ 10,000) ₹ 90,000, if Mr. A considers the introduction of Halsey Incentive Scheme to increase the employee productivity.

4. **Bonus under Rowan Scheme to be paid to 10 workers:**

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{hourly rate}$$

$$= \frac{2{,}000 \text{ hours}}{2{,}500 \text{ hours}} \times 500 \text{ hours} \times ₹\,40 = ₹16{,}000$$

Total wages to be paid to 10 workers are (₹ 80,000 + ₹ 16,000) ₹ 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 and 3)

$$= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$= \frac{₹\,80,000 + ₹\,10,000}{2,000 \text{ hours}} = ₹\,45$$

(b) **Effective hourly rate of earnings under Rowan scheme:**

(Refer to Working Notes 1, 2 and 4)

$$= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Rowan scheme}}{\text{Total hours worked}}$$

$$= \frac{₹\,80,000 + ₹\,16,000}{2,000 \text{ hours}} = ₹\,48$$

(ii). (a) **Saving in terms of direct Employee cost per piece under Halsey scheme:**

(Refer to Working Note 3)

Employee cost per piece (under time wage scheme)

= 2 hours × ₹ 40 = ₹ 80.

Employee cost per piece (under Halsey scheme)

$$= \frac{\text{Total wages paid under the scheme}}{\text{Total number of units produced}} = \frac{₹\,90,000}{1,250} = ₹\,72$$

Saving per piece: (₹ 80 – ₹ 72) = ₹ 8

(b) **Saving in terms of direct Employee cost per piece under Rowan Scheme:**

(Refer to Working Note 4)

Employee cost per piece under Rowan scheme = ₹ 96,000/1,250 units = ₹ 76.80

Saving per piece = ₹ 80 – ₹ 76.80 = ₹ 3.20

Q17 ICAI Mat

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 ₹ 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.

Reference

Labour Cost - Piece rate, Halsey and Rowan

What's New

Average cost per 100 pieces

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Answer

Calculation of earnings under different wage schemes:

(i) **Day wages**

Worker	Day wages (₹)	Actual Output (Units)	Labour cost per 100 pieces (₹)
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:

$$= \frac{\text{Total wages paid}}{\text{Total output}} \times 100 = \frac{₹\,1,800}{400 \text{ units}} \times 100 = ₹\,450$$

(ii) **Piece rate**

Worker	Actual Output (Units)	Piece rate (₹)	Wages earned (₹)	Labour cost per 100 pieces (₹)
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:

$$= \frac{₹\,3,000}{400 \text{ units}} \times 100 = ₹\,750$$

(iii) **Halsey Scheme**

Worker	Actual Output (Units) A	Std. time (Hrs.) B	Actual time (Hrs.) C	Time saved (Hrs.) D = B – C	Bonus hours (50% of time saved) E	Rate per hour (₹) F	Total wages (₹) G = F × (C + E)	Labour cost per 100 pieces (₹) 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

$$= \frac{₹\ 2,400}{400 \text{ units}} \times 100 = ₹\ 600$$

(iv) **Rowan Scheme:**

Worker	Actual Output (Units) A	Std. time (Hrs.) B	Actual time (Hrs.) C	Time saved (Hrs.) D=B-C	Bonus hours* E	Rate per hour (₹) F	Total wages including bonus (₹) G=F×(C+D)	Labour cost per 100 pieces (₹) 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	

$$* \text{ Bonus hours} = \frac{\text{Time Saved}}{\text{Std. Time}} \times \text{Actual time}$$

Average cost of labour for the company to produce 100 pieces

$$= \frac{₹\ 2,453}{400 \text{ units}} \times 100 = ₹\ 613.25$$

Q18 RTP May'18; MTP Apr'19

Jyoti Ltd. wants to ascertain the profit lost during the year 2017-18 due to increased labour turnover. For this purpose, it has 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 ₹ 25.

(3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.

(4) Selling price per unit is ₹ 180 and P/V ratio is 20%.

(5) Settlement cost of the workers leaving the organization was ₹ 1,83,480.

(6) Recruitment cost was ₹ 1,56,340

(7) Training cost was ₹ 1,13,180

Required:

CALCULATE the profit lost by the company due to increased labour turnover during the year 2017-18.

Reference | What's New

Profit lost due to labour turnover

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Answer

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
Contribution per unit	= 20% of ₹180 = ₹ 36
Total contribution lost	= ₹36 × 12,000 units = ₹ 4,32,000
Cost of repairing defective units	= 3,000 units × 0.2 × ₹ 25 = ₹ 15,000

Profit forgone due to labour turnover

	(₹)
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 2017-18	9,00,000

Q19 May'18

A worker takes 15 hours to complete a piece of work for which time allowed is 20 hours. His wage rate is ₹ 5 per hour. Following additional information are also available:

Material cost of work	₹ 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

Reference | **What's New**

Factory cost under Rowan plan and Halsey plan

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Answer

		₹
(i)	**Rowan Plan :** Normal time wage = 15 hours @ ₹ 5	75
	Bonus = Time saved /Time allowed × (Time taken × Time rate) $= \frac{5}{20} \times (15 \times 15)$	18.75
		93.75
(ii)	**Halsey Plan:** Normal time wage = 15 hours @ ₹ 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 (₹)	Halsey Plan (₹)
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

Q 20 May'18

The information regarding number of employees on roll in a shopping mall for the month of December 2017 are given below:

Number of employees as on 01-12-2017	900
Number of employees as on 31-12-2017	1100

During December, 2017, 40 employees resigned and 60 employees were discharged. 300 employees were recruited during the month. Out of these 300 employees, 225 employees were recruited for an expansion project of the mall and rest were recruited due to exit of employees.

Assuming 365 days in a year, **calculate** Employee Turnover Rate and Equivalent Annual' Employee Turnover Rate by applying the following:

(i) Replacement Method

(ii) Separation Method

(iii) Flux Method (10 Marks)

Reference | What's **New**

Labour Turnover Rate using different methods and Equivalent Annual Labour Turnover Rate

Calculate daywise to annualise

Watch **Video** Scan Me

Answer

Labour turnover rate:

It comprises of computation of labour turnover by using following methods:

(i) **Replacement Method:**

$$\text{Labour Turnover Rate} = \frac{\text{No. of workers replaced}}{\text{Average number of workers}} \times 100$$

$$= \frac{75}{1{,}000} \times 100 = 7.5\%$$

$$\text{Equivalent Annual Turnover Rate} = \frac{75 \times 365}{31} = 88.31\%$$

(ii) **Separation Method:**

$$\text{Labour Turnover Rate} = \frac{\text{Number of workers left} + \text{Number of workers discharged}}{\text{Average number of workers}} \times 100$$

$$= \frac{(40+60)}{(900+1{,}100)\div 2} \times 100 = \frac{100}{1{,}000} \times 100 = 10\%$$

$$\text{Equivalent Annual Turnover Rate} = \frac{10 \times 365}{31} = 117.74\%$$

(iii) **Flux Method:**

$$\text{Labour turnover rate} = \frac{\text{Number of separations} + \text{Number of accessions}}{\text{Average number of workers}} \times 100$$

$$= \frac{(100+300)}{(900+1{,}100)\div 2} \times 100 = \frac{400}{1{,}000} \times 100 = 40\%$$

$$\text{Equivalent Annual Turnover Rate} = \frac{40 \times 365}{31} = 470.97\%$$

OR

(iii) **Flux Method:**

$$\text{Labour Turnover Rate} = \frac{\text{No. of separation} + \text{No. of replaced}}{\text{Average no. of workers}} \times 100$$

$$= \frac{100+75}{1{,}000} \times 100 = 17.5\%$$

$$\text{Equivalent Annual Turnover Rate} = \frac{17.5 \times 365}{31} = 206.05\%$$

Q21 RTP Nov'18

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 ₹ 7.50 per labour hour worked. The factory cost of the job comes to ₹ 2,600 irrespective of the workman engaged.

Required:

INTERPRET the hourly wage rate and cost of raw materials input. Also show cost against each element of cost included in factory cost.

Reference | What's **New**

Halsey and Rowan Scheme - Using Simultaneous Equation

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Answer

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 @ ₹ x per hr. (₹)	32x	30x

2. **Bonus Plan:**

	Halsey	Rowan
Time saved (hrs.)	8	10
Bonus (₹)	4x $\left[\frac{8\text{ hrs} \times ₹\ x}{2}\right]$	7.5x $\left[\frac{10\text{ hrs}}{40\text{ hrs}} \times 30\text{ hrs} \times ₹\ x\right]$

3. **Total wages:**

Workman A: 32x + 4x = ₹ 36x

Workman B: 30x + 7.5x = ₹ 37.5x

Statement of factory cost of the job

Workmen	A (₹)	B (₹)
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 = ₹ 10 per hour

On substituting the value of x in (i) we get y = ₹ 2,000

Hence the wage rate per hour is ₹ 10 and the cost of raw material is ₹ 2,000 on the job.

Q22 MTP Aug'18

Corrs Consultancy Ltd. is engaged in BPO industry. One of its trainee executives in the Personnel department has calculated Labour Turnover rate 24.92% for the last year using Flux method.

Following is the some data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Data Processors	540	1,080	60	1,560
Payroll Processors	?	20	60	40
Supervisors	?	60	---	?

Voice Agents	?	20	20	?
Assistant Managers	?	20	---	30
Senior Voice Agents	4	---	---	12
Senior Data Processors	8	---	---	34
Team Leaders	?	---	---	?
Employees transferred from the Subsidiary Company				
Senior Voice Agents	---	8	---	---
Senior Data Processors	---	26	---	---
Employees transferred to the Subsidiary Company				
Team Leaders	---	---	60	---
Assistant Managers	---	---	10	---

At the beginning of the year there were total 772 employees on the payroll of the company. The opening strength of the Supervisors, Voice Agents and Assistant Managers were in the ratio of 3 : 3 : 2.

The company has decided to abandon the post of Team Leaders and consequently all the Team Leaders 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 CALCULATE:

(a) Labour Turnover rate using Replacement method and Separation method.

(b) Verify the Labour turnover rate calculated under Flux method by the trainee executive of the Corrs Consultancy Ltd. (10 Marks)

Reference | What's **New**

Labour Turnover rate calculation and verification

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Answer

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
Data Processors	540	1,560
Payroll Processors [Left (60) + Closing (40) – Joined (20)]	80	40
Supervisors*	30	90

Voice Agents*	30	30
Assistant Managers*	20	30
Senior Voice Agents	4	12
Senior Data Processors	8	34
Team Leaders	60	0
Total	772	1,796

(*) At the beginning of the year:

Strength of Supervisors, Voice Agents and Asst. Managers

= [772 – {540 + 80 + 4 + 8 + 60} employees] or [772 – 692 = 80 employees]

{Supervisors- $80 \times \frac{3}{8} = 30$, Voice Agents- $80 \times \frac{3}{8} = 30$ & Asst. Managers- $80 \times \frac{2}{8} = 20$}

At the end of the year:

[Supervisor-(Opening- 30 + 60 Joining) = 90; Voice Agents- (Opening- 30 + 20 Joined – 20 Left) = 30]

(ii) **No. of Employees Separated, Replaced and newly recruited during the year**

Particulars	Separations	New Recruitment	Replacement	Total Joining
Data Processors	60	1,020	60	1,080
Payroll Processors	60	--	20	20
Supervisors	--	60	--	60
Voice Agents	20	--	20	20
Assistant Managers	10	10	10	20
Sr. Voice Agents	--	8	--	8
Sr. Data Processors	--	26	--	26
Team Leaders	60	--	--	--
Total	210	1,124	110	1,234

(Since, Corrs Consultancy 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:**

$$\text{Replacement Method} = \frac{\text{No. of employees replaced during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$= \frac{110}{(772+1,796)/2} \times 100 = \frac{110}{1,284} \times 100 = 8.57\%$$

$$\text{Separation Method} = \frac{\text{No. of employees separated during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$= \frac{210}{1,284} \times 100 = 16.36\%$$

(b) **Labour Turnover under Flux Method**

$$= \frac{\text{No. of employees (Joined + Separated) during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$= \frac{\text{No. of employees (Replaced + New recruited + Separated) during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$= \frac{1,234 + 210}{1,284} \times 10 = 112.46\%$$

Labour Turnover calculated by the executive trainee of the Personnel department is incorrect as it has not taken the No. of new recruitment while calculating the labour turnover under Flux method.

Q23 Nov'18

Following data have been extracted from the books of M/s. ABC Private Limited:

(i) Salary (each employee, per month)	₹ 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	₹ 6,61,500 per annum
(v) Total leave permitted during the year	30 days
(v) 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 (5 Marks)

Reference | What's **New**

Annual cost, Employee cost per hour and Cost of abnormal idle time

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Answer

1.

Annual cost of each employee	₹.
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 $\frac{5,07,780}{2,170}$ = ₹. 234

*It is assumed 310 working days are without taking leave permitted into consideration

3. **Cost of abnormal idle time per employee =** ₹ 234× 50 hours= ₹ 11700

Alternative solution for Part (2) and (3)

(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

Q24 RTP May'19; MTP May'20

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 ₹)	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 ₹ 1/-

You are **required** to CALCULATE 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.

Reference — What's **New**

Guaranteed Hourly rate Basis, Piece Work Earning basis and Rowan Scheme.

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Answer

(i) **Computation of wages of each worker under guaranteed hourly rate basis**

Worker	Actual hours worked (Hours)	Hourly wage rate (₹)	Wages (₹)
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 (₹)	Worker-I		Worker-II		Worker-III	
		Units	Wages (₹)	Units	Wages (₹)	Units	Wages (₹)
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. ₹ 24,150, ₹ 7,500 and ₹ 36,000 respectively.

Working Notes:

1. **Piece rate per unit**

Product	Standard time per unit in minute	Piece rate each minute (₹)	Piece rate per unit (₹)
A	15	1	15
B	20	1	20
C	30	1	30

2. **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
III	600 units × 15 = 9,000	1, 350 units × 20 = 27,000	-	36,000/60 = 600

(iii) **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 (₹)	Earnings (₹)	Bonus (₹)*	Total Earning (₹)
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

$$*\frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Wage Rate}$$

$$\text{Worker-I} = \frac{380}{402.5} \times 22.5 \times 40 = 850$$

$$\text{Worker-II} = \frac{100}{125} \times 25 \times 50 = 1{,}000$$

$$\text{Worker-III} = \frac{540}{600} \times 60 \times 60 = 3{,}240$$

Q25 RTP May'19; MTP April'19; MTP May'20

DISCUSS the accounting treatment of Idle time and overtime wages.

Reference | What's **New**

Accounting treatment of Idle time and Overtime Wages

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Answer

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.

Q26 May'19

M/s Zeba Private Limited allotted a standard time of 40 hours for a job and the rate per hour is ₹ 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

Reference | **What's New**

Earnings under different plans

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Answer

(i) **Halsey Premium plan:**

$= (\text{Time taken} \times \text{Rate per hour}) + (\frac{1}{2} \times \text{Time saved} \times \text{Rate per hour})$

$= (30 \text{ hours} \times ₹75) + (\frac{1}{2} \times 10 \text{ hours} \times ₹75)$

$= ₹\,2,250 + ₹\,375 = ₹\,2,625$

(ii) **Rowan Premium plan:**

$$= \left(\text{Time Taken} \times \text{Rate per hour}\right) + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hour}\right)$$

$$= \left(30 \text{ hours} \times ₹\,75\right) + \left(\frac{10}{40} \times 30 \times ₹\,75\right)$$

$= ₹\,2,250 + ₹\,562.5 = ₹\,2,812.5$ or ₹ 2,813

(iii) **Time wage system:**

$= \text{Time taken} \times \text{Rate per hour}$

$= 30 \times ₹\,75 = ₹\,2,250$

(iv) **Piece Rate System:**

$= \text{Std. Time} \times \text{Rate per hour}$

$= 40 \times ₹\,75 = ₹\,3,000$

Q 27 RTP Nov'19

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.

Reference	What's New
Analysis of Halsey and Rowan Scheme and suggestion of Bonus scheme.	**What to calculate? Bonus, Total Wages, Earning / hr.**

Watch Video

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Answer

The Cost of labour under the bonus schemes are tabulated as below:

Time Allowed	Time taken	Wages (₹)	Bonus (₹)		Total Wages (₹)		Earning per hour (₹)	
			Halsey*	Rowan**	Halsey	Rowan	Halsey	Rowan
(1)	(2)	(3) = (2) × ₹ 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 upto 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.

Q 28 MTP Oct'19

Discuss the remedial steps to be taken to minimize the labour turnover.

Reference	What's New
Minimising Labour turnover	

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Answer

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**.

Q29 Nov'19

Zico Ltd. has its factory at two locations viz Nasik and Satara. Rowan plan is used at Nasik factory and Halsey plan at Satara factory.

Standard time and basic rate of wages are same for a job which is similar and is carried out on similar machinery. Normal working hours is 8 hours per day in a 5 day week.

Job at Nasik factory is completed in 32 hours while at Satara factory it has taken 30 hours. Conversion costs at Nasik and Satara are ₹ 5,408 and ₹ 4,950 respectively. Overheads account for ₹ 25 per hour.

Required:

(i) To find out the normal wage; and

(ii) To compare the respective conversion costs. (10 Marks)

Reference | What's New

Normal wage and Comparison of Conversion costs | **Simultaneous equation**

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Answer

Particulars	Nasik	Satara
Hours worked	32 hr.	30 hr.
Conversion Costs	₹5,408	₹4,950
Less: Overheads	₹800 (₹25×32 hr.)	₹750 (₹25×30 hr.)
Labour Cost	₹4,608	₹4,200

(i) **Finding of Normal wage rate:**

Let Wage rate be ₹R per hour, this is same for both the Nasik and Satara factory.

Normal wage rate can be found out taking total cost of either factory.

Nasik: Rowan Plan

Total Labour Cost = Wages for hours worked + Bonus as per Rowan plan

$$₹\,4{,}608 = \text{Hours worked} \times \text{Rate per hour} + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Hours worked} \times \text{Rate per hour}\right)$$

$$\text{Or, } ₹\,4{,}608 = 32 \text{ hr.} \times R + \left(\frac{40-32}{40} \times 32 \times R\right)$$

Or, ₹ 4,608 = 32R + 6.4R

R = ₹ 120

Normal wage = 32 hrs × ₹ 120 = ₹ 3,840

OR

Satara: Halsey Plan

Total Labour Cost = Wages for hours worked + Bonus as per Halsey plan

₹ 4,200 = Hours worked × Rate per hour + (50%×Hours saved×Rate per hour)

₹ 4,200 = 30 hr. × R + 50% × (40 hr. – 30 hr.) × R

₹ 4,200 = 35 R

Or R = ₹ 120

Normal Wage = 30 hrs × ₹ 120 = ₹ 3,600

(ii) **Comparison of conversion costs:**

Particulars	Nasik (₹)	Satara (₹)
Normal Wages (32 × 120)	3,840	
(30 × 120)		3,600
Bonus (6.4 × 120)	768	
(5 × 120)		600
Overhead	800	750
	5,408	4,950

Q30 RTP May'20; MTP May'21

From the following information, **CALCULATE** employee turnover rate using – (i) Separation Method, (ii) Replacement Method, (iii) New Recruitment Method, and (iv) Flux Method:

No. of workers as on 01.01.2019 = 3,600

No. of workers as on 31.12.2019 = 3,790

During the year, 40 workers left while 120 workers were discharged. 350 workers were recruited during the year, of these 150 workers were recruited because of exits and the rest were recruited in accordance with expansion plans.

Reference | What's **New**

Labour turnover rate using different methods.

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Answer

Employee turnover rate using:

(i) **Separation Method:**

$$= \frac{\text{No. of workers left} + \text{No. of workers discharged}}{\text{Average number of workers}} \times 100$$

$$= \frac{(40+120)}{(3,600+3,790)/2} \times 100 = \frac{160}{3,695} \times 100 = 4.33\%$$

(ii) **Replacement Method:**

$$= \frac{\text{No. of workers replaced}}{\text{Average number of workers}} \times 100 = \frac{150}{3,695} \times 100 = 4.06\%$$

(iii) **New Recruitment Method:**

$$= \frac{\text{No. of workers newly recruited}}{\text{Average number of workers}} \times 100$$

$$= \frac{\text{No. of Recruitments} - \text{No. of Replacement}}{\text{Average number of workers}} \times 100$$

$$= \frac{350-150}{3,695} \times 100 = \frac{200}{3,695} \times 100 = 5.41\%$$

(iv) **Flux Method:**

$$= \frac{\text{No. of separations} + \text{No. of accessions}}{\text{Average number of workers}} \times 100$$

$$= \frac{(160+350)}{(3,600+3,790)/2} \times 100 = \frac{510}{3,695} \times 100 = 13.80\%$$

Q 31 RTP Nov'20

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	₹1,000
(b) Dearness allowance (DA)	20% of basic salary
(c) House rent allowance	16% of basic salary
(d) Transport allowance	₹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 atleast 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.

Reference — What's **New**

Labour Cost and Wages allocated

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Answer

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 (₹)
Basic salary (₹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% × ₹31,200)	3,744
Employer's contribution to Pension fund (7% × ₹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 (₹)
Basic salary (₹1,000 × 26 days)	26,000
Additional basic salary for Sunday & holiday (₹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 (₹50 × 23 days)	1,150
Overtime allowance (₹160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × ₹33,600)	4,032
Employer's contribution to Pension fund (7% × ₹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 = ₹160 per hour

(iii) **Calculation of wages to be charged to Job no. HT200**

= ₹ 248 × 100 hours = ₹ 24,800

Q 32 Nov'20

Following are the particulars of two workers 'R' and 'S' for a month :

Particulars	R	S
(i) Basic Wages (₹)	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 : [6 Marks]

(i) **Calculate** ordinary wage rate per hour of 'R' and 'S'.

(ii) **Allocate** the worker's cost to each job 'A', 'B' and 'C'.

Reference | What's **New**

Wage Rate and Allocation to jobs

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Answer

(i) **Calculation of Net Wages paid to Worker 'R' and 'S'**

Particulars	R (₹)	S (₹)
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% × ₹ 15,000); (7.5% × ₹ 30,000)	(1,050.00)	(2,250.00)
Less: ESI (2% × ₹ 15,000); (2% × ₹ 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'

	R (₹)	S (₹)
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 (₹ 23,850 ÷ 200 hours); (₹ 47,850 ÷ 200 hours)	119.25	23.925

(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
	76,200.00	41,527.50	11,955.00	22,717.50

Working Note:

Normal Wages are considered as basic wages.

$$\text{Over time} = \frac{2\times(\text{Basic wage} + \text{D.A.})\times 20 \text{ hours}}{200 \text{ hours}}$$

$$= 2\times\frac{₹\,22,500}{200}\times 20 \text{ hours}$$

$$= ₹\,4,500$$

Q 33 Nov'20

Discuss any four objectives of 'Time keeping' in relation to attendance and payroll procedures.

[4 Marks]

Reference — What's New

Objectives of Time Keeping

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Answer

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

Q34 Jan'21

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)	₹ 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: [10 Marks]

(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 incentivising workers and also to adjust with the increase in demand.

Reference	What's New
Halsey and Rowan Scheme	**Selection of best as per assurance**

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Answer

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. × ₹ 50 × 50 workers = ₹ 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 × ₹ 50 = ₹ 62,175

   Total wages to be paid to 50 workers are (₹ 4,80,000 + ₹ 62,175) ₹ 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:**

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{hourly rate}$$

$$= \frac{9{,}600 \text{ hours}}{12{,}087 \text{ hours}} \times 2{,}487 \text{ hours} \times ₹\ 50 = ₹\ 98{,}764$$

Total wages to be paid to 50 workers are (₹ 4,80,000 + ₹ 98,764) ₹ 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)

$$= \frac{\text{Total time wages of 50 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$= \frac{₹\ 4{,}80{,}000 + ₹\ 62{,}175}{9{,}600 \text{ hours}} = ₹\ 56.48$$

Effective increase in earnings of worker (in %) = $\frac{₹\,56.48 - ₹\,50}{₹\,50} \times 100 = 2.96\%$

(b) **Effective hourly rate of earnings under Rowan scheme:**

(Refer to Working Notes 1, 2 and 4)

$$= \frac{\text{Total time wages of 50 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$= \frac{₹\,4,80,000 + ₹\,96,875}{9,600 \text{ hours}} = ₹\,60.29$$

Effective increase in earnings of worker (in %)= $\frac{₹\,60.29 - ₹\,50}{₹\,50} \times 100 = 20.58\%$

(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 × ₹ 50 = ₹ 98.75

Labour cost per unit (under Halsey scheme)

$$= \frac{\text{Total wages paid under the scheme}}{\text{Total number of units produced}} = \frac{₹\,5,42,175}{6,120} = ₹\,88.60$$

Saving per unit = ₹ 98.75 – ₹ 88.60 = ₹ 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 = ₹ 5,78,764/6,120 units = ₹ 94.57

Saving per unit = ₹ 98.75 – ₹ 94.57= ₹ 4.18

(iii) **Calculation of Productivity:**

Normal Production Hours worked/Unit per Hour (9,600/1.975)	4,861
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%.

Q 35 RTP May'21

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 the wages is ₹ 60 per hour. As per the new wages agreement the workers will be paid ₹ 72 per hour w.e.f. 1st January 2021. At the end of the month December 2020, the accountant of the company has wrongly calculated wages to these two workers taking ₹ 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?

Reference | **Halsey and Rowan**

What's **New** | **Loss due to incorrect rate**

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Answer

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 (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	120 (50% of 20 Hrs. × ₹12)	168 (50% of 28 Hrs. × ₹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 (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹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 $\left(\frac{100}{120} \times 20 \times ₹12\right)$	280 $\left(\frac{140}{168} \times 28 \times ₹12\right)$	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 (₹)
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.

Q36 July'21

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 : [5]

(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.

Reference | What's **New**

Employee Turonver Rates using Separation and Flux Method

Watch **Video**

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Answer

(i) **Employee Turnover rate**

Using Separation method:

$$= \frac{\text{Number of employees Separated during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{25}{500} \times 100 = 5\%$$

Using Flux method:

$$= \frac{\text{Number of employees Separated} + \text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{50+25}{500} \times 100 = 15\%$$

(ii) **Equivalent Employee Turnover rate:**

$$= \frac{\text{Employee Turnover rate for the period}}{\text{Number of days in the period}} \times 365$$

Using Separation Method $= \frac{5}{60} \times 365 = 30.42\%$

Or, $= \frac{5}{60} \times 360 = 30\%$

Or, $= \frac{5}{2} \times 12 = 30\%$

Using Flux method $= \frac{15}{60} \times 365 = 91.25\%$

Or, $= \frac{15}{60} \times 360 = 90\%$

Or, $= \frac{15}{2} \times 12 = 90\%$

Q 37 July'21

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. [5]

Reference — What's **New**

Rowan Premium Bonus System

Watch **Video**

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Answer

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.

$$\text{Bonus} = \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

Example explaining highly efficient worker and less efficient worker obtaining same bonus:

Time rate (per Hour)	₹ 60
Time allowed	8 hours.
Time taken by 'X'	6 hours.
Time taken by 'Y'	2 hours.

$$\text{Bonus} = \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

$$\text{For 'X'} = \frac{2 \text{ hours}}{8 \text{ hours}} \times 6 \text{ hours} \times ₹\ 60 = ₹\ 90$$

$$\text{For 'Y'} = \frac{6 \text{ hours}}{8 \text{ hours}} \times 2 \text{ hours} \times ₹\ 60 = ₹\ 90$$

From the above example, it can be concluded that a highly efficient worker may obtain same bonus as less efficient worker under this system.

Q38 Dec'21

A skilled worker is paid a guaranteed wage rate of ₹ 150 per hour. The standard time allowed for a job is 10 hours. He took 8 hours to complete the job. He has been paid the wages under Rowan Incentive Plan.

You are **required** to : [5]

(i) **Calculate** an effective hourly rate of earnings under Rowan Incentive Plan.

(ii) **Calculate** the time in which he should complete the job, if the worker is placed under Halsey Incentive Scheme (50%) and he wants to maintain the same effective hourly rate of earnings.

Reference — What's **New**

Bonus Scheme - Rowan and Halsey

Watch **Video** — **Scan Me**

Answer

(i) Calculation of Effective hourly rate of earnings under Rowan Incentive Plan:

Standard time allowed = 10 hours

Time taken = 8 hours; Time saved = 2 hours

	Particulars	Amount (₹)
A	Basic guaranteed wages (₹ 150 × 8 hours)	1,200
B	Add: Bonus for time saved ($\frac{2}{10} \times 8 \times$ ₹ 150)	240
C	Total earnings (A + B)	1,440
D	Hours worked	8 hours
E	Effective hourly rate (C ÷ D)	180

(ii) Let the time taken to complete the job is "T" and the time saved is 10-T

Effective hourly rate under the Halsey Incentive scheme

$$= \frac{(\text{Rate} \times \text{Hours Worked}) + (\text{Rate} \times 50\% \text{ of Time Saved})}{\text{Hours Worked}} = ₹\ 180$$

$$\frac{(₹150 \times T) + ₹150 \times 50\%(10 - T)}{T} = ₹\ 180$$

$150T + 750 - 75T = 180T$

$180T - 75T = 750$

$$T = \frac{750}{105} = 7.14 \text{ hours}$$

Q 39 Dec'21

Discuss the steps involved in setting labour time standards. [5]

Reference | What's **New**

Labour time standard | **Steps**

Watch **Video** Scan Me

Answer

Procedure of Setting Labour Time Standards

The following are the steps involved in setting labour standards:

(a) **Standardisation:** 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) **Standardisation 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.

Q40 MTP May'22

The standard time allowed for a certain piece of work is 240 hours. Normal wage rate is ₹ 75 per hour.

The bonus system applicable to the work is as follows:

Percentage of time saved to time allowed (slab rate)	Bonus
(i) Up to the first 20% of time allowed	25% of the corresponding saving in time.
(ii) For and within the next 30% of time allowed	40% of the corresponding saving in time.
(iii) For and within the next 30% of time allowed	30% of the corresponding saving in time.
(iv) For and within the next 20% of time allowed	10% of the corresponding saving in time.

CALCULATE the total earnings of a worker over the piece of work and his earnings per hour when he takes -

(a) 256 hours,

(b) 120 hours, and

(c) 24 hours respectively. [10]

Reference — What's **New**

Piece Rate System

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Answer

Calculation of total earnings and earnings per hour:

	Particulars	(a) Time taken is 256 hours	(b) Time taken is 120 hours	(c) Time taken is 24 hours
A.	Time Allowed	240 hours	240 hours	240 hours
B.	Time taken	256 hours	120 hours	24 hours
C.	Time Saved (A – B)	Nil	120 hours	216 hours
D.	Bonus hours (Refer workings)	Nil	40.80 hours	64.80 hours
E.	Hours to be paid (B + D)	256 hours	160.80 hours	88.80 hours
F.	Wages rate per hour	₹ 75	₹ 75	₹ 75
G.	Total earnings (E × F)	₹ 19,200	₹ 12,060	₹ 6,660
H.	Earnings per hour (G ÷ B)	₹ 75	₹ 100.50	₹ 277.50

Working Notes:

Calculation of bonus hours:

	Time saved 120 hours	Time saved 216 hours
For first 20% of time allowed i.e. 48 hours	12 (25% of 48 hours)	12 (25% of 48 hours)
For next 30% of time allowed i..e. 72 hours	28.80 (40% of 72 hours)	28.80 (40% of 72 hours)
For next 30% of time allowed i..e. 72 hours	-	21.60 (30% of 72 hours)
For next 20% of time allowed i..e. 48 hours	-	2.40 (10% of 24 hours)
Bonus hours	40.80	64.80

Q 41 MTP May'22

BRIEF OUT advantages and disadvantages of Halsey Premium Plan. [5]

Reference | What's **New**

Halsey Premium Plan - Advantages and Disadvantages

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Answer

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.

Q42 MTP Nov'22

Archika Tyre Manufacturing Private Limited has four workers Ram, Shyam, Mohan & Kundan who are paid wages on the basis of ₹ 100 per day, ₹ 120 per day, ₹ 130 per day & ₹ 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 ₹ 20,000 for October 2022 and overheads are charged equal to labour cost, **calculate** total cost for the month. [10]

Reference | What's **New**

Labour cost calculation

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Answer

(i) Calculation of net wages receivable by each employee from the employer (October 2022):

	Ram (₹)	Shyam (₹)	Mohan (₹)	Kundan (₹)	Total (₹)
Wages for October 2022	3,000 (₹ 100 x 30 days)	3,600 (₹ 120 x 30 days)	3,900 (₹ 130 x 30 days)	2,500	13,000
Less: Employee Contribution to PF @ 8%	240	288	312	200	1,040
Less: Employee Contribution to ESI @ 4%	120	144	156	100	520
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):

	(₹)
Total Wages for the month	13,000
Employer's Contribution to Provident Fund @8% of ₹ 13,000	1,040
Add: Employee's Contribution to Provident Fund @8% of ₹ 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):

	(₹)
Total Wages for the month	13,000
Employer's Contribution to ESI @5% of ₹ 13,000	650
Add: Employee's Contribution to ESI @4% of ₹ 13,000	520
Total amount of ESI required to be deposited by employer	1,170

(iv) Total labour cost to employer (October 2022):

	(₹)
Total Wages for the month	13,000
Add: Employer's Contribution to Provident Fund @8% of ₹ 13,000	1,040
Add: Employer's Contribution to ESI @5% of ₹ 13,000	650
Total labour cost to employer	14,690

(v) Calculation of Total Cost for October 2022

	(₹)
Total Material Cost	20,000
Total Labour Cost	14,690
Total Overheads (Equal to Labour Cost)	14,690
Total Cost	49,380

Q43 MTP Nov'22

STATE various causes of and treatment of Overtime Premium in Cost Accounting. [5]

Reference — What's **New**

Treatment of Overtime Premium

Watch **Video**

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Answer

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.

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Chapter 5

Overhead : Analysis of Semi Variable Cost

Q1 MTP Oct'18

Discuss with example the level of activity method of segregating semi-variable costs into fixed and variable costs.

Reference	What's New	Watch Video
Segregation of Semi variable cost into fixed and variable cost		Scan Me

Answer

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 (₹)
January	100	260
February	140	300
Difference	40	40

The variable cost :

$$\frac{\text{Change in Semi-variable expenses}}{\text{Change in production volume}} = \frac{₹\ 40}{40 \text{ units}} = ₹\ 1/\text{unit}$$

Thus, in January, the variable cost will be 100 × ₹ 1 = ₹ 100 and the fixed cost element will be (₹ 260 – ₹ 100) or ₹ 160. In February, the variable cost will be 140 × ₹ 1 = ₹ 140 whereas the fixed cost element will remain the same, i.e., ₹ 160.

Q2 Jan'21

XYZ Ltd is engaged in the manufacturing of toys. It can produce 4,20,000 toys at its 70% capacity on per annum basis. Company is in the process of determining sales price for the financial year 2020-21. It has provided the following information :

Direct Material	₹ 60 per unit
Direct Labour	₹ 30 per unit
Indirect Overheads :	
Fixed	₹ 65,50,000 per annum
Variable	₹ 15 per unit
Semi-variable	₹ 5,00,000 per annum up to 60% capacity and ₹ 50,000 for every 5% increase in capacity or part thereof up to 80% capacity and thereafter ₹ 75,000 for every 10% increase in capacity or part thereof.

Company desires to earn a profit of ₹ 25,00,000 for the year. Company has planned that the factory will operate at 50% of capacity for first six months of the year and at 75% of capacity for further three months and for the balance three months, factory will operate at full capacity.

You are **required** to :

(1) **Determine** the average selling price at which each of the toy should be sold to earn the desired profit.

(2) Given the above scenario, **advise** whether company should accept an offer to sell each Toy at:

(a) ₹ 130 per Toy

(b) ₹ 129 per Toy [10 Marks]

Reference | What's **New**

Different Capacity Levels

Watch **Video**

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Answer

(1) **Statement of Cost**

	For first 6 months 6,00,000 x 6/12 × 50% = 1,50,000 units	For further 3 months 6,00,000 x 3/12 × 75% = 1,12,500 units	For remaining 3 months 6,00,000 x 3/12 = 1,50,000 units	Total 4,12,500 units
Direct Material	90,00,000	67,50,000	90,00,000	2,47,50,000
Direct labour	45,00,000	33,75,000	45,00,000	1,23,75,000
Indirect – Variable Expenses	22,50,000	16,87,500	22,50,000	61,87,500
Indirect – Fixed Expenses	32,75,000	16,37,500	16,37,500	65,50,000
Indirect Semi-variable expenses				
- For first six months @ 5,00,000 per annum	2,50,000			
- For further three months @ 6,50,000* per annum		1,62,500		
- For further three months @ 8,50,000** per annum			2,12,500	6,25,000
Total Cost	1,92,75,000	1,36,12,500	1,76,00,000	5,04,87,500
Desired Profit				25,00,000
Sales value				5,29,87,500
Average Sales price per Toy				128.45

* ₹ 5,00,000 + [3 times (from 60% to 75%) × 50,000] = ₹ 6,50,000

** ₹ 6,50,000 + [1 time (from 75% to 80%) × 50,000] + [2 times (from 80% to 100%) × 75,000] = ₹ 8,50,000

(2) (a) Company Should accept the offer as it is above its targeted sales price of ₹ 128.45 per toy.

(b) Company Should accept the offer as it is above its targeted sales price of ₹ 128.45 per toy.

NOTES

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Chapter 6

Overhead : Absorption Costing

Q1 ICAI Mat

A light engineering factory fabricates machine parts to customers. The factory commenced fabrication of 12 Nos. machine parts to customers' specifications and the expenditure incurred on the job for the week ending 21st August, 20X8 is given below:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @₹ 15 per hour		300.00
Machine facilities :		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹ 8 per hour on 20 manual hours		160.00
Total cost		1,810.00

The overhead rate of ₹ 8 per hour is based on 3,000 man hours per week; similarly, the machine hour rates are based on the normal working of Machine Nos. I and II for 40 hours out of 45 hours per week.

After the close of each week, the factory levies a supplementary rate for the recovery of full overhead expenses on the basis of actual hours worked during the week. During the week ending 21st August, 20X8, the total labour hours worked was 2,400 and Machine Nos. I and II had worked for 30 hours and 32.5 hours respectively.

PREPARE a Cost Sheet for the job for the fabrication of 12 Nos. machine parts duly levying the supplementary rates.

Reference

Under/Over Absorption

What's **New**

Effect of supplementary rate on Job Cost

Watch **Video**

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Answer

Fabrication of 12 Nos. machine parts (job No.....) Date of commencement: 16 August, 20X8 Date of Completion. Cost sheet for the week ending, August 21, 20X8:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @₹ 15 per hour		300.00
Machine facilities:		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹ 8 per hour on 20 manual hours		160.00
Total cost		1,810.00
Supplementary Rates		
Overheads 20 hours @ ₹ 2 per hour	40.00	
Machine facilities:		
Machine No. I - 4 hours @ ₹ 15	60.00	
Machine No. II - 6 hours @ ₹ 15	90.00	190.00
Cost		2,000.00

Working notes:

Overheads budgeted: 3,000 hours × ₹ 8 =₹ 24,000

Actual hours: 2,400

Actual rate per hour ₹ 24,000 ÷ 2,400 hours = ₹ 10

Supplementary charge ₹ 2 (₹ 10 – ₹ 8) per hour

Machine facilities:

	Machine No. I	Machine No. II
Budgeted	₹ 1,800 (40 × ₹ 45)	₹ 2,600 (40 × ₹ 65)
Actual number of hours	30	32.5
Actual rate per hour	₹ 60.00	₹ 80.00
Supplementary rate per hour	₹ 15.00 (₹ 60.00 – ₹ 45.00)	₹ 15.00 (₹ 80.00 – ₹ 65.00)

Q2 ICAI Mat

In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administrative overheads are absorbed on a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period:

	Job 101 (₹)	Job 102 (₹)
Direct materials	54,000	37,500
Direct wages	42,000	30,000
Selling price	1,66,650	1,28,250
Profit percentage on Total Cost	10%	20%

Required:

(i) **COMPUTATION** of percentage recovery rates of factory overheads and administrative overheads.

(ii) **CALCULATION** of the amount of factory overheads, administrative overheads and profit for each of the two jobs.

(iii) Using the above recovery rates FIX the selling price of job 103. The additional data being:

Direct materials	₹ 24,000
Direct wages	₹ 20,000
Profit percentage on selling price	12-½%

Reference

Job Cost Sheet

What's New

Using simulataneous equation

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Answer

(i) Let factory overhead recovery rate, as percentage of direct wages be F and administrative overheads recovery rate, as percentage of factory cost be A.

Factory Cost of Jobs:

Job 101 = ₹ 96,000 + ₹ 42,000F

Job 102 = ₹ 67,500 + ₹ 30,000F

Total Cost of Jobs:

Job 101 = (₹ 96,000 + ₹ 42,000F) + (₹ 96,000+ ₹ 42,000F) A = ₹ 1,51,500

Job-102 = (₹ 67,500 + ₹ 30,000F) + (₹ 67,500+ ₹ 30,000F) A = ₹ 1,06,875

(Refer to working note)

On solving above relations: F = 0.60 and A = 0.25

Hence, percentage recovery rates of factory overheads and administrative overheads are 60% and 25% respectively.

Working note:

	Job 101	Job 102
Total cost (₹) $= \frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$	1,51,500 (₹ 1,66,650/110%)	1,06,875 (₹ 1,28,250/120%)

(ii) **Statement of jobs, showing amount of factory overheads, administrative overheads and profit**

	Job 101 (₹)	Job 102 (₹)
Direct materials	54,000	37,500
Direct wages	42,000	30,000
Prime cost	96,000	67,500
Factory overheads		
60% of direct wages	25,200	18,000
Factory cost	1,21,200	85,500
Administrative overheads		
25% of factory cost	30,300	21,375
Total cost	1,51,500	1,06,875
Profit	15,150	21,375
Selling price	1,66,650	1,28,250

(iii) **Selling price of Job 103**

	(₹)
Direct materials	24,000
Direct wages	20,000
Prime cost	44,000
Factory overheads (60% of Direct Wages)	12,000
Factory cost	56,000
Administrative overheads (25% of factory cost)	14,000
Total cost	70,000
Profit margin (balancing figure)	10,000
Selling price $\left[\frac{\text{Total Cost}}{87.5\%}\right]$	80,000

Q3 ICAI Mat

Job No. 198 was commenced on October 10, 20X8 and completed on November 1, 20X8. Materials used were ₹ 600 and labour charged directly to the job was ₹ 400. Other information is as follows:

Machine No. 215 used for 40 hours, the machine hour rate being ₹ 3.50.

Machine No. 160 used for 30 hours, the machine hour rate being ₹ 4.00. 6 welders worked on the job for five days of 8 hours each : the Direct labour hour per welder is ₹ 0.20.

Expenses not included for **calculating** the machine hour or direct labour hour rate total led ₹ 2,000, total direct wages for the period being ₹ 20,000. **Ascertain** the works costs of job No. 198.

Reference | **Job Cost**

What's **New** | **Labour Hour Rate Method and Machine Hour Rate Method**

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Answer

	(₹)	(₹)
Materials		600.00
Direct labour		400.00
		1,000.00
Factory overheads :		
Machine No. 215 : 40 hours @ ₹ 3.50	140.00	
Machine No. 160 : 30 hours @ ₹ 4.00	120.00	
240 hours of welders @ ₹ 0.20 per hr.	48.00	
General : 10% of wages	40.00	348.00
Works cost		1,348.00

1. 6 welders × 5 days × 8 hours = 240 hours
2. Un apportioned expenses ₹ 2,000 which works out at 10% of direct wages.

Q4 ICAI Mat

In a factory, overheads of a particular department are recovered on the basis of ₹ 5 per machine hour. The total expenses incurred and the actual machine hours for the department for the month of August were ₹ 80,000 and 10,000 hours respectively. Of the amount of ₹ 80,000, ₹ 15,000 became payable due to an award of the Labour Court and ₹ 5,000 was in respect of expenses of the previous year booked in the current month (August). Actual production was 40,000 units, of which 30,000 units were sold. On analysing the reasons, it was found that 60%

of the under-absorbed overhead was due to defective planning and the rest was attributed to normal cost increase.

EXPLAIN how would you treat the under-absorbed overhead in the cost accounts?

Reference | What's **New**

Treatment of Under-absorbed Overheads in Cost Accounting

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Answer

Under absorbed overhead expenses during the month of August

	(₹)	(₹)
Total expenses incurred in the month of August:		80,000
Less: The amount paid according to labour		
court award (Assumed to be non-recurring)	15,000	
Expenses of previous year	5,000	20,000
Net overhead expenses incurred for the month		60,000
Overhead recovered for 10,000 hours @ ₹ 5 per hour		50,000
Under-absorbed overheads		10,000

₹ 4,000 may be distributed over Finished Goods and Cost of Sales as follows:

Finished Goods	* ₹ 1,000
Cost of Sales	* ₹ 3,000

***Working notes**

Under-absorbed overhead (after 60% due to difective planning)	₹ 4,000
Units produced :	40,000
Rate of under-absorbed overhead recover	₹ 0.10 per unit
Amount of under-absorbed overheads charged to finished goods (10,000 × ₹ 0.10)	₹ 1,000
Amount of under-absorbed overheads charged to cost of sales : (30,000 × ₹ 0.10)	₹ 3,000

Q 5 ICAI Mat

In a manufacturing unit, factory overhead was recovered at a pre-determined rate of ₹ 25 per man-day. The total factory overhead expenses incurred and the man-days actually worked were ₹ 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?

Reference | What's **New**

Treatment of Under-absorbed Overheads in Cost Accounting

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Answer

Computation of unabsorbed overheads

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 ₹ 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 ₹ 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 ₹ 1,60,000 be charged to production i.e., 40,000 units at the supplementary overhead absorption rate i.e., ₹ 4 per unit (Refer to Working Note)

	(₹)
Charge to Costing Profit and Loss Account as part of the cost of unit sold (30,000 units @ ₹ 4 p.u.)	1,20,000
Add: To closing stock of finished goods (10,000 units @ ₹ 4 p.u.)	40,000
Total	1,60,000

Working Note :

$$\text{Supplementary overhead absorption rate} = \frac{₹\,1,60,000}{40,000 \text{ units}} = ₹\,4 \text{ p.u.}$$

Q6 ICAI Mat

A factory has three production departments. The policy of the factory is to recover the production overheads of the entire factory by adopting a single blanket rate based on the percentage of total factory overheads to total factory wages. The relevant data for a month are given below:

Department	Direct Materials	Direct Wages (₹)	Factory Overheads (₹)	Direct Labour hours (₹)	Machine hours
Budget:					
Machining	6,50,000	80,000	3,60,000	20,000	80,000
Assembly	1,70,000	3,50,000	1,40,000	1,00,000	10,000
Packing	1,00,000	70,000	1,25,000	50,000	–
Actual:					
Machining	7,80,000	96,000	3,90,000	24,000	96,000
Assembly	1,36,000	2,70,000	84,000	90,000	11,000
Packing	1,20,000	90,000	1,35,000	60,000	–

The details of one of the representative jobs produced during the month are as under:

Job No. CW 7083 :

Department	Direct Materials	Direct Wages (₹)	Direct Labour hours (₹)	Machine hours
Machining	1,200	240	60	180
Assembly	600	360	120	30
Packing	300	60	40	–

The factory adds 30% on the factory cost to cover administration and selling overheads and profit.

Required :

(i) **CALCULATE** the overhead absorption rate as per the current policy of the company and determine the selling price of the Job No. CW 7083.

(ii) Suggest any suitable alternative method(s) of absorption of the factory overheads and **CALCULATE** the overhead recovery rates based on the method(s) so recommended by you.

(iii) **DETERMINE** the selling price of Job CW 7083 based on the overhead application rates calculated in (ii) above.

(iv) **CALCULATE** the department-wise and total under or over recovery of overheads based on the company's current policy and the method(s) recommended by you.

Reference | **What's New**

Job Cost

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Answer

(i) **Computation of overhead absorption rate (as per the current policy of the company)**

Department	Budgeted factory Overheads (₹)	Budgeted direct wages (₹)
Machinery	3,60,000	80,000
Assembly	1,40,000	3,50,000
Packing	1,25,000	70,000
Total	6,25,000	5,00,000

$$\text{Overhead absorption rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct wages}} \times 100$$

$$= \frac{₹\,6,25,000}{₹\,5,00,000} \times 100 = 125\% \text{ of Direct wages}$$

Selling Price of the Job No. CW-7083

	(₹)
Direct materials (₹ 1,200 + ₹ 600 + ₹ 300)	2,100.00
Direct wages (₹ 240 + ₹ 360 + ₹ 60)	660.00
Overheads (125% × ₹ 660)	825.00
Total factory cost	3,585.00
Add: Mark-up (30% × ₹ 3,585)	1,075.50
Selling price	4,660.50

(ii) **Methods available for absorbing factory overheads and their overhead recovery rates in different departments**

1. **Machining Department**

In the machining department, the use of machine time is the predominant factor of production. Hence machine hour rate should be used to recover overheads in this department. The overhead recovery rate based on machine hours has been calculated as under:—

$$\text{Machine hour rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted machine hours}}$$

$$= \frac{₹\,3,60,000}{80,000 \text{ hours}} = ₹\,4.50 \text{ per hour}$$

2. **Assembly Department**

In this department direct labour hours is the main factor of production. Hence direct labour hour rate method should be used to recover overheads in this department. The overheads recovery rate in this case is:

$$\text{Direct labour hour rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct labour hours}}$$

$$= \frac{₹\,1,40,000}{1,00,000 \text{ hours}} = ₹\,1.40 \text{ per hour}$$

3. **Packing Department**

Labour is the most important factor of production in this department. Hence direct labour hour rate method should be used to recover overheads in this department.

The overhead recovery rate in this case comes to:

Budgeted factory overhead

$$\text{Direct labour hour rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted labour hours}}$$

$$= \frac{₹\,1,25,000}{50,000 \text{ hours}} = ₹\,2.50 \text{ per hour}$$

(iii) **Selling Price of Job CW-7083 [based on the overhead application rates calculated in (ii) above]**

	(₹)
Direct materials	2,100.00
Direct wages	660.00
Overheads (Refer to Working note)	1,078.00
Factory cost	3,838.00
Add: Mark up (30% of ₹ 3,838)	1,151.40
Selling price	4,989.40

Working note:

Overhead Summary Statement

Dept.	Basis	Hours	Rate (₹)	Overheads (₹)
Machining	Machine hour	180	4.50	810
Assembly	Direct labour hour	120	1.40	168
Packing	Direct labour hour	40	2.50	100
			Total	1,078

(iv) **Department-wise statement of total under or over recovery of overheads**

(a) **Under current policy**

Departments

	Machining (₹)	Assembly (₹)	Packing (₹)	Total (₹)
Direct wages (Actual)	96,000	2,70,000	90,000	
Overheads recovered @ 125% of Direct wages: (A)	1,20,000	3,37,500	1,12,500	5,70,000
Actual overheads: (B)	3,90,000	84,000	1,35,000	6,09,000
(Under)/Over recovery of overheads : (A – B)	(2,70,000)	2,53,500	(22,500)	(39,000)

(b) **As per methods suggested, Basis of overhead recovery**

	Machine hours	Direct labour hours	Direct labour hours	Total (₹)
Hours worked	96,000	90,000	60,000	
Rate/hour (₹)	4.50	1.40	2.50	
Overhead recovered (₹): (A)	4,32,000	1,26,000	1,50,000	7,08,000
Actual overheads (₹): (B)	3,90,000	84,000	1,35,000	6,09,000
(Under)/Over recovery: (A–B)	42,000	42,000	15,000	99,000

Q7 ICAI Mat

The total overhead expenses of a factory are ₹ 4,46,380. Taking into account the normal working of the factory, overhead was recovered in production at ₹ 1.25 per hour. The actual hours worked were 2,93,104. **STATE** how would you proceed to close the books of accounts, assuming that besides 7,800 units produced of which 7,000 were sold, there were 200 equivalent units in work-in-progress?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency. Also **give** the profit implication of the method suggested.

Reference

Treatment of Under-absorbed Overheads in Cost Accounting

What's **New**

Profit Implication

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Answer

	(₹)
Actual factory overhead expenses incurred	4,46,380
Less: Overheads recovered from production (2,93,104 hours × ₹ 1.25)	3,66,380
Unabsorbed overheads	80,000

Reasons for unabsorbed overheads

(i)	50% of the unabsorbed overhead was on account of increased in the cost of indirect materials and indirect labour	40,000
(ii)	50% of the unabsorbed overhead was due to factory inefficiency.	40,000

Treatment of unabsorbed overheads in Cost Accounting

1. Unabsorbed overhead amounting to ₹ 40,000, which were due to increase in the cost of indirect material and labour should be charged to units produced by using a supplementary rate.

$$\text{Supplementary rate} = \frac{₹\,40,000}{(7,800+200)\ \text{units}} = ₹\,5 \text{ per unit}$$

The sum of ₹ 40,000 (unabsorbed overhead) should be distributed by using a supplementary rate among cost of sales, finished goods and work-in progress as below:

	(₹)
Cost of sales (7,000 units × ₹ 5)	35,000
Finished goods (800 units × ₹ 5)	4,000
Work-in progress (200 units × ₹ 5)	1,000
	40,000

The use of cost of sales figure, would reduce the profit for the period by ₹ 35,000 and will increase the value of stock of finished goods and work-in-progress by ₹ 4,000 and ₹ 1,000 respectively.

2. The balance amount of unabsorbed overheads viz. of ₹ 40,000 due to factory inefficiency should be charged to Costing Profit & Loss Account, as this is an abnormal loss.

Q 8 ICAI Mat

ABC Ltd. manufactures a single product and absorbs the production overheads at a pre-determined rate of ₹ 10 per machine hour.

At the end of financial year 20X8-X9, it has been found that actual production overheads incurred were ₹ 6,00,000. It included ₹ 45,000 on account of 'written off' obsolete stores and ₹ 30,000 being the wages paid for the strike period under an award.

The production and sales data for the year 20X8-X9 is as under :

Production :	
Finished goods	20,000 units
Work-in-progress	8,000 units
(50% complete in all respects)	
Sales :	
Finished goods	18,000 units

The actual machine hours worked during the period were 48,000. It has been found that one-third of the under-absorption of production overheads was due to lack of production planning and the rest was attributable to normal increase in costs.

Required :

(i) **CALCULATE** the amount of under-absorption of production overheads during the year 20X8-X9; and

(ii) **SHOW** the accounting treatment of under-absorption of production overheads.

Reference — What's **New**

Treatment of Under-absorbed Overheads in Cost Accounting

Watch **Video**

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Answer

(i) **Amount of under-absorption of production overheads during the year 20X8-X9**

		(₹)
Total production overheads actually incurred during the year 20X8-X9		6,00,000
Less : 'Written off' obsolete stores	₹ 45,000	
Wages paid for strike period	₹ 30,000	75,000
Net production overheads actually incurred : (A)		5,25,000
Production overheads absorbed by 48,000 machine hours @ ₹ 10 per hour : (B)		4,80,000
Amount of under – absorption of production overheads : [(A) – (B)]		45,000

(ii) **Accounting treatment of under absorption of production overheads**

It is given in the statement of the question that 20,000 units were completely finished and 8,000 units were 50% complete, one third of the under-absorbed overheads were due to lack of production planning and the rest were attributable to normal increase in costs.

		(₹)
1.	(33 – 1/3% of ₹ 45,000) i.e., ₹ 15,000 of under-absorbed overheads were due to lack of production planning. This being abnormal, should be debited to the Costing Profit and Loss A/c.	15,000

2.	Balance (66–2/3% of ₹ 45,000) i.e., ₹ 30,000 of under-absorbed overheads should be distributed over work-in-progress, finished goods and cost of sales by using supplementary rate.	30,000
Total under-absorbed overheads		45,000

Apportionment of unabsorbed overheads of ₹ 30,000 over, work-in progress, finished goods and cost of sales

Equivalent Completed Units		(₹)
Work-in-Progress (4,000 units × ₹ 1.25) (Refer to working note)	4,000	5,000
Finished goods (2,000 units × ₹ 1.25)	2,000	2,500
Cost of sales (18,000 units × ₹ 1.25)	18,000	22,500
	24,000	30,000

Working Note

$$\text{Supplementary rate per unit} = \frac{₹\,30,000}{24,000} = ₹\,1.25$$

Q 9 RTP May'18; RTP Nov'19

PQR manufacturers – a small scale enterprise, produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The annual budgeted production overheads for the year 2017-18 are ₹ 44,00,000 and budgeted annual machine hours are 2,20,000.

For a period of first six months of the financial year 2017-18, following information were extracted from the books:

Actual production overheads	₹ 24,88,200
Amount included in the production overheads:	
Paid as per court's order	₹ 1,28,000
Expenses of previous year booked in current year	₹ 1,200
Paid to workers for strike period under an award	₹ 44,000
Obsolete stores written off	₹ 6,700
Production and sales data of the concern for the first six months are as under:	
Production:	
Finished goods	24,000 units
Works-in-progress (50% complete in every respect)	18,000 units
Sale:	
Finished goods	21,600 units

The actual machine hours worked during the period were 1,16,000 hours. It is revealed from the analysis of information that ¼ of the under/ over absorption was due to defective production policies and the balance was attributable to increase/decrease in costs.

Required:

(i) **DETERMINE** the amount of under/over absorption of production overheads for the six-month period of 2017-18.

(ii) **EXAMINE** the accounting treatment of under/ over absorption of production overheads, and

(iii) **CALCULATE** the apportionment of the under/ over absorbed overheads over the items.

Reference | What's **New**

Treatment of Under/Over Absorbed overheads

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Answer

(i) **Amount of under/ over absorption of production overheads during the period of first six months of the year 2017-2018:**

	Amount (₹)	Amount (₹)
Total production overheads actually incurred during the period		24,88,200
Less: Amount paid to worker as per court order	1,28,000	
Expenses of previous year booked in the current year	1,200	
Wages paid for the strike period under an award	44,000	
Obsolete stores written off	6,700	(1,79,900)
		23,08,300
Less: Production overheads absorbed as per machine hour rate (1,16,000 hours × ₹ 20*)		23,20,000
Amount of over absorbed production overheads		11,700

*Budgeted Machine hour rate (Blanket rate) = $\frac{₹\ 44,00,000}{2,20,000 \text{ hours}}$ =20 per hour

(ii) **Accounting treatment of over absorbed production overheads:** As, one fourth of the over absorbed overheads were due to defective production policies, this being abnormal, hence should be transferred to Costing Profit and Loss Account.

Amount to be transferred to Costing Profit and Loss Account = (11,700 × ¼) = ₹ 2,925

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 = (11,700 × ¾) =₹ 8,775

Supplementary rate = $\frac{₹\ 8,775}{33,000 \text{ units}}$ = ₹ 0.2659 per unit

(iii) **Apportionment of under absorbed production overheads over WIP, Finished goods and Cost of sales:**

	Equivalent completed units	Amount (₹)
Work-in-Progress (18,000 units × 50% × ₹ 0.2659)	9,000	2,393
Finished goods (2,400 units × ₹ 0.2659)	2,400	638
Cost of sales (21,600 units × ₹ 0.2659)	21,600	5,744
Total	33,000	8,775

Q10 MTP Mar'18

Explain Single and Multiple Overhead Rates.

Reference | What's **New**

Types of Overhead rates

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Answer

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:

$$\text{Single overhead rate} = \left(\frac{\text{Overhead costs for the entire factory}}{\text{Total quantity of the base selected}} \right)$$

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:

$$\text{Multiple overhead rate} = \left(\frac{\text{Overhead allocated/ appportioned to each department/ cost centre or product}}{\text{Corresponding base}} \right)$$

Under multiple overheads 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.

Q11 MTP Apr'19; MTP May'20

Madhu Ltd. has calculated a predetermined overhead rate of ₹ 22 per machine hour for its Quality Check (QC) department. This rate has been calculated for the budgeted level of activity and is considered as appropriate for absorbing overheads. The following overhead expenditures at various activity levels had been estimated.

Total overheads	Number of machine hours
₹ 3,38,875	14,500
₹ 3,47,625	15,500
₹ 3,56,375	16,500

You are **required** to:

(i) **CALCULATE** the variable overhead absorption rate per machine hour.

(ii) **CALCULATE** the estimated total fixed overheads.

(iii) **CALCULATE** the budgeted level of activity in machine hours.

(iv) **CALCULATE** the amount of under/over absorption of overheads if the actual machine hours were 14,970 and actual overheads were ₹ 3,22,000.

(v) **ANALYSE** the arguments for and against using departmental absorption rates as opposed to a single or blanket factory wide rate.

Reference | What's **New**

Segregating Total OH, Budgeted Activity Level, Under or Over Absorption, Departmental and Blanket Overhead Rates

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Answer

(i) **Variable overhead absorption rate**

$$= \frac{\text{Difference in Total Overheads}}{\text{Difference in levels in terms of machine hours}}$$

$$= \frac{₹\,3,47,625 - ₹\,3,38,875}{15,500 \text{ hours} - 14,500 \text{ hours}} = ₹\,8.75 \text{ per machine hour}$$

(ii) **Calculation of Total fixed overheads:**

	(₹)
Total overheads at 14,500 hours	3,38,875
Less: Variable overheads (₹ 8.75 × 14,500)	(1,26,875)
Total fixed overheads	2,12,000

(iii) **Calculation of Budgeted level of activity in machine hours:**

Let budgeted level of activity = X

$$\text{Then, } \frac{₹\,8.75X + ₹\,2,12,000}{X} = ₹\,22$$

$8.75X + ₹\,2,12,000 = 22X$

$13.25X = 2,12,000$

$X = 16,000$

Thus, budgeted level of activity = 16,000 machine hours.

(iv) **Calculation of Under / Over absorption of overheads:**

	(₹)
Actual overheads	3,22,000
Absorbed overheads (14,970 hours × ₹ 22 per hour)	3,29,340
Over-absorption (3,29,340 – 3,22,000)	7,340

(v) Departmental absorption rates provide costs which are more precise than those provided by the use of blanket absorption rates. Departmental absorption rates facilitate variance analysis and cost control. The application of these rates make the task of stock and work-in-process (WIP) valuation easier and more precise. However, the setting up and monitoring of these rates can be time consuming and expensive.

Q12 Nov'19

ABS Enterprises produces a product and adopts the policy to recover factory overheads applying blanket rate based on machine hours. The cost records of the concern reveal the following information:

Budgeted production overheads	₹ 10,35,000
Budgeted machine hours	₹ 90,000
Actual machine hours worked	₹ 45,000
Actual production overheads	₹ 8,80,000
Production overheads (actual) include-	
Paid to worker as per court's award	₹ 50,000
Wages paid for strike period	₹ 38,000
Stores written off	₹ 22,000
Expenses of previous year booked in current year	₹ 18,500
Production -	
Finished goods	30,000 units
Sale of finished goods	27,000 units

The analysis of cost information reveals that 1/3 of the under absorption of overheads was due to defective production planning and the balance was attributable to increase in costs.

You are **required**:

(i) To find out the amount of under absorbed production overheads.

(ii) To give the ways of treating it in Cost Accounts.

(iii) To apportion the under absorbed overheads over the items. (10 Marks)

Reference — What's **New**

Treatment of Under absorbed overheads

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Answer

(i) **Amount of under absorption of production overheads:**

Particular	Amount (₹)	Amount (₹)
Total production overheads actually incurred		8,80,000
Less: Amount paid to worker as per court order	50,000	
Wages paid for the strike period under an award	38,000	
Stores written off	22,000	
Expenses of previous year booked in the current year	18,500	1,28,500
		7,51,500
Less: Production overheads absorbed as per machine hour rate (45,000 hours × ₹ 11.50*)		5,17,500
Amount of under- absorbed production overheads		2,34,000

*Budgeted Machine hour rate (Blanket rate) = $\frac{₹\,10,35,000}{90,000}$ = ₹ 11.50 per hour

(ii) **Accounting treatment of under absorbed production overheads:**

(a) As 1/3rd of the under absorbed overheads were due to defective production planning, this being abnormal, hence should be debited to Costing Profit and Loss Account.

Amount to be debited to Costing Profit and Loss Account

= ₹ 2,34,000 × 1/3 = ₹ 78,000.

(b) Balance of under absorbed production overheads should be distributed over Finished goods and Cost of sales by applying supplementary rate*.

Amount to be distributed = ₹ 2,34,000 × 2/3 = ₹ 1,56,000

*Supplementary rate = $\frac{₹\,1,56,000}{30,000\ \text{units}}$ = ₹ 5.20 per unit

(iii) **Apportionment of under absorbed production overheads over Finished goods and Cost of sales:**

Particular	Units	Amount (₹)
Finished goods (3,000 units × ₹ 5.20)	3,000	15,600
Cost of sales (27,000 units × ₹ 5.20)	27,000	1,40,400
Total	30,000	1,56,000

Q13 Jan'21

Explain Blanket Overhead Rate and Departmental Overhead Rate. **How** they are calculated? **State** the conditions required for the application of Blanket Overhead Rate.

Reference	What's New
Different types of overhead rates	**Same as Question 10**

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Answer

Blanket Overhead Rate: Blanket overhead rate refers to the computation of one single overhead rate for the whole factory.

This overhead rate is computed as follows:

$$\text{Blanket Rate} = \frac{\text{Total overheads for the factory}}{\text{Total number of units of base for the factory}}$$

Departmental Overhead Rate: It refers to the computation of one single overhead rate for a particular production unit or department.

This overhead rate is determined by the following formula:

$$\text{Departmental overhead Rate} = \frac{\text{Overheads of department or cost centre}}{\text{Corresponding base}}$$

Conditions required for the Application of Blanket Overhead:

A blanket rate should be applied in the following cases:

(1) Where only one major product is being produced.

(2) Where several products are produced, but

(a) All products pass through all departments; and

(b) All products are processed for the same length of time in each department.

Q14 MTP May'21

Mix Soap Pvt. Ltd., manufactures three brands of soap - Luxury, Herbal and Beauty. The following information has been obtained for the period from June 1 to June 30, 2021 relating to three brands:

	Luxury	Herbal	Beauty
Actual Production (units)	6,750	14,000	77,500
Wages paid (₹)	7,500	18,750	1,15,000
Raw materials consumed (₹)	20,000	47,000	2,40,000
Selling price per unit (₹)	25	15	8

Other data are:

Factory overheads	₹ 80,000
General & administration overheads (equal for all)	₹ 48,000
Selling overheads	20% of Works cost

If the company limits the manufacture to just one brand of soap adopting a single brand production, then monthly production will be:

	Units
Luxury	5,000
Herbal	15,000
Beauty	30,000

Further, factory overheads are to be allocated to each brand on the basis of the units which could have been produced when single brand production was in operation.

You are **required** to:

(i) **Find** out the Factory overhead rate for all the brands.

(ii) **Prepare** a cost statement for the month of June showing the various elements of cost and also the profit earned. (10 Marks)

Reference — What's **New**

Factory Overhead Rate and Cost Statement

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Answer

(i) **Calculation of Factory overhead rate.**

If the single brand production was in operation, then

1 unit of Luxury = 3 units of Herbal = 6 units of Beauty. Therefore, the factory overhead ratio in the reverse order would be 5,000:15,000:30,000 or 1:3:6.

The overhead rate will be lowest in case of brand which will be produced in high number.

Therefore, in case of Beauty soap brand, the overhead rate will be:

$$= \frac{80,000}{6 \times 6,750 + 3 \times 14,000 + 1 \times 77,500}$$

$$= \frac{80,000}{40,500 + 42,000 + 77,500}$$

$$= \frac{80,000}{1,60,000} = 0.5$$

So, the overhead rate will be:

Luxury = 0.5 x 6 = ₹ 3

Herbal = 0.5 x 3 = ₹ 1.5

Beauty = 0.5 x 1 = ₹ 0.5

(ii) **Statement of Cost of Mix Soap Pvt. Ltd. for the month of June 2021:**

	Luxury (₹)	Herbal (₹)	Beauty (₹)	Total (₹)
Raw material consumed	20,000	47,000	2,40,000	3,07,000
Add: Wages paid	7,500	18,750	1,15,000	1,41,250
Prime cost	27,500	65,750	3,55,000	4,48,250
Add: Factory overheads	20,250 (₹ 3 × 6,750)	21,000 (₹ 1.5 × 14,000)	38,750 (₹ 0.5 × 77,500)	80,000
Works cost	47,750	86,750	3,93,750	5,28,250
Add: General & administration oveheads (1:1:1)	16,000	16,000	16,000	48,000
Add: Selling expenses	9,550 (₹ 47,750 × 0.20)	17,350 (₹ 86,750 × 0.20)	78,750 (₹ 3,93,750 × 0.20)	1,05,650
Cost of sales	73,300	1,20,100	4,88,500	6,81,900
Profit (Balancing figure)	95,450	89,900	1,31,500	3,16,850
Sales	1,68,750 (₹ 25 × 6,750)	2,10,000 (₹ 15 × 14,000)	6,20,000 (₹ 8 × 77,500)	9,98,750

Q15 Dec'21

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 strike 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: [10]

(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.

Reference — What's **New**

Unabsorbed Overheads and its treatment

Watch **Video**

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Answer

(i) Amount of under-absorption of overheads during the year 2020-21

		(₹)
Total production overheads actually incurred during the year 2020-21		35,50,000
Less: Wages paid during strike period	₹2,00,000	
Wages of previous year booked in current year	₹ 1,00,000	3,00,000
Net production overheads actually incurred: (A)		32,50,000
Production overheads absorbed by 1.50 lakh man-days @ ₹ 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.

	(₹)
1. (40% of ₹2,50,000) i.e. ₹ 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 ₹ 2,50,000) i.e. ₹ 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 ₹1,50,000 over work-in-progress, finished goods and cost of sales.

	Equivalent Completed units	(₹)
Work-in-progress (13,000 units × ₹ 2) (Refer to Working Note)	20000 * 65% = 13,000	26,000
Finished goods (12,000 units × ₹ 2)	12,000	24,000
Cost of sales (50,000 units × ₹ 2)	50,000	1,00,000
	75,000	1,50,000

Journal entry:

Work-in-progress control A/c	Dr.	₹ 26,000	
Finished goods control A/c	Dr.	₹ 24,000	
Cost of Sales A/c	Dr.	₹ 1,00,000	
Costing Profit & Loss A/c	Dr.	₹ 1,00,000	
To Overhead control A/c			₹ 2,50,000

Working Note:

$$\text{Supplementary overhead absorption rate} = \frac{₹\,1,50,000}{75,000\ \text{units}} = ₹\ 2\ \text{per unit}$$

Q16 RTP May'22

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 (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
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 (₹ 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.

Reference | What's **New**

Primary & Secondary Distribution | **Trial & Error Method**

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Answer

(a) Primary Distribution of Overheads

	Basis	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
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 (1:2:1:1)	Light Points	3,00,000	60,000	1,20,000	60,000	60,000
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,

$Y = 11,40,000 + 0.20\ (9,20,000 + 0.05\ Y)$

$= 13,24,000 + 0.01\ Y$

$Y - 0.01Y = \frac{13,24,000}{0.99}$

$Y = 13,24,000$

$Y = ₹\ 13,37,374$

The total expense of Y is ₹ 13,37,374 and that of X is ₹ 9,86,869 i.e., ₹ 9,20,000 + (0.05 × ₹ 13,37,374).

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	B (₹)
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 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 (₹)	Y (₹)
Overheads as per primary distribution	9,20,000	11,40,000
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 9,20,000)	---	1,84,000
	---	13,24,000
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,24,000)	66,200	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 66,200)	---	13,240
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,240)	662	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 662)		132
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 132)	7	
Total	9,86,869	13,37,372

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	B (₹)
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 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 (₹)	B (₹)	X (₹)	Y (₹)
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	-	-

Q17 May'22

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 Unit*	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 ₹ 20 per hour and production overheads are absorbed on a machine hour basis. The overhead absorption rate for the period is ₹ 30 per machine hour.

* 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. [10]

Reference — What's **New**

Conventional method and Activity based costing Method

Watch **Video**

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Answer

(i) **Statement showing "Cost per unit" using "conventional method"**

Particulars of Costs	AX (₹)	BX (₹)	CX (₹)
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
	(₹)	(₹)	(₹)
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	CX
(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 = ₹ 28,87,500

Calculation of Cost Driver Rate

Cost Pool	%	Overheads (₹)	Cost Driver (Basis)	Cost Driver (Units)	Cost Driver Rate (₹)
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

Q18 RTP Nov'22

SE Limited manufactures two products- A and B. The company had budgeted factory overheads amounting to ₹ 36,72,000 and budgeted direct labour hour of 1,80,000 hours. The company uses pre-determined overhead recovery rate for product costing purposes.

The department-wise break-up of the overheads and direct labour hours were as follows:

Particulars	Budgeted overheads	Budgeted direct labour hours	Rate per direct labour hour
Department Pie	₹ 25,92,000	90,000 hours	₹ 28.80
Department Qui	₹ 10,80,000	90,000 hours	₹ 12.00
Total	₹ 36,72,000	1,80,000 hours	

Additional Information:

Each unit of product A requires 4 hours in department Pie and 1 hour in department Qui. Also, each unit of product B requires 1 hour in department Pie and 4 hours in department Qui.

This was the first year of the company's operation. There was no WIP at the end of the year. However, 1,800 and 5,400 units of Products A and B were on hand at the end of the year.

The budgeted activity has been attained by the company.

You are **required** to:

(i) **DETERMINE** the production and sales quantities of both products 'A' and 'B' for the above year.

(ii) **ASCERTAIN** the effect of using a pre-determined overhead rate instead of department-wise overhead rates on the company's income due to its effect on stock value.

(iii) **CALCULATE** the difference in the selling price due to the use of pre-determined overhead rate instead of using department-wise overhead rates. Assume that the direct costs (material and labour costs) per unit of products A and B were ₹ 25 and ₹ 40 respectively and the selling price is fixed by adding 40% over and above these costs to cover profit and selling and administration overhead.

Reference | What's New

Pre-determined Overhead Rate vs Department-wise Overhead Rate

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Answer

(i) **Computation of production and sales quantities:**

The products processing times are as under –

Product	A	B	Total
Department Pie	4 hours	1 hour	90,000 hours
Department Qui	1 hour	4 hours	90,000 hours

Let X and Y be the number of units (production quantities) of the two products. Converting these into equations, we have –

$4X + Y = 90,000$ &

$X + 4Y = 90,000$

Solving the above, we get X = 18,000; Y = 18,000

Hence, the Production and Sales Quantities are determined as under –

Product	Production Quantity	Closing Stock (Given)	Sales Quantity (Balancing Figure)
A	18,000 units	1,800 units	16,200 units
B	18,000 units	5,400 units	12,600 units

(ii) **Effect of using pre-determined rate of overheads on the company's profit**

Product	Closing Stock Quantity	Overhead included using pre-determined rate	Overhead included using department rate	Difference in overhead in closing stock value / Effect on closing stock value
A	1,800 units	1,800 × 5 hours × ₹ 20.40 = ₹1,83,600	Pie = 1,800 units × 4 hours × ₹ 28.80 = ₹2,07,360 Qui = 1,800 units × 1 hour × ₹ 12 = ₹ 21,600	(-) ₹ 45,360
B	5,400 units	5,400 × 5 hours × ₹ 20.40 = ₹5,50,800	Pie = 5,400 units × 1 hour × ₹ 28.80 = ₹1,55,520	(+) ₹ 1,36,080

			Qui = 5,400 units × 4 hours × ₹12 = ₹2,59,200	
Total		₹ 7,34,400	₹ 6,43,680	(+) ₹ 90,720

Use of pre-determined overhead rate has resulted in over valuation of stock by ₹ 90,720 due to which the company's income would be affected (increase) by ₹ 90,720. Profit would be affected only to the extent of Overhead contained in closing finished goods and closing WIP, if any.

(iii) **Effect of using pre-determined on the products' selling prices**

Particulars	Product A	Product B
Selling Price per unit if pre-determined overhead rate is used	₹177.80	₹ 198.80
Selling Price per unit if department wise rate is used	₹ 213.08	₹163.52
Difference	₹ 35.28	₹ 35.28
	Under-Priced	Over-Priced

Workings:

(1) **Pre-determined overhead recovery rate** $= \frac{₹\ 36,72,000}{1,80,000 \text{ hours}} =$ ₹ 20.40 per direct labour hour

(2) **If pre-determined recovery rate is used**

Particulars	Product A in ₹	Product B in ₹
Materials & Labour	25.00	40.00
Add: Production Overhead A = 5 hours × ₹ 20.40 per hour B = 5 hours × ₹ 20.40 per hour	102.00	102.00
Cost of production	127.00	142.00
Add: 40% of margin	50.80	56.80
	177.80	198.50

(3) **If department-wise recovery rate is used**

Particulars	Product A in ₹	Product B in ₹
Materials & Labour	25.00	40.00
Add: Production Overhead	127.20	76.80
A = Pie = 4 hours × ₹ 28.80 Qui = 1 hour × ₹ 12 B = Pie = 1 hour × ₹ 28.80 Qui = 4 hours × ₹ 12		
Cost of production	152.20	116.80
Add: 40% of margin	60.88	46.72
Selling Price per unit	213.08	163.52

NOTES

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Chapter 7

Overhead : Primary and Secondary Distribution

Q1 ICAI Mat

XL Ltd., has three production departments and four service departments. The expenses for these departments as per Primary Distribution Summary are as follows:

Production Departments:	(₹)	(₹)
A	30,00,000	
B	26,00,000	
C	24,00,000	80,00,000
Service Departments:	**(₹)**	**(₹)**
Stores	4,00,000	
Time-keeping and Accounts	3,00,000	
Power	1,60,000	
Canteen	1,00,000	9,60,000

The following information is also available in respect of the production departments:

	Dept. A	Dept. B	Dept. C
Horse power of Machine	300	300	200
Number of workers	20	15	15
Value of stores requisition in (₹)	2,50,000	1,50,000	1,00,000

PREPARE a statement apportioning the costs of service departments over the production departments.

Reference

Reapportionment

What's **New**

Direct method

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Answer

Secondary Overhead Distribution Statement

Items of cost (as per primary distribution summary)	Basis of apportionment	Total (₹)	Production Departments		
			A (₹)	B (₹)	C (₹)
Cost as per primary distribution summary		80,00,000	30,00,000	26,00,000	24,00,000
Stores (5:3:2)	Value of Store requisition	4,00,000	2,00,000	1,20,000	80,000
Time-keeping and Accounts (4:3:3)	No. of workers	3,00,000	1,20,000	90,000	90,000
Power (3:3:2)	H.P. of Machine	1,60,000	60,000	60,000	40,000
Canteen (4:3:3)	No. of workers	1,00,000	40,000	30,000	30,000
		89,60,000	34,20,000	29,00,000	26,40,000

Q2 ICAI Mat

Suppose the expenses of two production departments A and B and two service departments X and Y are as under:

	Amount (₹)	Apportionment Basis		
		Y	A	B
X	2,00,000	25%	40%	35%
Y	1,50,000	—	40%	60%
A	3,00,000			
B	3,20,000			

Reference | What's **New**

Reapportionment | **Step down method**

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Answer

Summary of Overhead Distribution

Departments	X (₹)	Y (₹)	A (₹)	B (₹)
Amount as given above	2,00,000	1,50,000	3,00,000	3,20,000
Expenses of X Dept. apportioned over Y, A and B Dept. in the ratio (5:8:7)	(2,00,000)	50,000	80,000	70,000

		2,00,000	3,80,000	3,90,000
Expenses of Y Dept. apportioned over A and B Dept. in the ratio (2:3)	-	(2,00,000)	80,000	1,20,000
Total	Nil	Nil	4,60,000	5,10,000

Q3 ICAI Mat

Service departments' expenses

	(₹)
Boiler House	3,00,000
Pump Room	60,000
	3,60,000

The allocation is :

	Production Departments		Boiler House	Pump Room
	A	B		
Boiler House	60%	35%	–	5%
Pump Room	10%	40%	50%	–

Reference

Reapportionment

What's **New**

Simultaneous Equation method

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Answer

The total expenses of the two service departments will be determined as follows:

Let B stand for Boiler House expenses and P for Pump Room expenses.

Then

B = 3,00,000 + 1/2 P

P = 60,000 + 1/20 B

Substituting the value of B,

P = 60,000 + 1/20 (3,00,000 + 1/2 P)

= 60,000 + 15,000 + 1/40 P

= 75,000 + 1/40 P

40 P = 30,00,000 + P

39 P = 30,00,000

P = ₹ 76,923

The total of expenses of the Pump Room are ₹ 76,923 and that of the Boiler House is ₹ 3,38,462 i.e., ₹ 3,00,000 + 1/2 × ₹ 76,923.

The expenses will be allocated to the production departments as under:

Production departments:

	A (₹)	B (₹)
Boiler House (60% and 35% of ₹ 3,38,462)	2,03,077	1,18,462
Pump Room (10% and 40% of ₹ 76,923)	7,692	30,769
Total	2,10,769	1,49,231

The total of expenses apportioned to A and B is ₹ 3,60,000.

Q4 ICAI Mat

Sanz Ltd., is a manufacturing company having three production departments, 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December 20X3:

	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct material		1,00,000	2,00,000	4,00,000	2,00,000	1,00,000
Direct wages		5,00,000	2,00,000	8,00,000	1,00,000	2,00,000
Factory rent	4,00,000					
Power	2,50,000					
Depreciation	1,00,000					
Other overheads	9,00,000					

Additional information:

Area (Sq. ft.)	500	250	500	250	500
Capital value of assets (₹ lakhs)	20	40	20	10	10
Machine hours	1,000	2,000	4,000	1,000	1,000
Horse power of machines	50	40	20	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	C	X	Y
Service Dept. 'X' (%)	45	15	30	–	10
Service Dept. 'Y' (%)	60	35	–	5	–

Required:

(i) **PREPARE** a statement showing distribution of overheads to various departments.

(ii) **PREPARE** a statement showing re-distribution of service departments expenses to production departments using Trial and error method.

Reference | **What's New**

Reapportionment | **Trial and error method**

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Answer

(i) **Overhead Distribution Summary**

	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct materials	Direct	–	–	–	–	2,00,000	1,00,000
Direct wages	Direct	–	–	–	–	1,00,000	2,00,000
Factory rent	Area	4,00,000	1,00,000	50,000	1,00,000	50,000	1,00,000
Power	H.P. × Machine Hrs.	2,50,000	50,000	80,000	80,000	15,000	25,000
Depreciation	Capital value	1,00,000	20,000	40,000	20,000	10,000	10,000
Other overheads	Machine hrs.	9,00,000	1,00,000	2,00,000	4,00,000	1,00,000	1,00,000
		16,50,000	2,70,000	3,70,000	6,00,000	4,75,000	5,35,000

(ii) **Redistribution of Service Department's expenses:**

	Service Departments	
	X (₹)	Y (₹)
Overheads as per primary distribution	4,75,000	5,35,000
(i) Apportionment of Dept-X expenses to Dept-Y (10% of ₹ 4,75,000)	---	47,500
	---	5,82,500
(ii) Apportionment of Dept-Y expenses to Dept-X [5% of (₹ 5,35,000 + ₹ 47,500)]	29,125	---
(i) Apportionment of Dept-X expenses to Dept-Y (10% of ₹ 29,125)	---	2,913
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 2,913)	146	---
Total	5,04,271	5,85,413

Distribution of Service departments' overheads to Production departments

	Production Departments		
	A (₹)	B (₹)	C (₹)
Overhead as per primary distribution	2,70,000	3,70,000	6,00,000

Dept- X (90% of ₹ 5,04,300)	2,26,900	75,600	1,51,300
Dept- Y (95% of ₹ 5,85,400)	3,51,300	2,04,900	---
	8,48,200	6,50,500	7,51,300

Q5 ICAI Mat

PH Ltd., is a manufacturing company having three production departments, 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December 20X8:

	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct material		1,00,000	2,00,000	4,00,000	2,00,000	1,00,000
Direct wages		5,00,000	2,00,000	8,00,000	1,00,000	2,00,000
Factory rent	4,00,000					
Power	2,50,000					
Depreciation	1,00,000					
Other overheads	9,00,000					

Additional information:

Area (Sq. ft.)	500	250	500	250	500
Capital value of assets (₹ lakhs)	20	40	20	10	10
Machine hours	1,000	2,000	4,000	1,000	1,000
Horse power of machines	50	40	20	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	C	X	Y
Service Dept. 'X' (%)	45	15	30	–	10
Service Dept. 'Y' (%)	60	35	–	5	–

Required:

(i) **PREPARE** a statement showing distribution of overheads to various departments.

(ii) **PREPARE** a statement showing re-distribution of service departments expenses to production departments.

(iii) **CALCULATE** machine hour rates of the production departments 'A', 'B' and 'C'.

Reference — What's New

Reapportionment | **Repeated distribution method**

Watch Video

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Answer

(i) **Overhead Distribution Summary**

	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct materials	Direct	–	–	–	–	2,00,000	1,00,000
Direct wages	Direct	–	–	–	–	1,00,000	2,00,000
Factory rent	Area	4,00,000	1,00,000	50,000	1,00,000	50,000	1,00,000
Power	H.P. × Machine Hrs.	2,50,000	50,000	80,000	80,000	15,000	25,000
Depreciation	Capital value	1,00,000	20,000	40,000	20,000	10,000	10,000
Other overheads	Machine hrs.	9,00,000	1,00,000	2,00,000	4,00,000	1,00,000	1,00,000
		16,50,000	2,70,000	3,70,000	6,00,000	4,75,000	5,35,000

(ii) **Redistribution of Service Department's expenses**

	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Total overheads	2,70,000	3,70,000	6,00,000	4,75,000	5,35,000
Dept. X overhead apportioned in the ratio (45:15:30: —:10)	2,13,750	71,250	1,42,500	(4,75,000)	47,500
Dept. Y overhead apportioned in the ratio (60:35: —:5: —)	3,49,500	2,03,875	–	29,125	(5,82,500)
Dept. X overhead apportioned in the ratio (45:15:30: —:10)	13,106	4,369	8,738	(29,125)	2,912
Dept. Y overhead apportioned in the ratio (60:35: —:5: —)	1,747	1,019	–	146	(2,912)
Dept. X overhead apportioned in the ratio (45:15:30: —:10)	65	22	44	(146)	15
Dept. Y overhead apportioned in the ratio (60:35: —:5: —)	9	6	-	-	(15)
	8,48,177	6,50,541	7,51,282	–	–

(iii) **Machine hour rate:**

		A	B	C
A	Total overheads (₹)	8,48,177	6,50,541	7,51,282
B	Machine hours	1,000	2,000	4,000
C	Machine hour rate (₹) [A ÷ B]	848.18	325.27	187.82

Q6 ICAI Mat; MTP Nov'20

A Ltd., manufactures two products A and B. The manufacturing division consists of two production departments P_1 and P_2 and two service departments S_1 and S_2.

Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P_1 is based on direct machine hours, while the rate of Department P_2 is based on direct labour hours. In applying overheads, the pre-determined rates are multiplied by actual hours.

For allocating the service department costs to production departments, the basis adopted is as follows:

(i) Cost of Department S_1 to Department P_1 and P_2 equally, and

(ii) Cost of Department S_2 to Department P_1 and P_2 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	P_1	25,50,000	S_1	6,00,000
	P_2	21,75,000	S_2	4,50,000

Budgeted output in units:

Product A 50,000; B 30,000.

Budgeted raw-material cost per unit:

Product A ₹ 120; Product B ₹ 150.

Budgeted time required for production per unit:

Department P_1 : Product A : 1.5 machine hours
Product B : 1.0 machine hour

Department P_2 : Product A : 2 Direct labour hours
Product B : 2.5 Direct labour hours

Average wage rates budgeted in Department P_2 are:

Product A - ₹ 72 per hour and Product B – ₹ 75 per hour.

All materials are used in Department P_1 only.

Actual data: (for the month of July, 20X8)

Units actually produced: Product A : 4,000 units
Product B : 3,000 units

Actual direct machine hours worked in Department P_1:

On product A 6,100 hours, Product B 4,150 hours.

Actual direct labour hours worked in Department P_2:

on product A 8,200 hours, Product B 7,400 hours.

Costs actually incurred:

	Product A (₹)	Product B (₹)
Raw materials	4,89,000	4,56,000
Wages	5,91,900	5,52,000

Overheads: Department	P_1	2,31,000	S_1	60,000
	P_2	2,04,000	S_2	48,000

You are **required** to :

(i) **COMPUTE** the pre-determined overhead rate for each production department.

(ii) **PREPARE** a performance report for July, 20X8 that will reflect the budgeted costs and actual costs.

Reference | What's **New**

Primary distribution, Reapportionment and Overhead rate | **Performance report**

Watch **Video**

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Answer

(i) **Computation of predetermined overhead rate for each production department from budgeted data**

	Production Department		Service Department	
	P_1	P_2	S_1	S_2
Budgeted factory overheads for the year in (₹)	25,50,000	21,75,000	6,00,000	4,50,000
Allocation of service department S_1's costs to production departments P_1 and P_2 equally in (₹)	3,00,000	3,00,000	(6,00,000)	--
Allocation of service department S_2's costs to production departments P_1 and P_2 in the ratio of 2:1 in (₹)	3,00,000	1,50,000	–	(4,50,000)
Total	31,50,000	26,25,000	--	--
Budgeted machine hours in department P_1 (working note-1)	1,05,000	--		

Budgeted labour hours in department P_2 (working note-1)	--	1,75,000		
Budgeted machine/ labour hour rate (₹)	30.00	15.00		

(ii) **Performance report for July, 20X8**

(When 4,000 and 3,000 units of products A and B respectively were actually produced)

	Budgeted (₹)	Actual (₹)
Raw materials used in Dept. P_1:		
A : 4,000 units × ₹ 120	4,80,000	4,89,000
B : 3,000 units × ₹ 150	4,50,000	4,56,000
Direct labour cost (on the basis of labour hours worked in department P_2)		
A : 4,000 units × 2 hrs. × ₹ 72	5,76,000	5,91,900
B : 3,000 units × 2.5 hrs. × ₹ 75	5,62,500	5,52,000
Overhead absorbed on machine hour basis in Dept. P_1:		
A : 4,000 units × 1.5 hrs. × ₹ 30	1,80,000	1,74,400*
B : 3,000 units × 1 hr. × ₹ 30	90,000	1,18,649*
Overhead absorbed on labour hour basis in Dept. P_2:		
A : 4,000 units × 2 hrs. × ₹ 15	1,20,000	1,31,364**
B : 3,000 units × 2.5 hrs. × ₹ 15	1,12,500	1,18,548**
	25,71,000	26,31,861

* (Refer to working note 4)

** (Refer to working note 5)

Working notes:

1.

	Product A	Product B	Total
Budgeted output (in units)	50,000	30,000	
Budgeted machine hours in Dept. P_1	75,000 (50,000×1.5 hrs.)	30,000 (30,000×1 hr.)	1,05,000
Budgeted labour hours in Dept. P_2	1,00,000 (50,000×2 hrs.)	75,000 (30,000×2.5 hrs.)	1,75,000

2.

	Product A	Product B	Total
Actual output (in units)	4,000	3,000	
Actual machine hours utilized in Dept. P_1	6,100	4,150	10,250
Actual labour hours utilised in Dept. P_2	8,200	7,400	15,600

3. **Computation of actual overhead rates for each production department from actual data**

	Production Department		Service Department	
	P_1	P_2	S_1	S_2
Actual factory overheads for the month of July, 20X1 in (₹)	2,31,000	2,04,000	60,000	48,000
Allocation of service Dept. S_1's costs to production Dept. P_1 and P_2 equally in (₹)	30,000	30,000	(60,000)	–
Allocation of service Dept. S_2's costs to production Dept. P_1 and P_2 in the ratio of 2:1 in (₹)	32,000	16,000	–	(48,000)
Total	2,93,000	2,50,000	--	--
Actual machine hours in Dept. P_1 (working note-2)	10,250	--		
Actual labour hours in Dept. P_2 (working note-2)	--	15,600		
Actual machine/ labour hour rate (₹)	28.59	16.02		

4. **Actual overheads absorbed (based on machine hours)**

   A : 6,100 hrs × ₹ 28.59 = ₹ 1,74,400

   B : 4,150 hrs × ₹ 28.59 = ₹ 1,18,649

5. **Actual overheads absorbed (based on labour hours)**

   A : 8,200 hrs × ₹ 16.02 = ₹ 1,31,364

   B : 7,400 hrs × ₹ 16.02 = ₹ 1,18,548

Q7 ICAI Mat

A company which sells four products, some of them unprofitable, proposes discontinuing the sale of one of them. The following information is available regarding income, costs and activity for the year ended 31st March, 20X9.

	Products			
	A	B	C	D
Sales (₹)	30,00,000	50,00,000	25,00,000	45,00,000
Cost of sales (₹)	20,00,000	45,00,000	21,00,000	22,50,000
Area of storage (Sq.ft.)	50,000	40,000	80,000	30,000
Number of parcels sent	1,00,000	1,50,000	75,000	1,75,000
Number of invoices sent	80,000	1,40,000	60,000	1,20,000

Selling and Distribution overheads and the basis of allocation are:

	(₹)	Basis of allocation to products
Fixed Costs		
Rent & Insurance	3,00,000	Square feet
Depreciation	1,00,000	Parcel
Salesmen's salaries & expenses	6,00,000	Sales Volume
Administrative wages and salaries	5,00,000	No. of invoices
Variable Costs:		
Packing wages & materials	₹ 2 per parcel	
Commission	4% of sales	
Stationery	₹ 1 per invoice	

You are required to **PREPARE** Costing Profit & Loss Statement, showing the percentage of profit or loss to sales for each product.

Reference — What's **New**

Selling and Distribution Overheads

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Answer

Statement of Profit or Loss on Various Products during the year ended March 31, 20X9.

	Total (₹)	Products			
		A (₹)	B (₹)	C (₹)	D (₹)
Sales	1,50,00,000	30,00,000	50,00,000	25,00,000	45,00,000
Variable costs:					
Cost of sales	1,08,50,000	20,00,000	45,00,000	21,00,000	22,50,000
Commissions 4% of sales	6,00,000	1,20,000	2,00,000	1,00,000	1,80,000
Packing wages & materials @ ₹ 2 per parcel	10,00,000	2,00,000	3,00,000	1,50,000	3,50,000
Stationery @ ₹ 1 per invoice	4,00,000	80,000	1,40,000	60,000	1,20,000
Total variable costs	1,28,50,000	24,00,000	51,40,000	24,10,000	29,00,000
Contribution (Sales – variable cost)	21,50,000	6,00,000	(1,40,000)	90,000	16,00,000
Fixed Costs:					
Rent & Insurance (5:4:8:3)	3,00,000	75,000	60,000	1,20,000	45,000
Depreciation (4:6:3:7)	1,00,000	20,000	30,000	15,000	35,000
Salesmen's salaries & expenses (6:10:5:9)	6,00,000	1,20,000	2,00,000	1,00,000	1,80,000

Administrative wages & salaries (4:7:3:6)	5,00,000	1,00,000	1,75,000	75,000	1,50,000
Total Fixed costs	15,00,000	3,15,000	4,65,000	3,10,000	4,10,000
Profit or Loss (Contribution–fixed Costs)	6,50,000	2,85,000	(6,05,000)	(2,20,000)	11,90,000
Percentage of profit or Loss on sales (%)	4.33	9.50	(12.10)	(8.80)	26.4

Q8 ICAI Mat

The ABC Company has the following account balances and distribution of direct charges on 31st March, 20X1.

	Total	Production Depts.		Service Depts.	
		Machine shop	Packing	Gen. Plant	Store & Maintenance
	(₹)	(₹)	(₹)	(₹)	(₹)
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				
Insurance	1,000				
Taxes	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	Radiator Sections	No. of Employees	Investment (₹)	H.P hours
Machine Shop	2,000 Sq. ft.	45	20	640,000	3,500
Packing	800 " "	90	10	200,000	500
General Plant	400 " "	30	3	10,000	–
Store & Maint.	1,600 " "	60	5	150,000	1,000
	4,800 " "	225	38	1,000,000	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:

(a) **PREPARE** an overhead distribution statement with supporting schedules to show computations and basis of distribution including distribution of the service department expenses to producing department.

(b) **DETERMINE** the service department distribution by the method of continued distribution. Carry through 3 cycles. Show all calculations to the nearest rupees.

Reference

Primary Distribution and Reapportionment

What's **New**

Repeated Distribution Method

Watch **Video**

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Answer

(a) **Overhead Distribution Statement**

Allocated Expenses:	Production Departments		Service Departments	
	Machine Shop	Packing	General Plant	Stores & Maintenance
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	6,200	4,700	17,170	7,350
Apportioned expenses (See schedule below)	77,720	25,800	2,830	22,650
Total	83,920	30,500	20,000	30,000

Schedule of Apportioned Expenses

Item	Basis	Machine (₹)	Packing (₹)	General Plant (₹)	Stores & Maintenance (₹)
Power	Horse Power Hrs.	5,600	800	–	1,600
Rent	Floor Space	5,000	2,000	1,000	4,000
Fuel & Heat	Radiator Secs.	1,200	2,400	800	1,600
Insurance	Investment	640	200	10	150

Taxes	Investment	1,280	400	20	300
Depreciation	Investment	64,000	20,000	1,000	15,000
Total		77,720	25,800	2,830	22,650

(b) **Distribution of Service Department Expenses**

	Production Departments		Service Departments	
	Machine (₹)	Packing (₹)	General Plant (₹)	Stores & Maintenance (₹)
Total Expense [as per (a)]	83,920	30,500	20,000	30,000
Transfer from Stores & Maintenance	15,000	6,000	9,000	–30,000
Transfer from General Plant	16,571	8,286	–29,000	4,143
Transfer from Stores & Maintenance	2,072	829	1,242	–4,143
Transfer from General Plant	710	355	–1,242	177
Transfer from Stores & Maintenance	88	36	53	–177
Transfer from General Plant	35	18	–53	—
Total	1,18,396	46,024	—	—

Q9 ICAI Mat

Modern Manufactures Ltd. has three Production Departments P_1, P_2, P_3 and two Service Departments S_1 and S_2 details pertaining to which are as under:

	P_1	P_2	P_3	S_1	S_2
Direct wages (₹)	3,000	2,000	3,000	1,500	195
Working hours	3,070	4,475	2,419	-	-
Value of machines (₹)	60,000	80,000	1,00,000	5,000	5,000
H.P. of machines	60	30	50	10	-
Light points	10	15	20	10	5
Floor space (sq. ft.)	2,000	2,500	3,000	2,000	500

The following figures extracted from the Accounting records are relevant:

	(₹)
Rent and Rates	5,000
General Lighting	600
Indirect Wages	1,939
Power	1,500
Depreciation on Machines	10,000
Sundries	9,695

The expenses of the Service Departments are allocated as under :

	P_1	P_2	P_3	S_1	S_2
S_1	20%	30%	40%	-	10%
S_2	40%	20%	30%	10%	-

FIND OUT the total cost of product X which is processed for manufacture in Departments P_1, P_2 and P_3 for 4, 5 and 3 hours respectively, given that its Direct Material Cost is ₹ 50 and Direct Labour Cost is ₹ 30.

Reference

Primary Distribution, Reapportionment and Overhead rate and Product Cost

What's **New**

Repeated / Simultaneous

Watch **Video**

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Answer

Statement Showing Distribution of Overheads of Modern Manufactures Ltd.

Particulars	Basis	Total (₹)	Production Department			Service Departments	
			P_1 (₹)	P_2 (₹)	P_3 (₹)	S_1 (₹)	S_2 (₹)
Direct wages	Actual	1,695	-	-	-	1,500	195
Rent & rates	Area	5,000	1,000	1,250	1,500	1,000	250
General lighting	Light points	600	100	150	200	100	50
Indirect wages	Direct wages	1,939	600	400	600	300	39
Power	H.P.	1,500	600	300	500	100	–
Depreciation of machines	Value of machines	10,000	2,400	3,200	4,000	200	200
Sundries	Direct wages	9,695	3,000	2,000	3,000	1,500	195
		30,429	7,700	7,300	9,800	4,700	929

Redistribution of Service Department's Expenses over Production Departments

	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)	S_1 (₹)	S_2 (₹)
Total Overheads	30,429.00	7,700	7,300	9,800	4,700	929
Dept. S_1 Overheads apportioned in the ratio: (20:30:40:—:10)	4,700.00	940	1,410	1,880	-4,700	470
Dept. S_2 overheads apportioned in the ratio: (40:20:30:10:—)	1,399.00	559.60	279.80	419.70	139.90	-1,399.00

Dept. S_1 overheads apportioned in the ratio (20:30:40:—:10)	139.90	27.98	41.97	55.96	-139.90	13.99
Dept. S_2 overheads apportioned in the ratio (40:20:30:10:—)	13.99	5.60	2.80	4.20	1.39	-13.99
Dept. S_1 overheads apportioned in the ratio (20:30:40:—:10)	1.39	0.28	0.42	0.56	-1.39	0.13
Dept. S_2 overheads apportioned in the ratio (40:20:30:10:—)	0.13	0.06	0.03	0.04		-0.13
Total	9,233.52	9,035.02	12,160.46			
Working hours	3,070.00	4,475.00	2,419.00			
Working rate per hour	3.00	2.02	5.03			

Cost of the Product 'X'

	(₹)
Direct material cost	50.00
Direct labour cost	30.00
Overhead cost (See working note)	37.19
	117.19

Working Note :

Overhead cost :

(₹ 3 × 4 hrs.) + (₹ 2.02 × 5 hrs.) + (₹ 5.03 × 3 hrs.) = ₹ 12 + ₹ 10.10 + ₹ 15.09 = ₹ 37.19

Q10 ICAI Mat

Deccan Manufacturing Ltd., have three departments which are regarded as production departments. Service departments' costs are distributed to these production departments using the "Step Ladder Method" of distribution. Estimates of factory overhead costs to be incurred by each department in the forthcoming year are as follows. Data required for distribution is also shown against each department:

Department	Factory overhead (₹)	Direct labour hours	No. of employees	Area in sq.m.
Production:				
X	1,93,000	4,000	100	3,000
Y	64,000	3,000	125	1,500
Z	83,000	4,000	85	1,500

Service:				
P	45,000	1,000	10	500
Q	75,000	5,000	50	1,500
R	1,05,000	6,000	40	1,000
S	30,000	3,000	50	1,000

The overhead costs of the four service departments are distributed in the same order, viz., P, Q, R and S respectively on the following basis.

Department	Basis
P	Number of employees
Q	Direct labour hours
R	Area in square metres
S	Direct labour hours

You are **required** to:

(a) **PREPARE** a schedule showing the distribution of overhead costs of the four service departments to the three production departments; and

(b) **CALCULATE** the overhead recovery rate per direct labour hour for each of the three production departments.

Reference

Primary Distribution, Reapportionment and Overhead rate

What's **New**

Step down method

Watch **Video**

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Answer

(a) **Deccan Manufacturing Limited**

Schedule Showing the Distribution of Overhead Costs among Departments

	Service				Production		
	P (₹)	Q (₹)	R (₹)	S (₹)	X (₹)	Y (₹)	Z (₹)
Overhead costs	45,000	75,000	1,05,000	30,000	1,93,000	64,000	83,000
Distribution of overhead cost of Dept. 'P'	(45,000)	5,000	4,000	5,000	10,000	12,500	8,500
Distribution of overhead costs of Dept. 'Q'		(80,000)	24,000	12,000	16,000	12,000	16,000

Distribution of overhead cost of Dept. 'R'		-	(1,33,000)	19,000	57,000	28,500	28,500
Distribution of overhead costs of Dept. 'S'		-	-	(66,000)	24,000	18,000	24,000
Total (A)					3,00,000	1,35,000	1,60,000
(b) Direct labour hours (B)					4,000	3,000	4,000
Overhead recovery rate per hour $\frac{(A)}{(B)}$					₹ 75	₹ 45	₹ 40

Q11 MTP Oct'18

Explain the difference between Allocation and Apportionment of expenses.

Reference | What's **New**

Allocation and apportionment of expenses

Watch **Video** Scan Me

Answer

The **difference between the allocation and apportionment is** important to understand because the purpose of these two methods is the identification of the items of cost to cost units or centers. However, the main difference between the above methods is given below.

(1) Allocation deals with the **whole items of cost**, which are identifiable with any one department. For example, indirect wages of three departments are separately obtained and hence each department will be charged by the respective amount of wages individually.

On the other hand, apportionment deals with the **proportions of an item of cost** for example; the cost of the benefit of a service department will be divided between those departments which has availed those benefits.

(2) Allocation is a **direct process of charging** expenses to different cost centres whereas apportionment is an **indirect process** because there is a need for the identification of the appropriate portion of an expense to be borne by the different departments benefited.

(3) The allocation or apportionment of an expense **is not dependent** on its nature, but the relationship between the expense and the cost centre decides that whether it is to be allocated or apportioned.

(4) **Allocation is a much wider** term than apportionment.

Q12 Nov'18

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 ₹ 12.60 lakhs out of which ₹ 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. (5 Marks)

Reference: **Power cost per labour hour**

What's New: **Step ladder method**

Watch **Video** — Scan Me

Answer

(1) **Overheads Distribution Sheet**

Item	Basis	Total Amount (₹)	Production Departments		Service Departments	
			A (₹)	B (₹)	X (₹)	Y (₹)
Variable overheads (₹ 12.60 lakhs - ₹ 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 (₹)	B (₹)
Total overheads	6,75,000	5, 85,000
Direct labour hours	67,500	48,750
Factory overheads per hour	10	12

Q13 Nov'18

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)

Reference What's **New**

Appointment of Overhead Cost

Watch **Video**

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Answer

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.

Q14 MTP Oct'19

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	₹
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 (₹)	16,50,000	7,50,000	75,000	1,75,000
No. of stores requisitions	3,600	1,400	---	---
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	₹ 2,30,400
Direct Labour:	
Fabrication Department	240 hours @ ₹ 50 per hour
Assembly Department	180 hours @ ₹ 50 per hour
Machine hours required:	
Fabrication Department	210 hours
Assembly Department	180 hours

[10 Marks]

Reference

Distribution of overhead cost, Overhead recovery rate and Job Cost

What's **New**

Step Down Method

Watch **Video**

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Answer

(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	Actual	86,36,000	71,88,000	14,48,000	---	---
Other Overheads:						
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 (₹) (I)	Basis of Overhead Recovery Rate (II)	Overhead Recovery Rate (₹) [(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 (₹)
Direct Materials	2,30,400
Direct Labour:	
Fabrication Deptt. (240 hours × ₹ 50)	12,000
Assembly Deptt. (180 hours × ₹ 50)	9,000
Production Overheads:	
Fabrication Deptt. (210 hours × ₹ 3.60)	756
Assembly Deptt. (180 hours × ₹ 1.22)	220
Total Production Cost	2,52,376

Q15 RTP May'20

ABC Ltd. has three production departments P_1, P_2 and P_3 and two service departments S_1 and S_2. The following data are extracted from the records of the company for the month of January, 2020:

	(₹)
Rent and rates	6,25,000
General lighting	7,50,000
Indirect wages	1,87,500
Power	25,00,000
Depreciation on machinery	5,00,000
Insurance of machinery	2,00,000

Other Information:

	P_1	P_2	P_3	S_1	S_2
Direct wages (₹)	3,75,000	2,50,000	3,75,000	1,87,500	62,500
Horse Power of Machines used	60	30	50	10	–
Cost of machinery (₹)	30,00,000	40,00,000	50,00,000	2,50,000	2,50,000
Floor space (Sq. ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	–	–

Expenses of the service departments S_1 and S_2 are reapportioned as below:

	P_1	P_2	P_3	S_1	S_2
S_1	20%	30%	40%	–	10%
S_2	40%	20%	30%	10%	–

Required:

(i) **COMPUTE** overhead absorption rate per production hour for each production department.

(ii) **DETERMINE** the total cost of product X which is processed for manufacture in department P_1, P_2 and P_3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is ₹ 6,250 and direct labour cost is ₹ 3,750.

Reference | What's **New**

Primary and Secondary Distribution (any method), OH Rate, Product Cost

Watch **Video**

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Answer

Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)	S_1 (₹)	S_2 (₹)
Direct wages	Actual	2,50,000	--	--	--	1,87,500	62,500
Rent and rates	Floor area (4 : 5 : 6 : 4 : 1)	6,25,000	1,25,000	1,56,250	1,87,500	1,25,000	31,250
General lighting	Light points (2 : 3 : 4 : 2 : 1)	7,50,000	1,25,000	1,87,500	2,50,000	1,25,000	62,500
Indirect wages	Direct wages (6 : 4 : 6 : 3 : 1)	1,87,500	56,250	37,500	56,250	28,125	9,375
Power	Horse Power of machines used (6 : 3 : 5 : 1)	25,00,000	10,00,000	5,00,000	8,33,333	1,66,667	–
Depreciation of machinery	Value of machinery (12:16:20:1:1)	5,00,000	1,20,000	1,60,000	2,00,000	10,000	10,000
Insurance of machinery	Value of machinery (12:16:20:1:1)	2,00,000	48,000	64,000	80,000	4,000	4,000
		50,12,500	14,74,250	11,05,250	16,07,083	6,46,292	1,79,625

Overheads of service cost centres:

Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2.

$S_1 = 6,46,292 + 0.10\ S_2$

$S_2 = 1,79,625 + 0.10\ S_1$

Substituting the value of S_2 in S_1 we get

$S_1 = 6,46,292 + 0.10\ (1,79,625 + 0.10\ S_1)$

$S_1 = 6,46,292 + 17,962.5 + 0.01\ S_1$

$0.99\ S_1 = 6,64,254.5$

$\therefore\ S_1 =$ ₹ 6,70,964

$\therefore\ S_2 = 1,79,625 + 0.10 \times 6,70,964$

= ₹ 2,46,721.4

Secondary Distribution Summary

Particulars	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)
Allocated and Apportioned overheads as per primary distribution	41,86,583	14,74,250	11,05,250	16,07,083
S_1	6,70,964	1,34,192.8	2,01,289.2	2,68,385.6
S_2	2,46,721.4	98,688.6	49,344.3	74,016.5
		17,07,131.4	13,55,883.5	19,49,485.1

(i) **Overhead rate per hour**

	P_1	P_2	P_3
Total overheads cost (₹)	17,07,131.4	13,55,883.5	19,49,485.1
Production hours worked	6,225	4,050	4,100
Rate per hour (₹)	274.24	334.79	475.48

(ii) **Cost of Product X**

	(₹)
Direct material	6,250.00
Direct labour	3,750.00
Prime cost	10,000.00
Production on overheads	
P_1 5 hours × ₹ 274.24 = 1,371.20	
P_2 3 hours × ₹ 334.79 = 1,004.37	
P_3 4 hours × ₹ 475.48 = 1,901.92	4,277.49
Factory cost	14,277.49

Q16 Nov'20

TEE Ltd. is a manufacturing company having three production departments 'P', 'Q' and 'R' and two service departments 'X' and 'Y' details pertaining to which are as under :

	P	Q	R	X	Y
Direct wages (₹)	5,000	1,500	4,500	2,000	800
Working hours	13,191	7,598	14,995	–	–
Value of machine (₹)	1,00,000	80,000	1,00,000	20,000	50,000
H.P. of machines	100	80	100	20	50
Light points (Nos.)	20	10	15	5	10
Floor space (sq. ft.)	2,000	2,500	3,500	1,000	1,000

The expenses are as follows :

	(₹)
Rent and Rates	10,000
Genera] Lighting	600
Indirect Wages	3,450
Power	3,500
Depreciation on Machines	70,000
Sundries (apportionment on the basis of direct wages)	13,800

The expenses of Service Departments are allocated as under :

	P	Q	R	X	Y
X	45%	15%	30%	–	10%
Y	35%	25%	30%	10%	–

Product 'A' is processed for manufacture in Departments P, Q and R for 6, 5 and 2 hours respectively.

Direct Costs of Product A are :

Direct material cost is ₹ 65 per unit and Direct labour cost is ₹ 40 per unit

You are **Required** to :

(i) **Prepare** a statement showing distribution of overheads among the production and service departments.

(ii) **Calculate** recovery rate per hour of each production department after redistributing the service departments costs.

(iii) **Find** out the Total Cost of a 'Product A'. [10 Marks]

Reference

Primary, Secondary Distribution and OH Recovery rates

What's **New**

Repeated Distribution Method

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Answer

(i) **Statement showing distribution of Overheads**
Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P (₹)	Q (₹)	R (₹)	X (₹)	Y (₹)
Direct wages	Actual 2,800	–	–	–	2,000	800	
Rent and Rates	Floor area (4:5:7:2:2)	10,000	2,000	2,500	3,500	1,000	1,000
General lighting	Light points (4:2:3:1:2)	600	200	100	150	50	100
Indirect wages	Direct wages (50:15:45:20:8)	3,450	1,250	375	1,125	500	200
Power	Horse Power of machines used (10:8:10:2:5)	3,500	1,000	800	1,000	200	500
Depreciation of machinery	Value of machinery (10:8:10:2:5)	70,000	20,000	16,000	20,000	4,000	10,000
Sundries	Direct wages (50:15:45:20:8)	13,800	5,000	1,500	4,500	2,000	800
Total		1,04,150	29,450	21,275	30,275	9,750	13,400

Secondary Distribution using simultaneous equation method:

Overheads of service cost centres

Let, X be the overhead of service cost centre X

Y be the overhead of service cost centre Y

$X = 9,750 + 0.10\ Y$

$Y = 13,400 + 0.10\ X$

Substituting the value of Y in X we get

$X = 9,750 + 0.10\ (13,400 + 0.10\ X)$

$X = 9,750 + 1,340 + 0.01\ X$

$0.99\ X = 11,090$

$\therefore\ X = ₹\ 11,202$

$\therefore\ Y = 13,400 + 0.10 \times 11,202$

$= ₹\ 14,520.20$

Secondary Distribution Summary

Particulars	Total (₹)	P (₹)	Q (₹)	R (₹)
Allocated and Apportioned over-heads as per primary distribution		29,450.00	21,275.00	30,275.00
X	11,202.00	5,040.90	1,680.30	3,360.60
Y	14,520.20	5,082.07	3,630.05	4,356.06
Total		39,572.97	26,585.35	37,991.66

(ii) **Calculation of Overhead recovery rate per hour**

	P (₹)	Q (₹)	R (₹)
Total overheads cost	39,572.97	26,585.35	37,991.66
Working hours	13,191	7,598	14,995
Rate per hour (₹)	3	3.50	2.53

(iii) **Cost of Product A**

	(₹)
Direct material	65.00
Direct labour	40.00
Prime cost	105.00
Production on overheads	
P 6 hours × ₹ 3 = ₹ 18	
Q 5 hours × ₹ 3.50 = ₹ 17.50	
R 2 hours × ₹ 2.53 = ₹ 5.06	40.56
Total cost	145.56

Note: Secondary Distribution can also be done using repeated distribution Method

Q17 MTP May'21

The following account balances and distribution of indirect charges are taken from the accounts of a manufacturing concern for the year ending on 31st March 2021:

Item	Total Amount	Production Departments			Service Departments	
	(₹)	X (₹)	Y (₹)	Z (₹)	A (₹)	B (₹)
Indirect Material	2,50,000	40,000	60,000	90,000	50,000	10,000
Indirect Labour	5,20,000	90,000	1,00,000	1,40,000	1,20,000	70,000
Supervisor's Salary	1,92,000	-	-	1,92,000	-	-
Fuel & Heat	30,000					
Power	3,60,000					
Rent & Rates	3,00,000					
Insurance	36,000					
Canteen Charges	1,20,000					
Depreciation	5,40,000					

The following departmental data are also available:

	Production Departments			Service Departments	
	X	Y	Z	A	B
Area (Sq. ft.)	4,400	4,000	3,000	2,400	1,200
Capital Value of Assets (₹)	40,00,000	60,00,000	50,00,000	10,00,000	20,00,000
Kilowatt Hours	3,500	4,000	3,000	1,500	-
Radiator Sections	20	40	60	50	30
No. of Employees	60	70	120	30	20

Expenses charged to the service departments are to be distributed to other departments by the following percentages:

	X	Y	Z	A	B
Department A (%)	30	30	20	-	20
Department B (%)	25	40	25	10	-

Prepare an overhead distribution statement to show the total overheads of production departments after re-apportioning service departments' overhead by using simultaneous equation method. Show all the calculations to the nearest rupee. (10 Marks)

Reference — What's **New**

Simultaneous Equation Method

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Answer

Primary Distribution of Overheads

Item	Basis	Total Amount (₹)	Production Departments			Service Departments	
			X (₹)	Y (₹)	Z (₹)	A (₹)	B (₹)
Indirect Material	Actual	2,50,000	40,000	60,000	90,000	50,000	10,000
Indirect Labour	Actual	5,20,000	90,000	1,00,000	1,40,000	1,20,000	70,000
Supervisor's Salary	Actual	1,92,000	-	-	1,92,000	-	-
Fuel & Heat	Radiator Sections {2:4:6:5:3}	30,000	3,000	6,000	9,000	7,500	4,500
Power	Kilowatt Hours {7:8:6:3:-}	3,60,000	1,05,000	1,20,000	90,000	45,000	-
Rent & Rates	Area (Sq. ft.) {22:20:15:12:6}	3,00,000	88,000	80,000	60,000	48,000	24,000
Insurance	Capital Value of Assets {4:6:5:1:2}	36,000	8,000	12,000	10,000	2,000	4,000
Canteen Charges	No. of Employees {6:7:12:3:2}	1,20,000	24,000	28,000	48,000	12,000	8,000
Depreciation	Capital Value of Assets {4:6:5:1:2}	5,40,000	1,20,000	1,80,000	1,50,000	30,000	60,000
Total overheads		23,48,000	4,78,000	5,86,000	7,89,000	3,14,500	1,80,500

Re-distribution of Overheads of Service Department A and B

Total overheads of Service Departments may be distributed by simultaneous equation.

Let, the total overheads of A = a and the total overheads of B = b

a = 3,14,500 + 0.10 b (i)

or, 10a - b = 31,45,000 [(i) x10]

b = 1,80,500 + 0.20 a (ii)

or, –0.20a + b = 1,80,500

Solving equation (i) & (ii)

$$10a - b = 31,45,000$$
$$-0.20a + b = 1,80,500$$
$$9.8a = 33,25,500$$

a = ₹ 3,39,337

Putting the value of 'a' in equation (ii), we get

b = 1,80,500 + 0.20 × 3,39,337

b = ₹ 2,48,367

SecondaryDistribution of Overheads

	Production Departments		
	X (₹)	Y (₹)	Z (₹)
Total overhead as per primary distribution	4,78,000	5,86,000	7,89,000
Service Department A (80% of ₹3,39,337)	1,01,801	1,01,801	67,867
Service Department B (90% of ₹2,48,367)	62,092	99,347	62,092
Total	6,41,893	7,87,148	9,18,959

Q18 July'21

SNS Trading Company has three Main Departments and two Service Departments. The data for each department is given below :

Departments	Expenses (in ₹)	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 : [5]

(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.

Reference | What's New

Step Ladder Method

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Answer

(i) **Schedule Showing the Distribution of Expenses of Service Departments using Step ladder method.**

	Main Department			Service Department	
	Purchase (₹)	Packing (₹)	Distribution (₹)	Maintenance (₹)	Personnel (₹)
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 (₹)	7,96,000	12,61,000	5,53,000
Total Hours worked	4,380 (12 × 365)	8,760 (24 × 365)	2,920 (8 × 365)
Expenses rate per hour (₹)	181.74	143.95	189.38

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Chapter 8

Overhead : Machine Hour Rate

Q1 ICAI Mat

A machine costing ₹ 1,00,00,000 is expected to run for 10 years. At the end of this period its scrap value is likely to be ₹ 9,00,000. Repairs during the whole life of the machine are expected to be ₹ 18,00,000 and the machine is expected to run 4,380 hours per year on the average. Its electricity consumption is 15 units per hour, the rate per unit being ₹ 5. The machine occupies one-fourth of the area of the department and has two points out of a total of ten for lighting. The foreman has to devote about one sixth of his time to the machine. The monthly rent of the department is ₹ 30,000 and the lighting charges amount to ₹ 8,000 per month. The foreman is paid a monthly salary of ₹ 19,200.

FIND OUT the machine hour rate, assuming insurance is @ 1% p.a. and the expenses on oil, etc., are ₹ 900 per month.

Reference | What's **New**

Machine hour rate

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Answer

Total number of hours per annum- 4,380

Total number of hours per month- 365

Computation of Machine Hour Rate

	Per month (₹)	Per hour (₹)
Fixed costs (Standing Charges)		
Depreciation (Refer working note-1)	75,833	
Rent (₹ 30,000 × ¼)	7,500	
Lighting charges {(₹ 8,000 × 2 points) ÷ 10 points}	1,600	
Foreman's salary (₹ 19,200 × 1/6)	3,200	
Sundry expenses (oil etc.)	900	
Insurance {(1% of ₹ 91,00,000) ÷ 12 months}	7,583	
	96,616	264.70

Variable costs:		
Repairs (Refer working note -2)		41.10
Electricity (15 units × ₹ 5)		75.00
Machine Hour rate		380.80

Working Notes:

(1) Depreciation per month $= \frac{\text{Cost of Machine} - \text{Scrap value}}{\text{Life of the machine}}$

$= \frac{₹\,1,00,00,000 - ₹\,9,00,000}{(10\text{ years} \times 12\text{ months})^*} = ₹\,75,833$

*In the question the life of the machine is given as 10 years and it is also mentioned the machine will run for 4,380 hours per annum. The depreciation can be calculated either on the basis of time i.e. 10 years or on the basis of activity of 43,800 hours (4,380 hours p.a.)

(2) Repairs for the whole life is ₹ 18,00,000, which can be linked to activity level of 43,800 hours. Thus, Repairs cost per hour $= \frac{₹\,18,00,000}{43,800\text{ hours}} = ₹\,41.10$

Q2 ICAI Mat

Gemini Enterprises undertakes three different jobs A, B and C. All of them require the use of a special machine and also the use of a computer. The computer is hired and the hire charges work out to ₹ 4,20,000 per annum. The expenses regarding the machine are estimated as follows:

	(₹)
Rent for the quarter	17,500
Depreciation per annum	2,00,000
Indirect charges per annum	1,50,000

During the first month of operation the following details were taken from the job register:

	Job		
	A	B	C
Number of hours the machine was used :			
(a) Without the use of the computer	600	900	—
(b) With the use of the computer	400	600	1,000

You are required to **COMPUTE** the machine hour rate:

(a) For the firm as a whole for the month when the computer was used and when the computer was not used.

(b) For the individual jobs A, B and C.

Reference	What's New	Watch Video
Two Tier Machine Hour Rate	**Without and with use of computer**	Scan Me

Answer

Working notes:

		(₹)
(i)	Total machine hours used (600 + 900 + 400 + 600 + 1,000)	3,500
(ii)	Total machine hours without the use of computers (600 + 900)	1,500
(iii)	Total machine hours with the use of computer (400 + 600 + 1,000)	2,000
(iv)	Total overheads of the machine per month	
	Rent (₹ 17,500 ÷ 3 months)	5,833.33
	Depreciation (₹ 2,00,000 ÷ 12 months)	16,666.67
	Indirect Charges (₹ 1,50,000 ÷ 12 months)	12,500.00
	Total	35,000.00

(v) Computer hire charges for a month (₹ 4,20,000 ÷ 12 months) — ₹ 35,000

(vi) Overheads for using machines without computer

$$\left(\frac{₹\ 35,000}{3,500\ \text{hrs.}} \times 1,500\ \text{hrs.}\right)$$ — ₹ 15,000

(vii) Overheads for using machines with computer

$$\left(\frac{₹\ 35,000}{3,500\ \text{hrs.}} \times 2,000\ \text{hrs.} + ₹\ 35,000\right)$$ — ₹ 55,000

(a) **Machine hour rate of Gemini Enterprises for the firm as a whole for a month.**

(1) When the Computer was used: $\frac{₹\ 55,000}{2,000\ \text{hours}} = ₹\ 27.50$ per hour

(2) When the computer was not used: $\frac{₹\ 15,000}{1,500\ \text{hours}} = ₹\ 10$ per hour

(b) **Machine hour rate for individual job**

	Rate per hr.	Job					
		A		B		C	
	(₹)	Hrs.	(₹)	Hrs.	(₹)	Hrs.	(₹)
Overheads							
Without Computer	10.00	600	6,000	900	9,000	–	–
With computer	27.50	400	11,000	600	16,500	1,000	27,500
		1,000	17,000	1,500	25,500	1,000	27,500
Machine hour rate			₹ 17		₹ 17		₹ 27.50

Q3 — ICAI Mat

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 ₹ 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.	₹ 20
Production bonus estimated	15% on wages
Value of power consumed	₹ 8,050
Supervision and indirect labour	₹ 3,300
Lighting and electricity	₹ 1,200

These particulars are for a year

Repairs and maintenance including consumables	3% of value of machines
Insurance	₹ 40,000
Depreciation	10% of original cost
Other sundry works expenses	₹ 12,000
General management expenses allocated	₹ 54,530

You are required to **WORK OUT** a comprehensive machine hour rate for the machine shop.

Reference

Machine Hour Rate

What's New

Wages Calculation

Watch **Video**

Scan Me

Answer

Computation of comprehensive machine hour rate of machine shop

	(₹)
Operator's wages (Refer to working note 2)	17,100
Production bonus (15% on wages)	2,565
Power consumed	8,050
Supervision and indirect labour	3,300
Lighting and electricity	1,200
Repairs and maintenance	12,000
Insurance	20,000
Depreciation	40,000
Sundry works expenses	6,000
General management expenses	27,265
	1,37,480

$$\text{Machine hour rate} = \frac{\text{Total overheads of machine shop}}{\text{Hours of machines operation}}$$

$$= \frac{₹\,1,37,480}{5,760\ \text{hrs.}} \text{ (Refer to working note 1)} = ₹\ 23.87$$

Working notes

1. **Computation of hours, for which 6 operators are available for 6 months.**

Normal available hours p.m. per operator.		208
Less: Absenteeism hours	18	
Less: Leave hours	20	
Less: Idle time hours	10	
		48
Utilisable hours p.m. per operator		160

Total utilisable hours for 6 operators and for 6 months are = 160 × 6 × 6 = 5,760 hours

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 5,760 hours represent total machine hours.

2. **Computation of operator's wages**

Average rate of wages : $\frac{₹\,20}{8}$ = ₹ 2.50 per hour

Hours per month for which wages are paid to a worker (208 hours – 18 hours) = 190 hours.

Total wages paid to 6 operators for 6 months = 190 hours × 6 × 6 × ₹ 2.50 = ₹ 17,100

Q4 MTP Mar'18

A machine shop cost centre contains three machines of equal capacities.

To operate these three machines nine operators are required i.e. three operators on each machine. Operators are paid ₹ 20 per hour. The factory works for fourty eight hours in a week which includes 4 hours set up time. The work is jointly done by operators. The operators are paid fully for the fourty eight hours. In additions they are paid a bonus of 10 per cent of productive time. Costs are reported for this company on the basis of thirteen four-weekly period.

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available:

- Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is ₹ 52,000.
- Maintenance and repairs per week per machine is ₹ 60.
- Consumable stores per week per machine are ₹ 75.
- Power : 20 units per hour per machine at the rate of 80 paise per unit.
- Apportionment to the cost centre : Rent per annum ₹ 5,400, Heat and Light per annum ₹ 9,720, foreman's salary per annum ₹ 12,960 and other miscellaneous expenditure per annum ₹ 18,000.

Required:

(i) **CALCULATE** the cost of running one machine for a four-week period.

(ii) **CALCULATE** machine hour rate. (10 Marks)

Reference | What's New

Cost of running the machine and Machine hour rate

Watch Video

Scan Me

Answer

Effective Machine hour for four-week period

= Total working hours – unproductive set-up time

= {(48 hours × 4 weeks) – {(4 hours × 4 weeks)}

= (192 – 16) hours) = 176 hours.

(i) **Computation of cost of running one machine for a four week period**

		(₹)	(₹)
(A)	**Standing charges (per annum)**		
	Rent	5,400.00	

	Heat and light	9,720.00	
	Forman's salary	12,960.00	
	Other miscellaneous expenditure	18,000.00	
	Standing charges (per annum)	46,080.00	
	Total expenses for one machine for four week period $\left(\frac{₹\ 46,080}{3\ \text{machines} \times 13\ \text{four-week period}}\right)$		1,181.54
	Wages (48 hours × 4 weeks × ₹ 20 × 3 operators)		11,520.00
	Bonus {(176 hours × ₹ 20 × 3 operators) ×10%}		1,056.00
	Total standing charges		13,757.54
(B)	**Machine Expenses**		
	Depreciation $\left(₹\ 52,000 \times 10\% \times \frac{1}{13\ \text{four-week period}}\right)$		400.00
	Repairs and maintenance (₹ 60 × 4 weeks)		240.00
	Consumable stores (₹ 75 × 4 weeks)		300.00
	Power (176 hours × 20 units × ₹ 0 .80)		2,816.00
	Total machine expenses		3,756.00
(C)	**Total expenses (A) + (B)**		17,513.54

(ii) Machine hour rate = $\frac{₹\ 17,513.54}{176\ \text{hours}}$ = ₹ 99.51

Q5 RTP Nov'18

Sree Ajeet Ltd. having fifteen different types of automatic machines furnishes information as under for 20X8-20X9

(i) Overhead expenses: Factory rent ₹ 1,80,000 (Floor area 1,00,000 sq. ft.), Heat and gas ₹ 60,000 and supervision ₹ 1,50,000.

(ii) Wages of the operator are ₹ 200 per day of 8 hours. Operator attends to one machine when it is under set up and two machines while they are under operation.

In respect of machine B (one of the above machines) the following particulars are furnished:

(i) Cost of machine ₹ 1,80,000, Life of machine- 10 years and scrap value at the end of its life ₹ 10,000

(ii) Annual expenses on special equipment attached to the machine are estimated as ₹ 12,000

(iii) Estimated operation time of the machine is 3,600 hours while set up time is 400 hours per annum

(iv) The machine occupies 5,000 sq. ft. of floor area.

(v) Power costs ₹ 5 per hour while machine is in operation.

ESTIMATE the comprehensive machine hour rate of machine B. Also find out machine costs to be absorbed in respect of use of machine B on the following two work orders

	Work order- 1	Work order-2
Machine set up time (Hours)	15	30
Machine operation time (Hours)	100	190

Reference — What's **New**

Two tier Machine Hour Rate

Watch **Video**

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Answer

Sree Ajeet Ltd.
Statement showing comprehensive machine hour rate of Machine B

	(₹)
Standing Charges:	
Factory rent {(₹ 1,80,000/1,00,000 sq. ft.) × 5,000 Sq. ft.}	9,000
Heat and Gas (₹ 60,000/15 machines)	4,000
Supervision (₹ 1,50,000/ 15 machines)	10,000
Depreciation [(₹ 1,80,000 – ₹ 10,000)/ 10 years]	17,000
Annual expenses on special equipment	12,000
	52,000
Fixed cost per hour (₹ 52,000/ 4,000 hrs.)	13

	Set up rate per hour (₹)	Operational rate per hour (₹)
Fixed cost	13.00	13.00
Power	--	5.00
Wages	25.00	12.50
Comprehensive machine hour rate per hr.	38.00	30.50

Statement of 'B' machine costs to be absorbed on the two work orders

	Work order-1			Work order-2		
	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
Set up time cost	15	38	570	30	38	1,140
Operation time cost	100	30.5	3,050	190	30.5	5,795
Total cost			3,620			6,935

Q6 MTP Aug'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 ₹ 5,00,000. Life 10 years. Estimated scrap value at the end of life is ₹ 20,000.

	(₹)
– 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 ₹ 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. (10 Marks)

Reference — What's **New**

Two tier Machine Hour Rate

Watch **Video**

Scan Me

Answer

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 (₹)	Cost per hour (₹) (Cost per month ÷ 200 hours)
Supervisor's salary $\left(\frac{₹\,6,000}{3\,\text{machines}}\right)$	2,000	10.00

Rent of building $\left(\frac{1}{6} \times \frac{₹\,72,000}{12\text{ months}}\right)$	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 (₹)	Cost per hour (₹)
Depreciation $\left(\frac{₹\,(5,00,000 - 20,000)}{10\text{ years}} \times \frac{1}{12\text{ months}}\right)$	4,000	20.00 $\left(\frac{₹\,4,000}{200\text{ hours}}\right)$
Wages	2,500	12.50 $\left(\frac{₹\,2,500}{200\text{ hours}}\right)$
Repairs & Maintenance $\left(\frac{₹\,60,480}{12\text{ months}}\right)$	5,040	28.00 $\left(\frac{₹\,5,040}{180\text{ hours}}\right)$
Consumable stores $\left(\frac{₹\,47,520}{12\text{ months}}\right)$	3,960	22.00 $\left(\frac{₹\,3,960}{180\text{ hours}}\right)$
Power (25 units × ₹ 2 × 180 hours)	9,000	50.00
Total Machine Expenses	24,500	132.50

Computation of Two – tier machine hour rate

	Set up time rate per machine hour (₹)	Running time rate per machine hour (₹)
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

Q7 MTP Oct'18; RTP Nov'20

You are given the following information of the three machines of a manufacturing department of X Ltd.:

	Preliminary estimates of expenses (per annum)			
	Total (₹)	Machines		
		A (₹)	B (₹)	C (₹)
Depreciation	20,000	7,500	7,500	5,000
Spare parts	10,000	4,000	4,000	2,000
Power	40,000			
Consumable stores	8,000	3,000	2,500	2,500
Insurance of machinery	8,000			
Indirect employee cost	20,000			
Building maintenance expenses	20,000			
Annual interest on capital outlay	50,000	20,000	20,000	10,000
Monthly charge for rent and rates	10,000			
Salary of foreman (per month)	20,000			
Salary of Attendant (per month)	5,000			

(The foreman and attendant control all the three machines and spend equal time on each of them.)

The following additional information is also available:

	Machines		
	A	B	C
Estimated Direct Labour Hours	1,00,000	1,50,000	1,50,000
Ratio of K.W. Rating	3	2	3
Floor space (sq. ft.)	40,000	40,000	20,000

There are 12 holidays besides Sundays in the year, of which two were on Saturdays. The manufacturing department works 8 hours in a day but Saturdays are half days. All machines work at 90% capacity throughout the year and 2% is reasonable for breakdown.

You are **required** to:

CALCULATE predetermined machine hour rates for the above machines after taking into consideration the following factors:

(i) An increase of 15% in the price of spare parts.

(ii) An increase of 25% in the consumption of spare parts for machine 'B' & 'C' only.

(iii) 20% general increase in wages rates. (10 Marks)

Reference

Machine hour rate

What's New

Calculation of productive machine hours

Watch **Video**

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Answer

Computation of Machine Hour Rate

		Basis of apportionment	Total (₹)	Machines		
				A (₹)	B (₹)	C (₹)
(A)	**Standing Charges :**					
	Insurance	Depreciation Basis (3:3:2)	8,000	3,000	3,000	2,000
	Indirect employee cost	Direct Labour hours (2:3:3)	24,000	6,000	9,000	9,000
	Building maintenance expenses	Floor Space (2:2:1)	20,000	8,000	8,000	4,000
	Rent and Rates	Floor Space (2:2:1)	1,20,000	48,000	48,000	24,000
	Salary of foreman	Equal	2,40,000	80,000	80,000	80,000
	Salary of attendant	Equal	60,000	20,000	20,000	20,000
	Total standing charges		4,72,000	1,65,000	1,68,000	1,39,000
	Hourly rate for standing charges			84.70	86.24	71.36
(B)	**Machine Expenses:**					
	Depreciation	Direct	20,000	7,500	7,500	5,000
	Spare parts	Final estimates	13,225	4,600	5,750	2,875
	Power	K.W. rating (3:2:3)	40,000	15,000	10,000	15,000
	Consumable Stores	Direct	8,000	3,000	2,500	2,500
	Total Machine expenses		81,225	30,100	25,750	25,375
	Hourly Rate for Machine expenses			15.45	13.22	13.03
	Total (A + B)		553,225	1,95,100	1,93,750	1,64,375
	Machine Hour rate			100.15	99.46	84.38

Working Notes:

(i) **Calculation of effective working hours:**

No. of full off-days = No. of Sunday + No. of holidays

= 52 + 12 = 64 days

No. of half working days = 52 days – 2 holidays = 50 days

No. of full working days = 365 days – 64 days – 50 days = 251 days

Total working Hours = {(251 days × 8 hours) + (50 days × 4 hours)}

= 2,008 hours + 200 = 2,208 hours.

Total effective hours = Total working hours × 90% - 2% for break-down

= 2,208 hours × 90% - 2% (2,208 hours × 90%)

= 1,987.2 hours – 39.74 hours

= 1947.46 or Rounded up to 1948 hours.

(ii) **Amount of spare parts is calculated as under:**

	A (₹)	B (₹)	C (₹)
Preliminary estimates	4,000	4,000	2,000
Add: Increase in price @ 15%	600	600	300
	4,600	4,600	2,300
Add: Increase in consumption @ 25%	–	1,150	575
Estimated cost	4,600	5,750	2,875

(iii) **Amount of Indirect employee cost is calculated as under:**

	(₹)
Preliminary estimates	20,000
Add: Increase in wages @ 20%	4,000
	24,000

(iv) Interest on capital outlay is a finance cost, therefore it has been excluded from the cost accounts.

Q8 MTP Mar'19

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)	₹ 6,48,000
Normal working hours for the month (The machine works for only 75% of normal capacity)	200 hours
Wages to Machine-man	₹ 400 per day (of 8 hours)
Wages to Helper (machine attendant)	₹ 275 per day (of 8 hours)
Power cost for the month for the time worked	₹ 65,000
Supervision charges apportioned for the machine centre for the month	₹ 18,000
Electricity & Lighting for the month	₹ 9,500

Repairs & maintenance (machine) including Consumable stores per month	₹ 17,500
Insurance of Plant & Building (apportioned) for the year	₹ 18,250
Other general expense per annum	₹ 17,500

The workers are paid a fixed Dearness allowance of ₹ 4,575 per month. Production bonus payable to workers in terms of an award is equal to 33.33% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production.

From the details furnished above you are **required** to COMPUTE a comprehensive machine-hour rate: [10 Marks]

Reference — What's New

Machine hour rate | **Wages calculation**

Watch **Video** — Scan Me

Answer

Effective machine hours = 200 hours × 75% = 150 hours

Computation of Comprehensive Machine Hour Rate

	Per month (₹)	Per hour (₹)
Fixed cost		
Supervision charges	18,000.00	
Electricity and lighting	9,500.00	
Insurance of Plant and building (₹ 18,250 ÷12)	1,520.83	
Other General Expenses (₹ 17,500÷12)	1,458.33	
Depreciation (₹ 64,800÷12)	5,400.00	
	35,879.16	239.19
Direct Cost		
Repairs and maintenance	17,500.00	116.67
Power	65,000.00	433.33
Wages of machine man		139.27
Wages of Helper		109.41
Machine Hour rate (Comprehensive)		1,037.87

Wages per machine hour

	Machine man	Helper
Wages for 200 hours		
Machine-man (₹ 400 × 25)	₹ 10,000.00	---
Helper (₹ 275 × 25)	---	₹ 6,875.00
Dearness Allowance (DA)	₹ 4,575.00	₹ 4,575.00
	₹ 14,575.00	₹ 11,450.00
Production bonus (1/3 of Basic and DA)	4,858.33	3,816.67
Leave wages (10% of Basic and DA)	1,457.50	1,145.00
	20,890.83	16,411.67
Effective wage rate per machine hour	₹ 139.27	₹ 109.41

Q 9 May'19

M/s Zaina Private Limited has purchased a machine costing ₹ 29,14,800 and it is expected to have a salvage value of ₹ 1,50,000 at the end of its effective life of 15 years. Ordinarily the machine is expected to run for 4,500 hours per annum but it is estimated that 300 hours per annum will be lost for normal repair & maintenance. The other details in respect of the machine are as follows :

(i) Repair & Maintenance during the whole life of the machine are expected to be ₹ 5,40,000.

(ii) Insurance premium (per annum) 2% of the cost of the machine.

(iii) Oil and Lubricants required for operating the machine (per annum) ₹ 87,384.

(iv) Power consumptions: 10 units per hour @ ₹ 7 per unit. No power consumption during repair and maintenance.

(v) Salary to operator per month ₹ 24,000. The operator devotes one third of his time to the machine.

You are **required** to calculate comprehensive machine hour rate. (5 Marks)

Reference | What's **New**

Machine hour rate

Watch **Video** Scan Me

Answer

Effective machine hour = 4,500 – 300 = 4,200 hours

Calculation of Comprehensive machine hour rate

Elements of Cost and Revenue	Amount (₹) Per Annum
Repair and Maintenance (₹ 5,40,000 ÷15 years)	36,000
Power (4,200 hours × 10 units × ₹ 7)	2,94,000
Depreciation $\left(\frac{₹\ 29,14,800 - ₹\ 1,50,000}{15\ \text{years}}\right)$	1,84,320
Insurance (₹ 29,14,800 × 2%)	58,296
Oil and Lubricant	87,384
Salary to Operator {(₹ 24,000×12)/3}	96,000
Total Cost	7,56,000
Effective machine hour	4,200
Total Machine Rate Per Hour	180

Q10 Jan'21

A machine shop has 8 identical machines manned 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 ₹ 32,00,000. The following particulars are furnished for a six months period :

Normal available hours per month per operator	208
Absenteeism (without pay) hours per operator	18
Leave (with pay) hours per operator	20
Normal unavoidable idle time - hours per operator 10	
Average rate of wages per day of 8 hours per operator ₹ 100	
Production bonus estimated	10% on wages
Power consumed	₹ 40,250
Supervision and Indirect Labour	₹ 16,500
Lighting and Electricity	₹ 6,000
The following particulars are given for a year :	
Insurance	₹ 3,60,000
Sundry work Expenses	₹ 50,000
Management Expenses allocated	₹ 5,00,000
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.
[5 Marks]

Reference | What's New

Machine Hour Rate

Watch Video

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Answer

Workings:

Particulars	Six months 6 operators (Hours)
Normal available hours per month (208 × 6 months × 6 operators)	7,488
Less: Absenteeism hours (18 × 6 operators)	(108)
Paid hours (A)	7,380
Less: Leave hours (20 × 6 operators)	(120)
Less: Normal idle time (10 × 6 operators)	(60)
Effective working hours	7,200

Computation of Comprehensive Machine Hour Rate

Particulars	Amount for six months (₹)
Operators' wages (7,380/8 x100)	92,250
Production bonus (10% on wages)	9,225
Power consumed	40,250
Supervision and indirect labour	16,500
Lighting and Electricity	6,000
Repair and maintenance {(5% × ₹ 32,00,000)/2}	80,000
Insurance (₹ 3,60,000/2)	1,80,000
Depreciation {(₹ 32,00,000 × 10%)/2}	1,60,000
Sundry Work expenses (₹ 50,000/2)	25,000
Management expenses (₹ 5,00,000/2)	2,50,000
Total Overheads for 6 months	8,59,225
Comprehensive Machine Hour Rate = ₹ 8,59,225/7,200 hours	₹ 119.33

(Note: Machine hour rate may be calculated alternatively. Further, presentation of figures may also be done on monthly or annual basis.)

Q11 RTP May'21

A manufacturing unit has purchased and installed a new machine at a cost of ₹ 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 ₹ 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 ₹ 2,40,000 p.a.

(iii) The machine requires a component to be replaced every week at a cost of ₹ 2,400.

(iv) There are three operators to control the operations of all the 6 machines. Each operator is paid ₹ 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 ₹ 6.

(vi) Departmental and general works overhead allocated to the operation during last year was ₹ 5,00,000. During the current year it is estimated to increase by 10%.

Required:

COMPUTE the machine hour rate.

Reference | What's New

Machine Hour Rate

Watch **Video**

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Answer

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 × ₹ 30,000 × 12 months)	₹ 10,80,000
Add: Fringe benefits (20% of ₹ 10,80,000)	₹ 2,16,000
	₹ 12,96,000

3. **Depreciation per annum**

$$\frac{₹\,24,90,000 - ₹\,90,000}{12 \text{ years}} = ₹\,2,00,000$$

Computation of Machine hour Rate

	Amount p.a. (₹)	Amount per hour (₹)
Standing charges		
Operators' Salary $\left(\frac{₹\,12,96,000}{6 \text{ machines}} \times \frac{1}{2,184 \text{ hours}}\right)$	12,96,000	98.90
Departmental and general overheads:		
(₹ 5,00,000 × 110%) $\left(\frac{₹\,5,50,000}{6 \text{ machines}} \times \frac{1}{2,184 \text{ hours}}\right)$	5,50,000	41.97
(A)	18,46,000	140.87
Machine Expenses		
Depreciation $\left(\frac{₹\,2,00,000}{2,184 \text{ hours}}\right)$	2,00,000	91.58
Electricity:		
During working hours (2,496 hours × 60 units × ₹ 6)	8,98,560	411.43
During maintenance hours (416 hours × 10 units × ₹ 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

Q12 MTP May'21

The following particulars refer to process used in the treatment of material subsequently, incorporated in a component forming part of an electrical appliance:

(i) The original cost of the machine used (Purchased in June 2013) was ₹ 1,00,000. Its estimated life is 10 years, the estimated scrap value at the end of its life is ₹ 10,000, and the estimated working time per year (50 weeks of 44 hours) is 2,200 hours of which machine maintenance etc., is estimated to take up 200 hours.

No other loss of working time expected, setting up time, estimated at 100 hours, is regarded as productive time. (Holiday to be ignored).

(ii) Electricity used by the machine during production is 16 units per hour at cost of a 90 paisa per unit. No current is taken during maintenance or setting up.

(iii) The machine required a chemical solution which is replaced at the end of week at a cost of ₹ 200 each time.

(iv) The estimated cost of maintenance per year is ₹ 12,000.

(v) Two attendants control the operation of machine together with five other identical machines. Their combined weekly wages, insurance and the employer's contribution to holiday pay amount ₹ 1,200.

(vi) Departmental and general works overhead allocated to this machine for the current year amount to ₹ 20,000.

You are **required** to calculate the machine hour rate of operating the machine. (5 Marks)

Reference — What's **New**

Machine Hour Rate

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Answer

Working Notes:

(i) Total Productive hours = Estimated Working hours – Machine Maintenance hours

= 2,200 hours – 200 hours = 2,000 hours

(ii) Depreciation per annum $= \frac{₹\,1,00,000 - ₹\,10,000}{10 \text{ years}} = ₹\,9000$

(iii) Chemical solution cost per annum = ₹ 200 × 50 weeks = ₹ 10,000

(iv) Wages of attendants (per annum) $= \frac{₹\,1,200 \times 50 \text{ weeks}}{6 \text{ machines}} = ₹\,10,000$

Calculation of Machine hour rate

Particulars	Amount (₹) (per annum)	Amount (₹) (per hour)
A. Standing Charge		
(i) Wages of attendants	10,000	
(ii) Departmental and general works overheads	20,000	
Total Standing Charge	30,000	
Standing Charges per hour $\left(\frac{30,000}{2,000}\right)$		15.00
B. Machine Expense		
(iii) Depreciation	9,000	4.50

(iv) Electricity $\left(\frac{₹\ 0.9 \times 16 \text{ units} \times 1{,}900 \text{ hours}}{2{,}000 \text{ hours}}\right)$	–	13.68
(v) Chemical solution	10,000	5.00
(vi) Maintenance cost	12,000	6.00
Machine operating cost per hour (A + B)		44.18

Q13 MTP Oct'21

A machine costing ₹ 10 lakhs, was purchased on 01-04-2021. The expected life of the machine is 10 years. At the end of this period its scrap value is likely to be ₹ 10,000. The total cost of all the machines including new one was ₹ 90 lakhs.

The other information is given as follows:

(i) Working hours of the machine for the year was 4,200 including 200 non-productive hours.

(ii) Repairs and maintenance for the new machine during the year was ₹ 6,000.

(iii) Insurance Premium was paid for all the machine ₹ 9,000.

(iv) New machine consumes 8 units of electricity per hour, the rate per unit being ₹ 3.75

(v) The new machine occupies 1/10th area of the department. Rent of the department is ₹ 2,400 per month.

(vi) Depreciation is charged on straight line basis.

COMPUTE machine hour rate for the new machine. [5]

Reference — What's **New**

Machine Hour Rate

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Answer

Computation of machine hour rate of new Machine

	Total (₹)	Per hour (₹)
A. **Standing Charges**		
I. Insurance Premium $\left(₹\ 9{,}000 \times \frac{1}{9}\right)$	1,000	
II. Rent $\left(\frac{1}{10} \times ₹\ 2{,}400 \times 12 \text{ months}\right)$	2,880	

		3,880	0.97*
B.	**Machine expenses**		
	I. Repairs and Maintenance (₹ 6,000 ÷ 4,000 hours)		1.50
	II. Depreciation $\left[\frac{₹10,00,000 - ₹10,000}{10 \text{ years} \times 4,000 \text{ hours}}\right]$		24.75
	III. Electricity (8 units × ₹ 3.75)		30.00
Machine hour rate			57.22

Working Note

Calculation of Productive Machine Hour Rate

Total hours	4,200
Less: Non-Productive hours	200
Effective machine hours	4,000

* ₹ 3,880 ÷ 4,000 hours = ₹ 0.97

Q14 MTP May'22

M/s Avyukt Automobile Parts has four identical machines in its factory. Cost of each machine is ₹ 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 ₹ 5,000 per month

(ii) Lighting of Factory ₹ 3,000 per month

(iii) Operator Wages (Two operators and each operator is in charge of two machines) ₹ 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) ₹ 2,500 per month

(vii) Other factory overhead (Annual) ₹ 40,000

(viii) Power Consumption per machine per hour 80 units

(ix) Rate of Power ₹ 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. [10]

Reference | What's New

Comprehensive Machine Hour Rate

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Answer

Computation of Comprehensive Machine Hour Rate per Machine

Particulars	Per Annum (₹)	Per Hour (₹)
Standing Charges:		
Depreciation (Working Note 2)	50,000	
Factory Rent (₹ 5,000 x 12 months / 4)	15,000	
Lighting of Factory (₹ 3,000 x 12 months / 4)	9,000	
Operator Wages (₹ 10,000 x 12 months / 2)	60,000	
Repairs and maintenance (₹ 2,000 x 4)	8,000	
Insurance premium (₹ 5,00,000 x 3%)	15,000	
Forman's salary (₹ 2,500 x 12 x ⅙ / 4)	1,250	
Other factory overhead (₹ 40,000 / 4)	10,000	
	1,68,250	
Standing Charges per hour (₹ 1,68,250 / 1,500 hours)		112.17
Running Charges:		
Power (80 units x ₹ 150 / 100)		120.00
Comprehensive Machine Hour Rate		232.17

Working Notes:

1. **Computation of Total Operative Hours**

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**

$$\text{Annual Depreciation} = \frac{\text{Purchase Cost} - \text{Estimated Scrap Value}}{\text{Effective Life in Years}}$$

$$= \frac{₹\,5,00,000 - ₹\,50,000}{9 \text{ Years}}$$

$$= ₹\,50,000$$

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Chapter 9

Activity Based Costing

Q1 ICAI Mat

ABC Ltd. is a multiproduct company, manufacturing three products A, B and C. The budgeted costs and production for the year ending 31st March, 20X8 are as follows:

	A	B	C
Production quantity (Units)	4,000	3,000	1,600
Resources per Unit:			
- Direct Materials (Kg.)	4	6	3
- Direct Labour (Minutes)	30	45	60

The budgeted direct labour rate was ₹ 10 per hour, and the budgeted material cost was ₹ 2 per kg. Production overheads were budgeted at ₹ 99,450 and were absorbed to products using the direct labour hour rate. ABC Ltd. followed an Absorption Costing System.

ABC Ltd. is now considering to adopt an Activity Based Costing system. The following additional information is made available for this purpose.

1. **Budgeted overheads were analysed into the following:**

	(₹)
Material handling	29,100
Storage costs	31,200
Electricity	39,150

2. **The cost drivers identified were as follows:**

Material handling	Weight of material handled
Storage costs	Number of batches of material
Electricity	Number of Machine operations

3. **Data on Cost Drivers was as follows:**

	A	B	C
For complete production:			
Batches of material	10	5	15
Per unit of production:			
Number of Machine operators	6	3	2

You are **requested** to:

1. **PREPARE** a statement for management showing the unit costs and total costs of each product using the absorption costing method.
2. **PREPARE** a statement for management showing the product costs of each product using the ABC approach.
3. **STATE** what are the reasons for the different product costs under the two approaches?

Reference | What's **New**

Cost per unit under Traditional Absorption Costing and Activity-based Costing

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Answer

1. **Traditional Absorption Costing**

	A	B	C	Total
(a) Quantity (units)	4,000	3,000	1,600	8,600
(b) Direct labour (minutes)	30	45	60	-
(c) Direct labour hours (a × b)/60 minutes	2,000	2,250	1,600	5,850

Overhead rate per direct labour hour:

= Budgeted overheads ÷Budgeted labour hours

= ₹ 99,450 ÷ 5,850 hours

= ₹ 17 per direct labour hour

Unit Costs:

	A (₹)	B (₹)	C (₹)
Direct Costs:			
- Direct Labour	5.00	7.50	10.00
- Direct Material	8.00	12.00	6.00
Production Overhead:	8.50 $\left(\frac{17\times30}{60}\right)$	12.75 $\left(\frac{17\times45}{60}\right)$	17.00 $\left(\frac{17\times60}{60}\right)$
Total unit costs	21.50	32.25	33.00
Number of units	4,000	3,000	1,600
Total costs	86,000	96,750	52,800

2. **Activity Based Costing**

	A	B	C	Total
Quantity (units)	4,000	3,000	1,600	-
Weight per unit (Kg.)	4	6	3	-
Total weight	16,000	18,000	4,800	38,000
Machine operations per unit	6	3	2	-
Total operations	24,000	9,000	3,200	36,200
Total batches of Material	10	5	15	30

Material handling rate per kg. = ₹ 29,000 ÷ 38,800 kg. = ₹ 0.75 per kg.

Electricity rate per machine operations = ₹ 39,150 ÷ 36,200

= ₹ 1,082 per machine operations

Storage rate per batch = ₹ 31,200 ÷ 30 batches

= ₹ 1,040 per batch

Unit Costs:

	A (₹)	B (₹)	C (₹)
Direct Costs:			
Direct Labour	5.00	7.50	10.00
Direct material	8.00	12.00	6.00
Production Overheads:			
Material Handling	3.00 (₹ 0.75 × 4)	4.50 (₹ 0.75 × 6)	2.25 (₹ 0.75 × 3)
Electricity	6.49 (₹ 1.082 × 6)	3.25 (₹ 1.082 × 3)	2.16 (₹ 1.082 × 2)
Storage	2.60 $\left(₹10 \times \frac{₹1,040}{4,000}\right)$	1.73 $\left(₹5 \times \frac{₹1,040}{3,000}\right)$	9.75 $\left(₹15 \times \frac{₹1,040}{1,600}\right)$
Total unit costs	25.09	28.98	30.16
Number of units	4,000	3,000	1,600
Total costs	₹ 1,00,360	₹ 86,940	₹ 48,256

3. **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.

Q2 ICAI Mat; RTP May'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
Power	Kilowatt hours	50,000 kilowatt hours	₹ 2,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	₹ 3,00,000

The company makes three products M, S and T. For the year ended March 31, 20X9, 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) **COMPUTE** the costs allocated to each product from each activity.

(ii) **CALCULATE** the cost of unused capacity for each activity.

(iii) **DISCUSS** the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.

Reference — What's New

Cost of product using ABC and Cost of Unused capacity | **Factors to choose a capacity level**

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Answer

(i) **Statement of Cost Allocation to each Product from each Activity**

	Product			
	M (₹)	S (₹)	T (₹)	Total (₹)
Power (Refer to working note)	40,000 (10,000 kWh × ₹ 4)	80,000 (20,000 kWh ×₹ 4)	60,000 (15,000 kWh ×₹ 4)	1,80,000
Quality Inspections (Refer to working note)	1,05,000 (3,500 inspections × ₹ 30)	75,000 (2,500 inspections × ₹ 30)	90,000 (3,000 inspections × ₹ 30)	2,70,000

Working note

Rate per unit of cost driver:

Power	(₹ 2,00,000 / 50,000 kWh)	₹ 4/kWh
Quality Inspection	(₹ 3,00,000 / 10,000 inspections)	₹ 30 per inspection

(ii) **Computation of Cost of Unused Capacity for each Activity:**

	(₹)
Power (₹ 2,00,000 – ₹ 1,80,000)	20,000
Quality Inspections (₹ 3,00,000 – ₹ 2,70,000)	30,000
Total cost of unused capacity	50,000

(iii) **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 chosen capacity level concepts.

Q3 ICAI Mat; May'19

ABC Ltd. Manufactures two types of machinery equipment Y and Z and applies/absorbs overheads on the basis of direct-labour hours. The budgeted overheads and direct-labour hours for the month of December, 20X8 are ₹ 12,42,500 and 20,000 hours respectively. The information about Company's products is as follows:

	Equipment Y	Equipment Z
Budgeted Production volume	2,500 units	3,125 units
Direct material cost	₹ 300 per unit	₹ 450 per unit
Direct labour cost		
Y : 3 hours @ ₹ 150 per hour		
Z : 4 hours @ ₹ 150 per hour	₹ 450	₹ 600

ABC Ltd.'s overheads of ₹ 12,42,500 can be identified with three major activities:

Order Processing (₹ 2,10,000), machine processing (₹ 8,75,000), and product inspection (₹ 1,57,500). These activities are driven by 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
Y	350	23,000	4,000
Z	250	27,000	11,000
Total	600	50,000	15,000

Required:

(i) Assuming use of direct-labour hours to absorb/apply overheads to production, **COMPUTE** the unit manufacturing cost of the equipment Y and Z, if the budgeted manufacturing volume is attained.

(ii) Assuming use of activity-based costing, **COMPUTE** the unit manufacturing costs of the equipment Y and Z, if the budgeted manufacturing volume is achieved.

(iii) ABC 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-costed or over-costed) for each equipment.

Reference — What's **New**

Cost per unit under Traditional Absorption Costing and Activity-based Costing | **Cost distortion**

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Answer

(i) **Overheads application base: Direct labour hours**

	Equipment Y (₹)	Equipment Z (₹)
Direct material cost	300	450
Direct labour cost	450	600
Overheads*	186.38	248.50
	936.38	1,298.50

$$\text{*Pre-determined rate} = \frac{\text{Budgeted overheads}}{\text{Budgeted direct labour hour}} = \frac{₹\,12,42,500}{20,000\ \text{hours}} = ₹\,62.125$$

(ii) **Estimation of Cost-Driver rate**

Activity	Overhead cost (₹)	Cost-driver level	Cost driver rate (₹)
Order processing	2,10,000	600 Orders processed	350
Machine processing	8,75,000	50,000 Machine hours	17.50
Inspection	1,57,500	15,000 Inspection hours	10.50

	Equipment Y (₹)	Equipment Z (₹)
Direct material cost	300	450
Direct labour cost	450	600
Prime Cost	750	1,050
Overhead Cost		
Order processing 350 : 250	1,22,500	87,500
Machine processing 23,000 : 27,000	4,02,500	4,72,500
Inspection 4,000 : 11,000	42,000	1,15,500
Total overhead cost	5,67,000	6,75,500
Per unit cost		
5,67,000 /2,500	226.80	
6,75,500/ 3,125		216.16
Unit manufacturing cost	976.80	1,266.16

(iii)

	Equipment Y (₹)	Equipment Z (₹)
Unit manufacturing cost–using direct labour hours as an application base	936.38	1,298.50
Unit manufacturing cost-using activity based costing	976.80	1,266.16
Cost distortion	(-)40.42	+ 32.34

Low volume product Y is under-costed and high volume product Z is over costed using direct labour hours for overhead absorption.

Q4 ICAI Mat

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, 20X9 in respect of RST Limited has been reported:

	General Supermarket Chains (₹)	Drugstore Chains (₹)	Chemist Shops (₹)
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, 20X9 operating costs (other than cost of goods sold) of RST Limited are ₹ 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 April, 20X9 are as follows:

Activity Area	Total costs in April, 20X9 (₹)	Total Units of Cost Allocation Base used in April, 20X9
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 April, 20X9 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 shipped per store delivery	300	80	16
Average number of hours of shelf-stocking per store delivery	3	0.6	0.1

Required:

(i) **COMPUTE** for April, 20X9 gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.

(ii) **COMPUTE** the April, 20X9 rate per unit of the cost-allocation base for each of the five activity areas.

(iii) **COMPUTE** the operating income of each distribution channel in April, 20X9 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 April, 20X9 operating costs of ₹ 8,27,970 to five activity areas.

Reference | What's **New**

Reference	What's **New**
Operating Income under Traditional costing and Activity based costing	**Comments for challenges**

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Answer

(i) **Statement of operating income and gross margin percentage for each of its three distribution channel**

	General Super Market Chains	Drugstore Chains	Chemist Shops	Total
Revenues: (₹)	2,80,41,750 (330 × ₹ 84,975)	2,38,21,875 (825 × ₹ 28,875)	1,49,73,750 (2,750 × ₹5,445)	6,68,37,375
Less: Cost of goods sold: (₹)	2,72,25,000 (330 × ₹ 82,500)	2,26,87,500 (825 × ₹ 27,500)	1,36,12,500 (2,750 × ₹ 4,950)	635,25,000
Gross Margin: (₹)	8,16,750	11,34,375	13,61,250	33,12,375
Less: Other operating costs: (₹)				8,27,970
Operating income: (₹)				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 April 20X9**

	(₹)
Customer purchase order processing	
(₹. 2,20,000/ 5,500 orders)	40 order
Line item ordering	
(₹. 1,75,560/ 58,520 line items)	3 line item order
Store delivery	
(₹. 1,95,250/ 3,905 store deliveries)	50 delivery
Cartons dispatched	
(₹. 2,09,000/ 2,09,000 dispatches)	1 dispatch

Shelf-stocking at customer store	
(₹ 28,160/ 1,760 hours)	16 hour

(iii) **Operating Income Statement of each distribution channel in April-20X9 (Using the Activity based Costing information)**

	General Super Market Chains	Drugstore Chains	Chemist Shops
Gross margin (₹.) : (A)			
(Refer to (i) part of the answer)	8,16,750	11,34,375	13,61,260
Operating cost (₹.): (B)			
(Refer to working note)	1,62,910	1,90,410	4,74,650
Operating income (₹.) : (A–B)	6,53,840	9,43,965	8,86,600
Operating income (in %)			
(Operating income/ Revenue) × 100	2.33	3.96	5.96

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	
(₹ 1,62,910/ ₹. 2,80,00,750) × 100	0.58%
Drug store chains	
(₹ 1,90,410/ ₹ 2,38,21,875) × 100	0.80%
Chemist shops	
(₹ 4,74,650/ ₹ 1,49,73,750) ×100	3.17%

Working note:

Computation of operating cost of each distribution channel:

	General Super Market Chains (₹)	Drugstore Chains (₹)	Chemist Shops (₹)
Customer purchase order processing	15,400 (₹ 40 × 385 orders)	39,600 (₹ 40 × 990 orders)	1,65,000 (₹ 40 ×4125 orders)
Line item ordering	16,170 (₹ 3 × 14 x 385)	35,640 (₹ 3 × 12 x 990)	1,23,750 (₹ 3 × 10 × 4125)
Store delivery	16,500 (₹50 × 330 deliveries)	41,250 (₹50 × 825 deliveries)	1,37,500 (₹50 × 2750 deliveries)
Cartons dispatched	99,000 (₹ 1× 300 cartons × 300 deliveries)	66,000 (₹ 1 × 80 cartons × 825 deliveries)	44,000 (₹ 1 × 16 cartons × 2,750 deliveries)

Shelf stocking	15,840 (₹ 16 × 330 deliveries × 3 Av. hrs.)	7,920 (₹ 16 × 825 deliveries × 0.6 Av. hrs)	4,400 (₹ 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 ₹ 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.

Q5 ICAI Mat

Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at ₹ 90 per case and sells to retail customers at a list price of ₹ 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
List Selling Price	₹ 108	₹ 108	₹ 108	₹ 108	₹ 108
Actual Selling Price	₹ 108	₹ 106.20	₹ 99	₹ 104.40	₹ 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
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	₹ 750 per purchase order
Customer visits	₹ 600 per customer visit
Deliveries	₹ 5.75 per delivery Km travelled
Product handling	₹ 3.75 per case sold
Expedited deliveries	₹ 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?

Reference	What's New
Customer-level Operating Income under ABC	**Comments for challenges**

Watch **Video**

Scan Me

Answer

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) (₹): (b) {(a) × ₹ 108)}	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Discount (₹): (c) {(a) × Discount per case}	-	35,438 (19,688 cases × ₹ 1.80)	12,31,200 (1,36,800 cases × ₹ 9)	2,57,580 (71,550 cases × ₹ 3.60)	94,770 (8,775 cases × ₹ 10.80)
Cost of goods sold (₹) : (d) {(a) × ₹ 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 (₹): (No. of purchase × ₹ 750)	11,250	18,750	22,500	18,750	22,500
Customer visits costs (₹) (No. of customer visits × ₹ 600)	1,200	1,800	3,600	1,200	1,800
Delivery vehicles travel costs (₹) (₹ 5.75 per km) (Kms travelled by delivery vehicles × ₹ 5.75 per km.)	1,150	1,035	1,725	2,300	3,450
Product handling costs (₹) {(a) ×₹ 3.75}	17,550	73,830	5,13,000	2,68,313	32,906

Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 2,250}	-	-	-	-	2,250
Total cost of customer level operating activities (₹)	31,150	95,415	5,40,825	2,90,563	62,906

(i) **Computation of Customer level operating income**

	Customers				
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)
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, despite having only 52.30% of the unit volume of customer C. The main reason is that C receives a ₹ 9 per case discount while customer D receives only a ₹ 3.60 discount per case.

Customer E is less profitable, in comparison with the small customer A being profitable. Customer E received a discount of ₹ 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 (₹)
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 ₹ 10.80 discount per case for customer E should be explored.

Q6 RTP May'18

G-2020 Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Product A	Product B	Product C	
Direct Materials	50	40	40	₹/u
Direct Labour @ ₹ 10/ hour	30	40	50	₹/u
Production Overheads	30	40	50	₹/u
Total Cost	110	120	140	₹/u
Quantity Produced	10,000	20,000	30,000	Units

G-2020 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.

Reference | What's New

Activity Based Production Cost

Watch Video

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Answer

The total production overheads are ₹ 26,00,000:

Product A: 10,000 × ₹ 30 = ₹ 3,00,000

Product B: 20,000 × ₹ 40 = ₹ 8,00,000

Product C: 30,000 × ₹ 50 = ₹ 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 (₹)	A (₹)	B (₹)	C (₹)
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 Produces				10,000	20,000	30,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				80	80	90
Total				150.49	124.25	123.67

Q7 MTP Mar'18

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 (₹)	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	3,50,000	90,000	1,60,000

Required

(i) **CALCULATE** rates for each activity.

(ii) Using the rates computed in requirement (i), **CALCULATE** the cost of each product.

Reference — What's **New**

Rate of each activity and Cost of product

Watch **Video**

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Answer

(i) **Statement Showing "Activity Rate"**

Activity	Activity Cost [a] (₹)	Activity Driver	No. of Units of Activity Driver [b]	Activity Rate [a] / [b] (₹)
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 (₹)	Personal Loans (₹)	Gold Visa (₹)
Providing ATM Service	90,000 (1,80,000 tr.× ₹ 0.50)	---	10,000 (20,000 tr. × ₹ 0.50)

Computer Processing	8,00,000 (20,00,000 tr. × ₹ 0.40)	80,000 (2,00,000 tr. × ₹ 0.40)	1,20,000 (3,00,000 tr. × ₹ 0.40)
Issuing Statements	4,80,000 (3,00,000 st. × ₹ 1.60)	80,000 (50,000 st. × ₹ 1.60)	2,40,000 (1,50,000 st. × ₹ 1.60)
Customer Inquiries	2,10,000 (3,50,000 min. × ₹ 0.60)	54,000 (90,000 min. × ₹ 0.60)	96,000 (1,60,000 min. × ₹ 0.60)
Total Cost [a]	₹ 15,80,000	₹ 2,14,000	₹ 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

Q 8 May'18

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	₹
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. (10 Marks)

Reference — What's **New**

Cost per unit as per traditional and activity based costing

Watch **Video**

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Answer

(i) **Statement Showing Overhead Cost per unit "Traditional Method"**

	Gel Pen (₹)	Ball Pen (₹)
Units	5,500	24,000
Overheads (₹) (Refer to W.N.)	4,80,000 (20 x 24,000 hrs.)	10,80,000 (20 x 54,000 hrs.)
Overhead Rate per unit (₹)	87.27 (₹ 4,80,000 / 5,500 units)	45 (₹ 10,80,000 /24,000 units)

Working Notes:

$$= \frac{\text{Total Overhead incurred by the Company}}{\text{Total Machine Hours}}$$

$$= \frac{₹\,4,75,020 + 5,79,988 + 5,04,992}{24,000\text{ hours} + 54,000\text{ hours}} = \frac{₹\,15,60,000}{78,000\text{ hours}}$$

= ₹ 20 per machine hour

(ii) **Statement Showing "Activity Based Overhead Cost"**

Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	Gel Pen (₹)	Ball Pen (₹)
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 (₹)	Ball Pen (₹)
Overheads Cost per unit (₹) (Traditional Method)	87.27	45
Overheads Cost per unit (₹) (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.)

Q9 RTP Nov'18; MTP Oct'19; RTP May'20

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	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 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:

Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	₹ 60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	₹ 7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	₹ 12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	₹ 8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	₹ 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.

Reference — What's **New**

Operating Income in amount and as a % of Revenue

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Answer

(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 on the basis of cost of goods sold of each product)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
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:**

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
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):**

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{₹\ 45,00,000}{₹\ 1,50,00,000} \times 100 = 30\%$$

3. **Cost for each Activity Cost Driver:**

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	7,80,000	1,560 purchase orders	₹ 500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹ 400 per delivery

Shelf-stocking	8,64,000	8,640 hours	₹ 100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹ 1 per item sold

(ii) **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 (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of 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

Q10 MTP Oct'18

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 @ ₹ 20	4	12	8
Direct Material per unit (₹)	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 ₹ 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 analysed 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.

(10 Marks)

Reference — **What's New**

Cost per unit as per Traditional and Activity Based Costing

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Answer

(i) **Statement Showing "Cost per unit - Traditional Method"**

Particulars of Costs	P	Q	R
	(₹)	(₹)	(₹)
Direct Materials	90	80	120
Direct Labour [(4, 12, 8 hours) × ₹ 20]	80	240	160
Production Overheads [(10, 18, 14 hours) × ₹ 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
	(₹)	(₹)	(₹)
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 @ ₹ 1.80 per hour (30,000, 90,000, 2,80,000)	54,000	1,62,000	5,04,000

Setup Costs @ ₹ 9,600 per setup (20, 10, 20)	1,92,000	96,000	1,92,000
Inspection Costs @ ₹ 4,800 per inspection (100, 40, 60)	4,80,000	1,92,000	2,88,000
Purchase Related Costs @ ₹ 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. × ₹ 6 = ₹ 24,00,000

Cost Driver Rates-

Cost Pool	%	Overheads (₹)	Cost Driver (Units)	Cost Driver Rate (₹)
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

Q11 Nov'18

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 (₹)
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 ₹ 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	1,500
Maintenance hours	9,080
No. of set-ups	2,250
No. of inspections	2,710

The company has produced a batch of 15000 units and has incurred ₹ 26,38,700 and ₹ 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	25

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. (10 Marks)

Reference — What's **New**

Cost per unit as per Traditional and Activity Based Costing

Watch **Video**

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Answer

Working Note:

Overhead Absorption Rate = $\frac{51,79,300}{3,01,39,000} \times 100 = 17.18\%$

(i) **Cost of Product Under Absorption Costing**

Item of Cost	Amount (₹)
Material	26,38,700
Wages	3,75,200
Prime Cost	30,13,900
Overheads: $\frac{51,79,300}{3,01,39,000} \times 30,13,900$	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	₹.	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 (₹)
Material	26,38,700
Wages	3,75,200
Prime Cost	30,13,900
Material Purchase $\left(\frac{22,50,000}{1,500} \times 48\right)$	72,000
Maintenance $\left(\frac{17,30,000}{9,080} \times 810\right)$	1,54,328
Setup $\left(\frac{6,84,500}{2,250} \times 40\right)$	12,169

Quality Control $\left(\frac{5,14,800}{2,710} \times 25\right)$	4,749
Total Cost	32,57,146
Unit	15,000
Cost per unit	217.14

Q12 Nov'18

Explain 'Activity Based Budgeting'.

Reference | What's New

Activity based budgeting

Watch Video

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Answer

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.

Q13 MTP Mar'19

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 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 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	30	50
Number of batches on runs	150	120	180

Required

PREPARE a statement showing details of overhead costs allocated to each product type using activity based costing. [10 Marks]

Reference — What's **New**

Activity based product cost

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Answer

Calculation of "Activity Rate"

Cost Pool	Cost (₹) [A]	Cost Driver [B]	Cost Driver Rate (₹) [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 (₹)	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 × ₹14)	6,72,000 (48,000 × ₹14)	7,56,000 (54,000 × ₹14)	18,48,000
Assembly Department Expenses	Assembly Hours	2,40,000 (15,000 × ₹16)	---	4,32,000 (27,000 × ₹16)	6,72,000
Setup Cost	No. of Production Runs	30,000 (150 × ₹ 200)	24,000 (120 × ₹ 200)	36,000 (180 × ₹ 200)	90,000
Stores Receiving Cost	No. of Requisitions Raised on the Stores	40,000 (40 × ₹ 1,000)	30,000 (30 × ₹ 1,000)	50,000 (50 × ₹ 1,000)	1,20,000
Order Processing and Dispatch	No. of Customers Orders Executed	60,000 (1,250 × ₹ 48)	48,000 (1,000 × ₹ 48)	72,000 (1,500 × ₹ 48)	1,80,000
Inspection and Quality Control Cost	No. of Production Runs	12,000 (150 × ₹ 80)	9,600 (120 × ₹ 80)	14,400 (180 × ₹ 80)	36,000
Overhead (₹)		8,02,000	7,83,600	13,60,400	29,46,000

Q14 MTP Apr'19

'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 (₹)	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 Replenishment Cost	1,00,000	Expected to double during budget period.
	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.

(10 Marks)

Reference — What's **New**

Activity rate and cost per account.

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Answer

Statement Showing "Budgeted Cost per unit of the Product"

Activity	Activity Cost (Budgeted) (₹)	Activity Driver	No. of Units of Activity Driver (Budget)	Activity Rate (₹)	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 (₹)	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	– ₹ 2,50,000 (half of ₹ 5,00,000) is fixed and no change is expected.
	7,50,000	– ₹ 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. (₹ 2,00,000 x 180%)
Total	3,60,000	

Q15 RTP Nov'19

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 (₹)	350	460	410
Wages per unit @ ₹ 80 per hour	240	400	560
Overhead cost per unit (₹)	240	400	560
Total cost per unit (₹)	830	1,260	1,530
Selling price (₹)	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.

Reference — What's **New**

Cost per unit and selling price.

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Answer

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				₹ 80.00
Total overhead				₹ 4,86,00,000

Cost per activity and driver

Activity	Machine Set-up	Customer order processing	Customer complaint management	Total
Total overhead (₹)	1,45,80,000	1,45,80,000	1,94,40,000	4,86,00,000
No. of drivers	600	8,000	2,400	
Cost per driver (₹)	24,300	1,822.5	8,100	

(i) **Computation of Overhead Cost per unit:**

Particulars	Product X	Product Y	Product Z
Direct Material	350	460	410
Direct Wages	240	400	460
Prime Cost	590	860	970
Overheads			
Machine Setup	9,72,000	38,88,000	97,20,000
Customer related	18,22,500	40,09,500	87,48,000
Material ordering	32,40,000	64,80,000	97,20,000
	60,34,500	143,77,500	281,88,000
OH Cost / unit	134.1	273.86	939.6
TC / unit	724.1	1133.86	1906.6

(ii) **Determination of Selling Price per unit**

Particulars	Product X	Product Y	Product Z
Cost per unit	724.1	1133.86	1909.6
Mark up (25%)	181.03	283.47	477.4
Selling Price	905.13	1417.33	2387

Q16 Nov'19

PQR Ltd has decided to analyse the profitability of its five new customers. It buys soft drink bottles in cases at ₹ 45 per case and sells them to retail customers at a list price of ₹ 54 per case. The data pertaining to five customers are given below:

Particulars	A	B	C	D	E
Number of Cases Sold	9,360	14,200	62,000	38,000	9,800
List Selling Price (₹)	54	54	54	54	54
Actual Selling Price (₹)	54	53.40	49	50.20	48.60
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 expediate Deliveries	0	0	0	0	2

Its five activities and their cost drivers are:

Activity Cost Driver

Order taking	₹ 200 per purchase order
Customer visits	₹ 300 per each visit
Deliveries	₹ 4.00 per delivery km travelled
Product Handling	₹ 2.00 per case sold
Expedited deliveries	₹ 100 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 'D' in comparison with Customer 'C' and on Customer 'E' in comparison with Customer 'A'.

(10 Marks)

Reference | What's **New**

Operating profit of each customer and Comments

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Answer

Working note:

Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

Particular	Customers				
	A	B	C	D	E
Cases sold: (a)	9,360	14,200	62,000	38,000	9,800
Revenues (at listed price) (₹): (b) {(a) × ₹ 54)}	5,05,440	7,66,800	33,48,000	20,52,000	5,29,200
Discount (₹): (c) {(a) × Discount per case}	-	8,520 (14,200 cases × ₹ 0.6)	3,10,000 (62,000 cases × ₹ 5)	1,44,400 (38,000 cases × ₹ 3.80)	52,920 (9,800 cases × ₹ 5.40)
Cost of goods sold (₹): (d) {(a) × ₹ 45}	4,21,200	6,39,000	27,90,000	17,10,000	4,41000
Customer level operating activities costs					
Order taking costs (₹): (No. of purchase × ₹ 200)	6,000	10,000	12,000	10,000	12,000
Customer visits costs (₹) (No. of customer visits × ₹ 300)	1,200	1,800	3,600	1,200	1,800
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles × ₹ 4 per km.)	3,200	2,880	4,800	6,400	9,600
Product handling costs (₹) {(a) ×₹ 2}	18,720	28,400	1,24,000	76,000	19,600
Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 100}	-	-	-	-	200
Total cost of customer level operating activities (₹)	29,120	43,080	1,44,400	93,600	43,200

(i) **Computation of Customer level operating income**

Particular	Customers				
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)
Revenues (At list price) (Refer to working note)	5,05,440	7,66,800	33,48,000	20,52,000	5,29,200
Less: Discount (Refer to working note)	-	8,520	3,10,000	1,44,400	52,920
Revenue (At actual price)	5,05,440	7,58,280	30,38,000	19,07,600	4,76,280
Less: Cost of goods sold (Refer to working note)	4,21,200	6,39,000	27,90,000	17,10,000	4,41000
Gross margin	84,240	1,19280	2,48,000	1,97,600	35,280

Less: Customer level operating activities costs (Refer to working note)	29,120	43,080	1,44,400	93,600	43,200
Customer level operating income	55,120	76,200	1,03,600	1,04,000	(7,920)

(ii) **Comments**

Customer D in comparison with Customer C: Operating income of Customer D is more than of Customer C, despite having only 61.29% (38,000 units) of the units volume sold in comparison to Customer C (62,000 units). Customer C receives a higher percent of discount i.e. 9.26% (₹ 5) while Customer D receive a discount of 7.04% (₹ 3.80). Though the gross margin of customer C (₹ 2,48,000) is more than Customer D (₹ 1,97,600) but total cost of customer level operating activities of C (₹ 1,44,400) is more in comparison to Customer D (₹ 93,600). As a result, operating income is more in case of Customer D.

Customer E in comparison with Customer A: Customer E is not profitable while Customer A is profitable. Customer E receives a discount of 10% (₹ 5.4) while Customer A doesn't receive any discount. Sales Volume of Customer A and E is almost same. However, total cost of customer level operating activities of E is far more (₹ 43,200) in comparison to Customer A (₹ 29,120). This has resulted in occurrence of loss in case of Customer E.

Q17 RTP Nov'20

KD Ltd. is following Activity based costing. Budgeted overheads, cost drivers and volume are as follows:

Cost pool	Budgeted overheads (₹)	Cost driver	Budgeted volume
Material procurement	18,42,000	No. or 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 ₹ 24,62,000 and wages ₹ 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.

Reference | **What's New**

Acivity wise rate and Total Cost

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Answer

(i) **Calculation of Cost Driver rate:**

Cost pool	Budgeted overheads (₹)	Cost driver	Cost driver rate (₹)
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 (₹)	Amount (₹)
Material cost		24,62,000.00
Wages		4,68,500.00
Overheads:		
- Material procurement (₹ 1,535×56 orders)	85,960.00	
- Material handling (₹ 685.48×84 movements)	57,580.32	
- Maintenance (₹ 139.94×1,420 hours)	1,98,714.80	
- Set-up (₹ 628.97×60 set-ups)	37,738.20	
- Quality control (₹ 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

Q18 MTP Nov'20

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:

Production of soaps (Units)	BABYSOFT- Gold 4,000		BABYSOFT- Pearl 3,000		BABYSOFT- Diamond 2,000	
Resources per Unit:	**Qty**	**Rate**	**Qty**	**Rate**	**Qty**	**Rate**
- Essential Oils	60 ml	₹ 200 / 100 ml	55 ml	₹ 300 / 100 ml	65 ml	₹ 300 / 100 ml
- Cocoa Butter	20 g	₹ 200 / 100 g	20 g	₹ 200 / 100 g	20 g	₹ 200 / 100 g
- Filtered Water	30 ml	₹ 15 / 100 ml	30 ml	₹ 15 / 100 ml	30 ml	₹ 15 / 100 ml
- Chemicals	10 g	₹ 30 / 100 g	12 g	₹ 50 / 100 g	15 g	₹ 60 / 100 g
- Direct Labour	30 minutes	₹ 10 / hour	40 minutes	₹ 10 / hour	60 minutes	₹ 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 ₹ 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	(₹)	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?

[10 Marks]

Reference — What's New

Absorption Cost and Activity Based Cost

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Answer

(i) **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

= ₹ 1,98,000 ¸ 6,000 hours

= ₹ 33 per direct labour hour

Unit Costs:

	BABYSOFT- Gold (₹)	BABYSOFT- Pearl (₹)	BABYSOFT- Diamond (₹)
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 note1)	167.50	215.50	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 (₹)	BABYSOFT- Pearl (₹)	BABYSOFT- Diamond (₹)
Essential oils	120.00 $\left(\frac{200\times60}{100}\right)$	165.00 $\left(\frac{300\times55}{100}\right)$	195.00 $\left(\frac{300\times65}{100}\right)$

Cocoa Butter	40.00 $\left(\frac{200\times20}{100}\right)$	40.00 $\left(\frac{200\times20}{100}\right)$	40.00 $\left(\frac{200\times20}{100}\right)$
Filtered water	4.50 $\left(\frac{15\times30}{100}\right)$	4.50 $\left(\frac{15\times30}{100}\right)$	4.50 $\left(\frac{15\times30}{100}\right)$
Chemicals	3.00 $\left(\frac{30\times10}{100}\right)$	6.00 $\left(\frac{50\times12}{100}\right)$	9.00 $\left(\frac{60\times15}{100}\right)$
Total costs	167.50	215.50	248.50

(ii) **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	-
Direct labour hours	2,000 $\left(\frac{4,000\times30}{60}\right)$	2,000 $\left(\frac{3,000\times40}{60}\right)$	2,000 $\left(\frac{2,000\times60}{60}\right)$	6,000
Machine operations per unit	5	5	6	-
Total operations	20,000	15,000	12,000	47,000

Forklifting rate per gram = ₹ 58,000 ÷ 9,84,000 grams = ₹ 0.06 per gram

Supervising rate per direct labour hour = ₹ 60,000 ÷ 6,000 hours = ₹ 10 per labour hour

Utilities rate per machine operations = ₹ 80,000 ÷ 47,000 machine operations

= ₹ 1.70 per machine operations

Unit Costs under ABC:

	BABYSOFT Gold (₹)	BABYSOFT Pearl (₹)	BABYSOFT Diamond (₹)
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 $\left(\frac{10\times30}{60}\right)$	6.67 $\left(\frac{10\times40}{60}\right)$	10.00 $\left(\frac{10\times60}{60}\right)$
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.

Q19 Nov'20

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 (₹)	8	6	5
Direct Labour per unit (₹)	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 :

	(₹)
Ordering costs	64,000

Delivery costs	1,58,200
Shelf Stocking costs	87,560

Required :

(i) **Calculate** cost driver's rate.

(ii) **Calculate** total cost of each product using Activity Based Costing. [6 Marks]

Reference — What's **New**

Cost Driver Rate and Total Cost

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Answer

(i) **Calculation Cost-Driver's rate**

Activity	Overhead cost (₹) (A)	Cost-driver level (B)	Cost driver rate (₹) (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 (₹)	Orange (₹)	Mixed Fruit (₹)
Material cost	80,000 (10,000 x ₹ 8)	90,000 (15,000 x ₹ 6)	1,00,000 (20,000 x ₹ 5)
Direct labour cost	50,000 (10,000 x ₹ 5)	60,000 (15,000 x ₹ 4)	60,000 (20,000 x ₹ 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

Q20 Nov'20

Describe the various levels of activities under 'ABC' methodology. [4 Markas]

Reference | What's **New**

Levels of activities

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Answer

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.

Q21 Jan'21

ABC Ltd. manufactures three products X, Y and Z using the same plant and resources. It has given the following information for the year ended on 31st March, 2020:

	X	Y	Z
Production Quantity (units)	1200	1440	1968
Cost per unit:			
Direct Material (₹)	90	84	176
Direct Labour (₹)	18	20	30

Budgeted direct labour rate was ₹ 4 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 (₹)	Cost Driver	Remarks
Material Procurement	50,000	No. of Orders	No. of orders was 25 units for each product.
Set-up	40,000	No. of Production Runs	All the three products are produced in production runs of 48 units.
Quality Control	28,240	No. of Inspections	Done for each production run.
Maintenance	1,28,000	Maintenance Hours	Total maintenance hours were 6,400 and was allocated in the ratio of 1:1:2 between X, Y & Z.

Required: [10 Marks]

1. **Calculate** the total cost per unit of each product using the Absorption Costing Method.
2. **Calculate** the total cost per unit of each product using the Activity Based Costing Method.

Reference — What's **New**

Absorption Costing and Activity Based Costing

Watch **Video**

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Answer

1. **Traditional Absorption Costing**

	X	Y	Z	Total
(a) Quantity (units)	1,200	1,440	1,968	4608
(b) Direct labour per unit (₹)	18	20	30	-
(c) Direct labour hours (a × b)/₹ 4	5,400	7,200	14,760	27,360

Overhead rate per direct labour hour:

= Budgeted overheads ÷ Budgeted labour hours

= (₹ 50,000 + ₹ 40,000 + ₹ 28,240 + ₹ 1,28,000) ÷ 27,360 hours

= ₹ 2,46,240 ÷ 27,360 hours

= ₹ 9 per direct labour hour

Unit Costs:

	X	Y	Z
Direct Costs:			
- Direct Labour (₹)	18.00	20.00	30.00
- Direct Material (₹)	90.00	84.00	176.00
Production Overhead: (₹)	40.50 $\left(\frac{9\times18}{4}\right)$	45.00 $\left(\frac{9\times20}{4}\right)$	67.50 $\left(\frac{9\times30}{4}\right)$
Total cost per unit (₹)	148.50	149.00	273.50

2. **Calculation of Cost-Driver level under Activity Based Costing**

	X	Y	Z	Total
Quantity (units)	1,200	1,440	1,968	-
No. of orders (to be rounded off for fraction)	48 (1200 / 25)	58 (1440 / 25)	79 (1968 / 25)	185
No. of production runs	25 (1200 / 48)	30 (1440 / 48)	41 (1968 / 48)	96
No. of Inspections (done for each production run)	25	30	41	96
Maintenance hours	1,600	1,600	3,200	6,400

Calculation of Cost-Driver rate

Activity	Budgeted Cost (₹) (a)	Cost-driver level (b)	Cost Driver rate (₹) (c) = (a) / (b)
Material procurement	50,000	185	270.27
Set-up	40,000	96	416.67
Quality control	28,240	96	294.17
Maintenance	1,28,000	6,400	20.00

Calculation of total cost of products using Activity Based Costing

Particulars	Product		
	X (₹)	Y (₹)	Z (₹)
Direct Labour	18.00	20.00	30.00
Direct Material	90.00	84.00	176.00
Prime Cost per unit (A)	108.00	104.00	206.00
Material procurement	10.81 [(48 × 270.27)/1200]	10.89 [(58 × 270.27)/1440]	10.85 [(79 × 270.27)/1968]

Set-up	8.68 [(25 × 416.67)/1200]	8.68 [(30 × 416.67)/ 1440]	8.68 [(41 × 416.67)/ 1968]
Quality control	6.13 [(25 × 294.17)/1200]	6.13 [(30 × 294.17)/ 1440]	6.13 [(41 × 294.17)/ 1968]
Maintenance	26.67 [(1,600 × 20)/1200]	22.22 [(1,600 × 20)/ 1440]	32.52 [(3,200 × 20)/ 1968]
Overhead Cost per unit (B)	52.29	47.92	58.18
Total Cost per unit (A + B)	160.29	151.92	264.18

Note: Question may also be solved assuming no. of orders for material procurement to be 25 for each product.

Q22 RTP May'21

The following budgeted information relates to N Ltd. for the year 2021:

	Products		
	X	Y	Z
Production and Sales (units)	1,00,000	80,000	60,000
	(₹)	(₹)	(₹)
Selling price per unit	90	180	140
Direct cost per unit	50	90	95
	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 ₹ 73,60,000

Assembly Department ₹ 55,00,000

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 (₹)	Cost Driver	Quantity
Machining services	64,40,000	Machine hours	9,20,000 hours
Assembly services	44,00,000	Direct labour hours	11,00,000 hours

Set-up costs	9,00,000	Machine set-ups	9,000 set-ups
Order processing	7,20,000	Customer orders	7,200 orders
Purchasing	4,00,000	Purchase orders	800 orders

As per an estimate the activities will be used by the three products:

	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.

Reference — What's **New**

Absorption Costing Method and Activity Base Method

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Answer

(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 (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads:				
(i)	Machine department (₹) (Working note-1)	24,00,000	25,60,000	24,00,000	73,60,000
(ii)	Assembly department (₹) (Working note-1)	30,00,000	16,00,000	9,00,000	55,00,000
G.	Total Cost (₹) [E+F]	1,04,00,000	1,13,60,000	90,00,000	3,07,60,000
H.	Profit (C-G)	(14,00,000)	30,40,000	(6,00,000)	10,40,000

(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 (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads: (Refer working note-3)				
(i)	Machining services (₹)	21,00,000	22,40,000	21,00,000	64,40,000
(ii)	Assembly services (₹)	24,00,000	12,80,000	7,20,000	44,00,000
(iii)	Set-up costs (₹)	4,50,000	3,00,000	1,50,000	9,00,000
(iv)	Order processing (₹)	2,20,000	2,40,000	2,60,000	7,20,000
(v)	Purchasing (₹)	1,50,000	1,75,000	75,000	4,00,000
G.	Total Cost (₹) [E+F]	1,03,20,000	1,14,35,000	90,05,000	3,07,60,000
H.	Profit (₹) (C-G)	(13,20,000)	29,65,000	(6,05,000)	10,40,000

Working Notes:

1.

	Particulars	Products			Total
		X	Y	Z	
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 (₹)	8	8	8	
E.	**Machine Dept. cost [C × D]**	24,00,000	25,60,000	24,00,000	73,60,000
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 (₹)	5	5	5	
I.	**Assembly Dept. cost [G×H]**	30,00,000	16,00,000	9,00,000	55,00,000

$$\text{Machine hour rate} = \frac{₹\,73,60,000}{9,20,000 \text{ hours}} = ₹\,8$$

$$\text{Labour hour rate} = \frac{₹\,55,00,000}{11,00,000 \text{ hours}} = ₹\,5$$

2. **Calculation of cost driver rate**

Cost Pool	Amount (₹)	Cost Driver	Quantity	Driver rate (₹)
Machining services	64,40,000	Machine hours	9,20,000 hours	7.00
Assembly services	44,00,000	Direct labour hours	11,00,000 hours	4.00
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups	100.00
Order processing	7,20,000	Customer orders	7,200 orders	100.00
Purchasing	4,00,000	Purchase orders	800 orders	500.00

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 (₹) (Refer Working note-2)	7	7	7	
C.	**Machining services cost (₹) [A × B]**	21,00,000	22,40,000	21,00,000	64,40,000
D.	Labour hours (Refer Working note-1)	6,00,000	3,20,000	1,80,000	11,00,000
E.	Labour hour rate (₹) (Refer Working note-2)	4	4	4	
F.	**Assembly services cost (₹) [D × E]**	24,00,000	12,80,000	7,20,000	44,00,000
G.	Machine set-ups	4,500	3,000	1,500	9,000
H.	Rate per set-up (₹) (Refer Working note-2)	100	100	100	
I.	**Set-up cost (₹) [G × H]**	4,50,000	3,00,000	1,50,000	9,00,000
J.	Customer orders	2,200	2,400	2,600	7,200
K.	Rate per order (₹) (Refer Working note-2)	100	100	100	
L.	**Order processing cost (₹) [J × K]**	2,20,000	2,40,000	2,60,000	7,20,000
M.	Purchase orders	300	350	150	800
N.	Rate per order (₹) (Refer Working note-2)	500	500	500	
O.	**Purchasing cost (₹) [M × N]**	1,50,000	1,75,000	75,000	4,00,000

Q23 MTP May'21

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	₹ 84	₹ 90	₹ 80	₹ 96
Direct Labour	₹ 20	₹ 18	₹ 14	₹ 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:

	(₹)
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. (10 Marks)

Reference | What's New

Product Cost Statement

Watch Video

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Answer

(i) Total Overhead = ₹ (2,52,000 + 80,000 + 60,000 + 40,000 + 10,368) = ₹ 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.

$\therefore$ Overhead recovery rate / M.H. $= \frac{₹\ 4,42,368}{12,288\ \text{M.Hrs}} = ₹\ 36$

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:				
Direct material	84	90	80	96
Direct labour	20	18	14	16
Overhead (@ ₹ 36)	144 (4 × ₹ 36)	108 (3 × ₹ 36)	72 (2 × ₹ 36)	36 (1× ₹ 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 ₹ 2,52,000 to be apportioned to set-up cost, store receiving and inspection in 4 : 3 : 2 i.e. ₹ 1,12,000, ₹ 84,000 and ₹ 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 96 runs.

(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 (₹)	Cost driver	Quantity	Cost driver rate
Set-up	80,000 + 1,12,000 = 1,92,000	No. of production run	96	₹ 2,000 per production run
Store-receiving	60,000 + 84,000 = 1,44,000	Requisition raised	50 × 4 = 200	₹ 720 per requisition
Inspection	40,000 + 56,000 = 96,000	No. of production run	96	₹ 1,000 per production run
Material handling	10,368	Orders executed (No. of batches)	192	₹ 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
	(₹)	(₹)	(₹)	(₹)
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

Q 24 MTP May'21

RVP Cinema provides the following data for the year 2020-21:

Particulars	Premium Hall (₹)	Recliner Hall (₹)	7D Hall (₹)	Cafeteria (₹)
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 (₹)	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. (10 Marks)

Reference — What's **New**

Operating Income under Traditional and ABC

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Answer

Computation showing Rates for each Activity

Activity	Activity Cost (₹) (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 (₹)	Recliner Hall (₹)	7D Hall (₹)	Cafeteria (₹)
Marketing Expenses	78,750 (2,62,500 x 0.3)	90,000 (3,00,000 x 0.3)	45,000 (1,50,000 x 0.3)	11,250 (37,500 x 0.3)
Website Maintenance Expenses	52,500 (2,10,000 x 0.25)	61,875 (2,47,500 x 0.25)	30,000 (1,20,000 x 0.25)	5,625 (22,500 x 0.25)
Credit Card Processing Fees	37,500 (75,000 x 0.5)	45,000 (90,000 x 0.5)	30,000 (60,000 x 0.5)	22,500 (45,000 x 0.5)
Cleaning Equipment Cost	90,000 (3,000 x 30)	1,35,000 (4,500 x 30)	67,500 (2,250 x 30)	22,500 (750 x 30)
Inspecting and Testing Cost	60,000 (12,000 x 5)	90,000 (18,000 x 5)	75,000 (15,000 x 5)	37,500 (7,500 x 5)
Setting up machine's cost	1,12,500 (225 x 500)	2,25,000 (450 x 500)	75,000 (150 x 500)	37,500 (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 (₹)	Recliner Hall (₹)	7D Hall (₹)	Cafeteria (₹)
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. (₹ 63,000) or percentage of profit/loss is (12%).

Q25 July'21

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 (₹)
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 ; [10]

(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 ₹ 30,000 and per quarter production will involve the following :

Direct Material	₹ 18,000
Direct Labour hours	1,500 hours
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.

Reference | What's **New**

Cost of product using ABC and Cost of unused capacity | **Quotation using ABC**

Watch **Video** Scan Me

Answer

(i) **Statement of cost allocation to each product from each activity**

	Product			
	P (₹)	Q (₹)	R (₹)	Total (₹)
Direct Labour hours (Refer to working note)	1,00,000 (10,000 Labour hours × ₹ 10)	80,000 (8,000 Labour hours × ₹ 10)	60,000 (6,000 Labour hours × ₹ 10)	2,40,000
Production runs (Refer to working note)	60,000 (200 Production runs × ₹ 300)	54,000 (180 Production runs × ₹ 300)	48,000 (160 Production runs × ₹ 300)	1,62,000
Quality Inspections (Refer to working note)	90,000 (3,000 Inspections × ₹ 30)	75,000 (2,500 Inspections × ₹ 30)	45,000 (1,500 Inspections × ₹ 30)	2,10,000

Working note:

Rate per unit of cost driver

Direct Labour hours	(₹ 3,00,000/30,000 Labour hours)	₹ 10 per Labour hour
Production runs	(₹ 1,80,000/600 Production runs)	₹ 300 per Production run
Quality Inspection	(₹ 2,40,000/8,000 Inspections)	₹ 30 per Inspection

(ii) **Computation of cost of unused capacity for each activity**

Particulars	(₹)
Direct Labour hours [(₹ 3,00,000 – ₹ 2,40,000) or (6,000 × ₹ 10)]	60,000
Production runs [(₹ 1,80,000 – ₹ 1,62,000) or (60 × ₹ 300)]	18,000
Quality Inspection [(₹ 2,40,000 – ₹ 2,10,000) or (1,000 × ₹ 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	(₹)
1500 units of product 'S' to be delivered per quarter	
Initial design cost per quarter (₹ 30,000 / 8 quarters)	3,750
Direct Material Cost	18,000
Direct Labour Cost (1,500 Labour hours × ₹ 10)	15,000
Direct Costs (A)	36,750
Set up Cost (15 Production runs × ₹ 300)	4,500
Inspection Cost (250 Inspections × ₹ 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' (₹ 58,500/1500 units)	39

Q26 Dec'21

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 the year 2020-21 for each product line :

	Drugs Types		
	A	B	C
Revenues (in ₹)	74,50,000	1,11,75,000	1,86,25,000
Cost of goods sold (in ₹)	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 (₹)	Cost allocation base
Drug Licence fee	Drug Licence 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 goods	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 : [10]

(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.

Reference — What's **New**

Operating Income in amount and as a % of Revenue

Watch **Video**

Scan Me

Answer

(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 (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
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:

	(₹)
Drug Licence Fee	5,00,000
Ordering	8,30,000
Delivery	18,20,000
Shelf stocking	32,40,000
Customer support	28,20,000
Total support cost	92,10,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{₹\ 92,10,000}{₹\ 2,30,25,000} \times 100 = 40\%$$

3. Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	8,30,000	2,000 purchase orders	₹ 415 per purchase order
Delivery	18,20,000	2,800 deliveries	₹ 650 per delivery
Shelf-stocking	32,40,000	4,500 hours	₹ 720 per stocking hour
Customer support	28,20,000	4,70,000 units sold	₹ 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 (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
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

(ii) **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 (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
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 (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
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.

Q27 RTP May'22

PCP Limited belongs to the apparel industry. It specializes in the distribution of fashionable garments. It buys from the industry and resells the same to the following two different supermarkets:

(i) Supermarket A dealing in Adults' garments (Age group 15 - 30)

(ii) Supermarket B dealing in Kids' garments (Age group 5 - 10)

The following data for the month of April in respect of PCP Limited has been reported:

	Supermarket A (₹)	Supermarket B (₹)
Average revenue per delivery	1,69,950	57,750
Average cost of goods sold per delivery	1,65,000	55,000
Number of deliveries	660	1,650

In the past, PCP Limited has used gross margin percentage to evaluate the relative profitability of its supermarket segments.

The company plans to use activity –based costing for analysing the profitability of its supermarket segments.

The April month's operating costs (other than cost of goods sold) of PCP Limited are ₹ 16,55,995. These operating costs are assigned to five activity areas. The cost in each area and Activity analysis including cost driver for the month of April are as follows:

Activity Area	Total costs (₹)	Cost Driver
Store delivery	3,90,500	Store deliveries
Cartons dispatched to store	4,15,250	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	64,845	Hours of shelf-stocking
Line-item ordering	3,45,400	Line-items per purchase order
Customer purchase order processing	4,40,000	Purchase orders by customers

Other data for the month of April include the following:

	Supermarket A	Supermarket B
Total number of store deliveries	1,100	2,805
Average number of cartons shipped per store delivery	250	50
Average number of hours of shelf-stocking per store delivery	6	1.5

Average number of line items per order	14	12
Total number of orders	770	1,980

Required:

(i) **COMPUTE** gross-margin percentage for each of its supermarket segments and compute PCP Limited's operating income.

(ii) **COMPUTE** the operating income of each supermarket segments using the activity- based costing information.

Reference — What's New

Operating Income under Tradational and ABC

Watch Video — Scan Me

Answer

(i)

PCP Limited's

Statement of operating income and gross margin percentage for each of its supermarket segments

Particulars	Supermarket A	Supermarket B	Total
Revenues: (₹)	11,21,67,000 (660 × ₹ 1,69,950)	9,52,87,500 (1,650 × ₹ 57,750)	20,74,54,500
Less: Cost of goods sold: (₹)	10,89,00,000 (660 × ₹ 1,65,000)	9,07,50,000 (1650 × ₹ 55,000)	19,96,50,000
Gross Margin: (₹)	32,67,000	45,37,500	78,04,500
Less: Other operating costs: (₹)			16,55,995
Operating income: (₹)			61,48,505
Gross Margin	2.91%	4.76 %	3.76%
Operating income %			2.96%

(ii) **Operating Income Statement of each distribution channel in April (Using the Activity based Costing information)**

	Supermarket A	Supermarket B
Gross margin (₹) : (A) (Refer to (i) part of the answer)	32,67,000	45,37,500
Operating cost (₹): (B) (Refer to working note)	6,55,600	10,00,395
Operating income (₹): (A–B)	26,11,400	35,37,105
Operating income (in %) (Operating income/Revenue) ×100	2.33	3.71

Working note:

Computation of rate per unit of the cost allocation base for each of the five activity areas for the month of April

	(₹)
Store delivery [₹ 3,90,500/ (1,100 + 2,805 store deliveries)]	100 per delivery
Cartons dispatched [₹ 4,15,250/ {(250 × 1,100) + (50×2,805)} carton dispatches]	1 per carton dispatch
Shelf-stocking at customer store (₹) [₹ 64,845/ {(6 × 1,100) + (1.5 × 2,805)} hours]	6 per hour
Line item ordering [₹ 3,45,400/ {(14 × 770) + (12 × 1,980)} line items]	10 per line item order
Customer purchase order processing [₹ 4,40,000/ (770 + 1,980 orders)]	160 per order

Computation of operating cost of each distribution channel:

	Supermarket A (₹)	Supermarket B (₹)
Store delivery	1,10,000 (₹ 100 × 1,100 deliveries)	2,80,500 (₹ 100 × 2,805 deliveries)
Cartons dispatched	2,75,000 (₹ 1× 250 cartons × 1,100 deliveries)	1,40,250 (₹ 1 × 50 cartons × 2,805 deliveries)
Shelf stocking	39,600 (₹ 6 × 1,100 deliveries × 6 Av. hrs.)	25,245 (₹ 6 × 2,805 deliveries × 1.5 Av. hrs)
Line item ordering	1,07,800 (₹ 10 × 14 line item x 770 orders)	2,37,600 (₹ 10 × 12 line item x 1,980 orders)
Customer purchase order processing	1,23,200 (₹ 160 × 770 orders)	3,16,800 (₹ 160 × 1,980 orders)
Operating cost	6,55,600	10,00,395

Q28 RTP Nov'22

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 (in ₹)

	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 labour)	60,00,000	48,00,000	10,80,000	1,20,000	1,20,00,000
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	(₹)
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 ₹ 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 (₹)	150	150	155	165	
Material cost (₹)	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.

(ii) **STATE** the reasons for different operating income under traditional income system and activity-based costing system.

Reference | What's **New**

Operating Income using Activity Based Costing System

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Answer

(i) **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
	(₹)		(₹)		(₹)
Indirect labour + 40% for incentives	56,00,000	50%	28,00,000	300 Production runs	9,333.33
		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

* $(100 \times 4) + (100 \times 1) + (76 \times 6) + (24 \times 4)$

$= (400 + 100 + 456 + 96)$

$= 1052$ setup hours

Activity Based Costing

	Brown	Black	Red	Green	Total
Quantity (units)	1,00,000	80,000	18,000	2,000	2,00,000
	(₹)	(₹)	(₹)	(₹)	(₹)
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
Overheads					
Indirect labour + incentives					
- 50% based on Production runs	9,33,333 (9,333.33 × 100)	9,33,333 (9,333.33 × 100)	7,09,334 (9,333.33 × 76)	2,24,000 (9,333.33 × 24)	28,00,000
- 40% based on Setup hours	8,51,711 (2,129.28 × 400)	2,12,928 (2,129.28 × 100)	9,70,951 (2,129.28 × 456)	2,04,410 (2,129.28x 96)	22,40,000

- 10% based on number of parts	1,40,000 (1,40,000 × 1)	1,40,000	1,40,000	1,40,000	5,60,000
Computer Systems					
- 80% based on Production runs	5,33,333 (5,333.33 × 100)	5,33,333 (5,333.33 × 100)	4,05,334 (5,333.33 × 76)	1,28,000 (5,333.33 × 24)	16,00,000
- 20% based on number of parts	1,00,000 (1,00,000 × 1)	1,00,000	1,00,000	1,00,000	4,00,000
Machinery depreciation	8,00,000 (80 × 0.1 × 1,00,000)	6,40,000 (80 × 0.1 × 80,000)	1,44,000 (80 × 0.1 × 18,000)	16,000 (80 × 0.1 × 2,000)	16,00,000
Machine Maintenance	4,00,000 (40 × 0.1 × 1,00,000)	3,20,000 (40 × 0.1 × 80,000)	72,000 (40 × 0.1 × 18,000)	8,000 (40 × 0.1 × 2,000)	8,00,000
Energy for Machinery	2,00,000 (20 × 0.1 × 1,00,000)	1,60,000 (20 × 0.1 × 80,000)	36,000 (20 × 0.1 × 18,000)	4,000 (20 × 0.1 × 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

(ii) 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.

Q29 MTP Nov'22

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 (₹)	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: ₹ 60 per hour
- Machine hour rate: ₹ 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. [10]

Reference — What's New

Unit cost and total cost under

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Answer

(i) **Cost per unit - Conventional Costing: Absorption rate method**

Particulars	A (₹)	B (₹)	C (₹)	D (₹)
Material	140	90	180	150
Labour @ ₹ 60 per labour hour	60	180	120	90
Overheads @ ₹ 280 per machine hour	840	560	1680	1120
Cost per unit (in ₹)	1,040	830	1,980	1,360

No of units	1,500	2,500	10,000	6,000
Total cost (₹)	15,60,000	20,75,000	1,98,00,000	81,60,000

(ii) **Statement of apportionment of overheads:** Amount (₹)

Type of Cost	Cost Driver	A	B	C	D
Setups	No of Setups	7,48,000 (100 x 7,480)	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 x 11,900)	10,11,500 (85 x 11,900)
Inspection	No. of Inspections	9,16,300 (200 x 4,581.50)	11,45,375 (250 x 4,581.50)	41,23,350 (900 x 4,581.50)	29,77,975 (650 x 4,581.50)
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 (₹)	B (₹)	C (₹)	D (₹)
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 = ₹ 2,61,80,000

2. **Calculation of cost driver rate**

Cost pool	Amount of cost (₹)	Cost Driver (basis)	Cost Driver (units)	Cost Driver Rate (₹)
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			

Q30 MTP Nov'22

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 [5]

Reference What's **New**

Corresponding Cost Drivers

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Answer

Activity Cost Pools	Related Cost Drivers
Inspecting and testing costs	Number of tests
Setting up machines cost	Number of set-ups
Machining costs	Machine hours
Supervising Costs	Direct labour hours
Ordering and Receiving Materials cost	Number of purchase orders

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Chapter 10

Control Accounts

Q1 ICAI Mat; RTP May'18; RTP Nov'19; RTP May'20

As on 31st March, 20X8, the following balances existed in a firm's Cost Ledger:

	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	3,01,435	
Work-in-Process Control A/c	1,22,365	
Finished Stock Ledger Control A/c	2,51,945	
Manufacturing Overhead Control A/c		10,525
Cost Ledger Control A/c		6,65,220
	6,75,745	6,75,745

During the next three months the following items arose:

	(₹)
Finished product (at cost)	2,10,835
Manufacturing overhead incurred	91,510
Raw materials purchased	1,23,000
Factory Wages	50,530
Indirect Labour	21,665
Cost of Sales	1,85,890
Material issued to production	1,27,315
Sales returned at Cost	5,380
Material returned to suppliers	2,900
Manufacturing overhead charged to production	77,200

You are required to **PASS** the Journal Entries; write up the accounts and schedule the balances, stating what each balance represents.

Reference

Non-Integrated Accounting System

What's **New**

Journal and Ledger

Watch **Video**

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Answer

Journal entries are as follows:

			Dr. (₹)	Cr. (₹)
1.	Finished stock ledger Control A/c	Dr.	2,10,835	
	To Work-in-Process Control A/c			2,10,835
2.	Manufacturing Overhead Control A/c	Dr.	91,510	
	To Cost Ledger Control A/c			91,510
3.	Stores Ledger Control A/c	Dr.	1,23,000	
	To Cost Ledger Control A/c			1,23,000
4.	(i) Wage Control A/c	Dr.	72,195	
	To Cost Ledger Control A/c			72,195
	(ii) Work-in-Process Control A/c	Dr.	50,530	
	To Wages Control A/c			50,530
	(iii) Manufacturing Overhead Control A/c	Dr.	21,665	
	To Wages Control A/c			21,665
5.	Cost of Sales A/c	Dr.	1,85,890	
	To Finished Stock Ledger A/c			1,85,890
6.	Work-in-Process Control A/c	Dr.	1,27,315	
	To Stores Ledger Control A/c			1,27,315
7.	Finished Stock Ledger Control A/c	Dr.	5,380	
	To Cost of Sales A/c			5,380
8.	Cost Ledger Control A/c	Dr.	2,900	
	To Stores Ledger Control A/c			2,900
9.	Work-in-Process Control A/c	Dr.	77,200	
	To Manufacturing Overhead Control A/c			77,200

COST LEDGERS

Cost Ledger Control Account

		(₹)			(₹)
To	Stores Ledger Control A/c (return)	2,900	By	Balance b/d	6,65,220
"	Balance c/d	9,49,025	"	Manufacturing OH Control A/c	91,510
			"	Stores Ledger Control A/c	1,23,000
			"	Wages Control A/c	72,195
		9,51,925			9,51,925

Stores Ledger Control Account

		(₹)			(₹)
To	Balance b/d	3,01,435	By	Work in Process Control A/c	1,27,315
″	Cost Ledger Control A/c	1,23,000	″	Cost Ledger Control A/c	2,900
			″	Balance c/d	2,94,220
		4,24,435			4,24,435

Work-in-Process Control Account

		(₹)			(₹)
To	Balance b/d	1,22,365	By	Finished Stock Ledger Control A/c	2,10,835
″	Wages Control A/c	50,530	″	Balance c/d	1,66,575
″	Stores Ledger Control A/c	1,27,315			
″	Manufacturing OH Control A/c	77,200			
		3,77,410			3,77,410

Finished Stock Ledger Control Account

		(₹)			(₹)
To	Balance b/d	2,51,945	By	Cost of Sales Control A/c	1,85,890
″	Work in Process Control A/c	2,10,835	″	Balance c/d	2,82,270
″	Cost of Sales Control A/c (Return at cost)	5,380			
		4,68,160			4,68,160

Manufacturing Overhead Control Account

		(₹)			(₹)
To	Cost Ledger Control A/c	91,510	By	Balance b/d	10,525
″	Wages Control A/c	21,665	″	Work in Process Control A/c	77,200
			″	Balance c/d	25,450
		1,13,175			1,13,175

Wages Control Account

		(₹)			(₹)
To	Cost Ledger Control A/c	72,195	By	Work in Process Control A/c	50,530
			″	Manufacturing OH Control A/c	21,665
		72,195			72,195

Cost of Sales Account

	(₹)		(₹)
To Finished Stock Ledger Control	1,85,890	By Finished Stock Ledger Control (Return)	5,380
		" Balance c/d	1,80,510
	1,85,890		1,85,890

Trial Balance

	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	2,94,220	
Work-in-Process Control A/c	1,66,575	
Finished Stock Ledger Control A/c	2,82,270	
Manufacturing Overhead Control A/c	25,450	
Cost of Sales A/c	1,80,510	
Cost Ledger Control A/c		9,49,025
	9,49,025	9,49,025

Q2 ICAI Mat

From the following details **PREPARE** the necessary accounts in the Cost Ledger

	Materials (₹)	Work-in-Process (₹)	Finished Stock (₹)
Opening balance	8,000	5,000	10,000
Closing balance	11,000	9,000	12,000

Transactions during the period	(₹)
Materials purchased	25,000
Wages paid (including ₹ 2,000 indirect)	10,000
Overheads incurred	8,000
Overheads absorbed	9,000
Sales	50,000

Reference — **Non-Integrated Accounting System**

What's **New** — **Ledgers and Trial Balance - Opening balance of GLA**

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Answer

Cost Ledgers

Cost Ledger Control Account

		(₹)			(₹)
To	Cost of Sales A/c	50,000	By	Balance b/d (8,000 + 5,000 + 10,000)	23,000
			″	Stores Ledger Control A/c	25,000
			″	Wages Control A/c	10,000
			″	Overheads Control A/c	8,000
″	Balance c/d (11,000 + 9,000 + 12,000)	32,000	″	Costing P&L A/c (profit)	16,000
		82,000			82,000

Stores Ledger Control Account

		(₹)			(₹)
To	Balance b/d	8,000	By	Work-in-process A/c (balancing figure)	22,000
″	Cost Ledger Control A/c	25,000	″	Balance c/d	11,000
		33,000			33,000

Work-in-process Control A/c

		(₹)			(₹)
To	Balance b/d	5,000	By	Finished stock (balancing figure)	35,000
″	Store Ledger Control A/c	22,000	″	Balance c/d	9,000
″	Wages Control A/c	8,000			
″	Overheads Control A/c	9,000			
		44,000			44,000

Finished Stock Account

		(₹)			(₹)
To	Balance b/d	10,000	By	Cost of Sales A/c (balancing figure)	33,000
″	Work-in-Process Control A/c	35,000	″	Balance c/d	12,000
		45,000			45,000

Wages Control Account

		(₹)			(₹)
To	Cost Ledger Control A/c	10,000	By	Work-in-process Control A/c	8,000
			″	Overheads A/c	2,000
		10,000			10,000

Overheads Control Account

		(₹)			(₹)
To	Cost Ledger Control A/c	8,000	By	Work-in-process Control A/c	9,000
″	Wages Control A/c	2,000	″	Costing P&L A/c*	1,000
		10,000			10,000

* [(Overhead incurred + Indirect wages) – Overheads absorbed]

[(₹ 8,000 + ₹ 2,000) - ₹ 9,000] = ₹ 1,000 (under-absorption)

Cost of Sales Account

		(₹)			(₹)
To	Finished Stock A/c	33,000	By	Costing P&L A/c	33,000
		33,000			33,000

Costing P & L Account

		(₹)			(₹)
To	Cost of Sales A/c	33,000	By	Cost Ledger Control A/c (Sales A/c)	50,000
″	Overheads Control (under-absorbed)	1,000			
″	Cost Ledger Control A/c (Profit) (balancing figure)	16,000			
		50,000			50,000

Q3 ICAI Mat

On 31st March, 20X8 the following balances were extracted from the books of the Supreme Manufacturing Company:

	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	35,000	
Work-in-Process Control A/c	38,000	
Finished Goods Control A/c	25,000	
Cost Ledger Control A/c		98,000
	98,000	98,000

The following transactions took place in April 20X8:

	Dr. (₹)
Raw Materials:	
- Purchased	95,000
- Returned to suppliers	3,000

- Issued to production	98,000
- Returned to stores	3,000
Productive wages	40,000
Indirect wages	25,000
Factory overhead expenses incurred	50,000
Selling and Administrative expenses	40,000
Cost of finished goods transferred to warehouse	2,13,000
Cost of Goods sold	2,10,000
Sales	3,00,000

Factory overheads are applied to production at 150% of direct wages, any under/over absorbed overhead being carried forward for adjustment in the subsequent months. All administrative and selling expenses are treated as period costs and charged off to the Profit and Loss Account of the month in which they are incurred.

PREPARE the following Accounts:

(a) Cost Ledger Control A/c

(b) Stores Ledger Control A/c

(c) Work-in-Process Control A/c

(d) Finished Goods Stock Control A/c

(e) Factory Overhead Control A/c

(f) Costing Profit and Loss A/c

(g) Trial Balance as at 30th April, 20X3.

Reference | What's **New**

Non-Integrated Accounting System | **Ledgers and Trial Balance**

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Answer

(a) **Cost Ledger Control A/c**

		(₹)			(₹)
To	Costing P&L A/c (sales)	3,00,000	By	Balance b/d	98,000
"	Stores Ledger Control A/c	3,000	"	Stores Ledger Control A/c	95,000
			"	Wages Control A/c (Productive + Indirect wages)	65,000
			"	Factory OH Control A/c	50,000

			″	Selling & Admn. OH A/c	40,000
″	Balance c/d	95,000	″	Costing P&L A/c (profit)	50,000
		3,98,000			3,98,000

(b) **Stores Ledger Control A/c**

		(₹)			(₹)
To	Balance b/d	35,000	By	Cost Ledger Control A/c	3,000
″	Cost Ledger Control A/c	95,000	″	Work-in-process Control A/c	98,000
″	Work-in-process Control A/c	3,000	″	Balance c/d	32,000
		1,33,000			1,33,000

(c) **Work-in-Process Control A/c**

		(₹)			(₹)
To	Balance b/d	38,000	By	Stores Ledger Control A/c	3,000
″	Store Ledger Control A/c	98,000	″	Finished Goods Control A/c	2,13,000
″	Wages Control A/c	40,000			
″	Factory OH Control A/c	60,000	″	Balance c/d	20,000
		2,36,000			2,36,000

(d) **Finished Goods Control A/c**

		(₹)			(₹)
To	Balance b/d	25,000	By	Cost of goods sold A/c	2,10,000
″	Work-in-process Control A/c	2,13,000	″	Balance c/d	28,000
		2,38,000			2,38,000

(e) **Factory Overhead Control A/c**

		(₹)			(₹)
To	Wages Control A/c (Indirect wages)	25,000	By	Work-in-process A/c (150% of ₹40,000)	60,000
″	Cost Ledger Control A/c	50,000	″	Balance c/d	15,000
		75,000			75,000

(f) **Costing Profit and Loss A/c**

		(₹)			(₹)
To	Cost of Goods Sold A/c	2,10,000	By	Cost Ledger Control A/c (Sales)	3,00,000
″	Selling and Admn. OH Control A/c	40,000			

" Cost Ledger Control A/c (Profit) (balancing figure)	50,000		
	3,00,000		3,00,000

(g) **Trial Balance (as at 30th April, 20X8)**

	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	32,000	
Work-in-Process Control A/c	20,000	
Finished Goods Control A/c	28,000	
Factory Overhead Control A/c	15,000	
Cost Ledger Control A/c		95,000
	95,000	95,000

Working Notes:

(1) **Wages Control A/c**

	(₹)		(₹)
To Cost Ledger Control A/c	65,000	By Work-in-process Control A/c	40,000
		" Factory OH Control A/c	25,000
	65,000		65,000

(2) **Cost of Goods Sold A/c**

	(₹)		(₹)
To Finished Goods Control A/c	2,10,000	By Costing P&L A/c	2,10,000
	2,10,000		2,10,000

(3) **Selling & Administrative Expenses A/c**

	(₹)		(₹)
To Cost Ledger Control A/c	40,000	By Costing P&L A/c	40,000
	40,000		40,000

Q4 ICAI Mat

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July, 20X8 as follows:

	(₹)	(₹)
Material Control A/c	1,24,000	
Work-in-Process Control A/c	62,500	
Finished Goods Control A/c	1,24,000	

Production Overhead Control A/c	8,400	
Administrative Overhead Control A/c		12,000
Selling & Distribution Overhead Control A/c	6,250	
Cost Ledger Control A/c		3,13,150
	3,25,150	3,25,150

The following are the transactions for the quarter ended 30th September 20X8:

	(₹)
Materials purchased	4,80,100
Materials issued to jobs	4,77,400
Materials to works maintenance	41,200
Materials to administration office	3,400
Materials to selling department	7,200
Wages direct	1,49,300
Wages indirect	65,000
Transportation for indirect materials	8,400
Production overheads	2,42,250
Absorbed production overheads	3,59,100
Administration overheads	74,000
Administration allocation to production	52,900
Administration allocation to sales	14,800
Sales overheads	64,200
Sales overheads absorbed	82,000
Finished goods produced	9,58,400
Finished goods sold	9,77,300
Sales	14,43,000

Make up the various accounts as you envisage in the Cost Ledger and **PREPARE** a Trial Balance as at 30th September, 20X8.

Reference | What's **New**

Non-Integrated Accounting System | **Ledgers and Trial Balance**

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Answer

Cost Ledgers Material Control A/c*

		(₹)			(₹)
To	Balance b/d	1,24,000	By	Work-in-process Control A/c	4,77,400
″	Cost Ledger Control A/c (purchase)	4,80,100	″	Production OH Control A/c	41,200
			″	Admn. OH Control A/c	3,400
			″	S&D OH Control A/c	7,200
			″	Balance c/d	74,900
		6,04,100			6,04,100

*Material Control A/c may also be written as Stores Ledger Control A/c

Wages Control A/c

		(₹)			(₹)
To	Cost Ledger Control A/c	2,14,300	By	Work-in-process Control A/c	1,49,300
			″	Production OH Control A/c	65,000
		2,14,300			2,14,300

Work-in-Process Control A/c

		(₹)			(₹)
To	Balance b/d	62,500	By	Finished goods Control A/c	9,58,400
″	Material Control A/c	4,77,400			
″	Wages Control A/c	1,49,300			
″	Production OH Control A/c	3,59,100	″	Balance c/d	89,900
		10,48,300			10,48,300

Production Overhead Control A/c

		(₹)			(₹)
To	Balance b/d	8,400	By	Work-in-process Control A/c	3,59,100
″	Cost Ledger Control A/c				
	- Transportation	8,400			
	- Production OH	2,42,250			
″	Wages Control A/c	65,000			
″	Material Control A/c	41,200	″	Balance c/d	6,150
		3,65,250			3,65,250

Administration Overhead Control A/c

		(₹)			(₹)
To	Cost Ledger Control A/c	74,000	By	Balance b/d	12,000
″	Material Control A/c	3,400	″	Finished Goods Control A/c	52,900

″	Balance c/d	2,300	″	Cost of sales A/c	14,800
		79,700			79,700

Selling and Distribution Overhead Control A/c

		(₹)			(₹)
To	Balance b/d	6,250	By	Cost of Sales A/c	82,000
″	Cost Ledger Control A/c:	64,200			
″	Material Control A/c	7,200			
″	Balance c/d	4,350			
		82,000			82,000

Finished Goods Control A/c

		(₹)			(₹)
To	Balance b/d	1,24,000	By	Cost of Sales A/c	9,77,300
″	Administration Overhead Control A/c	52,900			
″	Work-in-process Control A/c	9,58,400	″	Balance c/d	1,58,000
		11,35,300			11.35.300

Cost of Sales A/c

		(₹)			(₹)
To	Finished Goods Control A/c	9,77,300	By	Costing P&L A/c	10,74,100
″	Admn. OH Control A/c	14,800			
″	S&D OH Control A/c	82,000			
		10,74,100			10,74,100

Cost Ledger Control A/c

		(₹)			(₹)
To	Costing P&L A/c (Sales)	14,43,000	By	Balance b/d	3,13,150
			″	Material Control A/c	4,80,100
			″	Wages Control A/c	2,14,300
			″	Production OH Control A/c	2,50,650
			″	Administrative OH A/c	74,000
			″	S&D OH Control A/c	64,200
″	Balance c/d	3,22,300	″	Costing P&L A/c	3,68,900
		17,65,300			17,65,300

Costing Profit & Loss A/c

		(₹)			(₹)
To	Cost of sales A/c	10,74,100	By	Cost Ledger Control A/c (sales)	14,43,000

"	Cost Ledger Control A/c (profit) (balancing figure)	3,68,900		
		14,43,000		14,43,000

Trial Balance as at 30th September, 20X8

	Dr. (₹)	Cr. (₹)
Material Control A/c	74,900	
Production OH Control A/c	6,150	
Administrative OH Control A/c		2,300
Selling & Distribution OH Control A/c		4,350
Work-in-process Control A/c	89,900	
Finished Goods Control A/c	1,58,000	
Cost Ledger Control A/c		3,22,300
	3,28,950	3,28,950

Q5 ICAI Mat

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff in respect of January, 20X8:

(i) **Incomplete Ledger Entries:**

Materials Control A/c

		(₹)			(₹)
To	Balance b/d	32,000			

Work-in-Process Control A/c

		(₹)			(₹)
To	Balance b/d	9,200	By	Finished Goods Control A/c	1,51,000

Payables (Creditors) A/c

		(₹)			(₹)
			By	Balance b/d	16,400
To	Balance c/d	19,200			

Manufacturing Overheads Control A/c

		(₹)			(₹)
To	Cost Ledger Control A/c (Amount spent)	29,600			

Finished Goods Control A/c

	(₹)		(₹)
To Balance b/d	24,000	By Balance c/d	30,000

(ii) **Additional Information:**

(1) The cash-book showed that ₹ 89,200 have been paid to creditors for raw-material.

(2) Ending inventory of work-in-process included material ₹ 5,000 on which 300 direct labour hours have been booked against wages and overheads.

(3) The job card showed that workers have worked for 7,000 hours. The wage rate is ₹ 10 per labour hour.

(4) Overhead recovery rate was ₹ 4 per direct labour hour.

You are required to **COMPLETE** the above accounts in the cost ledger of the company:

Reference | What's **New**

Integrated Accounting System | **Incomplete ledgers**

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Answer

Materials Control A/c

	(₹)		(₹)
To Balance b/d	32,000	By Work-in-process control A/c	53,000
To Cost Ledger Control A/c (Purchases) (refer working note)	92,000	By Balance c/d	71,000
	1,24,000		1,24,000

Work-in-Process Control A/c

	(₹)			(₹)
To Balance b/d	9,200	By Finished Goods Control A/c		1,51,000
To Materials Control A/c (Bal. fig.)	53,000	By Balance c/d:		
To Wages Control A/c (₹10 × 7,000 hours)	70,000	Material	5,000	
		Wages (₹10 × 300 hours)	3,000	
To Overheads Control A/c (₹4 × 7,000 hours)	28,000	Overheads (₹4 × 300 hours)	1,200	9,200
	1,60,200			1,60,200

Finished Goods Control A/c

	(₹)			(₹)
To Balance b/d	24,000	By	Cost of sales A/c (Bal. fig.)	1,45,000
To Work-in-process Control A/c (as above)	1,51,000	By	Balance c/d	30,000
	1,75,000			1,75,000

Manufacturing Overheads A/c

	(₹)			(₹)
To Cost Ledger Control A/c	29,600	By	Work-in-process control A/c (₹4 × 7,000 hours)	28,000
		By	Costing P/L A/c (Under-absorbed OH)	1,600
	29,600			29,600

Working Note:

Payables (Creditors) A/c

	(₹)			(₹)
To Cash or Bank	89,200	By	Balance b/d	16,400
To Balance c/d	19,200	By	Purchases (Balancing fig.)	92,000
	1,08,400			1,08,400

Q6 ICAI Mat

JOURNALISE the following transactions assuming that cost and financial transactions are integrated:

	(₹)
Raw materials purchased	2,00,000
Direct materials issued to production	1,50,000
Wages paid (30% indirect)	1,20,000
Wages charged to production	84,000
Manufacturing expenses incurred	84,000
Manufacturing overhead charged to production	92,000
Selling and distribution costs	20,000
Finished products (at cost)	2,00,000
Sales	2,90,000
Closing stock	Nil
Receipts from debtors	69,000
Payments to creditors	1,10,000

Reference | **What's New**

Integrated Accounting System | **Journal entries**

Watch **Video**

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Answer

Journal entries are as follows:

		DR. (₹)	CR. (₹)
Stores Ledger Control A/c	Dr.	2,00,000	
To Payables (Creditors) A/c			2,00,000
(Materials purchased)			
Work-in-Progress Control A/c	Dr.	1,50,000	
To Store Ledger Control A/c			1,50,000
(Material issued to production)			
Wages Control A/c	Dr.	1,20,000	
To Bank A/c			1,20,000
(Wages paid)			
Factory Overhead Control A/c	Dr.	36,000	
To Wages Control A/c			36,000
(30% of wages paid being indirect charged to overhead)			
Work-in-Process Control A/c	Dr.	84,000	
To Wages Control A/c			84,000
(Direct wages charged to production)			
Factory Overhead Control A/c	Dr.	84,000	
To Bank A/c			84,000
(Manufacturing overhead incurred)			
Work-in-Process Control A/c	Dr.	92,000	
To Factory Overhead Control A/c			92,000
(Manufacturing overhead charged to production)			
Selling and Distribution Overhead Control A/c	Dr.	20,000	
To Bank A/c			20,000
(Selling and distribution costs incurred)			
Finished Goods Control A/c	Dr.	2,00,000	
To Work-in-Process Control A/c			2,00,000
(Cost of finished goods)			

Cost of Sales A/c	Dr.	2,20,000	
To Finished Goods Control A/c			2,00,000
To Selling and Distribution Control A/c			20,000
(Costs of goods sold)			
Receivables (Debtors) A/c	Dr.	2,90,000	
To Sales A/c			2,90,000
(Finished stock sold)			
Bank A/c	Dr.	69,000	
To Receivables (Debtors) A/c			69,000
(Receipts from receivables)			
Payables (Creditors) A/c	Dr.	1,10,000	
To Bank A/c			1,10,000
(Payment made to payables)			

Q7 ICAI Mat

Bangalore Petrochemicals Co. keeps books on integrated accounting system. The following balances appear in the books as on 1st January, 20X8.

	DR. (₹)	CR. (₹)
Stores Ledger control A/c	18,000	
Work-in-Process Control A/c	17,000	
Finished Goods Control A/c	13,000	
Bank A/c	10,000	
Creditors A/c		8,000
Fixed assets A/c	55,000	
Debtors A/c	12,000	
Share capital A/c		80,000
Provision for depreciation A/c		5,000
Profit and loss A/c		32,000
	1,25,000	1,25,000

Transaction for the year ended 31st Dec., 20X8 were as given below:

	(₹)	(₹)
Wages-direct	87,000	
Wages-indirect	5,000	92,000
Purchase of materials (on credit)		1,00,000

Materials issued to production		1,10,000
Materials for repairs		2,000
Goods finished during the year (at cost)		2,15,000
Sales (credit)		3,00,000
Cost of goods sold		2,20,000
Production overhead absorbed		48,000
Production overhead incurred		40,000
Administration overhead incurred (production)		12,000
Selling overhead incurred		14,000
Payments of creditors		1,01,000
Payments of debtors		2,90,000
Depreciation on machinery		1,300
Prepaid rent (included in factory overheads)		300

PREPARE accounts in the integrated ledger.

Reference

Integrated Accounting System

What's New

Ledgers - Provision for Depreciation and Prepaid Rent

Watch **Video**

Scan Me

Answer

Stores Ledger Control Account

	(₹)		(₹)
To Balance b/d	18,000	By Work-in-process Control A/c	1,10,000
To Payables (Creditors) A/c	1,00,000	By Production OH Control A/c	2,000
		By Balance c/d	6,000
	1,18,000		1,18,000

Wages Control Account

	(₹)		(₹)
To Bank A/c	92,000	By Work-in-process A/c	87,000
		By Production OH A/c	5,000
	92,000		92,000

Work-in-Process Control A/c

	(₹)		(₹)
To Balance b/d	17,000	By Finished Goods Control A/c	2,15,000
To Stores Ledger Control A/c	1,10,000	By Balance c/d	47,000

To	Wages Control A/c	87,000			
To	Production OH A/c	48,000			
		2,62,000			2,62,000

Production Overhead Control A/c

		(₹)			(₹)
To	Wages Control A/c	5,000	By	Work-in-process Control A/c	48,000
To	Stores Ledger Control A/c	2,000	By	Prepaid Rent A/c	300
To	Bank A/c	40,000			
To	Prov. for Depreciation	1,300			
		48,300			48,300

Finished Goods Control A/c

		(₹)			(₹)
To	Balance b/d	13,000	By	Cost of Sales A/c (Cost of goods sold)	2,20,000
To	Work-in-process Control A/c	2,15,000	By	Balance c/d	20,000
To	Administrative OH Control A/c	12,000			
		2,40,000			2,40,000

Administration Overheads Control A/c

		(₹)			(₹)
To	Bank A/c	12,000	By	Finished Goods Control A/c	12,000
		12,000			12,000

Cost of Sales A/c

		(₹)			(₹)
To	Finished Goods Control A/c	2,20,000	By	Sales A/c	2,34,000
To	Selling & Dist. OH A/c	14,000			
		2,34,000			2,34,000

Selling and Distribution Overheads A/c

		(₹)			(₹)
To	Bank A/c	14,000	By	Cost of Sales A/c	14,000
		14,000			14,000

Sales A/c

		(₹)			(₹)
To	Cost of Sales A/c	2,34,000	By	Receivables A/c	3,00,000
To	Costing P&L A/c	66,000			
		3,00,000			3,00,000

Prepaid Rent A/c

	(₹)		(₹)
To Production OH Control A/c	300	By Balance c/d	300
	300		300

Provision for Depreciation A/c

	(₹)		(₹)
To Balance c/d	6,300	By Balance b/d	5,000
		By Production OH Control A/c	1,300
	6,300		6,300

Profit and Loss A/c

	(₹)		(₹)
		By Balance b/d	32,000
To Balance c/d	98,000	By Sales A/c	66,000
	98,000		98,000

Receivables (Debtors) A/c

	(₹)		(₹)
To Balance b/d	12,000	By Bank A/c	2,90,000
To Sales	3,00,000	By Balance c/d	22,000
	3,12,000		3,12,000

Payables (Creditors) A/c

	(₹)		(₹)
To Bank A/c	1,01,000	By Balance b/d	8,000
To Balance c/d	7,000	By Stores Ledger Control A/c	1,00,000
	1,08,000		1,08,000

Bank A/c

	(₹)		(₹)
To Balance b/d	10,000	By Payables (Creditors) A/c	1,01,000
To Receivables (Debtors) A/c	2,90,000	By Wages Control A/c	92,000
		By Production OH A/c	40,000
		By Administration OH A/c	12,000
		By Selling & Dist. OH A/c	14,000
		By Balance c/d	41,000
	3,00,000		3,00,000

Fixed Assets A/c

	(₹)		(₹)
To Balance b/d	55,000	By Balance c/d	55,000
	55,000		55,000

Share Capital A/c

	(₹)		(₹)
To Balance c/d	80,000	By Balance b/d	80,000
	80,000		80,000

Q8 ICAI Mat

In the absence of the Chief Accountant, you have been asked to prepare a month's cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you:

	(₹)	(₹)
Balances at the beginning of the month:		
Stores Ledger Control Account		25,000
Work-in-Process Control Account		20,000
Finished Goods Control Account		35,000
Prepaid Production Overheads brought forward from previous month		3,000
Transactions during the month:		
Materials Purchased		75,000
Materials Issued:		
To production	30,000	
To factory maintenance	4,000	34,000
Materials transferred between batches		5,000
Total wages paid:		
To direct workers	25,000	
To indirect workers	5,000	30,000
Direct wages charged to batches		20,000
Recorded non-productive time of direct workers		5,000
Selling and Distribution Overheads Incurred		6,000
Other Production Overheads Incurred		12,000
Sales		1,00,000
Cost of Finished Goods Sold		80,000
Cost of Goods completed and transferred into finished goods during the month		65,000
Physical value of Work-in-Process at the end of the month		40,000

The production overhead absorption rate is 150% of direct wages charged to Work-in-Process.

Required:

PREPARE the following accounts for the month:

(a) Stores Ledger Control Account.
(b) Work-in-Process Control Account.
(c) Finished Goods Control Account.
(d) Production Overhead Control Account.
(e) Costing Profit and Loss Account.

Reference | What's New

Integrated Accounting System | **Ledgers - non productive direct wages**

Watch **Video** Scan Me

Answer

(a) **Stores Ledger Control Account**

		(₹)			(₹)
To	Balance b/d	25,000	By	Work in Process Control A/c	30,000
"	Creditors/ Bank A/c	75,000	"	Production OH Control A/c	4,000
			"	Balance c/d	66,000
		1,00,000			1,00,000

(b) **Work-in-Process Control Account**

		(₹)			(₹)
To	Balance b/d	20,000	By	Finished Goods Control A/c	65,000
"	Store Ledger Control A/c	30,000	"	Balance c/d (Physical value)	40,000
"	Wages Control A/c	20,000			
"	Production OH Control A/c (150% of direct wages)	30,000			
"	Costing P&L A/c (Stock Gains)	5,000			
		1,05,000			1,05,000

(c) **Finished Goods Control Account**

		(₹)			(₹)
To	Balance b/d	35,000	By	Cost of Goods Sold* A/c	80,000
″	Work-in-Process Control A/c	65,000	″	Balance c/d	20,000
		1,00,000			1,00,000

* Alternatively, Costing Profit & Loss Account

(d) **Production Overhead Control Account**

		(₹)			(₹)
To	Balance b/d (Prepaid amount)	3,000	By	Work-in-Process Control A/c (150% of direct wages)	30,000
″	Stores Ledger Control A/c	4,000			
″	Wages Control A/c (₹5,000 + ₹5,000)	10,000			
″	Bank A/c	12,000			
″	Costing P&L A/c* (Over-absorption, balancing figure)	1,000			
		30,000			30,000

* Alternatively the over absorbed overhead may be carried forward.

(e) **Costing Profit & Loss Account**

		(₹)			(₹)
To	Finished goods control A/c or Cost of Goods Sold A/c	80,000	By	Sales A/c	1,00,000
″	Selling & distribution OH A/c	6,000	″	Production OH Control A/c	1,000
″	Balance c/d	20,000	″	Work-in-Process Control A/c (Stock gain)	5,000
		1,06,000			1,06,000

Notes:

(1) Materials transferred between batches will not affect the Control Accounts.

(2) Non-production time of direct workers is a production overhead and therefore will not be charged to Work-in-Process control A/c.

(3) Production overheads absorbed in Work-in-Process Control A/c will then equal ₹ 30,000 (150% of ₹ 20,000).

(4) In the Work-in-Process Control A/c the excess physical value of stock is taken resulting in stock gain. Stock gain is transferred to Profit & Loss A/c.

Q 9 ICAI Mat

The following incomplete accounts are furnished to you for the month ended 31st October, 20X8.

Stores Ledger Control Account

1.10.20X8	To Balance	₹ 54,000			

Work in Process Control Account

1.10. 20X8	To Balance	₹ 6,000			

Finished Goods Control Account

1.10. 20X8	To Balance	₹ 75,000			

Factory Overheads Control Account

Total debits for October, 20X8		₹ 45,000			

Factory Overheads Applied Account

Cost of Goods Sold Account

Creditors for Purchases Account

			1.10. 20X8	By Balance	₹ 30,000

Additional information :

(i) The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 20X8 is ₹ 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 31.10.20X8 is ₹ 15,000 and the payments made to creditors in October, 20X8 amount to ₹ 1,05,000.

(iii) The finished goods inventory as on 31st October, 20X8 is ₹ 66,000.

(iv) The cost of goods sold during the month was ₹ 1,95,000.

(v) On 31st October, 20X8 there was only one unfinished job in the factory. The cost records show that ₹ 3,000 (1,200 direct labour hours) of direct labour cost and ₹ 6,000 of direct material cost had been charged.

(vi) A total of 28,200 direct labour hours were worked in October, 20X8. All factory workers earn same rate of pay.

(vii) All actual factory overheads incurred in October, 20X8 have been posted.

You are required to **FIND**:

(a) Materials purchased during October, 20X8.

(b) Cost of goods completed in October, 20X8.

(c) Overheads applied to production in October, 20X8.

(d) Balance of Work-in-process Control A/c on 31st October, 20X8.

(e) Direct materials consumed during October, 20X8.

(f) Balance of Stores Ledger Control Account on 31st October, 20X8.

(g) Over absorbed or under absorbed overheads for October, 20X8.

Reference	What's New	Watch Video
Integrated Accounting System	**Incomplete ledgers**	Scan Me

Answer

Working Notes:

(i) **Overhead recovery rate per direct labour hour:**

Budgeted factory overheads : ₹ 6,75,000

Budgeted direct labour hours : 4,50,000

Overhead recovery rate : $= \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct labour hours}}$

$= \frac{₹\ 6,75,000}{4,50,000 \text{ hours}}$

= ₹ 1.50 per direct labour

(ii) **Direct wage rate per hour:**

Direct labour cost of WIP (on 31st October 20X2) : ₹ 3,000

Direct labour hours of WIP : 1,200 hours

Direct wage rate per hour : $= \frac{\text{Direct labour cost on WIP}}{\text{Direct labour hours on WIP}}$

$= \frac{₹\ 3,000}{1,200 \text{ hours}} = ₹\ 2.50$

(iii) **Total direct wages charged to production:**

Total direct labour hours spent on production × Direct wage rate per hour

= 28,200 hours × ₹ 2.50 = ₹ 70,500

(a) **Material purchased during October, 20X8**

	(₹)
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 goods completed in October, 20X8**

	(₹)
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, 20X8**

= 28,200 hours × ₹ 1.50 = ₹ 42,300

(d) **Balance of Work-in-Process on 31st October, 20X8**

	(₹)
Direct material cost	6,000
Direct labour cost	3,000
Overheads (₹ 1.50 × 1,200 hours)	1,800
	10,800

(e) **Direct material consumed during October, 20X8** ₹ 78,000

(Refer to following Account)

Work in Process Control A/c

		(₹)			(₹)
To	Balance b/d	6,000	By	Finished goods stock	1,86,000
To	Wages Control A/c [Refer working note (iii)]	70,500	By	Balance c/d [Refer (d) above]	10,800
To	Factory OH Control A/c [Refer (c) above]	42,300			
To	Material consumed (Balancing fig.)	78,000			
		1,96,800			1,96,800

(f) **Balance of Stores Control Account on 31st October, 20X8** ₹ 66,000

(Refer to following Account)

Stores Ledger Control Account

		(₹)			(₹)
To	Balance b/d	54,000	By	Work-in-process Control A/c [Refer (e) above]	78,000
To	Cost Ledger Control A/c [Refer (a) above]	90,000	By	Balance c/d (Balancing fig.)	66,000
		1,44,000			1,44,000

(g) **Over-absorbed or under-absorbed overheads for October, 20X8:** Balance in Factory Overhead Account below showing that ₹ 2,700 is under-absorbed.

Factory Overhead Account

		(₹)			(₹)
To	Cost Ledger Control A/c	45,000	By	Work-in-process Control A/c (Factory OH applied)	42,300
			By	Costing P/L A/c (Under-absorbed)	2,700
		45,000			45,000

Q10 ICAI Mat

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:

	₹ (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 transaction took place:

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)		160
– 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 ₹ 55 lakhs and ₹ 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.

Reference | What's **New**

Non-Integrated Accounting System

Ledgers and Trial Balance - Building construction and back calculation

Watch **Video**

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Answer

Amount (in lakhs)

Cost Ledger Control A/c

		(₹)			(₹)
To	Costing P&L A/c	450	By	Balance b/d	540
To	Building Construction A/c	44	By	Stores Ledger Control A/c	40
To	Balance c/d	483	By	Wages Control A/c	150
			By	Works OH Control A/c	160
			By	Royalty A/c	5
			By	Admn. OH and S&D OH A/c	25
			By	Costing P&L A/c	57
		977			977

Stores Ledger Control A/c

		(₹)			(₹)
To	Balance b/d	80	By	Work-in-process A/c	50
To	Cost Ledger Control A/c	40	By	Works OH Control A/c	6
			By	Building Const. A/c	4

			By	Works OH Control A/c (Bal. fig.) (loss)	5
			By	Balance c/d	55
	120				120

Work-in-Process Control A/c

		(₹)			(₹)
To	Balance b/d	20	By	Finished Goods Control A/c (Balancing figure)	333
To	Stores Ledger Control A/c	50			
To	Wages Control A/c	100			
To	Works OH Control A/c	183			
To	Royalty A/c	5			
			By	Balance c/d	25
		358			358

Works Overhead Control A/c

		(₹)			(₹)
To	Stores Ledger Control A/c	6	By	Building Const. A/c	20
To	Wages Control A/c	40	By	Work-in-process Control A/c (Balancing figure)	183
To	Cost Ledger Control A/c	160	By	Costing P&L A/c (under-absorption)	8
To	Store Ledger Control A/c (loss)	5			
		211			211

Wages Control A/c

		(₹)			(₹)
To	Cost Ledger Control A/c	150	By	Works OH Control A/c	40
			By	Building Const. A/c	10
			By	Work-in-process Control A/c (Balancing figure)	100
		150			150

Royalty A/c

		(₹)			(₹)
To	Cost Ledger Control A/c	5	By	Work-in-process Control A/c	5
		5			5

Finished Goods Control A/c

		(₹)			(₹)
To	Balance b/d	430	By	Cost of Goods Sold A/c (80% of ₹ 450)	360
To	Work-in-process Control A/c	333	By	Balance c/d	403
		763			763

Cost of Goods Sold A/c

		(₹)			(₹)
To	Finished Goods Control A/c	360	By	Cost of sales A/c	360
		360			360

Selling, Distribution and Administration Overhead A/c

		(₹)			(₹)
To	Cost Ledger Control A/c	25	By	Cost of sales A/c	25
		25			25

Cost of Sales A/c

		(₹)			(₹)
To	Cost of Goods Sold	360	By	Costing P&L A/c	385
To	Admn. OH and S&D OH A/c	25			
		385			385

Costing P & L A/c

		(₹)			(₹)
To	Cost of Sales A/c	385	By	Cost Ledger Control A/c (Sales)	450
To	Works Overhead Control A/c	8			
To	Cost Ledger Control A/c (Profit) (Balancing figure)	57			
		450			450

Building Construction A/c

		(₹)			(₹)
To	Balance b/d	10	By	Cost Ledger Control A/c	44
To	Stores Ledger Control A/c	4			
To	Wages Control A/c	10			
To	Works OH Control A/c	20			
		44			44

Trial Balance (₹ in lakhs)

	DR. (₹)	CR. (₹)
Stores control A/c	55	
Work-in-Process A/c	25	
Finished goods A/c	403	
Cost Ledger Adjustment A/c		483
	483	483

Q11 ICAI Mat

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 30th June, 20X8.

(Narrations are not required.)

	(₹)
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

Reference

Integrated Accounting System

What's **New**

Journal entries

Watch **Video**

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Answer

Journal entries are as follows:

		DR. (₹)	CR. (₹)
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
Selling and Distribution 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	Dr.	3,75,000	
To Sales A/c			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

Q12 ICAI Mat

The manufacturing cost of a work order is ₹ 1,00,000; 8% of the production against that order is spoiled and the rejection is estimated to have a realisable value of ₹ 2,000 only. The normal rate of spoilage is 2%.

RECORD this in the costing journal.

Reference | What's **New**

Material Control - Journal entry

Watch **Video**

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Answer

Actual loss due to spoilage = 8% of ₹ 1,00,000 = ₹8,000 and Normal loss = 2% of ₹ 1,00,000 = ₹2,000, therefore abnormal loss = ₹6,000.

The rejection has a realisable value of ₹ 2,000, which is to be apportioned between normal loss and abnormal loss in the ratio of 2 : 6.

The accounting entries necessary for recording the above facts would be:

		(₹)	(₹)
Material Control Account	Dr.	2,000	
Overhead Control Account	Dr.	1,500	
Costing Profit and Loss Control Account	Dr.	4,500	
To Work-in-Progress Control Account			8,000

In the case of defectives being inherent in the manufacturing process, the rectification cost may be charged to the specific jobs in which they have arisen. In case detectives cannot be identified with jobs, the cost of rectification may be treated as factory overheads. Abnormal defectives should be written off to the Costing Profit and Loss Account.

Q13 MTP Mar'18; MTP Oct'18

Following information have been extracted from the cost records of XYZ Pvt. Ltd.

Stores	(₹)
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	(₹)
Opening balance	2,16,000
Direct wages applied	2,16,000
Overheads charged	8,64,000
Closing balance	1,44,000
Finished Production	**(₹)**
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. (10 Marks)

Reference — What's **New**

Non Integrated - Ledger accounts

Watch **Video**

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Answer

Stores Ledger Control A/c

Particulars	(₹)	Particulars	(₹)
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	(₹)	Particulars	(₹)
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	(₹)	Particulars	(₹)
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 (₹ 2,52,000- ₹ 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	(₹)	Particulars	(₹)
To Work in process	14,40,000	By Gen. ledger Adjust. A/c (Sales) (₹ 14,40,000 × 115%)	16,56,000
To Gen. Ledger Adjust. A/c (Profit)	2,16,000		
	16,56,000		16,56,000

Q14 Nov'18

The following balances were extracted from a Company's ledger as on 30th June, 2018:

Particulars	Debit (₹)	Credit (₹)
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:

		₹
(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 (10 Marks)

Reference — What's **New**

Non Integrated - Ledger accounts

Watch **Video**

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Answer

(i) **Raw Material Control A/c**

		(₹)			(₹)
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**

		(₹)			(₹)
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			
"	Factory OH Control A/c	1,36,350	"	Balance c/d	6,03,380
		19,91,880			19,91,880

(iii) **Finished Goods Control A/c**

		(₹)			(₹)
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**

		(₹)			(₹)
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

		(₹)			(₹)
To	Raw Material Control A/c	27,200	By	Balance b/d	9,13,250
"	Raw Material control A/c (loss)	6,000	"	Raw Material Control A/c	12,43,810
"	WIP control A/c (rejection)	12,300	"	Wages Control A/c	2,56,800
"	Finished stock Control A/c	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

		(₹)			(₹)
To	General Ledger Adjustment A/c	1,36,350	By	Work-in-progress A/c	1,36,350
		1,36,350			1,36,350

Q15 MTP Mar'19

"Is reconciliation of cost accounts and financial accounts necessary in case of integrated accounting system?" **Explain**.

Reference | What's **New**

Integrated System

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Answer

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 aacounting and financial accounting purpose so there is no necessity of reconciliation of cost and financial accounts.

Q16 May'19

Explain integrated accounting system and state its advantages.

Reference | What's **New**

Integrated Accounting System and its advantages

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Answer

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 finan-cial 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".

Q17 Nov'19

Journalise the following transactions in cost books under Non-Integrated system of Accounting.

(i)	Credit Purchase of Material	₹ 27,000
(ii)	Manufacturing overhead charged to Production	₹ 6,000
(iii)	Selling and Distribution overheads recovered from Sales	₹ 4,000
(iv)	Indirect wages incurred	₹ 8,000
(v)	Material returned from production to stores	₹ 9,000

Reference — What's **New**

Journal entries - Non Integrated

Watch **Video**

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Answer

Journal entries are as follows:

			Dr. (₹)	Cr. (₹)
(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	
	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

*Cost Ledger Control A/c is also known as General Ledger Control A/c

Q18 MTP May'20

SHOW Journal entries for the following transactions assuming cost and financial accounts are integrated:

(1)	Materials issued:	
	Direct	₹ 6,50,000
	Indirect (to factory)	₹ 2,30,000
(2)	Allocation of wages (25% indirect)	₹ 9,00,000
(3)	Under/Over absorbed overheads:	
	Factory (Over)	₹ 60,000
	Administration (Under)	₹ 50,000
(4)	Payment to Creditors (Trade payables)	₹ 9,00,000
(5)	Collection from Debtors (Trade receivables)	₹ 8,00,000

Reference What's **New**

Integrated System - Journal entries

Watch **Video**

Scan Me

Answer

Journal Entries under Integrated system of accounting

Particulars			₹	₹
(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	Dr.	6,75,000	
	Factory 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)			
	Costing Profit & Loss A/c	Dr.	50,000	
	To Administration Overhead Control A/c			50,000
	(Being transfer of under absorption of Administration overhead)			
(iv)	Trade Payables A/c	Dr.	9,00,000	
	To Cash/ Bank A/c			9,00,000
	(Being payment made to creditors)			
(v)	Cash/ Bank A/c	Dr.	8,00,000	
	To Trade receivables A/c			8,00,000
	(Being payment received from debtors)			

Q19 Nov'20

Explain what are the pre-requisites of integrated accounting. [5 Marks]

Reference | What's **New**

Pre-requisites of integrated accounting

Watch **Video** Scan Me

Answer

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.

Q20 May'22

Journalize the following transactions assuming the cost and financial accounts are integrated:

Particulars	Amount (₹)
Direct Materials issued to production	₹ 5,88,000
Allocation of Wages (Indirect)	₹ 7,50,000
Factory Overheads (Over absorbed)	₹ 2,25,000
Administrative Overheads (Under absorbed)	₹ 1,55,000
Deficiency found in stock of Raw material (Normal)	₹ 2,00,000

[5]

Reference — What's **New**

Journal entries - Integrated

Watch **Video**

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Answer

Particulars		(₹)	(₹)
(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)			

NOTES

IF YOU HAVE ANY DOUBT WHILE STUDYING FROM THIS BOOK,

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Submit Your Query

Chapter 11

Reconciliation

Q1 ICAI Mat

The following figures are available from the financial records of ABC Manufacturing Co. Ltd. for the year ended 31-3-20X8.

	(₹)
Sales (20,000 units)	25,00,000
Materials	10,00,000
Wages	5,00,000
Factory Overheads	4,50,000
Office and Administrative Overhead (production related)	2,60,000
Selling and Distribution Overheads	1,80,000
Finished goods (1,230 units)	1,50,000

	(₹)	(₹)
Work-in-Process:		
Materials	30,000	
Labour	20,000	
Factory overheads	20,000	70,000
Goodwill written off		2,00,000
Interest on capital		20,000

In the Costing records, factory overhead is charged at 100% of wages, administration overhead 10% of factory cost and selling and distribution overhead at the rate of ₹ 10 per unit sold.

PREPARE a statement reconciling the profit as per cost records with the profit as per financial records.

Reference

Financial P/L, Cost Sheet and Reconciliation Statement

What's **New**

Closing stock valuation

Watch **Video**

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Answer

Profit & Loss Account of ABC Manufacturing Co. Ltd. (for the year ended 31-3-20X8)

		(₹)			(₹)
To	Opening Stock	Nil	By	Sales (20,000 units)	25,00,000
To	Materials	10,00,000	By	Closing Stock:	
To	Wages	5,00,000	"	Finished goods (1,230 units)	1,50,000
To	Factory Overheads	4,50,000	"	Work-in-Process	70,000
To	Office & Admn. Overheads	2,60,000			
To	Selling & Dist. Overheads	1,80,000			
To	Goodwill written off	2,00,000			
To	Interest on Capital	20,000			
To	Net Profit	1,10,000			
		27,20,000			27,20,000

Cost Sheet

	(₹)
Materials	10,00,000
Wages	5,00,000
Direct Expenses	Nil
Prime Cost	15,00,000
Add: Factory overhead @ 100% of wages	5,00,000
Gross Factory Cost	20,00,000
Less: Closing WIP	(70,000)
Factory Cost of (20,000 + 1,230) units	19,30,000
Add Office & Admn. Overhead @ 10% of Factory cost	1,93,000
	21,23,000
Less: Closing Stock of finished goods (1,230 units)	(1,23,000)*
Production Cost of 20,000 units	20,00,000
Add: Selling & Dist. Overhead @ ₹ 10 per unit	2,00,000
Cost of sales of 20,000 units	22,00,000
Sales of 20,000 units	25,00,000
Profit	3,00,000

* (₹ 21,23,000 x 1,230 units/ 21,230 units)

Reconciliation Statement

	(₹)	(₹)
Profit as per Cost Accounts		3,00,000
Add: Factory overheads over-absorbed (₹ 5,00,000 – ₹ 4,50,000)	50,000	
Selling & Dist. Overhead over-absorbed (₹ 2,00,000 – ₹ 1,80,000)	20,000	
Difference in the valuation of closing stock of finished goods (₹ 1,50,000 – ₹ 1,23,000)	27,000	97,000
		3,97,000
Less: Office & Admn. overhead under-absorbed (₹ 2,60,000 – ₹ 1,93,000)	67,000	
Goodwill written off taken in financial accounts	2,00,000	
Interest on capital	20,000	2,87,000
Profit as per financial accounts		1,10,000

Q2 ICAI Mat

Following are the figures extracted from the Cost Ledger of a manufacturing unit.

	(₹)
Stores:	
Opening balance	15,000
Purchases	80,000
Transfer from WIP	40,000
Issue to WIP	80,000
Issue to repairs and maintenance	10,000
Sold as a special case at cost	5,000
Shortage in the year	3,000
Work-in-Process:	
Opening inventory	30,000
Direct labour cost charged	30,000
Overhead cost charged	1,20,000
Closing Balance	20,000
Finished Products:	
Entire output is sold at 10% profit on actual cost from work-in-process.	
Others:	
Wages for the period	35,000
Overhead Expenses	1,25,000

ASCERTAIN the profit or loss as per financial account and cost accounts and reconcile them.

Reference | What's **New**

Costing P/L, Financial P/L and Reconciliation

Cost sheet using Control Accounts

Watch **Video**

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Answer

Stores Ledger Control A/c

		(₹)			(₹)
To	Balance b/d	15,000	By	Work-in-process Control A/c (Issued to WIP)	80,000
To	Cost Ledger Control A/c (Purchases)	80,000	By	Overhead Control A/c (Issued for repairs)	10,000
To	Work-in-process Control A/c (Return from WIP)	40,000	By	Cost Ledger Control A/c (Sold at cost)	5,000
			By	Overheads Control A/c* (Shortages)	3,000
			By	Balance c/d	37,000
		1,35,000			1,35,000

* Assumed normal

Wages Control A/c

		(₹)			(₹)
To	Cost Ledger Control A/c	35,000	By	Work-in-process Control A/c	30,000
			By	Overhead Control A/c	5,000
		35,000			35,000

Overhead Control A/c

		(₹)			(₹)
To	Stores Ledger Control A/c	10,000	By	Work-in-process Control A/c	1,20,000
To	Stores Ledger Control A/c	3,000			
To	Cost Ledger Control A/c	1,25,000			
To	Wages Control A/c	5,000			
			By	Balance c/d	23,000
		1,43,000			1,43,000

WIP Control A/c

	(₹)		(₹)
To Balance b/d	30,000	By Stores Ledger Control A/c	40,000
To Stores Ledger Control A/c	80,000	By Finished goods Control A/c	2,00,000*
To Wages Control A/c	30,000		
To Overheads Control A/c	1,20,000		
		By Balance c/d	20,000
	2,60,000		2,60,000

* Finished output at cost	2,00,000
Profit at 10% on actual cost from WIP Sales	20,000
	2,20,000

Statement of Profit as per Costing Records

	(₹)
Direct material Cost	40,000
Direct wages	30,000
Prime Cost	70,000
Production Overheads	1,20,000
Works Cost	1,90,000
Add: Opening WIP	30,000
	2,20,000
Less: Closing WIP	(20,000)
Cost of finished goods	2,00,000
Profit (10% of cost)	20,000
Sales	2,20,000

Profit & Loss A/c

	(₹)		(₹)
To Material (Op. bal. + Purchases - Sale)	90,000	By Sales A/c	2,20,000
To Work-in-process Control A/c	30,000	By Closing Work-in-process	20,000
To Wages Control A/c	35,000	By Closing Finished goods	37,000
To Overheads Control A/c	1,25,000	By Net loss	3,000
	2,80,000		2,80,000

Reconciliation Statement

	(₹)
Profit (loss) as per Financial Accounts	(3,000)
Add: Overheads over absorbed in Cost A/c	23,000
Net Profit as per Cost Accounts	20,000

Q3 ICAI Mat; MTP May'21

The following figures have been extracted from the Financial Accounts of a manufacturing firm for the first year of its operation:

	(₹)
Direct Material Consumption	50,00,000
Direct Wages	30,00,000
Factory Overhead	16,00,000
Administration Overheads (production related)	7,00,000
Selling and Distribution Overheads	9,60,000
Bad Debts	80,000
Preliminary Expenses written off	40,000
Legal Charges	10,000
Dividends Received	1,00,000
Interest Received on Deposits	20,000
Sales (1,20,000 units)	1,20,00,000
Closing Stock:	
Finished Goods (4,000 units)	3,20,000
Work-in-Process	2,40,000

The cost accounts for the same period reveal that the direct material consumption was ₹ 56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at ₹ 6 per unit of production. Selling and distribution overheads are recovered at ₹ 8 per unit sold.

PREPARE the Profit and Loss Accounts both as per financial records and as per cost records. RECONCILE the profits as per the two records.

Reference

Financial P/L, Cost Sheet and Reconciliation Statement

What's New

Closing stock valuation

Watch **Video**

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Answer

Profit and Loss Account
(As per financial records)

		(₹)			(₹)
To	Direct Material	50,00,000	By	Sales (1,20,000 units)	1,20,00,000
To	Direct Wages	30,00,000	By	Closing Stock	
To	Factory Overheads	16,00,000	"	Work-in-process	2,40,000

To	Gross Profit c/d	29,60,000	"	Finished Goods (4,000 units)	3,20,000
		1,25,60,000			1,25,60,000
To	Administration Overheads	7,00,000	By	Gross Profit b/d	29,60,000
To	Selling and Dist.	9,60,000	By	Dividend	1,00,000
	OH				
To	Bad Debts	80,000	By	Interest	20,000
To	Preliminary Expenses written off	40,000			
To	Legal Charges	10,000			
To	Net Profit	12,90,000			
		30,80,000			30,80,000

Statement of Cost and Profit

(As per Cost Records)

	Total (₹)
Direct Material	56,00,000
Direct Wages	30,00,000
Prime Cost	86,00,000
Factory Overhead (20% of ₹ 86,00,000)	17,20,000
	1,03,20,000
Less: Closing Stock (WIP)	(2,40,000)
Works Cost (1,24,000 units)	1,00,80,000
Administration overhead (1,24,000 units @ ₹ 6 p.u.)	7,44,000
Cost of production of (1,24,000 units)	1,08,24,000
Less: Finished Goods (4,000 units @ ₹ 87.29)	(3,49,160)
Cost of goods sold (1,20,000 units)	1,04,74,840
Selling and Distribution Overhead (1,20,000 @ ₹ 8 p.u.)	9,60,000
Cost of Sales	1,14,34,840
Net profit (Balancing figure)	5,65,160
Sales Revenue	1,20,00,000

Statement of Reconciliation of profit as obtained under Cost and Financial Accounts

	(₹)	Total (₹)
Profit as per Cost Records		5,65,160
Add: Excess of Material Consumption	6,00,000	
Factory Overhead	1,20,000	
Administration Overhead	44,000	
Dividend Received	1,00,000	

Interest Received	20,000	8,84,000
		14,49,160
Less: Bad debts	80,000	
Preliminary expenses written off	40,000	
Legal Charges	10,000	
Over-valuation of stock in cost book (₹ 3,49,160 – ₹ 3,20,000)	29,160	(1,59,160)
Profit as per Financial Records		12,90,000

Q4 ICAI Mat

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, 20X8:

(i) Sales ₹ 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 ₹ 5,00,000 and ₹ 2,50,000 respectively.

(iv) Actual factory expenses were ₹ 1,50,000 of which 60% are fixed.

(v) Actual administrative expenses related with production activities were ₹ 45,000 which are completely fixed.

(vi) Actual selling and distribution expenses were ₹ 30,000 of which 40% are fixed.

(vii) Interest and dividends received ₹ 15,000.

You are **required** to:

(a) **FIND OUT** profit as per financial books for the year ended 31st March,20X8;

(b) **PREPARE** the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March, 20X8 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.

Reference

Financial P/L, Cost Sheet and Reconciliation Statement

What's New

Overhead Absorbed based on budgeted volume

Watch **Video**

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Answer

Working Note:

Profit & Loss Account

(for the year ended 31st March, 20X8)

	(₹)		(₹)
To Direct Material	5,00,000	By Sales (50,000 units)	10,00,000
To Direct Wages	2,50,000	By Interest and dividends	15,000
To Factory expenses	1,50,000		
To Administrative expenses	45,000		
To Selling & Dist. Expenses	30,000		
To Net Profit	40,000		
	10,15,000		10,15,000

(a) Profit as per financial books for the year ended 31st March, 20X8 is ₹ 40,000 (Refer to above Working note).

(b) **Cost Sheet**

(for the year ended 31st March, 20X8)

	(₹)	(₹)
Direct material		5,00,000
Direct wages		2,50,000
Prime cost		7,50,000
Factory expenses:		
Variable (40% of ₹ 1,50,000)	60,000	
Fixed (₹ 90,000 × 50,000/60,000)	75,000	1,35,000
Works cost		8,85,000
Administrative expenses: (₹ 45,000 × 50,000/60,000)		37,500
Cost of production		9,22,500
Selling & distribution expenses:		
Variable (60% of ₹ 30,000)	18,000	
Fixed* (₹ 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.

(c) **Statement of Reconciliation**

(Reconciling profit shown by Financial and Cost Accounts)

	(₹)	(₹)
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 (₹ 1,50,000 – ₹ 1,35,000)	15,000	
Administrative expenses under-charged in	7,500	
Cost Accounts (₹ 45,000 – ₹ 37,500)		
Selling & distribution expenses under—charged in Cost Accounts (₹ 30,000 – ₹ 28,000)	2,000	24,500
Profit as per Financial Accounts		40,000

Q5 ICAI Mat

M/s. H.K. Piano Company showed a net loss of ₹ 4,16,000 as per their financial accounts for the year ended 31st March, 20X8. The cost accounts, however, disclosed a net loss of ₹ 3,28,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books:

	(₹)
(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.

Reference — What's New

Memorandum Reconciliation Account

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Answer

Memorandum Reconciliation Account

		(₹)			(₹)
To	Net loss as per costing books	3,28,000	By	Administration overhead over-recovered in costs	4,000
To	Factory overheads under-recovered in costs	6,000	By	Depreciation overcharged in costs	10,000
To	Income-tax not provided in costs	1,20,000	By	Interest on investments not included in costs	20,000
			By	Transfer fees in financial books	2,000
			By	Stores adjustment	2,000
			By	Net loss as per financial books	4,16,000
		4,54,000			4,54,000

Q6 May'18

GK Ltd. showed net loss of ₹ 2,43,300 as per their financial accounts for the year ended 31st March, 2018. However, cost accounts disclosed net loss of ₹ 2,48,300 for the same period. On scrutinizing both the set of books of accounts, the following information were revealed:

		(₹)
(i)	Works overheads over recovered	30,400
(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.

Reference — What's **New**

Reconciliation statement

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Answer

Reconciliation Statement

Particulars	(₹)	(₹)
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)

Q7 RTP Nov'18; RTP May'21

The financial books of a company reveal the following data for the year ended 31st March, 20X8:

	(₹)
Opening Stock:	
Finished goods (625 units)	53,125
Work-in-process	46,000
01.04.20X7 to 31.03.20X8	
Raw materials consumed	8,40,000
Direct Labour	6,10,000
Factory overheads	4,22,000
Administration overheads (Production related)	1,98,000
Dividend paid	1,22,000
Bad Debts	18,000
Selling and Distribution Overheads	72,000
Interest received	38,000
Rent received	46,000
Sales (12,615 units)	22,80,000
Closing Stock:	
Finished goods 415 units	45,650
Work-in-process	41,200

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 ₹ 3 per unit sold.

- Opening Stock of finished goods is valued at ₹ 120 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(i) **PREPARE** a statements for the year ended 31st March, 20X8. Show
- 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.

Reference | What's **New**

Profit as per Financial Records, Costing Reords and Reconciliation

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Answer

(i) **Statement of Profit as per Financial records (for the year ended March 31, 20X8)**

		(₹)			(₹)
To	Opening stock of Finished Goods	53,125	By	Sales	22,80,000
To	Work-in-process	46,000	By	Closing stock of Finished Goods	45,650
To	Raw materials consumed	8,40,000	By	Work-in-Process	41,200
To	Direct labour	6,10,000	By	Rent received	46,000
To	Factory overheads	4,22,000	By	Interest received	38,000
To	Administration overheads	1,98,000			
To	Selling & Distribution overheads	72,000			
To	Dividend paid	1,22,000			
To	Bad debts	18,000			
To	Profit	69,725			
		24,50,850			24,50,850

Statement of Profit as per Costing records
(for the year ended March 31,20X8)

	(₹)
Sales revenue (A) (12,615 units)	22,80,000
Cost of sales:	
Opening stock (625 units ×₹ 120)	75,000
Add: Cost of production of 12,405 units (Refer to working note 2)	21,63,350
Less: Closing stock (₹ 174.39 × 415 units)	(72,372)
Cost of goods sold (12,615 units)	21,65,978
Selling & distribution overheads (12,615 units ×₹ 3)	37,845
Cost of sales: (B)	22,03,823
Profit: {(A) – (B)}	76,177

(ii) **Statement of Reconciliation**
(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		76,177
Add: Administration overheads over absorbed (₹ 2,81,550 – ₹ 1,98,000)	83,550	
Opening stock overvalued (₹ 75,000 – ₹ 53,125)	21,875	
Interest received	38,000	
Rent received	46,000	
Factory overheads over recovered (₹ 4,27,000 – ₹ 4,22,000)	5,000	1,94,425
		2,70,602
Less: Selling & distribution overheads under recovery (₹ 72,000 – ₹ 37,845)	34,155	
Closing stock overvalued (₹ 72,372 – ₹ 45,650)	26,722	
Dividend	1,22,000	
Bad debts	18,000	(2,00,877)
Profit as per financial accounts	69,725	

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**

	(₹)
Raw materials consumed	8,40,000
Direct labour	6,10,000
Prime cost	14,50,000
Factory overheads (70% of direct wages)	4,27,000
Factory cost	18,77,000
Add: Opening work-in-process	46,000
Less: Closing work-in-process	(41,200)
Factory cost of goods produced	18,81,800
Administration overheads (15% of factory cost)	2,81,550
Cost of production of 12,405 units (Refer to working note 1)	21,63,350
Cost of production per unit:	
$= \frac{\text{Total Cost of Production}}{\text{No. of unit produced}} = \frac{₹\ 21,63,350}{12,405\ \text{unit}}$	₹ 174.36

Q8 MTP Aug'18; MTP May'20

The Trading and Profit and Loss Account of a company for the year ended 31-03-20X8 is as under:

Trading and Profit and Loss Account

Particulars	₹	Particulars	₹
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	20,000
To Administrative Expenses	4,80,200		
To Selling Expenses	2,50,000		
To Preliminary Expenses written off	50,000		
To Net Profit	1,79,800		
	63,70,000		63,70,000

In the Cost Accounts:

(i) Factory expenses have been allocated to production at 20% of Prime Cost.

(ii) Administrative expenses (production related) absorbed at 10% of factory cost.

(iii) Selling expenses charged at ₹ 10 per unit sold.

PREPARE the Costing Profit and Loss Account of the company and reconcile the Profit/Loss with the profit as shown in the Financial Accounts. (10 Marks)

Reference — What's **New**

Costing Profit & Loss Account and Reconciliation Statement

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Answer

Workings:

Preparation of Cost Sheet/ Cost Statement

Particulars	Amount (₹)
Materials	26,80,000
Wages	17,80,000
Prime Cost	44,60,000
Add: Factory expenses (20% of ₹ 44,60,000)	8,92,000
Factory Cost	53,52,000
Add: Administrative expenses (10% of ₹ 53,52,000)	5,35,200
Cost of Production	58,87,200
Less: Closing Stock $\left(\frac{₹\,58,87,200}{52,000\text{ units}} \times 2,000\text{ units}\right)$	(2,26,431)
Cost of Goods Sold	56,60,769
Add: Selling expenses (₹ 10 × 50,000 units)	5,00,000
Cost of Sales	61,60,769
Profit (Balancing figure)	39,231
Sales Value	62,00,000

Costing Profit and Loss Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Materials	26,80,000	By Sales	62,00,000
To Wages	17,80,000	By Closing stock	2,26,431
To Factory expenses	8,92,000		
To Administrative expenses	5,35,200		
To Selling expenses	5,00,000		
To Profit (Balancing figure)	39,231		
	64,26,431		64,26,431

Reconciliation of profit as per Cost Accounts and as per Financial Accounts

Particulars	Amount (₹)
Profit as per Cost Accounts	39,231
Additions:	
Administrative expenses (Over-absorbed) (₹ 5,35,200 – ₹ 4,80,200)	55,000
Selling expenses (Overcharged) (₹ 5,00,000 – ₹ 2,50,000)	2,50,000
Dividend received	20,000
	3,64,231
Deductions:	
Factory expenses (Under -absorbed) (₹ 9,50,000 – 8,92,000)	58,000
Closing stock (Over-valued) (₹ 2,26,431 – ₹ 1,50,000)	76,431
Preliminary expenses written off	50,000
	1,84,431
Profit as per Financial Accounts	1,79,800

(Reconciliation statement may also be prepared by taking financial profit as base.)

Q 9 RTP May'19

The following is the summarised Trading and Profit and Loss Account of XYZ Ltd. for the year ended 31st March 2019:

Particulars	Amount (₹)	Particulars		Amount (₹)
Direct Material	14,16,000	Sales (30,000 units)		30,00,000
Direct wages	7,42,000	Finished stock (2,000 units)		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 ₹ 5 per finished unit, and (iii) selling and distribution overheads are recovered at ₹ 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.

Reference | **What's New**

Costing Profit & Loss Account and Reconciliation Statement

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Answer

(i) **Costing Profit and Loss Account for the year ended 31st March 2019:**

Particulars	Amount (₹)	Particulars	Amount (₹)
Material consumed	14,16,000	Sales (30,000 units)	30,00,000
Direct wages	7,42,000		
Prime Cost	21,58,000		
Works overheads (20% of Prime cost)	4,31,600		
	25,89,600		
Less: Work in progress	(54,000)		
Factory cost	25,35,600		
Administration overheads (₹ 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 overheads (₹ 6 × 30,000 unit)	1,80,000		
Cost of sales	27,07,125		
Profit (balancing figure)	2,92,875		
	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 (₹)	Amount (₹)
Profit as per cost records		2,92,875
Add: Overheads over-absorbed:		
- Works overheads (₹ 4,31,600 – ₹ 4,26,000)	5,600	
- Administration OH (₹ 1,60,000 – ₹ 1,50,000)	10,000	
- Selling and Distribution (₹ 1,80,000 – ₹ 1,65,000)	15,000	30,600

Less: Closing stock overvalued (₹ 1,68,475 – ₹ 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.

Q10 MTP Mar'19; RTP Nov'20; MTP May'21

A manufacturing company disclosed a net loss of ₹ 3,47,000 as per their cost accounts for the year ended March 31,20X8. The financial accounts however disclosed a net loss of ₹ 5,10,000 for the same period. The following information was revealed as a result 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. [5 Marks]

Reference | What's **New**

Memorandum Reconciliation Account

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Answer

Dr. **Memorandum Reconciliation Accounts** Cr.

		(₹)			(₹)
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	Interest on Loan Funds in Financial Accounts	2,45,000	By	Dividend received in financial books	32,000
			By	Net loss as per Financial books	5,10,000
		7,36,000			7,36,000

Q11 MTP Apr'19

R Limited showed a net loss of ₹ 35,400 as per their cost accounts for the year ended 31st March, 20X8. However, the financial accounts disclosed a net profit of ₹ 67,800 for the same period. The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:

		(₹)	(₹)
(i)	Administrative overhead under recovered	25,500	
(ii)	Factory overhead over recovered		1,35,000
(iii)	Depreciation under charged in Cost Accounts	26,000	
(iv)	Dividend received		20,000
(v)	Loss due to obsolescence charged in Financial Accounts	16,800	
(vi)	Income tax provided	43,600	
(vii)	Bank interest credited in Financial Accounts	13,600	
(viii)	Value of opening stock:		
	- In Cost Accounts	1,65,000	
	- In Financial Accounts	1,45,000	
(ix)	Value of closing stock:		
	- In Cost Accounts	1,25,500	
	- In Financial Accounts	1,32,000	
(x)	Goodwill written-off in Financial Accounts	25,000	
(xi)	Notional rent of own premises charged in Cost Accounts	60,000	
(xii)	Provision for doubtful debts in Financial Accounts	15,000	

PREPARE a reconciliation statement by taking costing net loss as base. (10 Marks)

Reference | What's **New**

Reconciliation Statement

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Answer

Statement of Reconciliation

Sl. No.	Particulars	Amount (₹)	Amount (₹)
	Net loss as per Cost Accounts		(35,400)
	Additions		
1.	Factory O/H over recovered	1,35,000	
2.	Dividend received	20,000	
3.	Bank Interest received	13,600	
4.	Difference in Value of Opening Stock (1,65,000 – 1,45,000)	20,000	
5.	Difference in Value of Closing Stock (1,32,000 – 1,25,500)	6,500	
6.	Notional Rent of own Premises	60,000	2,55,100
	Deductions		
1.	Administration O/H under recovered	25,500	
2.	Depreciation under charged	26,000	
3.	Loss due to obsolescence	16,800	
4.	Income tax Provided	43,600	
5.	Goodwill written-off	25,000	
6.	Provision for doubtful debts	15,000	(1,51,900)
	Net Profit as per Financial A/c.		67,800

Q12 May'19

M/s Abid Private Limited disclosed a net profit of ₹ 48,408 as per cost books for the year ending 31st March 2019. However, financial accounts disclosed net loss of ₹ 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. [5 Marks]

Reference | **What's New**

Memorandum Reconciliation account

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Answer

Dr. **Memorandum Reconciliation Account** Cr.

Particulars	(₹)	Particulars	(₹)
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 recovered 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 Net loss as per financial accounts	15,000
		By Depreciation over-charged	5,000
	1,19,033		1,19,033

[Note: This question may also be solved by taking net loss as per financial accounts as basis.]

Q13 MTP Oct'19

A manufacturing company has disclosed a net loss of ₹ 2,25,000 as per their cost accounting records for the year ended March 31, 2019. However, their financial accounting records disclosed a net loss of ₹ 2,70,000 for the same period. A scrutiny of data of both the sets of books of accounts revealed the following information:

	(₹)
(i) Factory overheads under-absorbed	5,000
(ii) Administration overheads over-absorbed	3,000
(iii) Depreciation charged in financial accounts	70,000
(iv) Depreciation charged in cost accounts	80,000
(v) Interest on investments not included in cost accounts	20,000
(vi) Income-tax provided in financial accounts	65,000
(vii) Transfer fees (credit in financial accounts)	2,000
(viii) Preliminary expenses written off	3,000
(ix) Over-valuation of closing stock of finished goods in cost accounts	7,000

Required:

PREPARE a Memorandum Reconciliation Account. [5 Marks]

Reference | What's New

Memorandum Reconciliation Account

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Answer

Memorandum Reconciliation Account

Particulars		(₹)	Particulars		(₹)
To	Net loss as per Costing books	2,25,000	By	Administrative overhead over absorbed in costs	3,000
To	Factory overheads under absorbed	5,000	By	Depreciation over charged in Cost books (₹ 80,000 – ₹ 70,000)	10,000
To	Income tax not provided in Cost books	65,000	By	Interest on investments not included in Cost books	20,000
To	Preliminary expenses written off in Financial books	3,000	By	Transfer fees not considered in Cost books	2,000
To	Over-valuation of Closing Stock of finished goods in Cost books	7,000	By	Net loss as per Financial books	2,70,000
		3,05,000			3,05,000

Q14 MTP Nov'20

List five financial expenses that causes differences in Financial and Cost Accounts.

Reference | What's New

Financial Expenses

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Answer

Financial expenses causing differences in Financial and Cost Accounts:

(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) Goodwill written off.

(vi) Preliminary expenses written off.

(vii) Income tax, donations, subscriptions.

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

Q15 July'21

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 ₹ 12,000.

You are **required** to : [10]

(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.

Reference — What's **New**

Cost Sheet and Profit Reconciliation Statement

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Answer

(i)

Cost Sheet
(for the year ended 31st March, 2021)

	(₹)	(₹)
Direct material		6,50,000
Direct wages		3,50,000
Prime cost		10,00,000
Factory Overheads:		
Variable (50% of ₹ 2,60,000)	1,30,000	
Fixed (₹ 1,30,000 × 15,000/20,000)	97,500	2,27,500
Works cost		12,27,500
Administrative Overheads (₹ 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
Sales revenue		15,00,000

(ii)

Statement of Reconciliation
(Reconciling profit shown by Financial and Cost Accounts)

	(₹)	(₹)
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 (₹ 2,60,000 – ₹ 2,27,500)	32,500	
Less: Administrative expenses under-charged in Cost Accounts (₹ 1,05,000 – ₹ 78,750)	26,250	
Less: Loss on sale of Investments	2,000	(60,750)
Profit as per Financial Accounts		57,000

Q16 Dec'21

R Ltd. showed a Net Profit of ₹ 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	(₹)
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. [5]

Reference — What's New

Reconciliation Statement

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Answer

Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
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

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Chapter 12

Unit, Job and Batch Costing

Q1 ICAI Mat

The following data relate to the manufacture of a standard product during the 4-week ended 28th February 20X9:

Raw Materials Consumed	₹ 4,00,000
Direct Wages	₹ 2,40,000
Machine Hours Worked	3,200 hours
Machine Hour Rate	₹ 40
Office Overheads	10% of works cost
Selling Overheads	₹ 20 per unit
Units produced and sold	10,000 at ₹ 120 each

You are required to **FIND OUT** the cost per unit and profit for the 4- week ended 28th February 20X9.

Reference

Unit Costing - Cost per unit and profit

What's **New**

Machine hour rate

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Answer

No. of units produced: 10,000 units

Statement of Cost per Unit

Particulars	Cost per unit (₹)	Amount (₹)
Raw Materials Consumed	40.00	4,00,000
Direct Wages	24.00	2,40,000
Prime cost	64.00	6,40,000
Add: Manufacturing Overheads (3,200 hours × ₹ 40)	12.80	1,28,000
Works cost	76.80	7,68,000
Add: Office Overheads (10% of Works Cost)	7.68	76,800
Cost of goods sold	84.48	8,44,800
Add: Selling Overheads (10,000 units × ₹ 20)	20.00	2,00,000

Cost of sales / Total cost	104.48	10,44,800
Add: Profit (Bal Figure)	15.52	1,55,200
Sales	120.00	12,00,000

Q2 ICAI Mat

Atharva Pharmacare Limited produced a uniform type of product and has a manufacturing capacity of 3,000 units per week of 48 hours. From the records of the company, the following data are available relating to output and cost of 3 consecutive weeks

Week Number	Units Manufactured	Direct Material (₹)	Direct Wages (₹)	Factory Overheads (₹)
1	1,200	9,000	3,600	31,000
2	1,600	12,000	4,800	33,000
3	1,800	13,500	5,400	34,000

Assuming that the company charges a profit of 20% on selling price, FIND OUT the selling price per unit when the weekly output is 2,000 units

Reference — What's **New**

Unit Costing - Selling price per unit

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Answer

Statement of Cost and Selling price for 2,000 units of output

Particulars	Cost per unit (₹)	Total Cost (₹)
Direct Materials	7.50	15,000
Direct Labour	3.00	6,000
Prime cost	10.50	21,000
Add: Factory Overheads (Refer working note-2)	17.50	35,000
Total cost	28.00	56,000
Add: Profit (25% of Cost)	7.00	14,000
Sales	35.00	70,000

Working Notes:

(1) Direct Material and Direct Labour cost is varying directly in proportion to units produced and shall remain same per unit of output.

(2) Calculation of Factory Overheads- An observation of Cots related to different output levels for factory overheads shall reveal 2 things

a. Total cost increases from ₹ 31,000 to ₹ 34,000 along with increase in output from 1,200 units to 1,800 units but cost per unit is not constant

b. Cost per unit is reducing along with increase in output from ₹ 25.83 (₹ 31,000 ÷ 1,200 units) to ₹ 18.89 (₹ 34,000 ÷ 1,800 units)

We can see that the cost is a semi- variable cost and has to be calculated for 2,000 units by analysing its Fixed and Variable components

Week Number	Units Manufactured	Factory Overheads
1	1,200	31,000
2	1,600	33,000
Difference	400	2,000

Therefore, Variable Cost per Unit = Change in Factory Overheads ÷ Change in output

= ₹ 2,000 ÷ 400 = ₹ 5

Now total Factory Overheads for week 2 = ₹ 33,000

Of this Variable Overheads = 1,600 units × ₹ 5 = ₹ 8,000

Therefore, Variable Cost for 2,000 units = 2,000 units × ₹ 5 = ₹ 10,000

Fixed Cost will not change and hence will be = ₹ 25,000

Therefore, Total Factory Cost = Variable Overheads + Fixed Overheads

Overheads for 2,000 units = ₹ 10,000 + ₹ 25,000 = ₹ 35,000

Q3 ICAI Mat; MTP Nov'20; MTP May'21

A jobbing factory has undertaken to supply 200 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 ₹ 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 1,200 pieces.

Month	Batch Output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	210	650	120	240
February	200	640	140	280
March	220	680	150	280
April	180	630	140	270
May	200	700	150	300
June	220	720	160	320

The other details are:

Month	Overhead (₹)	Direct labour 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

Reference | What's **New**

Batch Costing - Cost and profit per piece of each batch | **Overall profit**

Watch **Video** Scan Me

Answer

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	210	200	220	180	200	220	1,230
Sale value (₹)	1,680	1,600	1,760	1,440	1,600	1,760	9,840
Material cost (₹)	650	640	680	630	700	720	4,020
Direct wages (₹)	120	140	150	140	150	160	860
Chargeable expenses* (₹)	600	672	672	621	780	800	4,145
Total cost (₹)	1,370	1,452	1,502	1,391	1,630	1,680	9,025
Profit per batch (₹)	310	148	258	49	(30)	80	815
Total cost per unit (₹)	6.52	7.26	6.83	7.73	8.15	7.64	7.34
Profit per unit (₹)	1.48	0.74	1.17	0.27	(0.15)	0.36	0.66

Overall position of the order for 1,200 units

Sales value of 1,200 units @ ₹ 8 per unit	₹ 9,600
Total cost of 1,200 units @ ₹ 7.34 per unit	₹ 8,808
Profit	₹ 792

$$* \frac{\text{Overhead}}{\text{Direct labour hour for the month}} \times \text{Direct labout hours for batch}$$

Q4 ICAI Mat

Monthly demand for a product	500 units
Setting-up cost per batch	₹ 60
Cost of manufacturing per unit	₹ 20
Rate of interest	10% p.a.

DETERMINE economic batch quantity.

Reference | What's **New**

Batch Costing - Economic Batch Quantity

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Answer

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 500 \times 12 \times 60}{0.1 \times 20}} = 600 \text{ units.}$$

Q5 ICAI Mat

A Company has an annual demand from a single customer for 50,000 litres of a paint product. The total demand can be made up of a range of colour to be produced in a continuous production run after which a set-up of the machinery will be required to accommodate the colour change. The total output of each colour will be stored and then delivered to the customer as single load immediately before production of the next colour commences.

The Set up costs are ₹ 100 per set up. The service is supplied by an outside company as required.

The Holding costs are incurred on rented storage space which costs ₹ 50 per sq. meter per annum. Each square meter can hold 250 Litres suitably stacked.

You are **required** to:

(i) **CALCULATE** the total cost per year where batches may range from 4,000 to 10,000 litres in multiples of 1,000 litres and hence choose the production batch size which will minimize the cost.

(ii) Use the economic batch size formula to **CALCULATE** the batch size which will minimise total cost.

Reference | What's **New**

Batch Costing - Economic Batch Quantity | **Total cost at different batch sizes**

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Answer

(i)

Production Batch Size (Lt.)	Set-up costs per annum (₹)	Holding Costs per annum (₹)	Total Costs per annum (₹)
4,000	1,250	400	1,650
5,000	1,000	500	1,500
6,000	833	600	1,433
7,000	714	700	1,414
8,000	625	800	1,425
9,000	556	900	1,456
10,000	500	1000	1,500

As the total cost is minimum at 7,000 ltr. i.e. ₹ 1,414, thus economic production lot would be 7,000 Litres

(ii) **Economic Batch Quantity (EBQ):**

$$EBQ = \sqrt{\frac{2DS}{C}}$$

Where, D = Annual demand for the product = 50,000 Litres

S = Setting up cost per batch = ₹ 100 per set-up

C = Carrying cost per unit of production

= ₹ 50 / 250 litres = 0.20 per litre per annum

$$= \sqrt{\frac{2 \times 50,000 \times 100}{0.2 \times 1}} = 7,071 \text{ Litres}$$

Working Note:

1. For Production batch size of 7,000 litres

Number of set ups per year = $\frac{50,000}{7,000}$ = 7.14 or 8 set-ups

Hence, Annual Set up cost per year = 8 × ₹ 100 = ₹ 800

Average Quantity = $\frac{7,000}{2}$ = 3,500 litres

Holding Costs = $\frac{3,500 \text{ ltr.}}{250} \times 50$ = ₹ 700

2. It can be seen that EBQ determined with mathematical formula (7,071 litres) slightly varies from the one determined by trial and error method (7,000 Litres)

Q6 ICAI Mat

Wonder Ltd. has a capacity of 120,000 Units per annum as its optimum capacity. The production costs are as under

Direct Material – ₹ 90 per unit

Direct Labour- ₹ 60 per unit

Overheads:

Fixed: ₹ 30,00,000 per annum

Variable : ₹ 100 per unit

Semi Variable : ₹ 20,00,000 per annum upto 50% capacity and an extra amount of ₹ 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 ₹ 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.

Reference — What's **New**

Unit Costing - Average selling price

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Answer

Statement of Cost and Total Sales **Amount (₹)**

Particulars	First 3 months	Next 9 months	Total
Capacity Utilisation (No of units)	15,000	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 ₹ 20,00,000)	21,00,000 (at the rate of ₹ 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 = ₹ 2,93,50,000 ÷ 87,000 units = ₹ 337.356

Q7 ICAI Mat

Rio Limited undertakes to supply 1000 units of a component per month for the months of January, February and March 20X3. 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 ₹ 15 per unit.

Month	Batch Output (Numbers)	Material Cost (₹)	Labour Cost (₹)
January 20X3	1,250	6,250	2,500
February 20X3	1,500	9,000	3,000
March 20X3	1,000	5,000	2,000

Labour is paid at the rate of ₹ 2 per hour. The other details are:

Month	Overheads (₹)	Total Labour Hours
January 20X3	12,000	4,000
February 20X3	9,000	4,500
March 20X3	15,000	5,000

From the above data, **CALCULATE** the profit per unit of each batch order and the overall position of the order for the 3,000 units.

Reference | What's **New**

Batch Costing - Cost and profit per piece of each batch | **Overall profit**

Watch **Video**

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Answer

Statement of Cost and Profit per unit of each batch

	Jan. 20X3	Feb. 20X3	March. 20X3	Total
a) Batch Output (Nos.)	1,250	1,500	1,000	3,750
b) Sales Value (@ ₹ 15 per unit)	(₹) 18,750	(₹) 22,500	(₹) 15,000	(₹) 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 × ₹ 15)	₹ 45,000
Less: Total cost (3,000 units × ₹ 10)	30,000
Profit	15,000

Calculation of overhead per hour:

	Jan. 20X3	Feb. 20X3	March 20X3
i. **Labour hours:** $= \frac{\text{Labour cost}}{\text{Labour rates per hour}}$	$\frac{₹\ 2,500}{2} = 1,250$	$\frac{₹\ 3,000}{2} = 1,500$	$\frac{₹\ 2,000}{2} = 1,000$
ii. **Overhead per hour:** $= \frac{\text{Total overheads}}{\text{Total labour hour}}$	$\frac{₹\ 12,000}{4,000} = ₹\ 3$	$\frac{₹\ 9,000}{4,500} = ₹\ 2$	$\frac{₹\ 15,000}{5,000} = ₹\ 3$
iii.**Overhead for batch** (i) × (ii)	₹ 3,750	₹ 3,000	₹ 3,000

Q8 ICAI Mat

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 comprises ₹ 2,120 for material, ₹ 60 for labour and ₹ 20 for fixed overheads. It costs ₹ 1,500 to set up for one run of 18,000 column and inventory carrying cost is 5%.

Required :

(i) **FIND** the most economic production run.

(ii) **CALCULATE** the extra cost that company incur due to processing of 18,000 columns in a batch.

Reference

Batch Costing - Economic Batch Quantity

What's New

Extra cost due to different batch size

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Answer

(i) **Calculation of Economic Batch Quantity (EBQ):**

$$EBQ = \sqrt{\frac{2 \times 90,000 \times ₹1,500}{5\% \text{ of } ₹2,200}} = \sqrt{\frac{27,00,00,000}{₹110}} = 1,567 \text{ columns.}$$

(ii) **Calculation of Extra Cost due to processing of 18,000 columns in a batch**

	When run size is 1,567 columns	When run size is 18,000 columns
Total set up cost	$= \frac{90,000}{1,567} \times ₹1,500$ $= ₹87,000$	$= \frac{90,000}{18,000} \times ₹1,500$ $= ₹7,500$
Total Carrying cost	½ × 1,567 × ₹ 110 = ₹ 86,185	½ × 18,000 × ₹ 110 = ₹ 9,90,000
Total Cost	₹ 1,73,185	₹ 9,97,500

Thus, extra cost = ₹ 9,97,500 – ₹ 1,73,185 = ₹ 8,24,315

Q9 ICAI Mat

A shop floor supervisor of a small factory presented the following cost for Job No. 303, to determine the selling price.

	Per unit (₹)
Materials	70
Direct wages 18 hours @ ₹ 2.50 (Deptt. X 8 hours; Deptt. Y 6 hours; Deptt. Z 4 hours)	45
Chargeable expenses	5
	120
Add : 33-1/3 % for expenses cost	40
	160

Analysis of the Profit/Loss Account
(for the year 20X9)

		(₹)		(₹)
Materials used		1,50,000	Sales less returns	2,50,000
Direct wages:				
Deptt. X	10,000			
Deptt. Y	12,000			
Deptt. Z	8,000	30,000		
Special stores items		4,000		
Overheads:				

Deptt. X	5,000			
Deptt. Y	9,000			
Deptt. Z	2,000	16,000		
Works cost		2,00,000		
Gross profit c/d		50,000		
		2,50,000		2,50,000
Selling expenses		20,000	Gross profit b/d	50,000
Net profit		30,000		
		50,000		50,000

It is also noted that average hourly rates for the three Departments X, Y and Z are similar.

You are **required** to:

(i) **PREPARE** a job cost sheet.

(ii) **CALCULATE** the entire revised cost using 20X9 actual figures as basis.

(iii) Add 20% to total cost to **DETERMINE** selling price.

Reference — What's **New**

Job Costing - Job Cost Sheet, Revised cost and Selling price

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Answer

Job Cost Sheet

Customer Details_____ Job No._____

Date of commencement_____ Date of completion _____

Particulars	Amount (₹)
Direct materials	70
Direct wages:	
Deptt. X ₹ 2.50 × 8 hrs. = ₹ 20.00	
Deptt. Y ₹ 2.50 × 6 hrs. = ₹ 15.00	
Deptt. Z ₹ 2.50 × 4 hrs. = ₹ 10.00	45
Chargeable expenses	5
Prime cost	120
Overheads:	
Deptt. X = $\frac{₹\,5,000}{₹\,10,000} \times 100 = 50\%$ of ₹ 20 = ₹ 10.00	

Deptt. Y = $\frac{₹\ 9,000}{₹\ 12,000} \times 100$ = 75% of ₹ 15 = ₹ 11.25	
Deptt. Z = $\frac{₹\ 2,000}{₹\ 8,000} \times 100$ = 25% of ₹ 10 = ₹ 2.50	23.75
Works cost	143.75
Selling expenses= $\frac{₹\ 20,000}{₹\ 2,00,000} \times 100$ = 10% of work cost	14.38
Total cost	158.13
Profit (20% of total cost)	31.63
Selling price	189.76

Q10 ICAI Mat

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 (₹)	Direct Hrs.	Labour (₹)	Factory Overheads applied (₹)
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 (₹)
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
	316	101

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 ₹ 3 per hour while at shop B, it is ₹ 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?

Reference — What's **New**

Job Costing - Factory Cost of completed jobs and Invoice Price

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Answer

Factory Cost Statement of Completed Job.

Month	Job No. (₹)	Materials (₹)	Direct labour (₹)	Factory overheads (80% of direct labour cost) (₹)	Factory cost (₹)
September	115	1,325	800	640	2765
October	115	--	125	100	225
Total		1,325	925	740	2,990
September	118	810	500	400	1,710
October	118	515	330	264	1,109
Total		1,325	830	664	2,819
September	120	765	475	380	1,620
October	120	665	245	196	1,106
Total		1,430	720	576	2,726

Invoice Price of Complete Job

Job No.	115 (₹)	118 (₹)	120 (₹)
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.

Q11 RTP May'18; ICAI Mat; MTP Aug'18

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, the following cost would be incurred:

Direct materials - ₹ 5,000

Direct wages - ₹ 500 (irrespective of units)

Oven set- up cost - ₹ 750 (irrespective of units)

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.

Reference — What's New

Batch Cost

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Answer

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

	Particulars	Cost per batch (₹)	Total Cost (₹)
	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 (₹ 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 (₹)
Direct Material Cost	60,500
Direct Wages (₹ 500 × 13 batches)	6,500
Oven set-up cost (₹ 750 × 13 batches)	9,750
Add: Production Overheads (20% of Direct wages)	1,300
Total Production cost	78,050
Add: S&D and Administration overheads (10% of Total production cost)	7,805
Total Cost	85,855
Add: Profit (1/3rd of total cost)	28,618
Sales price	1,14,473
No. of units	605 units
Selling price per unit (₹ 1,14,473 ÷ 605 units)	189.21

Q12 RTP May'18; MTP Aug'18; RTP May'20

A factory uses job costing. The following data are obtained from its books for the year ended 31st March, 2018:

	Amount (₹)
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

Required:

(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 ₹ 2,40,000 and direct labour will cost ₹ 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 overheads is recovered as percentage of wages paid, whereas, other overheads as a percentage of Cost of Production, based on cost rates prevailing in the previous year.

Reference | What's **New**

Job Cost- with previous year based pricing for an order

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Answer

(i)

Production Statement

For the year ended 31st March, 2018

	Amount (₹)
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 = $\frac{₹\ 4,50,000}{₹\ 7,50,000} \times 100 = 60\%$

2. Percentage of administration overheads to Cost of production = $\frac{₹\ 4,20,000}{₹\ 21,00,000} \times 100 = 20\%$

3. Selling and distribution overheads = ₹ 5,25,000 × 115% = ₹ 6,03,750

   Selling and distribution overhead % to Cost of production

   $= \frac{₹\ 6,03,750}{₹\ 21,00,000} \times 100 = 28.75\%$

4. Percentage of profit to sales = $\frac{₹\ 6,09,000}{₹\ 36,54,000} \times 100 = 16.67\%$

(ii) **Calculation of Price for the Job received in 2018-19**

	Amount (₹)
Direct materials	2,40,000
Direct wages	1,50,000
Prime Cost	3,90,000
Factory overheads (60% of ₹ 1,50,000)	90,000
Cost of Production	4,80,000
Administration overheads (20% of ₹ 4,80,000)	96,000
Selling and distribution overheads (28.75% of ₹ 4,80,000)	1,38,000
Cost of Sales	7,14,000
Profit (20% of ₹ 7,14,000)	1,42,800
Sales value	8,56,800

Q13 MTP Mar'18

State how Economic Batch Quantity is determined?

Reference — What's **New**

Economic batch quantity

Watch **Video**

Scan Me

Answer

In batch costing the most important problem is the determination of '**Economic Batch Quantity**'

The determination of economic batch quantity involves two types of costs viz, (i) set up cost and (ii) carrying cost. With the increase in the batch size, there is an increase in the carrying cost but the set-up cost per unit of the product is reduced; this situation is reversed when the batch size is reduced. Thus **there is one particular batch size for which both set up and carrying costs are minimum**. This size of a batch is known as economic or optimum batch quantity.

Economic batch quantity can be determined with the help of a table, graph or mathematical formula. The mathematical formula usually used for its determination is as follows:

$$\text{EBQ} = \sqrt{\frac{2DC}{C}}$$

Where,

D = Annual demand for the product

S = Setting up cost per batch

C = Carrying cost per unit of production per annum

Q14 May'18

Explain 'Job Costing' and 'Batch Costing'.

Reference | What's **New**

Job costing and Batch costing

Watch **Video**

Scan Me

Answer

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.

Q15 RTP Nov'18

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 @ ₹ 10 per kg

Direct labour 20 hours @ ₹ 5 per hour

Variable production overheads are recovered at the rate of ₹ 2 per labour hour.

Fixed production overheads for the company are budgeted to be ₹ 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 ₹ 50 per job.

DETERMINE quote for the job by the Company.

Reference — What's **New**

Job Cost

Watch **Video**

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Answer

Determination of quotation price for the job

Cost	(₹)
Direct Material (10kg × ₹ 10)	100
Direct Labour (20hrs × ₹ 5)	100
Variable production overhead (20hrs × ₹ 2)	40
Fixed Overhead $\left(\frac{₹\ 1,00,000}{10,000\ \text{budgeted hours}} \times 20\ \text{hours}\right)$	200
Other costs	50
Total costs	490

Net profit is 30% of sales, therefore total costs represent 70% (₹ 490 × 100) ÷ 70 = ₹ 700 price to quote for job.

To check answer is correct; profit achieved will be ₹ 210 (₹ 700 - ₹ 490)

= ₹ 210 ÷ ₹ 700 = 30%

Q16 RTP Nov'18; MTP Oct'19; MTP May'20

State the differences between Job costing and Batch costing.

Reference | What's **New**

Difference between Job Costing and Batch Costing

Watch **Video**

Scan Me

Answer

Differences between Job costing and Batch costing:

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**.

Q17 ICAI Mat; MTP Oct'18

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 ₹ 1 as inventory holding cost per bearing per month and that the set up cost per run of bearing manufacture is ₹ 3,200

Required:

(i) **DETERMINE** what would be the optimum run size of bearing manufacture?

(ii) **DETERMINE** what would be the interval between two consecutive optimum runs?

(iii) **CALCULATE** the minimum inventory cost? (5 Marks)

Reference | What's **New**

Batch Costing - EBQ, Run size, Time interval

Watch **Video**

Scan Me

Answer

(i) **Optimum Batch Size or Economic Batch Quantity (EBQ):**

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48,000 \times 3,200}{12}} = 5,060 \text{ units}$$

(ii) **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

(iii) **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 = ₹ 1 × 12 months = ₹ 12

Minimum Inventory Holding Costs = 2,530 units × ₹ 12 = ₹ 30,360

Q18 MTP Oct'18; MTP Mar'19; MTP Apr'19; RTP Nov'20

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 ₹ 1.50 as inventory holding cost per piston per month and that the set-up cost per run of piston manufacture is ₹ 3,500.

Required:

(i) **DETERMINE** the optimum run size for piston manufacturing?

(ii) Assuming that the company has a policy of manufacturing 40,000 pistons per run, **CALCULATE** the extra costs company would be incurring as compared to the optimum run suggested in (i) above?

(iii) **IDENTIFY** variability of cost with respect to unit and batch level from the following cost:

(a) Inventory carrying cost; (b) Designing cost for a job; (c) Machine set-up cost to run production and (d) Depreciation of factory building. (10 Marks)

Reference	What's New	Watch Video
Batch Costing	**Optimum run size, Extra cost over EBQ policy and Variability of cost**	Scan Me

Answer

(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 = ₹ 3,500

C = Inventory holding cost per unit per annum

= ₹ 1.5 × 12 months = ₹ 18

$$EBQ = \sqrt{\frac{2 \times 9,20,000 \text{ units} \times ₹ 3,500}{₹ 18}} = 18,915 \text{ units}$$

(ii) **Calculation of Total Cost of set-up and inventory holding**

	Batch size	No. of set-ups	Set-up Cost (₹)	Inventory holding cost (₹)	Total Cost (₹)
A	40,000 units	23 $\left(\frac{9,20,000}{40,000}\right)$	80,500 (23 × ₹ 3,500)	3,60,000 $\left(\frac{40,000 \times ₹ 18}{2}\right)$	4,40,500
B	18,915 units	49 $\left(\frac{9,20,000}{18,915}\right)$	1,71,500 (49 × ₹ 3,500)	1,70,235 $\left(\frac{18,915 \times ₹ 18}{2}\right)$	3,41,735
	Extra Cost (A – B)				98,765

(iii)

	Costs	Unit level	Batch level
(a)	Inventory carrying cost	Variable cost	Variable cost
(b)	Designing cost for a job	Fixed cost	Variable cost, provided the entire job work is processed in a single batch.
(c)	Machine set-up cost to run production	Fixed cost	Variable cost
(d)	Depreciation of factory building	Fixed cost	Fixed cost

Q19 Nov'18; RTP Nov'21

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 ₹ 0.20 as inventory holding cost per bearing per month and the set-up cost per run of bearing manufacture is ₹ 384.

You are **required** to:

(i) **Compute** the optimum run size and number of runs for bearing manufacture.

(ii) **Compute** the interval between two consecutive runs.

(iii) **Find out** the extra costs to be incurred, if company adopts a policy to manufacture 8000 bearings per run as compared to optimum run size.

(iv) **Give** your opinion regarding run size of bearing manufacture.

Assume 365 days in a year. (10 Marks)

Reference

Batch Costing

What's New

Optimum run size , Number of runs, Interval, Extra Cost and Opinion on batch size

Watch **Video**

Scan Me

Answer

(i) **Optimum batch size or Economic Batch Quantity (EBQ):**

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48,000 \times 384}{2.4}} = 3,919.18 \text{ or } 3,920 \text{ units}$$

Number of Optimum runs = 48,000 ÷ 3,920 = 12.245 or 13 run

(ii) **Interval between 2 runs (in days)** = 365 days ÷ 13 = 28 days

Or 365 ÷ 12.24 = 29.82 days

(iii) **If 8,000 bearings are manufactures in a run:**

Total cost = Set-up cost + Inventory holding cost

= ₹ 384 × (48,000 ÷ 8,000) + (8,000 ÷ 2)× ₹ 2.4

= 2304 + 9,600 = 11,904

Extra cost = ₹(11,904 – 9,406*) =₹ 2,498/-

OR

Extra cost = ₹ (11,904 – 9,696*) = ₹ 2,208/-

* Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit p.a.

Average Inventory = 3,920 units ÷ 2 = 1,960 units

Carrying Cost per unit per annum = ₹ 0.2 × 12 months = ₹ 2.4

Minimum Inventory Holding Costs = 1,960 units × ₹ 2.4 = ₹ 4,704

Total cost = Set-up cost + Inventory holding cost = (12.245 × 384) + 4704 = ₹ 9,406 (approx.)

OR

Total cost = Set-up cost + Inventory holding cost = (13 × 384) + 4704 = ₹ 9,696 (approx.)

(iv) To save cost the company should run at optimum batch size i.e. 3,920 Units. It saves ₹ 2,498 or 2208. Run size should match with the Economic production run of bearing manufacture. When managers of a manufacturing operation make decisions about the number of units to produce for each production run, they must consider the costs related to setting up the production process and the costs of holding inventory.

Alternative presentation to part 3(a) (iii)

Statement showing Total Cost at Production Run size of 3,600 and 8,000 bearings

A.	Annual requirement	48,000	48,000
B.	Run Size	3,920	8,000
C.	No. of runs (A/B)	12.245	6
D.	Set up cost per run	₹ 384	₹ 384
E.	Total set up cost (CxD)	₹ 4,702	₹ 2,304
F.	Average inventory (B/2)	1,960	4,000
G.	Carrying cost per unit p.a.	2.40	2.40
H.	Total Carrying cost (FxG)	4,704	9,600
I.	Total cost (E+H)	9,406	11,904

Extra cost incurred, if run size is of 8,000= ₹ 11,904 – 9,406 = ₹ 2,498

Q20 RTP Nov'19

BTL LLP. manufactures glass bottles for HDL Ltd., a pharmaceutical company, which is in ayurvedic medicines business..

BTL can produce 2,00,000 bottles in a month. Set-up cost of each production run is ₹ 5,200 and the cost of holding one bottle for a year is ₹ 1.50.

As per an estimate HDL Ltd. can order as much as 19,00,000 bottles in a year spreading evenly throughout the year.

At present the BTL manufactures 1,60,000 bottles in a batch.

Required:

(i) **COMPUTE** the Economic Batch Quantity for bottle production.

(ii) **COMPUTE** the annual cost saving to BTL by adopting the EBQ of a production.

Reference — What's **New**

Economic Batch Quantity & Annual Cost Saving

Watch **Video**

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Answer

Economic Batch Quantity (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

(i) **Computation of EBQ :**

$$= \sqrt{\frac{2 \times 19,00,000 \times ₹\,5,200}{₹\,1.5}}$$

= 1,14,775 bottles

(ii) **Computation of savings in cost by adopting EBQ:**

Batch Size	No. of Batch	Set-up cost	Carrying cost	Total Cost
1,60,000 bottles	12	62,400 (₹ 5,200 × 12)	1,20,000 (₹ 1.5 × ½ × 1,60,000)	1,82,400
1,14,775 bottles	17	88,400 (₹ 5,200 × 17)	86,081.25 (₹ 1.5 × ½ × 1,14,775)	1,74,481.25
Saving				7,918.75

Q 21 RTP Nov'19

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 utilised – ₹ 1,87,00,000

Direct labour utilised – 2,400 hours at ₹ 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 ₹ 18,00,000 for the period and recovered on the basis of total budgeted total production cost of ₹ 36,00,00,000.

Required:

CALCULATE the price to be charged for the job.

Reference — What's **New**

Job Cost

Watch **Video**

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Answer

Calculation of job price

Particulars	Amount (₹)
Direct materials	1,87,00,000
Direct wages (₹ 80 × 2,400 hours)	1,92,000
Production overheads $\left(\frac{₹\ 48,00,000}{24,000\ hrs} \times 2,400\ hrs\right)$	4,80,000
Production cost	1,93,72,000
Selling and administration overheads $\left(\frac{₹\ 18,00,000}{₹\ 36,00,00,000} \times ₹\ 1,93,72,000\right)$	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

Q22 MTP Oct'19; RTP Nov'20

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 @ ₹ 600 each
- 20mm GI Pipe, 10 units of 15 feet size @ ₹ 660 each
- Other fitting materials, 60 units @ ₹ 26 each
- Stainless Steel Faucet, 6 units @ ₹ 204 each
- Valve, 8 units @ ₹ 404 each

Purchases:

On 16th August 2019:

- 20mm GI Pipe, 30 units of 15 feet size @ ₹ 610 each
- 10 units of Valve @ ₹ 402 each

On 18th August 2019:

- Other fitting materials, 150 units @ ₹ 28 each
- Stainless Steel Faucet, 15 units @ ₹ 209 each

On 27th August 2019:

- 15mm GI Pipe, 35 units of 15 feet size @ ₹ 628 each
- 20mm GI Pipe, 20 units of 15 feet size @ ₹ 660 each
- Valve, 14 units @ ₹ 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 @ ₹ 50 per hour (includes 12 hours overtime)

Helper: 192 hours @ ₹ 35 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ ₹ 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. [10 Marks]

Reference | **What's New**

Job Costing | **Total cost of job and Price charged.**

Watch **Video**

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Answer

(a) **Calculation of Total Cost for the Hostel Job**

Particulars	Amount (₹)	Amount (₹)
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 $15\text{ units} \times \left(\frac{6 \times ₹\,204 + 15 \times ₹\,209}{21\text{units}}\right)$	3,113.57	
- Valve $6\text{ units} \times \left(\frac{8 \times ₹\,404 + 10 \times ₹\,402 + 14 \times ₹\,424}{32\text{ units}}\right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours × ₹ 50) + (12 hours × ₹ 25)]	9,300.00	
- Helper [(192 hours × ₹ 35) + (24 hours × ₹ 17.5)]	7,140.00	16,440.00
- Overheads [₹ 13 × (180 + 192) hours]		4,836.00
Total Cost		44,367.95

(b) **Price to be charged for the job work:**

	Amount (₹)
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 (₹)
17-08-2019	8 units × ₹ 600	4,800.00
28-08-2019	$10\text{ units} \times \left(\frac{4 \times ₹\,600 + 35 \times ₹\,628}{39\text{ units}}\right)$	6,251.28
		11,051.28

2. **Cost of 20mm GI Pipe**

Date		Amount (₹)
12-08-2019	2 units × ₹ 660	1,320.00
28-08-2019	$2\text{ units} \times \left(\frac{8 \times ₹\,660 + 30 \times ₹\,610 + 20 \times ₹\,660}{58\text{ units}}\right)$	1,268.28
		2,588.28

3. **Cost of Other fitting materials**

Date		Amount (₹)
12-08-2019	18 units × ₹ 26	468.00
17-08-2019	30 units × ₹ 26	780.00
28-08-2019	$34\text{ units} \times \left(\frac{12 \times ₹\,26 + 150 \times ₹\,28}{162\text{ units}}\right)$	946.96
30-08-2019	$60\text{ units} \times \left(\frac{12 \times ₹\,26 + 150 \times ₹\,28}{162\text{ units}}\right)$	1,671.11
		3,866.07

Q 23 Nov'19

The following data is presented by the supervisor of a factory for a Job:

	₹ per unit
Direct Material	120
Direct Wages @ ₹ 4 per hour	
(Departments A-4 hrs, B-7 hrs, C-2 hrs & D-2 hrs)	60
Chargeable Expenses	20
Total	200

Analysis of the Profit and Loss Account for the year ended 31st March, 2019

Material		2,00,000	Sales	4,30,000
Direct Wages				
Dept. A	12,000			
Dept. B	8,000			
Dept. C	10,000			
Dept. D	20,000	50,000		
Special Store items		6,000		
Overheads				
Dept. A	12,000			
Dept. B	6,000			
Dept. C	9,000			
Dept. D	17,000	44,000		
Gross Profit c/d		1,30,000		
		4,30,000		4,30,000
Selling Expenses		90,000	Gross Profit b/d	1,30,000
Net Profit		40,000		
		1,30,000		1,30,000

It is also to be noted that average hourly rates for all the four departments are similar.

Required:

(i) **Prepare** a Job Cost Sheet.

(ii) **Calculate** the entire revised cost using the above figures as the base.

(iii) Add 20% profit on selling price to **determine** the selling price. [5 Marks]

Reference

Job Costing

What's **New**

Job cost sheet, Revised cost and Sellling price.

Watch **Video**

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Answer

Job Cost Sheet

Customer Details ———— Job No._____

Date of commencement —— Date of completion _____

Particulars	Amount (₹)	
Direct materials		120
Direct wages:		
Deptt. A (₹ 4.00 × 4 hrs.)	16.00	
Deptt. B (₹ 4.00 × 7 hrs.)	28.00	
Deptt. C (₹ 4.00 × 2 hrs.)	8.00	
Deptt. D (₹ 4.00 × 2 hrs.)	8.00	60
Chargeable expenses		20
Prime cost		200
Overheads		
Deptt. A = $\frac{₹12,000}{₹12,000} \times 100$ =100% of ₹ 16	16	
Deptt. B = $\frac{₹6,000}{₹8,000} \times 100$ = 75% of ₹ 28	21	
Deptt. C = $\frac{₹9,000}{₹10,000} \times 100$ = 90% of ₹ 8	7.20	
Deptt. D = $\frac{₹17,000}{₹20,000} \times 100$ = 85% of ₹ 8	6.80	51.00
Works cost		251.00
Selling expenses = $\frac{₹90,000}{₹3,00,000} \times 100$ = 30% of work cost		75.30
Total cost		326.30
Profit (20% profit on selling price i.e 25% of total cost)		81.58
Selling price		407.88

Q 24 Nov'19

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

(x) Hospital

Reference — What's **New**

Cost units for different products

Watch **Video**

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Answer

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

Q25 Nov'20

State the Method of Costing to be used in the following industries: [5 Marks]

(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

Reference | What's **New**

Methods of Costing

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Answer

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

Q 26 Jan'21

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 ₹ 225.

Required: [5 Marks]

(i) **What** would be the optimum run size for Stent manufacture ?

(ii) **What** is the minimum inventory holding cost ?

(iii) Assuming that the company has a policy of manufacturing 4,000 stents per run, **how** much extra costs the company would be incurring as compared to the optimum run suggested in (i) above ?

Reference | What's New

EBQ, Minimum Inventory Holding Cost and Extra Cost

Watch Video
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Answer

(i) **Computation of Optimum Run size of 'Stents' or Economic Batch Quantity (EBQ)**

$$\text{Economic Batch Quantity (EBQ)} = \sqrt{\frac{2DS}{C}}$$

Where, D = Annual demand for the Stents
= 4,00,00,000 × 2.5% = 10,00,000 units
S = Set- up cost per run
= ₹ 225
C = Carrying cost per unit per annum
= ₹ 1.50 × 12 = ₹ 18

$$\text{EBQ} = \sqrt{\frac{2 \times 10,00,000 \times ₹\,225}{₹\,18}}$$

= 5,000 units of Stents

(ii) **Minimum inventory holding cost**

Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum
= (5,000 ÷ 2) × ₹ 18
= ₹ 45,000

(iii) **Calculation of the extra cost due to manufacturing policy**

	When run size is 4,000 units	When run size is 5,000 units i.e. at EBQ
Total set up cost	$\frac{10,00,000}{4,000} \times ₹\,225$	$\frac{10,00,000}{5,000} \times ₹\,225$
	= ₹ 56,250	= ₹ 45,000
Total Carrying cost	½ × 4,000 × ₹ 18	½ × 5,000 × ₹ 18
	= ₹ 36,000	= ₹ 45,000
Total Cost	₹ 92,250	₹ 90,000

Extra cost = ₹ 92,250 – ₹ 90,000 = ₹ 2,250

Q 27 Jan'21

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

Reference | What's **New**

Methods of Costing

Watch **Video**

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Answer

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

Q 28 RTP May'21

SM Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2019-20:

	(₹)
(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 2020-21, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 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 ₹ 4,50,000.

You are **required** to:

(i) **CALCULATE** the overhead recovery rates based on actual costs for 2019-20.

(ii) **PREPARE** a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

Reference | What's **New**

Overhead recovery rates and Job Cost Sheet

Watch **Video**

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Answer

(i) **Calculation of Overhead Recovery Rate:**

$$\text{Factory Overhead Recovery Rate} = \frac{\text{Factory Overhead in 2019 - 20}}{\text{Direct Labour Cost in 2019 -20}} \times 100$$

$$= \frac{₹\ 30,80,000}{₹\ 90,50,000} \times 100 = 34\% \text{ of Direct labour}$$

$$\text{Administrative Overhead Recovery Rate} = \frac{\text{Administrative Overhead in 2019 - 20}}{\text{Factory Cost in 2019 -20 (W.N.)}} \times 100$$

$$= \frac{₹\ 20,50,400}{₹\ 2,96,80,000} \times 100 = 6.91\% \text{ of Factory Cost}$$

Working Note:

Calculation of Factory Cost in 2019-20

Particulars	Amount (₹)
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 2020-21**

Particulars	Amount (₹)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of ₹ 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of ₹ 1,34,27,000)	9,27,806
Cost of delivery	4,50,000
Total Cost	1,48,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	49,34,935
Sales value (Price to be quoted for the order)	1,97,39,741

Hence the price to be quoted is ₹ 1,97,39,741

Q29 July'21

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 ₹ 5,000 per vaccine. The set-up cost per production run of Covid-19 vaccines is ₹ 4,800. The carrying cost is ₹ 12 per vaccine per month.

You are **required** to : [5]

(i) **Find** the most Economical Production Run.

(ii) **Calculate** the extra cost that company incurs due to production of 15,000 vaccines in a batch.

Reference

Batch Costing - Economic Batch Quantity

What's **New**

Extra cost due to different batch size

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Answer

(i) **Calculation of most Economical Production Run**

$$= \sqrt{\frac{2 \times 60,000 \times ₹\ 4,800}{12 \times 12}}$$

(ii) **Calculation of Extra Cost due to processing of 15,000 vaccines in a batch**

	When run size is 2,000 vaccines	When run size is 15,000 vaccines
Total set up cost	$= \frac{60,000}{2,000} \times ₹ 4,800$ = ₹ 1,44,000	$= \frac{60,000}{15,000} \times ₹ 4,800$ = ₹ 19,200
Total Carrying cost	½ × 2,000 × ₹ 144 = ₹ 1,44,000	½ × 15,000 × ₹ 144 = ₹ 10,80,000
Total Cost	₹ 2,88,000	₹ 10,99,200

Thus, extra cost = ₹ 10,99,200 – ₹ 2,88,000 = ₹ 8,11,200

Q30 MTP May'22

STATE the method of costing for the following industries: [5]

(i) Sugar manufacturing

(ii) Bridge Construction

(iii) Advertising

(iv) Car Assembly

Reference — What's New

Methods of Costing

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Answer

S. No.	Industry	Method of costing
(i)	Sugar manufacturing	Process costing
(ii)	Bridge Construction	Contract Costing
(iii)	Advertising	Job costing
(iv)	Car Assembly	Multiple Costing (Combination of any method)

Q31 May'22

Distinguish between Job costing and Process Costing. [5]

Reference | What's New

Job Costing and Process Costing - Differences

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Answer

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.

Q32 RTP Nov'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	₹ 2,00,000
Direct Labour -	
Department A	800 labour hours @ ₹ 100 per hour.
Department B	1,400 labour hours @ ₹ 120 per hour.

Factory overheads are absorbed on labour hour basis and the rates are:

Department A	@ ₹ 140 per hour.

Department B @ ₹ 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'.

Reference — What's **New**

Selling Price Per unit

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Answer

Statement showing selling price per unit of Batch number 'PS143'

Particulars	Amount (₹)	Amount (₹)
Direct Materials		2,00,000
Direct Labour		
Department A 800 labour hours @ ₹100 per hour	80,000	
Department B 1400 labour hours @ ₹120 per hour	1,68,000	2,48,000
Factory overheads		
Department A 800 labour hours @ ₹140 per hour	1,12,000	
Department B 1400 labour hours @ ₹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% × 10%)		89,600
Cost of production		7,61,600
Add: Profit (15% of selling price) (6,72,000/75% × 15%)		1,34,400
Selling price of batch no 'PS143'		8,96,000
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 = ₹ 8,96,000

Q33 MTP Nov'22

DESCRIBE Unit Costing. **WHAT** kind of industries follow this method of costing? [5]

Reference | What's **New**

Unit Costing

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Answer

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 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, 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.

NOTES

Chapter 13

Contract Costing

Q1 ICAI Mat

COMPUTE estimated profit on a contract (which has been 90% complete) from the following particulars:

	(₹)
Total expenditure to date	22,50,000
Estimated further expenditure to complete the contract (including contingencies)	2,50,000
Contract price	32,50,000
Work certified	27,50,000
Work uncertified	1,75,000
Cash received	21,25,000

Reference

Estimated Profit

What's **New**

All methods

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Answer

Calculation of Estimated Profit:

	(₹)
Total expenditure to date	22,50,000
Estimated further expenditure to complete the contract (including contingencies)	2,50,000
	25,00,000
Estimated profit on contract (Balancing figure)	7,50,000
Contract price	32,50,000

Q2 ICAI Mat

The following expenses were incurred on a contract:

	(₹)
Materials purchased	6,00,000
Material drawn from stores	1,00,000
Wages	2,25,000
Plant issued	75,000
Chargeable expenses	75,000
Apportioned indirect expenses	25,000

The contract was for ₹ 20,00,000 and it commenced on January 1, 20X8. The value of the work completed and certified upto 30th November, 20X8 was ₹ 13,00,000 of which ₹ 10,40,000 was received in cash, the balance being held back as retention money by the contractee. The value of work completed subsequent to the architect's certificate but before 31st December, 20X8 was ₹ 60,000. There were also lying on the site materials of the value of ₹ 40,000. It was estimated that the value of plant as at 31st December, 20X8 was ₹ 30,000.

You are required to **COMPUTE** value of work certified, cost of work not certified and notional profit on the contract till the year ended 31st December, 20X8.

Reference — What's **New**

Value of Work Certified, Cost of Work Uncertified, Notional Profit

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Answer

Contract Account

Particulars		(₹)	Particulars		(₹)
To	Material purchased	6,00,000	By	Work-in-progress:	
"	Stores issued	1,00,000	"	Value of work certified	13,00,000
"	Wages	2,25,000	"	Cost of work uncertified	60,000
"	Plant	75,000	"	Material unused	40,000
"	Chargeable expenses	75,000	"	Plant less depreciation	30,000
"	Indirect expenses	25,000			
"	Costing P&L A/c				
	(Notional profit) (bal. figure)	3,30,000			
		14,30,000			14,30,000

Q3 ICAI Mat

A contractor prepares his accounts for the year ending 31st December each year. He commenced a contract on 1st April, 20X8.

The following information relates to the contract as on 31st December, 20X8:

	(₹)
Material issued	2,51,000
Wages	5,65,600
Salary to Foreman	81,300

A machine costing ₹ 2,60,000 has been on the site for 146 days, its working life is estimated at 7 years and its final scrap value at ₹ 15,000.

A supervisor, who is paid ₹ 8,000 p.m. has devoted one-half of his time to this contract.

All other expenses and administration charges amount to ₹ 1,36,500.

Material in hand at site costs ₹ 35,400 on 31st December, 20X8.

The contract price is ₹ 20,00,000. On 31st December, 20X8 two-third of the contract was completed. The architect issued certificates covering 50% of the contract price, and the contractor had been paid ₹ 7,50,000 on account.

PREPARE Contract A/c and show the notional profit or loss as on 31st December, 20X8.

Reference

Contract A/c

What's New

Cost of work uncertified

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Answer

Contract Account

Particulars	(₹)	Particulars	(₹)
To Material issued	2,51,000	By Machine (Working note 1)	2,46,000
"Wages	5,65,600	"Material (in hand)	35,400
"Foreman's salary	81,300	"Works cost (balancing figure)	10,49,000
"Machine	2,60,000		
"Supervisor's salary (₹ 8,000 × 9)/2	36,000		
"Administrative charges	1,36,500		
	13,30,400		13,30,400
"Works cost	10,49,000	"Value of work certified	10,00,000
"Costing P&L A/c (Notional profit)	2,13,250	"Cost of work uncertified (Working Note 2)	2,62,250
	12,62,250		12,62,250

Working notes:

1. Written down value of Machine:

$$= \frac{₹\,2,60,000 - ₹\,15,000}{7 \text{ years}} \times \frac{146 \text{ days}}{365 \text{ days}} = ₹\,14,000$$

Hence the value of machine after the period of 146 days = ₹ 2,60,000 – ₹ 14,000 = ₹ 2,46,000

2. The cost of 2/3rd of the contract is ₹ 10,49,000

∴ Cost of 100% of the contract is $= \frac{₹\,10,49,000}{2} \times 3 = ₹\,15,73,500 = ₹\,15,73,500$

∴ Cost of 50% of the contract which has been certified by the architect is ₹ 7,86,750. Also the cost of 1/3rd of the contract, which has been completed but not certified by the architect is ₹ 2,62,250.

Q4 ICAI Mat; MTP Mar'19

M/s. Bansals Construction Company Ltd. took a contract for ₹ 60,00,000 expected to be completed in three years. The following particulars relating to the contract are available:

	20X6 (₹)	20X7 (₹)	20X8 (₹)
Materials	6,75,000	10,50,000	9,00,000
Wages	6,20,000	9,00,000	7,50,000
Transportation cost	30,000	90,000	75,000
Other expenses	30,000	75,000	24,000
Cumulative work certified	13,50,000	45,00,000	60,00,000
Cumulative work uncertified	15,000	75,000	—

Plant costing ₹ 3,00,000 was bought at the commencement of the contract. Depreciation was to be charged at 25% per annum, on the written down value method. The contractee pays 75% of the value of work certified as and when certified, and makes the final payment on completion of the contract.

You are required to **PREPARE** a contract account for three years and total estimated profit/ loss from the contract.

Reference | What's **New**

Contract A/c for 3 years

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Answer

Contract Account (For the year ended 20X6)

Particulars		(₹)	Particulars		(₹)
To	Materials	6,75,000	By	Plant at site c/d (75% of ₹ 3,00,000)	2,25,000
″	Wages	6,20,000	″	Work-in-progress c/d:	
″	Transportation cost	30,000	-	Work certified	13,50,000
″	Other expenses	30,000	-	Work uncertified	15,000
″	Plant	3,00,000	″	Costing P&L A/c (Loss for the year)	65,000
		16,55,000			16,55,000

Contract Account (For the year ended 20X7)

Particulars			(₹)	Particulars			(₹)
To	Plant at site b/d		2,25,000	By	Plant at site c/d (75% of ₹ 2,25,000)		1,68,750
″	Work-in-progress b/d:			″	Work-in-progress c/d:		
-	Work certified	13,50,000		-	Work certified	45,00,000	
-	Work uncertified	15,000	13,65,000	-	Work uncertified	75,000	45,75,000
″	Materials		10,50,000				
″	Wages		9,00,000				
″	Transportation cost		90,000				
″	Other expenses		75,000				
″	Costing P&L A/c (Notional Profit for the year)		10,38,750				
			47,43,750				47,43,750

Contract Account (For the year ended 20X8)

Particulars			(₹)	Particulars			(₹)
To	Plant at site b/d		1,68,750	By	Plant at site c/d (75% of ₹ 1,68,750)		1,26,563
″	Work-in-progress b/d:			″	Contractee A/c		60,00,000
-	Work certified	45,00,000		″	Costing P&L A/c (Notional Loss for the year)		3,66,187
-	Work uncertified	75,000	45,75,000				
″	Materials		9,00,000				
″	Wages		7,50,000				
″	Transportation cost		75,000				
″	Other expenses		24,000				
			64,92,750				64,92,750

Costing Profit & Loss A/c

Particulars	(₹)	Particulars	(₹)
20X6		**20X7**	
To Contract A/c (Notional Loss)	65,000	By Contract A/c (Notional Profit)	10,38,750
20X8			
To Contract A/c (Notional Loss)	3,66,187		
To Estimated Profit from the Contract	6,07,563		
	10,38,750		10,38,750

Q5 ICAI Mat

AKP Builders Ltd. commenced a contract on April 1, 20X8. The total contract was for ₹ 5,00,000. Actual expenditure for the period April 1, 20X8 to March 31, 20X9 and estimated expenditure for April 1, 20X9 to December 31, 20X9 are given below:

Particulars	20X8-X9 (actual)	20X9-X0 (9 months) (estimated)
Materials issued	90,000	85,750
Wages: Paid	75,000	87,325
Outstanding at the end	6,250	8,300
Plant	25,000	-
Sundry expenses: Paid	7,250	6,875
Prepaid at the end	625	-
Establishment charges	14,625	-

A part of the material was unsuitable and was sold for ₹ 18,125 (cost being ₹ 15,000) and a part of plant was scrapped and disposed- off for ₹ 2,875. The value of plant at site on 31 March, 20X9 was ₹ 7,750 and the value of material at site was ₹ 4,250. Cash received on account to date was ₹ 1,75,000, representing 80% of the work certified. The cost of work uncertified was valued at ₹ 27,375.

The contractor estimated further expenditure that would be incurred in completion of the contract:

- The contract would be completed by 31st December, 20X9.
- A further sum of ₹ 31,250 would have to be spent on the plant and the residual value of the plant on the completion of the contract would be ₹ 3,750.
- Establishment charges would cost the same amount per month as in the previous year.
- ₹ 10,800 would be sufficient to provide for contingencies.

Required:

PREPARE a Contract Account for the year ended 31st March, 20X9, and **CALCULATE** estimated total profit on this contract.

Reference	What's New
Estimated Profit	**Method is given**

Watch **Video**

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Answer

Contract Account (20X8-X9)

	Particulars		(₹)		Particulars		(₹)
To	Materials issued		90,000	By	Material sold		18,125
To	Wages paid	75,000		By	Plant sold		2,875
	Add: Outstanding	6,250	81,250	By	Plant at site c/d		7,750
To	Plant		25,000	By	Material at site c/d		4,250
To	Sundry Expenses	7,250		By	Work-in-progress c/d		
	Less: Prepaid	625	6,625		Work certified (₹ 1,75,000 ÷ 80%)	2,18,750	
To	Establishment charges		14,625		Work uncertified	27,375	2,46,125
To	Costing P & L A/c (₹ 18,125 – ₹ 15,000)		3,125				
To	Notional profit (Profit for the year)		58,500				
			2,79,125				2,79,125

Calculation of Estimated Profit (₹)

		(₹)	(₹)
(1)	Material consumed (90,000 + 3,125 – 18,125)	75,000	
	Add: Further consumption	85,750	1,60,750
(2)	Wages:	81,250	
	Add: Further cost (87,325 – 6,250)	81,075	
	Add: Outstanding	8,300	1,70,625
(3)	Plant used (25,000 – 2,875)	22,125	
	Add: Further plant introduced	31,250	
	Less: Closing balance of plant	(3,750)	49,625
(4)	Establishment charges	14,625	
	Add: Further charges for nine months (14,625 × 9/12)	10,969	25,594

(5)	Sundry expenses	7,250	
	Add: Further expenses	6,875	14,125
(6)	Reserve for contingencies		10,800
	Estimated profit (balancing figure)		68,481
	Contract price		5,00,000

Q6 ICAI Mat; RTP Nov'19

RST Construction Ltd. commenced a contract on April 1, 20X8. The total contract was for ₹ 49,21,875. It was decided to estimate the total profit on the contract and to take to the credit of Costing Profit and Loss A/c that proportion of estimated profit on cash basis, which work completed bore to total contract. Actual expenditure for the period April 1, 20X8 to March 31, 20X9 and estimated expenditure for April 1, 20X9 to September 30, 20X9 are given below:

	April 1, 20X8 to March 31, 20X9 (Actual) (₹)	April 1, 20X9 to Sept. 30, 20X9 (Estimated) (₹)
Materials issued	7,76,250	12,99,375
Wages: Paid	5,17,500	6,18,750
Prepaid	37,500	-
Outstanding	12,500	5,750
Plant purchased	4,00,000	-
Expenses: Paid	2,25,000	3,75,000
Outstanding	25,000	10,000
Prepaid	15,000	-
Plant returns to store (historical cost)	1,00,000 (on September 30, 20X8)	3,00,000 (on September 30, 20X9)
Work certified	22,50,000	Full
Work uncertified	25,000	-
Cash received	18,75,000	-
Materials at site	82,500	42,500

The plant is subject to annual depreciation @ 25% on written down value method. The contract is likely to be completed on September 30, 20X9.

Required:

PREPARE the Contract A/c for the year ended 31st March, 20X9 and determine the estimated profit on the contract.

Reference | **What's New**

Estimated Profit | **Method is given**

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Answer

Contract A/c (1-4-20X8 to 31-3-20X9)

Particulars		(₹)	Particulars		(₹)
To Materials issued		7,76,250	By Plant returned to Store on 30-9-20X8	1,00,000	
To Wages	5,17,500		Less: Depreciation (1/2)	(12,500)	87,500
Less: Prepaid	(37,500)				
Add: Outstanding	12,500	4,92,500	By Plant at site on 31.3.X9	3,00,000	
To Plant purchased		4,00,000	Less: Depreciation	(75,000)	2,25,000
To Expenses	2,25,000		By Materials at site c/d		82,500
Less: Prepaid	(15,000)		By Work-in-progress c/d		
Add: Outstanding	25,000	2,35,000	Work certified		22,50,000
			Work uncertified		25,000
To Notional profit		7,66,250			-
		26,70,000			26,70,000

Computation of Estimated Profit
Contract A/c (1-4-20X8 to 30-9-20X9)

Particulars	(₹)	Particulars	(₹)
To Materials issued (7,76,250 +12,99,375)	20,75,625	By Materials at site	42,500
To Wages (5,17,500 - 37,500 + 12,500 + 6,18,750+37,500 -12,500 + 5,750)	11,42,000	By Plant returned to store on 30.9.20X8 (1,00,000 – 12,500)	87,500
To Plant purchased	4,00,000	By Plant returned to store on 30.9.X9 (4,00,000 – 1,00,000 – 1,03,125)	1,96,875
To Expenses (2,25,000+25,000 -15,000+ 3,75,000 - 25,000 + 15,000 + 10,000)	6,10,000	By Contractee A/c	49,21,875

To Estimated profit	10,21,125		
	52,48,750		52,48,750

Workings:

Calculation of written down value of plant as on 30-9-20X9.

	(₹)
Plant purchased on 1-4-20X8	4,00,000
Less: Plant returned to store on 30-9-20X8 (Depreciation on it ₹ 1,00,000 × 25/100 × 6/12 = ₹ 12,500)	1,00,000
	3,00,000
Less: Depreciation on Balance plant (3,00,000 × 25/100)	75,000
WDV of Plant on 1-4-20X9	2,25,000
Less: Depreciation (2,25,000 × 25/100 × 6/12)	28,125
WDV of plant returned to store on 30-9-20X9	1,96,875

Q7 RTP May'18; MTP Mar'19; RTP Nov'20

Describe the three advantages of Cost-plus contract.

Reference | What's **New**

Cost plus Contract

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Answer

Cost plus contracts have the following advantages:

(a) The Contractor is assured of a fixed percentage of profit. There is **no risk of incurring any loss** on the contract.

(b) It is useful specially when the **work to be done is not definitely fixed at the time of making the estimate**.

(c) Contractee can **ensure himself about 'the cost of the contract'**, as he is empowered to examine the books and documents of the contractor to ascertain the veracity of the cost of the contract.

Q8 May'18

XYZ Construction Company took a contract for construction of a stadium on 1st April, 2017 at a price of ₹ 160 lakhs. The relevant information for the year ended 31st March, 2018 are as under:

	Amount (₹ In '000)
Material purchased for the contract	6,800
Direct wages paid	3,450
Salaries	200
Direct wages prepaid at the end of the year	50
Salaries outstanding at the end of the year	100
Material returned to stores	150
Material at site as on 31st March, 2018	175
Payment received from the contractee (80% of work certified)	9,440
Work done but not certified	500

A plant was purchased for ₹ 12,00,000 on 1st November, 2017 and was in use at the site upto 31st March, 2018. Depreciation is to be charged on plant @ 15% per annum on straight line basis. Material costing ₹ 50,000 was stolen from the site.

You are **required** to:

(i) **Prepare** contract account for the year ended 31st March, 2018 showing the profit to be taken to Profit & Loss Account.

(ii) **Prepare** Balance Sheet showing the relevant items. (10 Marks)

Reference | What's **New**

Contract account and Balance sheet

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Answer

(i) **Contract Account**

	Particulars	(₹'000)	(₹'000)		Particulars	(₹'000)	(₹'000)
To	Material purchased		6,800	By	Material returned		150
"	Direct wages	3,450		"	Work-in-progress:		
	Less: Prepaid wages	(50)	3,400		Value of work certified (₹ 9,440 ÷ 0.8)	11,800	
"	Salaries	200			Cost of work uncertified	500	12,300
	Add: Outstanding	100	300	"	Material stolen at Site		50
				"	Material at site		175

	"	Depreciation on Plant {(₹ 1,200× 15%) × (5÷12)}		75		
	"	Costing P&L A/c (Notional profit) (bal. figure)		2,100		
				12,675		12,675

(ii) **Balance Sheet (extract) as on 31st March, 2018**

Liabilities		(₹'000)	Assets		(₹'000)
Capital			Plant at site		1,125
Add: Notional Profit	2,100		Work in Progress		
Outstanding Salary		100	Work certified	11,800	
			Work uncertified	500	
				12,300	
			Cash & Bank (in transit)	9,440	2,860
			Prepaid Direct wages		50
			Material at site		175

Q 9 RTP Nov'18

A construction company undertook a contract at an estimated price of ₹ 108 lakhs, which includes a budgeted profit of ₹ 18 lakhs. The relevant data for the year ended 31.03.20X8 are as under:

	(₹ '000)
Materials issued to site	5,000
Direct wages paid	3,800
Plant hired	700
Site office costs	270
Materials returned from site	100
Direct expenses	500
Work certified	10,000
Work not certified	230
Progress payment received	7,200

A special plant was purchased specifically for this contract at ₹ 8,00,000 and after use on this contract till the end of 31.02.20X8, it was valued at ₹ 5,00,000. This cost of materials at site at the end of the year was estimated at ₹ 18,00,000 Direct wages accrued as on 31.03.20X8 was ₹ 1,10,000.

Required:

PREPARE the Contract Account for the year ended 31st March, 20X8.

Reference | What's **New**

Contract Account

Watch **Video**

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Answer

Contract Account for the year ended 31st March, 20X8

		(₹'000)		(₹' 000)
To Material issued to site		5,000	By Material at site	1,800
To Direct wages	3,800		By Material returned	100
Add: Outstanding wages	110	3,910	By Work-in-progress:	
To Plant hire		700	- Value of work certified	10,000
To Site office cost		270	- Work uncertified	230
To Direct expenses		500		
To Depreciation (special plant)		300		
To Notional profit c/d		1,450		
		12,130		12,130

Q10 Nov'18

M/s. SD Private Limited commenced a contract on 1st July 2017 and the company closes its account for the year on 31st March every year. The following information relates to the contract as on 31st March 2018.

(i)	Material issued	₹ 9,48,000
(ii)	Direct wages	₹ 4,57,200
(iii)	Prepaid direct wages as on 31.3.2018	₹ 1,08,000
(iv)	Administration charges	₹ 7,20,000

(v) A supervisor, who is paid ₹ 50,000 per month, has devoted two-third of his time to this contract

(vi) A plant costing ₹ 7,85,270 has been on the site for 185 days, its working life is estimated at 9 years and its scrap value is ₹ 75,000

The contract price is ₹ 42 lakhs. On 31st March 2018 two-third of the contract was completed. The Architect issued certificate covering 50% of the contract price and the contractor had been paid ₹ 15.75 lakhs on account.

Assuming 365 days in a year, you are **required** to:

(i) **Prepare** a Contract Account showing work cost

(ii) **Calculate** Notional Profit or Loss as on 31st March 2018

Reference | What's **New**

Contract account and Notional profit/loss | **Cost of work uncertified**

Watch **Video** Scan Me

Answer

Contract Account

Particulars	(₹)	Particulars	(₹)
To Material issued	9,48,000	By Machine (Working note 1)**	7,45,270
" Direct Wages (4,57,200 – 1,08,000)	3,49,200		
" Administrative charges	7,20,000		
" Supervisor's salary (₹ 50,000 × 9 × 2/3)	3,00,000		
" Machine**	7,85,270	" Works cost (balancing figure)	23,57,200
	31,02,470		31,02,470
" Works cost	23,57,200	" Value of work certified (50% × 42,00,000)	21,00,000
" Costing P&L A/c (Notional profit)	3,32,100	" Cost of work uncertified (Working Note 2)	5,89,300
	26,89,300		26,89,300

** Alternatively Depreciation on machine can be shown debit side of Contract Account.

Working notes:

1. **Written down value of Machine:**

$$\text{Depreciation} = \frac{₹\,7,85,270 - ₹\,75,000}{9 \text{ years}} \times \frac{185 \text{ days}}{365 \text{ days}} = ₹\,40,000$$

Hence the value of machine after the period of 185 days = ₹ 7,85,270 – ₹ 40,000 = ₹ 7,45,270

2. The cost of 2/3rd of the contract is ₹ 23,57,200

∴ Cost of 100% of the contract is $\frac{23,57,200}{2} \times 3 = ₹\,35,35,800$

∴ Cost of 50% of the contract which has been certified by the architect is ₹. 17,67,900. Also, the cost of 1/3rd of the contract, which has been completed but not certified by the architect is ₹. 5,89,300.

SJC Institute

Q11 RTP May'19

Dream house (P) Ltd. is engaged in building two residential housing projects in the city. Particulars related to two housing projects are as below:

	HP-1 (₹)	HP-2 (₹)
Work in Progress on 1st April 2018	7,80,000	2,80,000
Materials Purchased	6,20,000	8,10,000
Land purchased near to the site to open an office	-	12,00,000
Brokerage and registration fee paid on the above purchase	-	60,000
Wages paid	85,000	62,000
Wages outstanding as on 31st March, 2019	12,000	8,400
Donation paid to local clubs	5,000	2,500
Plant hire charges paid for three years effecting from 1st April 2018	72,000	57,000
Value of materials at site as on 31st March, 2019	47,000	52,000
Contract price of the projects	48,00,000	36,00,000
Value of work certified	20,50,000	16,10,000
Work not certified	1,90,000	1,40,000

A concrete mixture machine was bought on 1st April 2018 for ₹ 8,20,000 and used for 180 days in HP-1 and for 100 days in HP-2. Depreciation is provided @ 15% p.a. (this machine can be used for any other projects)

PREPARE contract account for the two housing projects showing the notional profit or loss on each project for the year ended 31st March, 2019.

Reference

Contract Account and Notional Profit/Loss

What's **New**

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Answer

Dr. **Contract Account for the year ended 31st March, 2019** Cr.

Particulars	HP-1 (₹)	HP-2 (₹)	Particulars	HP-1 (₹)	HP-2 (₹)
To Balance b/d: W-I-P	7,80,000	2,80,000	By Closing material at site	47,000	52,000
To Material purchased	6,20,000	8,10,000	By W-I-P:		
To Wages: (₹ 85,000 + ₹ 12,000) (₹ 62,000 + ₹ 8,400)	 97,000	 70,400	Value of work certified	20,50,000	16,10,000

To	Donation to local club*	5,000	2,500	Cost of work not certified	1,90,000	1,40,000
To	Plant hire charges:					
	(₹ 72,000x1/3)	24,000				
	(₹ 57,000x1/3)		19,000			
To	Depreciation on concrete mixture**:					
	(₹8,20,000x15%x180/365)	60,658				
	(₹8,20,000x15%x100/365)		33,699			
To	Notional profit	7,00,342	5,86,401			
		22,87,000	18,02,000		22,87,000	18,02,000

* Assuming donation paid to local club was exclusively for the above projects, hence included in the contract account.

** Depreciation on concrete mixture machine is charged on the basis of number of days used for the projects, as it is clearly mentioned in the question that this machine can be used for other projects also.

(Land purchased and brokerage and registration fee paid for this purpose cannot be charged to contract account, hence not included in the contract account)

Q12 ICAI Mat; MTP Apr'19; MTP Nov'20

Cimech Constructions Limited has entered into a big contract at an agreed price of ₹ 1,50,00,000 subject to an escalation clause for material and labour as spent out on the contract and corresponding actual are as follows:

Material:	Standard		Actual	
	Quantity (Tons)	Rate per Ton (₹)	Quantity (Tons)	Rate per Ton (₹)
A	3,000	1,000	3,400	1,100
B	2,400	800	2,300	700
C	500	4,000	600	3,900
D	100	30,000	90	31,500
Labour:	**Hours**	**Hourly Rate (₹)**	**Hours**	**Hourly Rate (₹)**
L1	60,000	15	56,000	18
L2	40,000	30	38,000	35

You are **required** to:

(i) **ANALYSE** admissible escalation claim and **DETERMINE** the final contract price payable.

(ii) **PREPARE** the contract account, if the all expenses other than material and labour related to the contract are ₹ 13,45,000. (10 Marks)

Reference — What's New — Watch Video

Escalation Clause

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Answer

In case of escalation clause in a contract, a contractor is paid for the any increase in price of materials and rate of labours which are beyond the control of the contractor. Any increase in the cost due to inefficiencies in usage of the materials and labours are not admissible. Thus any increase in cost due to usage in excess of standard quantity or hours are not paid.

(i) **Statement showing Additional claim due to Escalation clause.**

	Standard Qty / Hours (a)	Std. Rate (₹) (b)	Actual Rate (₹) (c)	Variation in Rate (₹) (d) = (c-b)	Escalation claim (₹) (e) = (a × d)
Material:					
A	3,000	1,000	1,100	+100	+3,00,000
B	2,400	800	700	-100	-2,40,000
C	500	4,000	3,900	-100	-50,000
D	100	30,000	31,500	+1,500	+1,50,000
Material escalation claim					1,60,000
Labour:					
L1	60,000	15	18	+3	+1,80,000
L2	40,000	30	35	+5	+2,00,000
Labour escalation claim					3,80,000

Statement showing Final Contract Price

	(₹)	(₹)
Agreed contract price		1,50,00,000
Add: Agreed escalation claim:		
Material Cost	1,60,000	
Labour Cost	3,80,000	5,40,000
Final Contract Price		1,55,40,000

(ii)

Dr. **Contract Account** Cr.

Particulars	(₹)	Particulars	(₹)	
To Material:			By Contractee's A/c	1,55,40,000
A – (3,400 × ₹ 1,100)	37,40,000			

	B – (2,300 × ₹ 700)	16,10,000			
	C – (600 × ₹ 3,900)	23,40,000			
	D – (90 × ₹ 31,500)	28,35,000	1,05,25,000		
To	Labour:				
	L1 – (56,000 × ₹ 18)	10,08,000			
	L2 – (38,000 × ₹ 35)	13,30,000	23,38,000		
To	Other expenses		13,45,000		
To	Estimated Profit		13,32,000		
			1,55,40,000		1,55,40,000

Q13 MTP Apr'19

XYZ LLP, contractors and civil engineers, are building a new wing to a school. The quoted fixed price for the contract is ₹ 30,00,000. Work commenced on 1st January 20X8 and is expected to be completed on schedule by 30 June 20X9.

Data relating to the contract at the year ended 31st March 20X9 is as follows.

	Amount (₹)
Plant sent to site at commencement of contract	2,40,000
Hire of plant and equipment	77,000
Materials sent to site	6,62,000
Materials returned from site	47,000
Direct wages paid	9,60,000
Wage related costs	1,32,000
Direct expenses incurred	34,000
Supervisory staff salaries	
- Direct	90,000
- Indirect	20,000
Regional office expenses apportioned to contract	50,000
Head office expenses apportioned to contract	30,000
Surveyor's fees	27,000
Progress payments received from school	18,00,000

Additional information:

1. Plant is to be depreciated at the rate of 25 % per annum following straight line method, with no residual value.
2. Unused materials on site at 31st March are estimated at ₹ 50,000.
3. Wages owed to direct workers total ₹ 40,000
4. No profit in respect of this contract was included in the year ended 31st March 2018.

5. Budgeted profit on the contract is ₹ 8,00,000
6. Value of work certified by the surveyor is ₹ 24,00,000.
7. The surveyor has not certified the work costing ₹ 1,80,000

You are **required** to PREPARE the account for the school contract for the fifteen months ended 31st March 20X9, and **CALCULATE** the notional profit to date. (10 Marks)

Reference | What's **New**

Contract account and Notional profit to date.

Watch **Video**

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Answer

School Contract Account

Particulars		Amount (₹)	Particulars		Amount (₹)
To Plant		2,40,000	By Material returned		47,000
To Hire of plant		77,000	By Plant c/d		1,65,000
To Materials		6,62,000	By Materials c/d		50,000
To Direct wages	9,60,000		By WIP c/d:		
Add: Accrued	40,000	10,00,000	Value of work certified		24,00,000
To Wages related costs		1,32,000	Cost of work not certified		1,80,000
To Direct expenses		34,000			
To Supervisory staff:					
Direct	90,000				
Indirect	20,000	1,10,000			
To Regional office expenses		50,000			
To Head office expenses		30,000			
To Surveyors' fees		27,000			
To Notional profit c/d		4,80,000			
		28,42,000			28,42,000

Q14 May'19

A contractor prepares his accounts for the year ending 31st March each year. He commenced a contract on 1st September, 2018. The following information relates to contract as on 31st March, 2019:

Material sent to site	₹ 18,75,000
Wages paid	₹ 9,28,500
Wages outstanding at end	₹ 84,800
Sundry expenses	₹ 33,825
Material returned to supplier	₹ 15,000
Plant purchased	₹ 3,75,000
Salary of supervisor	₹ 15,000 per month
(Devotes 1/3rd of his time on contract)	
Material at site as on 31-03-2019	₹ 2,16,800

Some of material costing ₹ 10,000 was found unsuitable and was sold for ₹ 11,200. On 31-12-2018 plant which costs ₹ 25,000 was transferred to some other contract and on 31-01-2019 plant which costs ₹ 32,000 was returned to stores. The plant is subject to annual depreciation @ 15% on written down value method.

The contract price is ₹ 45,00,000. On 31st March, 2019 two-third-of the contract was completed. The architect issued certificate covering 50% of the contract price.

Prepare Contract A/c and show the notional profit or loss as on 31st March, 2019. (10 Marks)

Reference — What's **New**

Contract account and Notional profit/loss

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Answer

Contract Account as on 31-03-2019

Particulars		(₹)	Particulars		(₹)
To	Materials sent to site	18,75,000	By	Material returned to Supplier	15,000
To	Wages paid 9,28,500		By	Material sold	11,200
	Add: Outstanding 84,800	10,13,300	By	Plant transferred to other contract	23,750
To	Plant purchased	3,75,000	By	Plant returned to stores	30,000
To	Sundry Expenses	33,825	By	Plant at site c/d	2,90,175

To	Salary of Supervisor {1/3rd (₹ 15,000 × 7 month)}		35,000	By	Material at site c/d	2,16,800
To	Costing P & L A/c (₹11,200 – ₹10,000)		1,200	By	Works Cost	27,46,400
			33,33,325			33,33,325
To	Works Cost		27,46,400	By	Work-in-progress c/d Work certified	22,50,000
				By	Work uncertified	6,86,600
To	Notional profit (Profit for the year)		1,90,200			
			29,36,600			29,36,600

Working Notes:

1. **Value of plant transferred to other contract:**

   ₹ 25,000 less Depreciation for 4 months

   = ₹ 25,000-(₹ 25,000×15%×4/12) = ₹ 23,750

2. **Value of plant returned to stores:**

   ₹ 32,000 less Depreciation for 5 months

   = ₹ 32,000-(₹ 32,000×15%×5/12) = ₹ 30,000

3. **Value for work uncertified:**

   The cost of 2/3rd of the contract is ₹ 27,46,400

   ∴ Cost of 100% of the contract is $\frac{₹\ 27,46,400}{2} \times 3$ = ₹ 41,19,600

   ∴ Cost of 50% of the contract which has been certified by the architect is ₹ 41,19,600 /2 = ₹ 20,59,800. Also, the cost of 1/3rd of the contract, which has been completed but not certified by the architect is ₹ (27,46,400- 20,59,800) = ₹ 6,86,600/-

Q15 RTP May'20

DISCUSS the Escalation Clause in a Contract.

Reference — What's New

Escalation clause

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Answer

Escalation clause in a contract empowers a contractor to revise the price of the contract in case of increase in the prices of inputs due to some macro-economic or other agreed reasons. A contract takes longer period to complete and the factors based on which price negotiation is done at the time of entering into the contract may change till the contract completes. This protect the contractor from adverse financial impacts and empowers the contractor to recover the increased prices. As per this clause, the contractor increases the contract price if the cost of materials, employees and other expenses increase beyond a certain limit. Inclusion of such a clause in a contract deed is called an "Escalation Clause".

Q16 Nov'20

W Limited undertook a contract for ₹ 5,00,000 on 1st July, 2019. On 30th June, 2020 when the accounts were closed, the following details about the contract were gathered :

	Amount (₹)
Materials purchased	1,00,000
Wages paid	45,000
General expenses	10,000
Materials on hand (30-6-2020)	25,000
Wages accrued (30-6-2020)	5,000
Work certified	2,00,000
Cash received	1,50,000
Work uncertified	15,000

The above contract contained "Escalation clause" which read as follows :

"In the event of increase in the prices of materials and rates of wages by more than 5%, the contract price would be increased accordingly by 25% of the rise in the cost of materials and wages beyond 5% in each case."

It was found that since the date of signing the agreement, the prices of materials and wage rates increased by 25%. The value of the work certified does not take into account the effect of the above clause.

Calculate the 'value of work certified' after taking the effect of 'Escalation Clause' as on 30th June, 2020. [5 Marks]

Reference | What's **New**

Escalation Clause

Watch **Video** Scan Me

Answer

Workings:

(i) **Percentage of work certified:**

$$\frac{\text{Value of work certified}}{\text{Contract price}} \times 100 = \frac{₹\ 2,00,000}{₹\ 5,00,000} \times 100 = 40\%$$

(ii) **Value of material and labour used in the contract:**

Particulars	Amount (₹)	Amount (₹)
Material purchased	1,00,000	
Less: Material on hand (30-06-2020)	(25,000)	75,000
Wages paid	45,000	
Add: Wages accrued (30-06-2020)	5,000	50,000
		1,25,000

Price of materials and wages has been increased by 25%, the value before price increase is:

$$\frac{₹\ 1,25,000}{125} \times 100 = ₹\ 1,00,000$$

(iii) **Calculation of Value of work certified:**

The value of the contract would be increased by 25% of the price increased beyond 5%.

Price increased beyond 5% = ₹ 25,000 – 5% of ₹ 1,00,000 = ₹ 20,000

Value of contract would be increased by 25% of ₹ 20,000 = ₹ 5,000

Therefore, the revised contract value = ₹ 5,00,000 + ₹ 5,000 = ₹ 5,05,000

Calculation of the Value of work certified after taking the effect of escalation clause:

Revised contract value × Percentage of work certified = ₹ 5,05,000 × 40%

= ₹ 2,02,000

Q17 RTP May'21

Write note on cost-plus-contracts.

Reference | What's **New**

Cost plus contract

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Answer

These contracts provide for the payment by the contractee of the actual cost of construction plus a stipulated profit, mutually decided between the two parties.

The main features of these contracts are as follows:

(i) The practice of cost-plus contracts is adopted in the case of those contracts where the probable cost of the contracts cannot be ascertained in advance with a reasonable accuracy.

(ii) These contracts are preferred when the cost of material and labour is not steady and the contract completion may take number of years.

(iii) The different costs to be included in the execution of the contract are mutually agreed, so that no dispute may arise in future in this respect. Under such type of contracts, contractee is allowed to check or scrutinize the concerned books, documents and accounts.

(iv) Such a contract offers a fair price to the contractee and also a reasonable profit to the contractor.

The contract price here is ascertained by adding a fixed and mutually pre-decided component of profit to the total cost of the work.

Q18 MTP May'21

Zed Limited obtained a contract No. 1551 for ₹ 150 lacs. The following details are available in respect of this contract for the year ended March 31, 2021:

	₹
Materials purchased	4,80,000
Materials issued from stores	15,00,000
Wages paid	21,00,000
Drawing and maps	1,80,000
Sundry expenses	45,000
Electricity charges	75,000
Plant hire expenses	1,80,000
Sub-contract cost	60,000
Materials returned to stores	90,000
Materials returned to suppliers	60,000

The following balances relating to the contract No. 1551 for the year ended on March 31, 2020 and March 31, 2021 are available:

	as on 31st March, 2020	as on 31st March, 2021
Work certified	36,00,000	1,05,00,000
Work uncertified	60,000	1,20,000

Materials at site	45,000	90,000
Wages outstanding	30,000	60,000

The contractor receives 70% of work certified in cash.

Prepare Contract Account and Contractee's Account. (10 Marks)

Reference — What's **New** — Watch **Video**

Contract Account and Contractee's Account

Scan Me

Answer

Dr. **Contract No. 1551 Account for the year ended 31st March, 2021** Cr.

Particulars		Amount (₹)	Particulars	Amount (₹)
To Work in progress b/d:			By Material returned to stores	90,000
- Work certified		36,00,000	By Material returned to suppliers	60,000
- Work uncertified		60,000	By Stock (Materials) c/d	90,000
To Stock (Materials) b/d		45,000	By Work in progress c/d:	
To Material purchased		4,80,000	- Work certified	1,05,00,000
To Material issued		15,00,000	- Work uncertified	1,20,000
To Wages paid	21,00,000			
Less: Opening O/s	(30,000)			
Add: Closing O/s	60,000	21,30,000		
To Drawing and maps		1,80,000		
To Sundry expenses		45,000		
To Electricity charges		75,000		
To Plant hire expenses		1,80,000		
To Sub-contract cost		60,000		
To Notional profit c/d (balancing figure)		25,05,000		
		1,08,60,000		1,08,60,000

Dr. **Contractee's Account** Cr.

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance c/d (₹ 1,05,00,000 × 70%)	73,50,000	By Balance b/d (70% of ₹ 36,00,000)	25,20,000
		By Bank A/c	48,30,000
	73,50,000		73,50,000

Q19 July'21

Brick Constructions Ltd. commenced a contract on April 1,2020. The contract was for ₹ 10,00,000. The following information relates to the Contract as on 31st March, 2021 :

- The value of work completed up to Feb. 28, 2021 was certified by the architect and as a matter of policy; the Contractee has retained ₹ 1,30,000 as retention money which is 20% of the certified work and paid the balance amount.
- The cost of work completed subsequent to the architect's certificate was of ₹ 30,000.
- The expenditure incurred related to material purchase, wages and other chargeable expenses were ₹ 5,10,000
- Materials of the value of ₹ 20,000 were lying on the site.
- A special plant was purchased specifically for this contract at ₹ 40,000 and after use on this contract till 31st March, 2021; it was valued at ₹ 25,000.

You are **required** to compute the value of Work Certified, Cash received for certified work and Notional profit of the contract for the year ended on 31st March, 2021. [5]

Reference — What's **New**

Value of work certified, Cash received and Notional Profit

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Answer

1. **Value of Work Certified**

$$= \frac{₹\,1,30,000}{20\%} = ₹\,6,50,000$$

2. **Cash Received**

= Value of Work certified – Retention Money

= 6,50,000 – 1,30,000 = ₹ 5,20,000

3. **Notional Profit**

= Value of Work certified – Cost of work certified

= 6,50,000 - 4,75,000* = ₹ 1,75,000

***Working Note**

Cost of work certified = Work cost – Cost of work uncertified

= (Expenditure + Plant used – Material at site) – Cost of work uncertified

= [5,10,000 + (40,000 – 25,000) – 20,000] – 30,000 = ₹ 4,75,000

Q20 MTP Oct'21

From the following particulars, **COMPUTE** Notional profit and estimated profit on a contract (which has been 80% complete): [5]

	(₹)
Total expenditure to date	4,00,000
Estimated further expenditure to complete the contract (including contingencies)	22,000
Contract price	5,44,000
Work certified	4,89,600
Work uncertified	30,200
Cash received	3,91,680

Reference — What's **New**

Notional Profit and Estimated Profit

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Answer

Computation of Notional Profit

	(₹)
Value of work certified	4,89,600
Less: Cost of work certified (₹ 4,00,000 – ₹ 30,200)	3,69,800
Notional profit	1,19,800

Computation of Estimated Profit

		(₹)
Contract price		5,44,000
Less: Estimated total cost		
Cost of work to date	4,00,000	
Estimated further expenditure to complete the contract	22,000	4,22,000
Estimated profit		1,22,000

Q 21 Dec'21

A construction company has obtained a contract of ₹ 30 lakhs contract price.

The following details are available in respect of this contract for the year ended March 31,2021 :

Particulars	(₹)
Materials purchased	2,00,000
Materials issued from stores	8,00,000
Wages paid	1,50,000
Plant Supervisor Salary	2,40,000
Drawing and maps	50,000
Sundry expenses	30,000
Electricity charges	40,000
Plant hire expenses paid	75,000
Sub-contract cost	40,000
Materials returned to stores	35,000
Materials returned to suppliers	50,000

The following balances related to the contract for the year ended on March 31,2020 and March 31,2021 are available :

	As on 31st March, 2020 (₹)	As on 31st March, 2021 (₹)
Work certified	2,50,000	70% of Contract Price
Work uncertified	10,000	?
Materials at site	35,000	25,000
Wages outstanding	15,000	22,000
Plant hire charges outstanding	20,000	15,000

Further informations are as under :

1. An additional plant was used for 270 days costing ₹ 5,00,000 with a residual value of ₹ 20,000 having life of 4 years.
2. During the year, material costing ₹ 40,000 was sold for ₹ 20,000.
3. Plant supervisor has devoted l/3rd of his time to this contract.
4. As on 31 -03-2021, 80% of the contract was completed.

You are **required** to prepare Contract Account and show the notional profit or loss as on 31st March, 2021. (Assume 360 days in a year.) [10]

Reference | What's New

Contract Account

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Answer

Dr. **Contract A/c** Cr.

Particulars		Amount (₹)	Particulars	Amount (₹)
To Opening Work in progress			By Material returned to store	35,000
- Work certified	2,50,000		By Material returned to suppliers	50,000
- Work uncertified	10,000	2,60,000	By Costing P&L (Loss on sale of material)	20,000
To Material at site		35,000	By Material Sold	20,000
To Material purchased		2,00,000	By Material at site	25,000
To Stores		8,00,000	By Works cost (Bal. fig.)	17,02,000
To Wages	1,50,000			
Add: Closing O/s wages	22,000			
Less: Opening O/s wages	(15,000)	1,57,000		
To Plant supervisor salary (2,40,000 × 1/3)		80,000		
To Drawing and maps		50,000		
To Sundry expenses		30,000		
To Electricity charges		40,000		
To Plant hire expenses	75,000			
Add: O/s at end	15,000			
Less: O/s at beginning	(20,000)	70,000		
To Sub-contract		40,000		

To Depreciation $\left[\frac{5,00,000-20,000}{4}\times\frac{270}{360}\right]$		90,000		
		18,52,000		18,52,000
To works cost		17,02,000	By work in progress:	
To Costing P& L (Notional profit)		6,10,750	Work certified 21,00,000	
			Work uncertified 2,12,750	23,12,750
		23,12,750		23,12,750

Working Note:

Calculation of Value of work uncertified

Cost incurred till date	17,02,000
Estimate total cost $\left[\frac{17,02,000}{80\%}\right]$	21,27,500
Cost of work certified till date (21,27,500 × 70%)	14,89,250
Cost of uncertified work (17,02,000 – 14,89,250)	2,12,750

Q22 MTP Nov'22

Premier Construction Company undertook a contract for ₹50,00,000 on 1st August, 2021. On 31st March, 2022 when the accounts were closed, the following information was available:

Cost of work uncertified	₹12,00,000
Cash received	₹25,00,000 (80 of work certified)
Profit transferred to costing Profit and Loss account at the end of the year on Incomplete contract	₹8,00,000

CALCULATE:

(i) The value of work in progress certified

(ii) Degree of completion of contract

(iii) Notional Profit and

(iv) Cost of contract as on 31-03-2022. [5]

Reference | What's **New**

Value of Work in Progress Certified, DOC of Contract, Notional Profit, Cost of Contract

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Answer

(i) **Value of work in progress certified:**

Since, Cash Received of ₹ 25,00,000 is 80% of work certified

Therefore, Value of work in progress certified = $\frac{₹\ 25,00,000}{80\%}$ = ₹ 31,25,000

(ii) **Degree of completion of contract:**

$= \frac{\text{Value of work certified}}{\text{Value of contract}} \times 100 = \frac{₹\ 31,25,000}{₹\ 50,00,000} \times 100 = 62.5\%$

(iii) **Notional Profit:**

Profit transferred to Costing Profit & Loss A/c = $\frac{2}{3} \times \text{Notional Profit} \times \frac{\text{Cash Received}}{\text{Value of work certified}}$

(Since contract completion is 62.5% i.e. more than 50%)

Or, ₹ 8,00,000 = $\frac{2}{3} \times \text{Notional Profit} \times \frac{₹\ 25,00,000}{₹\ 31,25,000}$

Notional Profit = ₹ 15,00,000

(iv) **Cost of contract as on 31-03-2022:**

= Value of Work certified + Cost of work uncertified – Notional profit

= ₹ 31,25,000 + ₹12,00,000 – ₹ 15,00,000

= ₹ 28,25,000

NOTES

Chapter 14

Process Costing and WIP Valuation

Q1 ICAI Mat

	Process I (₹)	Process II (₹)	Process III (₹)
Materials	1,50,000	50,000	20,000
Labour	80,000	2,00,000	60,000
Other expenses	26,000	72,000	25,000

Indirect expenses amounting to ₹ 85,000 may be apportioned on the basis of wages. There was no opening or closing stock.

From the above data, **PREPARE** process accounts indicating the cost of each process and the total cost. The total units that pass through each process were 240 for the period.

Reference — What's **New**

Process Accounts

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Answer

Dr. **Process- I Account** Cr.

Particulars	Per unit (₹)	Total (₹)	Particulars	Per unit (₹)	Total (₹)
To Material	625	1,50,000	By Process -II A/c	1,150	2,76,000
" Labour	334	80,000	(Transfer to Process-II)		
" Other expenses	108	26,000			
" Indirect expenses*	83	20,000			
	1,150	2,76,000		1,150	2,76,000

Dr. **Process- II Account** Cr.

Particulars	Per unit (₹)	Total (₹)	Particulars	Per unit (₹)	Total (₹)
To Process-I A/c	1,150	2,76,000	By Process-III A/c	2,700	6,48,000
" Material	208	50,000	(Transfer to Process-III)		
" Labour	834	2,00,000			

"	Other expenses	300	72,000			
"	Indirect expenses*	208	50,000			
		2,700	6,48,000		2,700	6,48,000

Dr. **Process- III Account** Cr.

Particulars		Per unit (₹)	Total (₹)	Particulars		Per unit (₹)	Total (₹)
To	Process-II A/c	2,700	6,48,000	By	Finished Stock A/c (Transferred)	3,200	7,68,000
"	Material	83	20,000				
"	Labour	250	60,000				
"	Other expenses	104	25,000				
"	Indirect expenses*	63	15,000				
		3,200	7,68,000			3,200	7,68,000

* Apportionment of Indirect expenses among Process-I, Process-II and Process-III

Total Wages to processes (I + II +III) = ₹ 80,000 + ₹ 2,00,000 + ₹ 60,000 = ₹ 3,40,000

Apportionment to:

$$\text{Process- I} = \frac{₹\,85,000}{₹\,3,40,000} \times ₹\,80,000 = ₹\,20,000;$$

$$\text{Process- II} = \frac{₹\,85,000}{₹\,3,40,000} \times ₹\,2,00,000 = ₹\,50,000 \text{ and}$$

$$\text{Process- III} = \frac{₹\,85,000}{₹\,3,40,000} \times ₹\,60,000 = ₹\,15,000$$

Q2 ICAI Mat

A product passes through Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,750 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has no realisable value.

You are required to **PREPARE** Process- I account, value of normal loss and units transferred to Process-II.

Reference

Process Accounts

What's **New**

Normal Loss with No Realisable Value

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Answer

Process- I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material	5,000	40,000	By Normal loss	250	0
To Wages	-	30,000			
To Overhead	-	27,000	By Process II	4,750	97,000
	5,000	97,000		5,000	97,000

Value of Normal loss = Scrap realisable value less cost to sale

Since, scraps do not realise any value, hence, value of normal loss is zero.

Value of units transferred to Process-II:

$$= \frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal loss units}} \times \text{Unit transferred}$$

$$= \frac{₹\,97,000 - 0}{5,000\text{ units} - 250\text{ units}} \times 4,750\text{ units} = 97,000$$

Q3 ICAI Mat

A product passes through Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,750 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has realisable value of ₹ 2 per unit.

You are required to **PREPARE** Process- I account, value of normal loss and units transferred to Process-II.

Reference

Process Accounts

What's New

Normal Loss with Realisable Value

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Answer

Process- I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material	5,000	40,000	By Normal loss	250	500
To Wages	-	30,000			
To Overhead	-	27,000	By Process II	4,750	96,500
	5,000	97,000		5,000	97,000

Value of Normal loss = Scrap realisable value less cost to sale

= 250 units × ₹ 2 = ₹ 500

Value of units transferred to Process-II:

$$= \frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal loss units}} \times \text{Unit transferred}$$

$$= \frac{₹\,97,000 - ₹\,500}{5,000 \text{ units} - 250 \text{ units}} \times 4,750 \text{ units} = 96,500$$

Q4 ICAI Mat

A product passes through Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,550 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has realisable value of ₹ 2 per unit.

You are **required** to **PREPARE** Process- I account, value of normal loss, abnormal loss and units transferred to Process-II.

Reference

Process Accounts

What's New

Abnormal Loss with Realisable Value

Watch **Video**

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Answer

Process- I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material	5,000	40,000	By Normal loss	250	500
To Wages	-	30,000	By Abnormal Loss	200	4,063
To Overhead	-	27,000	By Process II	4,550	92,437
	5,000	97,000		5,000	97,000

Value of Normal loss = Scrap realisable value less cost to sale

= 250 units × ₹ 2 = ₹ 500

Value of Abnormal loss:

$$= \frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal loss units}} \times \text{Abnormal loss units}$$

$$= \frac{₹\ 97,000 - 500}{5,000\ \text{units} - 250\ \text{units}} \times 200\ \text{units} = ₹\ 4,063$$

Value of units transferred to Process-II:

$$= \frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal loss units}} \times \text{Unit transferred}$$

$$= \frac{₹\ 97,000 - 500}{5,000\ \text{units} - 250\ \text{units}} \times 4,550\ \text{units} = 92,437$$

Q5 ICAI Mat

A product passes through Process- I and Process- II. Materials issued to Process- I amounted to ₹ 40,000, Wages ₹ 30,000 and manufacturing overheads were ₹ 27,000. Normal loss anticipated was 5% of input. 4,850 units of output were produced and transferred-out from Process-I. There were no opening stocks. Input raw material issued to Process I were 5,000 units. Scrap has realisable value of ₹ 2 per unit.

You are required to **PREPARE** Process- I account, value of normal loss, abnormal loss/ gain and units transferred to Process-II.

Reference

Process Accounts

What's New

Abnormal Gain/Yield with Realisable Value

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Answer

Process- I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material	5,000	40,000	By Normal loss	250	500
To Wages	-	30,000			
To Overhead	-	27,000			
To Abnormal Gain A/c	100	2,032	By Process II	4,850	98,532
	5,100	99,032		5,100	99,032

Value of Normal loss = Scrap realisable value less cost to sale

= 250 units × ₹ 2 = ₹ 500

(even though the actual loss is less than the expected loss (Normal loss), value of the normal loss is calculated on the estimated figure)

Value of Abnormal Gain:

$$= \frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal loss units}} \times \text{Abnormal Gain units}$$

$$= \frac{₹\,97,000 - 500}{5,000 \text{ units} - 250 \text{ units}} \times 100 \text{ units} = ₹\,2,032$$

Value of units transferred to Process-II:

$$= \frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal loss units}} \times \text{Unit transferred}$$

$$= \frac{₹\,97,000 - ₹\,500}{5,000 \text{ units} - 250 \text{ units}} \times 4,850 \text{ units} = 98,532$$

(Process A/c is debited with the value of abnormal gain as calculated above but the Costing Profit & Loss Account will only be credited with actual amount of abnormal gain only considering the actual realisable value through Abnormal Gain A/c, as shown below)

Abnormal Gain A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Normal Loss A/c (100 units × ₹ 2)	100	200	By Process-I A/c	100	2,032
To Costing P&L A/c	-	1,832			
	100	2,032		100	2,032

(The Costing P&L Account is credited only for actual gain amount)

Q6 ICAI Mat

A product passes through three processes. The output of each process is treated as the raw material of the next process to which it is transferred and output of the third process is transferred to finished stock.

	Process-I (₹)	Process-II (₹)	Process-III (₹)
Materials issued	40,000	20,000	10,000
Labour	6,000	4,000	1,000
Manufacturing overhead	10,000	10,000	15,000

10,000 units have been issued to the Process-I and after processing, the output of each process is as under:

Process	Output	Normal Loss
Process-I	9,750 units	2%
Process-II	9,400 units	5%
Process-III	8,000 units	10%

No stock of materials or of work-in-process was left at the end.

CALCULATE the cost of the finished articles.

Reference | What's **New**

Process Accounts

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Answer

Dr. **Process-I Account** Cr.

Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
To	Material	10,000	40,000	By	Normal Loss A/c (2% of 10,000 units)	200	--
"	Labour	--	6,000	"	Abnormal Loss A/c (₹ 5.7142 × 50 units)	50	286
"	Manufacturing OH	--	10,000	"	Process-II A/c (₹ 5.7142 × 9,750 units)	9,750	55,714
		10,000	56,000			10,000	56,000

Cost per unit of completed units and abnormal loss:

$$\frac{\text{Total Cost}}{\text{Inputs} - \text{Normal loss}} = \frac{₹\,56,000}{10,000 \text{ units} - 200 \text{ units}} = ₹\,5.7142$$

Dr. **Process-II Account** Cr.

Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
To	Process-I A/c	9,750	55,714	By	Normal Loss A/c (5% of 9,750 units)	488	--
"	Material	--	20,000	"	Process-III A/c (₹ 9.6862 × 9,400 units)	9,400	91,051
"	Labour	--	4,000				
"	Manufacturing OH	--	10,000				
"	Abnormal Gain A/c (₹ 9.6862 × 138 units)	138	1,337				
		9,888	91,051			9,888	91,051

Cost per unit of completed units and abnormal gain:

$$\frac{\text{Total Cost}}{\text{Inputs} - \text{Normal loss}} = \frac{₹\,89,714}{9,750 \text{ units} - 488 \text{ units}} = ₹\,9.6862$$

Dr. **Process-III Account** Cr.

Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
To	Process-II A/c	9,400	91,051	By	Normal Loss A/c (10% of 9,400 units)	940	--
"	Material	--	10,000	"	Abnormal Loss A/c (₹ 13.8358 × 460 units)	460	6,364
"	Labour	--	1,000	"	Finished Stock A/c (₹ 13.8358 × 8,000 units)	8,000	1,10,687
"	Manufacturing OH	--	15,000				
		9,400	1,17,051			9,400	1,17,051

Cost per unit of completed units and abnormal loss:

$$\frac{\text{Total Cost}}{\text{Inputs} - \text{Normal loss}} = \frac{₹\,1,17,051}{9,400\text{ units} - 940\text{ units}} = ₹\,13.8358$$

Q7 ICAI Mat; Nov'18

Opening work-in-process 1,000 units (60% complete); Cost ₹ 1,10,000. Units introduced during the period 10,000 units; Cost ₹ 19,30,000. Transferred to next process - 9,000 units.

Closing work-in-process - 800 units (75% complete). Normal loss is estimated at 10% of total input including units in process at the beginning. Scraps realise ₹ 10 per unit. Scraps are 100% complete.

Using FIFO method, **COMPUTE** equivalent production and cost per equivalent unit. Also evaluate the output.

Reference | **What's New**

WIP Valuation | **FIFO Method**

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Answer

Statement of Equivalent Production Units (Under FIFO Method)

Particulars	Input units	Particulars	Output units	Equivalent Production	
				(%)	Equivalent units
Opening W-I-P	1,000	From opening W-I-P	1,000	40	400
Units introduced	10,000	From fresh inputs	8,000	100	8,000

		Units completed (Transferred to next process)	9,000		
		Normal Loss {10% (1,000 + 10,000 units)}	1,100	--	--
		Closing W-I-P	800	75	600
		Abnormal loss (Balancing figure)	100	100	100
	11,000		11,000		9,100

Computation of cost per equivalent production unit:

Cost of the Process (for the period)	₹ 19,30,000
Less: Scrap value of normal loss (₹ 10 × 1,100 units)	(₹ 11,000)
Total process cost	₹ 19,19,000

$$\text{Cost per equivalent unit} = \frac{₹19,19,000}{9,100 \text{ units}} = ₹ 210.88$$

Statement of Evaluation

Particulars	Equivalent Units (EU)	Cost per EU (₹)	Amount (₹)
(i) Opening W-I-P completed during the period	400	210.88	84,352
Add: Cost of W-I-P at beginning	--	--	1,10,000
Complete cost of 1,000 units of opening W-I-P	1,000	194.35	1,94,352
(ii) Completely processed units	8,000	210.88	16,87,040
(iii) Abnormal Loss	100	210.88	21,088
(iv) Closing W-I-P	600	210.88	1,26,528

(The difference in total amount may arise due to rounding off error)

Q 8 ICAI Mat; May'19

A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 20X8:

	Process- I (₹)	Process-II (₹)	Finished Stock (₹)
Opening stock	7,500	9,000	22,500
Direct materials	15,000	15,750	--
Direct wages	11,200	11,250	--
Factory overheads	10,500	4,500	--
Closing stock	3,700	4,500	11,250
Inter-process profit included in opening stock	--	1,500	8,250

Output of Process- I is transferred to Process- II at 25% profit on the transfer price.

Output of Process- II 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 II. Sales during the period are ₹ 1,40,000.

PREPARE Process cost accounts and finished goods account showing the profit element at each stage.

Reference | What's **New**

Inter - Process Profits

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Answer

Process- I Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	7,500	7,500	--	Process- II A/c	54,000	40,500	13,500
Direct materials	15,000	15,000	--				
Direct wages	11,200	11,200	--				
	33,700	33,700	--				
Less: Closing stock	(3,700)	(3,700)					
Prime cost	30,000	30,000	--				
Overheads	10,500	10,500	--				
Process cost	40,500	40,500	--				
Profit (33⅓ of total cost)	13,500	--	13,500				
	54,000	40,500	13,500		54,000	40,500	13,500

Process- II Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	9,000	7,500	1,500	Finished Stock A/c	1,12,500	75,750	36,750
Transferred from Process- I	54,000	40,500	13,500				
Direct materials	15,750	15,750	--				
Direct wages	11,250	11,250	--				
	90,000	75,000	15,000				
Less Closing stock*	(4,500)	(3,750)	(750)				

Prime cost	85,500	71,250	14,250				
Overheads	4,500	4,500	--				
Process cost	90,000	75,750	14,250				
Profit (25% on total cost)	22,500	--	22,500				
	1,12,500	75,750	36,750		1,12,500	75,750	36,750

* Cost of Closing Stock = $\frac{₹\,75,750}{₹\,90,000} \times ₹\,4,500 = ₹\,3,750$

Finished Stock Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	22,500	14,250	8,250	Costing P&L A/c	1,40,000	82,425	57,575
Process- II	1,12,500	75,750	36,750				
	1,35,000	90,000	45,000				
Less: Closing stock*	(11,250)	(7,575)	(3,675)				
Finished stock	1,23,750	82,425	41,325				
Profit	16,250	--	16,250				
	1,40,000	82,425	57,575		1,40,000	82,425	57,575

* Cost of Closing Stock = $\frac{₹\,75,750}{₹\,1,12,500} \times ₹\,11,250 = ₹\,7,575$

Working Notes:

Let the transfer price be 100 then profit is 25; i.e. cost price is ₹ 75.

1. If cost is ₹ 75 then profit is ₹ 25

   If cost is ₹ 40,500 then profit is $\frac{25}{75} \times 40,500 = ₹\,13,500$

2. If cost is ₹ 80 then profit is ₹ 20

   If cost is ₹ 90,000 then profit is $\frac{20}{80} \times 90,000 = ₹\,22,500$

Q9 ICAI Mat; RTP May'19

Following information is available regarding Process-I for the month of February, 20X9 :

Production Record:	
Units in process as on 1.2.20X9	4,000
(All materials used, 25% complete for labour and overhead)	
New units introduced	16,000
Units completed	14,000

Units in process as on 28.2.20X9	6,000
(All materials used, 33-1/3% complete for labour and overhead)	
Cost Records:	
Work-in-process as on 1.2.20X9	(₹)
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.

Reference — **WIP Valuation**

What's **New** — **Weighted Average Method**

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Answer

(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 (₹)	Labour (₹)	Overhead (₹)	Total (₹)
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 (₹)	Amount (₹)
1. Value of units completed and transferred (14,000 units × ₹ 3.58)		50,120
2. Value of Closing W-I-P:		
- Materials (6,000 units × ₹ 1.58)	9,480	
- Labour (2,000 units × ₹ 1)	2,000	
- Overheads (2,000 units × ₹ 1)	2,000	13,480

(iv) **Process-I Cost Account**

	Particulars	Units	(₹)		Particulars	Units	(₹)
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

Q10 ICAI Mat; Nov'20

Following details are related to the work done in Process-I by XYZ Company during the month of March, 20X9:

	(₹)
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%
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 ₹ 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.

Reference — **WIP Valuation**

What's **New** — **Weighted Average Method**

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Answer

(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 (₹)	Labour (₹)	Overhead (₹)	Total (₹)
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 (₹ 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 (₹)	Amount (₹)
1.	Value of units completed and transferred (35,000 units × ₹ 80)		28,00,000
2.	Value of Abnormal Loss:		
	Materials (1,000 units × ₹ 40)	40,000	
	Labour (800 units × ₹ 10)	8,000	
	Overheads (800 units × ₹ 30)	24,000	72,000
3.	Value of Closing W-I-P:		
	Materials (2,000 units × ₹ 40)	80,000	
	Labour (1,600 units × ₹ 10)	16,000	
	Overheads (1,600 units × ₹ 30)	48,000	1,44,000

(iv) **Process-I A/c**

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W.I.P:			By Normal Loss (₹ 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	(₹)		Particulars	Units	(₹)
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	(₹)		Particulars	Units	(₹)
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

Q11 ICAI Mat; RTP May'21

A company produces a component, which passes through two processes. During the month of April, 20X9, 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	₹ 15,000
Direct wages	₹ 18,000
Factory overheads	₹ 12,000

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.

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	₹ 4,000
Direct wages	₹ 3,500
Factory overheads	₹ 4,500

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.

Reference | What's New

WIP Valuation | **No opening WIP, effect of packing material**

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Answer

(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 (₹)	Equivalent Production (units)	Process Cost p.u. (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (₹) (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
	45,000				8,035	36,965

Process I A/c

Particulars	Unit	(₹)	Particulars	Units	(₹)
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 (₹)	Equivalent Production (units)	Process Cost p.u. (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (₹) (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	(₹)	Particulars		Units	(₹)
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

Q12 RTP May'18; RTP May'20

Star Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes and the company uses FIFO method 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 paper containing records of the process operations for the month.

Star 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 800 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 26,640.
- 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 ₹ 15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹ 39 for the month made up as follows:

	(₹)
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.

Reference | What's **New**

FIFO Method - Back Calculation for computing the input

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Answer

(i) **Calculation of Raw Material inputs during the month:**

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	800	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,360	Process Losses	1,800
		Closing WIP	160
	6,160		6,160

(ii) **Calculation of Normal Loss and Abnormal Loss/Gain**

	Litres
Total process losses for month	1,800
Normal Loss (10% input)	536
Abnormal Loss (balancing figure)	1,264

(iii) **Calculation of values of Raw Material, Labour and Overheads added to the process:**

	Material	Labour	Overheads
Cost per equivalent unit	₹ 23.00	₹ 7.00	₹ 9.00
Equivalent units (litre) (refer the working note)	4,824	4,952	5,016
Cost of equivalent units	₹ 1,10,952	₹ 34,664	₹ 45,144
Add: Scrap value of normal loss (536 units × ₹ 15)	₹ 8,040	--	--
Total value added	₹ 1,18,992	₹ 34,664	₹ 45,144

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	800	Units completed:							
Units introduced	5,360	- Opening WIP	800	--	--	240	30	320	40
		- Fresh inputs	3,400	3,400	100	3,400	100	3,400	100
		Normal loss	536	--	--	--	--	--	--
		Abnormal loss	1,264	1,264	100	1,264	100	1,264	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,824		4,952		5,016	

(iv) **Process Account for Month**

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	800	26,640	By Finished goods	4,200	1,63,800
To Raw Materials	5,360	1,18,992	By Normal loss	536	8,040
To Wages	--	34,664	By Abnormal loss	1,264	49,296
To Overheads	--	45,144	By Closing WIP	160	4,304
	6,160	2,25,440		6,160	2,25,440

Q13 MTP Mar'18

The following are the details in respect of Process A and Process B of a processing factory:

	Process A (₹)	Process B (₹)
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 ₹ 4,00,000 for the finished goods received from Process B.

PREPARE process accounts and **CALCULATE** total profit, assuming that there was no opening or closing work-in-progress.

Reference — What's **New**

Inter Process Profit

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Answer

Dr. **Process A Account** Cr.

	₹		₹
To Materials	40,000	By Process B A/c (Transfer to Process B)	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.

	₹		₹
To Process A A/c (Transferred from Process A)	1,20,000	By Finished Stock A/c (Transfer to finished stock)	2,88,000
To Labour	56,000		
To Overhead	40,000		

	2,16,000		
To Profit (25% of transfer price i.e., 33.33% of cost)	72,000		
	2,88,000		2,88,000

Statement of Total Profit

	₹
Profit from Process A	24,000
Profit from Process B	72,000
Profit on Sales (₹ 4,00,000 – ₹ 2,88,000)	1,12,000
Total Profit	2,08,000

Q 14 May'18

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:

Particulars	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 ₹ 90,000 were recovered as percentage of direct labour.

10,000 kg of raw material @ ₹ 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 ₹ 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.
(10 Marks)

Reference — **Process accounts and Selling price**

What's New

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Answer

Process- P Account

Particulars	Kg.	Amount (₹)	Particulars	Kg.	Amount (₹)
To Input	10,000	50,000	By Normal wastage (1,000 kg. × ₹ 1)	1,000	1,000
To Direct Material	---	38,000	By Process- Q (9,000 kg. × ₹ 15.50)	9,000	1,39,500
To Direct Labour	---	30,000			
To Production OH (₹ 90,000 × 3/12)	---	22,500			
	10,000	1,40,500		10,000	1,40,500

$$\text{Cost per unit} = \frac{₹\,1,40,500 - ₹\,1,000}{10,000\text{ kg} - 1,000\text{ kg}} = ₹\,15.50$$

Process- Q Account

Particulars	Kg.	Amount (₹)	Particulars	Kg.	Amount (₹)
To Process-P A/c	9,000	1,39,500	By Normal wastage (900 kg. × ₹ 1)	900	900
To Direct Material	---	42,500	By Process- Q (8,200 kg. × ₹ 31)	8,200	2,54,200
To Direct Labour	---	40,000			
To Production OH (₹ 90,000 × 4/12)	---	30,000			
To Abnormal Gain (100 kg. × ₹ 31)	100	3,100			
	9,100	2,55,100		9,100	2,55,100

$$\text{Cost per unit} = \frac{₹\,2,52,000 - ₹\,900}{9,000\text{ kg} - 900\text{ kg}} = ₹\,31$$

Process- R Account

Particulars	Kg.	Amount (₹)	Particulars	Kg.	Amount (₹)
To Process-Q A/c	8,200	2,54,200	By Normal wastage (820 kg. × ₹ 1)	820	820
To Direct Material	---	42,880	By Abnormal loss (80 kg. × ₹ 52)	80	4,160
To Direct Labour	---	50,000	By Finished Goods (7,300 kg. × ₹ 52)	7,300	3,79,600
To Production OH (₹ 90,000 × 5/12)	---	37,500			
	8,200	3,84,580		8,200	3,84,580

$$\text{Cost per unit} = \frac{₹\,3,84,580 - ₹\,820}{8,200\,\text{kg} - 820\,\text{kg}} = ₹\,52$$

Calculation of Selling price per unit of end product:

Cost per unit	₹ 52.00
Add: Profit 25% on selling price i.e. 1/3rd of cost	₹ 17.33
Selling price per unit	₹ 69.33

Q15 RTP Nov'18

From the following information for the month of January, 20X9, **PREPARE** Process-III cost accounts.

Opening WIP in Process-III	1,600 units at ₹ 24,000
Transfer from Process-II	55,400 units at ₹ 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	₹ 2,12,400
Direct wages	₹ 96,420
Production overheads	₹ 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 @ ₹ 5 per unit.

(Students may treat material transferred from Process – II as Material – A and fresh material used in Process – III as Material B)

Reference | What's New

Material Added | **FIFO Method**

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Answer

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	(2,040)	100	(2,040)
	57,000		57,000		52,760		51,820		51,300

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 (₹)	Equivalent units	Cost per equivalent units (₹)
Material A (Transferred from previous process)	6,23,250		
Less: Scrap value of normal loss (2,640 units × ₹ 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 (₹)	Amount (₹)
Opening WIP	Material A		24,000
Completed opening WIP units-1600	Material B (320 units × ₹ 4.0988)	1311.62	
	Wages (640 units × ₹ 1.8795)	1202.88	

	Overheads (640 units × ₹ 1.0994)	703.62	3,218.12
Introduced & Completed- 50,600 units	50,600 units × ₹ 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 × ₹ 11.5627)		48,563.34
	Material B (2,940 units × ₹ 4.0988)		12,050.47
	Wages (2,100 units × ₹ 1.8795)		3,946.95
	Overheads (2,100 units × ₹ 1.0994)		2,308.74
			66,869.50
Abnormal gain units - 2,040	(2,040 units × ₹ 18.6404)		38026.42

Process III A/c

Particulars		Units	Amount (₹)	Particulars		Units	Amount (₹)
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

Q16 MTP Oct'18; MTP May'21

The following information relate to Process A:

(i)	Opening Work-in-Process	8,000 units at ₹ 15,00,000
	Degree of Completion: Material	100%
	Labour and Overhead	60%
(ii)	Input 1,82,000 units at	₹ 1,47,50,000
(iii)	Wages paid	₹ 68,12,000
(iv)	Overheads paid	₹ 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 ₹ 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. (10 Marks)

Reference | What's **New**

FIFO Method | **Equivalent production, Cost per unit and value of units transferred to next process.**

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Answer

(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 (₹)	Labour (₹)	Overhead (₹)
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 × ₹ 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 = ₹ (88.7423 + 42.3632 + 21.1816) = ₹ 152.2871

(iii) **Value of units transferred to next process:**

	Amount (₹)	Amount (₹)
Opening W-I-P	15,00,000.00	
Add: Labour (3,200 units × ₹ 42.3632)	1,35,562.24	
Overhead (3,200 units × ₹ 21.1816)	67,781.12	17,03,343.36
New introduced (1,50,000 units × ₹ 152.2871)		2,28,43,065.00
		2,45,46,408.36

Q17 MTP Mar'19

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.

Process-I

Input:	
Material A	6,000 kilograms at ₹ 50 per kilogram
Material B	4,000 kilograms at ₹ 100 per kilogram
Labour	430 hours at ₹ 50 per hour
Normal loss	5% of inputs. Scrap are disposed off at ₹ 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 ₹ 125 per kilogram
Material D	4,200 kilograms at ₹ 75 per kilogram
Flavouring Essence	₹ 3,300
Labour	370 hours at ₹ 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 ₹ 92,000 incurred to be absorbed on the basis of labour hours.

From the information given above, 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.

[10 Marks]

Reference | What's **New**

Only Closing WIP | **Process accounts and Abnormal gain/loss account**

Watch **Video**

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Answer

Process-I A/c

Particulars	Qty. (kgs)	Amount (₹)	Particulars	Qty. (kgs)	Amount (₹)
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 $\left(\frac{₹\,92,000 \times 430\ \text{hrs.}}{800\ \text{hrs.}}\right)$	--	49,450			
	10,000	7,70,950		10,000	7,70,950

$$*\frac{\{(₹\,3,00,000 + ₹\,4,00,000 + ₹\,21,500 + ₹\,49,450) - ₹\,8,000\}}{(10,000 - 500)\ \text{units}} = \frac{₹\,7,70,950 - ₹\,8,000}{9,500\ \text{units}} = ₹\,80.3105$$

Process-II A/c

Particulars	Qty. (kgs)	Amount (₹)	Particulars	Qty. (kgs)	Amount (₹)
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 $\left(\frac{₹\,92,000 \times 370\ \text{hrs}}{800\ \text{hrs}}\right)$	--	42,550			
	20,000	19,43,207		20,000	19,43,207

Abnormal loss A/c

Particulars	Qty. (kgs)	Amount (₹)	Particulars	Qty. (kgs)	Amount (₹)
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 (₹)	Equivalent units	Cost per unit (₹)
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 × ₹ 102.3609 = ₹ 18,42,496

Value of WIP : For Materials- 1,000 units × ₹ 99.0609 = ₹ 99,061

For Labour & Overheads 500 units × ₹ 3.30 = ₹ 1,650

₹ 1,00,711

Q18 MTP Apr'19

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 ₹ 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 ₹ 55,20,000 for 9,200 units.

(4) Direct wages incurred ₹ 18,60,000

(5) Production overhead ₹ 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 ₹ 60 per unit.

You are **required** to:

(i) **COMPUTE** equivalent production,

(ii) **CALCULATE** the cost per equivalent unit for each element.

(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. (10 Marks)

Reference

FIFO method

What's New

Equivalent production and Cost per equivalent unit

Watch **Video**

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Answer

(i) **Statement of Equivalent Production (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	(₹)	Cost (₹)	Equivalent units (EU)	Cost per EU (₹)
Material Cost	55,20,000			
Less: Scrap realisation 392 units @ ₹ 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**

	(₹)	(₹)
Material cost of 192 units @ ₹ 624.03 p.u.	1,19,813.76	
Labour cost of 192 units @ ₹ 210.45 p.u.	40,406.40	
Production OH cost of 192 units @ ₹ 97.65 p.u.	18,748.80	1,78,968.96

Cost of closing WIP – 700 Units

Material cost of 700 equivalent units @ ₹ 624.03 p.u.	4,36,821.00	
Labour cost of 490 equivalent units @ ₹ 210.45 p.u.	1,03,120.50	
Production OH cost of 490 equivalent @ ₹ 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 @ ₹ 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 @ ₹ 932.13 p.u.	77,36,679.00
	Total cost [(i) + (ii) + (iii))]	86,50,623.00

Q19 RTP Nov'19

A product is manufactured in two sequential processes, namely Process-1 and Process-2. The following information relates to Process-1. At the beginning of June 2019, there were 1,000 WIP goods (60% completed in terms of conversion cost) in the inventory, which are valued at ₹ 2,86,020 (Material cost: ₹ 2,55,000 and Conversion cost: ₹ 31,020). Other information relating to Process-1 for the month of June 2019 is as follows;

Cost of materials introduced- 40,000 units (₹)	96,80,000
Conversion cost added (₹)	18,42,000
Transferred to Process-2 (Units)	35,000
Closing WIP (Units) (60% completed in terms of conversion cost)	1,500

100% of materials are introduced to Process-1 at the beginning. Normal loss is estimated at 10% of input materials (excluding opening WIP).

Required:

(i) **PREPARE** a statement of equivalent units using the weighted average cost method and thereby calculate the following:

(ii) **CALCULATE** the value of output transferred to Process-2 and closing WIP.

Reference — What's **New**

Weighted Average Method

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Answer

(i) **Statement of Equivalent Production**

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Conversion cost	
				%	Units	%	Units
Opening WIP	1,000	Completed and transferred to Process-2	35,000	100	35,000	100	35,000
Units introduced	40,000	Normal Loss (10% of 40,000)	4,000	--	--	--	--
		Abnormal loss (Balancing figure)	500	100	500	60	300
		Closing WIP	1,500	100	1,500	60	900
	41,000		41,000		37,000		36,200

(ii) **Calculation of value of output transferred to Process-2 & Closing WIP**

		Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (35,000 units × ₹ 320.25) (Refer working note)		1,12,08,750
3.	Value of Closing W-I-P:		
	- Materials (1,500 units × ₹ 268.51)	4,02,765	
	- Conversion cost (900 units × ₹ 51.74)	46,566	4,49,331

Workings:

Cost for each element

Particulars	Materials (₹)	Conversion (₹)	Total (₹)
Cost of opening work-in-process	2,55,000	31,020	2,86,020
Cost incurred during the month	96,80,000	18,42,000	1,15,22,000
Total cost: (A)	99,35,000	18,73,020	1,18,08,020
Equivalent units: (B)	37,000	36,200	
Cost per equivalent unit: (C) = (A ÷ B)	268.51	51.74	320.25

Q20 RTP Nov'19

Explain the term Equivalent units used in process industries.

Reference | What's **New**

Equivalent units

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Answer

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:

Equivalent completed units = (Actual number of units in the process of manufacture × Percentage of Work completed)

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-inprocess will be equal to the cost of 50 finished units.

Q 21 ICAI Mat; Nov'19

A product passes through two distinct processes before completion.

Following information are available in this respect :

	Process-1	Process-2
Raw materials used	10,000 units	-
Raw material cost (per unit)	₹ 75	-
Transfer to next process/Finished good	9,000 units	8,200 units
Normal loss (on inputs)	5%	10%
Direct wages	₹ 3,00,000	₹ 5,60,000
Direct expenses	50% of direct wages	65% of direct wages
Manufacturing overheads	25% of direct wages	15% of direct wages
Realisable value of scrap (per unit)	₹ 13.50	₹ 145

8,000 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. (10 Marks)

Reference | What's **New**

Valuation of output in each process - All accounts - Finished Goods A/c

Watch **Video**

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Answer

(i)

Dr. **Process-1 Account** Cr.

Particulars	Units	Total (₹)	Particulars	Units	Total (₹)
To Raw Material Consumed	10,000	7,50,000	By Normal Loss A/c @ 13.5	500	6,750
" Direct Wages	--	3,00,000	" Process 2 @ 133.5	9,000	12,01,500
" Direct Expenses	--	1,50,000	" 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:

$$= \frac{₹12,75,000 - ₹6,750}{10,000 \text{ units} - 500 \text{ units}} = ₹133.5$$

(ii)

Dr. **Process-2 Account** Cr.

Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
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
To	Direct Expenses	--	3,64,000				
To	Manufacturing Overheads	--	84,000				
To	Abnormal gain (₹ 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:

$$= \frac{₹22,09,500 - ₹1,30,500}{8,100 \text{ units}} = ₹256.67$$

Dr. **Finished Goods A/c** Cr.

Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
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 (₹)	Particulars		Units	Total (₹)
To	Process I	500	6,750	By	Abnormal Gain	100	14,500
To	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 (₹)	Particulars	Units	Total (₹)
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 (₹)	Particulars	Units	Total (₹)
To Normal Loss A/c @ 145	100	14,500	By Process II	100	25,667
To Costing P & L A/C		11,167			
	100	25,667		100	25,667

Q22 MTP May'20

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	₹ 3,60,000	-
Material consumed	₹ 2,42,000	2,25,000
Direct wages	₹ 2,58,000	1,90,000
Manufacturing expenses	₹ 1,96,000	1,23,720
Output in units	37,000	27,000
Normal wastage of inputs	5%	10%
Scrap value (per unit)	₹ 15	20
Selling price (per unit)	₹ 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 ₹ 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.

(10 Marks)

Reference | What's **New**

Overall P/L Account

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Answer

(i) **Process- A Account**

Particulars		Units	Amount (₹)	Particulars		Units	Amount (₹)
To	Inputs	40,000	3,60,000	By	Normal wastage (2,000 units × ₹ 15)	2,000	30,000
To	Material	---	2,42,000	By	Abnormal loss A/c (1,000 units × ₹ 27)	1,000	27,000
To	Direct wages	---	2,58,000	By	Process- B (29,600 units × ₹ 27)	29,600	7,99,200
To	Manufacturing Exp.	---	1,96,000	By	Profit & Loss A/c (7,400 units × ₹ 27)	7,400	1,99,800
		40,000	10,56,000			40,000	10,56,000

Cost per unit $= \frac{₹\,10,56,000 - ₹\,30,000}{40,000 \text{ units} - 2,000 \text{ units}} = ₹\,27$ 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 (₹)	Particulars		Units	Amount (₹)
To	Process- A A/c	29,600	7,99,200	By	Normal wastage (2,960 units × ₹ 20)	2,960	59,200
To	Material	---	2,25,000	By	Profit & Loss A/c (27,000 units × ₹ 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 × ₹ 48)	360	17,280			
		29,960	13,55,200		29,960	13,55,200

Cost per unit $= \frac{₹\,13,37,920 - ₹\,59,200}{29,600 \text{ units} - 2,960 \text{ units}} = ₹\,48$ 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 (₹)	Particulars		Amount (₹)
To	Process- A A/c	1,99,800	By	Sales:	
To	Process- B A/c	12,96,000		- Process-A (7,400 units × ₹ 37)	2,73,800
To	Abnormal loss A/c	12,000		- Process- B (27,000 units × ₹ 61)	16,47,000
To	Indirect Expenses	4,48,080	By	Abnormal gain	10,080
			By	Net loss	25,000
		19,55,880			19,55,880

Working Notes:

Normal wastage (Loss) Account

Particulars		Units	Amount (₹)	Particulars		Units	Amount (₹)
To	Process- A A/c	2,000	30,000	By	Abnormal Gain A/c (360 units × ₹ 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 (₹)	Particulars		Units	Amount (₹)
To	Process- A A/c	1,000	27,000	By	Bank A/c (1,000 units × ₹ 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 (₹)	Particulars		Units	Amount (₹)
To	Normal loss A/c (360 units × ₹ 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

Q23 RTP Nov'20; MTP May'21

M 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 ₹ 85 per unit, product Z is produced. The information related for the month of August 2020 is as follows:

	Process-I	Process-II	Process-III
Normal loss	5%	10%	5%
Materials introduced (7,000 units)	1,40,000	-	-
Other 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 ₹ 2,88,000, which is absorbed as a percentage of direct wages.

The scrapes are sold at ₹ 10 per unit

Product-Z can be sold at ₹ 135 per unit with a selling cost of ₹ 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 process.

Reference | What's **New**

Process Accounts

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Answer

(i) **Process-I A/c**

Particulars		Units	Amt.(₹)	Particulars		Units	Amt.(₹)
To	Materials	7,000	1,40,000	By	Normal loss (5% of 7,000)	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 ₹ 42,000)	-	84,000			
		7,000	3,42,000		7,000	3,42,000

$$*\frac{₹(3,42,000-3,500)}{(7,000-350)\text{ Units}}=₹\,50.9022$$

Process-II A/c

Particulars		Units	Amt.(₹)	Particulars		Units	Amt.(₹)
To	Process-I A/c	6,600	3,35,955	By	Normal loss (10% of 6,600)	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 ₹ 54,000)	-	1,08,000				
		6,600	6,49,955			6,600	6,49,955

$$**\frac{₹(6,49,955-6,600)}{(6,600-660)\text{ Units}}=₹\,108.3089$$

Process-III A/c

Particulars		Units	Amt.(₹)	Particulars		Units	Amt.(₹)
To	Process-I A/c	5,200	5,63,206	By	Normal loss (5% of 5,200)	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# (₹ 35×600)	600	21,000
To	Production OH (200% of ₹ 48,000)	-	96,000				
To	Abnormal gain***	460	82,864				
		5,660	8,88,270			5,660	8,88,270

$$***\frac{₹(8,05,406-2,600-21,000)}{(5,200-260-600)\text{ Units}}=₹\,180.1396$$

Realisable value = ₹ 135 – (85+15) = ₹ 35

(ii) **By-Product Process A/c**

Particulars	Units	Amt.(₹)	Particulars	Units	Amt.(₹)
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

Q24 MTP Nov'20

'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 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:

	(₹)
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:	
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. [10 Marks]

Reference | What's **New**

WIP Valuation | **Average Method**

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Answer

(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 (₹)	Labour (₹)	Overhead (₹)	Total (₹)
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 (₹)	Amount (₹)
1.	Value of units completed and transferred (39,500 units × ₹ 29.216)		11,54,032
2.	Value of Abnormal Loss:		
	- Sugarcane (1,000 units × ₹ 11.111)	11,111	
	- Labour (800 units × ₹ 4.526)	3,621	
	- Overheads (800 units × ₹ 13.579)	10,863	25,595
3.	Value of Closing W-I-P:		
	- Sugarcane (9,000 units × ₹ 11.111)	99,999	
	- Labour (7,200 units × ₹ 4.526)	32,587	
	- Overheads (7,200 units × ₹ 13.579)	97,769	2,30,355

(iv) **Process-I A/c**

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Opening W.I.P:			By	Normal Loss	55,000	--
	- Sugarcane	4,500	50,000	By	Abnormal loss (₹ 25,595 + ₹ 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

Q25 Jan'21

MNO Ltd has provided following details :

- Opening work in progress is 10,000 units at ₹ 50,000 (Material 100%, Labour and overheads 70% complete).
- Input of materials is 55,000 units at ₹ 2,20,000. Amount spent on Labour and Overheads is ₹ 26,500 and ₹ 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 ₹ 8.50 per unit.

You are **required** to prepare using FIFO method: [5 Marks]

(i) Statement of Equivalent production

(ii) Abnormal Loss Account

Reference | What's **New**

WIP Valuation | **FIFO Method**

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Answer

(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

(ii) **Abnormal Loss A/c**

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process-I A/c (Refer Working Note-2)	6,250	29,698	By	Cost Ledger Control A/c (6,250 units × ₹ 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 (₹)	Labour (₹)	Overhead (₹)
Input costs	2,20,000	26,500	61,500
Less: Realisable value of normal scrap (3,250 units × ₹ 8.5)	(27,625)	--	--
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 = ₹ (3.7174 + 0.5191 + 1.2047) = ₹ 5.4412

2. **Valuation of Abnormal Loss**

	(₹)
Materials (6,250 units × ₹ 3.7174)	23,233.75
Labour (3,750 units × ₹ 0.5191)	1,946.63
Overheads (3,750 units × ₹ 1.2047)	4,517.62
	29,698

Q26 MTP May'21

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

Required :

(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 ₹ 80 per kg.

Reference — What's New

Waste Multiplier

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Answer

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:

$$= \frac{0.5}{500} \times 990 = 0.99 \text{ kg.}$$

The cost of raw material would be ₹ 80 × 0.99 kg. = ₹ 79.20

Q27 ICAI Mat

Opening work-in-process 1,000 units (60% complete); Cost ₹ 1,10,000. Units introduced during the period 10,000 units; Cost ₹ 19,30,000. Transferred to next process - 9,000 units.

Closing work-in-process - 800 units (75% complete). Normal loss is estimated at 10% of total input including units in process at the beginning. Scraps realise ₹ 10 per unit. Scraps are 100% complete.

Using Weighted Average Method, **COMPUTE** equivalent production and cost per equivalent unit. Also evaluate the output.

Reference | What's New

WIP Valuation | **Weighted Average Method**

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Answer

Statement of Equivalent Units (Under Weighted Average Method)

Particulars	Input units	Particulars	Output units	Equivalent Production	
				(%)	Equivalent units
Opening W-I-P	1,000	Units completed (Transferred to next process)	9,000	100	9,000
Units introduced	10,000	Normal Loss {10% (1,000 + 10,000 units)}	1,100	--	--
		Closing W-I-P	800	75	600
		Abnormal loss (Balancing figure)	100	100	100
	11,000		11,000		9,700

Computation of cost per equivalent production unit :

Cost of Opening W-I-P	₹ 1,10,000
Cost of the Process (for the period)	₹ 19,30,000
Less: Scrap value of normal loss (₹ 1 × 1,100 units)	(₹ 11,000)
Total process cost	₹ 20,29,000

$$\text{Cost per equivalent unit} = \frac{₹\ 20,29,000}{9,700 \text{ units}} = ₹\ 209.18$$

Statement of Evaluation

Particulars	Equivalent Units (EU)	Cost per EU (₹)	Amount (₹)
(i) Units Completed and transferred to next process	9,000	209.18	18,82,620
(ii) Abnormal Loss	100	209.18	20,918
(iii) Closing W-I-P	600	209.18	1,25,508

(The difference in total amount may arise due to rounding off error)

Q28 ICAI Mat

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:	₹ 33,000
Conversion costs:	₹ 17,000
Total	₹ 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 departments 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.

Reference — **WIP Valuation**

What's New — **Conversion Cost**

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Answer

(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
Total	10,000	Total	10,000		10,000		8,500

(ii) **Calculation of cost per equivalent unit**

	Direct Material	Conversion costs
Total cost (₹)	33,000	17,000
Equivalent units	10,000	8,500
Cost per equivalent unit (₹)	3.30	2.00

(iii) **The cost of closing work in process (WIP):**

Costs	Equivalent units	Rate (₹)	Total Cost (₹)
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 (₹)	Total Cost (₹)
Direct Material	8,000	3.30	26,400
Conversion costs	8,000	2.00	16,000
Total			42,400

Q29 ICAI Mat

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 ₹ 27,670, direct labour ₹ 30,120 and factory overhead ₹ 12,720

Cost incurred during May are material used, ₹ 4,79,000, direct labour ₹ 1,82,880, factory overheads ₹ 3,91,160.

CALCULATE:

(i) Using the FIFO method, the equivalent units of production for material.

(ii) Cost per equivalent unit for conversion cost.

Reference | What's New

WIP Valuation | **FIFO Method**

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Answer

(i) **Calculation of equivalent units of production:**

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Beginning WIP	16,000	From beginning WIP	16,000	40	6,400	80	12,800
Unit Introduced	1,00,000	Completed output	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 (₹)
Direct labour	1,82,880
Factory overheads	3,91,160
	5,74,040
Equivalent units	98,400
Cost per equivalent unit (₹)	5.83

Q30 July'21

A Manufacturing unit manufactures a product 'XYZ' which passes through three distinct Processes - X, Y and Z. The following, data is given:

	Process X	Process Y	Process Z
Material consumed (in ₹)	2,600	2,250	2,000
Direct wages (in ₹)	4,000	3,500	3,000

- The total Production Overhead of ₹ 15,750 was recovered @ 150% of Direct wages.
- 15,000 units at ₹ 2 each were introduced to Process'X'.

- The output of each process passes to the next process and finally, 12,000 units were transferred to Finished Stock Account from Process 'Z'.
- 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 (₹)
X	6%	1.10
Y	?	2.00
Z	5%	1.00

You are **required** to : [10]

(i) **Find** out the percentage of wastage in process 'Y', given that the output of Process 'Y' is transferred to Process 'Z' at ₹ 4 per unit.

(ii) **Prepare** Process accounts for all the three processes X, Y and Z.

Reference | What's **New**

Process Accounts | **Percentage of Wastage**

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Answer

Dr. **Process-X Account** Cr.

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material Introduced	15,000	30,000	By Normal Loss A/c [(6% of 15,000 units) × ₹ 1.1]	900	990
To Additional Material	--	2,600	By Process-Y A/c (₹ 2.951* × 14,100 units)	14,100	41,610
To Direct Wages	--	4,000			
To Production OH	--	6,000			
	15,000	42,600		15,000	42,600

*Cost per unit of completed units

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\,42,600 - ₹\,990}{15,000 \text{ units} - 900 \text{ units}} = ₹\,2.951$$

Dr. **Process-Y Account** Cr.

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process-X A/c	14,100	41,610	By	Normal Loss A/c [(#13.44% of 14,100 units) × ₹ 2]	1,895	3,790
To	Additional Material	--	2,250	By	Process-Z A/c (₹ 4 × 12,205 units)	12,205	48,820
To	Direct Wages	--	3,500				
To	Production OH	--	5,250				
		14,100	52,610			14,100	52,610

#Calculation for % of wastage in process 'Y':

Let's consider number of units lost under process 'Y' = A

$$\text{Now, } \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = 4$$

$$\frac{₹\,52,610 - ₹\,2A}{14,100 \text{ units} - A} = ₹\,4$$

₹ 52,610 – ₹ 2A = ₹ 56,400 – ₹ 4A

2A = ₹ 3,790

A = 1,895 units

$$\% \text{ of wastage} = \frac{1,895 \text{ units}}{14,100 \text{ units}} = 13.44\%$$

Dr. **Process-Z Account** Cr.

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process-Y A/c	12,205	48,820	By	Normal Loss A/c [(5% of 12,205 units) × ₹ 1]	610	610
To	Additional Material	--	2,000	By	Finished Stock A/c (₹ 4.9771* × 12,000 units)	12,000	59,726
To	Direct Wages	--	3,000				
To	Production OH	--	4,500				

To	Abnormal Gain (₹ 4.9771* × 405 units)	405	2,016			
		12,610	60,336		12,610	60,336

***Cost per unit of completed units**

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\,58,320 - ₹\,610}{12,205\text{ units} - 610\text{ units}} = ₹\,4.9771$$

Alternative Solution

Dr. **Process-X Account** Cr.

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Material Introduced	15,000	30,000	By	Normal Loss A/c [(6% of 15,000 units) × ₹ 1.1]	900	990
To	Additional Material	--	2,600	By	Process-Y A/c (₹ 2.951* × 14,100 units)	14,100	41,610
To	Direct Wages	--	4,000				
To	Production OH	--	6,000				
		15,000	42,600			15,000	42,600

***Cost per unit of completed units**

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\,42,600 - ₹\,990}{15,000\text{ units} - 900\text{ units}} = ₹\,2.951$$

Dr. **Process-Y Account** Cr.

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process-X A/c	14,100	41,610	By	Normal Loss A/c [(#13.44% of 14,100 units) × ₹ 2]	1,895	3,790
To	Additional Material	--	2,250	By	Process-Z A/c (₹ 4 × 12,631** units)	12,631	50,524
To	Direct Wages	--	3,500				
To	Production OH	--	5,250				
To	Abnormal Gain (₹ 4 × 426 units)	426	1,704				
		14,526	54,314			14,526	54,314

Working Notes:

**1. Units Transferred from Process Z Account to Finished Stock = 12,000 Units i.e 95% of Inputs.

So, Input of Z or Output of Y is 12,000 × 100/95 = 12,631 Units and Normal Loss (5%) is 631 units.

2. Let's consider number of units lost under process 'Y' as:

For Normal loss = A

For Abnormal loss = B

Now, A + B = 1,469 [i.e. 14,100 – 12,631] ... (I)

(A × ₹ 2 per unit) + (B × ₹ 4 per unit) = [52,610 – 50,524]

2A + 4B = 2,086 ... (II)

Now, putting the values of (I) in (II), we get

2(1,469 – B) + 4B = 2,086

2938 – 2B + 4B = 2,086

2B = – 852

B = – 426 units

Since, the figure of B is in negative, it is an abnormal gain of 426 units.

Further, A (i.e. normal loss) = 1,469 + 426 = 1,895 units

#3. % of wastage in Process Y Account = $\frac{1,895 \text{ units}}{14,100 \text{ units}}$ = 13.44%

Dr. **Process-Z Account** Cr.

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process-Y A/c	12,631	50,524	By	Normal Loss A/c [(5% of 12,631 units) × ₹ 1]	631	631
To	Additional Material	--	2,000				
To	Direct Wages	--	3,000				
To	Production OH	--	4,500	By	Finished Stock A/c (₹ 4.9494*** × 12,000 units)	12,000	59,393
		12,631	60,024			12,631	60,024

***Cost per unit of completed units

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\,60,024 - ₹\,631}{12,631 \text{units} - 631 \text{units}} = ₹\,4.9494$$

Q 31 MTP May'22

WHAT is inter-process profit? **STATE** its advantages and disadvantages. [5]

Reference | What's New

Inter-process Profit

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Answer

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.

Q 32 May'22

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 ₹)
Opening work-in-progress cost	
Material cost	29,500
Processing cost	14,750
Material input cost	3,34,500
Processing cost	2,53,100

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 ₹ 10 per kg. Any quantity of output completed in Process I, are sold as Chemical 'G' @ ₹ 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 ₹ 85,000

Processing Costs ₹ 50,000

You are **required**:

(i) **Prepare** Statement of Equivalent production 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) [10]

Reference — What's **New**

WIP Valuation

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Answer

(i) **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 (₹)
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

	(₹)	(₹)
Material	$\frac{29,500+3,34,500}{1,04,000}$	3.5
Processing cost	$\frac{14,750+3,34,500}{97,400}$	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**

	(₹)
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	(₹)	(₹)
Sales if further processed (A) (60,000 x 1.20 x ₹ 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 ₹ 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

	(₹)
If 60,000 units are sold @ ₹ 9	5,40,000
If 60,000 units are processed in process II (60,000 × 1.2 × ₹ 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'.

Q33 RTP Nov'22

SM Pvt. Ltd. manufactures their products in three consecutive processes. The details are as below:

	Process A	Process B	Process C
Transferred to next Process	60%	50%	
Transferred to warehouse for sale	40%	50%	100%

In each process, there is a weight loss of 2% and scrap of 8% of input of each process. The realizable value of scrap of each process is as below:

Process A @ ₹ 2 per ton

Process B @ ₹ 4 per ton

Process C @ ₹ 6 per ton.

The following particulars relate to April, 2022:

	Process A	Process B	Process C
Materials used (in Tons)	1,000	260	140
Rate per ton	₹ 20	₹ 15	₹ 10
Direct Wages	₹ 4,000	₹ 3,000	₹ 2,000
Direct Expenses	₹ 3,160	₹ 2,356	₹ 1,340

PREPARE Process Accounts- A, B and C & calculate cost per ton at each process.

Reference — What's New

Process Accounts and Cost per ton

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Answer

Process A Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Materials	1,000	20,000	By Weight Loss	20	---
To Wages		4,000	By Scrap	80	160
To Direct Expenses		3,160	By Process B	540	16,200
			By Warehouse	360	10,800
Total	1,000	27,160	Total	1,000	27,160

$$\text{Cost per Tonne} = \frac{27,160 - 160}{1,000 - 20 - 80}$$

$$= \frac{27,000}{900}$$

= ₹ 30 per ton

Process B Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process A	540	16,200	By Weight Loss	16	---
To Materials	260	3,900	By Scrap	64	256
To Wages		3,000	By Process C	360	12,600
To Direct Expenses		2,356	By Warehouse	360	12,600
Total	800	25,456	Total	800	25,456

$$\text{Cost per Tonne} = \frac{25,456 - 256}{800 - 16 - 64}$$

$$= \frac{25,200}{720}$$

= ₹35 per ton

Process C Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process B	360	12,600	By Weight Loss	10	---
To Materials	140	1,400	By Scrap	40	240
To Wages		2,000	By Warehouse	450	17,100
To Direct Expenses		1,340			
Total	500	17,340	Total	500	17,340

$$\text{Cost per Tonne} = \frac{17,340 - 240}{500 - 10 - 40}$$

$$= \frac{17,100}{450}$$

= ₹ 38 per ton

NOTES

Chapter 15

Joint Products & By Products

Q1 ICAI Mat

A coke manufacturing company produces the following products by using 5,000 tons of coal @ ₹1,100 per ton into a common process.

Coke	3,500 tons
Tar	1,200 tons
Sulphate of ammonia	52 tons
Benzol	48 tons

PREPARE a statement apportioning the joint cost amongst the products on the basis of the physical unit method.

Reference

Apportionment of Joint Cost

What's **New**

Physical Units Method

Watch **Video**

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Answer

	Products					
	Coke	**Tar**	**Sulphate of ammonia**	**Benzole**	**Wastage**	**Total**
Output (in ton)	3,500	1,200	52	48	200	5,000
Wastage (in ton) (Refer Note-1)	146	50	2	2	(200)	
Net weight (in ton)	3,646	1,250	54	50	-	5,000
Share of Joint Cost @ ₹1,100 per ton (in ₹)	40,10,600	13,75,000	59,400	55,000	-	55,00,000

Note-1: Apportionment of wastage of 200 tons over the four products is as follows:

Coke: $\frac{200}{4,800} \times 3,500 \text{ tons} = 146 \text{ tons}$

Tar : $\frac{200}{4,800} \times 1,200 \text{ tons} = 50 \text{ tons}$

Sulphate of ammonia: $\frac{200}{4,800} \times 52 \text{ tons} = 2 \text{ tons}$

Benzole : $\frac{200}{4,800} \times 48 \text{ tons} = 2 \text{ tons}$

Q2 ICAI Mat

(a) Pre-separation Joint Cost ₹ 60,000

(b) Production data:

Products	Units produced
A	500
B	200
C	300
	1,000

FIND OUT the cost of joint products A, B and C using average unit cost method from the above data:

Reference | What's **New**

Apportionment of Joint Cost | **Average Unit Cost method**

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Answer

$$\text{Average cost per unit} = \frac{\text{Total joint costs}}{\text{Unit produced}} = \frac{₹\,60,000}{1,000\text{ units}} = ₹\,60$$

The joint costs apportioned @ ₹ 60 are as follows:

Products	Units	Cost per unit (₹)	Value (₹)
A	500	60	30,000
B	200	60	12,000
C	300	60	18,000
			60,000

Q3 ICAI Mat

Sales	
A : 100 kg @ ₹ 60 per kg.	
B : 120 kg @ ₹ 30 per kg.	
Joint costs	
Marginal cost	₹ 4,400
Fixed cost	₹ 3,900

FIND OUT the cost of joint products A and B using contribution margin method from the following data :

Reference | What's New

Apportionment of Joint Cost | **Contribution Margin Method**

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Answer

The marginal cost (variable cost) of ₹ 4,400 is apportioned over the joint products A and B in the ratio of their physical quantity i.e 100 : 120

Marginal cost for Product A : ₹ 4,400 × $\frac{100}{220}$ = ₹ 2,000

Marginal cost for Product B : ₹ 4,400 × $\frac{100}{220}$ = ₹ 2,400

The fixed cost of ₹ 3,900 is apportioned over the joint products A and B in the ratio of their contribution margin i.e. 40 : 12

(Refer to working note)

Product A : ₹ 3,900 × 40/52 = ₹ 3,000

Product B : ₹ 3,900 × 12/52 = ₹ 900

Working Note:

Computation of contribution margin ratio

Products	Sales revenue	Marginal cost	Contribution
	(₹)	(₹)	(₹)
A	6,000	2,000	4,000
B	3,600	2,400 (Refer to above)	1,200

Contribution ratio is 40 : 12

Q4 ICAI Mat; MTP Nov'20

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC. In the month of July, Inorganic Chemicals purchased Salt for ₹ 40,000. Conversion cost of ₹ 60,000 were incurred upto the split off point, at which time two sealable products were produced. Chlorine can be further processed into PVC.

The July production and sales information is as follows:

	Production (in ton)	Sales Quantity (in ton)	Selling price per ton (₹)
Caustic Soda	1,200	1,200	50
Chlorine	800	—	—
PVC	500	500	200

All 800 tons of Chlorine were further processed, at an incremental cost of ₹ 20,000 to yield 500 tons of PVC. There was no beginning or ending inventories of Caustic Soda, Chlorine or PVC in July.

There is active market for Chlorine. Inorganic Chemicals could have sold all its July production of Chlorine at ₹ 75 per ton.

Required :

(1) **SHOW** how joint cost of ₹1,00,000 would be apportioned between Caustic Soda and Chlorine under each of following methods:

(a) Sales value at split- off point ;

(b) Physical Unit Method, and

(c) Estimated Net Realisable Value.

(2) Lifetime Swimming Pool Products offers to purchase 800 tonnes of Chlorine in August at ₹75 per tonne. This sale of Chlorine would mean that no PVC would be produced in August. **EXPLAIN** how the acceptance of this offer for the month of August would affect operating income?

Reference

Apportionment of Joint Cost and Evaluation of further processing

What's New

Sales value at split off and NRV Method

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Answer

1. (a) **Sales value at split- off point method**

Products	Sales (in Ton)	Selling Price per Ton (₹)	Sales Revenue (₹)	Joint Cost Apportioned (₹)
Caustic Soda	1,200	50	60,000	50,000
Chlorine	800	75	60,000	50,000
			1,20,000	1,00,000

Apportionment of joint cost

$$= \frac{\text{Total joint cost}}{\text{Total sale value}} \times \text{Sale revenue of each product}$$

$$\text{Joint cost apportioned to Caustic Soda} = \frac{₹\,1,00,000}{₹\,1,20,000} \times ₹\,60,000 = ₹\,50,000$$

$$\text{Joint cost apportioned to Chlorine} = \frac{₹\,1,00,000}{₹\,1,20,000} \times ₹\,60,000 = ₹\,50,000$$

(b) **Physical measure method**

Products	Sales (in Ton)	Joint Cost Apportioned (₹)
Caustic Soda	1,200	60,000
Chlorine	800	40,000
		1,00,000

Apportioned joint cost

$$= \frac{\text{Total joint cost}}{\text{Total physical value}} \times \text{Physical units of each product}$$

$$\text{Joint cost apportioned to Caustic Soda} = \frac{₹\,1,00,000}{2,000 \text{ tonnes}} \times 1,200 \text{ tonnes} = ₹\,60,000$$

$$\text{Joint cost apportioned to chlorine} = \frac{₹\,1,00,000}{2,000 \text{ tonnes}} \times 800 \text{ tonnes} = ₹\,40,000$$

(c) **Estimated Net Realisable Value Method:**

	Caustic Soda Amount (₹)	Chlorine Amount (₹)
Sales Value	60,000 (₹ 50 × 1,200 tons)	1,00,000 (₹ 200 × 500 tons)
Less: Post split-off cost (Further processing cost)	-	(20,000)
Net Realisable Value	60,000	80,000
Apportionment of Joint Cost of ₹ 1,00,000 in ratio of 3:4	42,857	57,143

2. **Incremental revenue from further processing of Chlorine into PVC**

(500 tons × ₹ 200 – 800 tons × ₹ 75)	₹ 40,000
Less : Incremental cost of further processing of Chlorine into PVC	₹ 20,000
Incremental operating income from further processing	₹ 20,000

The operating income of Inorganic Chemicals will be reduced by ₹ 20,000 in August if it sells 800 tons of Chlorine to Lifetime Swimming Pool Products, instead of further processing of Chlorine into PVC for sale.

Q5 ICAI Mat

Sun-moon Ltd. produces and sells the following products:

Products	Units	Selling price at split-off point (₹)	Selling price after further processing (₹)
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 ₹35,90,000 and other manufacturing expenses cost ₹ 5,47,000 in the manufacturing process which are absorbed on the products on the basis of their 'Net Realisable Value'. The further processing costs of A, B, C and E are ₹12,50,000; ₹1,50,000; ₹ 50,000 and ₹ 1,50,000 respectively. Fixed costs are ₹ 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 maximise its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

Reference | What's **New**

Apportionment of Joint Cost, Income Statement and Evaluation of further processing | **Fixed cost excluded from Joint Cost**

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Answer

Working Note:

Apportionment of joint costs on the basis of Net Realisable Value method

Products	Sales Value (₹)	Post separation Cost (₹)	Net Realisable Value (₹)	Apportioned Cost (₹)
A	50,00,000 (2,00,000 units × ₹ 25)	12,50,000	37,50,000	26,25,000
B	5,10,000 (30,000 units × ₹ 17)	1,50,000	3,60,000	2,52,000
C	3,00,000 (25,000 units × ₹ 12)	50,000	2,50,000	1,75,000
D	2,00,000 (20,000 units × ₹ 10)	—	2,00,000	1,40,000
E	15,00,000 (75,000 units × ₹ 20)	1,50,000	13,50,000	9,45,000
			59,10,000	41,37,000

Total Joint Cost = Raw material costs + Manufacturing expenses

= ₹ 35,90,000 + ₹ 5,47,000 = ₹ 41,37,000

Apportioned Joint Cost

$$= \frac{\text{Total joint cost}}{\text{Total Net Realisable Value}} \times \text{Net Realisable Value of each product}$$

Apportioned Joint Cost for Product A

$$= \frac{₹\ 41,37,000}{₹\ 59,10,000} \times ₹\ 37,50,000 = ₹\ 26,25,000$$

Similarly, the apportioned joint cost for products B, C, D and E are ₹ 2,52,000, ₹ 1,75,000, ₹ 1,40,000 and ₹ 9,45,000 respectively.

(a) **Statement showing income forecast of the company assuming that none of its products are further processed**

	Products					
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	Total (₹)
Sales revenue	34,00,000 (₹17 × 2,00,000)	3,90,000 (₹13 × 30,000)	2,00,000 (₹8 × 25,000)	2,00,000 (₹10 × 20,000)	10,50,000 (₹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 (₹)	B (₹)	C (₹)	D (₹)	E (₹)	Total (₹)
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 process-ing 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 ₹ 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 (₹)	B (₹)	C (₹)	D (₹)	E (₹)	Total (₹)
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 ₹ 30,000.

Q6 RTP May'18; RTP May'19

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 ₹ 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 ₹ 1,80,000 and ₹ 1,50,000 respectively.

X was further processed in Department 3 at a cost of ₹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 (₹)	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 ₹ 50, ₹ 40 and ₹ 10 per kg respectively.

Required:

(i) **PREPARE** a statement showing the apportionment of joint costs to A, B and X.

(ii) **PREPARE** 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) **DECIDE** with supporting calculations as to whether any or all the products should be further processed or not

Reference | What's **New**

Method for apportionment not given | **Apportionment and Profitability**

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Answer

(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 (₹)	9,00,000 (₹ 50 x 18,000)	4,00,000 (₹ 40 x 10,000)	5,40,000 (₹ 10 x 54,000)	18,40,000
Joint cost apportionment on the basis of sales value at the point of split off (₹)	6,30,000 $\left(\frac{₹12,88,000}{₹18,40,000} \times ₹9,00,000\right)$	2,80,000 $\left(\frac{₹12,88,000}{₹18,40,000} \times ₹4,00,000\right)$	3,78,000 $\left(\frac{₹12,88,000}{₹18,40,000} \times ₹5,40,000\right)$	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 (₹) : (I)	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000
Joint cost per kg (₹): (I ÷ II)	35	28	7
Further processing cost per kg. (₹)	10 $\left(\frac{₹1,80,000}{18,000\ kg}\right)$	15 $\left(\frac{₹1,50,000}{10,000\ kg}\right)$	2 $\left(\frac{₹1,08,000}{54,000\ kg}\right)$
Total cost per kg (₹)	45	43	9

(iii) **Statement showing the product wise and total profit for the period**

Products	A	B	X	Total
Sales value (₹)	12,24,000	2,50,000	7,92,000	
Add: Closing stock value (₹) (Refer to Working note 2)	45,000	2,15,000	90,000	
Value of production (₹)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (₹)	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (₹)	1,80,000	1,50,000	1,08,000	
Total cost (₹)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (₹)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

Products	A	B	X
Sales value (₹)	12,24,000	2,50,000	7,92,000
Quantity sold (Kgs.)	17,000	5,000	44,000
Selling price ₹/kg	72 $\left(\frac{₹\,12,24,000}{17,000\ kg}\right)$	50 $\left(\frac{₹\,2,50,000}{5,000\ kg}\right)$	18 $\left(\frac{₹\,7,92,000}{44,000\ kg}\right)$

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 (₹)	45	43	9	
Closing stock value (₹)	45,000 (₹ 45 x 1,000 kg)	2,15,000 (₹ 43 x 5,000 kg)	90,000 (₹ 9x10,000 kg)	3,50,000

(iv) **Calculations for processing decision**

Products	A	B	X
Selling price per kg at the point of split off (₹)	50	40	10
Selling price per kg after further processing (₹) (Refer to working Note 1)	72	50	18
Incremental selling price per kg (₹)	22	10	8
Less: Further processing cost per kg (₹)	(10)	(15)	(2)
Incremental profit (loss) per kg (₹)	12	(5)	6

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.

Q7 MTP Mar'18

SV chemicals Limited processes 9,00,000 kgs. of raw material in a month purchased at ₹ 95 per kg in department X. The input output ratio of department X is 100 : 90. Processing of the material results in two joint products being produced 'P1' and 'P2' in the ratio of 60 : 40. Product 'P1' can be sold at split off stage or can be further processed in department Y and sold as a new product 'YP1'. The input output ratio of department Y is 100 : 95. Department Y is utilized only for further processing of product 'P1' to product 'YP1'. Individual departmental expenses are as follows:

	Dept. X (₹ lakhs)	Dept. Y (₹ lakhs)
Direct Materials	95.00	14.00
Direct Wages	80.00	27.00
Variable Overheads	100.00	35.00
Fixed Overheads	75.00	52.00
Total	350.00	128.00

Further, selling expenses to be incurred on three products are:

Particulars	Amount (₹ in lakhs)
Product 'P1'	28.38
Product 'P2'	25.00
Product 'YP1'	19.00

Selling price of the products 'P1' and 'P2' at split off point is ₹ 110 per kg and ₹ 325 per kg respectively. Selling price of new product 'YP1' is ₹ 150 per kg.

You are **required** to:

(i) **PREPARE** a statement showing apportionment of joint costs, in the ratio of value of sales, net of selling expenses.

(ii) **PREPARE** a Statement showing profitability at split off point.

(iii) **PREPARE** a Statement of profitability of 'YP1'.

(iv) **DETERMINE** that would you recommend further processing of P1? (10 Marks)

Reference

Apportionment of Joint Cost And Further Processing Decision

What's New

Method of Apprortionment not given - Effect of selling expenses

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Answer

Working Notes:

Input output ratio of material processed in Department X = 100:90

Particulars	Quantity (Kg)
Material input	9,00,000
Less: Loss of material in process @ 10% of 9,00,000 kgs	(90,000)
Output	8,10,000

Output of department X is product 'P_1' and 'P_2' in the ratio of 60 : 40.

Output 'P_1' = $\frac{60 \times 8,10,000}{100}$ = 4,86,000 kgs.

Output 'P_2' = $\frac{40 \times 8,10,000}{100}$ = 3,24,000 kgs.

Statement showing ratio of net sales

Product	P_1	P_2	Total
Quantity (kgs)	4,86,000	3,24,000	8,10,000
Selling price per kg (₹)	110.00	325.00	
Sales Value (₹ in lakhs)	534.60	1,053.00	1587.60
Less: Selling Expenses (₹ in lakhs)	(28.38)	(25.00)	(53.38)
Net Sales (₹ in lakhs)	506.22	1,028.00	1,534.22
Ratio	33%	67%	100.00

Computation of Joint Costs

Particulars	Amount (₹ Lakhs)
Raw Material input 9,00,000 kgs @ ₹ 95 per kg	855.00
Direct Materials	95.00
Direct Wages	80.00
Variable Overheads	100.00
Fixed Overheads	75.00
Total	1,205.00

(i) **Statement showing apportionment of joint costs in the ratio of net sales**

Particulars	Amount (₹ in lakhs)
Joint cost of P_1 – 33% of ₹ 1,205 lakhs	397.65
Joint cost of P_2 – 67% of ₹ 1,205 lakhs	807.35
Total	1,205.00

(ii) **Statement showing profitability at split off point**

Product	P_1	P_2	Total
Net Sales Value (₹ in lakhs) – [A]	506.22	1,028.00	1,534.22
Less: Joint costs (₹ in lakhs)	(397.65)	(807.35)	(1,205.00)
Profit (₹ in lakhs) [A] – [B]	108.57	220.65	329.22

Alternative Presentation

Product	P_1	P_2	Total
Sales Value (₹ in lakhs) – [A]	534.60	1,053.00	1,587.60
Less: Joint costs (₹ in lakhs)	397.65	807.35	1,205.00
Selling Expenses	28.38	25.00	53.38
Total Cost [B]	426.03	832.35	1,258.38
Profit (₹ in lakhs) [A] – [B]	108.57	220.65	329.22

(iii) **Statement of profitability of product 'YP1'**

Particulars		YP_1
Sales Value (₹ in lakhs) (Refer working note) [A]		692.55
Less: Cost of P_1	397.65	
Cost of Department Y	128.00	
Selling Expenses of Product 'YP_1'	19.00	
Total Costs [B]		544.65
Profit (₹ in lakhs) [A] – [B]		147.90

Working Note:

Computation of product 'YP_1'

Quantity of product P_1 input used = 4,86,000 kgs

Input output ratio of material processed in Department Y = 100 : 95

Particulars	Quantity (Kg)
Material input	4,86,000
Less: Loss of material in process @ 5% of 4,86,000	(24,300)
Output	4,61,700

Sales Value of YP_1 = 4,61,700 kgs @ ₹ 150 per kg = ₹ 692.55 lakhs

(iv) **Determination of profitability after further processing of Product P_1 into Product YP_1:**

Particulars	(₹ in lakhs)
Profit of Product 'P_1' {refer (ii) above}	108.57
Profit of Product 'YP_1' {refer (iii) above}	84.90
Decrease in profit after further processing	23.67

Based on the above profitability statement, further processing of Product P_1 into YP_1 should not be recommended.

Q8 RTP Nov'18; MTP Oct'19

In an Oil Mill four products emerge from a refining process. The total cost of input during the quarter ending March 20X8 is ₹1,48,000. The output, sales and additional processing costs are as under:

Products	Output in Litres	Additional processing cost after split off (₹)	Sales value (₹)
ACH	8,000	43,000	1,72,500
BCH	4,000	9,000	15,000
CSH	2,000	–	6,000
DSH	4,000	1,500	45,000

In case these products were disposed-off at the split off point that is before further processing, the selling price per litre would have been:

ACH (₹)	BCH (₹)	CSH (₹)	DSH (₹)
15.00	6.00	3.00	7.50

PRODUCE a statement of profitability based on:

(i) If the products are sold after further processing is carried out in the mill.

(ii) If they are sold at the split off point.

Reference | What's New

Profitability - After further processing and at split off

Watch Video

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Answer

(i) **Statement of profitability of the Oil Mill (after carrying out further processing) for the quarter ending 31st March 20X8.**

Products	Sales Value after further processing	Share of Joint cost	Additional processing cost	Total cost after processing	Profit (loss)
ACH	1,72,500	98,667	43,000	1,41,667	30,833
BCH	15,000	19,733	9,000	28,733	(13,733)
CSH	6,000	4,933	--	4,933	1,067
DSH	45,000	24,667	1,500	26,167	18,833
	2,38,500	1,48,000	53,500	2,01,500	37,000

(ii) **Statement of profitability at the split off point**

Products	Selling price of split off	Output in units	Sales value at split off point	Share of joint cost	Profit at split off point
ACH	15.00	8,000	1,20,000	98,667	21,333
BCH	6.00	4,000	24,000	19,733	4,267
CSH	3.00	2,000	6,000	4,933	1,067
DSH	7.50	4,000	30,000	24,667	5,333
			1,80,000	1,48,000	32,000

Note: Share of Joint Cost has been arrived at by considering the sales value at split off point.

Q 9 MTP Aug'18

Three products X,Y and Z along with a byproduct B are obtained in a crude state which require further processing at a cost of ₹ 5 for X; ₹ 4 for Y; and ₹ 2.50 for Z per unit before sale. The byproduct is however saleable as such to a nearby factory. The selling prices for the three main products and byproduct, assuming they should yield a net margin of 25 percent of cost, are fixed at ₹ 13.75, ₹ 8.75, ₹ 7.50 and ₹ 1.00 respectively – all per unit quantity sold.

During a period, the joint input cost including the material cost was ₹ 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. (10 Marks)

Reference

Reverse NRV Method

What's **New**

Reverse treatment of by products

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Answer

Working Notes:

(i) **Computation of Allocation Ratio for Joint Costs**

	Products		
	X (₹)	Y (₹)	Z (₹)
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**

	₹	₹
Joint input cost including material cost		90,800
Less: Credit for realization from by-product B:		
Sales revenue (1,000 × ₹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 (₹)	Output(units) (₹)	Joint cost per unit (₹)
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 (₹)	Post spilt off cost (₹)	Total Cost (₹)	Selling Price (₹)	Margin (₹)	Margin % on cost (₹)
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

$X = \frac{24}{40} \times 90,000$	54,000
$Y = \frac{9}{40} \times 90,000$	20,250
$Z = \frac{7}{40} \times 90,000$	15,750
	90,000

Q10 MTP Aug'18

Describe Net Realizable Value method of treatment of by-products

Reference | What's **New**

Net Realizable Method

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Answer

(a) **Net Realisable Value method: The realisation on the disposal of the by-product may be deducted from the total cost of production** so as to arrive at the cost of the main product. For example, the amount realised by the sale of molasses in a sugar factory goes to reduce the cost of sugar produced in the factory.

(b) **When the by-product requires some additional processing** and expenses are incurred in making it saleable to the best advantage of the concern, the expenses so incurred should be deducted from the total value realised from the sale of the by-product and only **the net realisations should be deducted from the total cost of production to arrive at the cost of production of the main product**. Separate accounts should be maintained for collecting additional expenses incurred on:

(i) further processing of the by-product, and

(ii) selling, distribution and administration expenses attributable to the by-product.

Q11 May'19

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 Expenses (₹)	Separate Expenses (₹)	
		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.

Reference — What's **New**

Treatment of By-product under Reverse Cost Accounting, Joint Cost and Profitability

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Answer

(i) **Statement Showing Joint Cost Allocation to 'Cromex'**

Particulars	Cromex (₹)
Sales (₹ 40 × 2,000 units)	80,000
Less: Post Split Off Costs (4,000+18,000+6,000)	(28,000)
Less: Estimated Profit (₹ 5 × 2,000 units)	(10,000)
Joint cost allocable	42,000

(ii) **Statement Showing Product Wise and Overall Profitability**

Particulars	Bomex (₹)	Cromex (₹)	Total (₹)
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	26,000	10,000	36,000

(*) 1,80,000 – 42,000

Q12 Nov'19

A Factory produces two products, 'A' and 'B' from a single process. The joint processing costs during a particular month are :

Direct Material	₹30,000
Direct Labour	₹ 9,600
Variable Overheads	₹ 12,000
Fixed Overheads	₹ 32,000

Sales: A- 100 units@ ₹ 600 per unit; B – 120 units @ ₹ 200 per unit.

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. [5 Marks]

Reference

Apportionment of Joint Cost and Profit/Loss

What's New

Physical Qty and Contribution Margin Method

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Answer

Total Joint Cost

	Amount (₹)
Direct Material	30,000
Direct Labour	9,600
Variable Overheads	12,000
Total Variable Cost	51,600
Fixed Overheads	32,000
Total joint cost	83,600

Apportionment of Joint Costs:

			Product-A	Product-B
I.	(i)	Apportionment of Joint Cost on the basis of 'Physical Quantity'	₹ 38,000 $\left(\frac{₹\ 83,600}{100+120\ \text{units}}\times 100\right)$	₹ 45,600 $\left(\frac{₹\ 83,600}{100+120\ \text{units}}\times 120\right)$

	(ii)	Apportionment of Joint Cost on the basis of 'Contribution Margin Method':		
		- Variable Costs (on basis of physical units)	₹ 23,455 $\left(\frac{₹\ 51,600}{100+120\ \text{units}}\times 100\right)$	₹ 28,145 $\left(\frac{₹\ 51,600}{100+120\ \text{units}}\times 120\right)$
		Contribution Margin	36,545 (₹ 600×100 – 23,455)	– 4,145 (₹ 200×120 – 28,145)
		Fixed Costs*	₹ 32,000	
		Total apportioned cost	₹ 55,455	₹ 28,145
II.	(iii)	**Profit or Loss:**		
		When Joint cost apportioned on basis of physical units		
	A.	Sales Value	₹ 60,000	₹ 24,000
	B.	Apportioned Joint Cost on basis of 'Physical Quantity':	₹ 38,000	₹ 45,600
	A-B	Profit or (Loss)	22,000	(21,600)
		When Joint cost apportioned on basis of 'Contribution Margin Method'		
	C.	Apportioned Joint Cost on basis of 'Contribution Margin Method'	₹ 55,455	₹ 28,145
	A-C	Profit or (Loss)	₹ 4,545	₹ (4,145)

* The fixed cost of ₹ 32,000 is to be apportioned over the joint products A and B in the ratio of their contribution margin but contribution margin of Product B is negative so fixed cost will be charged to Product A only.

Q13 RTP May'20; MTP May'20; Nov'18

DISCUSS the treatment of by-product cost in cost accounting.

Reference | What's **New**

Treatment of By product.

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Answer

By-product cost can be dealt in cost accounting in the following ways:

(i) **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.

(ii) **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 upto 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).

(iii) **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 (i).

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 (ii).

Q14 RTP Nov'20

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 2019-20, the selling prices of the items and the total amounts sold were:

X – 186 tons sold for ₹3,000 per ton

Y – 527 tons sold for ₹2,250 per ton

Z – 736 tons sold for ₹1,500 per ton

The total joint manufacturing costs for the year were ₹12,50,000. An additional ₹ 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, 2020, using Net realizable value (NRV) method of joint cost allocation.

Reference — What's New

Cost of Inventory | **NRV Method**

Watch **Video** Scan Me

Answer

Statement of Joint Cost allocation of inventories of X, Y and Z
(By using Net Realisable Value Method)

	Products			Total
	X (₹)	Y (₹)	Z (₹)	(₹)
Final sales value of total production (Working Note 1)	10,98,000 (366 × ₹3,000)	13,20,750 (587 × ₹2,250)	11,41,500 (761 × ₹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, 2020
(By using Net Realisable Value Method)

	Products			Total
	X (₹)	Y (₹)	Z (₹)	(₹)
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 2019-2020**

Products (1)	Quantity sold in tones (2)	Quantity of ending inventory in tons (3)	Total production (4) = [(2) + (3)}	Ending inventory percentage (%) (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:**

$$\frac{\text{Total Joint Cost}}{\text{Total Net Realisable Value}} \times \text{Net Realisable Value of each product}$$

$$\text{Totalcos t of Product X} = \frac{₹\,12,50,000}{₹\,29,40,250} \times ₹\,10,98,000 = ₹\,4,66,797$$

$$\text{Totalcos t of Product Y} = \frac{₹\,12,50,000}{₹\,29,40,250} \times ₹\,13,20,750 = ₹\,5,61,496$$

$$\text{Totalcos t of Product Z} = \frac{₹\,12,50,000}{₹\,29,40,250} \times ₹\,5,21,500 = ₹\,2,21,707$$

Q15 Nov'20

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 ₹ 80 per unit.

Processing cost is ₹ 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'.

Reference | What's New

Joint Cost Apportionment

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Answer

Comprehensive Cost Statement

Particulars	Total Cost (₹)	Product-M (₹)	Product-N (₹)
No. of units produced *		5,400 units	810 units
Cost of raw material (₹ 80 × 6,750 units)	5,40,000		
Processing cost:			
- Labour cost (₹ 2,25,000 × 66%)	1,48,500		
- Other costs (₹ 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 $\left(\frac{1,48,500\times100}{180}\right)$	66,000 $\left(\frac{1,48,500\times80}{180}\right)$
Other joint costs (including material) in the ratio of output (5,400:810)	6,16,500	5,36,087 $\left(\frac{6,16,500\times5,400}{6,210}\right)$	80,413 $\left(\frac{6,16,500\times810}{6,210}\right)$
(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

Q16 Jan'21

Mayura Chemicals Ltd buys a particular raw material at ₹ 8 per litre. At the end of the processing in Department-1, 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	₹ 4,80,000	–	–
Direct Labour	₹ 70,000	₹ 4,50,000	₹ 6,50,000
Manufacturing Overhead	₹ 48,000	₹ 2,10,000	₹ 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 (₹)	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- realisable 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. [10 Marks]

Reference — What's **New**

NRV Method

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Answer

(i) **Statement of Joint Cost allocation of inventories of X, Y and Z**

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Final sales value of total production (Working Note 1)	4,50,000 (15,000 × ₹ 30)	9,60,000 (15,000 × ₹ 64)	15,00,000 (30,000 × ₹ 50)	29,10,000
Less: Additional cost	--	6,60,000	11,00,000	17,60,000
Net realisable 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 (₹)
	X (₹)	Y (₹)	Z (₹)	
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 (₹)
	X (₹)	Y (₹)	Z (₹)	
Sales revenue	3,00,000 (10,000 × ₹ 30)	9,60,000 (15,000 × ₹ 64)	11,25,000 (22,500 × ₹ 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 (1)	Quantity sold in litres (2)	Quantity of closing inventory in litres (3)	Total production (4) = [(2) + (3)}	Closing inventory percentage (%) (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:**

$$= \frac{\text{Total Joint Cost}}{\text{Total Net Realisable Vale}} \times \text{Net Realisable Value of each product}$$

$$\text{Joint cost of product X} = \frac{₹\,5,98,000}{₹\,11,50,000} \times ₹\,4,50,000 = ₹\,2,34,000$$

$$\text{Joint cost of product Y} = \frac{₹\,5,98,000}{₹\,11,50,000} \times ₹\,3,00,000 = ₹\,1,56,000$$

$$\text{Joint cost of product Z} = \frac{₹\,5,98,000}{₹\,11,50,000} \times ₹\,4,00,000 = ₹\,2,08,000$$

Q17 RTP May'21

How apportionment of joint costs upto the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? **Discuss**

Reference | What's **New**

Apportionment of Joint Cost

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Answer

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 upto 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.

Q18 MTP May'21

Discuss the Net Realisable Value (NRV) method of apportioning joint costs to by-products.

Reference | What's **New**

Apportionment of Joint Cost to by-product through NRV Method

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Answer

Net Realisable Value method: The realisation on the disposal of the by-product may be deducted from the total cost of production so as to arrive at the cost of the main product. For example, the amount realised by the sale of molasses in a sugar factory goes to reduce the cost of sugar produced in the factory.

When the by-product requires some additional processing and expenses are incurred in making it saleable to the best advantage of the concern, the expenses so incurred should be deducted from the total value realised from the sale of the by-product and only the net realisations should be deducted from the total cost of production to arrive at the cost of production of the main product. Separate accounts should be maintained for collecting additional expenses incurred on:

(i) further processing of the by-product, and

(ii) selling, distribution and administration expenses attributable to the by -product.

Q19 RTP Nov'21

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 ₹ 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 ₹ 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 ₹ 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 (₹)	10	4

There were no opening stocks. If these products sold at split-off-point, the selling price of A and B would be ₹ 8 and ₹ 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.

Reference | What's New

Apportionment and Profitability | **Decision of Further Processing**

Watch Video

Scan Me

Answer

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 2,00,000 kg.)	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

(i) **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 (₹)	8	4
Sales value (₹)	16,00,000	6,40,000
Share in Joint cost (5:2)	12,50,000 (₹ 17,50,000 × 5 ÷ 7)	5,00,000 (₹ 17,50,000 × 2 ÷ 7)

(ii) **Statement of cost per kg**

	Product A	Product B
Output (kg)	1,60,000	3,20,000
Share in joint cost (₹)	12,50,000	5,00,000
Joint Cost per kg (₹) (A)	7.8125	1.5625
Further processing cost (₹)	2,60,000	3,00,000
Further processing cost per kg (₹) (B)	1.625	0.9375
Total cost per kg (₹) {(A)+(B)}	9.4375	2.5000

(iii) **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

	(₹)	(₹)
Sales	15,00,000 (1,50,000 kg × ₹ 10)	12,00,000 (3,00,000 kg × ₹ 4)
Add: closing stock (at full cost)	94,375 (10,000 kg × ₹ 9.4375)	50,000 (20,000 kg × ₹ 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

(iv) **Profitability statement before and after processing**

	Product A		Product B	
	Before (₹)	After (₹)	Before (₹)	After (₹)
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.

Q20 ICAI Mat

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 ₹ 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.	₹ 50	₹ 30	₹ 5
Process costs	₹ 2,00,000	₹ 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?

Reference	What's New	Watch Video
Apportionment of Joint Cost	**Physical Volume Method**	Scan Me

Answer

Calculation of Net joint costs to be allocated:

Particulars	Amount (₹)
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:

$$= \frac{\text{Physical quantity of Product-B}}{\text{Total Quantity}} \times \text{Net joint costs to be allocated}$$

$$= \frac{1,20,000 \text{ units}}{1,80,000 \text{ units}} \times ₹\,7,50,000 = ₹\,5,00,000$$

Q 21 ICAI Mat

'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, 2020, 'Buttery Butter' purchased 50 Kilolitre processed cream @ ₹ 100 per 1000 ml. Conversion cost of ₹ 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, 2020 production and sales information is as follows:

Products	Production (in Kilolitre/tonne)	Sales Quantity (in Kilolitre/tonne)	Selling price per Litre/Kg (₹)
Buttermilk	28	28	30
Butter	20	—	—
Ghee	16	16	480

All 20 tonne of butter were further processed at an incremental cost of ₹ 1,20,000 to yield 16 Kilolitre of Ghee. There was no opening or closing inventories of buttermilk, butter or ghee in January, 2020.

Required:

(i) **SHOW** how joint cost would be apportioned between Buttermilk and Butter under Estimated Net Realisable Value method.

(ii) 'Healthy Bones' offers to purchase 20 tonne of butter in February at ₹ 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?

Reference

Apportionment of Joint Cost and Further Processing Decision

What's New

Net Realisable Method

Watch **Video**

Scan Me

Answer

(i) **Estimated Net Realisable Value Method:**

	Buttermilk Amount (₹)	Butter Amount (₹)
Sales Value	8,40,000 (₹ 30 × 28× 1000)	76,80,000 (₹ 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 ₹ 51,00,000* in ratio of 1:9	5,10,000	45,90,000

* [(₹ 100 × 50 × 1000) + ₹ 1,00,000] = ₹ 51,00,000

(ii) **Incremental revenue from further processing of Butter into Ghee**

(₹ 480 × 16 × 1000 - ₹ 360 × 20 × 1000)	₹ 4,80,000
Less: Incremental cost of further processing of Butter into Ghee	₹ 1,20,000
Incremental operating income from further processing	₹ 3,60,000

The operating income of 'Buttery Butter' will be reduced by ₹ 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.

Q22 ICAI Mat

NN Manufacturing company uses joint production process that produces three products at the split off point. Joint productions costs during September were ₹ 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	₹ 100		
After further processing	₹ 150	₹ 175	₹ 50
Costs to process after split-off	₹ 1,50,000	₹ 1,50,000	₹ 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?

Reference

Total Cost of Product

What's **New**

Net Realisable Method

Watch **Video**

Scan Me

Answer

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 ₹ 150,000, whereas the additional revenue to be earned by processing it further is only ₹ 75,000 (₹ 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 ₹ 100 × 1,500 units, or ₹ 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 ₹ 5,25,000 (₹ 175 selling price after further processing × 3,000 units produced) – ₹ 1,50,000 in further processing costs = ₹ 3,75,000.

Product C, the by-product, must also be processed further to be sold. The net realizable value of Product C is ₹ 75,000 (₹ 50 sales price after further processing × 4,500 units produced – ₹ 1,50,000 in further processing costs = ₹ 75,000).

Joint production costs total ₹ 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 ₹ 7,65,000 (₹ 8,40,000 minus the ₹ 75,000 NRV of Product C), to be allocated between Product A (sales value ₹ 1,50,000) and Product B (net realizable value ₹ 3,75,000). So, the total on which the allocation of the joint costs is based is ₹ 1,50,000 + 3,75,000 = ₹ 5,25,000. Product A represents 28.571% of the total (₹ 1,50,000 ÷ ₹ 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 ₹ 7,65,000, or ₹ 2,18,568.

Q23 July'21

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 ₹ 40,000. Other details are as follows :

Product	Further processing costs (₹)	Sales at split-off point (₹)	Sales after further processing (₹)
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. [5]

Reference — What's **New**

Further Processing Decision

Watch **Video**

Scan Me

Answer

Statement of Comparison of Profits before and after further processing

		S (₹)	P (₹)	N (₹)	A (₹)	Total (₹)
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. ₹ 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

$$\text{Apportioned joint cost} = \frac{\text{Total joint cost}}{\text{Total Sales value at split-off point}} \times \text{Sales value of each product}$$

Where,

Total Joint cost = ₹ 40,000

Total sales at split off point (S, P, N and A) = 20,000 + 12,000 + 28,000 + 20,000 = ₹ 80,000

$$\text{Share of S in joint cost} = \frac{₹\,40,000}{₹\,80,000} \times ₹\,20,000 = ₹\,10,000$$

$$\text{Share of P in joint cost} = \frac{₹\,40,000}{₹\,80,000} \times ₹\,12,000 = ₹\,6,000$$

$$\text{Share of N in joint cost} = \frac{₹\,40,000}{₹\,80,000} \times ₹\,28,000 = ₹\,14,000$$

$$\text{Share of A in joint cost} = \frac{₹\,40,000}{₹\,80,000} \times ₹\,20,000 = ₹\,10,000$$

Alternative Solution

Decision for further processing of Product S, P and N

Products	S (₹)	P (₹)	N (₹)
Sales revenue after further processing	1,20,000	40,000	48,000
Less: sales value at split-off point	20,000	12,000	28,000
Incremental Sales Revenue	1,00,000	28,000	20,000
Less: Further Processing cost	80,000	32,000	36,000
Profit/ loss arising due to further processing	20,000	(-)4,000	(-)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. ₹ 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.

Q 24 Dec'21

Narrate the terms 'Joint Products' and 'By-Products' with an example of each term. [5]

Reference | What's **New** | Watch **Video**

Joints Product and By product

Scan Me

Answer

(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.

Q25 MTP Nov'22

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 8 ₹ 9,200; Labour ₹ 8,200; Overheads ₹ 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.

Reference | What's **New**

Total and per unit cost

Watch **Video**

Scan Me

Answer

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

Chapter 16
Service Costing

Q1 ICAI Mat

Lorry starts with a load of 20 MT of Goods from Station 'A'. It unloads 8 MT in Station 'B' and balance goods in Station 'C'. On return trip, it reaches Station 'A' with a load of 16 MT, loaded at Station 'C'. The distance between A to B, B to C and C to A are 80 Kms, 120 Kms and 160 Kms, respectively.

COMPUTE "Absolute MT-Kilometer" and "Commercial MT – Kilometer".

(MT = Metric Ton or Ton).

Reference	What's New	Watch Video
Goods Transport	**Absolute and Commercial Tonne Km**	Scan Me

Answer

Weighted Average or Absolute basis – MT – Kilometer:

= (20 MT × 80 Kms) + (12 MT × 120 Kms) + (16 MT × 160 Kms)

= 1,600 + 1,440 + 2,560 = 5,600 MT - Kilometer

Simple Average or Commercial basis – MT – Kilometer:

= [{(20+12+16) / 3} MT × {(80+120+160) Kms]

= 16 MT × 360 Kms = 5,760 MT – Kilometer

Q2 ICAI Mat

AXA Passenger Transport Company is running 5 buses between two towns, which are 40 kms apart. Seating capacity of each bus is 40 passengers. Following details are available from their books, for the month of April 20X9:

	Amount (₹)
Salary of Drivers, Cleaners and Conductors	24,000
Salary to Supervisor	10,000
Diesel and other Oil	40,000
Repairs and Maintenance	8,000

Tax and Insurance	16,000
Depreciation	26,000
Interest	20,000
	1,44,000

Actual passengers carried were 75% of the seating capacity. All the five buses run on all days for the month. Each bus made one round trip per day.

CALCULATE cost per passenger – Kilometer.

Reference | What's **New**

Bus Service	**Cost per passenger km**

Watch **Video**

Scan Me

Answer

Working Note:

Total Passenger Kilometres

= Number of Buses × Distance × Seating Capacity × Used Capacity × Number of days in the month × Number of trips

= 5 Buses × 40 kms. × 40 Seats × 75% × 30 Days × 2 Single trips (1 Round Trip)

= 3,60,000 Passenger-Kms.

Cost per Passenger-Km = Total costs ÷ Total Passenger Kilometers

Statement of Cost per Passenger – Km

Particulars	Cost Per Month	Cost per Passenger – Km
A. **Standing Charges:**		
Wages of Drivers, Cleaners and Conductors	24,000	
Salary to Supervisor	10,000	
Tax and Insurance	16,000	
Depreciation	26,000	
Interest	20,000	
Total Standing Charges	96,000	0.267
B. **Running Charges**		
Diesel and other Oil	40,000	0.111
C. **Maintenance Charges**		
Repairs and Maintenance	8,000	0.022
Total	1,44,000	0.400

Cost per Passenger-Km = ₹ 0.40

Q3 ICAI Mat

ABC Transport Company has given a route 40 kilometers long to run bus.

(a) The bus costs the company a sum of ₹ 10,00,000

(b) It has been insured at 3% p.a. and

(c) The annual tax will amount to ₹ 20,000

(d) Garage rent is ₹ 20,000 per month.

(e) Annual repairs will be ₹ 2,04,000

(f) The bus is likely to last for 2.5 years

(g) The driver's salary will be ₹ 30,000 per month and the conductor's salary will be ₹ 25,000 per month in addition to 10% of takings as commission [To be shared by the driver and conductor equally].

(h) Cost of stationery will be ₹ 1,000 per month.

(i) Manager-cum-accountant's salary is ₹ 17,000 per month.

(j) Petrol and oil will be ₹ 500 per 100 kilometers.

(k) The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.

(l) The bus will run on an average 25 days in a month.

Assuming 15% profit on takings.

CALCULATE the bus fare to be charged from each passenger.

Reference	What's New
Bus Service	**Fare per passenger km**

Watch **Video**

Scan Me

Answer

Working Note:

(1) **Total Kilometres run per annum:**

= Number of Buses × Distance × Number of days in the Month × Number of trips × 12 months

= 1 Bus × 40 kms × 25 Days × 6 Single trips (3 Round Trips) × 12 months = 72,000 kms.

(2) **Total Passenger Kilometres per annum:**

Total Kilometres run per annum × Seating Capacity

= 72,000 Kms × 40 Seats = 28,80,000 Passenger-Kms.

(3) **Petrol & Oil Consumption per annum:**

Total Kilometres run per annum × Petrol Consumption per KM

= 72,000 Kms × (₹ 500 / 100 Kms) = ₹ 3,60,000

Statement of Cost per Passenger – Km

Particulars		Per Annum	Per Passenger - Kilometer
A.	**Standing Charges:**		
	Insurance @ 3% on ₹ 10,00,000	30,000	
	Annual Tax	20,000	
	Garage rent (₹ 20,000 × 12)	2,40,000	
	Depreciation	4,00,000	
	Salary of Driver (fixed part)	3,60,000	
	Salary of Conductor (fixed part)	3,00,000	
	Stationary	12,000	
	Manager-cum-accountant's salary	2,04,000	
	Total Standing Charges	15,66,000	0.5438
B.	**Running Charges:**		
	Diesel and other Oil (WN-3)	3,60,000	
	Commission to Driver* (10% × ₹ 28,40,000 × 1/2)	1,42,000	
	Commission to Conductor* (10% × ₹ 28,40,000 × 1/2)	1,42,000	
	Total Running Charges	6,44,000	0.2236
C.	**Maintenance Charges:**		
	Repairs	2,04,000	0.0708
	Grand Total (A+B+C)	24,14,000	0.8382
	Profit (15%×₹ 28,40,000)	4,26,000	0.1479
	Fare per Passenger Kilometer		0.9861

*Total takings = Standing Charges + (Running cost + Commission on takings) + Maintenance cost + Profit

Let Takings = X

Or, X = 15,66,000 + (3,60,000 + 0.1X) + 2,04,000 + 0.15X

Or, X – 0.25X = 21,30,000

Or, X = 28,40,000

Q4 ICAI Mat

SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a larger 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 work-load 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 the junior students. Similarly, in the after-noon 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 25 days in a month and remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all 12 months in a year.

The details of expenses for a year are as under:

Driver's salary	₹ 4,500 per month per driver
Cleaner's salary	₹ 3,500 per month
(Salary payable for all 12 months)	
(one cleaner employed for all the five buses)	
Licence fee, taxes, etc.	₹ 8,600 per bus per annum
Insurance	₹ 10,000 per bus per annum
Repairs & maintenance	₹ 35,000 per bus per annum
Purchase price of the bus	₹ 15,00,000 each
Life of each bus	12 years
Scrap value of buses at the end of life	₹ 3,00,000
Diesel cost	₹ 45.00 per litre

Each bus gives an average mileage of 4 km. per litre of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range up to 4 km. of distance from the school are charged half fare and fifty per cent of the students travelling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost.

You are **required** to:

(i) **PREPARE** a statement showing the expenses of operating a single bus and the fleet of five buses for a year.

(ii) **WORK OUT** the average cost per student per month in respect of –

(A) students coming from a distance of upto 4 km. from the school and

(B) students coming from a distance beyond 4 km. from the school.

Reference	What's New
School Bus Service	**Cost per student per month**

Watch **Video**

Scan Me

Answer

(i) **Statement of Expenses of operating bus/ buses for a year**

Particulars	Rate (₹)	Per Bus per annum (₹)	Fleet of 5 buses p.a. (₹)
(i) **Standing Charges:**			
Driver's salary	4,500 p.m	54,000	2,70,000
Cleaner's salary	3,500 p.m	8,400	42,000
Licence fee, taxes etc.	8,600 p.a.	8,600	43,000
Insurance	10,000 p.a.	10,000	50,000
Depreciation (15,00,000 – 3,00,000) ÷ 12 yrs	1,00,000 p.a.	1,00,000	5,00,000
(ii) **Maintenance Charges:**			
Repairs & maintenance	35,000 p.a.	35,000	1,75,000
(iii) **Operating Charges:**			
Diesel (Working Note 1)		1,62,000	8,10,000
Total Cost [(i) + (ii) + (iii)]		3,78,000	18,90,000
Cost per month		31,500	1,57,500
Total no. of equivalent students		150	750
Total Cost per half fare equivalent student		₹ 210	₹ 210

(ii) **Average cost per student per month:**

A. **Students coming from distance of upto 4 km. from school**

$$= \frac{\text{Total cost per month}}{\text{Total no. of equivalent students}} = \frac{₹\,31,500}{150 \text{ students}} = ₹\,210$$

B. **Students coming from a distance beyond 4 km. from school**

= Cost of per half fare student × 2 = ₹ 210 × 2 = ₹ 420

Working Notes:

1. **Calculation of Diesel cost per bus :**

Distance travelled in a year: (8 round trip × 8 km. × 25 days × 9 months)

Distance travelled p.a.: 14,400 km.

Cost of diesel (per bus p.a.): $\frac{14,400 \text{ km}}{4 \text{ kmpl}} \times ₹\,45 = ₹\,1,62,000$

2. **Calculation of equivalent number of students per bus :**

Seating capacity of a bus	50 students
Half fare students (50% of 50 students)	25 students
Full fare students (50% of 50 students)	25 students
Total number of students equivalent to half fare students	
Full fare students (25 students × 2)	50 students
Add: Half fare students	25 students
Total Equivalent number of students in a trip	75 students
Total number of equivalent students in two trips (Senior + Junior)	150 students

Q5 ICAI Mat; RTP May'19

A company runs a holiday home. For this purpose, it has hired a building at a rent of ₹ 10,000 per month along with 5% of total taking. It has three types of suites for its customers, viz., single room, double rooms and triple rooms.

Following information is given:

Type of suite	Number	Occupancy percentage
Single room	100	100%
Double rooms	50	80%
Triple rooms	30	60%

The rent of double rooms suite is to be fixed at 2.5 times of the single room suite and that of triple rooms suite as twice of the double rooms suite.

The other expenses for the year 20X8 are as follows:

	(₹)
Staff salaries	14,25,000
Room attendants' wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000

Provide profit @ 20% on total taking and assume 360 days in a year.

You are required to **CALCULATE** the rent to be charged for each type of suite.

Reference	What's New	Watch Video
Hotel Industry	**Rent per room day**	Scan Me

Answer

Working Notes:

(i) **Total equivalent single room suites**

Nature of suite	Occupancy (Room-days)	Equivalent single room suites (Room-days)
Single room suites	36,000 (100 rooms × 360 days × 100%)	36,000 (36,000 × 1)
Double rooms suites	14,400 (50 rooms × 360 days × 80%)	36,000 (14,400 × 2.5)
Triple rooms suites	6,480 (30 rooms × 360 days × 60%)	32,400 (6,480 × 5)
		1,04,400

(ii) **Statement of total cost:**

	(₹)
Staff salaries	14,25,000
Room attendant's wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000
	25,21,000
Building rent {(₹ 10,000 × 12 months) + 5% on total taking}	1,20,000+ 5% on total takings
Total cost	26,41,000 + 5% on total takings

Profit is 20% of total takings

∴ Total takings = ₹ 26,41,000 + 25% (5% +20%) of total takings

Let R be rent for single room suite

Then 1,04,400 R = 26,41,000 + (0.25 × 1,04,400 R)

Or, 1,04,400 R = 26,41,000 + 26,100 R

Or, 78,300 R = 26,41,000

Or, R = ₹ 33.73

Rent to be charged:

Rent to be charged for single room suite = ₹ 33.73

Rent for double rooms suites ₹ 33.73 × 2.5 = ₹ 84.33

Rent for triple rooms suites ₹ 33.73 × 5 = ₹ 168.65

Q6 ICAI Mat; Nov'19

A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off- season months in a year. 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 20X7. [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 ₹ 200 lakhs of which 80% relate to buildings and balance for furniture and equipment.

(iii) Expenses:

Staff salary [Excluding room attendants] :	₹ 5,50,000
Repairs to building :	₹ 2,61,000
Laundry charges :	₹ 80, 000
Interior :	₹ 1,75,000
Miscellaneous expenses :	₹ 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 ₹ 10 per room day on the basis of occupancy of the rooms in a month.

(vi) Monthly lighting charges are ₹ 120 per room, except in four months in winter when it is ₹ 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.

Reference | **Hotel Industry**

What's **New** | **Rent per room day - seasonal effect**

Watch **Video** — **Scan Me**

Answer

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 ₹ 120 per month and during winter season of 4 months it is ₹ 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 × ₹ 120 per month = ₹ 57,600
Off- season & Non-winter – 40% Occupancy (8 – 6 months)	100 Rooms × 40% × 2 months × ₹ 120 per month = ₹ 9,600
Off- season & winter – 40% Occupancy months)	100 Rooms × 40% × 4 months × ₹ 30 per month = ₹ 4,800
Total Lighting charges	₹ 57,600+ 9,600 + 4,800 = ₹ 72,000

Statement of total cost:

	(₹)
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 (₹ 200 Lakhs × 80% × 5%)	8,00,000
Depreciation on Furniture & Equipment (₹ 200 Lakhs × 20% × 15%)	6,00,000

Room attendant's wages (₹ 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 = ₹ 36,81,000/ 18,000 = ₹ 204.50

Room Rent during Season – ₹ 204.50

Room Rent during Off season = ₹ 204.50 × 50% = ₹ 102.25

Q7 ICAI Mat

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 - ₹ 75,000

Supervisors – 2 persons – ₹ 25,000 Per month – each

Nurses – 4 persons – ₹ 20,000 per month – each

Ward Boys – 4 persons – ₹ 5,000 per month – each

Doctors paid ₹ 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) – ₹ 81,000

Food to Patients (Variable) – ₹ 8,80,000

Other services to patients (Variable) – ₹ 3,00,000

Laundry charges (Variable) – ₹ 6,00,000

Medicines (Variable) – ₹ 7,50,000

Other fixed expenses – ₹ 10,80,000

Administration expenses allocated – ₹ 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 ₹ 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 –

(a) **CALCULATE** profit per Patient day, if the hospital recovers on an average ₹ 2,000 per day from each patient

(b) **FIND OUT** Breakeven point for the hospital.

Reference	What's New
Hospital Industry	**Profit per patient day and Break Even point**

Watch **Video** Scan Me

Answer

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 (₹ 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (₹ 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) – (₹)	6,00,000	
Medicines (Variable) – (₹)	7,50,000	
Bed Hire Charges (₹ 100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (₹ 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × ₹ 25,000 × 12)	6,00,000	
Nurses (4 persons × ₹ 20,000 × 12)	9,60,000	
Ward Boys (4 persons × ₹ 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses – (₹)	10,80,000	

Administration expenses allocated – (₹)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

(1) **Calculation of Contribution per Patient day**

Total Contribution – ₹ 1,03,95,000

Total Patient days – 8,000

Contribution per Patient day – ₹ 1,03,95,000 / 8,000 = ₹ 1,299.375

(2) **Breakeven Point = Fixed Cost / Contribution per Patient day**

= ₹ 48,61,000 / ₹ 1,299.375

= 3,741 patient days

Q8 ICAI Mat

Following are the data pertaining to Infotech Pvt. Ltd, for the year 20X8-X9

	Amount (₹)
Salary to Software Engineers (5 persons)	15,00,000
Salary to Project Leaders (2 persons)	9,00,000
Salary to Project Manager	6,00,000
Repairs & maintenance	3,00,000
Administration overheads	12,00,000

The company executes a Project XYZ, the details of the same as are as follows:

Project duration – 6 months

One Project Leader and three Software Engineers were involved for the entire duration of the project, whereas Project Manager spends 2 months' efforts, during the execution of the project.

Travel expenses incurred for the project – ₹ 1,87,500

Two Laptops were purchased at a cost of ₹ 50,000 each, for use in the project and the life of the same is estimated to be 2 years

PREPARE Project cost sheet

Reference

IT Industry

What's **New**

Project cost sheet

Watch **Video**

Scan Me

Answer

Working Notes:

(1) **Calculation of Cost per month and Overhead absorption rate**

Particulars	Total Per Annum	Per Person Per Annum	Per Person Per Month
Salary to Software Engineer (5 Persons)	₹ 15,00,000	₹ 3,00,000	₹ 25,000
Salary to Project Leaders (2 persons)	₹ 9,00,000	₹ 4,50,000	₹ 37,500
Salary to Project Manager	₹ 6,00,000	₹ 6,00,000	₹ 50,000
Total	₹ 30,00,000		₹ 1,12,500

(2) **Total Overhead** = Repairs & maintenance + Administration overheads
= ₹ 3,00,000 + ₹ 12,00,000 = ₹ 15,00,000

(3) **Calculation of Overhead absorption rate**
= Total Overhead / Total Salary = ₹ 15,00,000 / ₹ 30,00,000 = 50%

Project Cost Sheet

	(₹)
Salary Cost:	
Salary of Software Engineers (3 × ₹ 25,000 × 6 months)	4,50,000
Salary of Project Leader (₹ 37,500 × 6 months)	2,25,000
Salary of Project Manager (₹ 50,000 × 2 months)	1,00,000
Total Salary	7,75,000
Overheads (50% of Salary)	3,87,500
Travel Expenses	1,87,500
Depreciation on Laptops (₹ 1,00,000 / 2 years × 6 months)	25,000
Total Project Cost	13,75,000

Q9 ICAI Mat; Nov'20

BHG Toll Plaza Ltd built a 60 km. long highway and now operates a toll plaza to collect tolls from passing vehicles using the same. The company has invested ₹ 600 crore to build the road and has estimated that a total of 60 crore vehicles will be using the highway during the 10 years toll collection tenure. Toll Operating and Maintenance cost for the month of April 20X9 are as follows:

(i) Salary to –

- Collection Personnel (3 Shifts and 4 persons per shift) - ₹ 150 per day per person
- Supervisor (2 Shifts and 1 person per shift) - ₹ 250 per day per person
- Security Personnel (3 Shifts and 2 persons per shift) - ₹ 150 per day per person
- Toll Booth Manager (2 Shifts and 1 person per shift) - ₹ 400 per day per person

(ii) Electricity – ₹ 80,000

(iii) Telephone – ₹ 40,000

(iv) Maintenance cost – ₹ 30 Lacs

(v) The company needs 25% profit over total cost to cover interest and other costs.

Required:

(i) **CALCULATE** cost per kilometer.

(ii) **CALCULATE** the toll rate per vehicle (assume there is only type of vehicle).

Reference	What's New	Watch Video
Toll Plaza	**Cost per km, Toll Rate per Vehicle**	Scan Me

Answer

Statement of cost

		(₹)
A. Apportionment of capital cost	$\left(\frac{₹\,600\text{ crore}}{10\text{ years}} \times \frac{1}{12\text{ months}}\right)$	5,00,00,000
B. Operating Cost		
Salary to Collection Personnel	(3 Shifts × 4 persons per shift × 30 days × ₹ 150 per day)	54,000
Salary to Supervisor	(2 Shifts × 1 persons per shift × 30 days × ₹ 250 per day)	15,000
Salary to Security Personnel	(3 Shifts × 2 persons per shift × 30 days × ₹ 150 per day)	27,000
Salary to Toll Booth Manager	(2 Shifts × 1 persons per shift × 30 days × ₹ 400 per day)	24,000
Electricity		80,000
Telephone		40,000
		2,40,000
C. Maintenance cost		30,00,000
Total (A + B + C)		5,32,40,000

(i) **Calculation of cost per kilometer:**

$$= \frac{\text{Total Cost}}{\text{Total km.}} = \frac{₹\,5,32,40,000}{60\text{km.}} = ₹\,8,87,333,33$$

(ii) **Calculation of toll rate per vehicle:**

$$= \frac{\text{Total Cost} + 25\% \text{ profit}}{\text{Vehicles per month}} = \frac{₹\,5,32,40,000 + ₹\,1,33,10,000}{50,00,000} = ₹\,13.31$$

Working:

No. of vehicles using the highway per month

$$\frac{\text{Total estimated vehicles}}{10 \text{ years}} \times \frac{1 \text{month}}{12 \text{ months}} = \frac{60 \text{ crore}}{10 \text{ years}} \times \frac{1 \text{month}}{12 \text{ months}} = 50 \text{ lakhs}$$

Q10 ICAI Mat

The loan department of a bank performs several functions in addition to home loan application processing task. It is estimated that 25% of the overhead costs of loan department are applicable to the processing of home-loan application. The following information is given concerning the processing of a loan application:

	(₹)
Direct professional labor:	
Loan processor monthly salary: (4 employees @ ₹ 60,000 each)	2,40,000
Loan department overhead costs (monthly)	
Chief loan officer's salary	75,000
Telephone expenses	7,500
Depreciation Building	28,000
Legal advice	24,000
Advertising	40,000
Miscellaneous	6,500
Total overhead costs	1,81,000

You are required to **COMPUTE** the cost of processing home loan application on the assumption that five hundred home loan applications are processed each month.

Reference

Financial Institutions

What's **New**

Cost of Processing Home Loan

Watch **Video**

Scan Me

Answer

Statement showing computation of the cost of processing a typical home loan application

	(₹)
Direct professional labour cost (4 employees @ ₹ 60,000 each)	2,40,000
Service overhead cost (25% of ₹ 1,81,000)	45,250
Total processing cost per month	2,85,250
No. of applications processed per month	500
Total processing cost per home loan application	570.5

Q11 ICAI Mat

Total units generated 10,00,000 kWh

	Amount (₹)
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 @ ₹ 4.25 per kg. Depreciation charges @ 5% on capital cost of ₹ 2,00,00,000.

From the above data pertaining to the year 20X8-X9 **PREPARE** a cost statement showing the cost of electricity generated per kWh by Chambal Thermal Power Station.

Reference | What's **New**

Power Houses | **Cost per Kwh**

Watch **Video**

Scan Me

Answer

Cost Statement of Chambal Thermal Power Station

Total units generated 10,00,000 kWh.

	Per annum (₹)	Per kWh (₹)
Fixed costs:		
Plant supervision	3,00,000	
Administration overheads	20,00,000	

Depreciation (5% of ₹ 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) × ₹ 4.25 per kg. = ₹ 8,50,000

Q12 ICAI Mat

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	₹ 12,00,000
	Salary of the Driver	₹ 24,000 p.m.
	Salary of the Conductor	₹ 21,000 p.m.
	Salary of the part-time Accountant	₹ 5,000 p.m.
	Insurance of the bus	₹ 4,800 p.a.
	Diesel consumption 4 km. per litre at	₹ 56 per litre
	Road tax	₹ 15,915 p.a.
	Lubricant oil	₹ 10 per 100 km.
	Permit fee	₹ 315 p.m.

Repairs and maintenance	₹ 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.

Reference — **Bus Service**

What's **New** — **Fare per passenger km for different routes**

Watch **Video** — Scan Me

Answer

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

		(₹)	(₹)
(i)	**Running Costs**		
	Diesel {(11,440 km ÷ 4 km) × ₹ 56}	1,60,160	
	Lubricant oil {(11,440 km ÷ 100) × ₹ 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 (₹ 4,800 ÷12)	400	
	Road tax (₹ 15,915 ÷12)	1,326.25	
	Permit fee	315	
	Depreciation {(₹ 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 = ₹ 2,34,345.25 + 0.2 X + 0.3 X

0.5 X = ₹ 2,34,345.25 or, X = ₹ 4,68,690.50

Passenger Tax = 20% of ₹ 4,68,690.50 = ₹ 93,738.10

Profit = 30% of ₹ 4,68,690.50 = ₹ 1,40,607.15

Calculation of Rate per passenger km. and fares to be charged for different routes

$$\textbf{Rate per Passenger-Km.} = \frac{\text{Total things per month}}{\text{Total Passenger-Km. per month}}$$

$$= \frac{₹\ 4,68,690.50}{5,20,500 \text{ Passenger-Km.}} = ₹\ 0.90$$

Bus fare to be charged per passenger.

Delhi to Chandigarh = ₹ 0.90 × 250 km = ₹ 225.00

Delhi to Agra = ₹ 0.90 × 210 km = ₹ 189.00

Delhi to Jaipur = ₹ 0.90 × 270 km = ₹ 243.00

Q13 ICAI Mat

A company is considering three alternative proposals for conveyance facilities for its sales personnel who has to do considerable traveling, approximately 20,000 kilometres every year. The proposals are as follows:

(i) Purchase and maintain its own fleet of cars. The average cost of a car is ₹ 6,00,000.

(ii) Allow the Executive use his own car and reimburse expenses at the rate of ₹ 10 per kilometer and also bear insurance costs.

(iii) Hire cars from an agency at ₹ 1,80,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol ₹ 6 per km.	Repairs and maintenance ₹ 0.20 per km.
Tyre ₹ 0.12 per km.	Insurance ₹ 1,200 per car per annum
Taxes ₹ 800 per car per annum	Life of the car: 5 years with annual mileage of 20,000 km.

Resale value: ₹ 80,000 at the end of the fifth year.

WORK OUT the relative costs of three proposals and rank them.

Reference | What's **New**

Personal Conveyance | **Evaluation on the basis of Cost per km**

Watch **Video**

Scan Me

Answer

Calculation of relative costs of three proposals and their ranking

		I Use of company's car	II Use of own car	III Use of hired car
	per annum (₹)	per km. (₹)	per km. (₹)	per km. (₹)
Reimbursement		--	10.00	9.00*
Fixed cost:				
Insurance	1,200	0.06	0.06	--
Taxes	800	0.04	--	0.04
Depreciation (₹ 6,00,000 - ₹ 80,000) ÷ 5 year	1,04,000	5.20	--	--
Running and Maintenance Cost:				
Petrol	--	6.00	--	6.00
Repairs and Maintenance	--	0.20	--	--

Tyre	--	0.12	--	0.12
Total cost per km.	--	11.62	10.06	15.16
Cost for 20,000 km.		2,32,400	2,01,200	3,03,200
Ranking of proposals		II	I	III

* (₹ 1,80,000 ÷ 20,000 km.)

The Second alternative i.e., use of own car by the executive and reimbursement of expenses by the company is the best alternative from company's point of view.

Q14 RTP May'18; RTP May'20

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 (₹)
Teachers' salary (15 teachers × ₹ 35,000 × 12 months)	63,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × ₹ 15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × ₹ 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
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 participates in annual functions and sports activities.

Required:

(i) **CALCULATE** cost per student per annum for all three streams.

(ii) If the management decides to take uniform fee of ₹ 1,000 per month from all higher secondary students, **CALCULATE** stream wise profitability.

(iii) If management decides to take 10% profit on cost, **COMPUTE** fee to be charged from the students of all three streams respectively.

Reference | **School**

What's New | **Apportionment of Cost like Activity Based Cost**

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Answer

Calculation of Cost per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
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 (₹)	Commerce (₹)	Science (₹)	Total (₹)
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 (₹)	Commerce (₹)	Science (₹)	Total (₹)
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 (₹)	Commerce (₹)	Science (₹)
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 (₹)	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**

Particulars	Economics		Mathematics	
	Arts	Commerce	Science	Commerce
No. of classes	832	208	940	160
Salary re-apportionment (₹)	(84,000)	84,000	(61,091)	61,091
	$\left(\frac{₹\,4,20,000}{1,040}\times 208\right)$		$\left(\frac{₹\,4,20,000}{1,100}\times 160\right)$	

(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 (₹)
Peon dedicated for higher secondary (1 peon × ₹ 10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × ₹ 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.

Q15 MTP Mar'18; MTP May'20

'RP' Resorts (P) Ltd. offers three types of rooms to its guests, viz deluxe room, super deluxe room and luxury suite.

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 (₹ lakhs)
Staff salaries	680.00
Lighting, Heating and Power	300.00
Repairs, Maintenance and Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior decoration	75.00
Sundries	30.28

An attendant for each room was provided when the room was occupied and he was paid ₹ 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on ₹ 900 lakhs, furniture and fixtures @ 10% on ₹ 90 lakhs and air conditioners @ 10% on ₹ 75 lakhs.

Profit is to be provided @ 25% on total taking and assume 360 days in a year.

You are **required** to **COMPUTE** the tariff to be charged to the customers for different types of rooms on the basis of above information: (10 Marks)

Reference | What's New

Hotel Industry - Rent of Rooms

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Answer

Operating cost statement of 'RP' Resort (P) Limited

Particulars	Cost per annum (₹ in lakhs)
Staff Salaries	680.00
Room Attendant's Wages (refer W.N-3)	286.20
Lighting, Heating & Power	300.00
Repairs, Maintenance & Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior Decoration	75.00
Sundries	30.28
Depreciation (refer W.N- 4):	
- Building	45.00
- Furniture & Fixture	9.00
- Air Conditioners	7.50
Total cost for the year	1,666.98

Computation of profit:

Let ₹ x be the rent for deluxe from.

Equivalent deluxe room days are 90,720 (refer W.N- 2)

Total takings = ₹ 90,720x

Profit is 25% of total takings.

Profit = 25% of ₹ 90,720x = ₹ 22,680x

Total takings = Total Cost + Profit

₹ 90,720x = ₹ 16,66,98,000 + ₹ 22,680x

₹ 90,720x - ₹ 22,680x = ₹ 16,66,98,000

₹ 68,040x = ₹ 16,66,98,000

$$X = \frac{₹\,16,66,98,000}{₹\,68,040} = ₹\,2,450$$

Rent to be charged for Deluxe room	₹ 2,450
Rent to be charged for Super deluxe room Rent of deluxe room × 2 = ₹ 2,450 × 2	₹ 4,900
Rent to be charged for Luxury suite Rent of Super Deluxe room × 1.5 = ₹ 4,900 × 1.5	₹ 7,350

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 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 × ₹ 500 per day

= 57,240 days × ₹ 500 = ₹ 286.20 lakhs

4. **Computation of Depreciation per annum:**

Particulars	Cost (₹)	Rate of Depreciation	Depreciation (₹)
Building	900,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

Q16 May'18

A group of 'Health Care Services' has decided to establish a Critical Care Unit in a metro city with an investment of ₹ 85 lakhs in hospital equipments. 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:

	(₹)
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 of patients attended and time spent by them)	5,50,000 per month
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 equipments	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 ₹ 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 ₹ 2,500 per day from each patient.

(ii) Break even point per patient day (Make calculation on annual basis) (10 Marks)

Reference

Hospital Industry

What's New

Profit and Break even point.

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Answer

Number of Patient Days = (200 × 50) + (105 × 30) + (60 × 20)

=14,350 patient days + 250 = 14,600

Statement Showing Profit

Elements of Cost and Revenue	Total (₹)
A. Revenue (14,600 x ₹ 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 ₹ 950)	2,37,500
Total Variable Cost	1,30,65,500

C. Fixed Costs	
Building Rent	27,00,000
Manager's Salary (₹ 50,000 x 3 x 12)	18,00,000
Nurse's Salary (₹ 18,000 x 12 x 24)	51,84,000
Ward boy's Salary (₹ 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
D. Total Cost (B+C)	2,94,16,500
E. Profit (A-D)	70,83,500

Profit per patient day = ₹ 70,83,500/14,600 = ₹ 485.17

(i) **Contribution (per patient day)** = (₹ 3,65,00,000 – ₹ 1,30,65,500)/ 14,600 = ₹ 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 ₹ 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 ₹ 5,50,000 p.m.

Q17 RTP Nov'18

Sanziet Lifecare Ltd. operates in life insurance business. Last year it has launched a new term insurance policy for practicing professionals 'Professionals Protection Plus'. The company has incurred the following expenditures during the last year for the policy:

Policy development cost	₹ 11,25,000
Cost of marketing of the policy	₹ 45,20,000
Sales support expenses	₹ 11,45,000
Policy issuance cost	₹ 10,05,900
Policy servicing cost	₹ 35,20,700
Claims management cost	₹ 1,25,600
IT cost	₹ 74,32,000
Postage and logistics	₹ 10,25,000
Facilities cost	₹ 15,24,000
Employees cost	₹ 5,60,000
Office administration cost	₹ 16,20,400

Number of policy sold- 528

Total insured value of policies- ₹ 1,320 crore

Required:

(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) **CACULATE** cost per rupee of insured value.

Reference | **What's New**

Insurance Company	**Life Insurance policy cost**

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Answer

(i) **Calculation of total cost for 'Professionals Protect Plus' policy**

	Particulars	Amount (₹)	Amount (₹)
1.	**Marketing and Sales support:**		
	- Policy development cost	11,25,000	
	- Cost of marketing	45,20,000	
	- Sales support expenses	11,45,000	67,90,000
2.	**Operations:**		
	- Policy issuance cost	10,05,900	
	- Policy servicing cost	35,20,700	
	- Claims management cost	1,25,600	46,52,200
3.	**IT Cost**		74,32,000
4.	**Support functions**		
	- Postage and logistics	10,25,000	
	- Facilities cost	15,24,000	
	- Employees cost	5,60,000	
	- Office administration cost	16,20,400	47,29,400
	Total Cost		2,36,03,600

(ii) **Calculation of cost per policy** $= \frac{\text{Total Cost}}{\text{No. of policies}} = \frac{₹\,2,36,03,600}{528} = ₹\,44,703.79$

(iii) **Cost per rupee of insured value** $= \frac{\text{Total Cost}}{\text{Total insured value}} = \frac{₹\,2.36 \text{ crore}}{₹\,1,320 \text{ crore}} = ₹\,0.0018$

Q18 MTP Aug'18

CALCULATE a suggested fare per passenger-km from the following information for a Mini Bus:

(i) Length of route: 30 km

(ii) Purchase price ₹ 4,00,000

(iii) Part of above cost met by loan, annual interest of which is ₹ 10,000 p.a.

(iv) Other annual charges: Insurance ₹ 15,000, Garage rent ₹ 9,000, Road tax ₹ 3,000, Repairs & maintenance ₹ 15,000, Administrative charges ₹ 5,000.

(v) Running Expenses: Driver & Conductor ₹ 5,000 p.m., Repairs/Replacement of tyre-tube ₹ 3,600 p.a., Diesel and oil cost per km ₹ 5.

(vi) Effective life of vehicle is estimated at 5 years at the end of which it will have a scrap value of ₹ 10,000.

(vii) Mini Bus has 20 seats and is planned to make Six no. two way trips for 25 days/p.m.

(viii) Provide profit @ 20% of total revenue.

Reference — What's **New**

Bus Service - Fare per passenger km

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Answer

Working Notes:

1. Depreciation per annum: $= \frac{\text{Purchase price} - \text{Scrap value}}{\text{Estimated life}}$

$$= \frac{₹\,4,00,000 - ₹\,10,000}{5 \text{ years}} = ₹\,78,000$$

2. Total distance travelled by mini-bus in 25 days:

= Length of the route (two -sides) × No. of trips per day × No. of days

= 60 km × 6 trips × 25 days = 9,000 km

3. Total Passenger-Km:

=Total distance travelled by mini-bus in 25 days × No. of seats

= 9,000 km × 20 seats = 1,80,000 passenger-km

Statement suggesting fare per passenger-km

Particulars	Cost per annum (₹)	Cost per month (₹)
Fixed expenses:		
Insurance	15,000	
Garage rent	9,000	
Road tax	3,000	
Administrative charges	5,000	
Depreciation	78,000	
Interest on loan	10,000	
	1,20,000	10,000
Running expenses:		
Repair and maintenance	15,000	1,250
Replacement of tyre-tube	3,600	300
Diesel and oil cost (9,000 km × ₹ 5)	-	45,000
Driver and conductor's salary	-	5,000
Total cost (per month)		61,550.00
Add: Profit 20% of total revenue cost or 25% of total cost		15,387.50
Total revenue		76,937.50

Rate per passenger-km ₹ 76,937.50/1,80,000 passenger km = 0.42743 i.e., = 0.43 i.e., 43 paise

Q19 MTP Oct'18

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	₹ 50,000
Variable fuel cost	₹ 28,00,000 per flight
Food service to passengers (not charged to Passengers)	₹ 2,600 per passenger
Commission to travel agents	15% of fare
Fixed annual lease cost allocated to each flight	₹ 15,30,000 per flight

Fixed ground services (maintenance, check in, Baggage handling cost) allocated to each flight	₹ 1,70,000 per flight
Fixed salaries of flight crew allocated to each flight	₹ 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 ₹ 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? (10 Marks

Reference | **Airlines Industry**

What's **New** | **Operating income and decision of fare reduction.**

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Answer

(i) **Statement of operating income of DKG Airlines for Melbourne-Delhi flight (one way)**

Particulars	Amount (₹)	Amount (₹)
Fare received (per flight): 250 passengers × ₹ 50,000		1,25,00,000
Variable costs (per flight):		
- Fuel cost	28,00,000	
- Food (250 × ₹ 2,600)	6,50,000	
- Commission to Travel Agents (15% of ₹ 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 × ₹ 48,000		1,32,00,000
Variable costs (per flight):		
Fuel cost	28,00,000	

Food (275 × ₹ 2,600)	7,15,000	
Commission to Travel Agents (17.5% of ₹ 1,32,00,000)	23,10,000	(58,25,000)
Contribution per flight		73,75,000

Excess contribution due to lowering of fare (₹ 73,75,000 – ₹ 71,75,000) = ₹ 2,00,000. DKG Airlines should lower its fare as it would increase its contribution by ₹ 2,00,000.

Q 20 Nov'18

M/s XY Travels has been given a 25 km. long route to run an air- conditioned Mini Bus. The cost of bus is ₹ 20,00,000. It has been insured @3% premium per annum while annual road tax amounts to ₹ 36,000. Annual repairs will be ₹ 50,000 and the bus is likely to last for 5 years. The driver's salary will be ₹ 2,40,000 per annum and the conductor's salary will be ₹ 1,80,000 per annum in addition to 10% of the takings as commission (to be shared by the driver and the conductor equally). Office and administration overheads will be ₹ 18,000 per annum. Diesel and oil will be ₹ 1,500 per 100 km. The bus will make 4 round trips carrying on an average 40 passengers on each trip.

Assuming 25% profit on takings and considering that the bus will run on an average 25 days in a month.

You are **required** to:

(i) **Prepare** operating cost sheet (for the month).

(ii) **Calculate** fare to be charged per passenger km. (10 Marks)

Reference | **Bus Service**

What's New | **Operating cost sheet and fare.**

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Answer

Statement showing the Operating Cost per Passenger-km.

		Yearly (₹.)	Monthly (₹.)
(A)	**Standing Charges:**		
	Insurance Charge (₹ 20,00,000 × 3%)	60,000	5,000
	Road Tax	36,000	3,000
	Depreciation (20,00,000/5)	4,00,000	33,333.33
	Total	4,96,000	41,333.33
(B)	**Maintenance Charges:**		
	Annual Repairs	50,000	4166.67

	Office and administration overheads	3,18,000	26,500
	Total	3,68,000	30666.67
(C)	**Running Cost/Charges:**		
	Driver's Salary	2,40,000	20,000
	Conductor's Salary	1,80,000	15,000
	Diesel & Oil $\left(60,000 \times \frac{1,500}{100}\right)$	9,00,000	75,000
	Total	13,20,000	41,333.33
	Total (A+B+C) Cost before commission and profit	21,84,000	1,82,000
	Commission (33,60,000 × 10%) (working note 2)	3,36,000	28,000
	Profit (33,60,000 × 25%) (working note 2)	8,40,000	70,000
	Takings (working note 1)	33,60,000	2,80,000

(ii) Fare per Passenger-km. $= \frac{\text{Total collection/Taking}}{\text{Total passenger-km}}$ (Working note 3)

$= \frac{33,60,000}{24,00,000} = ₹.\ 1.40$

OR

Fare per Passenger-km. (monthly) $= \frac{2,80,000}{2,00,000} = ₹.1.40$

Working note:

1. Cost before commission (10%) and profit (25%) is 21,84,000 which is 65% of total takings. So total takings is $\left(\frac{21,84,000}{65}\right) \times 100 = ₹\ 33,60,000$
2. Commission is 10% of ₹ 33,60,000 = ₹ 3,36,000 and Profit is 25% of ₹ 33,60,000 = ₹ 8,40,000
3. Total Km is (4 Round Trips × Days in a month × Month = (4×2×25 ×25×12) = 60,000 km
   Passenger km is 60,000 km × 40 passenger = 24,00,000

Q 21 MTP Mar'19; RTP Nov'19

A transport company has a fleet of three trucks of 10 tonnes 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	16	4	6
2	40	2	9
3	30	3	12

The analysis of maintenance cost and the total distance travelled during the last two years is as under

Year	Total distance travelled	Maintenance Cost (₹)
1	1,60,200	46,050
2	1,56,700	45,175

The following are the details of expenses for the year under review:

Diesel	₹ 65 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	₹ 24,000 per month
Licence and taxes	₹ 25,000 per annum per truck
Insurance	₹ 45,000 per annum for all the three vehicles
Purchase Price per truck	₹ 30,00,000, Life 10 years. Scrap value at the end of life is ₹ 1,00,000.
Oil and sundries	₹ 250 per 100 km run.
General Overhead	₹ 1,15,600 per annum

The vehicles operate 24 days per month on an average.

On the basis of commercial tone-km, you are **required** to:

(i) **PREPARE** an Annual Cost Statement covering the fleet of three vehicles.

(ii) **CALCULATE** the cost per km. run.

(iii) **DETERMINE** the freight rate per tonne km. to yield a profit of 10% on freight. [10 Marks]

Reference | What's New

Goods Transport | **Cost Statement,Cost per km and freight rate**

Watch Video

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Answer

(i) **Annual Cost Statement of three vehicles**

	(₹)
Diesel {(1,34,784 km. ÷ 4 km) × ₹ 65) (Refer to Working Note 1)	21,90,240
Oil & sundries {(1,34,784 km. ÷ 100 km.) × ₹ 250}	3,36,960
Maintenance {(1,34,784 km. × ₹ 0.25) + ₹ 6,000} (Refer to Working Note 2)	39,696

Drivers' salary {(₹ 24,000 × 12 months) × 3 trucks}	8,64,000
Licence and taxes (₹ 25,000 × 3 trucks)	75,000
Insurance	45,000
Depreciation {(₹ 29,00,000 ÷ 10 years) × 3 trucks}	8,70,000
General overhead	1,15,600
Total annual cost	45,36,496

(ii) **Cost per km. run**

$$\text{Cost per kilometer run} = \frac{\text{Total annual cost of vehicles}}{\text{Total kilometere travelled annually}} \text{ (Refer to Working Note 1)}$$

$$= \frac{₹\ 45,36,496}{1,34,784\ \text{kms}} = ₹\ 33.66$$

(iii) **Freight rate per tonne km (to yield a profit of 10% on freight)**

$$\text{Cost per tonne km} = \frac{\text{Total annual cost of three vehicles}}{\text{Total effective tonnes kms. per annum}} \text{ (Refer to Working Note 1)}$$

$$= \frac{₹\ 45,36,496}{6,06,528\ \text{kms.}} = ₹\ 7.48$$

$$\text{Freight rate per tonne km.} \left(\frac{₹\ 7.48}{0.9} \times 1\right) = ₹\ 8.31$$

Working Notes:

1. **Total kilometer travelled and Commercial tonnes kilometer (load carried) by three trucks in one year**

Truck	One way distance in kms a	No. of trips b	Total distance covered in km per day (with load) c = a × b	Total distance covered in km per day (up & down) d = c × 2	Load carried per trip / day in tonnes e	Total effective tonnes km f = 27/3 × c
1	16	4	64	128	6	576
2	40	2	80	160	9	720
3	30	3	90	180	12	810
Total			234	468	27	2,106

Total kilometre travelled by three trucks in one year

(468 km. × 24 days × 12 months) = 1,34,784

Total effective tonnes kilometre of load carried by three trucks during one year

(2,106 tonnes km. × 24 days × 12 months) = 6,06,528 tonne-km

2. **Fixed and variable component of maintenance cost:**

$$\text{Variable maintenance cost per km.} = \frac{\text{Difference in maintenance cost}}{\text{Difference in distance travelled}}$$

$$= \frac{₹\,46{,}050 - ₹\,45{,}175}{1{,}60{,}200\text{ kms} - 1{,}56{,}700\text{ kms}} = ₹\,0.25$$

Fixed maintenance cost = Total maintenance cost – Variable maintenance cost

= ₹ 46,050 – 1,60,200 kms × ₹ 0.25 = ₹ 6,000

Q22 May'19

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	₹ 60 per litre
Engine Oil	₹ 200 per week
Driver's Wages (fixed)	₹ 2,500 per week
Repairs	₹ 600 per week
Garage Rent	₹ 800 per week
Cost of Lorry (excluding cost of tyres)	₹ 9,50,000
Life of Lorry	1,60,000 kms
Insurance	₹ 18,200 per annum
Cost of Tyres	₹ 52,500
Life of Tyres	25,000 kms
Estimated sale value of the lorry at end of its life is	₹ 1,50,000
Vehicle License Cost	₹ 7,800 per annum
Other Overhead Cost	₹ 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)

(10 Marks)

Reference

Goods Transport

What's New

Total Cost analysed into running and fixed cost

Watch **Video**

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Answer

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**

Amount (₹)

	Particulars	For 4 weeks	For 1 week (by dividing by 4)
A.	**Fixed Charges:**		
	Drivers' wages (₹ 2,500 × 4 weeks)	10,000	2,500
	Garage rent (₹ 800 × 4 weeks)	3,200	800
	Insurance {(₹ 18,200 ÷ 52 weeks) × 4 weeks}	1,400	350
	Vehicle license {(₹ 7,800 ÷ 52 weeks) × 4 weeks}	600	150
	Other overheads cost {(₹ 41,600 ÷ 52 weeks) × 4 weeks}	3,200	800
	Total (A)	18,400	4,600
B.	**Running Cost:**		
	Cost of diesel {(3,200 ÷ 8 kms) × ₹ 60}	24,000	6,000
	Engine Oil (₹ 200 × 4 weeks)*	800	200
	Repairs (₹ 600 × 4 weeks)*	2,400	600
	Depreciation on vehicle $\left(\frac{₹\,9,50,000 - ₹\,1,50,000}{1,60,000\ km} \times 3,200\ km\right)$	16,000	4,000
	Depreciation on tyres $\left(\frac{₹\,52,500}{25,000\ km} \times 3,200\ km\right)$	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.

(ii) **Calculation of vehicle operating cost:**

$$\text{Operating cost per k.m.} = \frac{₹\,68,320}{3,200\text{ km}} \text{ or } \frac{₹\,17,080}{800\text{ km}} = ₹\,21.35$$

$$\text{Operating cost per Tonne-k.m.} = \frac{₹\,68,320}{16,000\text{ km}} \text{ or } \frac{₹\,17,080}{4,000\text{ km}} = ₹\,4.27$$

Q23 MTP Oct'19

SLS Infrastructure builts and operates a 110 k.m. long highway on the basis of Built-Operate-Transfer (BOT) model for a period of 25 years. A traffic assessment has been carried out to estimate the traffic flow per day. The details are as below:

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 (₹ 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	1,14,495.25

An average cost of ₹ 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%

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] [10 Marks]

Reference	What's New
Toll plaza	**Toll fee per vehicle.**

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Answer

(i) **Calculation of total project cost per day of concession period:**

Activities	Amount (₹ 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	1,14,495.25
Administration and toll plaza operation cost	1,120.00
Total Cost	1,15,615.25
Concession period in days (25 years × 365 days)	9,125
Cost per day of concession period (₹ 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

= ₹ 12,67,000 + ₹ 1,90,050 = ₹ 14,57,050

$$\text{Cost per equivalent vehicle} = \frac{₹\,14,57,050}{76,444 \text{ units}} \text{ (Refer working note)}$$

= ₹ 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	₹ 19.06	1	19.06
2.	Car and SUVs	₹ 19.06	4	76.24
3.	Bus and LCV	₹ 19.06	6	114.36
4.	Heavy commercial vehicles	₹ 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 Twowheeler [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

Q 24 Nov'19

Describe Composite Cost unit as used in Service Costing and discuss the ways of computing it.

Reference | What's **New**

Composite cost unit

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Answer

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.:

Σ (Weight Carried $\times$ Distance)$_1$ + (Weight Carried $\times$ Distance)$_2$ +….+ (Weight Carried $\times$ 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.

$$\Sigma (\text{Distance}_1 + \text{Distance}_2 + \ldots\ldots\ldots\ldots\ldots + \text{Distance}_n) \times \left(\frac{W_1 + W_2 + \ldots + W_n}{n}\right)$$

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.

Q25 RTP Nov'20

A transport company has 20 vehicles, the capacities are as follows:

No. of Vehicles	Capacity per vehicle
5	9 MT
6	12 MT
7	15 MT
2	20 MT

The company provides the goods transport service between stations 'A' to station 'B'. Distance between these stations is 100 kilometers. Each vehicle makes one round trip per day on an average. Vehicles are loaded with an average of 90 per cent of capacity at the time of departure from station 'A' to station 'B' and at the time of return back loaded with 70 per cent of capacity. 10 per cent of vehicles are laid up for repairs every day. The following information is related to the month of August, 2020:

Salary of Transport Manager	₹ 60,000
Salary of 30 drivers	₹ 20,000 each driver
Wages of 25 Helpers	₹ 12,000 each helper
Loading and unloading charges	₹ 850 each trip
Consumable stores (depends on running of vehicles)	₹ 1,35,000

Insurance (Annual)	₹ 8,40,000
Road Licence (Annual)	₹ 6,00,000
Cost of Diesel per litre	₹ 78
Kilometres run per litre each vehicle	5 Km.
Lubricant, Oil etc.	₹ 1,15,000
Cost of replacement of Tyres, Tubes, other parts etc. (on running basis)	₹ 4,25,000
Garage rent (Annual)	₹ 9,00,000
Routine mechanical services	₹ 3,00,000
Electricity charges (for office, garage and washing station)	₹ 55,000
Depreciation of vehicles (on time basis)	₹ 6,00,000

There is a workshop attached to transport department which repairs these vehicles and other vehicles also. 40 per cent of transport manager's salary is debited to the workshop. The transport department has been apportioned ₹ 88,000 by the workshop during the month. During the month operation was for 25 days.

You are **required**:

(i) **CALCULATE** per ton-km operating cost.

(ii) **DETERMINE** the freight to be charged per ton-km, if the company earned a profit of 25 per cent on freight.

Reference — What's **New**

Goods Transport - cost per ton km

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Answer

(i) **Operating Cost Sheet for the month of August, 2020**

	Particulars	Amount (₹)
A.	**Fixed Charges:**	
	Manager's salary (₹ 60,000 × 60%)	36,000
	Drivers' Salary (₹ 20,000 × 30 drivers)	6,00,000
	Helpers' wages (₹ 12,000 × 25 helpers)	3,00,000
	Insurance (₹ 8,40,000 ÷ 12 months)	70,000
	Road licence (₹ 6,00,000 ÷ 12 months)	50,000
	Garage rent (₹ 9,00,000 ÷ 12 months)	75,000
	Routine mechanical services	3,00,000
	Electricity charges (for office, garage and washing station)	55,000
	Depreciation of vehicles	6,00,000

	Apportioned workshop expenses	88,000
	Total (A)	21,74,000
B.	**Variable Charges:**	
	Loading and unloading charges (Working Note 1)	7,65,000
	Consumable Stores	1,35,000
	Cost of diesel (Working Note 2)	14,04,000
	Lubricant, Oil etc.	1,15,000
	Replacement of Tyres, Tubes & other parts	4,25,000
	Total (B)	28,44,000
C.	**Total Cost (A + B)**	50,18,000
D.	Total Ton-Kms. (Working Note 3)	9,43,200
E.	**Cost per ton-km. (C ÷ D)**	5.32

(ii) **Calculation of Chargeable Freight**

Cost per ton-km.	₹ 5.32
Add: Profit @ 25% on freight or 33⅓% on cost	₹ 1.77
Chargeable freight per ton-km.	₹ 7.09

Working Notes:

1. **Wages paid to loading and unloading labours:**

   Numbers of vehicles available per day × No. of days × trips × wages per trip

   (20 vehicles × 90%) × 25 days × 2 trips × ₹ 850

   18 × 25 × 2 × 850 = ₹ 7,65,000

2. **Cost of Diesel:**

   Distance covered by each vehicle during August, 2020

   = 100 k.m. × 2 × 25 days × 90% = 4,500 km.

   $$\text{Consumption of diesel} = \frac{4{,}500\ \text{k.m.} \times 20\ \text{vehicles}}{5\ \text{k.m.}} = 18{,}000\ \text{litres.}$$

   Cost of diesel = 18,000 litres × ₹ 78 = ₹ 14,04,000.

3. **Calculation of total ton-km:**

   Total Ton-Km. = Total Capacity × Distance covered by each vehicle × Average Capacity Utilisation ratio.

   $$= \left[(5 \times 9\,\text{MT}) + (6 \times 12\,\text{MT}) + (7 \times 15\,\text{MT}) + (2 \times 20\,\text{MT})\right] \times 4{,}500\ \text{km} \times \frac{(90\% + 70\%)}{2}$$

   = (45 + 72 + 105 + 40) × 4,500 k.m. × 80%

   = 262 × 4,500 × 80%.

   = 9,43,200 ton-km.

Q26 MTP Nov'20

Explain standing charges and running charges in the case of transport organisations. LIST three examples of both.

Reference | What's **New**

Transport Orgainsations - Standing Charges and Running Charges

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Answer

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.

Q27 Jan'21

ABC Health care runs an Intensive Medical Care Unit. For this purpose, it has hired a building at a rent of ₹ 50,000 per month with the agreement to bear the repairs and maintenance charges also.

The unit consists of 100 beds and 5 more beds can comfortably be accommodated when the situation demands. Though the unit is open for patients all the 365 days in a year, scrutiny of accounts for the year 2020 reveals that only for 120 days in the year, the unit had the full capacity of 100 patients per day and for another 80 days, it had, on an average only 40 beds

occupied per day. But, there were occasions when the beds were full, extra beds were hired at a charge of ₹ 50 per bed per day. This did not come to more than 5 beds above the normal capacity on any one day. The total hire charges for the extra beds incurred for the whole year amounted to ₹ 20,000.

The unit engaged expert doctors from outside to attend on the patients and the fees were paid on the basis of the number of patients attended and time spent by them which on an average worked out to ₹ 30,000 per month in the year 2020.

The permanent staff expenses and other expenses of the unit were as follows:

	₹
2 Supervisors each at a per month salary of	5,000
4 Nurses each at a per month salary of	3,000
2 Ward boys each at a per month salary of	1,500
Other Expenses for the year were as under:	
Repairs and Maintenance	28,000
Food supplied to patients	4,40,000
Caretaker and Other services for patients	1,25,000
Laundry charges for bed linen	1,40,000
Medicines supplied	2,80,000
Cost of Oxygen etc. other than directly borne for	75,000
treatment of patients	
General Administration Charges allocated to the unit	71,000

Required:

(i) **What** is the profit per patient day made by the unit in the year 2020, if the unit recovered an overall amount of ₹ 200 per day on an average from each patient.

(ii) The unit wants to work on a budget for the year 2021, but the number of patients requiring medical care is a very uncertain factor. Assuming that same revenue and expenses prevail in the year 2021 in the first instance, **work out** the number of patient days required by the unit to break even. [10 Marks]

Reference — What's **New**

Hospital Service - Break Even Point

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Answer

Workings:

Calculation of number of Patient days

100 Beds × 120 days	12000
40 Beds × 80 days	3,200
Extra beds	400
Total	15,600

(i) **Statement of Profitability**

Particulars	Amount (₹)	Amount (₹)
Income for the year (₹ 200 per patient per day × 15,600 patient days)		31,20,000
Variable Costs:		
Doctor Fees (₹ 30,000 per month × 12)	3,60,000	
Food to Patients (Variable)	4,40,000	
Caretaker Other services to patients (Variable)	1,25,000	
Laundry charges (Variable)	1,40,000	
Medicines (Variable)	2,80,000	
Bed Hire Charges (₹ 50 × 400 Beds)	20,000	
Total Variable costs		(13,65,000)
Contribution		17,55,000
Fixed Costs:		
Rent (₹ 50,000 per month × 12)	6,00,000	
Supervisor (2 persons × ₹ 5,000 × 12)	1,20,000	
Nurses (4 persons × ₹ 3,000 × 12)	1,44,000	
Ward Boys (2 persons × ₹ 1500 x12)	36,000	
Repairs (Fixed)	28,000	
Cost of Oxygen	75,000	
Administration expenses allocated	71,000	
Total Fixed Costs		(10,74,000)
Profit		6,81,000

Calculation of Contribution and profit per Patient day

Total Contribution = ₹ 17,55,000

Total Patient days = 15,600 days

Contribution per Patient day = ₹ 17,55,000 / 15,600 days = ₹ 112.50

Total Profit = ₹ 6,81,000

Total Patient days = 15,600 days

Profit per Patient day = ₹ 6,81,000 / 15,600 days = ₹ 43.65

(ii) **Breakeven Point** = Fixed Cost / Contribution per Patient day

= ₹ 10,74,000 / ₹ 112.50

= 9,547 patient days

Q28 RTP May'21

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 months	₹ 12,000 per month per driver
Cleaner's salary payable for all the 12 months	₹ 8,000 per month per cleaner
License fees, taxes etc.	₹ 8,400 per bus per annum
Insurance Premium	₹ 15,600 per bus per annum
Repairs and Maintenance	₹ 20,500 per bus per annum
Purchase price of the bus	₹ 20,00,000 each
Life of the bus	16 years
Scrap value	₹ 1,60,000
Diesel Cost	₹ 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.

Reference | What's New

School Bus Service | **Cost per student per month**

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Answer

(i) **Statement showing the expenses of operating a single bus and the fleet of 25 buses for a year**

Particulars	Per bus per annum (₹)	Fleet of 25 buses per annum (₹)
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 (₹ 12,000 × 12 months)	1,44,000	36,00,000
Cleaners salary (₹ 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 $\left(\frac{₹\,20,00,000 - ₹\,1,60,000}{16 \text{ years}}\right)$	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 {₹ 6,20,556 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 219.12
(b) 4 km. from the school (₹ 219.12 × 2)	₹ 438.24
(c) 8 km. from the school (₹ 219.12 × 4)	₹ 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 (₹)
Running costs : (A)	
Diesel (Refer to working note 3)	66,316.80
Repairs & maintenance costs: (B) (₹ 20,500 x 0.75)	15,375
Fixed charges:	
Driver's salary {₹ 12,000 × 3 months + (75% of ₹ 12,000 × 9 months)}	1,17,000
Cleaners salary {₹ 8,000 × 3 months + (75% of ₹ 8,000 × 9 months)}	78,000
Licence fee, taxes etc.	8,400
Insurance	15,600
Depreciation $\left(\frac{₹\ 20,00,000 - ₹\ 1,60,000}{16 \text{ years}}\right)$	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:

(a) 2 km. from the school {₹ 4,15,691.8 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 146.78
(b) 4 km. from the school (₹ 146.78 × 2)	₹ 293.56
(c) 8 km. from the school (₹ 146.78 × 4)	₹ 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 × ₹ 78.50)	₹ 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 × ₹ 78.50)	₹ 66,316.80

Q29 MTP May'21

GMCS Ltd. collects raw milk from the farmers of Ramgarh, Pratapgarh and Devgarh panchayats and processes this milk to make various dairy products. GMCS Ltd. has its own vehicles (tankers) to collect and bring the milk to the processing plant. Vehicles are parked in the GMCS Ltd.'s garage situated within the plant compound. Following are the information related with the vehicles:

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles assigned	4	3	5
No. of trips a day	3	2	4
One way distance from the processing plant	24 k.m.	34 k.m.	16 k.m.
Fess & taxes per month (₹)	5,600	6,400	---

All the 5 vehicles assigned to Devgarh panchayat, were purchased five years back at a cost of ₹ 9,25,000 each. The 4 vehicles assigned to Ramgarh panchayat, were purchased two years back at a cost of ₹ 11,02,000 each and the remaining vehicles assigned to Pratapgarh were purchased last year at a cost of ₹ 13,12,000 each. With the purchase of each vehicle a two years free servicing warranty is provided. A vehicle gives 10 kmpl mileage in the first two year of purchase, 8 kmpl in next two years and 6 kmpl afterwards. The vehicles are subject to depreciation of 10% p.a. on straight line basis irrespective of usage. A vehicle has the capacity to carry 10,000 litres of milk but on an average only 70% of the total capacity is utilized.

The following expenditures are related with the vehicles:

Salary of Driver (a driver for each vehicle)	₹ 24,000 p.m.
Salary to Cleaner (a cleaner for each vehicle)	₹ 12,000 p.m.

Allocated garage parking fee	₹ 4,200 per vehicle per month
Servicing cost	₹ 15,000 for every complete 5,000 k.m. run.
Price of diesel per litre	₹ 78.00

From the above information you are required to **Calculate**

(i) Total operating cost per month for each vehicle. (Take 30 days for the month)

(ii) Vehicle operating cost per litre of milk. (10 Marks)

Reference | What's **New**

Goods Transport

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Answer

(i) **Calculation of Operating Cost per month for each vehicle**

	Ramgarh (₹)	Pratapgarh (₹)	Devgarh (₹)	Total (₹)
A. **Running Costs:**				
- Cost of diesel (Working Note- 2)	1,68,480	95,472	2,49,600	5,13,552
- Servicing cost (Working Note- 3)	45,000	-	45,000	90,000
	2,13,480	95,472	2,94,600	6,03,552
B. **Fixed Costs:**				
- Salary to drivers	96,000 (4 drivers × ₹ 24,000)	72,000 (3 drivers × ₹ 24,000)	1,20,000 (5 drivers × ₹ 24,000)	2,88,000
- Salary to cleaners	48,000 (4 cleaners × ₹ 12,000)	36,000 (3 cleaners × ₹ 12,000)	60,000 (5 cleaners × ₹ 12,000)	1,44,000
- Allocated garage parking fee	16,800 (4 vehicles × ₹ 4,200)	12,600 (3 vehicles × ₹ 4,200)	21,000 (5 vehicles × ₹ 4,200)	50,400
- Depreciation (Working Note- 4)	36,733	32,800	38,542	1,08,075
- Fess & taxes	5,600	6,400	---	12,000
	2,03,133	1,59,800	2,39,542	6,02,475
Total [A + B]	4,16,613	2,55,272	5,34,142	12,06,027
Operating Cost per vehicle	1,04,153 (₹4,16,613 ÷ 4 vehicles)	85,091 (₹2,55,272 ÷ 3 vehicles)	1,06,828 (₹5,34,142 ÷ 5 vehicles)	1,00,502 (₹12,06,027 ÷ 12 vehicles)

(ii) **Vehicle operating cost per litre of milk**

$$\frac{\text{Total Operating Cost per month}}{\text{Total milk carried a month}} = \frac{₹\,12,06,027}{₹\,79,80,000\ \text{(Working Note 5)}} = ₹\,0.15$$

Working Note :

1. **Distance covered by the vehicles in a month**

Route		Total Distance (in K.M.)
Ramgarh	(4 vehicles × 3 trips × 2 × 24 km. × 30 days)	17,280
Pratapgarh	(3 vehicles × 2 trips × 2 × 34 km. × 30 days)	12,240
Devgarh	(5 vehicles × 4 trips × 2 × 16 km. × 30 days)	19,200

2. **Cost of diesel consumption**

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	19,200
Mileage per litre of diesel	8 kmpl	10 kmpl	6 kmpl
Diesel consumption (Litre)	2,160 (17,280 ÷ 8)	1,224 (12,240 ÷ 10)	3,200 (19,200 ÷ 6)
Cost of diesel consumption @ ₹ 78 per litre (₹)	1,68,480	95,472	2,49,600

3. **Servicing Cost**

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	19,200
Covered under free service warranty	No	Yes	No
No. of services required	3 (17,280 k.m. ÷ 5,000 k.m.)	2 (12,240 k.m. ÷ 5,000 k.m.)	3 (19,200 k.m. ÷ 5,000 k.m.)
Total Service Cost (₹)	45,000 (₹ 15,000 × 3)	---	45,000 (₹ 15,000 × 3)

2. **Calculation of Depreciation**

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles	4	3	5
Cost of a vehicle (₹)	11,02,000	13,12,000	9,25,000
Total Cost of vehicles (₹)	44,08,000	39,36,000	46,25,000
Depreciation per month (₹)	36,733 $\left(\frac{₹\,44,08,000 \times 10\%}{12\ \text{months}}\right)$	32,800 $\left(\frac{₹\,39,36,000 \times 10\%}{12\ \text{months}}\right)$	38,542 $\left(\frac{₹\,46,25,000 \times 10\%}{12\ \text{months}}\right)$

3. **Total volume of Milk Carried**

Route		Milk Qty. (Litre)
Ramgarh	(10,000 ltr. × 0.7 × 4 vehicles × 3 trips × 30 days)	25,20,000
Pratapgarh	(10,000 ltr. × 0.7 × 3 vehicles × 2 trips × 30 days)	12,60,000
Devgarh	(10,000 ltr. × 0.7 × 5 vehicles × 4 trips × 30 days)	42,00,000
		79,80,000

Q30 MTP May'21

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	₹ 15per km.
Engine oil	₹ 4,200 for every 14,000 km.
Repair and maintenance	₹ 12,000 for every 10,000 km.
Driver's salary	₹ 20,000 per truck per month
Cleaner's salary	₹ 7,000 per truck per month
Supervision and other general expenses	₹ 15,000 per month
Cost of loading of goods	₹ 200 per Metric Ton (MT)

Each truck was purchased for ₹ 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. (10 Marks)

Reference | **What's New**

Goods Transport | **Absolute Tonne-km and Cost per ton-km**

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Answer

(i) **Calculation of Absolute Ton-km for the next month:**

Journey	Distance (in km) (a)	Weight-Up (in MT) (b)	Ton-km (c) = (a) × (b)	Weight-Down (in MT) (d)	Ton-km (e) = (a) × (d)	Total (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 (₹)	Amount (₹)
A.	Running cost:		
	- Diesel Cost {₹ 15 × (10,710 × 2)}	3,21,300	
	- Engine oil cost $\left(\frac{₹\,4,200}{14,000\text{ km}} \times 21,420\text{ km}\right)$	6,426	
	- Cost of loading of goods {₹ 200 × (79 + 21)}	20,000	
	- Depreciation $\left(\frac{₹\,20,00,000}{7,20,000\text{ km}} \times 21,420\text{ km}\right)$	59,500	4,07,226
B.	Repair & Maintenance Cost $\left(\frac{₹\,12,000}{10,000\text{ km}} \times 21,420\text{ km}\right)$		25,704
C.	Standing Charges		
	- Drivers' salary (₹ 20,000 × 5 trucks)	1,00,000	
	- Cleaners' salary (₹ 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

Q 31 ICAI Mat

GTC has a lorry of 6-ton carrying capacity. It operates lorry service from city A to city B. It charges ₹ 2,400 per ton from city 'A' to city 'B' and ₹ 2,200 per ton for the return journey from city 'B' to city 'A'. Goods are also delivered to an intermediate city 'C' but no concession or reduction in rates is given. Distance between the city 'A' to 'B' is 300 km and distance from city 'A' to 'C' is 140 km.

In January 2020, the truck made 12 outward journeys for city 'B'. The details of journeys are as follows:

Outward journey	No. of journeys	Load (in ton)
'A' to 'B'	10	6
'A' to 'C'	2	6
'C' to 'B'	2	4
Return journey	**No. of journeys**	**Load (in ton)**
'B' to 'A'	5	8
'B' to 'A'	6	6
'B' to 'C'	1	6
'C' to 'A'	1	0

Annual fixed costs and maintenance charges are ₹ 6,00,000 and ₹ 1,20,000 respectively. Running charges spent during January 2020 are ₹ 2,94,400 (includes ₹ 12,400 paid as penalty for overloading).

You are **required** to:

(i) **CALCULATE** the cost as per (a) Commercial ton-kilometre. (b) Absolute ton- kilometre

(ii) **CALCULATE** Net Profit/ loss for the month of January, 2020.

Reference

Goods Transport

What's **New**

Commercial and Absolute Ton-Kilometer and Net Profit or Loss

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Answer

(i) **Calculation of total monthly cost for running truck:**

Particulars		Amount per annum (₹)	Amount per month (₹)
(i) **Standing Charges:**			
Annual fixed costs		6,00,000	50,000
(ii) **Maintenance Charges:**		1,20,000	10,000
(iii) **Running Cost:**			
Running charges	2,94,400		
Less: Penalty paid for overloading	(12,400)		2,82,000
Total monthly cost			3,42,000

(a) **Cost per commercial ton-km.** $= \frac{₹\ 3,42,000}{44,856 \text{ ton-km.}} = ₹\ 7.62$

(Refer to working note-1)

(b) **Cost per absolute ton-km.** $= \frac{₹\ 3,42,000}{44,720 \text{ ton-km.}} = ₹\ 7.65$

(Refer to working note-2)

(ii) **Calculation of Net Profit/Loss for the month of January 2020:**

Particulars	(₹)	(₹)
Truck hire charges received during the month:		
From Outward journey (12 trips × 6 ton × ₹ 2,400)	1,72,800	
From return journey {(5 trips × 8 ton × ₹ 2,200) + (7 trips × 6 ton × ₹ 2,200)}	1,80,400	3,53,200
Less: Monthly running cost {as per (i) above}		(3,42,000)
Operating profit		11,200
Less: Penalty paid for overloading		(12,400)
Net Loss for the month		(1,200)

Working Notes:

1. **Calculation of Commercial Ton-km:**

Particulars		Ton-km.
A. Total Distance travelled		
To and fro (300 km × 2× 12 trips) (in km)		7,200
B. Average weight carried:		
Outward (12 journeys × 6 ton + 2 journeys × 4 ton)	80	
Return (5 journeys × 8 ton + 6 journeys × 6 ton + 1 journey × 6 ton)	82	

Total weight	162	
No. of journeys	26	
Average weight (in ton) (162÷26)	6.23	
Total Commercial Ton-km (A×B)		44,856

2. **Calculation of Absolute Ton-km:**

Particulars	Ton-km.	Ton-km.
Outward journeys:		
From city A to city B (10 journey × 300 km. × 6 ton)	18,000	
From city A to city C (2 journeys × 140 km. × 6 ton)	1,680	
From city C to city B (2 journeys × 160 km. × 4 ton)	1,280	20,960
Return journeys:		
From city B to city A (5 journeys × 300 km. × 8 ton) + (6 journeys × 300 km. × 6 ton)	22,800	
From city B to city C (1 journey × 160 km. × 6 ton)	960	23,760
Total Absolute Ton-km		44,720

Note: (i) While calculating absolute/commercial ton-km., actual load carried are considered irrespective of the fact it attracts fines or penalty. (ii) Penalty paid for overloading is an abnormal expenditure and is not included in the operating cost of the bus. This amount will be debited to Costing Profit and Loss A/c and hence deducted from operating profit to arrive at net profit/ loss.

Q32 July'21

MRSL Healthcare Ltd. has incurred the following expenditure during the last year for its newly launched 'COVID-19' Insurance policy :

	₹
Office administration cost	48,00,000
Claim management cost	3,80,000
Employees cost	16,20,000
Postage and logistics	32,40,000
Policy issuance cost	29,50,000
Facilities cost	46,75,000
Cost of marketing of the policy	1,38,90,000
Policy development cost	35,00,000
Policy servicing cost	96,45,000
Sales support expenses	32,00,000
I.T. Cost	?

Number of Policy sold : 2,800

Total insured value of policies - ₹ 3,500 Crores

Cost per rupee of insured value - ₹ 0.002

You are **required** to : [5]

(i) **Calculate** Total Cost for "COVID-19" Insurance policy segregating the costs into four main activities namely (a) Marketing and Sales support (b) Operations (c) I.T. Cost and (d) Support functions.

(ii) **Calculate** Cost Per Policy.

Reference | What's **New**

Insurance Company | **IT Cost**

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Answer

(i) **Calculation of total cost for 'COVID-19' Insurance policy**

	Particulars	Amount (₹)	Amount (₹)
a.	**Marketing and Sales support:**		
	- Policy development cost	35,00,000	
	- Cost of marketing	1,38,90,000	
	- Sales support expenses	32,00,000	2,05,90,000
b.	**Operations:**		
	- Policy issuance cost	29,50,000	
	- Policy servicing cost	96,45,000	
	- Claim management cost	3,80,000	1,29,75,000
c.	**IT Cost***		2,21,00,000
d.	**Support functions**		
	- Postage and logistics	32,40,000	
	- Facilities cost	46,75,000	
	- Employees cost	16,20,000	
	- Office administration cost	48,00,000	1,43,35,000
	Total Cost		7,00,00,000

*IT cost = (₹ 3,500 crores × 0.002) – ₹ 4,79,00,000 = ₹ 2,21,00,000

(ii) **Calculation of cost per policy** = $\frac{\text{Total cost}}{\text{No. of policies}} = \frac{₹\,7,00,00,000}{2,800}$ = ₹ 25,000

Q 33 July'21

What do you understand by Build-Operate-Transfer (BOT) approach in Service Costing ? **How** is the Toll rate computed ? [5]

Reference — What's **New**

Build-Operate-Transfer (BOT) and Toll Rate

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Answer

Build-Operate-Transfer (BOT) Approach: In recent years a growing trend emerged among Governments in many countries to solicit investments for public projects from the private sector under BOT scheme. **BOT is an option for the Government to outsource public projects to the private sector**.

With BOT, the private sector designs, finances, constructs and operate the facility and eventually, after specified concession period, the ownership is transferred to the Government. Therefore, BOT can be seen as a developing technique for infrastructure projects by making them amenable to private sector participation.

Toll Rate: In general, the toll rate should have a direct relation with the benefits that the road users would gain from its improvements. The benefits to road users are likely to be in terms of fuel savings, improvement in travel time and good riding quality.

To compute the toll rate, following formula may be used

$$= \frac{\text{Total Cost} + \text{Profit}}{\text{Number of Vehicles}}$$

Or, to compute the toll rate following formula with rounding off to nearest multiple of five has been adopted: User fee = Total distance × Toll rate per km.

Q 34 RTP May'22

Navya 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 details related with the owning of CNG & EV propelled cars are as tabulated below:

Particulars	CNG Car	EV Car
Car purchase price (₹)	9,20,000	15,20,000
Govt. subsidy on purchase of car (₹)	--	1,50,000
Life of the car	15 years	10 years
Residual value (₹)	95,000	1,70,000

Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (₹)	60	--
Power cost per Kwh (₹)	--	7.60
Annual Maintenance cost (₹)	8,000	5,200
Annual insurance cost (₹)	7,600	14,600
Tyre replacement cost in every 5 -year (₹)	16,000	16,000
Battery replacement cost in every 8- year (₹)	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 (₹)	20,000 p.m
Garage rent per car (₹)	4,500 p.m
Share of Office & Administration cost per car (₹)	1,500 p.m

Required:

CALCULATE the operating cost of vehicle per month per car for both CNG & EV options.

Reference — **Cab Service**

What's **New** — **Operating Cost per Vehicle**

Watch **Video** — **Scan Me**

Answer

Working Notes:

1. **Calculation of Depreciation per month:**

	Particulars	CNG Car	EV Car
A	Car purchase price (₹)	9,20,000	15,20,000
B	Less: Govt. subsidy (₹)	--	(1,50,000)
C	Less: Residual value (₹)	(95,000)	(1,70,000)
D	Depreciable value of car (₹) [A-B-C]	8,25,000	12,00,000
E	Life of the car	15 years	10 years
F	Annual depreciation (₹) [D÷E]	55,000	1,20,000
G	Depreciation per month (₹) [F÷12]	4,583.33	10,000

2. **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 (₹)	60	-
F	Power cost per Kwh (₹)	-	7.60
G	CNG Cost per month (₹) [C×E]	4,500	-
H	Power cost per month (₹) [D×F]	-	1,425

3. **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 (₹)	16,000	16,000
E	Total replacement cost (₹) [C×D]	32,000	16,000
F	Amortised cost per year (₹) [E÷A]	2,133.33	1,600
E	Cost per month (₹) [F÷12]	177.78	133.33

4. **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 (₹)	12,000	5,40,000
E	Total replacement cost (₹) [C×D]	12,000	5,40,000
F	Amortised cost per year (₹) [E÷A]	800	54,000
E	Cost per month (₹) [F÷12]	66.67	4,500

Calculation of Operating cost per month:

	Particulars	CNG Car (₹)	EV Car (₹)
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
		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

Q35 May'22

Coal is transported from two mines X & Y and unloaded at plots in a railway station. X is at distance of 15 kms and Y is at a distance of 20 kms from the rail head plots. A fleet of lorries having carrying capacity of 4 tonnes is used to transport coal from the mines. Records reveal that average speed of the lorries is 40 kms per hour when running and regularly take 15 minutes to unload at the rail head.

At Mine X average loading time is 30 minutes per load, while at mine Y average loading time is 25 minutes per load.

Additional Information:

Drivers' wages, depreciation, insurance and taxes, etc. ₹ 12 per hour

Operated Fuel, oil tyres, repairs and maintenance, etc. ₹ 1.60 per km

You are **required** to **prepare** a statement showing the cost per tonne kilometre of carrying coal from each mine 'X' and 'Y'. [5]

Reference | What's **New**

Goods Transport

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Answer

Statement showing the cost per tonne-kilometre of carrying mineral from each mine

	Mine X (₹)	Mine Y (₹)
Fixed cost per trip: (Refer to working note 1)		
(Driver's wages, depreciation, insurance and taxes)		
X: 1 hour 30 minutes @ ₹ 12 per hour	18.00	
Y: 1 hour 40 minutes @ ₹ 12 per hour		20.00

Running and maintenance cost:		
(Fuel, oil, tyres, repairs and maintenance)		
X: 30 km. ₹ 1.60 per km.	48.00	
Y: 40 km. ₹ 1.60 per km.		64.00
Total cost per trip (₹)	66.00	84.00
Cost per tonne-km (Refer to working note 2)	1.1 $\left(\frac{₹\ 66}{60\ \text{tonne-km}}\right)$	1.05 $\left(\frac{₹\ 84}{80\ \text{tonne-km}}\right)$

Working notes:

	Mine- X	**Mine- Y**
(1) Total operated time taken per trip		
Running time to & fro	45 minutes $\left(30\ \text{km.} \times \frac{60\ \text{minutes}}{40\ \text{km.}}\right)$	60 minutes $\left(40\ \text{km.} \times \frac{60\ \text{minutes}}{40\ \text{km.}}\right)$
Un-loading time	15 minutes	15 minutes
Loading time	30 minutes	25 minutes
Total operated time	90 minutes or	100 minutes or
	1 hour 30 minutes	1 hour 40 minutes
(2) Effective tones – km.	60 (4 tonnes × 15 km.)	80 (4 tonnes × 20 km.)

Q 36 RTP Nov'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:

	(₹)
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

12 Buses 60 Passengers

13 Buses 50 Passengers

Each bus makes 4 round trips a day covering a distance of 10 Kilometers 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.

Reference — **Passanger Transport**

What's **New** — **Cost Sheet**

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Answer

Operating Cost Sheet

Particulars	Amount (₹)	Amount (₹)
Standing Charges:		
Depreciation (₹ 24,00,000 × 10% × 1/12 × 25)	5,00,000	
Garage Rent	1,00,000	
Insurance	25,000	
Road Tax	20,000	
Manager's Salary	60,000	
Assistant's Salary (₹ 32,000 × 2)	64,000	
Supervisor's Salary (₹ 24,000 × 3)	72,000	
Driver's Salary (₹ 20,000 × 25)	5,00,000	
Cleaner's Salary (₹ 5,000 × 20)	1,00,000	

Office Staff's Salary	1,00,000	
Consumables	1,20,000	
Repairs & Maintenance	90,000	
Other Fixed Expenses	72,000	18,23,000
Running Charges		
Diesel (49,600 Kms / 10 Kms × ₹ 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

$$\text{Cost per passenger-km} = \frac{\text{Total Operating Cost}}{\text{Passenger-kms}}$$

$$= \frac{23,99,800}{27,18,080}$$

$$= 0.883$$

Working Note:

Calculation of Total Kilometers and Passenger Kilometers

Specification	Total Km.	Passenger–Km.
12 Buses (60 Passengers)	29,760 Kms (10 Kms × 4 × 2 trips × 31 days × 12 Buses)	14,28,480 (29760 Kms × 60 Pass. × 80%)
13 Buses (50 Passengers)	32,240 Kms (10 Kms × 4 × 2 trips × 31 days × 13 Buses)	12,89,600 (32240 Kms × 50 Pass. × 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

Q 37 RTP Nov'22

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				

Reference — What's **New**

Hospital Industry

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Answer

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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Chapter 17

Standard Costing

Q1 ICAI Mat

The standard and actual figures of product 'Z' are as under:

	Standard	Actual
Material quantity	50 units	45 units
Material price per unit	₹ 1.00	₹ 0.80

CALCULATE material cost variances.

Reference

Material Variance

What's **New**

MCV

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Answer

The variances may be calculated as under:

(a) Standard cost = Std. Qty × Std. price = 50 units × ₹ 1.00 = ₹ 50

(b) Actual cost = Actual qty. × Actual price = 45 units × ₹ 0.80 = ₹ 36

Variances:

(i) Price variance = Actual qty (Std. price – Actual price)
= 45 units (₹ 1.00 – ₹ 0.80) = ₹ 9 (F)

(ii) Usage variance = Std. price (Std. qty – Actual qty.)
= ₹ 1 (50 units – 45 units) = ₹ 5 (F)

(iii) Material cost variance (Total variance) = Standard cost – Actual cost
= ₹ 50 – ₹ 36 = ₹ 14 (F)

Q2 ICAI Mat

NXE Manufacturing Concern furnishes the following information:

Standard:	Material for 70 kg finished products	100 kg.
	Price of material	₹ 1 per kg.
Actual:	Output	2,10,000 kg.

	Material used	2,80,000 kg.
	Cost of Materials	₹ 2,52,000

CALCULATE: (a) Material usage variance, (b) Material price variance, (c) Material cost variance.

Reference — What's New

Material Variance	MUV, MPV and MCV

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Answer

Standard Quantity of input for actual output (SQ) = 2,10,000 kg × $\frac{100 \text{ kg}}{70 \text{ kg}}$

= 3, 00,000 kg.

Actual Price (AP) = (₹ 2,52,000 ÷ 2, 80,000 kg) = ₹ 0.90 per kg.

(a) **Material Usage Variance** = (SQ – AQ) × SP

= (3,00,000 – 2,80,000) × 1

= ₹ 20,000 (F)

(b) **Material Price Variance** = (SP – AP) × AQ

= (1 – 0.90) × 2,80,000= ₹ 28, 000 (F)

(c) **Material Cost Variance** = (SQ × SP) – (AQ × AP)

= (3, 00,000 × 1) – (2, 80,000 × 0.90)

= ₹ 48, 000 (F)

Check, MCV = MPV + MUV

₹ 48, 000 (F) = ₹ 28, 000 (F) + ₹ 20, 000 (F)

Q3 ICAI Mat

The standard cost of a chemical mixture is as follows:

40% material A at ₹ 20 per kg.

60% material B at ₹ 30 per kg.

A standard loss of 10% of input is expected in production. The cost records for a period showed the following usage:

90 kg material A at a cost of ₹ 18 per kg.

110 kg material B at a cost of ₹ 34 per kg.

The quantity produced was 182 kg. of good product.

CALCULATE all material variances.

Reference	What's New
Material Variance	**Processing loss**

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Answer

Basic Calculation

Material	Standard for 180 kg. output			Actual for 182 kg. output		
	Qty. Kg.	Rate (₹)	Amount (₹)	Qty Kg.	Rate (₹)	Amount (₹)
A	80	20	1,600	90	18	1,620
B	120	30	3,600	110	34	3,740
Total	200		5,200	200		5,360
Less: Loss	20	–	–	18	–	–
	180		5,200	182		5,360

Std. cost of actual output = ₹ 5,200 × $\frac{182}{180}$ = ₹ 5, 257.78

Calculation of Variances

1. **Material Cost Variance** = (Std. cost of actual output – Actual cost)
   = (5,257.78 – 5,360) = ₹ 102.22 (A)
2. **Material Price Variance** = (SP – AP) × AQ
   Material A = (20 – 18) × 90 = ₹ 180.00 (F)
   Material B = (30 – 34)) × 110 = ₹ 440.00 (A)
   MPV = ₹ 260.00 (A)
3. **Material Usage Variance** = (Std. Quantity for actual output – Actual Quantity) × Std. Price
   Material A = $\left(80 \times \frac{182}{180} - 90\right) \times 20$ = ₹ 182.22 (A)
   Material B = $\left(120 \times \frac{182}{180} - 110\right) \times 30$ = ₹ 340.00 (F)

MUV Check,

MCV ₹ 102.22 (A)

MPV ₹ 260 (A) | MUV ₹ 157.78 (F)

Q4 ICAI Mat

The standard and actual figures of a firm are as under

Standard time for the job	1,000 hours
Standard rate per hour	₹ 50
Actual time taken	900 hours
Actual wages paid	₹ 36,000

CALCULATE the variances.

Reference | What's New

Labour Variances | **LCV, LRV and LEV**

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Answer

	(₹)
(a) Std. labour cost (1,000 hours × ₹ 50)	50,000
(b) Actual wages paid	36,000
(c) Actual rate per hour (₹ 36,000/900 hours)	₹ 40

Variances

(i) **Labour Rate variance** = Actual time (Std. rate – Actual rate)
= 900 hours (₹ 50 – ₹ 40) = ₹ 9,000 (F)

(ii) **Efficiency variance** = Std. rate per hr. (Std. time – Actual time)
= ₹ 50 (1,000 hrs. – 900 hrs.) = ₹ 5,000 (F)

(iii) **Total labour cost variance** = Std. labour cost – Actual labour cost
= {(₹ 50 × 1,000 hours) – ₹ 36,000}
= (₹ 50,000 – ₹ 36,000) = ₹ 14,000 (F)

Q5 ICAI Mat

The standard labour employment and the actual labour engaged in a week for a job are as under:

	Skilled workers	Semi-skilled workers	Unskilled workers
Standard no. of workers in the gang	32	12	6
Actual no. of workers employed	28	18	4

Standard wage rate per hour	3	2	1
Actual wage rate per hour	4	3	2

During the 40 hours working week, the gang produced 1,800 standard labour hours of work.

CALCULATE :

(a) Labour Cost Variance (b) Labour Rate Variance

(c) Labour Efficiency Variance (d) Labour Mix Variance

(e) Labour Yield Variance

Reference | What's **New**

Labour Variances | **LMV and LYV**

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Answer

Workings:

1. **Standard hours (SH) for actual hours produced are calculated as below:**

Skilled = $\frac{1,800}{2,000} \times 1,280 = 1,152$ hrs.

Semi-skilled = $\frac{1,800}{2,000} \times 480 = 432$ hrs.

Unskilled = $\frac{1,800}{2,000} \times 240 = 215$ hrs.

2. **Actual hours (AH) paid are calculated as below:**

Category	No. of Worker	Hours in a week	Total Hours
Skilled	28	40	1,120
Semi-skilled	18	40	720
Unskilled	4	40	160
			2,000

3. **For 40 hours week total Revised Standard Hours (RSH) will be calculated as below:**

Category	No. of Worker	Hours in a week	Total Hours
Skilled	32	40	1,280
Semi-skilled	12	40	480
Unskilled	6	40	240
			2,000

Calculations

Category of workers	SH × SR	AH × SR	AH × AR	RSH × SR
Skilled	1,152 × 3 = 3,456	1,120 × 3 = 3,360	1,120 × 4 = 4,480	1,280 × 3 = 3,840
Semi-skilled	432 × 2 = 864	720 × 2 = 1,440	720 × 3 = 2,160	480 × 2 = 960
Unskilled	216 × 1 = 216	160 × 1 = 160	160 × 2 = 320	240 × 1 = 240
Total	₹ 4,536	₹ 4,960	₹ 6,960	₹ 5,040

(i) **Labour Cost Variance** = Std. Cost for hours worked – Actual cost paid
= (SH × SR) – (AH × AR)
= ₹ 4,536 – 6,960 = ₹ 2,424 (A)

(ii) **Labour Rate Variance** = AH (SR – AR) or (AH × SR) – (AH × AR)
Skilled = 3,360 – 4,480 = ₹ 1,120 (A)
Semi-skilled = 1,440 – 2,160 = ₹ 720 (A)
Unskilled = 160 - 320 = ₹ 160 (A) 2,000 (A)

(iii) **Labour Efficiency Variance** = SR (SH – AH) or (SR × SH) – (SR × AH)
Skilled = 3,456 – 3,360 = ₹ 96 (F)
Semi-skilled = 864 – 1,440 = ₹ 576 (A)
Unskilled = 216 - 160 = ₹ 56 (F) ₹ 424 (A)

(iv) **Labour Mix Variance** = SR (RSH – AH) or (SR × RSH) – (SR × AH)
Skilled = 3,840 – 3,360 = ₹ 480 (F)
Semi-skilled = 960 – 1,440 = ₹ 480 (A)
Unskilled = 240 - 160 = ₹ 80 (F) ₹ 80 (F)

(v) **Labour Yield Variance** = SR (SH – RSH) or (SR × SH – SR × RSH)
Skilled = 3,456 - 3,840 = ₹ 384 (A)
Semi-skilled = 864 - 960 = ₹ 96 (A)
Unskilled = 216 - 240 = ₹ 24 (A) ₹ 504 (A)

Check

(i) LCV = LRV + LEV
₹ 2,424 (A) = ₹ 2,000 (A) + ₹ 424 (A)

(ii) LEV = LMV + LYV
₹ 424 (A) = ₹ 80 (F) + ₹ 504 (A)

Q6 ICAI Mat

From the following information of G Ltd., **CALCULATE** (i) Variable Overhead Cost Variance; (ii) Variable Overhead Expenditure Variance and (iii) Variable Overhead Efficiency Variance:

Budgeted production	6,000 units
Budgeted variable overhead	₹ 1,20,000
Standard time for one unit of output	2 hours
Actual production	5,900 units
Actual overhead incurred	₹ 1,22,000
Actual hours worked	11,600 hours

Reference | What's **New**

Variable Overhead Variances | **Cost, Expenditure and Efficiency**

Watch **Video** Scan Me

Answer

Workings:

1. Standard cost per unit = $\frac{₹\,1,20,000}{60,000\ \text{units}} = ₹\,20$

2. Standard cost per hour = $\frac{₹\,1,20,000}{60,000\ \text{units} \times 2\ \text{hours}} = ₹\,10$

(i) **Variable Overhead Cost Variance:**

= Std. Overhead for actual production – Actual overhead incurred

= ₹ 20 × 5,900 units – ₹ 1,22,000 = ₹ 4,000 (A)

(ii) **Variable Overhead Expenditure Variance:**

= Std. overhead for Actual hours – Actual Overhead

= ₹ 10 ×11,600 hours - ₹ 1,22,000 = ₹ 6,000 (A)

(iii) **Variable Overhead Efficiency Variance:**

= Std. rate per hour × (Std. hours for actual production – Actual hours)

= ₹ 10 (2 hours × 5,900 units – 11,600 hours) = ₹ 2,000 (F)

Q7 ICAI Mat

The cost detail of J&G Ltd. for the month of September, 20X8 is as follows:

	Budgeted	Actual
Fixed overhead	₹ 15,00,000	₹ 15,60,000
Units of production	7,500	7,800
Standard time for one unit	2 hours	-
Actual hours worked	-	16,000 hours

Required:

CALCULATE (i) Fixed Overhead Cost Variance (ii) Fixed Overhead Expenditure Variance (iii) Fixed Overhead Volume Variance (iv) Fixed Overhead Efficiency Variance and (v) Fixed Overhead Capacity Variance.

Reference | What's **New**

Fixed Overhead Variances | **All variances**

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Answer

(i) **Fixed Overhead Cost Variance:**

= Overhead absorbed for actual production – Actual overhead incurred

$$= \left(\frac{₹\,15,00,000}{7,500} \times 7,800\right) - ₹\,15,60,000 = 0$$

(ii) **Fixed Overhead Expenditure Variance:**

= Budgeted overhead – Actual overhead

= ₹ 15,00,000 - ₹ 15,60,000 = ₹ 60,000 (A)

(iii) **Fixed Overhead Volume Variance:**

= Absorbed overhead – Budgeted overhead

$$= \left(\frac{₹\,15,00,000}{7,500} \times 7,800\right) - ₹\,15,00,000 = ₹\,60,000\,(F)$$

(iv) **Fixed Overhead Efficiency Variance:**

= Std. Rate (Std. hours for actual production - Actual hours)

$$= \frac{₹\,15,00,000}{7,500 \times 2} \times \{(2 \text{ hours} \times 7,800 \text{ hours}) - 16,000 \text{ hours}\}$$

= ₹ 100 (15,600 -16,000) = ₹ 40,000 (A)

(v) **Fixed Overhead Capacity Variance:**

= Std. Rate (Actual hours - Budgeted hours)

$= \frac{₹\,15,00,000}{7,500 \times 2} \times$ (16,000 hours -15,000 hours}

= ₹ 100 (16,000- 15,000) = ₹ 1,00,000 (F)

Q8 ICAI Mat

The overhead expense budget for a factory producing to a capacity of 200 units per month is as follows:

Description of overhead	Fixed cost per unit in (₹)	Variable cost per unit in (₹)	Total cost per unit in (₹)
Power and fuel	1,000	500	1,500
Repair and maintenance	500	250	750
Printing and stationary	500	250	750
Other overheads	1,000	500	1,500
	₹ 3,000	₹ 1,500	₹ 4,500

The factory has actually produced only 100 units in a particular month. Details of overheads actually incurred have been provided by the accounts department and are as follows:

Description of overhead	Actual cost
Power and fuel	₹ 4,00,000
Repair and maintenance	₹ 2,00,000
Printing and stationary	₹ 1,75,000
Other overheads	₹ 3,75,000

You are required to **CALCULATE** the Overhead Volume Variance and the Overhead Expense Variances.

Reference | What's **New**

Total Overhead Variances | **Volume and Expense variance**

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Answer

Overheads Volume Variance (in case of fixed overhead):

Standard fixed overheads per unit (SR) : ₹ 3,000 (Given)

Actual production : 100 units

Standard production (capacity) : 200 units

Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted Overhead

= (₹ 3,000 × 100 units) – (₹ 3,000 × 200 units)

= ₹ 3,00,000 - ₹ 6,00,000 = ₹ 3,00,000 (Adverse)

Overhead Expense Variances

For variable overhead:

= AQ (SR – AR)

= 100 units (₹ 1,500 - ₹ 1,500) = Nil

For Fixed Overhead:

= Budgeted Overhead – Actual Overhead

= (₹ 3,000 × 200 units) – (Total overhead – Variable overhead)

= (₹ 3,000 × 200 units) – (₹ 11,50,000 - ₹ 1,500 ×100 units)

= ₹ 6,00,000 – (₹ 11,50,000 - ₹ 1,50,000)

= ₹ 6,00,000 – ₹ 10,00,000 = ₹ 4,00,000 (Adverse)

Q 9 ICAI Mat

The following information was obtained from the records of a manufacturing unit using standard costing system.

	Standard	Actual
Production	4,000 units	3,800 units
Working days	20	21
Machine hours	8,000 hours	7,800 hours
Fixed Overhead	₹ 4,00,000	₹ 3,90,000
Variable Overhead	₹ 1,20,000	₹ 1,20,000

You are required to **CALCULATE** the following overhead variance:

(a) Variable overhead variances

(b) Fixed overhead variances

Reference What's **New**

Variable Overhead Variances and Fixed Overhead Variances

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Answer

(a) **Variable Overhead Variances**

(i) **Variable Overhead Variance:**

= Std. overhead for actual production – Actual overhead

$$= \left(\frac{₹\,1,20,000}{4,000\ \text{units}} \times 3,800\ \text{units}\right) - ₹\,1,20,000$$

= ₹ 1,14,000 – ₹ 1,20,000 = ₹ 6,000 (A)

(ii) **Variable Overhead Expenditure Variance:**

= Std. overhead for actual hours – Actual overhead

$$= \left(\frac{₹\,1,20,000}{8,000\ \text{hours}} \times 7,800\ \text{hours}\right) - ₹\,1,20,000$$

= ₹ 15 × 7,800 hours - ₹ 1,20,000 = ₹ 3,000 (A)

(iii) **Variable Overhead Efficiency Variance:**

= Std. Rate per hour (Std. hours for actual production – Actual hours)

$$= \frac{₹\,1,20,000}{8,000\ \text{hours}} \times \left[\left(\frac{8,000\ \text{hours}}{4,000\ \text{units}} \times 3,800\ \text{units}\right) - 7,800\ \text{hours}\right]$$

= ₹ 15 × (7,600 hours – 7,800 hours) = ₹ 3,000 (A)

(b) **Fixed Overhead Variance:**

(i) **Fixed Overhead Variance:**

= Absorbed overhead – Actual overhead

= {(SR × SH) – (AR × AH)}

$$= \left(\frac{₹\,4,00,000}{4,000\ \text{units}} \times 3,800\ \text{units}\right) - ₹\,3,90,000$$

= ₹ 3,80,000 - ₹ 3,90,000 = 10,000 (A)

(ii) **Fixed Overhead Expenditure Variance:**

= Budgeted Overhead – Actual Overhead

= ₹ 4,00,000 - ₹ 3,90,000 = ₹ 10,000 (F)

(iii) **Fixed Overhead Volume Variance:**

= Absorbed overhead – Budgeted Overhead

$$= \left(\frac{₹\,4,00,000}{4,000\ \text{units}} \times 3,800\ \text{units}\right) - ₹\,4,00,000$$

= ₹ 3,80,000 - ₹ 4,00,000 = ₹ 20,000 (A)

(iv) **Fixed Overhead Efficiency Variance:**

= SR × (Std. hours for actual production – Actual hours)

= ₹ 50 × {(2 hours × 3,800 units) – 7,800 hours}

= ₹ 3,80,000 - ₹ 3,90,000 = ₹ 10,000 (A)

(v) **Fixed Overhead Capacity Variance:**

= SR × (Actual hours – Revised budgeted hours)

$$= ₹\,50 \times \left[7{,}800\ \text{hours} - \frac{8{,}000}{20\ \text{days}} \times 21\ \text{days}\right]$$

= ₹ 50 × (7,800 hours – 8,400 hours) = ₹ 30,000 (A)

(vi) **Fixed Overhead Calendar Variance:**

= Rate per day (Budgeted days – Actual days)

$$= \frac{₹\,4{,}00{,}000}{20\ \text{days}} \times (20\ \text{days} - 21\ \text{days}) = ₹\,20{,}000\ (F)$$

Q10 ICAI Mat

For making 10 kg. of CEMCO, the standard material requirements is:

Material	Quantity	Rate per kg. (₹)
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. (₹)
A	750	7.00
B	500	5.00

CALCULATE (A) Material Cost Variance; (b) Material Price Variance; (c) Material Usage Variance.

Reference

Material Variance

What's **New**

MUV, MPV and MCV

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Answer

Basic Calculations

	Standard for 1,000 kg.			Actual for 1,000 kg.		
	Qty.	Rate	Amount	Qty.	Rate	Amount
	Kg.	(₹)	(₹)	Kg.	(₹)	(₹)
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 = 800B – 4÷10 × 1000 = 400)

Calculation of Variances:

(a) **Material Cost Variance** = Std. cost for actual output – Actual cost

MCV = 6,400 – 7,750 = ₹ 1, 350 (A)

(b) **Material Price Variance** = (SP – AP) × AQ

A = (6 – 7) × 750 = ₹ 750 (A)

B = (4 – 5) × 500 = ₹ 500 (A)

MPV = ₹ 1,250 (A)

(c) **Material Usage Variance** = (SQ – AQ) × SP

A = (800 – 750) × 6= ₹ 300 (F)

B = (400 – 500) × 4= ₹ 400 (A)

MUV = ₹ 100 (A)

Check

MCV = MPV + MUV

1,350 (A) = 1,250 (A) + 100 (A)

Q11 ICAI Mat

The standard mix to produce one unit of a product is as follows:

Material X	60	units @ ₹ 15 per unit	900
Material Y	80	units @ ₹ 20 per unit	1,600
Material Z	100	units @ ₹ 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 @ ₹ 17.50 per unit	11,200
Material Y	950	units @ ₹ 18.00 per unit	17,100
Material Z	870	units @ ₹ 27.50 per unit	23,925
	2,460	units	52,225

CALCULATE all material variances.

Reference	What's New
Material Variance	**All variances**

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Answer

Material	Standard for 10 units			Actual for 10 units		
	Qty. units	Rate (₹)	Amount (₹)	Qty. units	Rate (₹)	Amount (₹)
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
   = ₹ 50,000 – ₹ 52,225
   MCV = ₹ 2,225 (A)
2. **Material Price Variance** = (Std. Price – Actual Price) × Actual Qty.
   Material X = (15 – 17.50) × 640 = ₹ 1,600 (A)
   Material Y = (20 – 18) × 950 = ₹ 1,900 (F)
   Material Z = (25 – 27.50) × 870 = ₹ 2,175 (A)
   MPV = ₹ 1,875 (A)
3. **Material Usage Variance** = (Std. Qty. – Actual Qty.) × Std. Price
   Material X = (600 – 640) × 15 = ₹ 600 (A)
   Material Y = (800 – 950) × 20 = ₹ 3,000 (A)
   Material Z = (1,000 – 870) × 25 = ₹ 3,250 (F)
   MUV = ₹ 350 (A)

   Check MCV = MPV + MUV
   ₹ 2,225 (A) = ₹ 1,875 (A) + ₹ 350 (A)
4. **Material Mix Variance** = (Revised Std. Qty. – Actual Qty.) × Std. Price
   Material X = (615* – 640) × 15 = ₹ 375 (A)
   Material Y = (820* – 950) × 20 = ₹ 2,600 (A)
   Material Z = (1,025 – 870) × 25 = ₹ 3,875 (F)
   MMV = ₹ 900 (F)

*Revised Standard Quantity (RSQ) is calculated as follows:

Material X $= \frac{2,460}{2,400} \times 600 = 615$ units

Material Y $= \frac{2,460}{2,400} \times 800 = 820$ units

Material Z $= \frac{2,460}{2,400} \times 1,000 = 1,025$ units

5. **Material Yield Variance** = (Std. Qty - Revised Std. Qty.) × Std. Price

Material X = (600 - 615) × 15 = ₹ 225 (A)

Material Y = (800 - 820) × 20 = ₹ 400 (A)

Material Z = (1,000 - 1,025) × 25 = ₹ 625 (A)

MYV = ₹ 1,250 (A)

Check

MUV = MMV + MYV (Or MRUV)

₹ 350 (A) = ₹ 900 (F) + ₹ 1,250 (A)

or

MCV = MPV + MMV + MYV (Or MRUV)

₹ 2,225 (A) = ₹ 1,875 (A) + ₹ 900 (F) + ₹ 1,250 (A)

Q12 ICAI Mat

The following standards have been set to manufacture a product:

	(₹)
Direct Material:	
2 units of A @ ₹ 4 per unit	8.00
3 units of B @ ₹ 3 per unit	9.00
15 units of C @ ₹ 1 per unit	15.00
	32.00
Direct Labour: 3 hours @ ₹ 8 per hour	24.00
Total standard prime cost	56.00

The company manufactured and sold 6,000 units of the product during the year. Direct material costs were as follows:

12,500 units of A at ₹ 4.40 per unit

18,000 units of B at ₹ 2.80 per unit

88,500 units of C at ₹ 1.20 per unit

The company worked 17,500 direct labour hours during the year. For 2,500 of these hours, the company paid at ₹ 12 per hour while for the remaining, the wages were paid at standard rate.

CALCULATE (i) Materials Price Variance & Usage Variance and (ii) Labour Rate & Efficiency Variances.

Reference — What's **New**

Material and Labour Variances

Watch **Video**

Scan Me

Answer

For Material Cost Variances

	SQ × SP	AQ × AP	AQ × SP
A	12,000 × 4 = 48,000	12,500 × 4.40 = 55,000	12,500 × 4 = 50,000
B	18,000 × 3 = 54,000	18,000 × 2.80 = 50,400	18,000 × 3 = 54,000
C	90,000 × 1 = 90,000	88,500 × 1.20 = 1,06,200	88,500 × 1 = 88,500
Total	₹ 1,92,000	₹ 2,11,600	₹ 1,92,500

Variances:

Material Price Variance = Actual quantity (Std. price – Actual price)

Or, = (AQ × SP) – (AQ × AP)

Or, = ₹ 1,92,500 – ₹ 2,11,600

= ₹ 19,100 (A)

Material Usage Variance = Standard Price (Std. Quantity – Actual Quantity)

Or, = (SP × SQ) – (SP × AQ)

Or, = ₹ 1,92,000 – ₹ 1,92,500 = ₹ 500 (A)

For Labour Cost Variance :

	SH × SR	AH × AR	AH × SR
Labour	(6,000 × 3) × ₹ 8 = 1,44,000	2,500 × 12 = 30,000 15,000 × 8 = 1,20,000	17,500 × 8 = 1,40,000
Total	₹ 1,44,000	₹ 1,50,000	₹ 1,40,000

Variances:

Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)

Or, = (AH × SR) – (AH × AR)

Or, = ₹ 1,40,000 – ₹ 1,50,000

= ₹ 10,000 (A)

Labour Efficiency Variance = Standard Rate (Std. Hours – Actual Hours)

Or, = (SR × SH) – (SR × AH)

Or, = ₹ 1,44,000 – ₹ 1,40,000

= ₹ 4,000 (F)

Q13 ICAI Mat

XYZ Company has established the following standards for factory overheads.

Variable overhead per unit: ₹ 10/-

Fixed overheads per month: ₹ 1,00,000

Capacity of the plant 20,000 units per month.

The actual data for the month are as follows:

Actual overheads incurred: ₹ 3,00,000

Actual output (units): 15,000 units

Required:

CALCULATE overhead variances viz :

(i) Production volume variance

(ii) Overhead expense variance

Reference

Total Overhead Variances

What's **New**

Volume and Expense variance

Watch **Video**

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Answer

Production/ Overhead volume variance (only for fixed overhead)

Fixed Overhead Volume Variance = Absorbed overhead – Budgeted Overhead

= (₹ 5 × 15,000 units) – (₹ 5 × 20,000 units)

= ₹ 75,000 - ₹ 1,00,000 = ₹ 25,000 (Adverse)

Overhead expense variances

For variable overhead = AQ (SR – AR)

= 15,000 units (₹ 10 - ₹ 10) = Nil

For fixed overhead = Budgeted Overhead – Actual Overhead

= (₹ 5 × 20,000 units) – (Total overhead – Variable overhead)

= (₹ 5 × 20,000 units) – (₹ 3,00,000 - ₹ 10 ×15,000 units)

= ₹ 1,00,000 – (₹ 3,00,000 - ₹ 1,50,000)

= ₹ 1,00,000 – ₹ 1,50,000 = ₹ 50,000 (Adverse)

Q14 ICAI Mat

A company has a normal capacity of 120 machines, working 8 hours per day for 25 days in a month. The fixed overheads are budgeted at ₹ 1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.

In April, 20X2, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output. The actual fixed overheads were ₹ 1,42,000.

CALCULATE:

(i) Expense variance

(ii) Volume variance

(iii) Total Fixed Overheads Variance.

Reference — What's **New**

Fixed Overhead Variances

Watch **Video**

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Answer

Working Notes:

		Budget	Actual
1.	Working hours per month	24,000	20,160
2.	Production units per month = (Budget 24,000 ÷ 4 hrs, Actual given)	6,000	5,305
3.	Standard fixed overhead rate per unit = ₹ 1,44,000 ÷ 6,000 = ₹ 24		
4.	Standard fixed overhead rate per hour = ₹ 1,44,000 ÷ 24,000 = ₹ 6		
5.	Standard fixed overhead rate per day = ₹ 1,44,000 ÷ 25 = ₹ 5,760		

Fixed Overhead Variances:

Actual Fixed overhead incurred = ₹ 1,42,000 (given)

Budgeted fixed overhead for the period = ₹ 1,44,000.

Standard fixed overhead for actual production

= (Standard output for actual time × Standard Fixed Overhead per unit)

= 5,305 × ₹ 24 = ₹ 1,27,320.

Variances:

(i) **F.O. Expenditure Variance** = (Budgeted fixed overhead – Actual fixed overhead)
= 1,44,000 – 1,42,000 = ₹ 2,000 (F)

(ii) **Total Volume Variance** = (Standard fixed overhead – Budgeted fixed overhead)
= 1,27,320 – 1,44,000 = ₹ 16,680 (A)

(iii) **Fixed overhead variance** = (Standard fixed overhead – Actual Fixed overhead)
= 1,27,320 – 1,42,000 = ₹ 14,680 (A)

Q15 ICAI Mat

Following information is available from the records of a factory:

	Budget	Actual
Fixed overhead for June, 20X2	₹ 10,000	₹ 12,000
Production in June, 20X2 (units)	2,000	2,100
Standard time per unit (hours)	10	–
Actual hours worked in June	–	21,000

CALCULATE:

(i) Fixed Overhead Cost Variance,

(Ii) Expenditure Variance,

(Iii) Volume Variance.

Reference | What's **New**

Fixed Overhead Variances

Watch **Video**

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Answer

For fixed overhead variances:

Actual F.O. incurred (given)	₹ 12,000
Budgeted F.O. for the period	₹ 10,000
Standard F.O. for production (Standard output for actual time × Standard Fixed Overhead per unit) (2,100 units × {₹ 10,000 ÷ 2,000 units})	₹ 10,500

(i) **Fixed Overhead Variance** = Standard F.O. – Actual F.O.
= ₹ 10,500 – ₹ 12,000
= ₹ 1,500 (A)

(ii) **F.O. Expenditure Variance** = Budgeted F.O – Actual F.O.
= ₹ 10,000 – ₹ 12,000
= ₹ 2,000 (A)

(iii) **F.O. Volume Variance** = Standard F.O – Budgeted F.O.
= ₹ 10,500 – ₹ 10,000
= ₹ 500 (F)

Q16 ICAI Mat

XYZ Ltd. has furnished you the following information for the month of August, 20X2:

	Budget	Actual
Output (units)	30,000	32,500
Hours	30,000	33,000
Fixed overhead	₹ 45,000	₹ 50,000
Variable overhead	₹ 60,000	₹ 68,000
Working days	25	26

CALCULATE overhead variances.

Reference

Variable Overhead Variances and Fixed Overhead Variances

What's **New**

Watch **Video**

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Answer

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 $= \frac{\text{Budgeted overhead}}{\text{Budgeted hours}}$

For fixed overhead $= \frac{45,000}{30,000} =$ ₹ 1.50 per hour

For variable overhead $= \frac{60,000}{30,000} =$ ₹ 2 per hour

Std. F.O. rate per day = ₹ 45,000 ÷ 25 days = ₹ 1,800

Recovered overhead = Std. hrs. for actual output × St. rate

For fixed overhead = 32,500 hrs. × ₹ 1.50 = ₹ 48,750

For variable overhead = 32,500 hrs. × ₹ 2 = ₹ 65,000

Standard overhead = Actual hours × Std. rate

For fixed overhead = 33,000 × 1.50 = ₹ 49,500

For variable overhead = 33,000 × 2 = ₹ 66,000

Revised budget hours $= \frac{\text{Budgeted hours}}{\text{Budgeted days}} \times \text{Actual days}$

$= \frac{30,000}{25} \times 26 = 31,200 \text{ hours}$

Revised budgeted overhead (for fixed overhead) = 31,200 × 1.50 = ₹ 46,800

Calculation of variances

Fixed Overhead Variances:

(i) **F.O. Cost Variance** = Recovered Overhead – Actual Overhead
= ₹ 48,750 – ₹ 50,000
= ₹ 1,250 (A)

(ii) **F.O. Expenditure Variance** = Budgeted Overhead – Actual Overhead
= ₹ 45,000 – ₹ 50,000
= ₹ 5,000 (A)

(iii) **F.O. Volume Variance** = Recovered Overhead – Budgeted Overhead
= ₹ 48,750 – ₹ 45,000
= ₹ 3,750 (F)

(iv) **F.O. Efficiency Variance** = Recovered Overhead – Standard Overhead
= ₹ 48,750 – ₹ 49,500
= ₹ 750 (A)

(v) **F.O. Capacity Variance** = Standard Overhead- Revised Budgeted Overhead
= ₹ 49,500 – ₹ 46800
= ₹ 2,700 (F)

(v) **Calendar Variance** = (Actual Days – Budget Days) × St. rate per day.
= (26 – 25) × 1,800
= ₹ 1,800 (F)

Variable Overhead Variances:

(i) **V.O. Cost variance** = Recovered Overhead – Actual Overhead
= ₹ 65,000 – ₹ 68,000 = ₹ 3,000 (A)

(ii) **V.O. Expenditure Variance** = Standard Overhead – Actual Overhead
= ₹ 66,000 – ₹ 68,000 = ₹ 2,000 (A)

(iii) **V.O. Efficiency Variance** = Recovered Overhead – Standard Overhead
= ₹ 65,000 – ₹ 66,000 = ₹ 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 = VarianceEfficiency+VarianceCapacity+VarianceCalendar
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).

Q17 ICAI Mat

S.V. Ltd. has furnished the following data:

	Budget	Actual, July (20X2)
No. of working days	25	27
Production in units	20,000	22,000
Fixed overheads	₹ 30,000	₹ 31,000

Budgeted fixed overhead rate is ₹ 1.00 per hour. In July, 20X2, the actual hours worked were 31,500.

CALCULATE the following variances:

(i) Volume variance.

(ii) Expenditure variance.

(iii) Total overhead variance.

Reference What's **New**

Fixed Overhead Variances

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Answer

For Fixed Overhead Variances

Actual fixed overhead incurred	₹ 31,000
Budgeted fixed overhead for the period	₹ 30,000
Standard fixed overhead for production (Standard output for actual time × Standard Fixed Overhead per unit) (₹ 30,000 ÷ 20,000 units) × 22,000	₹ 33,000

Computation of Variances:

(i) **Fixed overhead expenditure variance:**

= Budgeted fixed overhead – Actual fixed overhead

= ₹ 30,000 – ₹ 31,000 = ₹ 1,000 (A)

(ii) **Fixed overhead volume variance:**

= Standard fixed overhead – Budgeted fixed overhead

= ₹ 33,000 – ₹ 30,000 = ₹ 3,000 (F)

(iii) **Fixed overhead variance:**

= Standard fixed overhead – Actual fixed overhead

= ₹ 33,000 – ₹ 31,000 = ₹ 2,000 (F)

Q18 ICAI Mat

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	₹ 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	₹ 1,56,000

CALCULATE fixed overhead variances:

(a) Expenditure Variance

(b) Volume Variance,

(c) Fixed Cost Variance.

Reference | What's New

Fixed Overhead Variances

Watch **Video** Scan Me

Answer

For Fixed overheads Variances:

Actual fixed overhead incurred	₹ 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) × (₹ 1,50,000 ÷ 1,50,000 units)	₹ 1,53,090

(a) **Fixed Overhead Expenditure Variance**

= Budgeted fixed overhead – Actual fixed overhead

= ₹ 1,50,000 – ₹ 1,56,000 = ₹ 6,000 (A)

(b) **Fixed Overhead Volume Variance**

= Standard fixed overhead – Budgeted fixed overhead

= ₹ 1,53,090 – ₹ 1,50,000 = ₹ 3,090 (F)

(c) **Fixed Overhead Variance**

= Standard fixed overhead – Actual fixed overhead

= ₹ 1,53,090 – ₹ 1,56,000 = ₹ 2,910 (A)

Q19 ICAI Mat

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 April, 20X2, 60 batches were prepared to produce an output of 5,600 kg. of NXE. The standard and actual particulars for April, 20X2, are as follows :

Raw Materials	Standard		Actual		Quantity of Raw Materials Purchased
	Mix (%)	Price per kg. (₹)	Mix (%)	Price per Kg. (₹)	(Kg.)
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

CALCULATE all variances.

Reference | What's New

Material Variances | **Standard and actual mix**

Watch Video

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Answer

Actual material used = 125 kg × 60 = 7,500 kg.

Actual cost of actual material used (AQ × AR)	(₹)
A (60%) 4,500 kg × ₹ 21	94,500
B (20%) 1,500 kg × ₹ 8	12,000
C (20%) 1,500 kg × ₹ 6	9,000
7,500 kg	1,15,500

Standard cost of actual material used (AQ × SR)	(₹)
A (4,500 kg × ₹ 20)	90,000
B (1,500 kg × ₹ 10)	15,000
C (1,500 kg × ₹ 5)	7,500
7,500 kg	1,12,500

Standard cost of material, if it had been used in standard proportion (Standard Proportion × Standard Rate)

	(₹)
A (50%) 3,750 kg × ₹ 20	75,000
B (30%) 2,250 kg × ₹ 10	22,500
C (20%) 1,500 kg × ₹ 5	7,500
7,500 kg	1,05,000

Standard cost of production (SQ for actual production × SR)	(₹)
Standard cost of output for 100 kg:	
A (62.50 kg × ₹ 20)	1,250
B (37.50 kg × ₹ 10)	375
C (25.00 kg × ₹ 5)	125
125.00 kg	1,750

Standard cost for output of 5,600 kg.

$= \frac{1,750}{100}$ kg × 5,600 kg. = ₹ 98,000

Material Price Variance = Standard cost of actual material used – Actual cost of actual material used = ₹ 1,12,500 – ₹ 1,15,500 = ₹ 3,000 (A)

Material Usage Variance = Standard cost of production – Standard cost of actual material used
= ₹ 98,000 – ₹ 1,12,500 = ₹ 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 × ₹ 21	₹ 1,05,000
B 2,000 kg × ₹ 8	₹ 16,000
C 1,200 kg × ₹ 6	₹ 7,200
	1,28,200

Standard cost of material purchased

A 5,000 kg × ₹ 20	₹ 1,00,000
B 2,000 kg × ₹ 10	₹ 20,000
C 1,200 kg × ₹ 5	₹ 6,000
	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

= ₹ 1,26,000 – ₹ 1,28,200 = ₹ 2,200 (A)

Q20 RTP May'18; RTP May'19; RTP May'20

ABC Ltd. had prepared the following estimation for the month of April:

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	45.00	36,000
Material-B	600 kg.	30.00	18,000
Skilled labour	1,000 hours	37.50	37,500
Unskilled labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

The company has produced 1,480 kg. finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	43.00	38,700
Material-B	650 kg.	32.50	21,125

Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

Required:

CALCULATE:

(i) Material Cost Variance;

(ii) Material Price Variance;

(iii) Material Mix Variance;

(iv) Material Yield Variance;

(v) Labour Cost Variance;

(vi) Labour Efficiency Variance and

(vii) Labour Yield Variance.

Reference — What's **New**

Material and Labour Variance

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Answer

Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	45.00	42,300	886 kg.	39,870	900 kg.	40,500	43.00	38,700
B	705 kg.	30.00	21,150	664 kg.	19,920	650 kg.	19,500	32.50	21,125
	1645 kg		63,450	1550 kg	59,790	1550 kg	60,000		59,825

WN-1: Standard Quantity (SQ):

Material A - $\left(\frac{800\text{ kg.}}{0.9\times 1,400\text{ kg.}}\times 1,480\text{ kg.}\right) = 939.68$ or 940 kg.

Material B- $\left(\frac{600\text{ kg.}}{0.9\times 1,400\text{ kg.}}\times 1,480\text{ kg.}\right) = 704.76$ or 705 kg.

WN- 2: Revised Standard Quantity (RSQ):

Material A - $\left(\frac{800\text{ kg.}}{1,400\text{ kg.}}\times 1,550\text{ kg.}\right) = 885.71$ or 886 kg.

Material B - $\left(\frac{600\text{ kg.}}{1,400\text{ kg.}} \times 1,550\text{ kg.}\right)$ = 664.28 or 664 kg.

(i) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
= {63,450 – 59,825} = 3,625 (F)

(ii) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)
= {60,000 – 59,825} = 175 (F)

(iii) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
= {59,790 – 60,000} = 210 (A)

(iv) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
= {63,450 – 59,790} = 3,660 (F)

Labour Variances:

Labour	SH (WN-3)	SR (₹)	SH × SR (₹)	RSH (WN-4)	RSH × SR (₹)	AH	AH × SR (₹)	AR (₹)	AH × AR (₹)
Skilled	1,116 hrs	37.50	41,850	1144	42,900	1,200	45,000	35.50	42,600
Unskilled	893 hrs	22.00	19,646	916	20,152	860	18,920	23.00	19,780
	2,009 hrs		61,496	2,060	63,052	2,060	63,920		62,380

WN- 3: Standard Hours (SH):

Skilled labour - $\left(\frac{0.95 \times 1,000\text{ hr.}}{0.90 \times 1,400\text{ kg.}} \times 1,480\text{ kg.}\right)$ =1,115.87 or 1,116 hrs.

Unskilled labour - $\left(\frac{0.95 \times 800\text{ hr.}}{0.90 \times 1,400\text{ kg.}} \times 1,480\text{ kg.}\right)$ = 892.69 or 893 hrs.

WN- 4: Revised Standard Hours (RSH):

Skilled labour - $\left(\frac{1,000\text{ hr.}}{1,800\text{ hr.}} \times 2,060\text{ hr.}\right)$ = 1,144.44 or 1,144 hrs.

Unskilled labour - $\left(\frac{800\text{ hr.}}{1,800\text{ hr.}} \times 2,060\text{ hr.}\right)$ = 915.56 or 916 hrs.

(v) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
= {61,496 – 62,380} = 884 (A)

(vi) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
= {61,496 – 63,920} = 2,424 (A)

(vii) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}
= {61,496 – 63,052} = 1,556 (A)

Q 21 MTP Mar'18

The standard labour employment and the actual labour engaged in a week for a job are as follows:

	Skilled Workers	Semi-skilled Workers	Un-Skilled workers
Standard number of workers in the gang	32	12	6
Standard wage rate per hour (₹)	30	20	10
Actual number of workers employed in the gang during the week	28	18	4
Actual wages rate per hour (₹)	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. (10 Marks)

Reference

Labour Variance

What's **New**

Standard hours produced

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Answer

Work produced by the gang 1,800 standard labour hours, i.e.,

$\frac{1,800}{32+12+6}$ or 36 gang hours

Standard hours of Skilled Labour (36 × 32)	1,152 hours
Standard hours of Semi-skilled Labour (36 × 12)	432 hours
Standard hours of Un-skilled Labour (36 × 6)	216 hours
Total	1,800 hours
Actual hours of Skilled Labour (40 × 28)	1,120 hours
Actual hours of Semi-skilled Labour (40 × 18)	720 hours
Actual hours of Un-skilled Labour (40 × 4)	160 hours
Total	2,000 hours

Revised Standard hours (actual hours worked expressed in standard ratio)

Skilled Labour $\frac{1,152}{1,800} \times 2,000$	1,280 hours
Semi-skilled Labour $\frac{432}{1,800} \times 2,000$	480 hours
Unskilled Labour $\frac{216}{1,800} \times 2,000$	240 hours
	2,000 hours

Standard Cost for Actual Output:

		₹
Skilled Labour	1,152 hours @ ₹ 30	34,560
Semi-skilled Labour	432 hours @ ₹ 20	8,640
Unskilled Labour	216 hours @ ₹ 10	2,160
	1,800 hours	45,360

Actual Cost:

Skilled Labour	1,120 hours @ ₹ 34	38,080
Semi-skilled Labour	720 hours @ ₹ 23	16,560
Unskilled Labour	160 hours @ ₹ 12	1,920
	2,000 hours	56,560

(i) **Total Labour Cost Variance**

Standard Cost- Actual Cost = ₹ 45,360 - ₹ 56,560 11,200 (A)

(ii) **Labour Yield Variance:**

(Standard hours for Actual Output - Revised Standard hours) × Standard Rate

Skilled	(1,152 - 1,280) × ₹ 30	3,840 (A)	
Semi -skilled	(432 - 480) × ₹ 20	960 (A)	
Un-skilled	(216 - 240) × ₹ 10	240 (A)	
		5,040 (A)	5,040 (A)

(iii) **Labour Mix Variance:**

(Revised Standard Hours - Actual Hours) × Standard Rate

Skilled	(1,280 - 1,120) × ₹ 30	4,800 (F)	
Semi-skilled	(480-720) × ₹ 20	4,800(A)	
Un-skilled	(240-160) × ₹ 10	800 (F)	
		800(F)	800 (F)

(iv) **Labour Wage Rate Variance:**

(Standard Rate - Actual Rate) × Actual Hours

Skilled	(₹ 30 - ₹ 34) × 1,120	4,480 (A)	
Semi-skilled	(₹ 20 - ₹ 23) × 720	2,160 (A)	
Un-skilled	(₹ 10 - ₹ 12) × 160	320 (A)	
		6,960 (A)	6,960 (A)

Check : Total Labour Cost Variance = Yield + Mix + Rate 11,200 (A)

Q22 May'18

Beta Ltd. is manufacturing Product N. This is manufactured by mixing two materials namely Material P and Material Q. The Standard Cost of Mixture is as under:

Material P 150 ltrs. @ ₹ 40 per ltr.

Material Q 100 ltrs. @ ₹ 60 per ltr.

Standard loss @ 20 of total input is expected during production.

The cost records for the period exhibit following consumption:

Material P 140 ltrs. @ ₹ 42 per ltr,

Material Q 110 ltrs. @ ₹ 56 per ltr,

Quantity produced was 195 ltrs.

Calculate:

(i) Material Cost Variance

(ii) Material Usage Variance.

(iii) Material Price Variance (5 Marks)

Reference | What's **New**

Material Variances

Watch **Video** Scan Me

Answer

Workings:

Take the good output of 195 ltr. The standard quantity of material required for 195 ltr. of output is $\frac{195}{80} \times 100 = 243.75$ ltr.

Statement showing computation of Standard Cost/Actual Cost/ Revised Actual Quantity

Material	Standard Cost			Actual Cost		
	Quantity [SQ] (Kg.)	Rate [SP] (₹)	Amount [SQ × SP] (₹)	Quantity [AQ] (Kg.)	Rate [AP] (₹)	Amount [AQ × AP] (₹)
A (60% of 243.75 ltr.)	146.25	40	5,850.00	140	42	5,880
B (40% of. 243.75 Kg.)	97.50	60	5,850.00	110	56	6,160
	243.75		11,700.00	200		12,040

Note: SQ = Standard Quantity = Expected Consumption for Actual Output
AQ = Actual Quantity of Material Consumed
SP = Standard Price Per Unit
AP = Actual Price Per Unit

Computation of Variances:

Material Cost Variance = SQ × SP – AQ × AP

A = ₹ 146.25 ltr. × ₹ 40– 140 ltr. × ₹ 42 = ₹ 30.00 (A)

B = ₹ 97.50 ltr. × ₹ 60 – 110 ltr. × ₹ 56 = ₹ 310.00 (A)

Total = ₹ 30.00 (A) + ₹ 310.00 (A)
= ₹ 340.00 (A)

Material Usage Variance = SP × (SQ – AQ)

A = ₹ 40 × (146.25 ltr. –140 ltr.) = ₹ 250.00 (F)

B = ₹ 60 × (97.50 ltr. – 110 ltr.) = ₹ 750.00 (A)

Total = ₹ 250.00 (F) + ₹ 750.00 (A)
= ₹ 500.00 (A)

Material Price Variance = AQ × (SP – AP)

A = 140 Kg. × (₹ 40 – ₹ 42) = ₹ 280 (A)

B = 110 Kg. × (₹ 60 – ₹ 56) = ₹ 440 (F)

Total = ₹ 280 (A) + ₹ 440 (F)
= ₹ 160 (F)

Q23 RTP Nov'18

Aaradhya Ltd.manufactures a commercial product for which the standard cost per unit is as follows:

	(₹)
Material:	
5 kg. @ ₹ 4 per kg.	20.00
Labour:	
3 hours @ ₹ 10 per hour	30.00

Overhead	
Variable: 3 hours @ ₹ 1	3.00
Fixed: 3 hours @ ₹ 0.50	1.50
Total	54.50

During Jan. 20X8, 600 units of the product were manufactured at the cost shown below:

	(₹)
Materials purchased:	
5,000 kg. @ ₹ 4.10 per kg.	20,500
Materials used:	
3,500 kg.	
Direct Labour:	
1,700 hours @ ₹ 9	15,300
Variable overhead	1,900
Fixed overhead	900
Total	38,600

The flexible budget required 1,800 direct labour hours for operation at the monthly activity level used to set the fixed overhead rate.

COMPUTE:

(a) Material price variance, (b) Material Usage variance; (c) Labour rate variance; (d) Labour efficiency variance; (e) Variable overhead expenditure variance; (f) Variable overhead efficiency variance; (g) Fixed overhead expenditure variance; (h) Fixed overhead volume variance; (i) Fixed overhead capacity variance; and (j) Fixed overhead efficiency variance.

Also **RECONCILE** the standard and actual cost of production.

Reference | What's **New**

Material, Labour, VOH, FOH and Reconciliation of Standard Cost and Actual Cost

Watch **Video**

Scan Me

Answer

(a) **Material Price variance:**

= (Standard price – Actual Price) × Actual quantity

= (₹ 4 – ₹ 4.10) × 5,000 = ₹ 500 Adv.

(b) **Material Usage variance:**

= (Std. quantity for actual output – Actual qty.) × Std. price

= (600 × 5 – 3,500) × 4 = ₹ 2,000 Adv.

(c) **Labour Rate Variance:**

= (Standard rate – Actual rate) × Actual hours

= (₹ 10 – ₹ 9) × 1,700 = ₹ 1,700 Fav.

(d) **Labour Efficiency Variance:**

= (Standard hours for actual output – Actual hours) × Standard rate

= (600 × 3 – 1,700) × ₹ 10

= ₹ 1,000 Fav.

(e) **Variable Overhead Expenditure Variance**

= (Actual Hours × Standard Rate) – Actual Overhead

= (1,700 × ₹ 1) – ₹ 1,900

= ₹ 200 Adv.

(f) **Variable Overhead Efficiency Variance:**

= Std. hours for actual output – Actual hours) × Std. rate

= (600 × 3 – 1,700) × ₹ 1 = ₹ 100 Fav.

(g) **Fixed Overhead Expenditure Variance:**

= (Budgeted overhead – Actual overhead)

= (1,800 × 0.50 – 900) = Nil

(h) **Fixed Overhead Volume Variance:**

= (Std. hours for actual output – Budgeted hours) × Std. rate

= (600 × 3 – 1,800) × ₹ 0.50 = Nil

(i) **Fixed Overhead Capacity Variance:**

= (Budgeted hours – Actual Hours) × Standard rate

= (1,800 – 1,700) × ₹ 0.50 = ₹ 50 Adv.

(j) **Fixed Overhead Efficiency Variance:**

= (Std. hours for actual output – Actual hours) × Standard rate

= (600 × 3 – 1,700) × ₹ 0.50 = ₹ 50 Fav.

Verification:

	(₹)	(₹)
Overhead recovered: 600 units @ ₹ 4.50		2,700
Actual Overhead:		
Variable	1,900	
Fixed	900	2,800
		100 Adv.

Variable expenditure variance		200 Adv
Variable Efficiency variance		100 Fav.
Fixed expenditure variance		Nil
Fixed overhead volume variance		Nil
		100 Adv.

Reconciliation Statement

Standard Cost: 600 units @ ₹ 54.50		32,700	
Actual Cost:	38,600		
Less: Material Stock at standard cost: (1,500 × ₹ 4)	6,000	(32,600)	100 Fav.

Variances:

	Adv. (₹)	Fav. (₹)	
Material price	500		
Material usage	2,000		
Labour rate		1,700	
Labour efficiency		1,000	
Variable expenditure	200		
Variable efficiency		100	
Total	2,700	2,800	100 Fav.

Q 24 MTP Oct'18

Arnav Ltd. manufactures a product Q, the standard cost of which is as follows:

	Standard Cost per unit (₹)
Direct Material	600
Direct labour:	
- Skilled @ ₹ 80 per hour	120
- Unskilled @ ₹ 60 per hour	90
Variable overheads	75
Fixed overheads	30
	915

During the month just ended 4,000 units of Q were produced. The actual labour cost was as follows.

	Rate per hour (₹)	Cost (₹)
Skilled	87.50	5,77,500
Unskilled	55.00	2,97,000

10% of the labour time was lost due to idle time. The standard idle time was 7.5% of labour time. Arnav Ltd. has budgeted to produce 4,200 units of Q. Arnav Ltd. absorbs its overheads on direct labour hour (effective hours) basis. Actual fixed and variable overheads incurred were ₹ 1,55,000 and ₹ 2,85,000 respectively.

CALCULATE:

(i) Labour rate variance;

(ii) Labour efficiency variance;

(iii) Labour mix variance;

(iv) Labour yield variance;

(v) Labour idle time variance;

(vi) Variable overhead expenditure variance and

(vii) Variable overhead efficiency variance. (10 Marks)

Reference | What's **New**

Labour Variances and Variable Overhead Variances | **Effect of standard and actual idle time**

Watch **Video** Scan Me

Answer

Workings:

	Skilled	Unskilled
Standard Rate per hour	80	60
Standard time for producing one unit	1.5 hours (₹ 120 ÷ ₹ 80)	1.5 hours (₹ 90 ÷ ₹ 60)
Actual hours paid (AH_{Paid})	6,600 hours	5,400 hours
Standard hours required to produce 4,000 units (SH)	6,000 hours (1.5 hours× 4,000 units)	6,000 hours (1.5 hours× 4,000 units)
Actual hours worked (AH_{Worked})	$\frac{6,600}{100} \times 97.5$ = 6,435 hours	$\frac{5,400}{100} \times 97.5$ = 5,265 hours
Revised Std. Hours (RSH)	$\left(\frac{6,600+5,400}{100} \times 97.5\right) \times 0.5$ = 5,850 hours	$\left(\frac{6,600+5,400}{100} \times 97.5\right) \times 0.5$ = 5,850 hours
$Idle\ time_{Abnormal}$	6,600 - 6,435 = 165 hours	5,400 – 5,265 = 135 hours

(i) **Labour Rate Variance** = AH_{Paid}(Std. Rate – Actual Rate)

- Skilled	= 6,600 hours (₹ 80 – ₹ 87.50)	=	₹ 49,500 (A)
- Unskilled	= 5,400 hours (₹ 60 – ₹ 55)	=	₹ 27,000 (F)
		=	₹ 22,500 (A)

(ii) **Labour Efficiency Variance** = Std. Rate (SH – AH_{Worked})

- Skilled	= ₹ 80 (6,000 hours – 6,435 hours)	=	₹ 34,800 (A)
- Unskilled	= ₹ 60 (6,000 hours – 5,265 hours)	=	₹ 44,100 (F)
		=	₹ 9,300 (F)

(iii) **Labour Mix Variance** = Std. Rate (RSH – AH_{Worked})

- Skilled	= ₹ 80 (5,850 hours – 6,435 hours)	=	₹ 46,800 (A)
- Unskilled	= ₹ 60 (5,850 hours – 5,265 hours)	=	₹ 35,100 (F)
		=	₹ 11,700 (A)

(iv) **Labour Yield Variance** = Std. Rate (SH – RSH)

- Skilled	= ₹ 80 (6,000 hours – 5,850 hours)	=	₹ 12,000 (F)
- Unskilled	= ₹ 60 (6,000 hours – 5,850 hours)	=	₹ 9,000 (F)
		=	₹ 21,000 (F)

(v) **Labour Idle time Variance** = Std. Rate × Idle timeAbnormal

- Skilled	= ₹ 80 × 165 hours	=	₹ 13,200 (A)
- Unskilled	= ₹ 60 × 135 hours	=	₹ 8,100 (A)
		=	₹ 21,300 (A)

(vi) **Variable Overhead Expenditure Variance**

$= AH_{Worked}$ (SR - AR)

$= 11{,}700 \text{ hours} \left(\frac{₹\,75}{2 \times 1.5 \text{ hours}} - \frac{₹\,2{,}85{,}000}{11{,}700 \text{ hours}} \right)$

= 11,700 hours (₹ 25 – ₹ 24.36) = ₹ 7,488 (F)

(vii) **Variable Overhead Efficiency Variance**

= Std. Rate (SH – AH_{Worked})

= ₹ 25 (12,000 – 11,700) = ₹ 7,500 (F)

Q25 Nov'18

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	₹ 5,00,000	₹ 4,90,000

Compute:

(i) Fixed overhead variance

(ii) Fixed overhead expenditure variance

(iii) Fixed overhead volume variance

(iv) Fixed overhead efficiency variance

Reference — What's **New**

Fixed Overhead Variances

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Answer

Calculation of Variances:

(i) **Fixed Overhead Variance:**

Standard fixed overhead – Actual fixed overhead

= ₹ [(5,00,000÷5000) ×4800] – ₹ 4,90,000 = ₹ 10,000 (A)

(ii) **Fixed Overhead Expenditure Variances:**

Budgeted fixed overhead – Actual fixed overhead

= ₹ 5,00, 000 – ₹ 4,90, 000 = ₹ 10,000 (F)

(iii) **Fixed Overhead Volume Variance:**

Standard fixed overhead – Budgeted fixed overhead

= ₹ 4,80, 000 – ₹ 5,00, 000 = ₹ 20,000 (A)

(iv) **Fixed Overhead efficiency Variance:**

Standard fixed overhead – Budgeted fixed overhead for Actual days

= ₹ 4,80, 000 – [(₹ 5,00, 000÷25) ×23] = ₹ 20,000 (F)

Q 26 MTP Mar'19

The following standards have been set to manufacture a product:

	(₹)
Direct Materials:	
2 units of X at ₹ 40 per unit	80.00
3 units of Y at ₹ 30 per unit	90.00
15 units of Z at ₹ 10 per unit	150.00
	320.00
Direct labour 3 hours @ ₹ 55 per hour	165.00
Total standard prime cost	485.00

The company manufactured and sold 6,000 units of the product during the year 20X8.

Direct material costs were as follows:

12,500 units of X at ₹ 44 per unit.

18,000 units of Y at ₹ 28 per unit.

88,500 units of Z at ₹ 12 per unit.

The company worked 17,500 direct labour hours during the year 20X8. For 2,500 of these hours the company paid at ₹ 58 per hour while for the remaining hours the wages were paid at the standard rate.

Required:

COMPUTE the following variances:

Material Price, Material Usage, Material Mix, Material Yield, Labour Rate and Labour Efficiency.

[10 Marks]

Reference | What's **New**

Material and Labour Variances

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Answer

Material Price Variance = Actual Quantity (Std. Price – Actual Price)

X = 12,500 units (₹ 40 – ₹ 44) =	₹ 50,000 (A)
Y = 18,000 units (₹ 30 – ₹ 28) =	₹ 36,000 (F)
Z = 88,500 units (₹ 10 – ₹ 12) =	₹ 1,77,000 (A)
	₹ 1,91,000 (A)

Material Usage Variance = Std. Price (Std. Qty – Actual Qty.)

X = ₹ 40 (6,000 × 2 – 12,500) =	₹ 20,000 (A)
Y = ₹ 30 (6,000 × 3 – 18,000) =	Nil
Z = ₹ 10 (6,000 × 15 – 88,500) =	₹ 15,000 (F)
	₹ 5,000 (A)

Material Mix Variance = Std. Price (Revised Std. Qty. – Actual Qty.)

$X = ₹ 40 \left(\frac{1,19,000 \times 2}{20} - 12,500\right) =$	₹ 24,000 (A)
$Y = ₹ 30 \left(\frac{1,19,000 \times 3}{20} - 18,000\right) =$	₹ 4,500 (A)
$Z = ₹ 10 \left(\frac{1,19,000 \times 15}{20} - 88,500\right) =$	₹ 7,500 (F)
	₹ 21,000 (A)

Material Yield Variance = Std. Price (Std. Qty. – Revised Std. Qty.)

$X = ₹ 40 \left(6,000 \times 2 - \frac{1,19,000 \times 2}{20}\right) =$	₹ 4,000 (F)
$Y = ₹ 30 \left(6,000 \times 3 - \frac{1,19,000 \times 3}{20}\right) =$	₹ 4,500 (F)
$Z = ₹ 10 \left(6,000 \times 15 - \frac{1,19,000 \times 15}{20}\right) =$	₹ 7,500 (F)
	₹ 16,000 (F)

Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 2,500 hours (₹ 55 – ₹ 58) = ₹ 7,500 (A)

Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
= ₹ 55 (6,000 × 3 – 17,500) = ₹ 27,500 (F)

Q 27 MTP Apr'19

BBC Ltd. manufactures Ordinary Portland Cement (OPC). The standard data for the raw materials that are used to manufacture OPC are as follows:

Raw Material	Composition (%)	Rate per Metric Ton (₹)
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 (₹)
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. (10 Marks)

Reference — What's **New**

Material variances

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Answer

(i) **Material Price Variance** = Actual Quantity (Std. Price – Actual Price)

Limestone	$= 340\left(₹\,565 - \frac{₹\,1,90,400}{340}\right)$	
	= 340 (₹ 565 – ₹ 560)	1,700 (F)
Silica	$= 105\left(₹\,4,800 - \frac{₹\,5,09,250}{105}\right)$	
	= 105 (₹ 4,800 - ₹ 4,850)	5,250 (A)
Alumina	$= 25\left(₹\,32,100 - \frac{₹\,8,12,500}{25}\right)$	
	= 25 (₹ 32,100 - ₹ 32,500)	10,000 (A)
Iron ore	$= 30\left(₹\,1,800 - \frac{₹\,53,400}{30}\right)$	
	= 30 (₹ 1,800 - ₹ 1,780)	600 (F)

Others	$= 23\left(₹\,2,400 - \frac{₹\,51,750}{23}\right)$	
	= 23 (₹ 2,400 - ₹ 2,250)	3,450 (F)
		9,500 (A)

(ii) **Material Mix Variance** = Std. Price (Revised Std. Quantity – Actual Quantity)

Limestone	= ₹ 565 (523 × 65% - 340)	
	= ₹ 565 (339.95 - 340)	28.25 (A)
Silica	= ₹ 4,800 (523 × 20% - 105)	
	= ₹ 4,800 (104.6 - 105)	1,920 (A)
Alumina	= ₹ 32,100 (523 × 5% - 25)	
	= ₹ 32,100 (26.15 - 25)	36,915 (F)
Iron ore	= ₹ 1,800 (523 × 5% - 30)	
	= ₹ 1,800 (26.15 - 30)	6,930 (A)
Others	= ₹ 2,400 (523 × 5% - 23)	
	= ₹ 2,400 (26.15 - 23) =	7,560 (F)
		35,596.75 (F)

(iii) **Material Yield Variance** = Std. Price (Standard Quantity – Revised Std. Quantity)

Limestone	= ₹ 565 (500 × 65% - 523 × 65%)	
	= ₹ 565 (325 - 339.95)	8,446.75 (A)
Silica	= ₹ 4,800 (500 × 20% - 523 × 20%)	
	= ₹ 4,800 (100 - 104.6)	22,080 (A)
Alumina	= ₹ 32,100 (500 × 5% - 523 × 5%)	
	= ₹ 32,100 (25 - 26.15)	36,915 (A)
Iron ore	= ₹ 1,800 (500 × 5% - 523 × 5%)	
	= ₹ 1,800 (25 - 26.15)	2,070 (A)
Others	= ₹ 2,400 (500 × 5% - 523 × 5%)	
	= ₹ 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	= ₹ 565 × (500 × 65%) - ₹ 1,90,400	
	= ₹ 1,83,625 - ₹ 1,90,400	6,775 (A)
Silica	= ₹ 4,800 × (500 × 20%) - ₹ 5,09,250	
	= ₹ 4,80,000 – ₹ 5,09,250	29,250 (A)
Alumina	= ₹ 32,100 (500 × 5%) – ₹ 8,12,500	
	= ₹ 8,02,500 – ₹ 8,12,500	10,000 (A)
Iron ore	= ₹ 1,800 (500 × 5%) – ₹ 53,400	

	= ₹ 45,000 – ₹ 53,400	8,400 (A)
Others	= ₹ 2,400 (500 × 5%) – ₹ 51,750	
	= ₹ 60,000 – ₹ 51,750	8,250 (F)
		46,175 (A)

Q 28 May'19

A gang of workers normally consists of 30 skilled workers, 15 semi-skilled workers and 10 unskilled workers. They are paid at standard rate per hour as under:

Skilled	₹ 70
Semi-skilled	₹ 65
Unskilled	₹ 50

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output. During the week ended 31st March, 2019, the gang consisted of 40 skilled, 10 semi-skilled and 5 unskilled workers. The actual wages paid were at the rate of ₹ 75, ₹ 60 and ₹ 52 per hour respectively. Four hours were lost due to machine breakdown and 1,600 units were produced.

Calculate the following variances showing clearly adverse (A) or favourable (F)

(i) Labour Cost Variance
(ii) Labour Rate Variance
(iii) Labour Efficiency Variance
(iv) Labour Mix Variance
(v) Labour Idle Time Variance (10 Marks)

Reference — What's **New**

Labour variances

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Answer

(i) **Labour Cost Variance** = Standard Cost – Actual Cost
= ₹ 1,14,400 – ₹ 1,54,400 (16,000 × 75 + 400 × 60 + 200 × 52)
= ₹ 40,000 (A)

Or

Types of workers	Standard Cost – Actual Cost	Amount (₹)
Skilled Workers	(30 x 40 x 70/2,000 x 1,600) – (40 x 40 x 75) 67,200 –1,20,000	52,800 (A)
Semi- Skilled	(15 x 40 x 65/2,000 x 1,600) – (10 x 40 x 60) 31,200-24,000	7,200 (F)

Un-Skilled Workers	(10 x 40 x 50/2,000 x 1,600 – (5 x 40 x 52) 16,000 – 10,400	5,600 (F)
Total	1,14,400-1,54,400	40,000 (A)

(ii) **Labour Rate Variance**

Types of workers	Actual Hours × (Standard Rate - Actual Rate)	Amount (₹)
Skilled Workers	1,600 hours × (₹ 70.00 – ₹ 75.00)	8,000 (A)
Semi- Skilled	400 hours × (₹ 65.00 – ₹ 60.00)	2,000 (F)
Un-Skilled Workers	200 hours × (₹ 50.00 – ₹ 52.00)	400 (A)
Total	₹ 8,000 (A) + ₹ 2,000 (F) + ₹ 400 (A)	6,400 (A)

(iii) **Labour Efficiency Variance**

Types of workers	Standard Rate × (Standard Hours – Actual Hours)	Amount (₹)
Skilled Workers	₹ 70.00 × (960 hours – 1,440 hours)	33,600 (A)
Semi- Skilled	₹ 65.00 × (480 hours – 360 hours)	7,800 (F)
Un-Skilled Workers	₹ 50.00 × (320 hours – 180 hours)	7,000 (F)
Total	33,600 (A) + 7,800 (F) + 7,000 (F)	18,800 (A)

Alternatively labour efficiency can be calculated on basis of labour hours paid

Types of workers	Standard Rate × (Standard Hours – Actual Hours)	Amount (₹)
Skilled Workers	70.00 × (960 hours – 1600 hours)	44,800 (A)
Semi- Skilled	65.00 × (480 hours – 400 hours)	5,200 (F)
Un-Skilled Workers	50.00 × (320 hours – 200 hours)	6,000 (F)
Total	33,600 (A) + 7,800 (F) + 7,000 (F)	33,600 (A)

(iv) **Labour Mix Variance**

= Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang Less Average Standard Rate per hour of Actual Gang}

@ on the basis of hours worked

$$= 1,980 \text{ hours} \times \left(\frac{₹\,1,14,400}{1,760 \text{ hrs.}} - \frac{1,440 \text{ hrs} \times ₹\,70 + 360 \text{ hrs} \times ₹\,65 + 180 \text{ hrs} \times ₹\,50}{1,980 \text{ hrs.}} \right)$$

= ₹ 4,500 (A)

Or

Labour Mix Variance

Types of workers	Std. Rate × (Revised Actual Hours Worked – Actual Hours Worked)	Amount (₹)
Skilled Workers	₹ 70 × (1,080 hrs. – 1440 hrs.)	25,200 (A)
Semi- Skilled	₹ 65 × (540 hrs. – 360 hrs.)	11,700 (F)
Un Skilled Workers	₹ 50 × (360 hrs. – 180 hrs.)	9,000 (F)
Total	₹ 25,200 (A) + ₹ 11,700 (F) + ₹ 9,000 (F)	4,500 (A)

(v) **Labour Idle Time Variance**

Types of workers	Standard Rate × (Hours Paid – Hours Worked)	Amount (₹)
Skilled Workers	₹ 70.00 × (1,600 hours – 1,440 hours)	11,200 (A)
Semi- Skilled	₹ 65.00 × (400 hours – 360 hours)	2,600 (A)
Un-Skilled Workers	₹ 50.00 × (200 hours – 180 hours)	1,000 (A)
Total	11,200 (A) + 2,600 (A) + 1,000 (A)	14,800 (A)

Verification:

Labour Cost Variance

= Labour Rate Variance + Labour Efficiency Variance + Labour Idle Time Variance

= 6,400 (A) + 18,800 (A) + 14,800 (A) = ₹ 40,000 (A)

Labour Cost Variance

= Labour Rate Variance + Labour Efficiency Variance

= 6400(A) + 33600(A)= ₹ 40000(A)

In this case, labour idle time variance is a part of labour efficiency variance.

Working Notes:

Category	Standard Cost			Actual (1600 units)			Revised Actual Hours
	Hrs.	Rate	Amt. (₹)	Hrs.	Rate	Amt. (₹)	
Skilled	960 (30Wx40x1,600/2,000)	70.00	67,200	1,440 (40Wx36)	75.00	1,08,000	1,080 (1,980x6/11)
Semi Skilled	480 (15W x 40 x 1,600/2,000)	65.00	31,200	360 (10Wx36)	60.00	21,600	540 (1,980x3/11)
Unskilled	320 (10Wx40 x1,600/2,000)	50.00	16,000	180 (5Wx36)	52.00	9,360	360 (1,980x2/11)
Total	1,760		1,14,400	1,980		1,38,960	1,980

Q29 RTP Nov'19

JVG Ltd. produces a product and operates a standard costing system and value material and finished goods inventories at standard cost. The information related with the product is as follows:

Particulars	Cost per unit (₹)
Direct materials (30 kg at ₹ 350 per kg)	10,500
Direct labour (5 hours at ₹ 80 per hour)	400

The actual information for the month just ended is as follows:

(a) The budgeted and actual production for the month of September 2019 is 1,000 units.

(b) Direct materials –5,000 kg at the beginning of the month. The closing balance of direct materials for the month was 10,000 kg. Purchases during the month were made at ₹ 365 per kg. The actual utilization of direct materials was 7,200 kg more than the budgeted quantity.

(c) Direct labour – 5,300 hours were utilised at a cost of ₹ 4,34,600.

Required:

CALCULATE (i) Direct material price and usage variances (ii) Direct labour rate and efficiency variances.

Reference | What's **New**

Material and Labour Variances

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Answer

Working:

Quantity of material purchased and used.

No. of units produced	1,000 units
Std. input per unit	30 kg.
Std. quantity (Kg.)	30,000 kg.
Add: Excess usage	7,200 kg.
Actual Quantity	37,200 kg.
Add: Closing Stock	10,000 kg.
Less: Opening stock	5,000 kg.
Quantity of Material purchased	42,200 kg.

(i) **Direct Material Price Variance:**

= Actual Quantity purchased (Std. Price – Actual Price)

= 42,200 kg.(₹ 350 – ₹ 365) = ₹ 6,33,000 (Adverse)

Direct Material Usage Variance:

= Std. Price (Std. Quantity – Actual Quantity)

= ₹ 350 (30,000 kg. – 37,200 kg.) = ₹ 25,20,000 (Adverse)

(ii) **Direct Labour Rate Variance:**

= Actual hours (Std. Rate – Actual Rate)

= 5,300 hours (₹ 80 – ₹ 82) = ₹ 10,600 (Adverse)

Direct Labour Efficiency Variance:

= Std. Rate (Std. hours – Actual hours)

= ₹ 80 (1,000 units × 5 hours – 5,300 hours) = ₹ 24,000 (Adverse)

Q30 MTP Oct'19

In a manufacturing company the standard units of production of the year were fixed at 1,20,000 units and overhead expenditures were estimated to be:

Fixed	₹ 12,00,000
Variable	₹ 6,00,000
Semi-Variable	₹ 1,80,000

Actual production during the April, 2019 of the year was 8,000 units. Each month has 20 working days.

During the month there was one public holiday. The actual overheads amounted to:

Fixed	₹ 1,10,000
Variable	₹ 48,000
Semi-variable	₹ 19,200

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable character.

CALCULATE the followings:

(i) Overhead Cost Variance

(ii) Fixed Overhead Cost Variance

(iii) Variable Overhead Cost Variance

(iv) Fixed Overhead Volume Variance

(v) Fixed Overhead Expenditure Variance

(vi) Calendar Variance. [10 Marks]

Reference

Total Overhead Variance

What's **New**

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Answer

COMPUTATION OF VARIANCES

(i) **Overhead Cost Variance** = Absorbed Overheads – Actual Overheads
= (₹ 87,200 + ₹ 44,800) – (₹ 1,21,520 + ₹ 55,680)
= ₹ 45,200 (A)

(ii) **Fixed Overhead Cost Variance** = Absorbed Fixed Overheads – Actual Fixed Overheads
= ₹ 87,200 – ₹ 1,21,520
= ₹ 34,320 (A)

(iii) **Variable Overhead Cost Variance** = Standard Variable Overheads for Production – Actual Variable Overheads
= ₹ 44,800 – ₹ 55,680
= ₹ 10,880 (A)

(iv) **Fixed Overhead Volume Variance** = Absorbed Fixed Overheads – Budgeted Fixed Overheads
= ₹ 87,200 – ₹ 1,09,000
= ₹ 21,800 (A)

(v) **Fixed Overhead Expenditure Variance** = Budgeted Fixed Overheads – Actual Fixed Overheads
= ₹ 10.90 × 10,000 units – ₹ 1,21,520
= ₹ 12,520 (A)

(vi) **Calendar Variance** = Possible Fixed Overheads – Budgeted Fixed Overheads
= ₹ 1,03,550 – ₹ 1,09,000
= ₹ 5,450 (A)

WORKING NOTE

Fixed Overheads per Unit = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{₹\,12,00,000}{1,20,000\ \text{units}}$	₹ 10
Fixed Overheads element in Semi-Variable Overheads i.e. 60% of ₹ 1,80,000	₹ 1,08,000
Fixed Overheads per Unit = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{₹\,1,08,000}{1,20,000\ \text{units}}$	₹ 0.90
Standard Rate of Absorption of Fixed Overheads per unit (₹ 10 + ₹ 0.90)	₹ 10.90
Fixed Overheads Absorbed on 8,000 units @ ₹ 10.90	₹ 87,200
Budgeted Variable Overheads	₹ 6,00,000

Add : Variable element in Semi-Variable Overheads 40% of ₹ 1,80,000	₹ 72,000
Total Budgeted Variable Overheads	₹ 6,72,000
Standard Variable Cost per unit = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{₹\ 6,72,000}{1,20,000\ \text{units}}$	₹ 5.60
Standard Variable Overheads for 8,000 units @ ₹ 5.60	₹ 44,800
Budgeted Annual Fixed Overheads (₹ 12,00,000 + 60% of ₹ 1,80,000)	₹ 13,08,000
Possible Fixed Overheads $= \frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted days}} \times \text{Actual Days}$ $= \left[\frac{₹\ 1,09,000}{20\ \text{days}} \times 19\ \text{Days}\right]$	₹ 1,03,550
Actual Fixed Overheads (₹ 1,10,000 + 60% of ₹ 19,200)	₹ 1,21,520
Actual Variable Overheads (₹ 48,000 + 40% of ₹ 19,200)	₹ 55,680

Q 31 Nov'19

The standard cost of a chemical mixture is as follows:

60% of Material A @ ₹ 50 per kg

40% Material B @ ₹ 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 @ ₹ 60 per kg

260 kg of Material B @ ₹ 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. (10 Marks)

Reference | **What's New**

Material variances - with processing loss

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Answer

Basic Calculation

Material	Standard for 640 kg. output			Actual for 680 kg. output		
	Qty. Kg.	Rate (₹)	Amt (₹)	Qty Kg.	Rate (₹)	Amt (₹)
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 = ₹ 43,200 × 680/640 = ₹ 45,900

Calculation of Variances

(i) **Material Cost Variance** = (Std. cost of actual output – Actual cost)

= (45,900– 45,400)

= ₹ 500 (F)

(ii) **Material Price Variance** = (SP – AP) × AQ

Material A = (50 – 60) × 540 = ₹ 5400 (A)

Material B = (60 – 50)) × 260 = ₹ 2600 (F)

MPV = ₹ 2800 (A)

(iii) **Material Usage Variance (MUV)** = (Std. Quantity for actual output – Actual Quantity) × Std. Price

Material A $= \left(\frac{480 \times 680}{640} - 540\right) \times 50$ = ₹ 1,500 (A)

Material B $= \left(\frac{320 \times 680}{640} - 260\right) \times 60$ = ₹ 4,800 (F)

MUV = ₹ 3,300 (F)

(iv) **Material Mix Variance** = SP × (RAQ – AQ)

A = ₹ 50× (480 Kg – 540 Kg) = ₹ 3,000 (A)

B = ₹ 60 × (320 Kg. – 260 Kg.) = ₹ 3,600 (F)

Total = ₹ 3,000 (A) + ₹ 3,600 (F) = ₹ 600 (F)

(v) **Material Yield Variance** = SP × (SQ – RAQ)

A = ₹ 50 × (510 Kg. – 480 Kg) = ₹ 1,500 (F)

B = ₹ 60 × (340 Kg. – 320 Kg.) = ₹ 1,200 (F)

Total = ₹ 1,500 (F) + ₹ 1,200 (F) = ₹ 2,700 (F)

Q 32 MTP May'20

ZX Ltd. has furnished the following information:

	Budgeted	Actual March 2020
Number of working days	25	27
Production (in units)	20,000	22,000
Fixed Overheads	₹ 3,00,000	₹ 3,10,000

Budgeted fixed overhead rate is ₹ 10.00 per hour. In March 2020, the actual hours worked were 31,500. In relation to fixed overheads.

CALCULATE:

(i) Efficiency Variance

(ii) Capacity Variance

(iii) Calendar Variance

(iv) Volume Variance

(v) Expenditure Variance [5 Marks]

Reference | What's **New**

Fixed Overhead Variances

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Answer

Workings:

(1) Budgeted Hours = $\frac{₹\ 3,00,000}{₹\ 10 \text{ per hour}}$ = 30,000 hours

(2) Standard Fixed Overhead rate per hour (Standard Rate):

$= \frac{\text{Budgeted fixed overheads}}{\text{Budgeted hours}} = \frac{₹\ 3,00,000}{30,000 \text{ hours}} = ₹\ 10$

(3) Standard hour per unit of output = $\frac{30,000 \text{ hours}}{20,000 \text{ units}}$ = 1.5 hours

(4) Standard hours for Actual Output = 22,000 units × 1.5 hours = 33,000 Hours

(5) Budgeted Overhead per day for budgeted days= $\frac{₹\ 3,00,000}{25\ Days}$ = ₹ 12, 000

(6) Budgeted Overhead for actual days worked = ₹ 12,000 × 27 days = ₹ 3,24,000

(7) Budgeted Hours for Actual days worked = $\frac{30,000\ hours}{25\ Days}$ × 27days = 32,400 hours

Computation of Variances in relation to Fixed Overheads:

(i) **Efficiency Variance**

= Standard Rate × (Standard hours for actual output – Actual hours worked)

= ₹ 10 (33,000 hours – 31,500 hours) = ₹ 15,000 (Favourable)

(ii) **Capacity Variance**

= Standard Rate × (Actual Hours – Budgeted Hours for actual days worked)

= ₹ 10 (31,500 hours – 32,400 hours) = ₹ 9,000 (Adverse)

(iii) **Calendar Variance**

= Standard/Budgeted Fixed Overhead Rate per day × (Actual Working days – Budgeted working days)

= ₹ 12,000 (27 days – 25 days) = ₹ 24,000 (Favourable)

(iv) **Volume Variance**

= Standard Rate × (Standard hours – Budgeted hours)

= ₹ 10 (33,000 hours – 30,000 hours) = ₹ 30,000 (Favourable)

(v) **Expenditure Variance**

= Budgeted Overheads – Actual Overheads

= ₹ 3,00,000 – ₹ 3,10,000 = ₹ 10,000 (Adverse)

Note: Overhead Variances may also be calculated based on output.

Q 33 RTP Nov'20

Following are the standard cost for a product-X:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹ 100 per hour	800
Variable Overhead 8 hours @ ₹ 15 per hour	120
Fixed Overhead	400
	2,220

Budgeted output for the year was 2,000 units.

Actual output is 1,800 units. Actual cost for year is as follows:

	(₹)
Direct Materials (17,800 Kg @ ₹ 92 per Kg.)	16,37,600
Direct Labour (14,000 hours @ ₹ 104 per hour)	14,56,000
Variable Overhead incurred	2,17,500
Fixed Overhead incurred	7,68,000

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.

Reference — What's **New**

Material, Labour, VOH and FOH Variance

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Answer

(i) **Material Usage Variance** = Std. Price (Std. Quantity – Actual Quantity)
= ₹ 90 (18,000 kg. – 17,800 kg.)
= ₹ 18,000 (Favourable)

(ii) **Material Price Variance** = Actual Quantity (Std. Price – Actual Price)
= 17,800 kg. (₹ 90 – ₹ 92) = ₹ 35,600 (Adverse)

(iii) **Material Cost Variance** = Std. Material Cost – Actual Material Cost
= (SQ × SP) – (AQ × AP)
= (18,000 kg. × ₹ 90) – (17,800 kg. × ₹ 92)
= ₹ 16,20,000 – ₹ 16,37,600
= ₹ 17,600 (Adverse)

(iv) **Labour Efficiency Variance** = Std. Rate (Std. Hours – Actual Hours)
= ₹ 100 (1,800 units × 8 – 14,000 hrs.)
= ₹ 100 (14,400 hrs. – 14,000 hrs.)
= ₹ 40,000 (Favourable)

(v) **Labour Rate Variance** = Actual Hours (Std. Rate – Actual Rate)
= 14,000 hrs. (₹ 100 – ₹ 104)
= ₹ 56,000 (Adverse)

(vi) **Labour Cost Variance** = Std. Labour Cost – Actual Labour Cost
= (SH × SR) – (AH × AR)
= (14,400 hrs. × ₹ 100) – (14,000 hrs. × ₹ 104)
= ₹ 14,40,000 – ₹ 14,56,000
= ₹ 16,000 (Adverse)

(vii) **Variable Cost Variance** = Std. Variable Cost – Actual Variable Cost
= (14,400 hrs. × ₹ 15) – ₹ 2,17,500
= ₹ 1,500 (Adverse)

(viii) **Fixed Overhead Cost Variance** = Absorbed Fixed Overhead – Actual Fixed Overhead
= (1,800 units × ₹ 400) - ₹ 7,68,000
= ₹ 7,20,000 – ₹ 7,68,000 = ₹ 48,000 (Adverse)

Q34 MTP Nov'20

Following data is extracted from the books of XYZ Ltd. for the month of January, 2020:

(i) Estimation

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
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 (₹)	Amount (₹)
Material-A	900	?	--
Material-B	?	32.50	--
			59,825

(iii) Other Information

Material Cost Variance = ₹ 3,625 (F)

Material Price Variance = ₹ 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; [10 Marks]

Reference | What's **New**

Material Variances | **Back Calculation**

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Answer

(i) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}

₹ 3,625 = (SQ × SP) – ₹ 59,825

(SQ × SP) = ₹ 63,450

$(SQ_A \times SP_A) + (SQ_B \times SP_B)$ = ₹ 63,450

$(940\ kg \times SP_A) + (705\ kg \times ₹\ 30)$ = ₹ 63,450

$(940\ kg \times SP_A)$ + ₹ 21,150 = ₹ 63,450

$(940\ kg \times SP_A)$ = ₹ 42,300

SP_A = ₹ 42,300 940kg

Standard Price of Material-A = ₹ 45

Working Note:

SQ i.e. quantity of inputs to be used to produce actual output

$$= \frac{1,480\ kg}{90\%} = 1,645\ kg$$

$$SQ_A = \frac{800\ kg}{(800+600)} \times 1,645\ kg = 940\ kg$$

$$SQ_B = \frac{600\ kg}{(800+600)} \times 1,645\ kg = 705\ kg$$

(ii) Material Price Variance (A + B)= {(AQ × SP) – (AQ × AP)}

₹ 175	= (AQ × SP) – ₹ 59,825
(AQ × SP)	= ₹ 60,000
$(AQ_A \times SP_A) + (AQ_B \times SP_B)$	= ₹ 60,000
(900 kg × ₹ 45 (from (i) above)) + $(AQ_B \times ₹30)$	= ₹ 60,000
₹ 40,500 + $(AQ_B \times ₹ 30)$	= ₹ 60,000
$(AQ_B \times ₹ 30)$	= ₹ 19,500
AQ_B	$= \frac{19,500}{30} = 650$ kg

Actual Quantity of Material B = 650 kg.

(iii) (AQ × AP) = ₹ 59,825

$(AQ_A \times AP_A) + (AQ_B \times AP_B)$	= ₹ 59,825
(900 kg × AP_A) + (650 kg (from (ii) above) × ₹ 32.5)	= ₹ 59,825
(900 kg × AP_A) + ₹ 21,125	= ₹ 59,825
(900 kg × AP_A)	= ₹ 38,700
AP_A	$= \frac{38,700}{900} = 43$

Actual Price of Material-A = ₹ 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,

Revised $SQ_A = \frac{800 \text{ kg}}{(800+600)} \times 1,550$ kg. = 886 kg.

Revised $SQ_B = \frac{600 \text{ kg}}{(800+600)} \times 1,550$ kg. = 664 kg

(v) **Material Mix Variance (A + B)** = {(RSQ × SP) – (AQ × SP)}

= $\{(RSQ_A \times SP_A) + (RSQ_B \times SP_B) – 60,000\}$

= (886 kg (from (iv) above) × ₹ 45 (from (i) above)) + (664 kg (from (iv) above) × ₹ 30) – ₹60,000

= (39,870 + 19,920) – 60,000 = ₹ 210 (A)

Q35 Nov'20

ABC Ltd. has furnished the following information regarding the overheads for the month of June 2020 .

(i)	Fixed Overhead Cost Variance	₹ 2,800 (Adverse)
(ii)	Fixed Overhead Volume Variance	₹ 2,000 (Adverse)
(iii)	Budgeted Hours for June, 2020	2,400 hours
(iv)	Budgeted Overheads for June, 2020	₹ 12,000
(v)	Actual rate of recovery of overheads ₹ 8 Per Hour From the above given information	

Calculate: [10 Marks]

(1) Fixed Overhead Expenditure Variance

(2) Actual Overheads Incurred

(3) Actual Hours for Actual Production

(4) Fixed Overhead Capacity Variance

(5) Standard hours for Actual Production

(6) Fixed Overhead Efficiency Variance

Reference

Fixed Overhead Variances

What's New

Back Calculation

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Answer

(1) **Fixed Overhead Expenditure Variance**

= Budgeted Fixed Overheads – Actual Fixed Overheads

= ₹ 12,000 – ₹ 12,800 (as calculated below) = ₹ 800 (A)

(2) **Fixed Overhead Cost Variance** = Absorbed Fixed Overheads – Actual Fixed Overheads

2,800 (A) = ₹ 10,000 – Actual Overheads

Actual Overheads = ₹ 12,800

(3) **Actual Hours for Actual Production** = ₹ 12,800/ ₹8 = 1,600 hrs.

(4) **Fixed Overhead capacity Variance**

= Budgeted Fixed Overheads for Actual Hours– Budgeted Fixed Overheads

= ₹ 5 x 1600 hrs. – ₹ 12,000 = ₹ 4,000 (A)

(5) **Standard Hours for Actual Production**

= Absorbed Overheads/ Std. Rate

= ₹ 10,000/ ₹ 5 = 2,000 hrs.

(6) **Fixed Overhead Efficiency Variance**

= Absorbed Fixed Overheads – Budgeted Fixed Overheads for Actual Hours

= ₹ 10,000 – ₹ 5 x 1,600 hrs. = ₹ 2,000 (F)

Working Note:

(i) Fixed Overhead Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads

2,000 (A) = Absorbed Fixed Overheads – ₹12,000

Absorbed Fixed Overheads = ₹ 10,000

(ii) Standard Rate/ Hour = ₹ 5 (₹ 12,000/2,400 hrs.)

Q36 Jan'21

Premier Industries has a small factory where 52 workers are employed on an average for 25 days a month and they work 8 hours per day. The normal down time is 15%. The firm has introduced standard costing for cost control. Its monthly budget for November, 2020 shows that the budgeted variable and fixed overhead are ₹ 1,06,080 and ₹ 2,21,000 respectively.

The firm reports the following details of actual performance for November, 2020, after the end of the month:

Actual hours worked	8,100 hrs.
Actual production expressed in standard hours	8,800 hrs.
Actual Variable Overheads	₹ 1,02,000
Actual Fixed Overheads	₹ 2,00,000

You are **required** to calculate: [10 Marks]

(i) Variable Overhead Variances :

(a) Variable overhead expenditure variance.

(b) Variable overhead efficiency variance.

(ii) Fixed Overhead Variances :

(a) Fixed overhead budget variance.

(b) Fixed overhead capacity variance.

(c) Fixed overhead efficiency variance.

(iii) Control Ratios :

(a) Capacity ratio.

(b) Efficiency ratio.

(c) Activity ratio.

Reference — What's **New**

Variable Overhead Variances, FIxed Overhead Variances and Control Ratios

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Answer

Workings:

Calculation of budgeted hours

Budgeted hours = (52 × 25 × 8) × 85% = 8,840 hours

(i) **Variable overheads variance**

(a) Variable overhead expenditure variance

= Std. overhead for Actual hours – Actual variable Overhead

$$= \left(\frac{₹\,1,06,080}{8,840} \times 8,100\right) - ₹\,1,02,000$$

= 4800 A

(b) Variable overhead efficiency variance

Std. rate per hour × (Std. hours for actual production – Actual hours)

$$= \frac{₹\,1,06,080}{8,840} \text{ (8,800 hours – 8,100 hours)}$$

= 8400 F

(ii) **Fixed overhead variances**

(a) Fixed overhead budget variance

= Budgeted overhead – Actual overhead

= ₹ 2,21,000 – ₹ 2,00,000

= 21,000 F

(b) Fixed overhead capacity variance

= Std rate × (Actual hours – budgeted hours)

$$= \frac{₹\,2,21,000}{8,840} \times (8,100 - 8,840)$$

= 18,500 A

(c) Fixed overhead efficiency variance

= Std rate × (Std hours for actual production – Actual hours)

$$= \frac{₹\ 2,21,000}{8,840} \times (8,800 - 8,100)$$

= 17,500 F

(iii) **Control Ratios**

(a) Capacity Ratio

$$= \frac{\text{Actual hours}}{\text{Budgeted hours}} \times 100$$

$$= \frac{8,100}{8,840} \times 100 \times 100 = 91.63\%$$

(b) Efficiency Ratio

$$= \frac{\text{Standard hours}}{\text{Actual hours}} \times 100$$

$$= \frac{8,800}{8,100} \times 100 = 108.64\%$$

(c) Activity Ratio

$$= \frac{\text{Standard hours}}{\text{Actual hours}} \times 100$$

$$= \frac{8,800}{8,840} \times 100 \times 100 = 99.55\%$$

Q37 RTP May'21

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:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹ 80 per hour	640
Variable Overhead 8 hours @ ₹ 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:

	(₹)
Direct Materials 8,900 Kg @ ₹ 92 per Kg.	8,18,800
Direct Labour 7,000 hours @ ₹ 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

Reference | What's **New**

Material Variances, Labour Variances, VOH Cost Variance, FOH Cost Variance

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Answer

(i) **Material Usage Variance** = Std. Price (Std. Quantity – Actual Quantity)

= ₹ 90 (9,000 kg. – 8,900 kg.)

= ₹ 9,000 (Favourable)

(ii) **Material Price Variance** = Actual Quantity (Std. Price – Actual Price)

= 8,900 kg. (₹ 90 – ₹ 92) = ₹ 17,800 (Adverse)

(iii) **Material Cost Variance** = Std. Material Cost – Actual Material Cost

= (SQ × SP) – (AQ × AP)

= (9,000 kg. × ₹ 90) – (8,900 kg. × ₹ 92)

= ₹ 8,10,000 – ₹ 8,18,800

= ₹ 8,800 (Adverse)

(iv) **Labour Efficiency Variance** = Std. Rate (Std. Hours – Actual Hours)

$= ₹\ 80 \left(\frac{9,000}{10} \times 8 \text{ hours} - 7,000 \text{ hrs.} \right)$

= ₹ 80 (7,200 hrs. – 7,000 hrs.)

= ₹ 16,000 (Favourable)

(v) **Labour Rate Variance** = Actual Hours (Std. Rate – Actual Rate)
= 7,000 hrs. (₹ 80 – ₹ 84)
= ₹ 28,000 (Adverse)

(vi) **Labour Cost Variance** = Std. Labour Cost – Actual Labour Cost
= (SH × SR) – (AH × AR)
= (7,200 hrs. × ₹ 80) – (7,000 hrs. × ₹ 84)
= ₹ 5,76,000 – ₹ 5,88,000
= ₹ 12,000 (Adverse)

(vii) **Variable Cost Variance** = Std. Variable Cost – Actual Variable Cost
= (7,200 hrs. × ₹ 20) – ₹ 1,40,000
= ₹ 4,000 (Adverse)

(viii) **Fixed Overhead Cost Variance** = Absorbed Fixed Overhead – Actual Fixed Overhead
$= \frac{₹\ 250}{10\ kgs.} \times 9{,}000 kgs. - ₹\ 2{,}60{,}000$
= ₹ 2,25,000 – ₹ 2,60,000 = ₹ 35,000 (Adverse)

Q38 MTP May'21

AK Ltd. has furnished the following standard cost data per unit of production:

Material 10 kg @ ₹ 100 per kg.

Labour 6 hours @ ₹ 55 per hour

Variable overhead 6 hours @ ₹ 100 per hour.

Fixed overhead ₹45,00,000 per month (Based on a normal volume of 30,000 labour hrs)

The actual cost data for the month of September 2020 are as follows:

Material used 50,000 kg at a cost of ₹ 52,50,000.

Labour paid ₹ 15,50,000 for 31,000 hours

Variable overheads ₹ 29,30,000

Fixed overheads ₹ 47,00,000

Actual production 4,800 units.

Calculate:

(i) Material Cost Variance.

(ii) Labour Cost Variance.

(iii) Fixed Overhead Cost Variance.

(iv) Variable Overhead Cost Variance. (5 Marks)

Reference | What's New

Material , Labour , FOH , VOH Cost Variances

Watch Video

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Answer

Budgeted Production 30,000 hours ÷ 6 hours per unit = 5,000 units

Budgeted Fixed Overhead Rate = ₹ 45,00,000 ÷ 5,000 units = ₹ 900 per unit Or

= ₹ 45,00,000 ÷ 30,000 hours = ₹ 150 per hour.

(i) **Material Cost Variance** = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)

= (4,800 units × 10 kg. × ₹100) - ₹ 52,50,000

= ₹ 48,00,000 – ₹ 52,50,000

= ₹ 4,50,000 (A)

(ii) **Labour Cost Variance** = (Std. Hours × Std. Rate) – (Actual Hours × Actual rate)

= (4,800 units × 6 hours × ₹ 55) – ₹ 15,50,000

= ₹ 15,84,000 – ₹ 15,50,000

= ₹ 34,000 (F)

(iii) **Fixed Overhead Cost Variance** = (Budgeted Rate × Actual Qty) – Actual Overhead

= (₹ 900 × 4,800 units) – ₹47,00,000

= ₹ 3,80,000 (A)

OR

= (Budgeted Rate × Std. Hours) – Actual Overhead

= (₹ 150 × 4,800 units × 6 hours) – ₹ 47,00,000

= ₹ 3,80,000 (A)

(iv) **Variable Overhead Cost Variance** = (Std. Rate × Std. Hours) – Actual Overhead

= (4,800 units × 6 hours × ₹ 100) - ₹ 29,30,000

= ₹ 28,80,000 - ₹ 29,30,000

= ₹ 50,000 (A)

Q39 ICAI Mat

NPX Ltd. uses standard costing system for manufacturing of its product X. Following is the budget data given in relation to labour hours for manufacture of 1 unit of Product X :

Labour	Hours	Rate (₹)
Skilled	2	6
Semi-Skilled	3	4
Un- Skilled	5	3
Total	10	

In the month of January, 2020, total 10,000 units were produced following are the details:

Labour	Hours	Rate (₹)	Amount (₹)
Skilled	18,000	7	1,26,000
Semi-Skilled	33,000	3.5	1,15,500
Un- Skilled	58,000	4	2,32,000
Total	1,09,000		4,73,500

Actual Idle hours (abnormal) during the month:

Skilled:	500
Semi- Skilled:	700
Unskilled:	800
Total	2,000

CALCULATE:

(a) Labour Variances.

(b) Also show the effect on Labour Rate Variance if 5,000 hours of Skilled Labour are paid @ ₹ 5.5 per hour and balance were paid @ ₹ 7 per hour.

Reference | What's **New**

Labour Variances | **Effect of Labour Rate Variances**

Watch **Video** — Scan Me

Answer

Working Notes:

	Budget			Standard for actual			Actual		
	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
Skilled	2	6	12	20,000	6	1,20,000	18,000	7	1,26,000
Semi- skilled	3	4	12	30,000	4	1,20,000	33,000	3.5	1,15,500

Unskilled	5	3	15	50,000	3	1,50,000	58,000	4	2,32,000
	10		39	1,00,000		3,90,000	1,09,000		4,73,500

	Idle Hours	Hours worked
Skilled	500	17,500
Semi-skilled	700	32,300
Unskilled	800	57,200
	2,000	1,07,000

(a) (i) **Labour Cost Variance= (SH × SR – AH × AR)**

Skilled	20,000 × 6 – 18,000× 7	=	₹ 6,000 (A)
Semi-Skilled	30,000 ×4 – 33,000 × 3.5	=	₹ 4,500 (F)
Unskilled	50,000× 3 – 58,000 × 4	=	₹ 82,000 (A)
Total			₹ 83,500 (A)

(ii) **Labour Rate Variance = (SR – AR) × AH_{Paid}**

Skilled	(6 – 7) × 18,000	=	₹ 18,000 (A)
Semi-Skilled	(4 – 3.5) × 33,000	=	₹ 16,500 (F)
Unskilled	(3 – 4) × 58,000	=	₹ 58,000 (A)
Total			₹ 59,500 (A)

(iii) **Labour Efficiency Variance = (SH – AH) × SR**

Skilled	(20,000 – 17,500) × 6	=	₹ 15,000 (F)
Semi- Skilled	(30,000 – 32,300) × 4	=	₹ 9,200 (A)
Unskilled	(50,000 – 57,200) × 3	=	₹ 21,600 (A)
Total			₹ 15,800 (A)

(iv) **Labour Idle Time Variance = (Idle Hours × SR)**

Skilled	500 × 6	=	₹ 3,000 (A)
Semi- Skilled	700 × 4	=	₹ 2,800 (A)
Unskilled	800 × 3	=	₹ 2,400 (A)
Total			₹ 8,200 (A)

(v) **Labour Mix Variance = (RSH – AH_{Worked}) × SR**

Revised Std. hours (RSH) = $\frac{\text{Std. Hours}}{\text{Total Std. hours}} \times \text{Total Actual Hours}$

Skilled	$\left(\frac{20,000}{1,00,000} \times 1,07,000 - 17,500\right) \times 6$	=	₹ 23,400 (F)
Semi- Skilled	$\left(\frac{30,000}{1,00,000} \times 1,07,000 - 32,300\right) \times 4$	=	₹ 800 (A)

	Unskilled	$\left(\frac{50,000}{1,00,000}\times 1,07,000-57,200\right)\times 3$	= ₹ 11,100 (A)
	Total		₹ 11,500 (F)

(vi) **Labour Yield Variance = (SH – RSH) × SR**

Skilled	$\left(20,000-\frac{20,000}{1,00,000}\times 1,07,000\right)\times 6$	= ₹ 8,400 (A)
Semi- Skilled	$\left(30,000-\frac{30,000}{1,00,000}\times 1,07,000\right)\times 4$	= ₹ 8,400 (A)
Unskilled	$\left(50,000-\frac{50,000}{1,00,000}\times 1,07,000\right)\times 3$	= ₹ 10,500 (A)
Total		₹ 27,300 (A)

(b) **Labour Rate Variance = (SR – AR) ×AH_{Paid}**

Skilled	(6 – 5.5) × 5,000 + (6 – 7) × 13,000	= ₹ 10,500 (A)
Semi- Skilled	(4 – 3.5) × 33,000	= ₹ 16,500 (F)
Unskilled	(3 – 4) × 58,000	= ₹ 58,000 (A)
Total		= ₹ 52,000 (A)

Q40 ICAI Mat

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 (₹)	Amount (₹)
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 (₹)	Amount (₹)
A	70	?	?
B	?	30	?

Material Price Variance (A) ₹ 105(A)

Material cost variance ₹ 275(A)

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

Reference | What's **New**

Material Variances

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Answer

(i) **Actual Price of Material A**

Let Actual Price of Material A be 'X'

Material Price Variance (A) = ₹ 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) = ₹ 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 = ₹ 105 (A)

Material B = (30 – 30) × 39 = ₹ 0

Total = ₹ 105 (A)

(iv) **Material Usage Variance = (SQ – AQ) × SP**

Material A = (60 – 70) × 20 = ₹ 200 (A)

Material B = (40 – 39) × 30 = ₹ 30 (F)

Total = ₹ 170 (A)

(v) **Material Mix Variance = (RSQ – AQ) × SP**

$$\text{Material A} = \left(\frac{109}{100}\times 60 - 70\right)\times 20 = ₹\ 92\ (A)$$

$$\text{Material B} = \left(\frac{109}{100}\times 40 - 39\right)\times 30 = ₹\ 138\ (F)$$

Total = ₹ 46 (F)

(vi) **Material Yield Variance = (SQ – RSQ) × SP**

$$\text{Material A} = \left(60 - \frac{109}{100}\times 60\right)\times 20 = ₹\ 108\ (A)$$

$$\text{Material B} = \left(40 - \frac{109}{100}\times 40\right)\times 30 = ₹\ 108\ (A)$$

Total = ₹ 216 (A)

Q 41 ICAI Mat; MTP Aug'18; RTP Nov'21

Paras Synthetics uses Standard costing system in manufacturing of its product 'Star 95 Mask'. The details are as follows;

Direct Material 0.50 Meter @ ₹ 60 per meter	₹ 30
Direct Labour 1 hour @ ₹ 20 per hour	₹ 20
Variable overhead 1 hour @ ₹ 10 per hour	₹ 10
Total	₹ 60

During the month of August, 2020 10,000 units of 'Star 95 Mask' were manufactured.

Details are as follows:

Direct material consumed 5700 meters @ ₹ 58 per meter

Direct labour Hours ? @ ? ₹ 2,24,400

Variable overhead incurred ₹ 1,12,200

Variable overhead efficiency variance is ₹ 2,000(A). Variable overheads are based on Direct Labour Hours.

You are **required** to calculate the missing data and all the relevant Variances.

Reference | **What's New**

Variable Overhead Variances

Watch **Video**

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Answer

(i) **Material Variances**

	Budget			Std. for actual			Actual		
	Quantity	Price (₹)	Amount (₹)	Quantity	Price (₹)	Amount (₹)	Quantity	Price (₹)	Amount (₹)
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 = ₹ 30,600(A)

Material Price Variance **= (SP – AP) AQ**

(60 – 58) × 5,700 = ₹ 11,400 (F)

Material Usage Variance **= (SQ – AQ) SP**

(5,000 – 5,700) × 60 = ₹ 42,000 (A)

(ii) **Variable Overheads variances**

Variable Overhead Cost Variance = (Standard variable overhead – Actual Variable Overhead)

= (1,00,000 – 1,12,200) = ₹ 12,200(A)

Where, Standard Variable Overheads: 10,000 units × 10 = 1,00,000

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 = ₹ 10,200 (A)

(iii) **Labour variances**

	Budget			Std. for actual			Actual		
	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
Labour	1	20	20	10,000	20	2,00,000	10,200	22	2,24,400

Actual Rate = ₹ 2,24,400 ÷10,200 hours = ₹ 22

Labour Cost Variance **= (SH × SR) – (AH × AR)**

10,000 × 20 – 10,200 × 22 = ₹ 24,400 (A)

Labour Rate Variance **= (SR – AR) × AH**

(20 – 22) × 10,200 = ₹ 20,400 (A)

Labour Efficiency Variance **= (SH – AH) × SR**

(10,000 – 10,200) × 20 = ₹ 4,000 (A)

Q42 July'21

The standard output of a Product 'DJ' is 25 units per hour in manufacturing department of a Company employing 100 workers. In a 40 hours week, the department produced 960 units of product 'DJ' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹ 6.20, ₹ 6.00 and ₹ 5.70 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹ 240 (F).

You are **required** to compute : [10]

(i) Total Labour Cost Variance.

(ii) Total Labour Rate Variance.

(iii) Total Labour Gang Variance.

(iv) Total Labour Yield Variance, and

(v) Total Labour Idle Time Variance.

Reference | **Labour Variances**

What's **New** | **Idle time Variance**

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Answer

Working Notes:

1. **Calculation of Standard Man hours**

When 100 workers work for 1 hour, the standard output is 25 units.

$$\text{Standard man hours per unit} = \frac{100 \text{ hours}}{25 \text{ units}} = 4 \text{ hours per unit}$$

2. **Calculation of standard man hours for actual output:**

= 960 units × 4 hours = 3,840 hours.

3. **Calculation of actual cost**

Type of Workers	No of Workers	Actual Hours Paid	Rate (₹)	Amount (₹)	Idle Hours (5% of hours paid)	Actual hours Worked
Group 'A'	10	400	6.2	2,480	20	380
Group 'B'	30	1,200	6	7,200	60	1,140
Group 'C'	60	2,400	5.7	13,680	120	2,280
	100	**4,000**		**23,360**	**200**	**3,800**

4. **Calculation of Standard wage Rate:**

Labour Efficiency Variance	= 240F
(Standard hours for Actual production – Actual Hours) × SR	= 240F
(3,840 – 3,800) × SR	= 240
Standard Rate (SR)	= ₹ 6 per hour

(i) **Total Labour Cost Variance**

= (Standard hours × Standard Rate) – (Actual Hours × Actual rate)

= (3,840 × 6) – 23,360 = 320A

(ii) **Total Labour Rate Variance**

= (Standard Rate – Actual Rate) × Actual Hours

Group 'A' = (6 – 6.2) 400	80A
Group 'B' = (6 – 6) 1,200	0
Group 'C' = (6 – 5.7) 2,400	720F
	640F

(iii) **Total Labour Gang Variance**

= Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang – Average Standard Rate per hour of Actual Gang*}

* on the basis of hours worked

$$= 3,800 \times \left(6 - \frac{3,840 \times 6}{3,800}\right)$$

$$= 0$$

(iv) **Total Labour Yield Variance**

= Average Standard Rate per hour of Standard Gang × {Total Standard Time (hours) – Total Actual Time worked (hours)}

= 6 × (3,840 – 3,800)

= 240F

(v) **Total Labour idle time variance**

= Total Idle hours × standard rate per hour

= 200 hours × 6

= 1,200A

Q43 ICAI Mat

ABC Ltd. produces an article by lending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials:

Material	Standard mix	Standard price (₹ per kg)
A	40%	4
B	60%	3

The standard loss in processing is 15%. During April 2021, the company produced 1,700 kgs. of finished output.

The position of stock and purchases for the month of April 2021 are as under:

Material	Stock on 01.04.2021 (Kg.)	Stock on 30.04.2021 (Kg.)	Purchased during April 2021	
			(Kg.)	(₹)
A	35	5	800	3,400
B	40	50	1,200	3,000

Opening stock of material is valued at standard price.

CALCULATE the following variances:

(i) Material price variance

(ii) Material usage variance

(iii) Material yield variance

(iv) Material mix variance

(v) Total Material cost variance

Reference | What's New

Material Variances

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Answer

Types of material	Standard			Actual		
	Qty. (Kg.)	Rate (₹)	Amount (₹)	Qty. (Kg.)	Rate (₹)	Amount (₹)
A	800	4	3,200	35	4	140.00
				795	4.25	3,378.75
B	1200	3	3,600	40	3	120.00
				1,150	2.50	2,875.00
Total	2,000		6,800	2,020		6,513.75

(i) **Material Price Variance**

= Actual qty. × (Standard price – Actual price)

Material A: Since the actual price and standard price in respect of 35 kg. of raw materials A are same i.e. ₹ 4, there will be no price variance in respect of this quantity. Price variance will be in respect of only 795 kg. as given below:

= 795 kg. (₹ 4 – ₹ 4.25) = ₹ 198.75 (A)

Material B: For Material B also, price variance will only be in respect of 1,150 kg. as given below:

= 1,150 kg. (₹ 3 – ₹ 2.50) = ₹ 575 (F)

Total = ₹ 198.75 (A) + 575 (F) = ₹ 376.25(F)

(ii) **Material Usage Variance**

= (Std. qty. for actual output – Actual qty.) × Std. price

Material A	= (800 – 830) × 4	=	120 (A)
Material B	= (1,200 – 1,190) × 3	=	30 (F)
			₹ 90 (A)

(iii) **Material Yield Variance**

= (Std. qty. - Revised Std. qty.) × Std. Price

Material A	= (800 – 808) × 4	=	32 (A)
Material B	= (1,200 – 1,212) × 3	=	36 (A)
			₹ 68 (A)

Check

MUV = MMV + MYV

90 (A) = 22 (A) + 68 (A)

(iv) **Material Mix Variance**

= (Revised std. qty. – Actual qty.) × Std. Price

Material A	= (808 – 830) × 4	=	88 (A)
Material B	= (1,212 – 1,190) × 3	=	66 (F)
			₹ 22 (A)

(v) **Total Material Cost Variance**

= Std. cost for actual output – Actual cost = 6,800 – 6,513.75 = 286.25 (F)

Check, MCV = MPV + MUV

286.25 (F) = 376.25 (F) + 90 (A)

Working Notes:

1. **Standard Quantity for Actual Output**

The standard loss being 15%. It means to produce, 1,700 kg. of the article, standard quantity of material required is:

$$= \frac{100}{85} \times 1{,}700 \text{ kgs.} = 2{,}000 \text{ kg.}$$

Out of 2,000 kg. of material used, 40% is of type A and 60% is of type B, i.e., Standard quantity for actual output for :

$$\text{Material A} = 2{,}000 \times \frac{40}{100} = 800 \text{ kg.}$$

$$\text{Material B} = 2{,}000 \times \frac{60}{100} = 1{,}200 \text{ kg.}$$

2. **Actual Quantity of Material**

= Opening stock + Purchases – Closing stock

Material A = 35 + 800 – 5 = 830 kg.

Material B = 40 + 1,200 – 50 = 1,190 kg.

3. **Standard Cost per unit**

$$= \frac{\text{Total sandard cost}}{\text{Total standard output of std. mix}}$$

$$= \frac{₹\ 6{,}800}{1{,}700 \text{ kg.}} = ₹\ 4 \text{ per kg.}$$

4. **Revised Standard Quantity**

Material A = $\frac{2,020}{2,000} \times 800 = 808$ kg.

Material B = $\frac{2,020}{2,000} \times 1,200 = 1,212$ kg.

Q44 ICAI Mat

The standard output of product 'EXE' is 25 units per hour in manufacturing department of a company employing 100 workers. The standard wage rate per labour hour is ₹ 6.

In a 42 hours week, the department produced 1,040 units of 'EXE' despite 5% of the time paid being lost due to an abnormal reason. The hourly wages actually paid were ₹ 6.20, ₹ 6 and ₹ 5.70 respectively to 10, 30 and 60 of the workers.

CALCULATE relevant labour variances.

Reference — What's **New**

Labour Variances

Watch **Video**

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Answer

Working Notes:

1. **Calculation of standard man hours**

When 100 worker works for 1 hr., then the std. output is 25 units.

Std. man hour per unit = $\frac{100 \text{ hrs.}}{25 \text{ units}}$ = 4 hrs.

2. **Calculation of std. man hours for actual output**

Total std. man hours = 1,040 units × 4 hrs. = 4,160 hrs.

Standard for Actual			Actual					
Hours	Rate (₹)	Amount (₹)	No. of workers	Actual hours paid	Idle time hrs.	Production hours	Rate (₹)	Amount paid (₹)
4,160	6	24,960	10	420	21	399	6.20	2,604
			30	1,260	63	1,197	6.00	7,560
			60	2,520	126	2,394	5.70	14,364
4,160	6	24,960	100	4,200	210	3,990		24,528

1. **Labour Cost Variance**

= Std. labour cost – Actual labour cost

= 24,960 – 24,528 = ₹ 432 (F)

2. **Labour Rate Variance**

   = (SR – AR) × Actual Hrs Paid

   = (6 – 6.20) × 420 = 84 (A)

   = (6 - 6) × 1260 = NIL

   = (6 - 5.70) × 2,520 = 756 (F)

   = 672 (F)

3. **Labour Efficiency Variance**

   = (SH – AH) × SR

   = (4,160 – 3,990) × 6 = 1,020 (F)

4. **Labour Idle time variance**

   = Idle Hours × SR

   = 210 × 6 = 1,260 (A)

Q45 ICAI Mat

A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at ₹ 1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.

In April 2021, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output. The actual fixed overheads were ₹ 1,42,000.

COMPUTE the following Fixed Overhead Variance:

1. Efficiency Variance
2. Capacity Variance
3. Calendar Variance
4. Expenditure Variance
5. Volume Variance
6. Total Fixed Overhead Variance

Reference | What's **New**

Fixed Overhead Variances

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Answer

Working Notes:

	Budget	Actual
(1) Fixed overheads for the month	1,44,000	1,42,000
(2) Working days per month	25	24
(3) Working hours per month	(120 machines × 8 hrs. × 25 days) = 24,000	(840 machines hours × 24 days) = 20,160
(4) Production units per month	24,000 hrs. / 4 hrs. = 6,000	5,305

(5) Standard hours for actual production = Actual production units × Std. hours per unit = 5,305 × 4 = 21,220 hrs.

(6) Standard fixed overhead rate per unit = $\frac{₹\,1,44,000}{6,000\ \text{units}}$ = ₹ 24

(7) Standard fixed overhead rate per hour = $\frac{₹\,1,44,000}{24,000\ \text{hrs.}}$ = ₹ 6

(8) Standard fixed overhead per day = $\frac{₹\,1,44,000}{25\ \text{days}}$ = ₹ 5,760

1. **Efficiency Variance**

   = Std. rate per hr. (Std. hrs. for actual production – Actual hrs.)

   = 6 × (21,220 – 20,160) = ₹ 6,360 (F)

2. **Capacity Variance**

   = Std. Rate (Actual hours - Budgeted hours)

   = 6 × {20,160 – (24 days × 120 machine × 8 hrs.)} = ₹ 17,280 (A)

3. **Calendar Variance**

   = (Actual No. of days – Budgeted No. of days) × Std. rate per day

   = (24 – 25) × 5,760 = ₹ 5,760 (A)

4. **Expenditure Variance**

   = Budgeted overhead – Actual overhead

   = 1,44,000 – 1,42,000 = ₹ 2,000 (F)

5. **Volume Variance**

   = Absorbed overhead – Budgeted overhead

   = (5,305 × 24) – 1,44,000 = ₹ 16,680 (A)

6. **Total Fixed Overhead Variance**

   = Absorbed overhead – Actual overhead incurred

   = (5,305 × 24) – 1,42,000 = ₹ 14,680 (A)

Q46 ICAI Mat

One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June 2021:

(a) Standard mix for chemical A is 50% and chemical B is 50%.

(b) Standard price kilogram of chemical A is ₹ 12 and chemical B is ₹ 15.

(c) Actual input of chemical B is 70 kilograms.

(d) Actual price per kilogram of chemical A is ₹ 15

(e) Standard normal loss is 10% of total input

(f) Total Material cost variance is ₹ 650 adverse.

(g) Total Material yield variance is ₹ 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

Reference | What's **New**

Material Variances

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Answer

Working Notes:

(1) **Calculation of standard mix of input (assuming Standard input as 100 kg)**

	Qty. (Kg)	Price (₹)	Amount (₹)
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 ₹ Y.

Given,

Material Yield Variance = (Total standard input – Total Actual input) × Standard cost per unit of input

= [100 – (70 + X)] × 13.5 = 135 (A)

Therefore, X = 40 kg.

Also, Material Cost Variance = (Standard quantity × Standard price) – (Actual quantity × Actual price)

= 1,350 – {(40 × 15) + (70 × Y)} = 650 (A)

= 1,350 – 600 – 70Y = 650A

Therefore, Y = ₹ 20

(i) **Material Mix Variance**

= (Revised Std. Quantity* – Actual quantity) × Standard Price

Chemical A = (55 – 40) × 12	=	180 (F)
Chemical B = (55 - 70) × 15	=	225 (A)
		₹ 45 (A)
Chemical A = (70 + 40) × 50%	=	55
Chemical B = (70 + 40) × 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)
		₹ 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)
		₹ 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** = ₹ 20 [As calculated in Working note (2)].

Q 47 ICAI Mat

The following information is available from the cost records of Novell & Co. for the month of March 2021:

Materials purchased	20,000 units @ ₹ 88,000
Materials consumed	19,000 units
Actual wages paid for 4,950 hrs.	₹ 24,750
Units produced	1,800 units
Standard rates and pieces are:	
Direct material	₹ 4 per unit
Standard output	10 number for one unit
Direct labour rate	₹ 4.00 per hour
Standard requirement	2.5 hours per unit

You are **required** to CALCULATE relevant Material and Labour Variance for the month.

Reference — What's **New**

Material and Labour Variances

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Answer

Material Variances

1. **Material Cost Variance**

   = (Std. qty for actual output* × Std. price) – (Actual qty. × Actual price)

   = (18,000 × 4) – (19,000 × 4.40)

   = 72,000 – 83,600 = ₹ 11,600 (A)

   * Std. qty. for actual output = 1,800 × 10 = 18,000 units

2. **Material Price Variance**

   = (Std. price – Actual price) × Actual qty.

   = (4 - 4.40) × 19,000

   = 0.40 × 19,000 = ₹ 7,600 (A)

3. **Material Usage Variance**

   = (Std. qty. – Actual qty.) × Std. price

   = (18,000 – 19,000) × 4

   = 1,000 × 4 = ₹ 4,000 (A)

Labour Variances

1. **Labour Cost Variance**

   = (Std. hours for actual output* × Std. price) – Actual cost

   = (4,500 × 4) – 24,750

   = 18,000 – 24,750 = ₹ 6,750 (A)

   *Std. hours for actual output = 1,800 × 2.5 = 4,500 hrs.

2. **Labour Rate Variance**

   = (Std. rate – Actual rate) × Actual hrs.

   = (4 – 5) × 4,950 = ₹ 4,950 (A)

3. **Labour Efficiency Variance**

   = (Std. hrs. for actual output – Actual hrs.) × Std. rate

   = (4,500 – 4,950)× 4 = ₹ 1,800 (A)

Q48 ICAI Mat

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 ₹)	10,000	9,150

The standard time to produce one unit of the product is 20 hours.

CALCULATE relevant Variable Overhead Variances.

Reference — What's New

Variable Overhead Variances

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Answer

1. **Calculation of Standard Variable Overhead per unit**

$$= \frac{\text{Budgeted variable overhead}}{\text{Budgeted production}} = \frac{10,000}{400} = ₹ 25 \text{ per unit}$$

2. **Calculation of Standard Variable Overhead per hour**

$$= \frac{\text{Budgeted variable overhead}}{\text{Budgeted man hours}} = \frac{10,000}{8,000} = ₹ 1.25 \text{ per unit}$$

3. **Calculation of Std. Variable Overhead for actual output**

   = Actual output × Std. variable overhead per unit

   = 360 units × ₹ 25 = ₹ 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 = ₹ 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 = ₹ 150 (A)

   (ii) **Variable Overhead Expenditure Variance**

   = Std. overhead for Actual hours – Actual Overhead

   = 8,750 – 9,150 = ₹ 400 (A)

   (iii) **Variable Overhead Efficiency Variance**

   = (Std. hours for actual output – Actual hours) × Std. rate per hour

   = (7,200 – 7,000) × 1.25 = ₹ 250 (F)

Q49 MTP Oct'21

Following information has been provided by a company:

Number of units produced and sold	9,000
Standard labour rate per hour	₹ 12
Standard hours required for 9,000 units	-
Actual hours required	25,641 hours
Labour efficiency	105.3%
Labour rate variance	₹ 1,53,846 (A)

You are **required** to **CALCULATE**:

(i) Actual labour rate per hour

(ii) Standard hours required for 9,000 units

(iii) Labour Efficiency Variance

(iv) Standard labour cost per unit

(v) Actual labour cost per unit. [10]

Reference | What's New

Labour Variances

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Answer

SR – Standard Labour Rate per hour

AR – Actual Labour Rate per hour

SH – Standard Hours

AH – Actual Hours

(i) Labour Rate Variance = AH (SR – AR)

- 1,53,846 = 25,641 (12 – AR)

- 6 = 12 – AR

AR = ₹ 18

(ii) Labour Efficiency $= \frac{SH}{AH} \times 100 = 105.3$

$SH = \frac{AH \times 105.3}{100} = \frac{25,641 \times 105.3}{100}$

SH = 26,999.973

SH = 27,000 hours

(iii) Labour Efficiency Variance = SR (SH – AH)

= 12 (27,000 – 25,641)

= ₹ 16,308 (F)

(iv) Standard Labour Cost per unit $= \frac{27,000 \times 12}{9,000} = ₹ 36$

(v) Actual Labour Cost per unit $= \frac{25,641 \times 18}{9,000} = ₹ 51.282$

Q 50 MTP May'22

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 @ ₹ 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 [10]

Reference What's **New**

Fixed Overhead Variances

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Answer

(i) Fixed Overhead Cost Variance = (Std Fixed Overheads – Actual Fixed Overheads)

$$= \left(\frac{1,00,000}{20,000} \times 21,000 \text{ units} - \text{Actual Fixed Overheads}\right) = 15,000A$$

$$= (1,05,000 - \text{Actual Fixed Overheads}) = 15,000A$$

=> Actual Fixed Overheads = 1,20,000

(ii) Fixed Overhead Calendar Variance = (Actual Days – Budgeted Days) × Budgeted rate per day

$$= (\text{Actual Days} - 25) \times \frac{1,00,000}{25} = 8,000F$$

$$= (\text{Actual Days} - 25) = 2$$

=> Actual Days = 27

(iii) Fixed Overhead Efficiency Variance = (Standard Hours for Actual Production – Actual Hours) × Budgeted rate per hour

$$= \left(\frac{10,000}{20,000} \times 21,000 - \text{Actual Hours}\right) \times 10 = 10,000A$$

$$= (10,500 - \text{Actual Hours}) = -1,000$$

=> 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) × Budgeted Rate per unit

$$= (20,000 - 21,000) \times \frac{1,00,000}{20,000} = 5,000F$$

(vi) Fixed overheads capacity variance = (Budgeted Hours for Actual Days – Actual Hours) × Budgeted Rate per Hour

$$= \left(\frac{10,000}{25} \times 27 - 11,500\right) \times 10 = 7,000F$$

Q 51 MTP May'22

Rounak Minerals Ltd. operates in iron ore mining through open cast mining method. Explosives and detonators are used for excavation of iron ores from the mines. The following are the details of standard quantity of explosives materials used for mining:

Particulars	Rate (₹)	Standard Qty. for Iron ore	Standard Qty. for Overburden (OB)
SME	40.00 per kg.	2.4 kg per tonne	1.9 kg per cubic- meter
Detonators	20.00 per piece	2 pcs per tonne	2 pcs per cubic-meter

The standard stripping ratio is 3:1 (means 3 cubic- meter of overburden soil to be removed to get one tonne of iron ore).

During the month of December 2021, the company produced 20,000 tonnes of iron ore and removed 58,000 cubic- meter of OB. The quantity of explosive materials used and paid for the month is as below:

Material	Quantity	Amount (₹)
SME	1,67,200 kg.	63,53,600
Detonators	1,18,400 pcs	24,27,200

You are required to **COMPUTE**:

(i) Material price variance

(ii) Material quantity variance

(iii) Material cost variance. [10]

Reference — What's **New**

Material Variances

Watch **Video**

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Answer

Workings:

1. **Calculation of Standard Qty. of Explosives and Detonators for actual output:**

	Particulars	Iron ore	Overburden (OB)	Total
SME:				
A	Actual Output	20,000 tonne	58,000 M3	
B	Standard Qty per unit	2.4 kg./tonne	1.9 kg./M3	
C	Standard Qty. for actual production [A × B]	48,000 kg.	1,10,200 kg.	1,58,200 kg.
Detonators:				
D	Standard Qty per unit	2 pcs/ tonne	2 pcs/ M3	
E	Standard Qty. for actual production [A × D]	40,000 pcs.	1,16,000 pcs	1,56,000 pcs

2. **Calculation of Actual Price per unit of materials:**

Material	Quantity [A]	Amount (₹) [B]	Rate (₹) [C = B ÷ A]
SME	1,67,200 kg.	63,53,600	38.00
Detonators	1,18,400 pcs	24,27,200	20.50

(i) **Computation of material price variance:**

Material Price Variance = Actual Qty. × (Std. Price - Actual Price)

SME = 1,67,200 kg. × (₹ 40 – ₹ 38) = ₹ 3,34,400 (F)

Detonators = 1,18,400 pcs × (₹ 20 – ₹ 20.5) = ₹ 59,200 (A)

Total = ₹ 2,75,200 (F)

(ii) **Computation of material quantity variance:**

Material Qty. Variance = Std. Price × (Std. Qty for actual output – Actual Qty.)

SME = ₹ 40 × (1,58,200 kg. - 1,67,200 kg.) = ₹ 3,60,000 (A)

Detonators = ₹ 20 × (1,56,000 pcs -1,18,400 pcs) = ₹ 7,52,000 (F)

Total = ₹ 3,92,000 (F)

(iii) **Computation of material cost variance:**

Material cost variance = Std. cost – Actual Cost

Or, (Std. Price × Std. Qty) – (Actual Price × Actual Qty.)

SME = (₹ 40 × 1,58,200 kg) – (₹ 38 × 1,67,200 kg.)

= ₹ 63,28,000 – ₹ 63,53,600 = ₹ 25,600 (A)

Detonators	= (₹ 20 × 1,56,000 pcs) – (₹ 20.50 × 1,18,400 pcs)	
	= ₹ 31,20,000 – ₹ 24,27,200	= ₹ 6,92,800 (F)
Total		

Q52 RTP Nov'22

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 ₹ 24 per kilogram.
- The standard wage rate is ₹ 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 @ ₹ 22 per kilogram.
- Total direct wages cost was ₹ 43,92,000
- Fixed production overhead cost incurred was ₹ 45,00,000 Analysis of variances was as follows:

Variances	Favourable	Adverse
Direct material price	₹ 4,80,000	-
Direct material usage	₹ 48,000	
Direct labour rate	-	₹ 69,120
Direct labour efficiency	₹ 33,120	-
Fixed production overhead expenditure		₹ 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

Reference | What's New

Material variance, Labour Variance, Production Overhead Cost Variance

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Answer

(i) **Direct Material Cost Variance** = Direct Material Price Variance + Direct Material Usage Variance

= ₹ 4,80,000 F + ₹ 48,000 F = ₹ 5,28,000 F

(ii) **Budgeted Output (units)**

Fixed Production Overhead Expenditure Variance

= Budgeted Fixed Overhead – Actual Fixed Overheads

= Budgeted Output × Standard Overhead Rate – Actual Fixed Overheads

₹ 1,80,000 A = Budgeted Output × ₹ 360 (5 hrs @₹ 72) – ₹ 45,00,000

$$\text{Budgeted Output} = \frac{₹\,45,00,000 - ₹\,1,80,000}{₹\,360} = 12,000 \text{ units}$$

(iii) **Quantity of Materials purchased (in kilograms)**

Material Price Variance = Actual Usage (Standard Price per kg – Actual price per kg)

₹ 4,80,000 F = Actual Usage (₹ 24 – ₹ 22)

$$\text{Actual usage in kgs} = \frac{₹\,4,80,000 - ₹\,1,80,000}{₹\,2} = 2,40,000 \text{ kgs}$$

(iv) **Actual Output (units)**

Actual Direct Wages	₹ 43,92,000
Direct labour rate variance	₹ 69,120 A
Direct labour efficiency variance	₹ 33,120 F
Standard labour cost for actual output	₹ 43,56,000

$$\text{Actual Output} = \frac{\text{Standard labour cost for actual output}}{\text{Standard wage rate per unit}}$$

$$= \frac{₹\,43,56,000}{₹\,360(72 \times 5)} = 12,100 \text{ units}$$

Alternatively, let X be the actual quantity of output

Then, Standard Quantity of input for actual output 'X'

20X = SQ

Material cost variance = (SQ × SP) – (AQ × AP)

₹ 5,28,000 = (20 X x ₹ 24) – (2,40,000 kgs × ₹ 22)

480X = ₹ 52,80,000 + ₹ 5,28,000

480X = ₹ 58,08,000

$$X = \frac{₹\ 58,08,000}{480} = 12,100 \text{ units}$$

(v) **Actual hours worked**

Labour Efficiency Variance = Standard Labour Rate (Standard time for actual output – Actual time)

₹ 33,120 F = ₹ 72 (5 hours × 12100 units – Actual time)

460 hours = 60,500 hours – Actual time

Actual time = 60,500 – 460 = 60,040 hours

(vi) **Actual wage rate per hour**

Actual Wages paid = ₹ 43,92,000

Actual hours worked = 60,040 hours

$$\text{Actual Wage rate per hour} = \frac{₹\ 43,92,000}{60,040 \text{ hours}} = ₹\ 73.15 \text{ per hour}$$

(vii) **Labour cost variance**

= Labour rate variance + Labour efficiency variance

=₹ 69,120 A + ₹ 33,120 F

= ₹ 36,000 A

(viii) **Production Overhead Cost Variance**

= Actual Output × Standard overhead rate – Actual Overheads Incurred

= 12,100 units x₹ 360 – ₹ 45,00,000

= ₹ 43,56,000 – ₹ 45,00,000

= ₹ 1,44,000 A

Q53 MTP Nov'22

The details regarding a product manufactured by the company for the last one week are as follows:

Standard cost (per unit)

Direct materials 10 units @ ₹ 22.50	₹ 225
Direct wages 5 hours @ ₹ 120	₹ 600
Total:	₹ 825
Actual (for whole activity):	
Direct materials	₹ 96,525
Direct wages	₹ 2,44,860
Analysis of variances:	
Direct materials:	
Price	₹ 8,775 (Adverse)
Usage	₹ 5,625 (Favourable)
Direct wages (labour):	
Efficiency	₹ 5,400 (Adverse)

You are required to **CALCULATE**:

(i) Material Cost variance

(ii) Actual output units

(iii) Actual price of material per unit

(iv) Actual Wages rate per labour hour

(v) Labour rate variance

(vi) Labour Cost variance [10]

Reference What's **New**

Material & Labour Variances

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Answer

(i) **Material Cost Variance** = Material Price Variance + Material Usage Variance

= ₹ 8,775 A + ₹ 5,625 F= ₹ 3,150 Adverse

(ii) **Actual output units**

Let x be the actual quantity of output

Then Standard Quantity of input for actual output 'x'

SQ = 10x

Material cost variance	= (SQ x SP) - (AQ x AP)
-3,150	= (10x x ₹ 22.50) - ₹ 96,525
-3,150	= 225x - ₹ 96,525
225x	= ₹ 96,525 – 3,150 = ₹ 93,375
x	= ₹ 93,375/225 = 415 Units

(iii) **Actual Price of Material per unit**

Material Usage variance	= (SQ - AQ) x SP
5,625	= (10x - AQ) x ₹ 22.50
5,625	= (10 x 415 units - AQ) x ₹ 22.50
5,625/22.50	= 4,150 - AQ
AQ	= 4,150 - 250 = 3,900 units
Now, AQ x AP	= ₹ 96,525 (given)
AP	= ₹ 96,525/AQ
	= ₹ 96,525/3,900 units = ₹ 24.75

(iv) **Actual wages rate per labour hour**

Labour efficiency variance = 5,400 Adverse (given)

Standard rate per hour (Standard time – Actual time) = -5,400

₹ 120 [(Actual output units x Number of hours per output) – Actual time] = -5,400

₹ 120 [(415 units x 5 hrs) – Actual time]	= -5,400
2,075 hrs – Actual time	= -5,400/120
Actual time	= 2,075 + 45
	= 2,120 hrs
Now Direct wages	= ₹ 2,44,860 (given)
Actual time x Actual rate per hour	= ₹ 2,44,860
Actual rate per hour	= ₹ 2,44,860 / 2,120 hrs
	= ₹ 115.50

(v) **Labour rate variance**

= Actual time (Standard Rate – Actual Rate)

= 2,120 hrs (₹ 120 - ₹ 115.50)

= 2,120 hrs x ₹ 4.50 = 9,540 Favourable

(vi) **Labour Cost variance**

= Labour rate variance+ Labour efficiency variance

= 9,540 F + 5,400 A = 4,140 Favourable

= ₹ 6,67,200 (F)

Q 54 MTP Nov'22

The following information is available from the cost records of a company for the month of July, 2022:

(1)	Material purchased	22,000 pieces	₹ 9,00,000
(2)	Material consumed	21,000 pieces	
(3)	Actual wages paid for	5,150 hours	₹ 2,57,500
(4)	Fixed Factory overhead incurred		₹ 4,60,000
(5)	Fixed Factory overhead budgeted		₹ 4,20,000
(6)	Units produced	1,900	
(7)	Standard rates and prices are:		
	Direct material	₹ 45 per piece	
	Standard input	10 pieces per unit	
	Direct labour rate	₹ 60 per hour	
	Standard requirement	2.5 hours per unit	
	Overheads	₹ 80 per labour hour	

You are required to **CALCULATE** the following variances:

(i) Material price variance

(ii) Material usage variance

(iii) Labour rate variance

(iv) Labour efficiency variance

(v) Fixed overhead expenditure variance

(vi) Fixed overhead efficiency variance

(vii) Fixed overhead capacity variance [10]

Reference | What's New

Material, Labour and FOH Variances

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Answer

(i) **Material price variance (on the basis of Single plan):**

= Actual Quantity Purchased (Std. Price – Actual Price)

$$=22{,}000 \text{ pcs} \left(₹\,45 - \frac{₹\,9{,}00{,}000}{22{,}000 \text{ pcs}} \right) = ₹90{,}000^{*} \text{ (Favourable)}$$

OR

Material price variance (on the basis of Partial plan):

= Actual Quantity consumed (Std. Price – Actual Price)

$$= 21{,}000 \text{ pcs} \left(₹\,45 - \frac{₹\,9{,}00{,}000}{22{,}000 \text{ pcs}} \right) = ₹85{,}909^{*} \text{ (Favourable)}$$

(*Figure may slightly differ due to rounding off the actual price per unit)

(ii) **Material usage variance:**

= Std. price per piece (Std. Quantity – Actual Quantity consumed)

= ₹45 (1,900 units × 10 – 21,000) = ₹ 90,000 (Adverse)

(iii) **Labour rate variance:**

= Actual hours paid (Std. rate – Actual rate)

$$= 5{,}150 \text{ hours} \left(₹\,60 - \frac{₹\,2{,}57{,}500}{5{,}150 \text{ hrs}} \right) = ₹\,51{,}500 \text{ (Favourable)}$$

(iv) **Labour efficiency variance:**

= Std. rate per hour (Std. hours – Actual hoursworked)

= ₹60 (1,900 units × 2.5 hours – 5,150 hours) = ₹ 24,000 (Adverse)

(v) **Fixed overhead expenditure variance:**

= Budgeted Overhead – Actual Overhead

= ₹ 4,20,000 – ₹ 4,60,000 = ₹ 40,000 (Adverse)

(vi) **Fixed overhead efficiency variance:**

= Std. rate (Std. hours - Actual hours worked)

= ₹80 (1,900 units × 2.5 hours - 5,150 hours) = ₹ 32,000 (Adverse)

Or,

Fixed overhead efficiency variance on basis of units

= Std. rate per unit (Actual output – Standard output for actual hours)

= ₹200 (1,900 units - 5,150 / 2.5 hours) = ₹ 32,000 (Adverse)

(vii) **Fixed overhead capacity variance:**

= Std. rate (Actual hours worked – Budgeted hours)

$$= ₹\ 80 \left(5{,}150 \text{ hours} - \frac{₹\ 4{,}20{,}000}{₹\ 80} \right) = ₹\ 8{,}000 \text{ (Adverse)}$$

Or,

Fixed overhead capacity variances on basis of units

= Std. rate per unit (Standard output for actual hours – Budgeted output)

= ₹200 (2,060 units - 4,20,000 / 200) = ₹ 8,000 (Adverse)

Q55 MTP Nov'22

Royal transport company has been given a 50-kilometre-long route to run 6 buses. The cost of each bus is ₹ 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	₹ 60,000 per month
Annual Repairs & Maintenance	₹ 2,40,000 each bus
Salaries of 6 drivers	₹ 20,000 each per month
Wages of 6 conductors	₹ 16,000 each per month
Wages of 6 cleaners	₹ 10,000 each per month
Manager's salary	₹ 50,000 per month
Road Tax, Permit fee, etc.	₹ 60,000 for a quarter
Office expenses	₹ 25,000 per month
Cost of diesel per litre	₹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)	₹ 20,000

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 ⅓ percent on taking (total receipts from passengers). [10]

Reference | What's New

Bus Fare

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Answer

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 (₹)
A.	**Fixed Charges:**	
	Garage rent (₹ 60,000 × 12 months)	7,20,000
	Salary of drivers (₹ 20,000 × 6 drivers ×12 months)	14,40,000
	Wages of Conductors (₹ 16,000 × 6 conductors × 12 months)	11,52,000
	Wages of Cleaners (₹ 10,000 × 6 cleaners × 12 months)	7,20,000
	Manager's salary (₹50,000 × 12 months)	6,00,000
	Road Tax, Permit fee, etc. (₹ 60,000 × 4 quarters)	2,40,000
	Office expenses (₹ 25,000 × 12 months)	3,00,000
	Depreciation (₹ 75,00,000 × 6 buses × 20%)	90,00,000
	Insurance (₹ 75,00,000 × 6 buses × 4%)	18,00,000
	Total (A)	1,59,72,000
B.	**Variable Charges:**	
	Repairs and Maintenance (₹ 2,40,000 × 6 buses)	14,40,000
	Diesel {(5,40,000 km. ÷ 6 km.) × ₹92}	82,80,000
	Engine oils & lubricants {(₹ 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

NOTES

IF YOU HAVE ANY DOUBT WHILE STUDYING FROM THIS BOOK,

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Submit Your Query

Chapter 18

Marginal Costing

Q1 ICAI Mat

Wonder Ltd. manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

Activity Level	50%	100%
Sales and production (units)	400	800
	(₹)	(₹)
Sales	8,00,000	16,00,000
Production costs:		
- Variable	3,20,000	6,40,000
- Fixed	1,60,000	1,60,000
Selling and distribution costs:		
- Variable	1,60,000	3,20,000
- Fixed	2,40,000	2,40,000

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter, 220 units were produced and 160 units were sold.

Required:

(a) **COMPUTE** the fixed production costs absorbed by ZEST if absorption costing is used?

(b) **CALCULATE** the under/over-recovery of overheads during the period?

(c) **CALCULATE** the profit using absorption costing?

(d) **CALCULATE** the profit using marginal costing?

Reference

Marginal Costing vs Absorption Costing

What's **New**

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Answer

(a) **Fixed production costs absorbed:** **(₹)**

Budgeted fixed production costs	1,60,000
Budgeted output (normal level of activity 800 units)	
Therefore, the absorption rate: 1,60,000/800 = ₹ 200 per unit	
During the first quarter, the fixed production	
cost absorbed by ZEST would be (220 units × ₹ 200)	44,000

(b) **Under /over-recovery of overheads during the period:** **(₹)**

Actual fixed production overhead (¼ of ₹ 1,60,000)	40,000
Absorbed fixed production overhead	44,000
Over-recovery of overheads	4,000

(c) **Profit for the Quarter (Absorption Costing)**

	(₹)	(₹)
Sales revenue (160 units × ₹ 2,000): (A)		3,20,000
Less: Production costs:		
- Variable cost (220 units × ₹ 800)	1,76,000	
- Fixed overheads absorbed (220 units × ₹ 200)	44,000	2,20,000
Add: Opening stock		--
Less: Closing Stock $\left(\frac{₹\ 2,20,000}{220\ \text{units}} \times 60\ \text{units}\right)$		(60,000)
Cost of Goods sold		1,60,000
Less: Adjustment for over-absorption of fixed production overheads		(4,000)
Add: Selling & Distribution Overheads:		
- Variable (160 units × ₹ 400)	64,000	
- Fixed (1/4th of ₹ 2,40,000)	60,000	1,24,000
Cost of Sales (B)		2,80,000
Profit {(A) – (B)}		40,000

(d) **Profit for the Quarter (Marginal Costing)**

	(₹)	(₹)
Sales revenue (160 units × ₹ 2,000): (A)		3,20,000
Less: Production costs:		
- Variable cost (220 units × ₹ 800)		1,76,000
Add: Opening stock		--

Less: Closing Stock $\left(\frac{₹\,1,76,000}{220\text{ units}} \times 60\text{ units}\right)$		(48,000)
Variable cost of goods sold		1,28,000
Add: Selling & Distribution Overheads:		
- Variable (160 units × ₹ 400)		64,000
Cost of Sales (B)		1,92,000
Contribution {(C) = (A) – (B)}		1,28,000
Less: Fixed Costs:		
- Production cost	(40,000)	
- Selling & distribution cost	(60,000)	(1,00,000)
Profit		28,000

Q2 ICAI Mat

MNP Ltd sold 2,75,000 units of its product at ₹ 37.50 per unit. Variable costs are ₹ 17.50 per unit (manufacturing costs of ₹ 14 and selling cost ₹ 3.50 per unit). Fixed costs are incurred uniformly throughout the year and amounting to ₹ 35,00,000 (including depreciation of ₹ 15,00,000). There is no beginning or ending inventories.

Required:

COMPUTE breakeven sales level quantity and cash breakeven sales level quantity.

Reference

Break Even Point and Cash Break-even Point in units

What's **New**

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Answer

Break even Sales Quantity $= \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{₹\,35,00,000}{₹\,20}$

$= 1,75,000$ units

Cash Break-even Sales Quantity $= \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{₹\,20,00,000}{₹\,20}$

$= 1,00,000$ units.

Q3 ICAI Mat

You are given the following particulars **CALCULATE**:

(a) Break-even point

(b) Sales to earn a profit of ₹ 20,000

i. Fixed cost ₹ 1,50,000

ii. Variable cost ₹ 15 per unit

iii. Selling price is ₹ 30 per unit

Reference | What's **New**

Break-even Point and Desired Sales

Watch **Video** Scan Me

Answer

(a) **Break-even point (BEP)** $= \frac{\text{Fixed Cost}}{\text{Contribution margin per unit*}} = \frac{₹\,1,50,000}{₹\,15} = 10,000$ Units

* (Contribution per unit = Sales per unit – Variable cost per unit = ₹ 30 - ₹ 15)

(b) **Sales to earn a Profit of ₹ 20,000:**

$$= \frac{\text{Fixed Cost} + \text{Desired profit}}{\text{Contribution per unit}} \times \text{Selling price per unit}$$

$$= \frac{₹\,1,50,000 - ₹\,20,000}{₹\,15} \times ₹\,30$$

$= ₹\,3,40,000$

Or

$$\frac{\text{Fixed cost} + \text{Desired profit}}{\text{P/V Ratio}} = \frac{₹\,1,70,000}{\text{P/V Ratio}} = \frac{₹\,1,70,000}{50\%} = ₹\,3,40,000$$

$$\text{PV Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{15}{30} \times 100 = 50\%$$

Q4 ICAI Mat

A company has a P/V ratio of 40%. COMPUTE by what percentage must sales be increased to offset: 20% reduction in selling price?

Reference | What's New

Sensitivity Analysis

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Answer

$$\text{Revised Sales Value} = \frac{\text{Desired Contribution}}{\text{Revised P/V Ratio*}} = \frac{0.40}{0.25} = 1.6$$

This means sales value to be increased by 60% of the existing sales.

$$\text{*Revised P/V Ratio} = \frac{\text{Desired Contribution}}{\text{Revised Selling Price}} = \frac{0.80 - 0.60}{0.80} = 0.25$$

$$\text{Required Sales Quantity} = \frac{\text{Desired Contribution}}{\text{Revised P/V Ratio*} \times \text{Revised Selling Price}} = \frac{0.40}{0.25 \times 0.80} = 2$$

Therefore, Sales value to be increased by 60% and sales quantity to be doubled to offset the reduction in selling price.

Proof:

Let selling price per unit is ₹ 10 and sales quantity is 100 units.

Data before change in selling price:

	(₹)
Sales (₹ 10 × 100 units)	1,000
Contribution (40% of 1,000)	400
Variable cost (balancing figure)	600

Data after the change in selling price:

Selling price is reduced by 20% that means it became ₹ 8 per unit. Since, we have to maintain the earlier contribution margin i.e. ₹ 400 by increasing the sales quantity only. Therefore, the target contribution will be ₹ 400.

The new P/V Ratio will be

	(₹)
Sales	8.00
Variable cost	6.00
Contribution per unit	2.00
P/V Ratio	25%

$$\text{Sales Value} = \frac{\text{Desired Contribution}}{\text{Revised P/V Ratio}} = \frac{₹\,400}{0.25} = ₹\,1,600$$

$$\text{Sales quantity} = \frac{\text{Sales value}}{\text{Selling price per unit}} = \frac{₹\,1,600}{₹\,8} = 200 \text{ units}$$

Q 5 ICAI Mat

PQR Ltd. has furnished the following data for the two years:

	20X3	20X4
Sales	8,00,000	?
Profit/Volume Ratio (P/V ratio)	50%	37.5%
Margin of Safety sales as a % of total sales	40%	21.875%

There has been substantial savings in the fixed cost in the year 20X4 due to the restructuring process. The company could maintain its sales quantity level of 20X3 in 20X4 by reducing selling price.

You are required to **CALCULATE** the following:

(i) Sales for 20X4 in Value,

(ii) Fixed cost for 20X4,

(iii) Break-even sales for 20X4 in Value.

Reference — What's **New**

Sales, Fixed Cost and Break-even Sales in Value

Watch **Video**

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Answer

In 20X3, PV ratio = 50%

Variable cost ratio = 100% - 50% = 50%

Variable cost in 20X3 = ₹ 8,00,000 × 50% = ₹ 4,00,000

In 20X4, sales quantity has not changed. Thus variable cost in 20X4 is ₹ 4,00,000.

In 20X4, P/V ratio = 37.50%

Thus, Variable cost ratio = 100% – 37.5% = 62.5%

(i) Thus sales in 20X4 = $\frac{4,00,000}{62.5\%}$ = ₹ 6,40,000

In 20X4, Break-even sales = 100% – 21.875% (Margin of safety) = 78.125%

(ii) Break-even sales = 6,40,000 × 78.125% = ₹ 5,00,000

(iii) Fixed cost = B.E. sales × P/V ratio = 5,00,000 × 37.50% = ₹ 1,87,500.

Q6 ICAI Mat

A manufacturing company incurs fixed costs of ₹ 3,00,000 per annum. It is a single product company with annual sales budgeted to be 70,000 units at a sales price of ₹ 300 per unit. Variable costs are ₹ 285 per unit.

(i) **Draw** a profit volume graph, and use it to determine the breakeven point.

The company is deliberating upon an increase in the selling price of the product to ₹ 350 per unit. This shall be required in order to improve the quality of the product. It is anticipated that despite increase in the selling price the sales volume shall remain unaffected, however, the fixed costs shall increase to ₹ 4,50,000 per annum and the variable costs to ₹ 330 per unit.

(ii) **Draw** on the same graph as for part (a) a second profit volume graph and give your comments.

Reference | What's **New**

Break-even Chart and Profit-volume Chart

Watch **Video**

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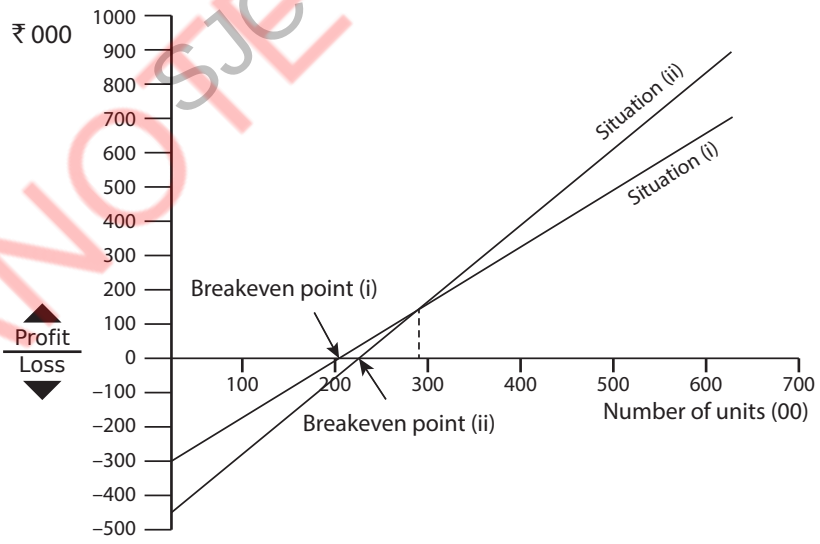
Answer

Figure showing changes with a profit-volume chart



Working notes (i)

The profit for sales of 70,000 units is ₹ 7,50,000.

	(₹'000)
Contribution 70,000 × (₹ 300 – ₹ 285)	1050

Fixed costs	300
Profit	750

This point is joined to the loss at zero activity, ₹ 3,00,000 i.e., the fixed costs.

Working notes (ii)

The profit for sales of 70,000 units is ₹ 9,50,000.

	(₹'000)
Contribution 70,000 × (₹ 350 – ₹ 330)	1400
Fixed costs	450
Profit	950

This point is joined to the loss at zero activity, ₹ 4,50,000 i.e., the fixed costs.

Comments:

It is clear from the graph that there are larger profits available from option (ii). It also shows an increase in the break-even point from 20,000 units to 22,500 units, however, the increase of 2,500 units may not be considered large in view of the projected sales volume. It is also possible to see that for sales volumes above 30,000 units the profit achieved will be higher with option (ii). For sales volumes below 30,000 units option (i) will yield higher profits (or lower losses).

Q7 ICAI Mat

You are given the following data for the year 20X7 of Rio Co. Ltd:

Variable cost	60,000	60%
Fixed cost	30,000	30%
Net profit	10,000	10%
Sales	1,00,000	100%

FIND OUT (a) Break-even point, (b) P/V ratio, and (c) Margin of safety. Also DRAW a break-even chart showing contribution and profit.

Reference | What's New

Breakeven Point , PV Ratio ,Margin of Safety | **Break even chart showing contribution**

Watch Video

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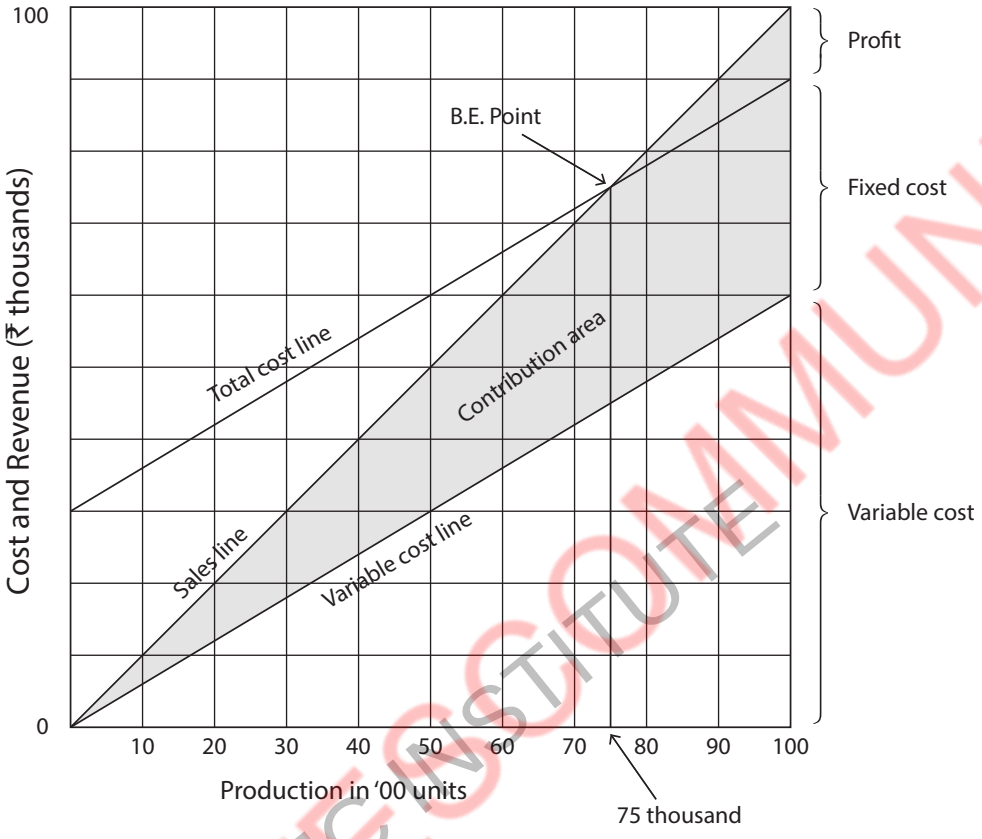
Answer

$$\text{P/V ratio} = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} = \frac{1,00,000 - 60,000}{1,00,000} = 40\%$$

$$\text{Break Even Point} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{30,000}{40\%} = 75,000$$

Margin of safety = Actual Sales – BE point = 1,00,000 – 75,000 = ₹ 25,000

Break even chart showing contribution is shown below:



Break-even chart

Q8 ICAI Mat

PREPARE a profit graph for products A, B and C and find break-even point from the following data:

Products	A	B	C	Total
Sales (₹)	7,500	7,500	3,750	18,750
Variable cost (₹)	1,500	5,250	4,500	11,250
Fixed cost (₹)	---	---	---	5,000

Reference | What's **New**

Profit Volume Chart

Watch **Video**

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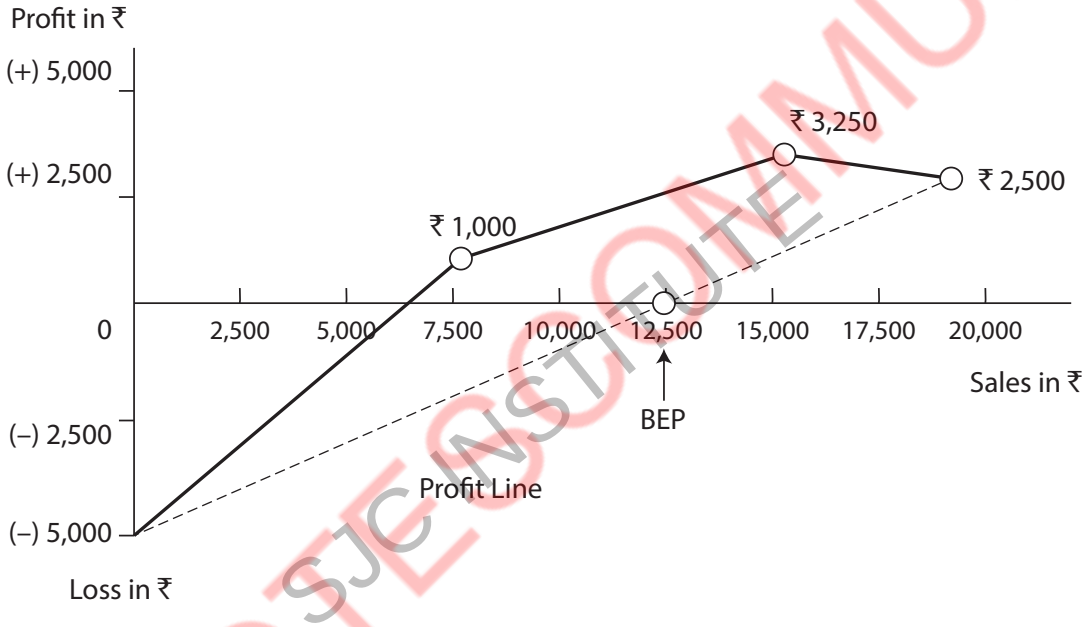
Answer

Statement Showing Cumulative Sales & Profit

Sales	Cumulative Sales		Variable Cost	Contribution	Cumulative Contribution	Cumulative Profit
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
A	7,500	7,500	1,500	6,000	6,000	1,000
B	7,500	15,000	5,250	2,250	8,250	3,250
C	3,750	18,750	4,500	(750)	7,500	2,500



Break Even Point (BEP) = ₹ 12,500

Q9 ICAI Mat

A company earned a profit of ₹ 30,000 during the year 20X4. If the marginal cost and selling price of the product are ₹ 8 and ₹ 10 per unit respectively,

FIND OUT the amount of margin of safety.

Reference — What's New

Margin of Safety

Watch **Video**

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Answer

$$\text{P/V ratio} = \frac{\text{Selling price} - \text{Variable cost per unit}}{\text{Selling price}} = \frac{₹10 - ₹8}{₹10} = 20\%$$

$$\text{Margin of safety} = \frac{\text{Profit}}{\text{P/V Ratio}} = \frac{30,000}{20\%} = ₹\ 1,50,000$$

Q10 ICAI Mat

A Ltd. Maintains margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to ₹ 5 lakhs.

CALCULATE the following:

i. Break-even sales

ii. Total sales

iii. Total variable cost

iv. Current profit

v. New 'margin of safety' if the sales volume is increased by 7 ½ %.

Reference | What's **New**

Breakeven Sales, Total Sales , Total Variable Cost, Profit and New Margin of Safety

Watch **Video**

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Answer

(i) We know that: Break- even Sales (BES) × P/V Ratio = Fixed Cost

Break-even Sales (BES) × 40% = ₹ 5,00,000

Break- even Sales (BES) = ₹ 12,50,000

(ii) Total Sales (S) = Break Even Sales + Margin of Safety

S = ₹ 12,50,000 + 0.375S

Or, S – 0.375S = ₹ 12,50,000

Or, S = ₹ 20,00,000

(iii) Contribution to Sales Ratio = 40%

Therefore, Variable cost to Sales Ratio = 60%

Variable cost = 60% of sales = 60% of 20,00,000

Variable cost = 12,00,000

(iv) Current Profit = Sales – (Variable Cost + Fixed Cost)

= ₹ 20,00,000 – (12,00,000 + 5,00,000) = ₹ 3,00,000

(v) If sales value is increased by 7 ½ %

New Sales value = ₹ 20,00,000 × 1.075 = ₹ 21,50,000

New Margin of Safety = New Sales value – BES

= ₹ 21,50,000 – ₹ 12,50,000 = ₹ 9,00,000

Q11 ICAI Mat

By noting "P/V will increase or P/V will decrease or P/V will not change", as the case may be.

STATE how the following independent situations will affect the P/V ratio:

(i) An increase in the physical sales volume;

(ii) An increase in the fixed cost;

(iii) A decrease in the variable cost per unit;

(iv) A decrease in the contribution margin;

(v) An increase in selling price per unit;

(vi) A decrease in the fixed cost;

(vii) A 10% increase in both selling price and variable cost per unit;

(viii) A 10% increase in the selling price per unit and 10% decrease in the physical sales volume;

(ix) A 50% increase in the variable cost per unit and 50% decrease in the fixed cost.

(x) An increase in the angle of incidence.

Reference — What's New

Situations affecting PV Ratio

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Answer

Item no.	P/V Ratio	Reason
(i)	Will not change	
(ii)	Will not change	
(iii)	Will increase	
(iv)	Will decrease	
(v)	Will increase	
(vi)	Will not change	

(vii)	Will not change	Reasoning 1
(viii)	Will increase	Reasoning 2
(ix)	Will decrease	Reasoning 3
(x)	Will increase	Reasoning 4

A 10% increase in both selling price and variable cost per unit.

Reasoning 1. Assumptions: a) Variable cost is less than selling price.

b) Selling price ₹ 100 variable cost ₹ 90 per unit.

c) P/V ratio = $\frac{100-90}{100}$ = 10%

10% increase in S.P. = ₹ 110

10% increase in variable cost = ₹ 99

P/V ratio = $\frac{110-99}{10}$ = 10% i.e. P/v ratio will not change

Reasoning 2. Increase or decrease in physical sales volume will not change P/V ratio. Hence 10% increase in selling price per unit will increase P/V ratio.

Reasoning 3. Increase or decrease in fixed cost will not change P/V ratio. Hence 50% increase in the variable cost per unit will decrease P/V ratio.

Reasoning 4. Angle of incidence is the angle at which sales line cuts the total cost line. If it is large, it indicates that the profits are being made at higher rate. Hence increase in the angle of incidence will increase the P/V ratio.

Q12 ICAI Mat

A company can make any one of the 3 products X, Y or Z in a year. It can exercise its option only at the beginning of each year.

Relevant information about the products for the next year is given below.

	X	Y	Z
Selling Price (₹ / unit)	10	12	12
Variable Costs (₹ / unit)	6	9	7
Market Demand (unit)	3,000	2,000	1,000
Production Capacity (unit)	2,000	3,000	900
Fixed Costs (₹)		30,000	

Required

COMPUTE the opportunity costs for each of the products.

Reference | **What's New**

Opportunity cost

Watch **Video**

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Answer

	X	Y	Z
I. Contribution per unit (₹)	4	3	5
II. Units (Lower of Production / Market Demand)	2,000	2,000	900
III. Possible Contribution (₹) [I × II]	8,000	6,000	4,500
IV. Opportunity Cost* (₹)	6,000	8,000	8,000

(*) Opportunity cost is the maximum possible contribution forgone by not producing alternative product i.e. if Product X is produced then opportunity cost will be maximum of (₹ 6,000 from Y, ₹ 4,500 from Z).

Q13 ICAI Mat; MTP Oct'19

M.K. Ltd. manufactures and sells a single product X whose selling price is ₹ 40 per unit and the variable cost is ₹ 16 per unit.

Required :

(i) If the Fixed Costs for this year are ₹ 4,80,000 and the annual sales are at 60% margin of safety, **CALCULATE** the rate of net return on sales, assuming an income tax level of 40%

(ii) For the next year, it is proposed to add another product line Y whose selling price would be ₹ 50 per unit and the variable cost ₹ 10 per unit. The total fixed costs are estimated at ₹ 6,66,600. The sales mix of X : Y would be 7 : 3. **DETERMINE** at what level of sales next year, would M.K. Ltd. break even? Give separately for both X and Y the break-even sales in rupee and quantities.

Reference | **What's New**

Rate of net return on sales and Breakeven sales

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Answer

(i) Contribution per unit = Selling price – Variable cost

= ₹ 40 – ₹ 16 = ₹ 24

Break-even Point $= \frac{₹\ 4,80,000}{₹\ 24} = 20,000$ units

$$\text{Percentage Margin of Safety} = \frac{\text{Actual Sales} - \text{Break-even Sales}}{\text{Actual Sales}}$$

$$\text{Or, } 60\% = \frac{\text{Actual Sales} - 20{,}000 \text{ units}}{\text{Actual Sales}}$$

$$\therefore \text{ Actual Sales} = 50{,}000 \text{ units}$$

	(₹)
Sales Value (50,000 units × ₹ 40)	20,00,000
Less: Variable Cost (50,000 units × ₹ 16)	8,00,000
Contribution	12,00,000
Less: Fixed Cost	4,80,000
Profit	7,20,000
Less: Income Tax @ 40%	2,88,000
Net Return	4,32,000

$$\text{Rate of Net Return on Sales} = 21.6\% \left(\frac{₹\ 4{,}32{,}000}{₹\ 20{,}00{,}000} \times 100 \right)$$

(ii)

	Products	
	X (₹)	Y (₹)
Selling Price	40	50
Less: Variable Cost	16	10
Contribution per unit	24	40
Sales Ratio	7	3
Contribution in sales Ratio	168	120

Method 1 : Based on Weighted Contribution

$$\text{Weighted Contribution} = \frac{24 \times 7 + 40 \times 3}{10} = ₹\ 28.8 \text{ per unit}$$

$$\textbf{Total Break-even Point} = \frac{\text{Total Fixed Cost}}{\text{Weighted Cost}} = \frac{6{,}66{,}600}{28.80} = 23{,}145.80 \text{ units}$$

Break-even Point

$$X = \frac{7}{10} \times 23{,}145.80 = 16{,}202 \text{ units} 10 \text{ or } 16{,}202 \times ₹\ 40 = ₹\ 6{,}48{,}080$$

$$Y = \frac{3}{10} \times 23{,}145.80 = 6{,}944 \text{ units or } 6{,}944 \times ₹\ 50 = ₹\ 3{,}47{,}200$$

Method 2 : Based on distributing fixed cost in the Weighted Contribution Ratio

Fixed Cost

$$X = \frac{168}{288} \times 6,66,600 = ₹\ 3,88,850$$

$$Y = \frac{120}{288} \times 6,66,600 = ₹\ 2,77,750$$

Break-even Point

$$X = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{3,88,850}{24} = 16,202 \text{ units or } ₹\ 6,48,000$$

$$Y = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{2,77,750}{40} = 6,944 \text{ units or } ₹\ 3,47,200$$

Q14 ICAI Mat

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

	Part A	Part B
Per unit		
Alloy usage	1.6 kgs.	1.6 kgs.
Machine Time: Machine A	0.6 hrs	0.25 hrs.
Machine Time: Machine B	0.5 hrs.	0.55 hrs.
Target Price (₹)	145	115

Total hours available Machine A 4,000 hours
Machine B 4,500 hours

Alloy available is 13,000 kgs. @ ₹ 12.50 per kg.

Variable overheads per machine hours

Machine A: ₹ 80

Machine B: ₹ 100

Required

(i) **IDENTIFY** the spare part which will optimize contribution at the offered price.

(ii) If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machine hour, **CALCULATE** the total contribution from the spare part identified above?

Reference — What's New

Evaluation of spare part

Watch **Video**

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Answer

(i)

	Part A	Part B
Machine "A" (4,000 hrs)	6,666	16,000
Machine "B" (4,500 hrs)	9,000	8,181
Alloy Available (13,000 kg.)	8,125	8,125
Maximum Number of Parts to be manufactured (Minimum of the above three)	6,666	8,125

	(₹)	(₹)
Material (₹ 12.5 × 1.6 kg.)	20.00	20.00
Variable Overhead: Machine "A"	48.00	20.00
Variable Overhead: Machine "B"	50.00	55.00
Total Variable Cost per unit	118.00	95.00
Price Offered	145.00	115.00
Contribution per unit	27.00	20.00
Total Contribution for units produced …(I)	1,79,982	1,62,500

Spare Part A will optimize the contribution.

(ii) **Statement Showing Total Contribution**

	Part A
Parts to be manufactured numbers	6,666
Machine A : to be used	4,000
Machine B : to be used	3,333
Underutilized Machine Hours (4,500 hrs. – 3,333 hrs.)	1,167
Compensation for unutilized machine hours (1,167hrs. × ₹ 60) (II)	70,020
Reduction in Price by 10%, Causing fall in Contribution of ₹ 14.50 per unit (6,666 units × ₹ 14.5) (III)	96,657
Total Contribution (I + II – III)	1,53,345

Q15 ICAI Mat

The profit for the year of R.J. Ltd. works out to 12.5% of the capital employed and the relevant figures are as under:

Sales	₹ 5,00,000
Direct Materials	₹ 2,50,000
Direct Labour	₹ 1,00,000
Variable Overheads	₹ 40,000
Capital Employed	₹ 4,00,000

The new Sales Manager who has joined the company recently estimates for next year a profit of about 23% on capital employed, provided the volume of sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

Required

FIND OUT by computing in detail the cost and profit for next year, whether the proposal of Sales Manager can be adopted.

Reference — What's New

Evaluation of proposal using ROI

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Answer

Statement Showing "Cost and Profit for the Next Year"

Particulars	Existing Volume, etc. (₹)	Volume, Costs, etc. after 10% Increase (₹)	Estimated Sale, Cost, Profit, etc.* (₹)
Sales	5,00,000	5,50,000	5,72,000
Less: Direct Materials	2,50,000	2,75,000	2,69,500
Direct Labour	1,00,000	1,10,000	1,07,800
Variable Overheads	40,000	44,000	43,120
Contribution	1,10,000	1,21,000	1,51,580
Less: Fixed Cost#	60,000	60,000	58,800
Profit	50,000	61,000	92,780

(*) for the next year after increase in selling price @ 4% and overall cost reduction by 2%.

(#) Fixed Cost = Existing Sales – Existing Marginal Cost – 12.5% on ₹ 4,00,000

= ₹ 5,00,000 – ₹ 3,90,000 – ₹ 50,000 = ₹ 60,000

Percentage Profit on Capital Employed equals to 23.19% $\left(\frac{₹\ 92,780}{₹\ 4,00,000} \times 100\right)$

Since the Profit of ₹ 92,780 is more than 23% of capital employed, the proposal of the Sales Manager can be adopted.

Q16 ICAI Mat

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 ₹ 11 per unit. The fixed costs are ₹ 3,60,000 per year. Variable selling costs are ₹ 3 per unit and fixed selling costs are ₹ 2,70,000 per year. The unit selling price is ₹ 20.

In the year just ended on 30th June, 20X4, the production was 1,60,000 units and sales were 1,50,000 units. The closing inventory on 30th June was 20,000 units. The actual variable production costs for the year were ₹ 35,000 higher than the standard.

Required :

(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.

Reference — What's **New**

Profit based on Absorption and Marginal Costing method

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Answer

Income Statement (Absorption Costing) for the year ending 30th June 20X4

	(₹)	(₹)
Sales (1,50,000 units @ ₹ 20)		30,00,000
Production Costs:		
Variable (1,60,000 units @ ₹ 11)	17,60,000	
Add: Increase	35,000	17,95,000
Fixed (1,60,000 units @ ₹ 2*)		3,20,000
Cost of Goods Produced		21,15,000
Add: Opening stock (10,000 units @ ₹ 13) *		1,30,000
		22,45,000
Less: Closing stock $\left(\frac{₹\,21,15,000}{1,60,000\ \text{units}} \times 20,000\ \text{units}\right)$		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 @ ₹ 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 are absorbed at a pre-determined rate based on normal capacity, i.e. ₹ 3,60,000 ÷ 1,80,000 units = ₹ 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 ₹ 13 per unit, i.e., ₹ 11 + ₹ 2 (Variable + fixed).

Income Statement (Marginal Costing) for the year ended 30th June, 20X4

	(₹)	(₹)
Sales (1,50,000 units @ ₹ 20)		30,00,000
Variable production cost (1,60,000 units @ ₹ 11 + ₹ 35,000)		17,95,000
Variable selling cost (1,50,000 units @ ₹ 3)		4,50,000
		22,45,000
Add: Opening Stock (10,000 units @ ₹ 11)		1,10,000
		23,55,000
Less: Closing stock $\left(\frac{₹\,17,95,000}{1,60,000\ \text{units}} \times 20,000\ \text{units}\right)$		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:

	(₹)
Profit as per absorption costing	2,59,375
Add: Op. stock under –valued in marginal costing (₹ 1,30,000 – 1,10,000)	20,000
	2,79,375
Less: Cl. Stock under –valued in marginal closing (₹ 2,64,375 – 2,24,375)	40,000
Profit as per marginal costing	2,39,375

Q17 ICAI Mat; MTP Nov'20

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 ₹ 14 per bottle.

Reference | What's **New**

Sales and Breakeven point

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Answer

(i) **Computation of Sale Price Per Bottle**

Output: 40,000 Bottles

	(₹)
Variable Cost:	
Material	2,10,000
Labour (₹ 1,50,000 × 80%)	1,20,000
Factory Overheads (₹ 92,000 × 60%)	55,200
Administrative Overheads (₹ 40,000 × 35%)	14,000
Commission (8% on ₹ 6,00,000) (W.N.-1)	48,000
Fixed Cost:	
Labour (₹ 1,50,000 × 20%)	30,000
Factory Overheads (₹ 92,000 × 40%)	36,800
Administrative Overheads (₹ 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 $\left(\frac{₹\ 6,00,000}{40,000\ \text{Bottles}}\right)$	15

(ii) **Calculation of Break-even Point**

Sales Price per Bottle = ₹ 14

Variable Cost per Bottle $= \frac{₹\ 4,44,000 (W.N.-2)}{40,000\ Bottles} = ₹\ 11.10$

Contribution per Bottle = ₹ 14 – ₹ 11.10 = ₹ 2.90

Break-even Point

(in number of Bottles) $= \frac{Fixed\ Costs}{Contribution\ per\ bottle}$

$= \frac{₹\ 92,800}{₹\ 290} = 32,000\ Bottles$

Break-even Point

(in Sales Value) = 32,000 Bottles × ₹ 14

= ₹ 4,48,000

Working Note

W.N.-1

Let the Sales Price be 'x'

Commission $= \frac{8x}{100}$

Profit $= \frac{10x}{100}$

$x = 4,92,000 + \frac{8x}{100} + \frac{10x}{100}$

$100x - 8x - 10x = 4,92,00,000$

$82x = 4,92,00,000$

$x = 4,92,00,000 / 82 = ₹\ 6,00,000$

W.N.-2

Total Variable Cost	(₹)
Material	2,10,000
Labour	1,20,000
Factory Overheads	55,200
Administrative Overheads	14,000
Commission [(40,000 Bottles × ₹ 14) × 8%]	44,800
	4,44,000

Q18 ICAI Mat

If P/V ratio is 60% and the Marginal cost of the product is ₹ 20.

CALCULATE the selling price?

Reference — What's **New**

Selling price

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Answer

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 = ₹ 50

Q19 ICAI Mat

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 ₹ 90,000. Also COMPUTE profit at 75% of the capacity sales.

Reference — What's **New**

Sales and Profit

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Answer

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 = ₹ 90,000

Or BES = ₹ 3,00,000

It is given that break-even occurs at 60% capacity.

Capacity sales = ₹ 3,00,000 ÷ 0.60 = ₹ 5,00,000

Computation of profit of 75% Capacity

75% of capacity sales (i.e. ₹ 5,00,000 × 0.75)	₹ 3,75,000
Less: Variable cost (i.e. ₹ 3,75,000 × 0.70)	₹ 2,62,500
	₹ 1,12,500
Less: Fixed Cost	₹ 90,000
Profit	₹ 22,500

Q20 ICAI Mat

		(₹)
(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
	BEP	40,000

Reference — What's **New**

Sales and Profit

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Answer

(i) We know that: B.E. Sales × P/V Ratio = Fixed Cost

or ₹ 1,60,000 × P/V ratio = ₹ 40,000

P/V ratio = 25%

We also know that Sales × P/V Ratio = Fixed Cost + Profit

or ₹ 2,00,000 × 0.25 = ₹ 40,000 + Profit

or **Profit** = ₹ 10,000

(ii) Again B.E. Sales × P/V ratio = Fixed Cost

or ₹ 40,000 × P/V Ratio = ₹ 20,000

or P/V ratio = 50%

We also know that: Sales × P/V ratio = Fixed Cost + Profit

or Sales × 0.50 = ₹ 20,000 + ₹ 10,000

or **Sales** = ₹ 60,000.

Q 21 ICAI Mat

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:

(₹ in '000)

	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.

Reference — What's **New**

Fixed costs and Breakeven sales

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Answer

Calculation of P/V Ratio (₹'000)

	Sales	Profit
North : Actual	1,100	135
Add : Under budgeted	400	180
Budgeted	1,500	315

$$\text{P/V ratio} = \frac{\text{Difference in profit}}{\text{Difference in sales}} = \frac{315-135}{1,500-1,100} \times 100 = \frac{180}{400} = 45\%$$

	Sales	Profit
East : Actual	1,450	210
Less : Over budgeted	(150)	(90)
Budgeted	1,300	120

$$\text{P/V ratio} = \frac{90}{150} \times 100 = 60\%$$

(₹'000)

	Sales	Profit
South : Actual	1,200	330
Add: Under budgeted	200	110
Budgeted	1,400	440

$$\text{P/V ratio} = \frac{110}{200} \times 100 = 55\%$$

(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 ₹'000)**

$$\text{B.E. Sales} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$

North = $\frac{360}{45\%}$	800
East = $\frac{660}{60\%}$	1,100
South = $\frac{330}{55\%}$	600
Total	2,500

Q22 ICAI Mat; RTP Nov'18

A company sells its product at ₹ 15 per unit. In a period, if it produces and sells 8,000 units, it incurs a loss of ₹ 5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹ 4 per unit.

CALCULATE break-even point both in terms of value as well as in units.

Reference — **Breakeven point**

What's **New**

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Answer

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 = ₹ 5, Variable cost per unit = ₹ 5

Putting this value in 3rd equation:

1,20,000 – (8,000 × 5) = y – 40,000

or, y = ₹ 1,20,000

Fixed Cost = ₹ 1,20,000

$$\text{P/V ratio} = \frac{S-V}{S} = \frac{15-15}{15} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%$$

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 units

Break-even sales in Value = 12,000 × 15 = ₹ 1,80,000.

Q23 ICAI Mat

The product mix of a Gama Ltd. is as under:

	Products	
	M	N
Units	54,000	18,000
Selling price	₹ 7.50	₹ 15.00
Variable cost	₹ 6.00	₹ 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 ₹ 18 and ₹ 9. Fixed Cost is ₹ 15,000.

Reference | **What's New**

Multi product Breakeven point

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Answer

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'	= ₹ 10.5 per unit
Contribution of 'O'	= ₹ 9 per unit

At Break Even Point:

10.5 x (2t) + 9 x t -15,000	
30t	= 15,000
t	= 500 units
BEP of 'N'	= 2t
	= 1,000 units
BEP of 'O'	= t = 500 units

Q24 ICAI Mat

Mr. X has ₹ 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 percent of sales, his fixed costs are ₹ 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 ₹ 25,000 as expenses per year. At what sales would he be better off by locking his business up?

Reference | **What's New**

Break Even Sales , Sales to get ROI and Shut down point

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Answer

	(₹)
Suppose sales	100
Variable cost	60
Contribution	40
P/V ratio	40%

Fixed cost = ₹ 80,000

(i) **Break-even point** = Fixed Cost ÷ P/V ratio = 80,000 ÷ 40% = ₹ 2,00,000

(ii) 15% return on ₹ 2,00,000 30,000

Fixed Cost 80,000

Contribution required 1,10,000

Sales volume required = ₹ 1,10,000 ÷ 40% or ₹ 2,75,000

(iii) Avoidable fixed cost if business is locked up = ₹ 80,000 - ₹ 25,000 = ₹ 55,000

Minimum sales required to meet this cost: ₹ 55,000 ÷ 40% or ₹ 1,37,500

Mr. X will be better off by locking his business up, if the sale is less than ₹ 1,37,500

Q25 ICAI Mat

An automobile manufacturing company produces different models of Cars. The budget in respect of model 007 for the month of March, 20X9 is as under:

Budgeted Output		40,000 Units
	₹ in lakhs	**₹ 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
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.

Reference — What's **New**

Profit and volume

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Answer

(i) Budgeted selling price = 2,10,000 lakhs/ 40,000 units = ₹ 5,25,000 per unit.

Budgeted variable cost = 1,32,000 lakhs/ 40,000 units = ₹ 3,30,000 per unit.

Increased selling price = ₹ 5,25,000 + 10% = ₹ 5,77,500 per unit

New volume (40,000 – 10%) = 36,000 units

Statement of Calculation of Profit

	(₹ In lakhs)
Sales 36,000 units at ₹ 5,77,500	2,07,900
Less: Variable cost: 36,000 × ₹ 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 = ₹ 1,98,000 per Unit

Increased material cost = (₹ 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

$$\text{Sales volume} = \frac{\text{Fixed cost} + \text{Profit}}{\text{Contribution per unit}} = \frac{60,750 \text{ lakhs} + 17,250 \text{ lakhs}}{₹ 1.752 \text{ lakhs}}$$

= 44,521 units are to be sold to maintain the original profit of ₹ 17,250 lakhs.

Q26 ICAI Mat

You are given the following data:

	Sales	Profit
Year 20X8	₹ 1,20,000	₹ 8,000
Year 20X9	₹ 1,40,000	₹ 13,000

FIND OUT –

(i) P/V ratio,

(ii) B.E. Point,

(iii) Profit when sales are ₹ 1,80,000,

(iv) Sales required earn a profit of ₹ 12,000,

(v) Margin of safety in year 20X9.

Reference | What's **New**

Break even point, P/V Ratio, Profit , Sales and Margin of safety

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Answer

	Sales	Profit
Year 20X8	₹ 1,20,000	₹ 8,000
Year 20X9	₹ 1,40,000	₹ 13,000
Difference	₹ 20,000	₹ 5,000

(i) **P/V Ratio** $= \frac{\text{Difference in profit}}{\text{Difference in Sales}} \times 100 = \frac{5,000}{20,000} \times 100 = 25\%$

	(₹)
Contribution in 20X8 (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** $= \frac{\text{Fixed cost}}{\text{P/V Ratio}} = \frac{22,000}{25\%} = ₹\ 88,000$

(iii) **Profit when sales are ₹ 1,80,000**

	(₹)
Contribution (₹ 1,80,000 × 25%)	45,000
Less: Fixed cost	22,000
Profit	23,000

(iv) **Sales to earn a profit of ₹ 12,000**

$$\frac{\text{Fixed cost} + \text{Desired profit}}{\text{P/V Ratio}} = \frac{22,000 + 12,000}{25\%} = ₹\ 1,36,000$$

(v) **Margin of safety in 20X9 –**

Margin of safety = Actual sales – Break-even sales

= 1,40,000 – 88,000 = ₹ 52,000.

Q27 ICAI Mat

A single product company sells its product at ₹ 60 per unit. In 20X8, the company operated at a margin of safety of 40%. The fixed costs amounted to ₹ 3,60,000 and the variable cost ratio to sales was 80%.

In 20X9, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

Required :

(i) **FIND** the selling price required to be fixed in 20X9 to earn the same P/V ratio as in 20X8.

(ii) Assuming the same selling price of ₹ 60 per unit in 20X9, **FIND** the number of units required to be produced and sold to earn the same profit as in 20X8.

Reference — What's **New**

Selling price and Number of units

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Answer

(i) **Profit earned in 20X8:**

	(₹)
Total contribution (50,000 × ₹ 12)	6,00,000
Less: Fixed cost	3,60,000
Profit	2,40,000

Selling price to be fixed in 20X9:	
Revised variable cost (₹ 48 × 1.10)	52.80
Revised fixed cost (3,60,000 × 1.05)	3,78,000
P/V Ratio (Same as of 20X8)	20%
Variable cost ratio to selling price	80%

Therefore, revised selling price per unit = ₹ 52.80 ÷ 80% = ₹ 66

(ii) **No. of units to be produced and sold in 20X9 to earn the same profit:**

We know that Fixed Cost plus profit = Contribution

	(₹)
Profit in 20X8	2,40,000
Fixed cost in 20X9	3,78,000
Desired contribution in 20X9	6,18,000

Contribution per unit = Selling price per unit – Variable cost per unit.

= ₹ 60 – ₹ 52.80 = ₹ 7.20.

No. of units to be produced in 20X9 = ₹ 6,18,000 ÷ ₹ 7.20 = 85,834 units.

Workings:

1. **PV Ratio in 20X8**

	(₹)
Selling price per unit	60
Variable cost (80% of Selling Price)	48
Contribution	12
P/V Ratio	20%

2. **No. of units sold in 20X8**

Break-even point = Fixed cost ÷ Contribution per unit

= ₹ 3,60,000 ÷ ₹ 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.

Q28 ICAI Mat

A company has made a profit of ₹ 50,000 during the year 20X8-X9. The selling price and marginal cost of the product are ₹ 15 and ₹ 12 per unit respectively.

FIND OUT the amount of margin of safety.

Reference | What's New

Margin of Safety

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Answer

P/V Ratio $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= [(15 - 12)/15] \times 100$

$= (3/15) \times 100 = 20\%$

Marginal of Safety = Profit ÷ P/V Ratio

= 50,000 ÷ 20% = ₹ 2,50,000

Q29 ICAI Mat

(a) If margin of safety is ₹ 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 ₹ 9,00,000.

(b) X Ltd. has earned a contribution of ₹ 2,00,000 and net profit of ₹ 1,50,000 of sales of ₹ 8,00,000. **What** is its margin of safety?

Reference | What's New

Breakeven sales, Profit and Margin of Safety

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Answer

(a) Total Sales $= 2,40,000 \times \frac{100}{40} = ₹ 6,00,000$

Contribution = 6,00,000 × 30% = ₹ 1,80,000

Profit = M/S × P/V ratio = 2,40,000 × 30% = ₹ 72,000

Fixed cost = Contribution – Profit

= 1,80,000 – 72,000 = ₹ 1,08,000

(1) **Break-even Sales** $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{1,08,000}{30\%} = ₹ 3,60,000$

(2) **Profit** = (Sales × P/V ratio) – Fixed cost

= (9,00,000 × 30%) – 1,08,000 = ₹ 1,62,000

(b) P/V ratio $= \frac{\text{Contribution}}{\text{Sales}} = \frac{2,00,000}{8,00,000} = 25\%$

Margin of safety $= \frac{\text{Profit}}{\text{P/V Ratio}} = \frac{1,50,000}{25\%} = ₹\ 6,00,000$

Alternatively:

Fixed cost = Contribution – Profit

= ₹ 2,00,000 – ₹ 1,50,000 = ₹ 50,000

B.E. Point = ₹ 50,000 ÷ 25% = ₹ 2,00,000

Margin of Safety = Actual sales – B.E. sales

= 8,00,000 – 2,00,000 = 6,00,000

Q30 ICAI Mat

A company had incurred fixed expenses of ₹ 4,50,000, with sales of ₹ 15,00,000 and earned a profit of ₹ 3,00,000 during the first half year. In the second half, it suffered a loss of ₹ 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.

Reference | What's **New**

P/V Ratio, Breakeven Point, Expected Sales Volume and Margin of Safety

Watch **Video**

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Answer

(i) **In the First half year**

Contribution = Fixed cost + Profit

= 4,50,000 + 3,00,000 = ₹ 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 $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{4,50,000}{50\%} \times 100 = ₹\ 9,00,000$

Margin of safety = Actual sales – Break-even point

= 15,00,000 – 9,00,000 = ₹ 6,00,000

(ii) **In the second half year**

Contribution = Fixed cost – Loss

= 4,50,000 – 1,50,000 = ₹ 3,00,000

Expected sales volume $= \frac{\text{Fixed Cost} - \text{Loss}}{\text{P/V Ratio}} = \frac{3,00,000}{50\%} \times 100 = ₹\ 6,00,000$

(iii) **For the whole year**

B.E. point $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{4,50,000 \times 2}{50\%} = ₹\ 18,00,000$

Margin of safety $= \frac{\text{Profit}}{\text{P/V Ratio}} = \frac{3,00,000 - 1,50,000}{50\%} = ₹\ 3,00,000$

Q 31 ICAI Mat

The following information is given by Star Ltd.:

Margin of Safety	₹ 1,87,500
Total Cost	₹ 1,93,750
Margin of Safety	3,750 units
Break-even Sales	1,250 units

Required:

CALCULATE Profit, P/V Ratio, BEP Sales (in ₹) and Fixed Cost.

Reference | What's **New**

P/V Ratio, Breakeven sales and Fixed costs

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Answer

Margin of Safety (%) $= \frac{3,750 \text{ units}}{3,750 \text{ units} + 1,250 \text{ units}}$

= 75%

Total Sales $= \frac{₹\ 1,87,500}{0.75}$

= ₹ 2,50,000

Profit = Total Sales – Total Cost

= ₹ 2,50,000 – ₹ 1,93,750

= ₹ 56,250

P/V Ratio $= \frac{\text{Profit}}{\text{Margin of Safety } (₹)} \times 100$

$= \frac{₹\ 56,250}{₹\ 1,87,500} \times 100$

$= 30\%$

Break-even Sales = Total Sales × [100 – Margin of Safety %]

= ₹ 2,50,000 × 0.25

= ₹ 62,500

Fixed Cost = Sales × P/V Ratio – Profit

= ₹ 2,50,000 × 0.30 – ₹ 56,250

= ₹ 18,750

Q 32 ICAI Mat

(a) You are given the following data for the coming year for a factory.

Budgeted output	8,00,000 units
Fixed expenses	₹ 40,00,000
Variable expenses per unit	₹ 100
Selling price per unit	₹ 200

DRAW a break-even chart showing the break-even point.

(b) If price is reduced to ₹ 180, **what** will be the new break-even point?

Reference — What's **New**

Breakeven chart and BEP

Watch **Video**

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Answer

(a) Contribution = S – V = ₹ 200 – ₹ 100 = ₹ 100 per unit.

B.E. Point $= \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{₹\ 40,00,000}{₹\ 100} = 40,000$ unit

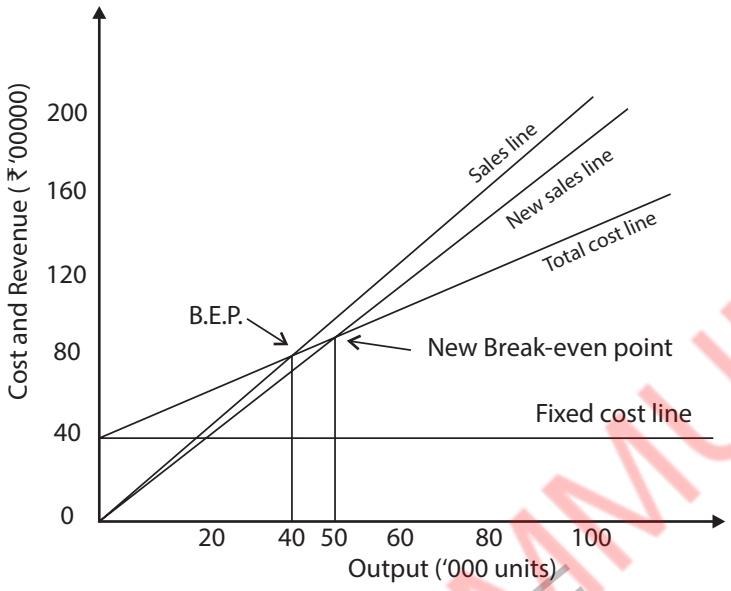
(b) **When selling price is reduced**

New selling price = ₹ 180

New Contribution = ₹ 180 – ₹ 100 = ₹ 80 per unit.

New B.E. Point $= \frac{40,00,000}{₹\ 80} = 50,000$ units

The break-even chart is shown below:



Q33 ICAI Mat

The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

	A Manual (₹)	B Semi-Automatic (₹)	C Fully-Automatic (₹)
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	₹ 200 (5 hrs × ₹ 40)	₹ 60 (1 hr × ₹ 60)	₹ 20 (0.25 hr × ₹ 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?

Reference | What's **New**

Cost Indifference point | **Three options**

Watch **Video** Scan Me

Answer

(i) **Cost Indifference Point**

	A and B (₹)	A and C (₹)	B and C (₹)
Differential Fixed Cost (I)	₹ 30,000 (₹ 45,000 – ₹ 15,000)	₹ 1,10,000 (₹ 1,25,000 – ₹ 15,000)	₹ 80,000 (₹ 1,25,000 – ₹ 45,000)
Differential Variable Costs (II)	₹ 100 (₹ 240 – ₹ 140)	₹ 200 (₹ 240 – ₹ 40)	₹ 100 (₹ 140 – ₹ 40)
Cost Indifference Point (I/II) (Differential Fixed Cost / Differential Variable Costs per case)	300 Cases	550 Cases	800 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.

No. of Cases	Alternative to be Chosen
Cases ≤ 300	Alternative 'A'
300 ≥ Cases ≤ 800	Alternative 'B'
Cases ≥ 800	Alternative 'C'

(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.

Q34 ICAI Mat

XY Ltd. makes two products X and Y, whose respective fixed costs are F_1 and F_2. 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 F_2 is ₹ 1,50,000, that the BEP of X is 1,800 units (for BEP of X, F_2 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 buildup as whatever is produced is sold.

Required

FIND OUT the values F_1 and F_2 and units contributions of X and Y.

Reference

Cost Indifference point

What's **New**

Using equation

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Answer

Let C_x be the Contribution per unit of Product X.

Therefore, Contribution per unit of Product Y = $C_y = 4/5C_x = 0.8C_x$

Given $F_1 + F_2$ = 1,50,000,

F_1 = $1,800C_x$ (Break even Volume × Contribution per unit)

Therefore, F_2 = $1,50,000 - 1,800C_x$.

$3,000C_x - F_1$ = $3,000 \times 0.8C_x - F_2$ or

$3,000C_x - F_1$ = $2,400\ C_x - F_2$ (Indifference Point)

i.e., $3,000C_x - 1,800C_x$ = $2,400C_x - 1,50,000 + 1,800C_x$

i.e., $3,000C_x$ = 1,50,000,

Therefore, C_x = ₹ 50/- (1,50,000 / 3,000)

Therefore, Contribution per unit of X = ₹ 50

Fixed Cost of X = F_1 = ₹ 90,000 (1,800 × 50)

Therefore, Contribution per unit of Y is ₹ 50 × 0.8 = ₹ 40 and

Fixed Cost of Y = F_2 = ₹ 60,000 (1,50,000 – 90,000)

The Value of F_1 = ₹ 90,000, F_2 = ₹ 60,000 and X = ₹ 50 and Y = ₹ 40

Q35 RTP May'18

A company manufactures two types of herbal product, A and B. Its budget shows profit figures after apportioning the fixed joint cost of ₹ 15 lacs in the proportion of the numbers of units sold. The budget for 2018, indicates:

	A	B
Profit (₹)	1,50,000	30,000
Selling Price / unit (₹)	200	120
P/V Ratio (%)	40	50

Required:

COMPUTE the best option among the following, if the company expects that the number of units to be sold would be equal.

(i) Due to exchange in a manufacturing process, the joint fixed cost would be reduced by 15% and the variables would be increased by 7½ %.

(ii) Price of A could be increased by 20% as it is expected that the price elasticity of demand would be unity over the range of price.

(iii) Simultaneous introduction of both the option, viz, (i) and (ii) above.

Reference | What's New

Decision Making

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Answer

Option (i)

Increase in profit when due to change in a manufacturing process there is reduction in joint fixed cost and increase in variable costs.

	(₹)
Revised Contribution from 12,000 units of A due to 7.5% increase in Variable Cost {12,000 units × (₹ 200 – ₹ 129)}	8,52,000
Revised Contribution from 12,000 units of B due to 7.5% increase in Variable Cost {12,000 units × (₹ 120 – ₹ 64.50)}	6,66,000
Total Revised Contribution	15,18,000
Less: Fixed Cost (₹ 15,00,000 – 15% × ₹ 15,00,000)	12,75,000
Revised Profit	2,43,000
Less: Existing Profit	1,80,000
Increase in Profit	63,000

Option (ii)

Increase in profit when the price of product A increased by 20% and the price elasticity of its demand would be unity over the range of price.

	(₹)
Budgeted Revenue from Product A (12,000 units × ₹ 200)	24,00,000
Revised Demand (in units) (₹ 24,00,000 / ₹ 240)	10,000
Revised Contribution (in ₹) [10,000 units × (₹ 240 – ₹ 120)]	12,00,000
Less: Existing Contribution (12,000 units × ₹ 80)	9,60,000
Increase in Profit (Contribution)	2,40,000

*__Note:__ Since Price Elasticity of Demand is 1, therefore the Revenue in respect of Products will remain same.

Option (iii)

Increase in profit on the simultaneous introduction of above two options.

	(₹)
Revised Contribution from Product A [10,000 units × (₹ 240 – ₹ 129)]	11,10,000
Revised Contribution from Product B [12,000 units × (₹ 120 – ₹ 64.50)]	6,66,000

Total Revised Contribution	17,76,000
Less: Revised Fixed Cost	12,75,000
Revised Profit	5,01,000
Less: Existing Profit	1,80,000
Increase in Profit	3,21,000

A comparison of increase in profit figures under above three options clearly indicates that the option (iii) is the best as it increases the profit of the concern by ₹ 3,21,000.

Note: The budgeted profit / (loss) for 2018 in respect of products A and B should be ₹ 2,10,000 and (₹ 30,000) respectively instead of ₹ 1,50,000 and ₹ 30,000.

Workings

1. **Contribution per unit of each product:**

	Product	
	A (₹)	**B (₹)**
Contribution per unit	80	60
(Sales × P/V Ratio)	(₹ 200 × 40%)	(₹ 120 × 50%)

2. **Number of units to be sold:**

Total Contribution – Fixed Cost = Profit

Let x be the number of units of each product sold, therefore:

(80x + 60x) – ₹ 15,00,000 = ₹ 1,50,000 + ₹ 30,000

Or x = 12,000 units

Q36 MTP Mar'18; RTP Nov'20

SK Ltd. engaged in the manufacture of tyres. Analysis of income statement indicated a profit of ₹ 150 lakhs on a sales volume of 50,000 units. The fixed cost is ₹ 850 lakhs which appears to be high. Existing selling price is ₹ 3,400 per unit. The company is considering to revise the profit target to ₹ 350 lakhs.

You are **required** to **COMPUTE** –

(i) Break-even point at existing levels in units and in rupees.

(ii) The number of units required to be sold to earn the target profit.

(iii) Profit with 15% increase in selling price and drop in sales volume by 10%.

(iv) Volume to be achieved to earn target profit at the revised selling price as calculated in (ii) above, if a reduction of 8% in the variable costs and ₹ 85 lakhs in the fixed cost is envisaged.

(10 Marks)

Reference | **What's New**

Breakeven Point, Sales for target profit and Profit

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Answer

Sales Volume 50,000 Units

Computation of existing contribution

Particulars	Per unit (₹)	Total (₹ in lakhs)
Sales	3,400	1,700
Fixed Cost	1,700	850
Profit	300	150
Contribution	2,000	1,000
Variable Cost	1,400	700

(i) **Break even sales in units** $= \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{8,50,00,000}{2,000} = 42,500$ units

Break even sales in rupees = 42,500 units × ₹ 3,400 = ₹ 1,445 lakhs

OR

P/V Ratio $= \frac{2,000}{3,400} \times 100 = 58.82\%$

B.E.P (in rupees) $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{8,50,00,000}{58.82\%} =$ ₹ 1,445 lakhs (approx.)

(ii) **Number of units sold to achieve a target profit of ₹ 350 lakhs:**

Desired Contribution = Fixed Cost + Target Profit

= 850 lakhs + 350 lakhs

= 1,200 lakhs

Number of units to be sold $= \frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{12,00,00,000}{2,000} = 60,000$ units

(iii) **Profit if selling price is increased by 15% and sales volume drops by 10%**

Existing Selling Price per unit = ₹ 3,400

Revised selling price per unit = ₹ 3,400 × 115% = ₹ 3,910

Existing Sales Volume = 50,000 units

Revised sales volume = 50,000 units – 10% of 50,000 = 45,000 units.

Statement of profit at sales volume of 45,000 units @ ₹ 3,910 per unit

Particulars	Per unit (₹)	Total (₹ in lakhs)
Sales	3,910.00	1,759.50
Less: Variable Costs	(1,400.00)	(630.00)
Contribution	2,510.00	1,129.50
Less: Fixed Cost		(850.00)
Profit		279.50

(iv) **Volume to be achieved to earn target profit of ₹ 350 lakhs with revised selling price and reduction of 8% in variable costs and ₹ 85 lakhs in fixed cost.**

Revised selling price per unit = ₹ 3,910

Variable costs per unit existing = ₹ 1,400

Revised Variable Costs

Reduction of 8% in variable costs = ₹ 1,400 – 8% of 1,400
= ₹ 1,400 – ₹ 112
= ₹ 1,288

Total Fixed Cost (existing) = ₹ 850 lakhs

Reduction in fixed cost = ₹ 85 lakhs

Revised fixed cost = ₹ 850 lakhs – ₹ 85 lakhs = ₹ 765 lakhs

Revised Contribution (unit) = Revised selling price per unit – Revised Variable Costs per units

Revised Contribution per unit = ₹ 3,910 – ₹ 1,288 = ₹ 2,622

Desired Contribution = Revised Fixed Cost + Target Profit
= ₹ 765 lakhs + ₹ 350 lakhs= ₹ 1,115 lakhs

No. of units to be sold $= \frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{₹\,1{,}115\text{ lakh}}{₹\,2{,}622} = 42{,}525$ units

Q 37 May'18

Following figures have been extracted from the books of M/s. RST Private Limited:

Financial Year	Sales (₹)	Profit/Loss (₹)
2016-17	4,00,000	15,000(loss)
2017-18	5,00,000	15,000 (Profit)

You are **required** to **calculate**:

(i) Profit Volume Ratio

(ii) Fixed Costs

(iii) Break Even Point

(iv) Sales required to earn a profit of ₹ 45,000.

(v) Margin of Safety in Financial Year 2017-18.

Reference — What's **New**

Breakeven Point ,Sales ,Profit volume ratio, Fixed cost and Margin of Safety

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Answer

	Sales (₹)	Profit (₹)
Year 2016	4,00,000	15,000 (loss)
Year 2017	5,00,000	15,000 (profit)
Difference	1,00,000	30,000

(i) **P/V Ratio** $= \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{30,000}{1,00,000} \times 100 = 30\ \%$

(ii)

	(₹)
Contribution in 2016 (4,00,000 × 30%)	1,20,000
Add: Loss	15,000
Fixed Cost*	1,35,000

*Contribution = Fixed cost + Profit

∴ **Fixed cost** = Contribution – Profit = ₹ 1,35,000

(iii) **Break-even point** $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{1,35,000}{30\%} =$ ₹ 4,50,000

(iv) **Sales to earn a profit of ₹ 45,000**

$\frac{\text{Fixed Cost} + \text{Desired profit}}{\text{P/V Ratio}} = \frac{1,35,000 + 45,000}{30\%} =$ ₹ 6,00,000

(v) **Margin of safety in 2017 –18**

Margin of safety = Actual sales – Break-even sales

= 5,00,000 – 4,50,000 = ₹ 50,000.

Q 38 May'18

PH Gems Ltd. is manufacturing readymade suits. It has annual production capacity of 2,000 pieces. The Cost Accountant has presented following information for the year to the management:

Particulars	Amount (₹)	Amount (₹)
Sales 1,500 pieces @ ₹ 1,800 per piece		27,00,000
Direct Material	5,94,200	
Direct Labour	4,42,600	
Overheads (40% Fixed)	11,97,000	22,33,800
Net Profit		4,66,300

Evaluate following options:

(i) If selling price is increased by ₹ 200, the sales will come down to 60% of the total annual capacity. **Should** the company increase its selling price?

(ii) The company can earn a profit of 20% on sales if the company provide TIEPIN with ready-made suit. The cost of each TIEPIN is ₹ 18. **Calculate** the sales to earn a profit of 20% on sales. (10 Marks)

Reference — What's **New**

Selling price increase decision and sales to earn a desired profit

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Answer

(i) **Evaluation of Option (i)**

Selling Price = ₹ 1800 + ₹ 200 = ₹ 2,000

Sales = 2000 × 60% = 1200 Pieces

	(₹)
Sales (1,200 pieces @ ₹ 2,000)	24,00,000
Less: Direct Material $\left(\frac{₹\,5,94,200}{1,500\ \text{units}} \times 1,200\right)$	4,75,360
Direct Labour $\left(\frac{₹\,4,42,600}{1,500\ \text{units}} \times 1,200\right)$	3,54,080
Variable Overhead $\left(\frac{₹\,11,97,000 \times 60\%}{1,500\ \text{units}} \times 1,200\right)$	5,74,560
Contribution	9,96,000
Less: Fixed cost (₹ 11,97,000 × 40%)	4,78,800
Profit	5,17,200

If price has been increased by 11.11% (increases by 200 on 1,800) sales goes down by 20% (decreased by 300 on 1,500). Change in demand is greater than change in price. Since the variable costs are still same profit has been arose to ₹ 5,17,200 in-spite of high elasticity of demand. PH gems would not be able to sustain this policy on account of change if any in variable costs.

(ii) **Evaluation of Option (ii)**

	(₹)
Sales	1,800.00
Less: Direct Material $\left(\frac{₹\,5,94,200}{1,500}\right)$	396.13
Cost of Tie PIN	18.00
Direct Labour $\left(\frac{₹\,4,42,600}{1,500}\right)$	295.07
Variable Overheads $\left(\frac{₹\,11,97,000 \times 60\%}{1,500}\right)$	478.80
Contribution	612.00
P/V Ratio $\left(\frac{₹\,612}{1,800} \times 100\right)$	34.0%

Sales to required earn a profit of 20%

$$\text{Sales} = \frac{₹\,4,78,800 + 0.20 \text{ of sales}}{34.00\%}$$

Sales = ₹ 34,20,000 or 1,900 units (₹ 34,20,000/1800)

To earn profit 20% on sales of readymade suit (along with TIE PIN) company has to sold 1,900 units i.e. 95% of the full capacity. This sales level of 1,900 units is justified only if variable cost is constant. Any upside in variable cost would impact profitability, to achieve the desired profitability. Production has to be increased but the scope is limited to 5% only.

Q 39 MTP Aug'18

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 (₹)	Process B (₹)
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?

Reference — What's **New**

Choosing between two processes

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Answer

(1) **Comparative Profitability Statements**

Particulars	Process- A (₹)	Process- B (₹)
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 (₹ 8 × 4,00,000)	24,00,000 (₹ 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 (₹ 8 × 4,30,000)	30,00,000 (₹ 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 (₹)	Process- B (₹)
*Capacity (units)	6,00,000	5,00,000
Total contribution	48,00,000 (₹ 8 × 6,00,000)	30,00,000 (₹ 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

Q40 MTP Aug'18

Fixed Cost	₹ 1,20,000
Variable costs	₹ 3 per unit
Selling price	₹ 7 per unit
Output	₹ 50,000 units

CALCULATE the profit for each of the following situation with the above data:

(i) with the data above

(ii) with a 10% increase in output & sales.

(iii) with a 10% increase in fixed costs.

(iv) with a 10% increase in variable costs.

(v) with a 10% increase in selling price.

(vi) taking all the above situations. (10 Marks)

Reference — What's **New**

Profit based on various situation.

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Answer

(i)

	₹
Sales (50,000 units at ₹ 7)	3,50,000
Variable cost (50,000 × 3)	1,50,000
Contribution (50,000 × 4)	2,00,000
Fixed costs	1,20,000
Profit	80,000

$$\text{P/V ratio} = \frac{S-V}{S} \times 100 = \frac{7-3}{7} \times 100 = \frac{4}{7} \times 100 = 57.14\%$$

$$\text{BEP}(\text{units}) = \frac{F}{\text{Contribution per unit}} = \frac{1,20,000}{4} = 30,000 \text{ units}$$

BEP (Value) = 30,000 Units × 7 = ₹ 2,10,000

Profit ₹ 80,000 (as calculated above)

(ii) **With a 10% increase in output & sales**

i.e., 50,000 + 5,000 = 55,000 units

Contribution (55,000 × ₹ 4 per unit)	₹ 2,20,000
Fixed costs	₹ 1,20,000
Profit	₹ 1,00,000

(iii) **With a 10% increase in Fixed Cost**

Contribution (50,000 × ₹ 4 per unit)	₹ 2,00,000
Fixed cost (1,20,000 + 12,000)	₹ 1,32,000
Profit	₹ 68,000

(iv) **With a 10% increase in variable costs**

Selling price per unit	7.00
Less: variable cost (3 + 0.30)	3.30
Contribution per unit	3.70
Total contribution (50,000 × 3.70)	1,85,000
Fixed costs	1,20,000
Profit	65,000

(v) **With a 10% increase in selling price**

Selling price per unit (7.00 + 0.70)	7.70
Variable cost per unit	3.00
Contribution per unit	4.70
Total contribution (50,000 × ₹ 4.70)	2,35,000
Fixed costs	1,20,000
Profit	1,15,000

(vi) **Effect of all the four above:**

Sales (55,000 × ₹ 7.70 per unit)	₹ 4,23,500
Variable cost (55,000 × 3.30)	₹ 1,81,500
Contribution (55,000 × 4.40)	₹ 2,42,000
Fixed cost (1,20,000 + 12,000)	₹ 1,32,000
Profit	₹ 1,10,000

Note: It is assumed that the increased output of 55,000 units has been sold.

Q 41 MTP Oct'18

Arnav Ltd. is producing a single product, has the profit-volume ratio of 40%. The company wishes to increase the selling price by 10% which will increase the variable cost by 5%. The fixed overheads will increase from its present level of ₹ 20,00,000 to ₹ 30,00,000.

Required:

(i) **COMPUTE** the company's original break-even point sales and the break-even point sales after the increase.

(ii) **ESTIMATE** the sales value for the firm to make a profit of ₹ 4,50,000 after the increase.

Reference | What's **New**

Break even point sales and Sales value

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Answer

Workings:

Let us assume that the selling price before increment is ₹ 100, the other relevant details are as follows:

Particulars	Before increase	After increase
Selling Price	100	110
Variable Cost	60	63
Contribution	40	47
P/V Ratio	40%	42.73%

(i) **Computation of Break-even point sales:**

$$\text{Break-even point sales} = \frac{\text{Fixed Overheads}}{\text{P/V Ratio}}$$

- Before increase $= \frac{₹\ 20,00,000}{40\%} = ₹\ 50,00,000$

- After increase $= \frac{₹\ 30,00,000}{42.73\%} = ₹\ 70,20,828$ (approx.)

(ii) **Sales value to make a profit of ₹ 4,50,000:**

$$= \frac{\text{Fixed Overhead} + \text{Desired profit}}{\text{P/V ratio}} = \frac{₹\ 30,00,000 + ₹\ 4,50,000}{42.73\%} = ₹\ 80,73,953$$

Q 42 Nov'18

A manufacturing company is producing a product 'A' which is sold in the market at ₹ 45 per unit. The company has the capacity to produce 40000 units per year. The budget for the year 2018-19 projects a sale of 30000 units.

The costs of each unit are expected as under:

	₹
Materials	12
Wages	9
Overheads	6

Margin of safety is ₹ 4,12,500.

You are **required** to:

(i) **Calculate** fixed cost and break-even point.

(ii) **Calculate** the volume of sales to earn profit of 20% on sales.

(iii) If management is willing to invest ₹ 10,00,000 with an expected return of 20%, **calculate** units to be sold to earn this profit.

(iv) Management expects additional sales if the selling price is reduced to ₹ 44. **Calculate** units to be sold to achieve the same profit as desired in above (iii). (10 Marks)

Reference — What's **New**

Fixed cost, Breakeven Point and Sales for desired profit

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Answer

$$\text{Margin of Safety} = \frac{\text{Profit}}{\text{P/V ratio}} = ₹\,4,12,500$$

$$= \frac{\text{Profit}}{\frac{45-(12+9+6)}{45}} = ₹\,4,12,500$$

$$= \frac{\text{Profit}}{\frac{18}{45}} = ₹\,4,12,500$$

Profit = 1,65,000 OR P/V = (18/45) × 100 =40%

(i) **Fixed Cost**

Profit = (Sales × P/V Ratio) – Fixed Cost

$$1,65,000 = \left((30,000 \times 45) \times \frac{18}{45}\right) - \text{Fixed Cost}$$

Or Fixed Cost = 5,40,000 – 1,65,000

= ₹ 3,75,000

OR

Profit = Contribution – Fixed Cost = ₹ 5,40,000 – ₹ 3,75,000 = ₹ 1,65,000

P/V Ratio $= \frac{18}{45} = 40\%$

Break-even Point = Total Sales – Margin of Safety

= ₹ (30,000 × 45) – 4,12,500

= 13,50,000 – 4,12,500 =₹ 9,37,500

Or

BEP $= \frac{\text{Fixed Cost}}{\text{P/V ratio}} = \frac{3,75,000}{\frac{18}{45}} = \frac{3,75,000}{40\%}$ = ₹ 9,37,500 OR 20833.33 Units

(ii) Let's assume, Sales Volume = S unit so total sales value is 45 S and

Contribution is 45 S - 27 S =18 S

Now, Contribution = Fixed Cost + Desired Profit

18 S = 3,75,000 + 9 S (20% of 45 S)

Or, 9S = 3,75,000

So, S = 3,75,000 Units

Volume of sales $= \frac{3,75,000 \times 45}{9}$ = ₹ 18,75,000 OR 41666.67 Units

So, ₹ 18,75,000 sales are required to earn profit on 20% of sales

(iii) Contribution = Fixed Cost + Desired Profit

18S = 3,75,000 + Return on Investment

18S = 3,75,000 + 2,00,000

S $= \frac{5,75,000}{18}$ =31,945 Units(approx.)

So, 31,945 Units to be sold to earn a return of ₹ 2,00,000.

(iv) Revised Contribution = Fixed Cost + Desired Profit

17S = 3,75.000 + 2,00,000

S $= \frac{5,75,000}{17}$ Units

S = 33,824 units (approx.)

∴ Additional Sales to be sold to achieve the same profit is 33,824 Units.

Q43 RTP May'19; RTP Nov'19

MNP Ltd sold 2,75,000 units of its product at ₹ 375 per unit. Variable costs are ₹ 175 per unit (manufacturing costs of ₹ 140 and selling cost ₹ 35 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹ 3,50,00,000 (including depreciation of ₹ 1,50,00,000). there are no beginning or ending inventories.

Required:

(i) **COMPUTE** breakeven sales level quantity and cash breakeven sales level quantity.

(ii) **COMPUTE** the P/V ratio.

(iii) **COMPUTE** the number of units that must be sold to earn an income (EBIT) of ₹ 25,00,000.

(iv) **COMPUTE** the sales level achieve an after-tax income (PAT) of ₹ 25,00,000. Assume 40% corporate Income Tax rate.

Reference | What's **New**

BEP, Cash BEP, Sales for desired profit

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Answer

(i) Contribution = ₹ 375 - ₹ 175 = ₹ 200 per unit.

Break even Sales Quantity $= \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{₹\,3,50,00,000}{₹\,200} = 1,75,000$ units

Cash Break even Sales Qty $= \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{₹\,2,00,00,000}{₹\,200} = 1,00,000$ units.

(ii) **P/V ratio** $= \frac{\text{Contribution / unit}}{\text{Selling Price / unit}} \times 100 = \frac{₹\,200}{₹\,375} \times 100 = 53.33\%$

(iii) **No. of units that must be sold to earn an Income (EBIT) of ₹ 25,00,000**

$$\frac{\text{Fixed Cost} + \text{Desired EBIT level}}{\text{Contribution margin per unit}} = \frac{3,50,00,000 + 25,00,000}{200} = 1,87,500 \text{ units}$$

(iv) After Tax Income (PAT) = ₹ 25,00,000

Tax rate = 40%

Desired level of Profit before tax $= \frac{₹\,25,00,000}{60} \times 100 = ₹\,41,66,667$

Estimated Sales Level $= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V ratio}}$

$$\text{Or, } \left(\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution unit}} \times \text{Selling Price per unit}\right)$$

$$= \left(\frac{₹\,3,50,00,000 + ₹\,41,66,667}{53.33\%} \times ₹\,7,34,42,091\right)$$

Q 44 MTP Mar'19

M Ltd. has an annual fixed cost of ₹ 98,50,000. In the year 20X8-X9, sales amounted to ₹ 7,80,60,000 as compared to ₹ 5,93,10,000 in the preceding year 20X7-X8. Profit in the year 20X8-X9 is ₹ 37,50,000 more than that in 20X7-X8.

Required:

(i) **CALCULATE** Break-even sales of the company;

(ii) **DETERMINE** profit/ loss on a forecasted sales volume of ₹ 8,20,00,000.

(iii) If there is a reduction in selling price by 10% in the financial year 20X8-X9 and company desires to earn the same amount of profit as in 20X7-X8, **COMPUTE** the required sales amount?

Reference | **What's New**

Breakeven sales, Profit and Sales.

Watch **Video**

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Answer

(i) $\text{Break-even sales} = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$

$$\text{P/V ratio} = \frac{\text{Change in Profit}}{\text{Change in Sale}} \times 100 \quad \text{Or, } \frac{₹\,37,50,000}{₹\,7,80,60,000 - ₹\,5,93,10,000} \times 100$$

$$\text{Or, } \frac{₹\,37,50,000}{₹\,1,87,50,000} \times 100 = 20\%$$

$$\textbf{Break-even sales} = \frac{₹\,98,50,000}{20\%} = ₹\,4,92,50,000$$

(ii) **Profit/ loss** = Contribution – Fixed Cost

= ₹ 8,20,00,000 × 20% - ₹ 98,50,000

= ₹ 1,64,00,000 – ₹ 98,50,000 = ₹ 65,50,000

(iii) To earn same amount of profit in 20X8-X9 as was in 20X7-X8, it has to earn the same amount of contribution as in 20X7-X8.

Sales – Variable cost = Contribution equal to 20X7-X8 contribution

Contribution in 20X7-X8 = Sales in 20X7-X8 × P/V Ratio in 20X7-X8

= ₹ 5,93,10,000 × 20% = ₹ 1,18,62,000

Let the number of units to be sold in 20X8-X9 = X

Sales in 20X8-X9 – Variable cost in 20X8-X9 = Desired Contribution

90 X – 80 X = ₹ 1,18,62,000

Or, 10 X = 1,18,62,000

Or, X = 11,86,200 units

Therefore, Sales amount required to earn a profit equals to 20X7-X8 profit

= ₹ 90 × 11,86,200 units = ₹ 10,67,58,000

Q45 MTP Apr'19

Yamuna Ltd. manufactures a product, currently utilising 80% capacity with a turnover of ₹ 8,00,000 at ₹ 25 per unit. The cost data are as under:

Material cost ₹ 7.50 per unit, Labour cost ₹ 6.25 per unit

Semi-variable cost (Including variable cost of ₹ 3.75) per unit ₹ 1,80,000.

Fixed cost ₹ 90,000 upto 80% level of output, beyond this an additional ₹ 20,000 will be incurred.

CALCULATE:

(i) Activity level at Break-Even-Point

(ii) Number of units to be sold to earn a net income of 8% of sales

(iii) Activity level needed to earn a profit of ₹ 95,000.

Reference | What's New

BEP and Sales - with step fixed cost

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Answer

Working notes:

1. (i) **Number of units sold at 80% capacity**

$$= \frac{\text{Turnover}}{\text{Selling price p.u.}} = \frac{₹\ 8,00,000}{₹\ 25} = 32,000 \text{ units}$$

(ii) **Number of units sold at 100% capacity**

$$\frac{₹\,32,000\ \text{units}}{80} \times 100 = 40,000\ \text{units}$$

2. **Component of fixed cost included in semi-variable cost of 32,000 units.**

Fixed cost = {Total semi-variable cost – Total variable cost }

= ₹ 1,80,000 – 32,000 units × ₹ 3.75

= ₹ 1,80,000 – ₹ 1,20,000

= ₹ 60,000

3. (i) **Total fixed cost at 80% capacity**

= Fixed cost + Component of fixed cost included in semi—variable cost (W.N. 2)

= ₹ 90,000 + ₹ 60,000 = ₹ 1,50,000

(ii) **Total fixed cost beyond 80% capacity**

= Total fixed cost at 80% capacity + Additional fixed cost to be incurred

= ₹ 1,50,000 + ₹ 20,000 = ₹ 1,70,000

4. **Variable cost and contribution per unit**

Variable cost per unit = Material cost + Labour cost + Variable cost component in semi variable cost

= ₹ 7.50 + ₹ 6.25 + ₹ 3.75 = ₹ 17.50

Contribution per unit = Selling price per unit – Variable cost per unit

= ₹ 25 – ₹ 17.50 = ₹ 7.50

5. **Profit at 80% capacity level**

= Sales revenue – Variable cost – Fixed cost

= ₹ 8,00,000 – ₹ 5,60,000 (32,000 units × ₹ 17.50) – ₹ 1,50,000

= ₹ 90,000

(i) **Activity level at Break–Even Point**

$$\text{Break-even point (units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{₹\,1,50,000}{₹\,7.50} = 20,000\ \text{units}$$

(Refer to working notes 3 & 4)

$$\text{Activity level at BEP} = \frac{\text{Break-even point (units)}}{\text{No. of units at 100\% capacity level}} \times 100$$

(Refer to working note 1(ii))

$$= \frac{20,000\ \text{units}}{40,000\ \text{units}} \times 100 = 50\%$$

(ii) **Number of units to be sold to earn a net income of 8% of sales**

Let S be the number of units sold to earn a net income of 8% of sales.

Mathematically it means that : (Sales revenue of S units)

= Variable cost of S units + Fixed cost + Net income

$$\text{Or, } ₹\ 25S = ₹\ 17.5S + ₹\ 1,50,000 + \frac{8}{100} \times (₹\ 25S)$$

$$\text{Or, } ₹\ 25S = ₹\ 17.5S + ₹\ 1,50,000 + ₹\ 2S$$

$$\text{Or, } S = (₹\ 1,50,000/₹\ 5.5) \text{ units}$$

$$\text{Or, } S = 27,273 \text{ units.}$$

(iii) **Activity level needed to earn a profit of ₹ 95,000**

The profit at 80% capacity level, is ₹ 90,000 which is less than the desired profit of ₹ 95,000, therefore the needed activity level would be more than 80%. Thus the fixed cost to be taken to determine the activity level needed should be ₹ 1,70,000 (Refer to Working Note 3 (ii))

Units to be sold to earn a profit of ₹ 95,000

$$= \frac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution per unit}}$$

$$= \frac{₹\ 1,70,000 + ₹\ 95,000}{₹\ 7.5}$$

= 35,333.33 units

Activity level needed to earn a profit of ₹ 95,000

$$= \frac{35,333.33 \text{ units}}{40,000 \text{ units}} \times 100 = 88.33\%$$

Q 46 May'19

M/s Gaurav Private Limited is manufacturing and selling two products:

'BLACK' and 'WHITE' at selling price of ₹ 20 and ₹ 30 respectively.

The following sales strategy has been outlined for the financial year 2019-20:

(i) Sales planned for the year will be ₹ 81,00,000 in the case of 'BLACK' and ₹ 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 ₹ 8,26,200 in the case of 'BLACK' and ₹ 7,45,200 in the case of 'WHITE'. This would be possible by reducing the present annual fixed cost of ₹ 42,00,000 allocated as ₹ 22,00,000 to 'BLACK' and ₹ 20,00,000 to 'WHITE'.

You are **required** to **calculate**:

(1) Number of units to be sold of 'BLACK' and 'WHITE' to Break even during the financial year 2019-20.

(2) Amount of reduction in fixed cost product-wise to achieve desired profit mentioned at (iv) above. (5 Marks)

Reference | What's **New**

Break even sales units and Reduction in fixed cost amount

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Answer

(i) **Statement Showing Break Even Sales**

Particulars	Black	White
Sales Planned	81,00,000	54,00,000
Selling Price (₹)	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
Or		
Break Even sales (in ₹),70% of total sales	56,70,000	37,80,000

(ii) **Statement Showing Fixed Cost Reduction**

Profit to be maintained (₹)	8,26,200	7,45,200
Margin of Safety (70% of Sales) (₹)	24,30,000	16,20,000
PVR (Profit/ Margin of Safety) × 100	34%	46%
Contribution (Sales × 34% or 46%) (₹)	27,54,000	24,84,000
Less: Profit (₹)	8,26,200	7,45,200
Revised Fixed Cost (₹)	19,27,800	17,38,800
Present Fixed Cost (₹)	22,00,000	20,00,000
Reduction in Fixed Cost	2,72,200	2,61,200

Q 47 May'19

What are the limitations of marginal costing?

Reference | What's **New**

Limitations of marginal costing

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Answer

Limitations of Marginal Costing

(i) **Difficulty in classifying fixed and variable elements:** It is difficult to classify exactly the expenses into fixed and variable category. **Most of the expenses are neither totally variable nor wholly fixed**. For example, various amenities provided to workers may have no relation either to volume of production or time factor.

(ii) **Dependence on key factors:** Contribution of a product itself is not a guide for optimum profitability unless it is linked with the key factor.

(iii) **Scope for Low Profitability: Sales staff may mistake marginal cost for total cost** and sell at a price; which will result in loss or low profits. Hence, sales staff should be cautioned while giving marginal cost.

(iv) **Faulty valuation: Overheads of fixed nature cannot altogether be excluded** particularly in large contracts, while valuing the work-in- progress. In order to show the correct position fixed overheads have to be included in work-in-progress.

(v) **Unpredictable nature of Cost:** Some of the assumptions regarding the behaviour of various costs are not necessarily true in a realistic situation. For example, the assumption **that fixed cost will remain static throughout is not correct**. Fixed cost may change from one period to another. For example, salaries bill may go up because of annual increments or due to change in pay rate etc. The **variable costs do not remain constant per unit of output**. There may be changes in the prices of raw materials, wage rates etc. after a certain level of output has been reached due to shortage of material, shortage of skilled labour, concessions of bulk purchases etc.

(vi) **Marginal costing ignores time factor and investment:** The **marginal cost of two jobs may be the same** but the time taken for their completion and the cost of machines used may differ. The true cost of a job which takes longer time and uses costlier machine would be higher. This fact is not disclosed by marginal costing.

(vii) **Understating of W-I-P:** Under marginal costing stocks and **work in progress are understated**.

Q48 Nov'19

When volume is 4,000 units; average cost is ₹ 3.75 per unit. When volume is 5,000 units, average cost is ₹ 3.50 per unit. The Break-Even point is 6,000 units.

Calculate: (i) Variable Cost per unit (ii) Fixed Cost and (iii) Profit Volume Ratio. [5 Marks]

Reference | What's **New**

Variable Cost per unit, Fixed cost and Profit Volume Ratio.

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Answer

(i) **Variable cost per unit** $= \dfrac{\text{Change in Total Cost}}{\text{Change in unit}}$

$$= \frac{(₹\,3.50 \times 5{,}000 \text{ units}) - (₹\,3.75 \times 4{,}000 \text{ units})}{5{,}000 - 4{,}000}$$

$$= \frac{₹\,17{,}500 - ₹\,15{,}000}{1{,}000} = \frac{₹\,2{,}500}{1{,}000} = ₹\,2.5$$

(ii) **Fixed cost** = Total Cost – Variable cost (at 5,000 units level)

= ₹ 17,500 – ₹ 2.5 × 5,000 = ₹ 5,000

(iii) Contribution per unit $= \dfrac{\text{Fixed Cost}}{\text{BEP}(\text{in units})} = \dfrac{₹\,5{,}000}{6{,}000 \text{ units}} = 0.833$

P/V Ratio $= \dfrac{\text{Contribution unit}}{\text{Sale price per unit}} = \dfrac{0.833}{2.5 + 0.833} = 25\%$

Q 49 RTP May'20

A Ltd. manufacture and sales its product R-9. The following figures have been collected from cost records of last year for the product R-9:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of Cost of Goods Sold	--
Direct Labour	15% of Cost of Goods Sold	--
Factory Overhead	10% of Cost of Goods Sold	₹ 2,30,000
Administration Overhead	2% of Cost of Goods Sold	₹ 71,000
Selling & Distribution Overhead	4% of Cost of Sales	₹ 68,000

Last Year 5,000 units were sold at ₹ 185 per unit. From the given **DETERMINE** the followings:

(i) Break-even Sales (in rupees)

(ii) Profit earned during last year

(iii) Margin of safety (in %)

(iv) Profit if the sales were 10% less than the actual sales.

(Assume that Administration Overhead is related with production activity)

Reference — What's **New**

Breakeven Sales, Profit, Margin of Safety

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Answer

Working Notes:

(1) **Calculation of Cost of Goods Sold (COGS):**

COGS = DM + DL + FOH + AOH

COGS = {0.3 COGS + 0.15 COGS + (0.10 COGS + ₹ 2,30,000) + (0.02 COGS + ₹ 71,000)}

Or, COGS = 0.57 COGS + ₹ 3,01,000

$$\text{Or, COGS} = \frac{₹\ 3,01,000}{0.43} = ₹\ 7,00,000$$

(2) **Calculation of Cost of Sales (COS):**

COS = COGS + S&DOH

COS = COGS + (0.04 COS + ₹ 68,000)

Or, COS = ₹ 7,00,000 + (0.04 COS + ₹ 68,000)

$$\text{Or, COS} = \frac{₹\ 7,68,000}{0.96} = ₹\ 8,00,000$$

(3) **Calculation of Variable Costs:**

Direct Material (0.30 × ₹ 7,00,000)	₹ 2,10,000
Direct Labour (0.15 × ₹ 7,00,000)	₹ 1,05,000
Factory Overhead (0.10 × ₹ 7,00,000)	₹ 70,000
Administration OH (0.02 × ₹ 7,00,000)	₹ 14,000
Selling & Distribution OH (0.04 × ₹ 8,00,000)	₹ 32,000
	₹ 4,31,000

(4) **Calculation of Total Fixed Costs:**

Factory Overhead-	₹ 2,30,000
Administration OH-	₹ 71,000
Selling & Distribution OH	₹ 68,000
	₹ 3,69,000

(5) **Calculation of P/V Ratio:**

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100$$

$$= \frac{(₹\ 185 \times 5,000\ \text{units}) - ₹\ 4,31,000}{₹\ 185 \times 5,000\ \text{units}} \times 100 = 53.41\%$$

(i) **Break-Even Sales**

$$= \frac{\text{Fixed Cost}}{\text{P/V Rato}} = \frac{₹\ 3,69,000}{53.41\%} = ₹\ 6,90,882$$

(ii) **Profit earned during the last year**

= (Sales – Total Variable Costs) – Total Fixed Costs

= (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 1,25,000

(iii) **Margin of Safety (%)**

$$= \frac{\text{Sales} - \text{Break-even sales}}{\text{Sales}} \times 100$$

$$= \frac{₹\,9,25,000 - ₹\,6,90,882}{₹\,9,25,000} \times 100 = 25.31\%$$

(iv) **Profit if the sales were 10% less than the actual sales:**

Profit = 90% (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 4,44,600 - ₹ 3,69,000 = ₹ 75,600

Q 50 MTP May'20

A company gives the following information:

Margin of Safety	₹ 7,50,000
Total Cost	₹ 7,75,000
Margin of Safety (Qty.)	15,000 units
Break Even Sales in Units	5,000 units

You are **required** to **CALCULATE**:

(i) Selling price per unit

(ii) Profit

(iii) Profit/ Volume Ratio

(iv) Break Even Sales (in Rupees)

(v) Fixed Cost [5 Marks]

Reference | What's **New**

Selling price, Profit Volume Ratio, Profit,Breakeven sales and Fixed cost.

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Answer

(i) **Selling Price per unit** $= \frac{\text{Margin of Safety in Rupee value}}{\text{Margin of Safety in Quantity}}$

$= \frac{₹\ 7,50,000}{15,000\ \text{units}} = ₹\ 50$

(ii) **Profit** = Sales Value – Total Cost

= Selling price per unit × (BEP units + MoS units) – Total Cost

= ₹ 50 × (5,000 + 15,000) units – ₹ 7,75,000

= ₹ 10,00,000 – ₹ 7,75,000 = ₹ 2,25,000

(iii) **Profit/ Volume (P/V) Ratio** $= \frac{\text{Profit}}{\text{Margin of Safety in Rupee value}} \times 100$

$= \frac{₹\ 2,25,000}{₹\ 7,50,000} \times 100 = 30\%$

(iv) **Break Even Sales (in Rupees)** = BEP units × Selling Price per unit

= 5,000 units × ₹ 50

= ₹ 2,50,000

(v) **Fixed Cost** = Contribution – Profit

= Sales Value × P/V Ratio – Profit

= (₹ 10,00,000 × 30%) – ₹ 2,25,000

= ₹ 3,00,000 – ₹ 2,25,000 = ₹ 75,000

Q 51 ICAI Mat; Nov'20

Moon Ltd. produces products 'X', 'Y' and 'Z' and has decided to analyse it's production mix in respect of these three products - 'X', 'Y' and 'Z'.

You have the following information :

	X	Y	Z
Direct Materials ₹ (per unit)	160	120	80
Variable Overheads ₹ (per unit)	8	20	12

Direct labour:

Departments:	Rate per hour (₹)	Hours per unit X	Hours per unit Y	Hours per unit Z
Department-A	4	6	10	5
Department-B	8	6	15	11

From the current budget, further details are as below :

	X	Y	Z
Annual Production at present (in units)	10,000	12,000	20,000
Estimated Selling Price per unit (₹)	312	400	240
Sales departments estimate of possible sales in the coming year (in units)	12,000	16,000	24,000

There is a constraint on supply of labour in Department-A and its manpower cannot be increased beyond its present level.

Required:

(i) **Identify** the best possible product mix of Moon Ltd.

(ii) **Calculate** the total contribution from the best possible product mix. [5 Marks]

Reference — What's **New**

Product MIx with Key Factor

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Answer

(i) **Statement Showing "Calculation of Contribution/ unit"**

Particulars	X (₹)	Y (₹)	Z (₹)
Selling Price (A)	312	400	240
Variable Cost:			
Direct Material	160	120	80
Direct Labour			
Dept. A (Rate × Hours)	24	40	20
Dept. B (Rate × Hours)	48	120	88
Variable Overheads	8	20	12
Total Variable Cost (B)	240	300	200
Contribution per unit (A – B)	72	100	40
Hours in Dept. A	6	10	5
Contribution per hour	12	10	8
Rank	I	II	III

Existing Hours = 10,000 × 6hrs. + 12,000 × 10 hrs. + 20,000 × 5 hrs. = 2,80,000 hrs.

Best possible product mix (Allocation of Hours on the basis of ranking)

Produce 'X' = 12,000 units

Hours Required = 72,000 hrs (12,000 units × 6 hrs.)

Balance Hours Available = 2,08,000 hrs (2,80,000 hrs. – 72,000 hrs.)

Produce 'Y' (the Next Best) = 16,000 units

Hours Required = 1,60,000 hrs (16,000 units × 10 hrs.)

Balance Hours Available = 48,000 hrs (2,08,000 hrs. – 1,60,000 hrs.)

Produce 'Z' (balance) = 9,600 units (48,000 hrs./ 5 hrs.)

(ii) **Statement Showing "Contribution"**

Product	Units	Contribution/ Unit (₹)	Total Contribution (₹)
X	12,000	72	8,64,000
Y	16,000	100	16,00,000
Z	9,600	40	3,84,000
Total			28,48,000

Q 52 Nov'20

Differentiate between "Marginal and Absorption Costing". [5 Marks]

Reference — What's New

Difference between Marginal And Absorption Costing

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Answer

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.

Q53 Jan'21

During a particular period ABC Ltd has furnished the following data: Sales ₹ 10,00,000

Contribution to sales ratio 37% and Margin of safety is 25% of sales.

A decrease in selling price and decrease in the fixed cost could change the "contribution to sales ratio" to 30% and "margin of safety" to 40% of the revised sales.

Calculate:

(i) Revised Fixed Cost.

(ii) Revised Sales and

(iii) New Break- Even Point. [5 Marks]

Reference

Fixed Cost, Sales and BEP

What's **New**

Use of MOS Ratio

Watch **Video**

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Answer

Contribution to sales ratio (P/V ratio) = 37%

Variable cost ratio = 100% – 37% = 63%

Variable cost = ₹ 10,00,000 × 63% = ₹ 6,30,000

After decrease in selling price and fixed cost, sales quantity has not changed. Thus, variable cost is ₹ 6,30,000.

Revised Contribution to sales = 30%

Thus, Variable cost ratio = 100% – 30% = 70%

Thus, Revised sales $= \frac{₹\ 6,30,000}{70\%} = ₹\ 9,00,000$

Revised, Break-even sales ratio = 100% – 40% (revised Margin of safety) = 60%

(i) **Revised fixed cost** = revised breakeven sales × revised contribution to sales ratio

= ₹ 5,40,000 (₹ 9,00,000 × 60%) × 30%

= ₹ 1,62,000

(ii) **Revised sales** = ₹ 9,00,000 (as calculated above)

(iii) **Revised Break-even point** = Revised sales × Revised break-even sales ratio
= ₹ 9,00,000 × 60%
= ₹ 5,40,000

Q 54 Jan'21

Two manufacturing companies A and B are planning to merge. The details are as follows :

	A	B
Capacity utilisation (%)	90	60
Sales (₹)	63,00,000	48,00,000
Variable Cost (₹)	39,60,000	22,50,000
Fixed Cost (?)	13,00,000	15,00,000

Assuming that the proposal is implemented,

Calculate : [10 Marks]

(i) Break-Even sales of the merged plant and the capacity utilization at that stage.

(ii) Profitability of the merged plant at 80% capacity utilization.

(iii) Sales Turnover of the merged plant to earn a profit of ₹ 60,00,000.

(iv) When the merged plant is working at a capacity to earn a profit of ₹ 60,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

Reference — What's **New**

Break Even in Case of Merger

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Answer

Workings:

1. **Statement showing computation of Breakeven of merged plant and other required information**

S. No.	Particulars	Plan A		Plant B		Merged Plant (100%) (₹)
		Before (90%) (₹)	After (100%) (₹)	Before (60%) (₹)	After (100%) (₹)	
(i)	Sales	63,00,000	70,00,000	48,00,000	80,00,000	1,50,00,000
(ii)	Variable cost	39,60,000	44,00,000	22,50,000	37,50,000	81,50,000

(iii)	Contribution (i - ii)	23,40,000	26,00,000	25,50,000	42,50,000	68,50,000
(iv)	Fixed Cost	13,00,000	13,00,000	15,00,000	15,00,000	28,00,000
(v)	Profit (iii - iv)	10,40,000	13,00,000	10,50,000	27,50,000	40,50,000

2. PV ratio of merged plant $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= \frac{₹\ 68,50,000}{₹\ 1,50,00,000} \times 100 = 45.67\ \%$

(i) **Break even sales of merged plant** $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$= \frac{₹\ 28,00,000}{45.67\%}$

$= ₹\ 61,30,939.34$ (approx.)

Capacity utilisation $= \frac{₹\ 61,30,939.34}{₹\ 1,50,00,000} \times 100 = 40.88\%$

(ii) **Profitability of the merged plant at 80% capacity utilisation**

= (₹ 1,50,00,000 × 80%) × P/v ratio – fixed cost

= ₹ 1,20,00,000 × 45.67% – ₹ 28,00,000

= ₹ 26,80,400

(iii) **Sales to earn a profit of ₹ 60,00,000**

Desired sales $= \frac{\text{Fixed Cost} + \text{Desired profit}}{\text{P/V Ratio}}$

$= \frac{₹\ 28,00,000 + ₹\ 60,00,000}{45.67\%}$

= ₹ 1,92,68,666 (approx.)

(iv) **Increase in fixed cost**

= ₹ 28,00,000 × 5% = ₹ 1,40,000

Therefore, percentage increase in sales price

$= \frac{₹\ 1,40,000}{₹\ 1,92,68,666} \times 100 = 0.726\%$ (approx.)

Q55 RTP May'21

Aditya Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	S	T	U
Sales Mix	35%	35%	30%
Selling Price	₹ 300	₹ 400	₹ 200
Variable Cost	₹ 150	₹ 200	₹ 120
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 60,00,000

The company has currently under discussion, a proposal to discontinue the manufacture of Product U and replace it with Product M, when the following results are anticipated:

	Products		
	S	T	M
Sales Mix	50%	25%	25%
Selling Price	₹ 300	₹ 400	₹ 300
Variable Cost	₹ 150	₹ 200	₹ 150
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 64,00,000

Required

(i) **COMPUTE** the PV ratio, total contribution, profit and Break-even sales for the existing product mix.

(ii) **COMPUTE** the PV ratio, total contribution, profit and Break-even sales for the proposed product mix.

Reference — What's **New**

Break even of multiple product

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Answer

(i) **Computation of PV ratio, contribution and break-even sales for existing product mix**

	Products			Total
	S	T	U	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	
Contribution per unit (₹)	150	200	80	
P/V Ratio (Contribution/Selling price)	50%	50%	40%	
Sales Mix	35%	35%	30%	

Contribution per rupee of sales (P/V Ratio × Sales Mix)	17.5%	17.5%	12%	47%
Present Total Contribution (₹ 60,00,000 × 47%)				₹ 28,20,000
Less: Fixed Costs				₹ 18,00,000
Present Profit				₹ 10,20,000
Present Break Even Sales (₹ 18,00,000/0.47)				₹ 38,29,787

(ii) **Computation of PV ratio, contribution and break-even sale for proposed product mix**

Products	S	T	M	Total
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	150	
P/V Ratio (Contribution/Selling price)	50%	50%	50%	
Sales Mix	50%	25%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	25%	12.5%	12.5%	50%
Proposed Total Contribution (₹ 64,00,000 × 50%)				₹ 32,00,000
Less: Fixed Costs				₹ 18,00,000
Proposed Profit				₹ 14,00,000
Proposed Break Even Sales (₹ 18,00,000/0.50)				₹ 36,00,000

Q56 MTP May'21

The following information has been obtained from the records of a manufacturing unit:

	₹	₹
Sales 80,000 units @ ₹ 50		40,00,000
Material consumed	16,00,000	
Variable Overheads	4,00,000	
Labour Charges	8,00,000	
Fixed Overheads	7,20,000	35,20,000
Net Profit		4,80,000

Calculate:

(i) The number of units by selling which the company will neither lose nor gain anything.

(ii) The sales needed to earn a profit of 20% on sales.

(iii) The extra units which should be sold to obtain the present profit if it is proposed to reduce the selling price by 20% and 25%.

(iv) The selling price to be fixed to bring down its Break-even Point to 10,000 units under present conditions. (10 Marks)

Reference | **What's New**

BEP and Profitability

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Answer

Workings:

(1) Contribution per unit = Selling price per unit – Variable cost per unit

= ₹ 50 – {₹ (16,00,000 + 4,00,000 + 8,00,000) ÷ 80,000 units}

= ₹ 50 – ₹ 35 = ₹ 15

(2) Profit-Volume (P/V) Ratio $= \frac{\text{Contribution per unit}}{\text{Selling price per unit}} \times 100 = \frac{₹\,15}{₹\,50} \times 100 = 30\%$

Calculations:

(i) **The number of units to be sold for neither loss nor gain i.e. Break-even units:**

$= \frac{\text{Fixed Overheads}}{\text{Contribution per unit}} = \frac{₹\,7,20,000}{₹\,15} = 48,000 \text{ units}$

(ii) **The sales needed to earn a profit of 20% on sales:**

As we know S = V + F + P

(S = Sales; V = Variable Cost; F = Fixed Cost; P = Profit) Suppose Sales units are x then

₹ 50x = ₹ 35 x + ₹ 7,20,000 + ₹ 10x

₹ 50x – ₹ 45x = ₹ 7,20,000

Or, $x = \frac{₹\,7,20,000}{₹\,5} = 1,44,000$ units

Therefore, Sales needed = 1,44,000 units × ₹ 50 = ₹ 72,00,000 to earn a profit of 20% on sales.

(iii) **Calculation of extra units to be sold to earn present profit of ₹ 4,80,000 under the following proposed selling price:**

		When selling price is reduced by	
		20% (₹)	25% (₹)
	Selling price per unit	40.00	37.50
		(₹ 50 × 80%)	(₹ 50 × 75%)
	Less: Variable Cost per unit	35.00	35.00
	Contribution per unit	5.00	2.50
	Desired Contribution:		

	Fixed Overheads	7,20,000	7,20,000
	Desired Profit	4,80,000	4,80,000
		12,00,000	12,00,000
(a)	Sales unit for desired contribution $\left[\frac{\text{Desired Contribution}}{\text{Contribution per unit}}\right]$	2,40,000 units $\left[\frac{₹\,12,00,000}{₹\,5}\right]$	4,80,000 units $\left[\frac{₹\,12,00,000}{₹\,2.5}\right]$
(b)	Units presently sold	80,000 units	80,000 units
(c)	Extra units to be sold {(a) – (b)}	1,60,000 units	4,00,000 units

(iv) **Sales price to bring down BEP to 10,000 units:**

$$\text{B.E.P (Units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$\text{Or, Contribution per unit} = \frac{₹\,7,20,000}{10,000 \text{ units}} = ₹\,72$$

So, Sales Price (per unit) = Variable Cost + Contribution

= ₹ 35 + ₹ 72 = ₹ 107

Q 57 MTP May'21

Following data is available from the costing department of Aarya Ltd. which manufactures and markets a single product:

Material	Rs. 32 per unit	Fixed Cost (Rs.)	Rs. 10,00,000
Conversion Cost (Variable)	Rs. 24 per unit	Present Sales (units)	90,000
Dealers Margin (10% of Sales)	Rs. 8 per unit	Capacity Utilization	60%
Selling Price	Rs. 80 per unit		

There is acute competition in the market, thus extra efforts are necessary to enhance the sales. For this, following suggestions have been proposed:

(i) Reducing selling price by 5 per cent.

(ii) Increasing dealer's margin by 20 per cent over the existing rate.

Which of these two suggestions would you **RECOMMEND**, if the company desires to maintain the present profit? **GIVE REASONS**. (10 Marks)

Reference | What's **New**

Selection of Alternatives | **Delear's Margin**

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Answer

Workings:

Statement Showing Profit on Sale of 90,000 units

	(₹)	(₹)
Selling Price per unit		80
Less: Variable Cost per unit		
Material	32	
Conversion Cost	24	
Dealers' Margin	8	64
Contribution per unit		16
Total Contribution (90,000 units × ₹ 16)		14,40,000
Less: Fixed Cost		10,00,000
Profit		4,40,000

In both the proposed suggestions, the fixed costs remain unchanged. Therefore, the present profit of ₹ 4,40,000 can be maintained by maintaining the total contribution at the present level i.e. ₹ 14,40,000.

(i) **Reducing Selling Price by 5%**

New Selling Price (₹ 80 – 5% of ₹ 80) = ₹ 76

New Dealer's Margin (10% of ₹ 76) = ₹ 7.60

New Variable Cost (₹ 32 + ₹ 24 + ₹ 7.60) = ₹ 63.60

New Contribution per unit (₹ 76 – ₹ 63.60) = ₹ 12.40

Level of sales required for present level of Profits $= \frac{\text{Total Contribution Required}}{\text{New Contribution per unit}}$

$= \frac{₹\,14,40,000}{₹\,12.40}$

= 1,16,129 units

(ii) **Increasing Dealer's Margin by 20%**

New Dealer's Margin after increasing it by 20% = ₹ 8 + (20% of ₹ 8)

= ₹ 9.60

New Variable Cost (₹ 32 + ₹ 24 + ₹ 9.60) = ₹ 65.60

Contribution (₹ 80 – ₹ 65.60) = ₹ 14.40

Level of sales required for present level of Profits $= \frac{\text{Total Contribution Required}}{\text{New Contribution per unit}}$

$= \frac{₹\,14,40,000}{₹\,14.40}$

= 1,00,000 units

Conclusion:

The second proposal, i.e., increasing the Dealer's Margin is recommended because:

1. The contribution per unit is higher which is ₹ 14.40 in comparison to ₹ 12.40 in the first proposal; and
2. The sales (in units) required to earn the same level of profit are lower. They are at 1,00,000 units as against 1,16,129 units in the first proposal. This means a lower sales effort and less finance would be required for implementing proposal (ii) as against proposal (i). Of course, under proposal (ii) the company can earn higher profits than at present level if it can increase its sales beyond 1,00,000 units.

Q58 MTP May'21

Discuss the assumptions of Cost Volume Profit analysis. (5 Marks)

Reference | What's **New**

Cost Volume Profit Analysis

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Answer

Assumptions of Cost Volume Profit analysis:

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 del ivered 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 cos ts 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**.

Q 59 ICAI Mat

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	₹ 300	₹ 400	₹ 200
Variable Cost	₹ 150	₹ 200	₹ 120
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 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	E
Sales Mix	45%	30%	25%
Selling Price	₹ 300	₹400	₹ 300
Variable Cost	₹ 150	₹200	₹ 150
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 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?

Reference

Breakeven Sales

What's **New**

Exisiting and Proposed Mix

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Answer

(i) **Calculation of Contribution to sales ratio at existing sales mix:**

	Products			Total
	A	B	C	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	
Contribution per unit (₹)	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 (₹ 60,00,000 × 47.5%)				₹ 28,50,000
Less: Fixed Costs				₹ 18,00,000
Present Profit				₹ 10,50,000
Present Break-Even Sales (₹ 18,00,000/0.475)				₹ 37,89,473.68

(ii) **Calculation of Contribution to sales ratio at proposed sales mix:**

	Products			Total
	A	B	E	
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	150	
P/V Ratio	50%	50%	50%	
Sales Mix	45%	30%	25%	
Contribution per rupee of sales (P/V Ratio x Sales Mix)	22.5%	15%	12.5%	50%
Proposed Total Contribution (₹ 64,00,000 × 50%)				₹ 32,00,000
Less: Fixed Costs				₹ 18,00,000
Proposed Profit				₹ 14,00,000
Proposed Break-Even Sales (₹ 18,00,000/0.50)				₹ 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 ₹ 10,50,000 to ₹ 14,00,000. Thus, the proposed sales mix should be accepted.

Q60 July'21

LR Ltd. is considering two alternative methods to manufacture a new product it intends to market. The two methods have a maximum output of 50,000 units each and produce identical items with a selling price of ₹ 25 each. The costs are :

	Method -1 Semi-Automatic (₹)	Method - 2 Fully-Automatic (₹)
Variable cost per unit	15	10
Fixed costs	1,00,000	3,00,000

You are **required** to calculate : [5]

(1) Cost Indifference Point in units. Interpret your results.

(2) The Break-even Point of each method in terms of units.

Reference — What's **New**

Cost Indifference Points | **Breakeven Point**

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Answer

(i) **Cost Indifference Point**

		Method-1 and Method-2 (₹)
Differential Fixed Cost	(I)	₹ 2,00,000 (₹ 3,00,000 – ₹ 1,00,000)
Differential Variable Costs	(II)	₹ 5 (₹ 15 – ₹ 10)
Cost Indifference Point (Differential Fixed Cost / Differential Variable Costs per unit)	(I/II)	40,000

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**.

No. of Product	Alternative to be Chosen
Product ≤ 40,000 units	Method-1, Semi-Automatic
Product ≥ 40,000 units	Method-2, Automatic

(ii) **Break Even point (in units)**

	Method-1	Method-2
BEP (in units) = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$	$\frac{1,00,000}{(25-15)} = 10,000$	$\frac{3,00,000}{(25-10)} = 20,000$

Q 61 July'21

What is Margin of Safety ? What does a large Margin of Safety indicates ? **How** can you calculate Margin of Safety ? [5]

Reference | What's **New**

Margin of Safety

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Answer

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.

The Margin of Safety can 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.

Margin of Safety = (Projected sales – Breakeven sales) in units × contribution per unit

It also can be calculated as:

$$\text{Margin of Safety} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

Q 62 ICAI Mat

ABC Limited produces and sells two product- X and Y. The product is highly demanded in the market.

Following information relating to both the products are given as under :

	Per Unit (₹)	
	X	Y
Direct Materials	140	180
Direct Wages	60	100

Variable Overheads (₹ 5 per machine hour)	20	40
Selling price	300	450

The company is facing scarcity of machine hours for working. The availability of machine hours are limited to 60,000 hrs in a month. At present, the monthly demand of product X and product Y is 8,000 units and 6,000 units respectively. The fixed expenses of the company are ₹ 2,25,000 per month.

You are **required** to:

DETERMINE the product mix that generates maximum profit to the company in the given situation and also **CALCULATE** the profit of the company.

Reference — What's **New**

Optimum Product Mix

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Answer

Workings:

Calculation of contribution (per unit)

	X (₹)	Y (₹)
Selling price (A)	300	450
Variable cost:		
Direct materials	140	180
Direct wages	60	100
Variable overheads	20	40
Total Variable Cost (B)	220	320
Contribution per unit (A – B)	80	130
Machine hours (MH)	4	8
Contribution per MH	20	16.25
Ranking	I	II

(i) **Product mix to maximise the profit**

Produce 'X' = 8,000 units

Hours Required = 32,000 hrs (8,000 units × 4 hrs.)

Balance Hours Available = 28,000 hrs (60,000 hrs. – 32,000 hrs.)

Produce 'Y' (balance) = 3,500 units (28,000 hrs./ 8 hrs.)

(ii) **Profitability of the concern in the best Product mix**

	X (₹)	Y (₹)	Total (₹)
Sales (in units)	8,000 units	3,500 units	
Contribution per unit	80	130	
Contribution	6,40,000	4,55,000	10,95,000
Less: Fixed cost			2,25,000
Profit			8,70,000

Q63 ICAI Mat

PQR Ltd. manufactures medals for winners of athletic events and other contests. Its manufacturing plant has the capacity to produce 10,000 medals each month. The company has current production and sales level of 7,500 medals per month. The current domestic market price of the medal is ₹ 150.

The cost data for the month of August 2021 is as under:

	(₹)
Variable costs:	
- Direct materials	2,62,500
- Direct labour cost	3,00,000
- Overhead	75,000
Fixed manufacturing costs	2,75,000
Fixed marketing costs	1,75,000
	10,87,500

PQR Ltd. has received a special one-time only order for 2,500 medals at ₹ 120 per medal.

Required:

(i) Should PQR Ltd. accept the special order? **Why**? **EXPLAIN** briefly.

(ii) Suppose the plant capacity was 9,000 medals instead of 10,000 medals each month. The special order must be taken either in full or rejected totally.

ANALYSE whether PQR Ltd. should accept the special order or not.

Reference — What's **New**

Acceptance of Order

Watch **Video**

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Answer

In this question, the existing demand for the medals is 7,500 units per month against the 10,000 units capacity. There is an idle capacity for 2,500 medals in a month. Since, the capacity of the plant (supply) is more than the demand, any additional order could increase the existing profit provided the offered price is more than the marginal cost.

The existing cost and profit structure is as under:

Particulars		Amount (₹)	Amount (₹)
A.	Selling price per unit		150.00
B.	Variable Cost per unit:		
	- Direct material (₹ 2,62,500 ÷ 7,500 units)	35.00	
	- Direct labour (₹ 3,00,000 ÷ 7,500 units)	40.00	
	- Overhead (₹ 75,000 ÷ 7,500 units)	10.00	85.00
C.	Contribution per unit (A-B)		65.00
D.	Total Contribution (₹ 85 × 7,500 units)		4,87,500
E.	Fixed Costs:		
	- Fixed manufacturing costs	2,75,000	
	- Fixed marketing costs	1,75,000	4,50,000
F.	Profit (D-E)		37,500

(i) The offered price for the additional demand of 2,500 medals is more than the variable cost per unit. Any additional demand will contribute towards fixed costs and profit.

Particulars		Amount (₹)	Amount (₹)
A.	Sales Value {(₹ 150 × 7,500) + (₹ 120 × 2,500)}		14,25,000
B.	Variable Cost (₹ 85 × 10,000)		8,50,000
C.	Contribution (A – B)		5,75,000
D.	Fixed Costs:		
	- Fixed manufacturing costs	2,75,000	
	- Fixed marketing costs	1,75,000	4,50,000
E.	Profit (C – D)		1,25,000

The offer for 2,500 unit be accepted as it increases the profit by ₹ 87,500 (₹ 1,25,000 – ₹ 37,500).

(ii) In this instant case, the capacity to produce medals is decreased by 1,000 unit per month and the existing demand for the medals is 7,500. The spare capacity is for 1,500 medals only but the special demand is for 2,500 medals. By accepting the offer, the company has to lose contribution on 1,000 medals from existing customers. The offer will only be acceptable if the gain from the new offer supersedes the loss from the existing customers.

Particulars		Amount (₹)	Amount (₹)
A.	Sales Value {(₹ 150 × 6,500) + (₹ 120 × 2,500)}		12,75,000
B.	Variable Cost (₹ 85 × 9,000)		7,65,000
C.	Contribution (A – B)		5,10,000
D.	Fixed Costs:		
	- Fixed manufacturing costs	2,75,000	
	- Fixed marketing costs	1,75,000	4,50,000
E.	Profit (C – D)		60,000

By accepting the special order at ₹ 120 per unit, the total profit of the company is increased by ₹ 22,500 (₹ 60,000 – ₹ 37,500) hence the order may be accepted, however, other qualitative factors may also be taken care-off.

Q64 ICAI Mat

NN Ltd. manufactures automobiles accessories and parts. The following are the total cost of processing 2,00,000 units:

Direct materials cost	₹ 375 per unit
Direct labour cost	₹ 80 per unit
Variable factory overhead	₹ 16 per unit
Fixed factory overhead	₹ 500 lakhs

The purchase price of the component is ₹ 485. The fixed overhead would continue to be incurred even when the component is bought from outside.

Required:

(a) **Should** the part be made or bought from outside considering that the present facility when released following a buying decision would remain idle?

(b) In case the released capacity can be rented out to another manufacturer for ₹ 32,00,000 having good demand. **What** should be the decision?

Reference

Make or Buy Decision

What's **New**

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Answer

The present cost structure is as follows:

Variable cost per unit is:

Direct materials cost	₹ 375
Direct labour cost	₹ 80
Variable factory overhead	₹ 16
Total variable cost per unit	₹ 471

The fixed cost of ₹ 500 lakhs is irrelevant for decision making as it would incur in either case.

(a) The decision shall be made comparing the marginal cost of making and buying the component.

Here the variable cost of making the component is ₹ 471 as compared to buying cost of ₹ 485. The component shall be **made by using own production** facility as it would save the company ₹ 14 per unit.

(b) If by releasing the production facility the company can earn a rental income of ₹ 32,00,000, then the additional cost of buying from outside and the rental income from releasing the capacity shall be compared for making decision.

(i) Rental income	₹ 32,00,000
(ii) Additional cost of buying (₹ 14 × 2,00,000 units)	₹ 28,00,000
Additional Income {(i)– (ii)}	₹ 4,00,000

The component should be **bought from outside** as it would save the company ₹ 4,00,000 in fixed cost.

Q65 ICAI Mat

A company is considering four alternative proposals for a new toy manufacturing Machine launched in the market. New machine is expected to produce approximately 25,000 toys every year. The proposals are as follows:

(i) Purchase and maintain the new toy manufacturing Machine and bear all related costs. These machines will run on fuel. The average cost of a Machine is ₹ 10,00,000. Life of the machine is 4 years with annual production of 25,000 toys and the Resale value is ₹ 2,00,000 at the end of the fourth year.

(ii) Hire from Agency-A: It can hire the machine from the Agency-A and pay hire charges at the rate of ₹ 20 per toy and bear no other cost.

(iii) Hire from Agency-B: It can hire the machine from the Agency-B and pay hire charges at the rate of ₹ 12 per toy and also bear insurance costs. All other costs will be borne by Agency-B.

(iv) Hire from Agency-C: Hire machine from Agency-C at ₹ 2,50,000 per year. These machines are more advanced and run on electricity and therefore, the running cost is considerably low. The company will have to bear costs of electricity, licensing fees and spare parts. However, Repairs and maintenance and Insurance cost are borne by Agency-C.

The following further details are available:

The cost of Fuel is ₹ 8 per toy, the cost of spare parts is ₹ 0.20 per toy and the cost of electricity is ₹ 2 per toy. Further, the cost of Repairs and maintenance is ₹ 0.25 per toy, the amount of licensing fees to be paid is ₹ 5,000 per machine per annum and the cost of Insurance to be paid is ₹ 25,000 per machine per annum. Consider no taxes.

You are **required** to:

(i) **CALCULATE** the relative costs of four proposals on cost per toy basis.

(ii) **RANK** the proposals on the basis of total cost for 25,000 toys per year.

(iii) **RECOMMEND** the best proposal to company in view of (ii) above.

Reference — What's **New**

Evaluation of Alternatives

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Answer

Calculation of relative costs of proposals

Particulars	Proposals			
	Purchase of machine (₹)	Hire Agency-A (₹)	Hire Agency-B (₹)	Hire Agency-C (₹)
Depreciation of machine (Working note 1)	2,00,000	-	-	-
Hire charges	-	5,00,000 (₹ 20 × 25,000)	3,00,000 (₹ 12 × 25,000)	2,50,000
Cost of fuel	2,00,000 (₹ 8 × 25,000)	-	-	-
Cost of spare parts	5,000 (₹ 0.2 × 25,000)	-	-	5,000 (₹ 0.2 × 25,000)
Cost of electricity	-	-	-	50,000 (₹ 2 × 25,000)
Repair & maintenance	6,250 (₹ 0.25 × 25,000)	-	-	-
Licencing fees	5,000	-	-	5,000
Insurance cost	25,000	-	25,000	-
Total Cost (A)	**4,41,250**	**5,00,000**	**3,25,000**	**3,10,000**
No. of toys (units) (B)	25,000	25,000	25,000	25,000
(i) **Cost per toy (A/B)**	**17.65**	**20.00**	**13.00**	**12.40**
(ii) **Ranking of proposals**	**III**	**IV**	**II**	**I**

(iii) **Recommendation:** Proposal of Hire machine from Agency-C is acceptable as the cost of manufacturing toys is lowest.

Working Note:

(1) **Depreciation per year:**

$$= \frac{\text{Cost of machine} - \text{Resale value}}{\text{Life of machine}} = \frac{₹\,10,00,000 - ₹\,2,00,000}{4 \text{ years}} = ₹\,2,00,000$$

Q66 Dec'21

AZ company has prepared its budget for the production of 2,00,000 units. The variable cost per unit is ₹ 16 and fixed cost is ₹ 4 per unit. The company fixes its selling price to fetch a profit of 20% on total cost.

You are **required** to calculate : [10]

(i) Present break-even sales (in ₹ and in quantity).

(ii) Present profit-volume ratio.

(iii) Revised break-even sales in ₹ and the revised profit-volume ratio, if it reduces its selling price by 10%.

(iv) **What** would be revised sales -in quantity and the amount, if a company desires a profit increase of 20% more than the budgeted profit and selling price is reduced by 10% as above in point (iii).

Reference | What's **New**

BES, PV Ratio, Revised BES, PV Ratio and Sales Quantity

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Answer

Variable Cost per Unit = ₹ 16

Fixed Cost per Unit = ₹ 4, Total Fixed Cost = 2,00,000 units x ₹ 4 = ₹ 8,00,000

Total Cost per Unit = ₹ 20

Selling Price per Unit = Total Cost + Profit =₹ 20 + ₹ 4 = ₹ 24

Contribution per Unit =₹ 24 – ₹ 16 = ₹ 8

(i) Present Break-even Sales (Quantity) $= \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{₹\,8,00,000}{₹\,8}$

$= 1,00,000$ units

Present Break-even Sales (₹) = 1,00,000 units × ₹ 24 = ₹ 24,00,000

(ii) Present P/V Ratio = $\frac{8}{24} \times 100 = 33.33\%$

(iii) Revised Selling Price per Unit = ₹ 24 – 10% of ₹ 24 = ₹ 21.60

Revised Contribution per Unit = ₹ 21.60 – ₹ 16 = ₹ 5.60

Revised P/V Ratio = $\frac{5.60}{21.60} \times 100 = 25.926\%$

Revised Break-even point (₹) = $\frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{8,00,000}{25.926\%} = ₹\ 30,85,705$

Or

Revised Break-even point (units) = $\frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{8,00,000}{5.60}$

= 1,42,857 units

Revised Break-even point (₹) = 1,42,857 units x ₹ 21.60 = ₹ 30,85,711

(iv) Present profit = ₹ 8,00,000

Desired Profit = 120% of ₹ 8,00,000 =₹ 9,60,000

Sales to earn a profit of ₹ 9,60,000

Total contribution required = 8.00.000 + 9,60,000 = ₹ 17,60,000

$\frac{\text{Fixed cost + Desired profit}}{\text{Contribution per unit}} = \frac{8,00,000 + 9,60,000}{5.60} = 3,14,286$ units

Revised sales (in ₹) = 3,14,286 units x ₹ 21.60 = ₹ 67,88,578

Q67 MTP May'22

Marginal Costing

At budget activity of 80% of total capacity, a company earns a P/V ratio of 30% and a profit of 15% of total sales. Due to covid pandemic resulting in poor demand, the company has to reduce its selling price by 10%. The company was able to achieve a production and sales volume for the year equivalent to 50% of total capacity. The sales value at this level was ₹ 27,00,000 at a reduced price of ₹ 18 per unit. Due to reduction in production, the actual variable cost went up by 5% of the budget.

You are **required** to:

(i) **PREPARE** statement of profitability at budget and actual activity.

(ii) **FIND** P/V ratio and BES (in ₹ and unit of the actual sales activity). [10]

Reference | What's **New**

Statement of Profitability, PV Ratio and BES

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Answer

Actual Sales	₹ 27,00,000
Actual Selling Price per unit	18
Actual units (50%) $\left(\frac{27,00,000}{18}\right)$	1,50,000
Therefore, budgeted units (80%) $\left(1,50,000 \times \frac{80}{50}\right)$	2,40,000
Budgeted Selling Price $\left(\frac{18}{90\%}\right)$	20

Budgeted Variable cost per unit $= \frac{(2,40,000 \times 20)(1-.30)}{2,40,000 \text{ units}} = \frac{33,60,000}{2,40,000 \text{ units}} = 33,60,000$

(i) **Statement of profitability at budget and actual activity**

Particulars		Budget (80%)	Actual (50%)
Units		2,40,000	1,50,000
Sales (₹)	(a)	48,00,000	27,00,000
Variable cost (₹)	(b)	33,60,000	22,05,000
Contribution (₹)	(c = a – b)	14,40,000	4,95,000
Fixed cost (₹)	(d)	7,20,000	7,20,000
Profit (₹)	(e = c – d)	7,20,000	(2,25,000)

(ii) **Calculation of P/V ratio and BES**

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{4,95,000}{27,00,000} \times 100 = 18.33\%$$

$$\text{Break Even Sales (in ₹)} = \frac{\text{Fixed Cost}}{\text{P/v Ratio}}$$

$$= \frac{7,20,000}{18.33\%} = ₹\ 39,27,987$$

$$\text{Break Even Sales (in Units)} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{7,20,000}{3.3^*} = 2,18,182 \text{ Units}$$

$$^*\text{Contribution per unit} = \frac{4,95,000}{1,50,000 \text{ units}} = 3.3 \text{ per unit}$$

Q68 MTP May'22

Company manufacture and sell 3 types of mobile handset. It also manufactures wireless charger for mobile. The company has worked out following estimates for next year.

	Annual Demand (in units)	Selling Price (₹ per unit)	Material cost (₹ per unit)	Labour cost (₹ per unit)
X5	5,000	8,000	2,000	1,000
X6	4,000	9,000	2,500	1,500
X7	3,000	12,000	3,000	2,000
Wireless Charger	15,000	1,500	300	200

To encourage the sale of wireless charger a discount of 10% in its price is being offered if it were to be purchased along with mobile. It is expected that customer buying mobile will also buy the wireless charger. The company factory has an effective capacity of 35,000 labour hours. The labour is paid @ ₹ 500 per hour. Overtime of labour has to be paid at double the normal rate. Other variable cost work out to be 50% of direct labour cost and fixed cost is ₹ 1,00,00,000. There will be no inventory at the end of the year.

PREPARE statement of profitability. [10]

Reference | What's New

Profitability Statement

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Answer

Calculation of Labour overtime hours

Total hours required for production		
X5	(5,000 x 2 hrs)	10,000
X6	(4,000 x 3 hrs)	12,000

X7	(3,000 x 4 hrs)	12,000
Wireless Charger	(15,000 x 0.40 hrs)	6,000
		40,000
Hours available		(35,000)
Overtime		5,000

Statement of Profitability

Particulars	Amount (₹)	Amount (₹)
Sales		
X5 (5,000 x 8,000)	4,00,00,000	
X6 (4,000 x 9,000)	3,60,00,000	
X7 (3,000 x 12,000)	3,60,00,000	
Wireless Charger [(12,000 x 1,350) + (3,000 x 1,500)	2,07,00,000	13,27,00,000
Less: Variable cost		
Material:		
X5 (5,000 x 2,000)		
X6 (4,000 x 2,500)		
X7 (3,000 x 3,000)		
Wireless Charger (15,000 x 300)	3,35,00,000	
Labour:		
X5 (5,000 x 1,000)		
X6 (4,000 x 1,500)		
X7 (3,000 x 2,000)		
Wireless Charger (15,000 x 200)		
Overtime (5,000 x 1,000)	2,50,00,000	
Other variable overheads	1,25,00,000	7,10,00,000
Contribution		6,17,00,000
Less: Fixed Cost		1,00,00,000
Profit		5,17,00,000

Q69 May'22

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	₹ 400.00	₹ 400.00
Variable cost per unit	₹ 240.00	₹ 260.00

Total fixed costs per year	₹ 350 lakhs	₹ 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? [5]

Reference | What's **New**

Evaluation of Machine

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Answer

		Machine-A	Machine-B	Total
A	Selling price per unit (₹)	400	400	
B	Variable cost per cost (₹)	240	260	
C	Contribution per unit (₹) [A – B]	160	140	
D	Units	8,00,000	10,00,000	
E	Total contribution (₹ [C × D]	12,80,00,000	14,00,00,000	26,80,00,000
F	Fixed Cost (₹)	3,50,00,000	2,00,00,000	5,50,00,000
G	Profit [E-F] (₹)	9,30,00,000	12,00,00,000	21,30,00,000
H	Profit per unit [G ÷ D] (₹)	116.25	120.00	

(i) Machine B has the higher profit of ₹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
A	Contribution per unit (₹)	160	140	
B	Units	12,00,000	12,00,000	
C	Total contribution (₹) [A × B]	19,20,00,000	16,80,00,000	36,00,00,000
D	Fixed Cost (₹)	3,50,00,000	2,00,00,000	5,50,00,000
E	Profit [C – E] (₹)	15,70,00,000	14,80,00,000	30,50,00,000
F	Profit per unit [E ÷ B] (₹)	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.

Q70 May'22

UV Limited started a manufacturing unit from 1st October 2021. It produces designer lamps and sells its lamps at ₹ 450 per unit.

During the quarter ending on 31st December, 2021, it produced and sold 12,000 units and suffered a loss of ₹ 35 per unit.

During the quarter ending on 31st March, 2022, it produced and sold 30,000 units and earned a profit of ₹ 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)

(iii) **Calculate** Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30th June, 2022). [5]

Reference — What's New

Total Fixed Cost, Break Even Sales, Profit

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Answer

	Quarter ending 31st December, 2021 (₹)	Quarter ending 31st March, 2022 (₹)
Sales (No. of units sold x ₹ 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000)	12,00,000
	[12,000 × 35]	[30,000 × 40]

$$\text{P/V Ratio} = \frac{\text{Change in profit}}{\text{Change in Sales}} \times 100$$

$$\therefore \frac{16,20,000}{81,00,000} \times 100 = 20\%$$

(i) Fixed Cost = Sales × P/V ratio – profit

= ₹ 1,35,00,000 × 20% – 12,00,000

= ₹ 15,00,000

Alternative Presentation for the calculation of Fixed cost

	Quarter ending 31st December, 2021 (₹)	Quarter ending 31st March, 2022 (₹)
Sales (No. of units sold x ₹ 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000)	12,00,000
	[12,000 × 35]	[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 = ₹ 360 per unit

Fixed cost = TC – VC, 58,20,000 (360 x12,000 units) ₹15,00,000

(ii) Break even sales value (in Rupees) $= \frac{\text{Fixed cost}}{\text{P/V ratio}} \times 100$

$= \frac{15,00,000}{20\%} = ₹75,00,000$

(iii) Profit, if sales reach 50,000 units for the quarter ending 30th June, 2022

	(₹)
Sales (50,000 × ₹ 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

Q71 RTP Nov'22

RPP Manufacturers is approached by an international customer for one-time special order similar to one offered to its domestic customers. Per unit data for sales to regular customers is provided below:

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Fixed manufacturing support	₹ 1092
Total manufacturing costs	₹ 2604
Markup (50%)	₹ 1302
Targeted selling price	₹ 3906

It is provided that RPP Manufacturers has excess capacity.

Required:

(i) **WHAT** is the full cost of the product per unit?

(ii) **WHAT** is the contribution margin per unit?

(iii) **WHICH** costs are relevant for making the decision regarding this one-time special order? **WHY**?

(iv) For RPP Manufacturers, **WHAT** is the minimum acceptable price of this one-time-special order only

(v) For this one-time-only special order, **SHOULD** RPP Manufacturers consider a price of ₹2100 per unit? **WHY** or why not?

Reference | What's **New**

Minimum Price for One time Special Order

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Answer

(i) **Full cost of the product per unit**

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Fixed manufacturing support	₹ 1092
Total manufacturing costs	₹ 2604

(ii) **Contribution margin per unit**

Selling price		₹ 3906
Less:	Variable costs	
	Direct material	₹ 693
	Direct labour	₹ 315
	Variable manufacturing support	₹ 504
Contribution margin per unit		₹ 2394

(iii) **Costs for decision making are those costs that differ between alternatives, which in this situation are the incremental costs.**

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Total incremental costs	₹ 1512

(iv) Minimum acceptable price would be the incremental costs in the short term i.e. ₹ 1512

(v) Yes, RPP Manufacturers may consider a price of ₹ 2100 per unit because this price is greater than the minimum acceptable price.

Q72 RTP Nov'22

The lab corner of Newlife Hospital Trust operates two types of specialist MRI scanning machine-MR10 and MR59. Following details are estimated for the next period:

Machine	MR10	MR59
Running hours	1,100	2,000
	(₹)	(₹)
Variable running costs excluding special technology	68,750	1,60,000
Fixed Costs	50,000	2,43,750

A brain scan is normally carried out on machine type MR10. This task uses special technology costing ₹ 100 each and takes four hours of machine time. Because of the nature of the process, around 10% of the scans produce blurred and therefore useless results.

Required:

(i) **CALCULATE** the total cost of a satisfactory brain scan on machine type MR10.

(ii) Brain scans can also be done on machine type MR59 and would take only 1.8 hours per scan with a reduced reject rate of 6%. However, the cost of the special technology would be ₹137.50 per scan. **ADVISE** which type should be used, assuming sufficient capacity is available on both types of machines. Consider fixed costs will remain unchanged.

Reference | What's New

Decision Making

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Answer

(i) Calculation of Total Cost of a satisfactory scan

Particulars	(₹)
Variable cost per running hour of Machine MR10 (₹ 68,750/1100 hours)	62.50
Fixed cost (₹ 50,000/1100 hours)	45.46
Cost of brain scan on Machine MR10:	(₹)
Variable machine cost (4 hours × ₹ 62.50)	250.00
Special technology	100.00
Total variable cost	350.00
Fixed machine cost (4 hours × ₹ 45.46)	181.84
Total cost of a scan	531.84
Total cost of a satisfactory scan (₹ 531.84/0.9)	590.93

(ii) It is given that fixed cost will remain unchanged and thus they are not relevant for the decision. The relevant costs would be the incremental costs of an additional scan:

Machine MR10:	(₹)
Variable cost per scan	350.00
Variable cost per satisfactory scan (₹ 350/0.9)	388.89
Machine MR59:	(₹)
Variable machine cost per scan (₹ 1,60,000 / 2000 hours × 1.8 hours)	144.00
Special technology	137.50
Variable cost per scan	281.50
Variable cost per satisfactory scan (₹ 281.50/0.94)	299.47

The relevant costs per satisfactory scan are cheaper on Machine MR59 and therefore brain scans should be undertaken on said machine.

Q73 MTP Nov'22

A company makes 1,500 units of a product for which the profitability statement is given below:

	(₹)
Sales	1,20,000
Direct Materials	30,000

Direct Labour	35,000
Variable Overheads	15,000
Fixed Cost	16,800
Profit	22,200

After the first 500 units of production, the company has to pay a premium of ₹ 5 per unit towards overtime labour. The premium so paid has been included in the direct labour cost of ₹ 35,000 given above.

You are required to **COMPUTE** the Break-even point. [5]

Reference — What's **New**

Break Even point

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Answer

Data / Unit	1 – 500 (₹)	501 – 1,500 (₹)
Sales (₹1,20,000 / 1,500 units)	80	80
Direct Material (₹30,000 / 1,500 units)	20	20
Direct Labour*	20	25
Variable Overheads (₹15,000 / 1,500 units)	10	10
Contribution	30	25

Contribution at 500 units = ₹ 15,000

Fixed Cost = ₹ 16,800

Shortfall = ₹ 1,800

No. of units to recover shortfall = 72 units (₹ 1,800 / ₹25)

Break Even Point = 572 units (500 units + 72 units)

(*)

Let X be the Direct Labour per unit up to 500 units. Total Direct Labour-

$500X + 1,000 \times (X + 5) = 35,000$

$1,500X + 5,000 = 35,000$

$X = 20$

Therefore, up to 500 units the Direct Labour is ₹ 20. After 500 units it is ₹ 25.

NOTES

IF YOU HAVE ANY DOUBT WHILE STUDYING FROM THIS BOOK,

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Chapter 19

Budget and Budgetary Control

Q1 ICAI Mat

A factory which expects to operate 7,000 hours, i.e., at 70% level of activity, furnishes details of expenses as under:

Variable expenses	₹ 1,260
Semi-variable expenses	₹ 1,200
Fixed expenses	₹ 1,800

The semi-variable expenses go up by 10% between 85% and 95% activity and by 20% above 95% activity.

PREPARE a flexible budget for 80, 90 and 100 per cent activities.

Reference — What's **New**

Flexible budget

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Answer

Head of Account	Control basis	70%	80%	90%	100%
Budgeted hours		7,000	8,000	9,000	10,000
		(₹)	(₹)	(₹)	(₹)
Variable expenses	V	1,260	1,440	1,620	1,800
Semi-variable expenses	SV	1,200	1,200	1,320	1,440
Fixed expenses	F	1,800	1,800	1,800	1,800
Total expenses		4,260	4,440	4,740	5,040
Recovery rate per hour		0.61	0.55	0.53	0.50

Conclusion:

We notice that the recovery rate at 70% activity is ₹ 0.61 per hour. If in a particular month the factory works 8,000 hours, it will be incorrect to estimate the allowance as ₹ 4,880 @ ₹ 0.61. The correct allowance will be ₹ 4,440 as shown in the table. If the actual expenses are ₹ 4,500 for this level of activity, the company has not saved any money but has over-spent by ₹ 60 (₹ 4,500 – ₹ 4,440).

Q2 ICAI Mat

A department of Company X attains sale of ₹ 6,00,000 at 80 per cent of its normal capacity and its expenses are given below:

	(₹)
Administration costs:	
Office salaries	90,000
General expenses	2 per cent of sales
Depreciation	7,500
Rates and taxes	8,750
Selling costs:	
Salaries	8 per cent of sales
Travelling expenses	2 per cent of sales
Sales office expenses	1 per cent of sales
General expenses	1 per cent of sales
Distribution costs:	
Wages	15,000
Rent	1 per cent of sales
Other expenses	4 per cent of sales

PREPARE flexible administration, selling and distribution costs budget, operating at 90 per cent, 100 per cent and 110 per cent of normal capacity.

Reference — What's New

Flexible Administration, Selling and Distribution Costs Budget

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Answer

Flexible Budget of Department....of Company 'X'

	80% (₹)	90% (₹)	100%(₹)	110%(₹)
Sales	6,00,000	6,75,000	7,50,000	8,25,000
Administration Costs:				
Office Salaries (fixed)	90,000	90,000	90,000	90,000
General expenses (2% of Sales)	12,000	13,500	15,000	16,500
Depreciation (fixed)	7,500	7,500	7,500	7,500
Rent and rates (fixed)	8,750	8,750	8,750	8,750
(A) Total Adm. Costs	1,18,250	1,19,750	1,21,250	1,22,750

Selling Costs:				
Salaries (8% of sales)	48,000	54,000	60,000	66,000
Travelling expenses (2% of sales)	12,000	13,500	15,000	16,500
Sales office (1% of sales)	6,000	6,750	7,500	8,250
General expenses (1% of sales)	6,000	6,750	7,500	8,250
(B) Total Selling Costs	72,000	81,000	90,000	99,000
Distribution Costs:				
Wages (fixed)	15,000	15,000	15,000	15,000
Rent (1% of sales)	6,000	6,750	7,500	8,250
Other expenses (4% of sales)	24,000	27,000	30,000	33,000
(C) Total Distribution Costs	45,000	48,750	52,500	56,250
Total Costs (A + B + C)	2,35,250	2,49,500	2,63,750	2,78,000

Note: In the absence of information it has been assumed that office salaries, depreciation, rates and taxes and wages remain the same at 110% level of activity also. However, in practice some of these costs may change if present capacity is exceeded.

Q3 ICAI Mat

Action Plan Manufacturers normally produce 8,000 units of their product in a month, in their Machine Shop. For the month of January, they had planned for a production of 10,000 units. Owing to a sudden cancellation of a contract in the middle of January, they could only produce 6,000 units in January.

Indirect manufacturing costs are carefully planned and monitored in the Machine Shop and the Foreman of the shop is paid a 10% of the savings as bonus when in any month the indirect manufacturing cost incurred is less than the budgeted provision.

The Foreman has put in a claim that he should be paid a bonus of ₹ 88.50 for the month of January. The Works Manager wonders how anyone can claim a bonus when the Company has lost a sizeable contract. The relevant figures are as under:

Indirect manufacturing	Expenses for a normal month (₹)	Planned for January (₹)	Actual in costs January (₹)
Salary of foreman	1,000	1,000	1,000
Indirect labour	720	900	600
Indirect material	800	1,000	700
Repairs and maintenance	600	650	600
Power	800	875	740
Tools consumed	320	400	300
Rates and taxes	150	150	150
Depreciation	800	800	800
Insurance	100	100	100
	5,290	5,875	4,990

Do you agree with the Works Manager? Is the Foreman entitled to any bonus for the performance in January? Substantiate your answer with facts and figures. **EXPLAIN**.

Reference | What's **New**

Flexible budget | **Variances**

Watch **Video**

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Answer

Flexible Budget of "Action Plan Manufacturers"
(for the month of January)

Indirect manufacturing cost	Nature of cost	Expenses for a normal month (₹)	Planned expenses (₹)	Expenses as per flexible budget (₹)	Actual expenses (₹)	Difference (₹)
	(1)	(2)	(3)	(4)	(5)	(6)=(5)–(4)
Salary of foreman	Fixed	1,000	1,000	1,000	1,000	Nil
Indirect labour (WN 1)	Variable	720	900	540	600	60
Indirect material (WN 2)	Variable	800	1,000	600	700	100
Repair and maintenance (WN 3)	Semi-variable	600	650	550	600	50
Power (WN 4)	Semi-variable	800	875	725	740	15
Tools consumed (WN 5)	Variable	320	400	240	300	60
Rates and taxes	Fixed	150	150	150	150	Nil
Depreciation	Fixed	800	800	800	800	Nil
Insurance	Fixed	100	100	100	100	Nil
		5,290	5,875	4,705	4,990	285

Conclusion: The above statement of flexible budget shows that the concern's expenses in the month of January have increased by ₹ 285 as compared to flexible budget. Under such circumstances assuming the expenses are controllable and based on the financial perspective the Foreman of the company may not be entitled for any performance bonus for the month of January.

Working notes:

1. Indirect labour cost per unit $\frac{₹\ 720}{8,000} = ₹\ 0.09$

   Indirect labour for 6,000 units = 6,000 × ₹ 0.09 = ₹ 540.

2. Indirect material cost per unit $\frac{₹\ 800}{8,000} = ₹\ 0.10$

   Indirect material for 6,000 units = 6,000 × ₹ 0.10 = ₹ 600

3. According to high and low point method of segregating semi-variable cost into fixed and variable components, following formulae may be used.

   Variable cost of repair and maintenance per unit $= \frac{\text{Change in expense level}}{\text{Change in output level}}$

   $= \frac{₹\ 650 - ₹\ 600}{2,000} = ₹\ 0.025$

   For 8,000 units

   Total Variable cost of repair and maintenance = ₹ 200

   Fixed repair & maintenance cost = ₹ 400

   Hence at 6,000 units output level, total cost of repair and maintenance should be

   = ₹ 400 + ₹ 0.025 × 6,000 units= ₹ 400 + ₹ 150 = ₹ 550

4. Variable cost of power per unit $= \frac{₹\ 875 - ₹\ 800}{2,000 \text{ units}} = 0.0375 = 0.0375$

   For 8,000 units

   Total variable cost of power = ₹ 300

   Fixed cost = ₹ 500

   Hence, at 6,000 units output level, total cost of power should be

   = ₹ 500 + ₹ 0.0375 × 6,000 units = ₹ 500 + ₹ 225 =₹ 725

5. Tools consumed cost for 8,000 units = ₹ 320

   Hence, tools consumed cost for 6,000 units = (₹ 320/8,000 units) × 6,000 units = ₹ 240

Q 4 ICAI Mat

A single product company estimated its sales for the next year quarter-wise as under:

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units and the company expects to maintain the closing stock of finished goods at 16,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg. and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below:

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per kg. (₹)
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of raw materials in the beginning of the year is ₹ 20,000.

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 and value).

(iv) Priced stores ledger card of the raw material using First in First out method.

Reference — What's **New**

Production Budget, Raw Material Consumption Budget, Raw Material Purchase Budget and Stores Ledger Card.

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Answer

Working Note:

Total Annual Production (in units)

Sales in 4 quarters	1,53,750 units
Add: Closing balance	16,250 units
	1,70,000 units
Less: Opening balance	10,000 units
Total number of units to be produced in the next year	1,60,000

(i) **Production Budget (in units)**

Quarters	I Units	II Units	III Units	IV Units	Total Units
Sales	30,000	37,500	41,250	45,000	1,53,750
Production in current quarter (80% of the sale of current quarter)	24,000	30,000	33,000	36,000	
Production for next quarter (20% of the sale of next quarter)	7,500	8,250	9,000	12,250*	
Total production	31,500	38,250	42,000	48,250	1,60,000

*Difference figure.

(ii) **Raw material consumption budget in quantity**

Quarters	I	II	III	IV	Total
Units to be produced in each quarter: (A)	31,500	38,250	42,000	48,250	1,60,000
Raw material consumption p.u. (kg.): (B)	2	2	2	2	
Total raw material consumption (Kg.) : (A × B)	63,000	76,500	84,000	96,500	3,20,000

(iii) **Raw material purchase budget (in quantity)**

Raw material required for production (kg.)	3,20,000
Add : Closing balance of raw material (kg.)	5,000
	3,25,000
Less : Opening balance (kg.)	10,000
Material to be purchased (kg.)	3,15,000

Raw material purchase budget (in value)

Quarters	% of annual requirement (Qty.) for purchasing raw material (kg.)	Quantity of raw material to be purchased	Rate per kg. (₹)	Amount (₹)
(1)	(2)	(3)	(4)	(5) = (3) × (4)
I	30	94,500 (3,15,000 kg. × 30%)	2	1,89,000
II	50	1,57,500 (3,15,000 kg. × 50%)	3	4,72,500
III	20	63,000 (3,15,000 kg. × 20%)	4	2,52,000
Total :		3,15,000		9,13,500

(iv) **Priced Stores Ledger Card (of the raw material using FIFO method)**

	Quarters											
	I			II			III			IV		
	Kg.	Rate (₹)	Value (₹)	Kg.	Rate (₹)	Value (₹)	Kg.	Rate (₹)	Value (₹)	Kg.	Rate (₹)	Value (₹)
Opening balance	10,000	2	20,000	41,500	2	83,000	1,22,500	3	3,67,500	38,500	3	1,15,500
(A)										63,000	4	2,52,000
Purchases: (B)	94,500	2	1,89,000	1,57,500	3	4,72,500	63,000	4	2,52,000	–	–	–
Consumption: (C)	63,000	2	1,26,000	41,500	2	83,000	84,000	3	2,52,000	38,500	3	1,15,500
				35,000	3	1,05,000				58,000	4	2,32,000
Balance: (D)	41,500	2	83,000	1,22,500	3	3,67,500	38,500	3	1,15,500	5,000	4	20,000
(D) = (A) +(B) – (C)							63,000	4	2,52,000			

Q5 ICAI Mat

A company is engaged in the manufacture of specialised sub-assemblies required for certain electronic equipment. The company envisages that in the forthcoming month, December, 20X9, the sales will take a pattern in the ratio of 3 : 4 : 2 respectively of sub-assemblies, ACB, MCB and DP.

The following is the schedule of components required for manufacture:

Component requirements

Sub-assembly	Selling Price	Base board	IC08	IC12	IC26
ACB	520	1	8	4	2
MCB	500	1	2	10	6
DP	350	1	2	4	8
Purchase price (₹)		60	20	12	8

The direct labour time and variable overheads required for each of the sub-assemblies are:

	Labour hours		Variable overheads
	Grade A	Grade B	
ACB	8	16	36
MCB	6	12	24
DP	4	8	24
Direct wage rate per hour (₹)	5	4	—

The labourers work 8 hours a day for 25 days a month.

The opening stocks of sub-assemblies and components for December, 20X9 are as under:

Sub-assemblies		Components	
ACB	800	Base Board	1,600
MCB	1,200	IC08	1,200
DP	2,800	IC12	6,000
		IC26	4,000

Fixed overheads amount to ₹ 7,57,200 for the month and a monthly profit target of ₹ 12 lacs has been set.

The company is eager for a reduction of closing inventories for December, 20X9 of sub-assemblies and components by 10% of quantity as compared to the opening stock.

PREPARE the following budgets for December 20X9:

(a) Sales budget in quantity and value.

(b) Production budget in quantity

(c) Component usage budget in quantity.

(d) Component purchase budget in quantity and value.

(e) Manpower budget showing the number of workers and the amount of wages payable.

Reference — What's **New**

Sales Budget, Production Budget, Component Usage Budget, Component Purchase Budget and Manpower Budget

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Answer

Working Note:

1. **Statement showing contribution:**

Sub- assemblies	ABC (₹)	MCB (₹)	DP (₹)	Total (₹)
Selling price per unit (p.u.) : (A)	520	500	350	
Marginal Cost p.u.				
Components				
- Base board	60	60	60	
- IC08	160	40	40	
- IC12	48	120	48	
- IC26	16	48	64	
Labour				
- Grade A	40	30	20	
- Grade B	64	48	32	

Variable production overhead	36	24	24	
Total marginal cost p.u. : (B)	424	370	288	
Contribution p.u. : (C) = (A) – (B)	96	130	62	
Sales ratio : (D)	3	4	2	
Contribution × Sales ratio: [(E) = (C) × (D)]	288	520	124	932

2. **Desired Contribution for the forthcoming month December, 20X9**

	(₹)
Fixed overheads	7,57,200
Desired profit	12,00,000
Desired contribution	19,57,200

3. **Sales mix required i.e. number of batches for the forthcoming month December, 20X9**

Sales mix required =Desired contribution/contribution × Sales ratio

= ₹ 19,57,200/932 (Refer to Working notes 1 and 2)

= 2,100 batches

Budgets for December, 20X2

(a) **Sales budget in quantity and value**

Sub-assemblies	ACB	MCB	DP	Total
Sales (quantity) (2,100 × 3:4:2) (Refer to working note 3)	6,300	8,400	4,200	
Selling price p.u. (₹)	520	500	350	
Sales value (₹)	32,76,000	42,00,000	14,70,000	89,46,000

(b) **Production budget in quantity**

Sub-assemblies	ACB	MCB	DP
Sales	6,300	8,400	4,200
Add : Closing stock (Opening stock less 10%)	720	1,080	2,520
Total quantity required	7,020	9,480	6,720
Less : Opening stock	800	1,200	2,800
Production	6,220	8,280	3,920

(c) **Component usage budget in quantity**

Sub-assemblies	ACB	MCB	DP	Total
Production	6,220	8,280	3,920	—
Base board (1 each)	6,220	8,280	3,920	18,420
Component IC08 (8 : 2 : 2)	49,760	16,560	7,840	74,160
	(6,220 × 8)	(8,280 × 2)	(3,920 × 2)	

Component IC12 (4 : 10 : 4)	24,880	82,800	15,680	1,23,360
	(6,220× 4)	(8,280×10)	(3,920 × 4)	
Component IC26 (2 : 6 : 8)	12,440	49,680	31,360	93,480
	(6,220× 2)	(8,280 × 6)	(3,920 × 8)	

(d) **Component Purchase budget in quantity and value**

Sub-assemblies	Base board	IC08	IC12	IC26	Total
Usage in production	18,420	74,160	1,23,360	93,480	
Add :Closing stock	1,440	1,080	5,400	3,600	
(Opening stock less 10%)					
	19,860	75,240	1,28,760	97,080	
Less :Opening stock	1,600	1,200	6,000	4,000	
Purchase (Quantity)	18,260	74,040	1,22,760	93,080	
Purchase price (₹)	60	20	12	8	
Purchase value (₹)	10,95,600	14,80,800	14,73,120	7,44,640	47,94,160

(e) **Manpower budget showing the number of workers and the amount of wages payable**

Sub-Assemblies	Budgeted Production	Direct labour				Total
		Grade A		Grade B		
		Hours per Unit	Total Hours	Hours per Unit	Total Hours	
ACB	6,220	8	49,760	16	99,520	
MCB	8,280	6	49,680	12	99,360	
DP	3,920	4	15,680	8	31,360	
(A) Total hours			1,15,120		2,30,240	
(B) Hours per man per month			200		200	
(C) Number of workers per month : (A/B)			576		1,152	
(D) Wage rate per month (₹)			1,000		800	
(E) Wages payable (₹) : (C × D)			5,76,000		9,21,600	14,97,600

Q6 ICAI Mat; MTP Nov'20

Float glass Manufacturing Company requires you to **PREPARE** the Master budget for the next year from the following information:

Sales:	
Toughened Glass	₹ 6,00,000

Bent Glass	₹ 2,00,000
Direct material cost	60% of sales
Direct wages	20 workers @ ₹ 150 per month
Factory overheads:	
Indirect labour –	
Works manager	₹ 500 per month
Foreman	₹ 400 per month
Stores and spares	2.5% on sales
Depreciation on machinery	₹ 12,600
Light and power	₹ 3,000
Repairs and maintenance	₹ 8,000
Others sundries	10% on direct wages
Administration, selling and distribution expenses	₹ 36,000 per year

Reference — What's **New**

Master Budget

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Answer

Master Budget for the year ending ...

			(₹)
Sales :			
Toughened Glass			6,00,000
Bent Glass			2,00,000
Total Sales			8,00,000
Less: Cost of production:			
Direct materials (60% of ₹ 8,00,000)		4,80,000	
Direct wages (20 workers × ₹ 150 × 12months)		36,000	
Prime Cost		5,16,000	
Fixed Factory Overhead:			
Works manager's salary (500 × 12)	6,000		
Foreman's salary (400 × 12)	4,800		
Depreciation	12,600		
Light and power (assumed fixed)	3,000	26,400	
Variable Factory Overhead:			
Stores and spares	20,000		
Repairs and maintenance	8,000		

Sundry expenses	3,600	31,600	
Works Cost			5,74,000
Gross Profit (Sales – Works cost)			2,26,000
Less: Adm., selling and distribution expenses			36,000
Net Profit			1,90,000

Q7 ICAI Mat; May'19

Following data is available for DKG and Co:

Standard working hours	8 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	6,400 hours
Std. hours expected to be earned per four weeks	8,000 hours
Actual hours worked in the four- week period	6,000 hours
Standard hours earned in the four- week period	7,000 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

CALCULATE the following ratios:

(1) Efficiency Ratio, (2) Activity Ratio, (3) Calendar Ratio, (4) Standard Capacity Usage Ratio, (5) Actual Capacity Usage Ratio, (6) Actual Usage of Budgeted Capacity Ratio.

Reference — What's **New**

Budget Ratios

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Answer

Maximum Capacity in a budget period

= 50 Employees × 8 Hrs. × 5 Days × 4 Weeks = 8,000 Hrs.

Budgeted Hours

40 Employees × 8 Hrs. × 5 Days × 4 Weeks = 6,400 Hrs.

Actual Hrs. = 6,000 Hrs. (given)

Standard Hrs. for Actual Output = 7,000 Hrs.

Budget No. of Days = 20 Days = 20 Days (4 Weeks x 5 Days)

Actual No. of Days = 20 – 1 = 19 Days

1. **Efficiency Ratio** $= \frac{\text{Standard Hrs}}{\text{Actual Hrs}} \times 100 = \frac{7{,}000 \text{ hours}}{6{,}000 \text{ hours}} \times 100 = 116.67\%$

2. **Activity Ratio** $= \frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100 = \frac{7{,}000 \text{ hours}}{6{,}400 \text{ hours}} \times 100 = 109.375\%$

3. **Calendar Ratio** $= \frac{\text{Available working days}}{\text{Budgeted working days}} \times 100 = \frac{19 \text{ days}}{20 \text{ days}} \times 100 = 95\%$

4. **Standard Capacity Usage Ratio** $= \frac{\text{Budgeted Hours}}{\text{Max. possible hours in the budgeted period}} \times 100$

$= \frac{6{,}400 \text{ hours}}{8{,}000 \text{ hours}} \times 100 = 80\%$

5. **Actual Capacity Usage Ratio** $= \frac{\text{Actual Hours worked}}{\text{Max. possible working hours in a period}} \times 100$

$= \frac{6{,}000 \text{ hours}}{8{,}000 \text{ hours}} \times 100 = 75\%$

6. **Actual Usage of Budgeted Capacity Ratio** $= \frac{\text{Actual working Hours}}{\text{Budgeted hours}} \times 100$

$= \frac{6{,}000 \text{ hours}}{6{,}400 \text{ hours}} \times 100 = 93.75\%$

Q8 ICAI Mat

ABC Ltd. Is currently operating at 75% of its capacity. In the past two years, the levels of operations were 55% and 65% respectively. Presently, the production is 75,000 units. The company is planning for 85% capacity level during 20X3-20X4. The cost details are as follows:

	55% (₹)	65% (₹)	75% (₹)
Direct Materials	11,00,000	13,00,000	15,00,000
Direct Labour	5,50,000	6,50,000	7,50,000
Factory Overheads	3,10,000	3,30,000	3,50,000
Selling Overheads	3,20,000	3,60,000	4,00,000
Administrative Overheads	1,60,000	1,60,000	1,60,000
	24,40,000	28,00,000	31,60,000

Profit is estimated @ 20% on sales.

The following increases in costs are expected during the year:

	In percentage
Direct Materials	8
Direct Labour	5

Variable Factory Overheads	5
Variable Selling Overheads	8
Fixed Factory Overheads	10
Fixed Selling Overheads	15
Administrative Overheads	10

PREPARE flexible budget for the period 20X3-20X4 at 85% level of capacity. Also ascertain profit and contribution.

Reference — What's **New**

Flexible Budget

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Answer

ABC Ltd.
Budget for 85% capacity level for the period 20X3-X4

Budgeted production (units)		85,000
	Per Unit (₹)	**Amount (₹)**
Direct Material (note 1)	21.60	18,36,000
Direct Labour (note 2)	10.50	8,92,500
Variable factory overhead (note 3)	2.10	1,78,500
Variable selling overhead (note 4)	4.32	3,67,200
Variable cost	38.52	32,74,200
Fixed factory overhead (note 3)		2,20,000
Fixed selling overhead (note 4)		1,15,000
Administrative overhead		1,76,000
Fixed cost		5,11,000
Total cost		37,85,200
Add: Profit 20% on sales or 25% on total cost		9,46,300
Sales		47,31,500
Contribution (Sales – Variable cost)		14,57,300

Working Notes:

1. **Direct Materials :**

75% Capacity	₹ 15,00,000	65% Capacity	₹ 13,00,000
65% Capacity	₹ 13,00,000	55% Capacity	₹ 11,00,000
10% change in capacity	₹ 2,00,000	10% change in capacity	₹ 2,00,000

For 10% increase in capacity, i.e., for increase by 10,000 units, the total direct material cost regularly changes by ₹ 2,00,000

Direct material cost (variable) = ₹ 2,00,000 ÷ 10,000 = ₹ 20

After 8% increase in price, direct material cost per unit = ₹ 20 × 1.08 = ₹ 21.60

Direct material cost for 85,000 budgeted units = 85,000 × ₹ 21.60 = ₹ 18,36,000

2. **Direct Labour :**

75% Capacity	₹ 7,50,000	65% Capacity	₹ 6,50,000
65% Capacity	₹ 6,50,000	55% Capacity	₹ 5,50,000
10% change in capacity	₹ 1,00,000	10% change in capacity	₹ 1,00,000

For 10% increase in capacity, direct labour cost regularly changes by ₹ 1,00,000.

Direct labour cost per unit = ₹ 1,00,000 ÷ 10,000 = ₹ 10

After 5% increase in price, direct labour cost per unit = ₹ 10 × 1.05 = ₹ 10.50

Direct labour for 85,000 units = 85,000 units × ₹ 10.50 = ₹ 8,92,500.

3. **Factory overheads are semi-variable overheads:**

75% Capacity	₹ 3,50,000	65% Capacity	₹ 3,30,000
65% Capacity	₹ 3,30,000	55% Capacity	₹ 3,10,000
10% change in capacity	₹ 20,000	10% change in capacity	₹ 20,000

Variable factory overhead = ₹ 20,000 ÷ 10,000 = ₹ 2

Variable factory overhead for 75,000 units = 75,000 × ₹ 2 = ₹ 1,50,000

Fixed factory overhead = ₹ 3,50,000 – ₹ 1,50,000 = ₹ 2,00,000.

Variable factory overhead after 5% increase = ₹ 2 × 1.05 = ₹ 2.10

Fixed factory overhead after 10% increase = ₹ 2,00,000 × 1.10 = ₹ 2,20,000.

4. **Selling overhead is semi-variable overhead :**

75% Capacity	₹ 4,00,000	65% Capacity	₹ 3,60,000
65% Capacity	₹ 3,60,000	55% Capacity	₹ 3,20,000
10% change in capacity	₹ 40,000	10% change in capacity	₹ 40,000

Variable selling overhead = ₹ 40,000 ÷ 10,000 units = ₹ 4

Variable selling overhead for 75,000 units = 75,000 × ₹ 4 = ₹ 3,00,000.

Fixed selling overhead = ₹ 4,00,000 – ₹ 3,00,000 = ₹ 1,00,000

Variable selling overhead after 8% increase = ₹ 4 × 1.08 = ₹ 4.32

Fixed selling overhead after 15% increase = ₹ 1,00,000 × 1.15 = ₹ 1,15,000

5. **Administrative overhead is fixed :**

After 10% increase = ₹ 1,60,000 × 1.10 = ₹ 1,76,000

Q9 ICAI Mat

The accountant of manufacturing company provides you the following details for year 20X9:

	(₹)		(₹)
Direct materials	1,75,000	Other variable costs	80,000
Direct Wages	1,00,000	Other fixed costs	80,000
Fixed factory overheads	1,00,000	Profit	1,15,000
Variable factory overheads	1,00,000	Sales	7,50,000

During the year, the company manufactured two products A and B and the output and costs were:

	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹ 2.00	₹ 3.50
Direct materials per unit	₹ 0.50	₹ 0.75
Direct wages per unit	₹ 0.25	₹ 0.50

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹ 0.25 per unit; and B ₹ 0.30 per unit.

During 20X0, it is expected that the demand for product A will fall by 25 % and for B by 50%. It is decided to manufacture a further product C, the cost for which are estimated as follows:

	Product C
Output (units)	2,00,000
Selling price per unit	₹ 1.75
Direct materials per unit	₹ 0.40
Direct wages per unit	₹ 0.25

It is anticipated that the other variable costs per unit will be the same as for product A.

PREPARE a budget to present to the management, showing the current position and the position for 20X0 . Comment on the comparative results.

Reference

Flexible Budget

What's New

Comments on New product

Watch **Video**

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Answer

Budget Showing Current Position and Position for 20X0

	Position for 20X9			Position for 20X0			
	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	–
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
(A) Sales	4,00,000	3,50,000	7,50,000	3,00,000	1,75,000	3,50,000	8,25,000
Direct Material	1,00,000	75,000	1,75,000	75,000	37,500	80,000	1,92,500
Direct wages	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Factory overhead (variable)	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Other variable costs	50,000	30,000	80,000	37,500	15,000	50,000	1,02,500
(B) Marginal Cost	2,50,000	2,05,000	4,55,000	1,87,500	1,02,500	2,30,000	5,20,000
(C) Contribution (A – B)	1,50,000	1,45,000	2,95,000	1,12,500	72,500	1,20,000	3,05,000
Fixed costs –Factory			1,00,000				1,00,000
– Others			80,000				80,000
(D) Total fixed cost			1,80,000				1,80,000
Profit (C – D)			1,15,000				1,25,000

Comments: Introduction of Product C is likely to increase profit by ₹ 10,000 (i.e. from ₹ 1,15,000 to ₹ 1,25,000) in 20X0 as compared to 20X9. Therefore, introduction of product C is recommended.

Q10 ICAI Mat

TQM Ltd. has furnished the following information for the month ending 30th June, 20X9:

	Master Budget	Actual	Variance
Units produced and sold	80,000	72,000	
Sales (₹)	3,20,000	2,80,000	40,000 (A)
Direct material (₹)	80,000	73,600	6,400 (F)
Direct wages (₹)	1,20,000	1,04,800	15,200 (F)
Variable overheads (₹)	40,000	37,600	2,400 (F)
Fixed overhead (₹)	40,000	39,200	800 (F)
Total Cost	2,80,000	2,55,200	

The Standard costs of the products are as follows:

	Per unit (₹)
Direct materials (1 kg. at the rate of ₹ 1 per kg.)	1.00
Direct wages (1 hour at the rate of ₹ 1.50)	1.50
Variable overheads (1 hour at the rate of ₹ 0.50)	0.50

Actual results for the month showed that 78,400 kg. of material were used and 70,400 labour hours were recorded.

Required:

(i) **PREPARE** Flexible budget for the month and compare with actual results.

(ii) **CALCULATE** Material, Labour, Sales Price, Variable Overhead and Fixed Overhead Expenditure Variances and Sales Volume (Profit) Variance.

Reference | **What's New**

Flexible Budget and Variances | **Material, Labour, VOH, FOH and Sales Variances**

Watch **Video**

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Answer

(i) **Statement showing Flexible Budget and its comparison with actual**

		Master Budget 80,000 units	Flexible Budget (at standard cost)		Actual for 72,000 units	Variance
			Per unit	72,000 units		
A.	Sales	3,20,000	4.00	2,88,000	2,80,000	8,000 (A)
B.	Direct material	80,000	1.00	72,000	73,600	1,600 (A)
C.	Direct wages	1,20,000	1.50	1,08,000	1,04,800	3,200 (F)
D.	Variable overhead	40,000	0.50	36,000	37,600	1,600 (A)
E.	Total variable cost	2,40,000	3.00	2,16,000	2,16,000	–
F.	Contribution	80,000	1.00	72,000	64,000	–
G.	Fixed overhead	40,000	0.50	40,000	39,200	800 (F)
H.	Net profit	40,000	0.50	32,000	24,800	7,200 (A)

(ii) **Variances:**

- Sales Price Variance = Actual Quantity (Standard Rate – Actual Rate)
  = 72,000 units (₹ 4.00 – ₹ 3.89)= ₹ 8,000 (A)
- Direct Material Cost Variance = Standard Cost for Actual output – Actual cost
  = ₹ 72,000 – ₹ 73,600 = ₹ 1,600 (A)

- Direct Material Price Variance = Actual Quantity (Standard Rate – Actual Rate)

$$= 78,400 \text{ units}\left(₹1.00 - \frac{₹73,600}{78,400 \text{ units}}\right)$$

= ₹ 4,800 (F)

- Direct Material Usage Variance = Standard Rate (Std. Qty. – Actual Quantity)

= ₹ 1 (72,000 units – 78,400 units)

= ₹ 6,400 (A)

- Direct Labour Cost Variance = Standard Cost for actual output – Actual cost

= ₹ 1,08,000 – ₹ 1,04,800 = ₹ 3,200 (F)

- Direct Labour Rate Variance = Actual Hour (Std Rate – Actual Rate)

$$= 70,400 \text{ hours}\left(₹1.5 - \frac{₹1,04,800}{70,400 \text{ hours}}\right)$$

= ₹ 800 (F)

- Direct Labour Efficiency = Standard Rate (Standard Hour – Actual Hour)

= ₹ 1.5 (72,000 – 70,400) = ₹ 2,400 (F)

- Variable Overhead = Recovered Variable Overhead – Actual Variable Overhead

= (72,000 units × ₹ 0.50) – ₹ 37,600 = ₹ 1,600(A)

- Fixed Overhead Expenditure = Budgeted Fixed Overhead – Actual Fixed Overhead

= ₹ 40,000 – ₹ 39,200 = ₹ 800 (F)

- Sales Volume (Profit) Variance = Std. Profit (Budgeted Quantity – Actual Quantity)

= ₹ 0.50 (80,000 – 72,000)= ₹ 4,000(A)

Q11 ICAI Mat; RTP Nov'18

Jigyasa Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 20X9-X0. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

	Minimax (MM)	Heavyhigh (HH)
Budgeted Production units	1,80,000	1,20,000
	(₹)	(₹)
Direct material cost per unit	220	280
Direct labour cost per unit	130	120
Manufacturing overhead	4,00,000	5,00,000

The estimated units to be sold in the first four months of the year 20X9-X0 are as under

	April	May	June	July
Minimax	8,000	10,000	12,000	16,000
Heavyhigh	6,000	8,000	9,000	14,000

PREPARE production budget for the first quarter in monthwise.

Reference — What's **New**

Production Budget

Watch **Video**

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Answer

Production Budget of Product Minimax and Heavyhigh (in units)

	April		May		June		Total	
	MM	HH	MM	HH	MM	HH	MM	HH
Sales	8,000	6,000	10,000	8,000	12,000	9,000	30,000	23,000
Add: Closing Stock (25% of next month's sale)	2,500	2,000	3,000	2,250	4,000	3,500	9,500	7,750
Less: Opening Stock	2,000*	1,500*	2,500	2,000	3,000	2,250	7,500	5,750
Production units	8,500	6,500	10,500	8,250	13,000	10,250	32,000	25,000

* Opening stock of April is the closing stock of March, which is as per company's policy 25% of next month" sale.

Production Cost Budget

Element of cost	Rate (₹)		Amount (₹)	
	MM (32,000 units)	HH (25,000 units)	MM	HH
Direct Material	220	280	70,40,000	70,00,000
Direct Labour	130	120	41,60,000	30,00,000
Manufacturing Overhead				
(4,00,000 ÷ 1,80,000 × 32,000)			71,111	
(5,00,000 ÷ 1,20,000 × 25,000)				1,04,167
			1,12,71,111	1,01,04,167

Q12 ICAI Mat

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 ₹ 4 and ₹ 6 per kg and labours are paid ₹ 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.

Reference — What's New

Material Budget and Wages Budget

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Answer

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 $\left(\frac{2,400 \text{ units}}{20 \text{ days}} \times 4 \text{ days}\right)\left(\frac{3,600 \text{ units}}{20 \text{ days}} \times 5 \text{ days}\right)$	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.)
	25,300	35,720
Add: Closing stock $\left(\frac{25,300 \text{ kgs.}}{20 \text{ days}} \times 10 \text{ days}\right)\left(\frac{37,720 \text{ kgs.}}{20 \text{ days}} \times 6 \text{ days}\right)$	12,650	10,716
Less: Opening stock	1,000	500
Quantity to be purchased	36,950	45,936
Rate per kg. of Material	₹ 4	₹ 6
Total Cost	₹ 1,47,800	₹ 2,75,616

(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 × ₹ 25 + 14,610 hours × ₹ 37.5

= ₹ 7,20,000 + ₹ 5,47,875= ₹ 12,67,875

Q13 RTP May'18

G Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 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 ₹ 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.

Reference | What's **New**

Functional Budget , Economic Order Quantity and Maximum Production units.

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Answer

(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 $\left(\frac{28,320}{0.96}\right)$	14,000 $\left(\frac{13,160}{0.94}\right)$

(b) **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	₹ 36	
Total purchase price	₹ 90,83,160	

(ii) **Calculation of Economic Order Quantity for Material Z**

$$EOQ = \sqrt{\frac{2 \times 2,52,310 \text{ kg.} \times ₹ 320}{₹ 36 \times 11\%}} = \sqrt{\frac{16,14,78,400}{₹ 3.96}} = 6,385.72 \text{ kg.}$$

(iii) Since, the maximum number of order per year can not 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. $\left(1,60,000 \times \frac{1,63,889}{2,52,310}\right)$	56,071 kg. $\left(1,60,000 \times \frac{88,421}{2,52,310}\right)$
Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for production	93,536 kg.	53,267 kg.
Units to be produced	18,707 units $\left(\frac{93,536 \text{ kg.}}{5 \text{ kg.}}\right)$	8,878 units $\left(\frac{53,267 \text{ kg.}}{6 \text{ kg.}}\right)$

Q14 RTP May'18; May' 18; RTP Nov'20

State the advantages of Zero-based budgeting 'or' **why** is Zero based budgeting considered superior to Traditional Budgeting?

Reference — What's **New**

Zero based Budgeting - Advantages

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Answer

The advantages of zero-based budgeting are as follows:

- It provides a systematic approach for the **evaluation of different activities and rank them** in order of preference **for the allocation of scarce resources**.
- It ensures that the **various functions undertaken by the organization are critical** for the achievement of its objectives and are being performed in the best possible way.
- It provides an opportunity to the management to allocate resources for various activities only after having a **thorough cost-benefit-analysis**. The chances of arbitrary cuts and enhancement are thus avoided.
- The areas of **wasteful expenditure can be easily identified** and eliminated.
- Departmental budgets are closely **linked with corporation objectives**.
- The technique can also be used for the introduction and implementation of the system of '**management by objective**.' Thus, it cannot only be used for fulfillment of the objectives of traditional budgeting but it can also be used for a variety of other purposes.

Q15 MTP Mar'18

Maximum Production capacity of KM (P) Ltd. is 28,000 units per month. Output at different levels along with cost data is furnished below:

Particulars of Costs	Activity Level		
	16,000 units	18,000 units	20,000 units
Direct Material	₹ 12,80,000	₹ 14,40,000	₹ 16,00,000
Direct labour	₹ 17,60,000	₹ 19,80,000	₹ 22,00,000
Total factory overheads	₹ 22,00,000	₹ 23,70,000	₹ 25,40,000

You are **required** to **CALCULATE** the selling price per unit at an activity level of 24,000 units by considering profit at the rate of 25% on sales.

Reference | What's **New**

Flexible Budget

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Answer

Computation of Overheads

$$\text{Variable Overhead per unit} = \frac{\text{Change in Factory Overheads}}{\text{Change in Activity level}}$$

$$= \frac{23,70,000 - 22,00,000}{18,000 - 16,000} \text{ or } \frac{25,40,000 - 23,70,000}{20,000 - 18,000}$$

$$= \frac{1,70,000}{2,000} = ₹ 85 \text{ per unit}$$

Fixed Overhead

Activity level = 16,000 units

Particulars	Amount (₹)
Total factory overheads	22,00,000
Less: Variable overheads 16,000 units @ ₹ 85 per unit	(13,60,000)
Fixed Overhead	8,40,000

Computation of Costs at Activity Level 24,000 units

	Per Unit (₹)	Amount (₹)
Direct Material (12,80,000/16,000)	80.00	19,20,000
Direct Labour (17,60,000/16,000)	110.00	26,40,000

Variable Overhead (As calculated above)	85.00	20,40,000
Fixed Overhead		8,40,000
Total Cost		74,40,000

Computation of Selling Price at activity level 24,000 units

Profit required is 25% on selling price, hence cost will be 75%.

Therefore desired profit = $\frac{25 \times 74,40,000}{75}$ = ₹ 24,80,000

Cost of 24,000 units	74,40,000
Desired Profit	24,80,000
Total Sales	99,20,000

Alternatively

Total Sales = $\frac{\text{Total Cost}}{75} \times 100 = \frac{74,40,000}{75} \times 100$ = ₹ 99,20,000

Selling Price per unit = $\frac{\text{Total Sales}}{\text{No. of Units}} = \frac{99,20,000}{24,000} \times 100$ = ₹ 413.33

Q16 MTP Mar'18; MTP May'20

R Limited is presently operating at 50% capacity and producing 60,000 units. The entire output is sold at a price of ₹ 200 per unit. The cost structure at the 50% level of activity is as under:

	₹
Direct Material	75 per unit
Direct Wages	25 per unit
Variable Overheads	25 per unit
Direct Expenses	15 per unit
Factory Expenses (25% fixed)	20 per unit
Selling and Distribution Exp. (80% variable)	10 per unit
Office and Administrative Exp. (100% fixed)	5 per unit

The company anticipates that the variable costs will go up by 10% and fixed costs will go up by 15%.

You are **required** to PREPARE an Expense budget, on the basis of marginal cost for the company at 50% and 60% level of activity and COMPUTE profits at respective levels. (10 Marks)

Reference — What's **New**

Flexible Budget

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Answer

Expense Budget of R Ltd. for the period......

	Per unit (₹)	50% Capacity 60,000 units Amount (₹)	60% Capacity 72,000 units Amount (₹)
Sales (A)	200.00	1,20,00,000	1,44,00,000
Less: Variable Costs:			
- Direct Material	82.50	49,50,000	59,40,000
- Direct Wages	27.50	16,50,000	19,80,000
- Variable Overheads	27.50	16,50,000	19,80,000
- Direct Expenses	16.50	9,90,000	11,88,000
- Variable factory expenses (75% of ₹ 20 p.u.)	16.50	9,90,000	11,88,000
- Variable Selling & Dist. exp. (80% of ₹ 10 p.u.)	8.80	5,28,000	6,33,600
Total Variable Cost (B)	179.30	1,07,58,000	1,29,09,600
Contribution (C) = (A – B)	20.70	12,42,000	14,90,400
Less: Fixed Costs:			
- Office and Admin. exp. (100%)	--	3,45,000	3,45,000
- Fixed factory exp. (25%)	--	3,45,000	3,45,000
- Fixed Selling & Dist. exp. (20%)	--	1,38,000	1,38,000
Total Fixed Costs (D)	--	8,28,000	8,28,000
Profit (C – D)	--	4,14,000	6,62,400

Q17 — MTP Aug'18; MTP Oct'19

CALCULATE from the following figures:

(i) Efficiency ratio

(ii) Activity ratio and

(iii) Capacity ratio.

Budgeted Production	880 units
Standard Hours per unit	10 hours
Actual Production	750 units
Actual Working Hours	6,000 hours

Reference — What's **New**

Budget Ratios

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Answer

(i) **Efficiency Ratio**

$$= \frac{\text{Actual Production in terms of standard hours}}{\text{Actual hours worked}} \times 100$$

$$= \frac{750 \text{ units} \times 10 \text{ hours}}{6{,}000} \times 100 = 125\%$$

(ii) **Activity ratio**

$$= \frac{\text{Actual Production in terms of standard hours}}{\text{Budgeted production in terms of standard hours}} \times 100$$

$$= \frac{7{,}500}{880 \times 10} \times 100 = 85.23\%$$

(iii) **Capacity Ratio**

$$= \frac{\text{Actual hour worked}}{\text{Maximum hours in a budget period}} \times 100$$

$$= \frac{6{,}000}{8{,}800} \times 100 = 68.19\%$$

Activity ratio = Efficiency Ratio × Capacity Ratio

Or, 85.23% = 125%× 68.19%

Q18 MTP Aug'18

Explain the difference between Fixed Budget and Flexible Budget

Reference | What's **New**

Fixed Budget and Flexible Budget

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Answer

Difference between Fixed and Flexible Budgets:

Sl. No.	Fixed Budget	Flexible Budget
1.	It **does not change** with actual volume of activity achieved. Thus it is known as rigid or inflexible budget	It can be **re-casted on the basis of activity level** to be achieved. Thus it is not rigid.

2.	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
3.	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.
4.	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.
5.	**Comparison** of actual performance with budgeted targets **will be meaningless** specially when there is a difference between the two activity levels.	It provides a **meaningful** basis of comparison of the actual performance with the budgeted targets.

Q19 MTP Oct'18

C 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 ₹ 4 and ₹ 6 per kg and labours are paid ₹ 25 per hour. Overtime premium is 50% and is paid, 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. (10 Marks)

Reference | What's New

Material Purchase Budget and Wages Budget | **Same as Q 12**

Watch **Video** Scan Me

Answer

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	480 $\left(\frac{2,400 \text{ units}}{20 \text{ days}} \times 4 \text{ days}\right)$	900 $\left(\frac{3,600 \text{ units}}{20 \text{ days}} \times 5 \text{ days}\right)$
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.)
	25,300	35,720
Add: Closing stock	12,650 $\left(\frac{25,300 \text{ kgs.}}{20 \text{ days}} \times 10 \text{ days}\right)$	10,716 $\left(\frac{35,720 \text{ kgs.}}{20 \text{ days}} \times 6 \text{ days}\right)$

Less: Opening stock	(1,000)	(500)
Quantity to be purchased	36,950	45,936
Rate per kg. of Material	₹ 4	₹ 6
Total Cost	₹ 1,47,800	₹ 2,75,616

(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 × ₹ 25 + 14,610 hours × ₹ 37.5

= ₹ 7,20,000 + ₹ 5,47,875

= ₹ 12,67,875

Q20 MTP Mar'19; RTP May'19

S Ltd. has prepared budget for the coming year for its two products A and B.

	Product A (₹)	Product B (₹)
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:

(a) Before marketing efforts

(b) After marketing efforts. [10 Marks]

Reference — What's **New**

Flexible Budget - before and after marketing

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Answer

(a) **Flexible Budget before marketing efforts:**

	Product A (₹) 6,000 units		Product B (₹) 9,000 units	
	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

(b) **Flexible Budget after marketing efforts:**

	Product A (₹) 7,500 units		Product B (₹) 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

Q21 MTP Apr'19; RTP May'20; Nov'18

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 ₹ 5,71,400 is incurred and sold through dealers at a uniform selling price of ₹ 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. (10 Marks)

Reference — What's **New**

Production Budget, Purchase Budget and Budgeted Gross Profit

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Answer

(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

(iii) **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 (₹ in lakh)	2,91,414	2,54,987.25	3,27,840.75	8,74,242
Less: Cost of Sales (₹ in lakh) (Sales unit × Cost per unit)	2,28,560	1,99,990.00	2,57,130.00	6,85,680
Gross Profit (₹ in lakh)	62,854	54,997.25	70,710.75	1,88,562

* Net Selling price unit = ₹ 8,57,100 – 15% commission on ₹ 8,57,100 = ₹ 7,28,535.

Q22 May'19

What are the cases when a flexible budget is found suitable?

Reference — What's New

Suitability of Flexible Budget

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Answer

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**.

Q23 RTP Nov'19

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.

Reference — What's **New**

Flexible Budget

Watch **Video** — Scan Me

Answer

Expense Budget of KLM Ltd.

Particulars	50,000 Units (₹)	35,000 Units (₹)	70,000 Units (₹)
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 (50,000 x 50)	17,50,000 (35,000 x 50)	35,00,000 (70,000 x 50)

Variable Overhead	20,00,000 (50,000 x 40)	14,00,000 (35,000 x 40)	28,00,000 (70,000 x 40)
Direct Expenses	7,50,000 (50,000 x 15)	5,25,000 (35,000 x 15)	10,50,000 (70,000 x 15)
Selling Expenses (Variable)*	10,00,000 (50,000 x 20)	7,00,000 (35,000 x 20)	14,00,000 (70,000 x 20)
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 (17 x 50,000)	5,95,000 (17 x 35,000)	11,90,000 (17 x 70,000)
Distribution Expenses (Fixed)** (3 x 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 = ₹ 25 x 20% = ₹ 5

Fixed Cost = ₹ 5 x 50,000 units = ₹ 2,50,000

Variable Cost Per unit = ₹ 25 – ₹ 5 = ₹ 20

**Distribution Expenses: Fixed cost per unit = ₹ 20 x 15% = ₹ 3

Fixed Cost = ₹ 3 x 50,000 units = ₹ 1,50,000

Variable cost per unit = ₹ 20 – ₹ 3 = ₹ 17

Q 24 RTP Nov'19; RTP May'21

Explain the meaning of Budget Manual 'or' **Describe** the salient features of Budget Manual

Reference | What's New

Budget Manual

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Answer

Budget Manual: A budget manual is a collection of documents that contains key information for those involved in the planning process. Typical contents could include the following:

- An introductory **explanation of the budgetary planning and control process**, including a statement of the budgetary objective and desired results.
- A **form of organisation chart** to show **who is responsible** for the preparation of each functional budget and the way in which the budgets are interrelated.

- A **timetable** for the preparation of each budget. This will prevent the formation of a 'bottleneck' with the late preparation of one budget holding up the preparation of all others.
- **Copies of all forms** to be completed by those responsible for preparing budgets, **with explanations** concerning their completion.
- A **list of the organization's account codes**, with full explanations of how to use them.
- **Information concerning key assumption** to be made by managers in their budgets, for example the rate of inflation, key exchange rates, etc.

Q25 MTP Oct'19

V Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2019.

The following information are made available for this purpose:

(i) It expects to sell 50,000 bags of 'X' during the second quarter of 2019 at the selling price of ₹ 900 per bag.

(ii) Each bag of 'X' requires 2.5 kgs. of a raw – material called 'Y' and 7.5 kgs. of raw – material called 'Z'.

(iii) Stock levels are planned as follows:

Particulars	Beginning of Quarter	End of Quarter
Finished Bags of 'X' (Nos.)	15,000	11,000
Raw – Material 'Y' (Kgs.)	32,000	26,000
Raw – Material 'Z' (Kgs.)	57,000	47,000
Empty Bag (Nos.)	37,000	28,000

(iv) 'Y' cost ₹ 120 per Kg., 'Z' costs ₹ 20 per Kg. and 'Empty Bag' costs ₹ 80 each.

(v) It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is ₹ 50 per hour.

(vi) Variable manufacturing costs are ₹ 45 per bag. Fixed manufacturing costs ₹ 30,00,000 per quarter.

(vii) Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are ₹ 20,50,000 per quarter.

Required

(i) **PREPARE** a production budget for the said quarter.

(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'.

(iv) **PREPARE** a statement of budgeted net income for the said quarter and show both per unit and total cost data. [10 Marks]

Reference | **What's New**

Production Budget, Purchase Budget, Budgeted Variable Cost and Budgeted Net Income.

Watch **Video**

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Answer

(i) **Production Budget of 'X' for the Second Quarter**

Particulars	Bags (Nos.)
Budgeted Sales	50,000
Add: Desired Closing stock	11,000
Total Requirements	61,000
Less: Opening stock	15,000
Required Production	46,000

(ii) **Raw–Materials Purchase Budget in Quantity as well as in ₹ for 46,000 Bags of 'X'**

Particulars	'Y' Kgs.	'Z' Kgs.	Empty Bags Nos.
Production Requirements Per bag of 'X'	2.5	7.5	1.0
Requirement for Production	1,15,000	3,45,000	46,000
	(46,000 × 2.5)	(46,000 × 7.5)	(46,000 × 1)
Add: Desired Closing Stock	26,000	47,000	28,000
Total Requirements	1,41,000	3,92,000	74,000
Less: Opening Stock	32,000	57,000	37,000
Quantity to be purchased	1,09,000	3,35,000	37,000
Cost per Kg./Bag	₹ 120	₹ 20	₹ 80
Cost of Purchase (₹)	1,30,80,000	67,00,000	29,60,000

(iii) **Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'**

Particulars	(₹)
Raw – Material	
Y (2.5 Kg @120)	300.00
Z (7.5 Kg. @20)	150.00
Empty Bag	80.00
Direct Labour (₹ 50× 9 minutes / 60 minutes)	7.50
Variable Manufacturing Overheads	45.00
Variable Cost of Production per bag	582.50

(iv) **Budgeted Net Income for the Second Quarter**

Particulars	Per Bag (₹)	Total (₹)
Sales Value (50,000 Bags)	900.00	4,50,00,000
Less: Variable Cost:		
Production Cost	582.50	2,91,25,000
Admn. & Selling Expenses (5% of Sales Price)	45.00	22,50,000
Budgeted Contribution	272.50	1,36,25,000
Less: Fixed Expenses:		
Manufacturing		30,00,000
Admn. & Selling		20,50,000
Budgeted Net Income		85,75,000

Q 26 Nov'19; MTP May'20

Define Zero Base Budgeting and mention its various stages.

Reference | What's **New**

Zero based budgeting

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Answer

Zero-based Budgeting: (ZBB) is an emergent form of budgeting which arises **to overcome the limitations of incremental (traditional) budgeting system**. Zero- based Budgeting (ZBB) is defined as 'a method of budgeting which requires each cost element to be specifically justified, although the activities to which the budget relates are being undertaken for the first time, without approval, the budget allowance is zero'.

ZBB is an activity based budgeting system where **budgets are prepared for each activities rather than functional department**. Justification in the form of **cost benefits for the activity** is required to be given. The activities are then **evaluated and prioritized** by the management on the basis of factors like synchronisation with organisational objectives, availability of funds, regulatory requirement etc.

ZBB is **suitable for both corporate and non-corporate entities**. In case of non-corporate entities like Government department, local bodies, not for profit organisations, where these entities need to justify the benefits of expenditures on social programmes like mid-day meal, installation of street lights, provision of drinking water etc.

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

Q 27 RTP Nov'20; MTP May'21

The information of Z Ltd. for the year ended 31st March 2020 is as below:

	Amount (₹)
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 (₹)	600	550
Direct material per unit (₹)	140	157.50
Direct wages per unit (₹)	90	132.50

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as:

Product X – ₹ 40 per unit and Product Y- ₹ 70 per unit.

For the FY 2020-21, due to a pandemic, 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** product- wise profitability statement on marginal costing method for the FY 2019-20 and

(ii) **PREPARE** a budget for the FY 2020-21.

Reference | What's **New**

Product wise profitability

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Answer

(i) **Product-wise Profitability Statement for the FY 2019-20:**

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
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 (₹ 140×8,000)	6,30,000 (₹ 157.50×4,000)	17,50,000
Direct wages	7,20,000 (₹ 90×8,000)	5,30,000 (₹ 132.5×4,000)	12,50,000
Variable factory overheads	5,47,200 (76%of 7,20,000)	4,02,800 (76%of 5,30,000)	9,50,000
Other variable costs	3,20,000 (₹ 40×8,000)	2,80,000 (₹ 70×4,000)	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

(ii) **Preparation of Budget for the FY 2020-21:**

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
Output (units)	6,400 (8,000×80%)	3,600 (4,000×90%)	
Selling price per unit	480 (600×80%)	440 (550×80%)	
Sales value	30,72,000	15,84,000	46,56,000
Direct material	8,96,000 (₹ 140×6,400)	5,67,000 (₹ 157.50×3,600)	14,63,000
Direct wages per unit	6,91,200 (₹ 108×6,400)	5,72,400 (₹ 159×3,600)	12,63,600
Variable factory overheads	5,25,312 (76%of 6,91,200)	4,35,024 (76%of 5,72,400)	9,60,336
Other variable costs	2,56,000 (₹ 40×6,400)	2,52,000 (₹ 70×3,600)	5,08,000
Contribution	7,03,488	(2,42,424)	4,61,064
Fixed factory overheads	-	-	12,00,000
Other fixed costs (110% of ₹ 4,00,000)	-	-	4,40,000
Profit/ (Loss)			(11,78,936)

Q28 MTP Nov'20

Describe objectives of Budgetary Control System.

Reference | What's **New**

Budgetary Control - Objectives

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Answer

Objectives of Budgetary Control System

1. **Portraying with precision the overall aims of the business** and determining targets of performance for each section or department of the business.
2. **Laying down the responsibilities** of each of the executives and other personnel so that everyone knows what is expected of him and how he will be judged. Budgetary control is one of the few ways in which an objective assessment of executives or department is possible.
3. **Providing a basis for the comparison** of actual performance with the predetermined targets and investigation of deviation, if any, of actual performance and expenses from the budgeted figures. This naturally helps in adopting corrective measures.
4. **Ensuring the best use of all available resources** to maximise profit or production, subject to the limiting factors. Since budgets cannot be properly drawn up without considering all aspects usually there is good co-ordination when a system of budgetary control operates.
5. **Co-ordinating the various activities** of the business, and centralising control and yet enabling management to decentralise responsibility and delegate authority in the overall interest of the business.
6. **Engendering a spirit of careful forethought**, assessment of what is possible and an attempt at it. It leads to dynamism without recklessness. Of course, much depends on the objectives of the firm and the vigour of its management.
7. **Providing a basis for revision** of current and future policies.
8. **Drawing up long range plans** with a fair measure of accuracy.
9. **Providing a yardstick** against which actual results can be compared.

Q29 Nov'20

G Ltd. manufactures a single product for which market demand exists for additional quantity. Present sales of ₹ 6,00,000 utilises only 60% capacity of the plant. The following data are available:

(1) Selling price : ₹ 100 per unit

(2) Variable cost : ₹ 30 per unit

(3) Semi-variable expenses : ₹ 60,000 fixed + ₹ 5 per unit

(4) Fixed expenses : ₹ 1,00,000 at present level, estimated to increase by 25% at and above 80% capacity.

You are **required** to prepare a flexible budget so as to arrive at the operating profit at 60%, 80% and 100% levels. [5 Marks]

Reference | What's **New**

Flexible Budget at different levels

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Answer

Flexible Budget

Activity Level	60%	80%	100%
Production (units)	6,000	8,000	10,000
	(₹)	(₹)	(₹)
Sales @ ₹ 100 per unit	6,00,000	8,00,000	10,00,000
Variable Cost (@ ₹ 35 (₹ 30 + ₹ 5) per unit	2,10,000	2,80,000	3,50,000
Contribution (A)	3,90,000	5,20,000	6,50,000
Fixed Cost (part of semi-variable cost)	60,000	60,000	60,000
Other Fixed Cost	1,00,000	1,25,000	1,25,000
Total Fixed Cost (B)	1,60,000	1,85,000	1,85,000
Operating Profit (A – B)	2,30,000	3,35,000	4,65,000

Q30 Nov'20

What are the important points a organisation should consider if it wans to adopt Performance Budgeting? [5 Marks]

Reference | What's **New**

Performance Budgeting

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Answer

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.

Q 31 Jan'21

State the limitations of Budgetary Control System.

Reference | What's **New**

Limitations

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Answer

Limitations of Budgetary Control System

Points	Description
1. Based on Estimates	Budgets are based on a series of estimates, which are based on the conditions prevalent or expected at the time budget is established. It requires revision in plan if conditions change.
2. Time factor	Budgets cannot be executed automatically. Some preliminary steps are required to be accomplished before budgets are implemented. It requires proper attention and time of management. Management must not expect too much during the initial development period.
3. Co-operation Required	Staff co-operation is usually not available during the initial budgetary control exercise. In a decentralised organisation, each unit has its own objective and these units enjoy some degree of discretion. In this type of organisation structure, coordination among different units is required. The success of the budgetary control depends upon willing co-operation and teamwork,
4. Expensive	The implementation of budget is somewhat expensive. For successful implementation of the budgetary control, proper organisation structure with responsibility is prerequisite. Budgeting process start from the collection of information to for preparing the budget and performance analysis. It consumes valuable resources (in terms of qualified manpower, equipment, etc.) for this purpose; hence, it is an expensive process.

5. Not a substitute for management	Budget is only a managerial tool and must be intelligently applied for management to get benefited. Budgets are not a substitute for good management.
6. Rigid document	Budgets are sometime considered as rigid documents. But in reality, an organisation is exposed to various uncertain internal and external factors. Budget should be flexible enough to incorporate ongoing developments in the internal and external factors affecting the very purpose of the budget.

Q32 RTP May'21

RS Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 302.4 lakh 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 ₹ 60 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 69,12,000.

The other relevant details are as under:

Purchase Price:	Material A	₹ 160 per kg
	Materials B	₹ 100 per kg
Labour Rate:	Machine Shop	₹ 140 per hour
	Assembly Shop	₹ 70 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

Reference — What's **New**

Production Budget, Material Purchase Budget and Sales Budget

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Answer

Workings:

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs. @ ₹ 140 per hour	560
Assembly Shop: 2 hrs. @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(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
= ₹ 1,72,80,000 / ₹ 2,160
= 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold
= ₹ 3,02,40,000 / 8,000 units
= ₹ 3,780

(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

Q33 MTP May'21

Tricon Co. furnishes the following information for the month of September, 2020.

Particulars	Budget Details	Static Budget	Actual
Units produced & Sold		4,000	3.200
		(₹)	(₹)
Direct Material	3 kg p.u. @ ₹ 30 per kg.	3,60,000	3,10,000
Direct Labour	1 hr. p.u. @ ₹ 72 per hr.	2,88,000	2,25,600
Variable Overhead	1 hr. p.u. @ ₹ 44 per hr.	1,76,000	1,47,200
Fixed Overhead		1,80,000	1,68,000
Total Cost		10,04,000	8,50,800
Sales		12,00,000	8,96,000
Profit		1,96,000	45,200

During the month 10,000 kg. of materials and 3,100 direct labour hours were utilized.

Required:

(i) **PREPARE** a flexible budget for the month.

(ii) **DETERMINE** the material usage variance and the direct labour rate variance for the actual vs the flexible budget. (10 Marks)

Reference

Flexible Budget

What's New

MUV and LRV

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Answer

(i) **Statement Showing "Flexible Budget for 3,200 units Activity Level"**

Particulars	Amount (₹)	Amount (₹)
Sales $\left(\frac{₹\,12,00,000}{4,000\ \text{units}} \times 3,200\ \text{units}\right)$		9,60,000
Less: Variable Cost		
Direct Material (3,200 units × 3 kg. p.u. × ₹ 30 per kg.)	2,88,000	
Direct Labour (3,200 units × 1 hr. p.u. × ₹ 72 per hr.)	2,30,400	
Variable Overhead (3,200 units × 1 hr. p.u. × ₹ 44 per hr.)	1,40,800	(6,59,200)
Contribution		3,00,800
Less: Fixed Overhead		1,80,000
Profit		1,20,800

(ii) **Computation of Variances**

Material Usage Variance = Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity

= (SQ × SP) – (AQ × SP)

Or

= (SQ – AQ) × SP

= [(3,200 units × 3 kg.) – 10,000 kg.] × ₹ 30.00

= ₹ 12,000 (A)

Labour Rate Variance = Standard Cost of Actual Time – Actual Cost

= (SR × AH) – (AR × AH)

Or

= (SR – AR) × AH

$= \left[\left(₹\,72 - \frac{₹\,2,25,600}{3,100\ \text{hrs.}}\right) \times 3,100\ \text{hrs.}\right]$

= ₹ 2,400 (A)

Q 34 MTP May'21

Describe the steps necessary for establishing a good budgetary control system (5 Marks)

Reference | What's New

Good Budgetary Control System

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Answer

The following steps are necessary for establishing a good budgetary control system:

1. Determining the objectives to be achieved, over the budget period, and the policy or policies that might be adopted for the achievement of these objectives.
2. Determining the activities that should be undertaken for the achievement of the objectives.
3. Drawing up a plan or a scheme of operation in respect of each class of activity, in quantitative as well as monetary terms for the budget period.
4. Laying out a system of comparison of actual performance by each person, or department with the relevant budget and determination of causes for the variation, if any.
5. Ensuring that corrective action will be taken where the plan has not been achieved and, if that is not possible, for the revision of the plan.

Q35 ICAI Mat

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 2019-20:

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	800 units at ₹18	1,200 units at ₹18	1,000 units at ₹18	1,400 units at ₹18
Y	600 units at ₹42	1,000 units at ₹42	400 units at ₹42	800 units at ₹42

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by ₹2, it will, find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹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 2020-21 after incorporating above estimates and also SHOW the Budgeted Sales and Actual Sales of 2019-20.

Reference | **What's New**

Sales Budget | **Actual and Budgeted Sales**

Watch **Video**

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Answer

Statement Showing Sales Budget for 2020-21

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	1,020[1]	20	20,400	815[3]	40	32,600	53,000
West	1,430[2]	20	28,600	1,225[4]	40	49,000	77,600
Total	1,200		49,000	1,000		81,600	1,30,600

Workings

1. $800 \times 112.5\% + 120$ = 1,020 units
2. $1,200 \times 107.5\% + 140$ = 1,430 units
3. $600 \times 122.5\% + 80$ = 815 units
4. $1,000 \times 112.5\% + 100$ = 1,225 units

Statement Showing Sales Budget for 2019-20

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
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 2019-20

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
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

Q36 July'21

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 ₹)	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 : [10]

(i) Sales Budget (in ₹)

(ii) Production budget (in units) and

(iii) Raw material Budget for Raw material 'A' and 'B' separately (in units)

Reference — What's New

Sales Budget, Production Budget, and Raw Material Budget

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Answer

(i) **Sales Budget** (in ₹)

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 (₹)	10	12	15	15	20	-
Total Sales (₹)	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 (in units)**

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

Q 37 Dec'21

What is 'Budgetary Control System' and discuss the components of the same. [5]

Reference | What's **New**

Budgetary Control System

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Answer

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.

Q 38 RTP May'22

Maharatna Ltd., a public sector undertaking (PSU), produces product A. The company is in process of preparing its revenue budget for the year 2022. The company has the following information which can be useful in preparing the budget:

(i) It has anticipated 12% growth in sales volume from the year 2021 of 4,20,000 tonnes.

(ii) The sales price of ₹23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.

(iii) To produce one tonne of product A, 2.3 tonnes of raw material are required. The raw material cost is ₹4,500 per tonne. The price of raw material will also increase by 10% if WPI increase by 5%.

(iv) The projected increase in WPI for 2022 is 4%

(v) A total of 6,000 employees works for the company. The company works 26 days in a month.

(vi) 85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is ₹ 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2022 and it is expected that a 15% increase in pay will be given.

(vii) The casual employees are getting a daily wage of ₹ 850. The wages in linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2022.

(viii) Power cost for the year 2021 is ₹ 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.

(ix) During the year 2021, the company has paid ₹ 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.

(x) During the year 2021, the company has paid ₹ 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2022.

(xi) During the year 2021, the company has paid ₹ 6,00,000 for car hire charges (excluding fuel cost). In year 2022, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.

(xii) Depreciation on fixed assets for the year 2021 is ₹ 80,40,00,000 and it will be 15% lower in 2022.

Required:

From the above information **PREPARE** Revenue (Flexible) budget for the year 2022 and also show the budgeted profit/ loss for the year.

Reference | What's **New** | Watch **Video**

Flexible Budget

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Answer

Revenue Budget (Flexible Budget) of Maharatna Ltd. for the Year 2022

	Particulars	PY 2021	CY 2022
A	Sales Volume (Tonnes)	4,20,000	4,70,400 [112%×4,20,000]
B	Selling Price per tonne (₹)	23,000	23,000

		(₹ in lakh)	(₹ in lakh)
C	**Sales value [A × B]**	96,600	1,08,192
D	**Raw material Cost:**		
(i)	Qty. of Material [2.3 tonnes × A] (tonnes)	9,66,000	10,81,920
(ii)	Price per tonne (₹)	4,500	4,500
(iii)	**Total raw material cost (₹ in lakh) [(i) × (ii)]**	43,470	48,686.40
E	**Wages & Salary Cost:**		
(i)	Wages to casual employees (15% × 6,000 = 900 employees)	2,386.80 [900 × 26 × 12 × ₹ 850]	2,508.47 [900 × 26 × 12 × ₹ 893.33]
(ii)	Salary to permanent employees (85% × 6,000 = 5,100 employees)	47,736 [5100 × 26 × 12 × ₹ 3,000]	51,316.20 [(5100 × 26 × 6 × ₹ 3,000) + (5100 × 26 × 6 × ₹ 3,450)]
(iii)	**Total wages & salary [(i) + (ii)]**	50,122.80	53,824.67
F	**Power cost:**		
(i)	For production (units)	4,20,000 [60% × 7,00,000]	4,70,400 [112% × 4,20,000]
(ii)	For employees & offices (units) [40% × 7,00.000]	2,80,000	2,80,000
(iii)	Total Power consumption (units) [(i) + (ii)]	7,00,000	7,50,400
(iv)	Power rate per unit (₹) [₹42,00,000 ÷ 7,00,000]	6.00	6.00
(v)	**Total power cost [(iii) × (iv)]**	42	45.024
G	**Safety and maintenance Cost**	60	67.20 [112% × 60,00,000]
H	**Diesel cost**	1.2	-
I	**Car Hire charge:**		
(i)	Car hire charge	6	6
(ii)	Fuel reimbursement cost	-	1.38 [115% × 1.2]
(iii)	GST@5% on RCM basis [5% × (i + ii)]	-	0.369
(iv)	**Total Car hire charge cost [(i) + (ii) + (iii)]**	6	7.749
J	**Depreciation**	8,040	6,834 [85% × 8040]
K	Total Cost [Sum of D to J]	1,01,742	1,09,465.043
L	**Profit / (Loss) [C – L]**	(5,142)	(1273.043)

Q39 May'22

SR Ltd. is a manufacturer of Garments. For the first three months of financial year 2022-23 commencing on 1st April 2022, production will be constrained by direct labour. It is estimated that only 12,000 hours of direct labour hours will be available in each month.

For market reasons, production of either of the two garments must be at least 25% of the production of the other. Estimated cost and revenue per garment are as follows:

	Shirt (₹)	Short (₹)
Sales price	60	44
Raw Materials		
Fabric @12 per metre	24	12
Dyes and cotton	6	4
Direct labour @ 8 per hour	8	4
Fixed Overhead @ 4 per hour	4	2
Profit	18	22

From the month of July 2022 direct labour will no longer be a constraint. The company expects to be able to sell 15,000 shirts and 20,000 shorts in July, 2022. There will be no opening stock at the beginning of July 2022.

Sales volumes are expected to grow at 10% per month cumulatively thereafter throughout the year. Following additional information is available:

- The company intends to carry stock of finished garments sufficient to meet 40% of the next month's sale from July 2022 onwards.
- The estimated selling price will be same as above.

Required:

I. **Calculate** the number of shirts and shorts to be produced per month in the first quarter of financial year 2022-2023 to maximize company's profit.

II. **Prepare** the following budgets on a monthly basis for July, August and September 2022:

(i) Sales budget showing sales units and sales revenue for each product.

(ii) Production budget (in units) for each product. [10]

Reference | What's **New**

Sales and production Budeget

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Answer

I. **Calculation of number of shirts & shorts to be produced per month:**

Contribution per labour hour:

		Shirts (₹)	Shorts (₹)
A	Sales Price per unit	60	44
B	Variable Cost:		
	- Raw materials	30	16
	- Direct labour	8	4
		38	20
C	Contribution per unit [A-B]	22	24
D	Labour hour per unit	1 hour	0.5 hour
E	Contribution per labour hour [C÷D]	22	48

Production plan for the first three months:

Since, Shorts has the higher Contribution per labour hour, it will be made first. Shirts will be 25% of Shorts. The quantity will be determined as below:

Let the Quantity of Shorts be X and Shirts will be 0.25 X, then

(Qty. of Shorts × labour hour per unit) + (Qty. of Shirts × labour hour per unit) = Total labour hours available

Or, (X × 0.5 hour) + (0.25X × 1 hour) = 12,000 hours

Or, 0.5X + 0.25X = 12,000 Or, 0.75X = 12,000

Or, X = 12,000÷0.75

= 16,000 units of Shorts

Therefore, for Shirts = 25% of 16,000 units

= 4,000 units

Production per month for the first quarter will be:

Shorts- 16,000 units &

Shirts- 4,000 units

II. (i) **Sales Budget for the month of July, August & September 2022:**

		July 2022		August 2022		September 2022	
		Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
A	Sales demand	15,000	20,000	16,500	22,000	18,150	24,200
B	Selling price per unit (₹)	60	44	60	44	60	44
C	Sales Revenue (₹)	9,00,000	8,80,000	9,90,000	9,68,000	10,89,000	10,64,800

(ii) **Production budget for the month of July, August & September 2022:**

		July 2022		August 2022		September 2022		October 2022	
		Shirts	Shorts	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
A	Opening stock	0	0	6,600	8,800	7,260	9,680		
B	Sales demand	15,000	20,000	16,500	22,000	18,150	24,200	19,965	26,620
C	Closing stock	6,600	8,800	7,260	9,680	7,986	10,648		
D	Production [B + C – A]	21,600	28,800	17,160	22,880	18,876	25,168		

Q40 MTP Nov'22

PS Limited is a manufacturing company and is operating at 75% capacity utilization. The PV ratio at this level of activity is 40%.

The flexible budget drafted by the company for two levels of activity is given below:

	Capacity utilization (75 %) Amount in ₹ (Lakhs)	Capacity utilization (100 %) Amount in ₹ (Lakhs)
Direct materials	180	240
Direct wages	120	160
Power and fuel	12	16
Repairs and maintenance	18	21
Consumables	21	28
Supervision	20	20
Indirect labour	36	42
Administrative expenses	21	21
Selling expenses	18	18
Depreciation	54	54

You are **required** to:

(i) **CALCULATE** the profit earned by PS Limited at 75% level of activity.

(ii) **CALCULATE** the break-even level of activity. [10]

Reference — What's New

Flexible Budget

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Answer

Calculation of Semi Variable component

	Repairs and Maintenance (₹)	Indirect labour (₹)
At 75% capacity	18,00,000	36,00,000
At 100% capacity	21,00,000	42,00,000
Variable component for 25%	3,00,000	6,00,000
Hence variable cost at 75%	3,00,000 x 75/25 = 9,00,000	6,00,000 x 75/25 = 18,00,000
Fixed cost at 75% capacity	18,00,000 – 9,00,000 = 9,00,000	36,00,000 – 18,00,000=18,00,000

Segregation of Fixed and Variable cost

	75%	100%	VC at 75%	FC at 75%
Direct Material	180	240	180	
Direct Labour	120	160	120	
Power and fuel	12	16	12	
Repairs and maintenance	18	21	9	9
Consumables	21	28	21	
Supervision	20	20		20
Indirect labour	36	42	18	18
Administrative expenses	21	21		21
Selling expenses	18	18		18
Depreciation	54	54		54
Total	500	620	360	140

(i) Calculation of profit earned at 75% capacity

Given PV ratio = 40%, Hence variable cost would be 60%

If variable cost is ₹ 360 lakhs then sales would be 360/ 0.60	= ₹ 600 lakhs
Less: Variable cost	= ₹ 360 lakhs
Less: Fixed cost	= ₹ 140 lakhs
Profit	= ₹ 100 lakhs

(ii) **Break-even level of activity**

BEP Sales = FC/ P/V ratio = 140 /0.40 = ₹ 350 lakhs

Q 41 MTP Nov'22

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 (₹)
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 ₹ 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. [10]

Reference

Flexible Budget

What's New

On the basis of Marginal Costing

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Answer

Workings -

1. **Fixed Production overheads (given)** = ₹ 25 per unit

   So, at 1,00,000 units capacity, it will be ₹ 25,00,000 (1,00,000 units x ₹ 25)

2. **Selling and distribution overheads:**

Given (1,00,000 units x ₹ 25)	= ₹ 25,00,000
So, Fixed component	= ₹ 25,00,000 x 20% = ₹ 5,00,000
Hence, variable component	= ₹ 25,00,000 - ₹ 5,00,000 = ₹ 20,00,000
Variable per unit	= ₹ 20,00,000/1,00,000 units
	= ₹ 20 per unit

Flexible Budget

Particulars	Per unit (₹)	Output Level	
		60,000 units (₹)	75,000 units (₹)
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
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 = (₹ 3,48,00,000/₹ 10,50,00,000) x 100 = 33.143%

OR

P/V Ratio = (₹ 4,35,00,000/₹ 13,12,50,000) x 100 = 33.143%

NOTES

IF YOU HAVE ANY DOUBT WHILE STUDYING FROM THIS BOOK,

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