

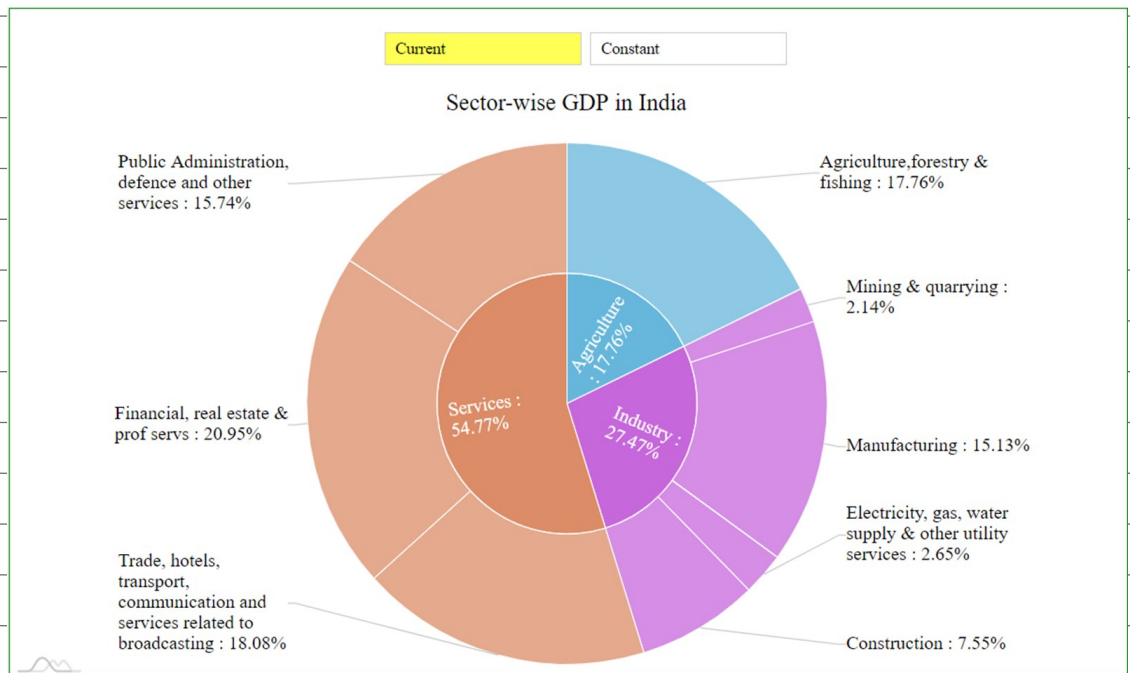
Chapter 12

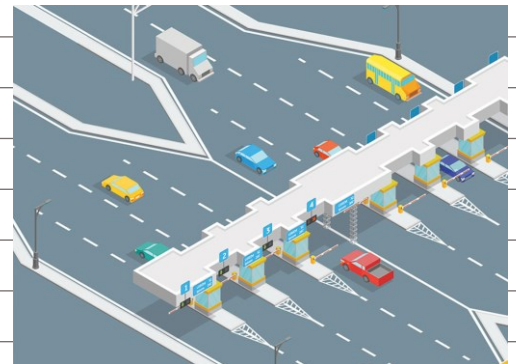
SERVICE COSTING

May 18	Nov 18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May 22
10	10	10	15	10	10	10	10	10

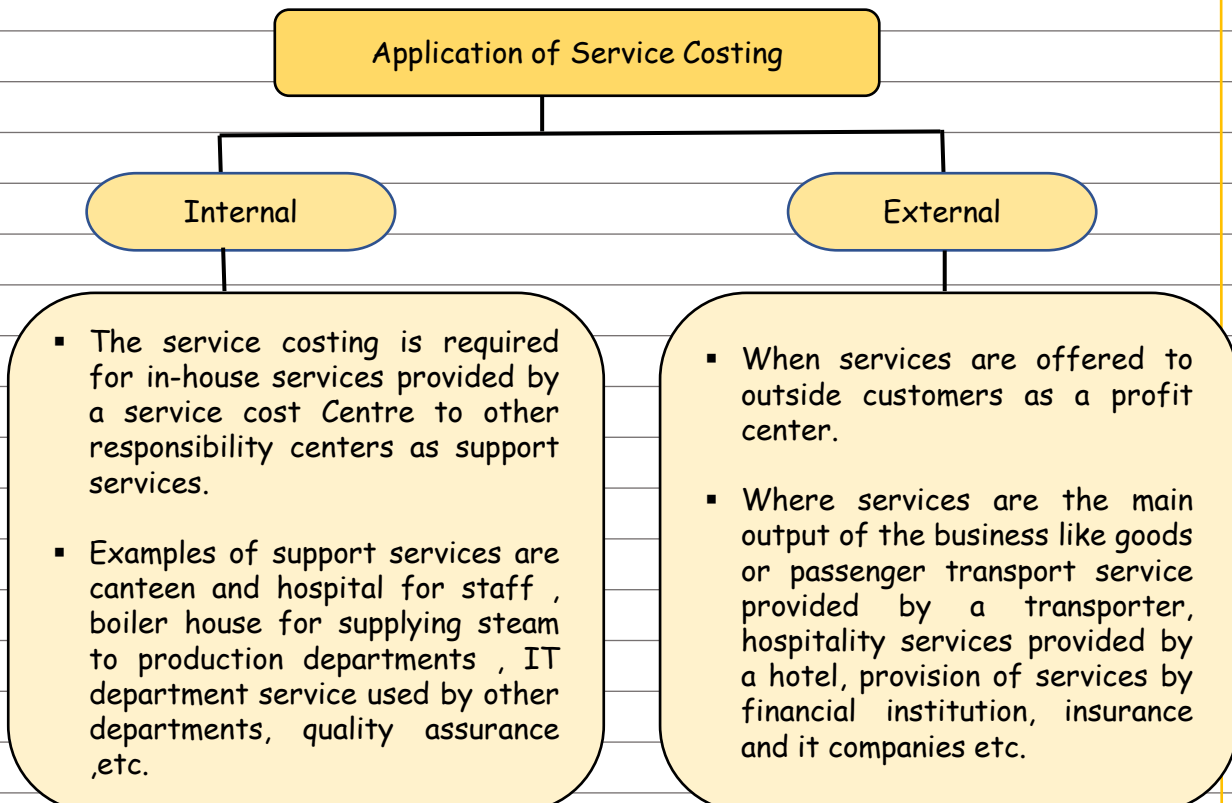
INTRODUCTION

- Service sector, being a fastest growing sector and having a significant contribution towards the GDP in India, is a very important sector where the role of the cost and management accounting is inevitable.
- The services sector is a key driver of India's economic growth. The sector contributed 55.39% to India's Gross Value Added at current price in FY20
- The competitiveness of a service entity is very much dependent on a robust cost and management accounting system for competitive pricing and identification of value adding activities.
- Service costing is also known as operating costing.





APPLICATION OF SERVICE COSTING



• Service Costing



SERVICE COSTING VS PRODUCT COSTING

- Unlike products, services are **intangible and cannot be stored**, hence, there is **no inventory** for the services.
- Use of **Composite cost units** for cost measurement and to express the volume of outputs.
- Unlike a product manufacturing, **employee (labour) cost constitutes a major cost element** than material cost.
- 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

SERVICE COST UNIT

- To compute the Service cost, it is necessary to understand the unit for which the cost is to be computed.
- All the costs incurred during a period are collected and analyzed and then expressed in terms of a cost per unit of service.
- One specific issue with service costing is the difficulty in defining a realistic cost unit that represents a suitable measure of the service provided
- A composite cost unit may be deemed more appropriate
- Sometime two measurement units are combined together to know the cost of service or operation. These are called composite cost units.

Service Industry	Unit of Cost (examples)
Transport Services	Passenger-km (in public transportation)
	Quintal-km, or Ton-km (in goods carriage)
Electricity Supply Service	kilowatt=-hour (kwh)
Hospital	Patient per day, room per day or per bed, Per operation etc.
Canteen	Per item, per meal etc.
Cinema	Per ticket.
Hotels	Guest days or Room Days
Bank or Financial Institutions	Per transaction, per services, (e.g. per letter of credit, per application, per project)
Educational Institute	Per Course, per student, per batch, per lecture etc.
IT & ITES	Cost per project, per module ,etc.
Insurance	Per policy, per claim, per TPA, etc

EQUIVALENT COST UNIT/ EQUIVALENT SERVICE UNIT

- To calculate cost or pricing of two more different grade of services which uses common resources, each grade of service is assigned a weight and converted into equivalent units.
- Converting services into equivalent units make different grade of services equivalent and comparable.

• Service Costing

Example 1

Type of Suit	Number of rooms	Room Tarrif
Standard	100	--
Deluxe	50	2.5 times of the standard suits
Luxurious	30	Twice of the deluxe suits

COST STATEMENTS FOR SERVICE SECTORS

- For preparing a statement of cost or a cost sheet for service sector, costs are usually collected and accumulated for a specified period viz. A month, quarter or a year, etc.
- The cost statement for services may be prepared either on the basis of functional classification as done for product costing or on the basis of variability.
- Cost sheet on the basis of variability is prepared classifying all the costs into three different heads:
 - Fixed Costs or Standing charges
 - Variable costs or Operating expenses
 - Semi-variable costs or Maintenance expenses

Note: In the absence of information about semi-variable costs, the costs would be shown under fixed and variable heads only

Under this chapter , we learn , how to calculate cost of various business.

Costing of

Transport Services

Hotels and Lodges

Hospitals

IT and ITES

Toll Roads

Educational Institutions

Insurance Companies

Financial Institutions

Power Houses

COSTING OF TRANSPORT SERVICES

- Transport organizations can be divided into two categories viz. Goods transport and Passenger transport.
- The cost unit for Goods transport organization is Ton-Kilometer - that means cost of carrying one Ton of goods over a distance of one kilometer.
- Cost unit for Passenger transport organization is Passenger-Kilometer - that means cost of carrying one Passenger over a distance of one kilometer.

Standing Charges or Fixed Costs	Insurance , Salary to Driver, Conductor, Cleaner etc. , If it is paid on monthly basis , License Fees, Garage Costs , Depreciation ,Taxes , Admin Expenses ;
Variable Costs/ Running Charges	Petrol and Diesel ; Lubricant Oils ; Wages to Driver, Conductor , Cleaner etc. if it is related to running ;
Semi -Variable Costs / maintenance charges	Repairs and maintenance cost , tyres and spares
The heads for a cost may change as per the situation or condition. For an example salary of driver may be treated as standing charges or running cost depending on the situation and nature of his employment.	

TYPES OF TON-KM

- **Weighted Average or Absolute basis:**

-- This is the sum total of Tonne-Kms arrived by multiplying various distances by respective load quantities carried in each trip

-- Numerically, $\Sigma(\text{Distance} \times \text{Respective Load Quantity})$

• Service Costing

▪ Simple Average or Commercial basis:

-- It is derived by multiplying total distance of all trips by average load quantity

-- Numerically, "Average Load in tons × Total Distance covered "

Note: If que. is silent we will use Absolute Ton Km

Que 1 SM Illustration 1 Notebook Page No.

A 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).

Que 2 SM Illustration 2 Notebook Page No.

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:

Particulars	Amount (₹)
Salary of Drivers, Cleaners and Conductors	24,000
Salary to Supervisor	10,000
Diesel and other Oil	40,000
Repairs & 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.

Que 3 SM Illustration 3 Notebook Page No

ABC Transport Company has given a route 40 kilometers long to run bus.

- The bus costs the company a sum of ₹ 10,00,000
- It has been insured at 3% p.a. and
- The annual tax will amount to ₹ 20,000
- Garage rent is ₹ 20,000 per month.
- Annual repairs will be ₹ 2,04,000
- 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.

Que 4

SM Illustration 5

Notebook Page No.

GTC has a lorry of 6-ton carrying capacity. It operates lorry service from city A to city B for a particular vendor. 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 extra charges are billed for unloading goods in-between destination city and no concession in rates is given for reduced load after unloading at intermediate city. Distance between the city 'A' to 'B' is 300 km and distance from city 'A' to 'C' is 140 km.

In the month of January, the truck made 12 journeys between city 'A' and city 'B'. The details of journeys are as follows:

Outward Journey	No. of Journey	Load (in ton)
'A' to 'B'	10	6
'A' to 'C'	2	6
'C' to 'B'	2	4
Return Journey	No. of Journey	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 the month of January are ₹ 2,94,400 (includes ₹ 12,400 paid as penalty for overloading).

You are required to:

• Service Costing

- (i) CALCULATE the cost as per (a) Commercial ton-kilometre. (b) Absolute ton-kilometre
- (ii) CALCULATE Net Profit/ loss for the month of January.

Que 5 SM Exercise Que 2 Notebook Page No.

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 liter |
| 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

Que 6

SM Illustration 4

Notebook Page No.

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 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 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)	
License 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 liter

Each bus gives an average mileage of 4 km. per liter 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

● Service Costing

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.

Que 7 SM Exercise Que. 3

Notebook Page No.

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 ton	Repairs & 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.

COSTING OF HOTELS & LODGES

- Service costing is an effective tool in respect if hotel industry. Hotels runs for Profits. Hence it is necessary to compute the cost - to fix the price of various services provided by the hotel and to find out the profit or loss at the end of a particular . period.
- In this case, the costs associated with different services offered should be identified and cost per unit should be worked out.
- The cost unit may be Guest-day or Room day.
- For calculation of cost per Guest day or Room day, estimated occupancy rate - at different point of time, for example - Peak season or Off season, are taken into . account.
- There is no requirement of format - Standing, running etc.

Que 7

SM Exercise Que. 3

Notebook Page No.

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 Suit	Number	Occupancy percentage
Single Room	100	100%
Double Room	50	80%
Triple Room	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 2020-21 are as follows:

	(₹)
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

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.

Que 9

SM Illustration 7 | PYQ Nov 2019

Notebook Page No.

A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off- season (Winter) months in a year when numbers of visitor are limited. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March. [Assume a month to be of 30 days].

- (i) Occupancy during the season is 80% while in the off- season it is 40% only.
- (ii) Total investment in the home is ₹ 200 lakhs of which 80% relate to buildings and balance for furniture and equipment.

● Service Costing

(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.

COSTING OF HOSPITALS

- A Hospital is providing various types of medical services to the patients. Hospital costing is applied to decide the cost of these services.
- Common unit of costs of various departments are as follows:
 - **Out Patient** - Per Out-patient
 - **In Patient** - Per Room Day
 - **Scanning** - Per Case
 - **Laundry** - Per 100 items laundered
- The cost of hospital can be divided in to fixed costs and variable costs.
 - **Fixed costs** are based on timelines and irrespective of services provided. For example, Staff salaries, Depreciation on Building and Equipment, etc.
 - **Variable costs** vary with the level of services rendered. For example, Laundry charges, Cost of food supplied to patients, Power, etc.

OPD (Out Patient Department)

An OPD is structured to be the primary point of communication among the patient and the medical professionals in a medical department. A patient who first arrives at the hospital goes straight to OPD, and then the OPD decides the unit to which a patient will go.

Que 10

SM Illustration 8 | PYQ May 18

Notebook Page No.

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 -

(1) CALCULATE contribution per Patient day, if the hospital recovers on an average ₹ 2,000 per day from each patient

(2) FIND OUT Breakeven point for the hospital

COSTING OF TOLL ROADS

- The Construction of roads brings about a variety of benefits that are enjoyed practically by all sectors of the economy.
- Highway economic analysis is a technique whereby the cost and benefit from a scheme are quantified over a selected time horizon and evaluated by a common yardstick.

• Service Costing

Cost of Toll Road

Capital Costs (Construction Period)	Operating and Maintenance Costs
▪ Preliminary and Pre-operative expenses ; ▪ Land Acquisition ; ▪ Interest during construction ; ▪ Material , Labour , Overheads ;	▪ Patching of potholes ; ▪ Sealing of cracks ; ▪ Edge Repair ; ▪ Surface Renewal ; ▪ Cost of operating toll booths ;



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.
- The fundamental principle in determining user levy is, 'if the price for a transport facility is set at a level that reflects the benefit, each user gains from improvements in the facility, it will result in traffic flow levels that equate social costs with user benefits.

Que 11 SM Illustration 10

Notebook Page No.

BHG Toll Plaza Ltd built a 60 km. long highway and now operates a toll plaza to collect tolls

from passing vehicles using the highway. The company has estimated that a total of 12 crore vehicles (only single type of vehicle) will be using the highway during the 10 years toll collection tenure.

Toll Operating and Maintenance cost for the month of April are as follows:

(i) Salary to -

- Collection Personnel (3 Shifts and 4 persons per shift) - ₹ 550 per day per Person ;
- Supervisor (2 Shifts and 1 person per shift) - ₹ 750 per day per person ;
- Security Personnel (3 Shifts and 6 persons per shift) - ₹ 450 per day per person ;
- Toll Booth Manager (2 Shifts and 1 person per shift) - ₹ 900 per day per person ;

(ii) Electricity - ₹ 8,00,000

(ii) Telephone - ₹1,40,000

(iv) Maintenance cost - ₹ 30 Lakh

Monthly depreciation and amortisation expenses will be ₹ 1.50 crore. Further, the company needs 25% profit over total cost to cover interest and other costs.

Required:

(i) CALCULATE cost per kilometer per month.

(ii) CALCULATE the toll rate per vehicle.

Que 12 SM Exercise Ques-1

Notebook Page No.

SLS Infrastructure built and operates 110 k.m. highway on the basis of Built- Operate-Transfer (BOT) for a period of 25 years. A traffic assessment carried out to estimate the traffic flow per day shows the following figures:

S.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;

(Fig.in lakhs)

S.No.	Activities	Amount (₹)
1.	Site clearance	170.70
2.	Land development and filling work	9080.35
3.	Sub base and base courses	10,260.70
4.	Bituminous	35,070.80
5.	Bridge, flyovers , underpasses, footbridge, etc.	29,055.6

● Service Costing

6	Drainage and protection work	9040.5
7	Traffic sign, making and road appurtenance	8405.00
8	Maintenance , repairing and rehabilitation	12,429.60
9	Environmental management	982.00
	Total Project Cost	1,14,495.25

An estimated 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:

S.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) CALCULATE 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]

COSTING OF IT/ ITES

- Information Technology (IT) and Information Technology Enabled Services (ITES) organizations provide their customers with services or intangible products. These organizations are highly labour intensive.
- In this sector employee (labour) cost constitutes a significant portion of the total operating costs. In addition to employee cost, significant overhead costs for offering the services are incurred and are classified as service overhead.

CONCEPT OF PROJECT

- In general - IT & ITES industries, the jobs undertaken are considered as Project.
 - Each project is unique in nature and varies in size, functionality requirements, duration and staffing requirements.
- Project Scheduling ;

- Effort Estimation ;
- Man Power Identification ;

COST OF IT COMPANIES

Effort Cost in IT / ITES		Other Costs
Direct man-power	▪ Software Engineer /Functional Consultants / business Analysts ; ▪ Project Leader ; Project Manager ;	▪ Hardware & Software Cost ; ▪ Travel & Training Cost ;
Support manpower	▪ Quality Assurance Team ; Testing team ; Staffing manager ;	

Effort Cost Unit: Cost per Person day or cost per Person week or cost per Person month. (depends on size) That means cost incurred for a person for rendering services per day or per week or per month.

Que 13

SM illustration 9

Notebook Page No.

Following are the data pertaining to Infotech Pvt. Ltd, for the year 2020-21

	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 considering overheads are absorbed on the basis of salary

● Service Costing

COSTING OF EDUCATIONAL INSTITUTIONS

- Educational institutions like schools, colleges, technical institutes for education and training, are run to impart education and training to students.
- The objective of running these institutions may be 'Not-for profit' or 'For profit'.
- Like other business entities, cost and management accounting is also inevitable for this sector.
- The Government, Local body of any other organization which provides education and training to students with an objective to benefit and upliftment of the society, are also need cost and management accounting system for cost-social benefit analysis, allocation of funds and budgeting (zero-based budgeting), performance measurement and evaluation etc.

Costs	
Operational Cost	Salary to teaching /non teaching staff ; Laboratory Maintenance Computer Maintenance ; Building Maintenance ; General Admins. ;
Cost Centers	▪ Primary or Direct cost centers (like Civil Engineering department, Mechanical Engineering department, etc.) ; ▪ Service cost centers (like Laboratory, Library, Sports, etc.) ; ▪ Student's Self-Supporting Services (like Transport, Hostel & Mess, etc.) ; ▪ Administration Cost centers (like Research & Improvement, Examination) ;
Publication Cost	In an educational institution, there will be a separate department for conducting research publication related exercise. The cost incurred would be directly allocated to that department.
Research & Development	▪ Educational institutions undertake academic research on Various fields of specialisations. ▪ The costs of such research including personal costs, books etc. are to be collected through a cost centre approach.

	▪ All costs incurred in that cost centre are collected and set off Against revenue generated from such research projects.
	▪ If any balance is left out as undistributed, then such balance costs can be collectively distributed to all other course cost centre as a separate cost element namely "Research costs".

Income	
▪ One Time Fees : Fees once in course period like Admission Fee, Development Fee, Annual Fee etc.	
▪ Recurring Fees: Tuition fee, laboratory, computer and internet fee, library fee, training fee, amenities fee, sports fee, extracurricular activities fee etc.	

Que 14

SM Illustration-11

Notebook Page no.

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 (₹)
Teacher's Salary (25 teachers x ₹35,000 x 12 months)	1,05,00,000
Principal's Salary	14,40,000
Lab attendants' salary	3,60,000
Salary to library staff	1,44,000
Salary to peons	4,80,000
Salary to other staffs	4,80,000
Examination expenditure	10,80,000
Office & administration cost	15,20,000
Annual day expenses	4,50,000
Sports expense	1,20,000

• Service Costing

Other information:

(i)

	Standard 11 & 12			Primary &
	Arts	Commerce	Science	Secondary
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 by				
Students 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	10

(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:

(a) Calculate cost per student per annum for all three streams

(b) If the management decides to take uniform fee of ₹ 1,000 per month from all higher secondary students, CALCULATE stream wise profitability.

(c) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively

COSTING OF INSURANCE COMPANIES

- Insurance or assurance industry operates in providing **social security** to the persons who subscribe for the policy.

- The Insurance companies are broadly classified as **Life insurer and Non-Life Insurer** (General Insurance providers).
- Life insurers provide insurance to the **policy holders' life** for the insured value.
- The Non-life insurers are providing insurance to the policyholder for actual loss upto insured value for the policy.
- The insurance companies are need to analyze it various insurance product for profitability.
- The product offered by insurance companies may include:
 - Life Insurance policies- with or without maturity benefits
 - General insurance- Health, Fire, Property, Travel Insurance etc.
 - Other services- Re-insurance, Fund management- Pension, Gratuity and other etc.
- Activity based costing (ABC) is used for analysis of cost-benefit of a product (Direct Product Profitability), policy profitability (Customer Profitability Analysis) etc.
- The activities can be divided into two part i.e. (i) Pre-product development activities and (ii) Post product development activities.

Que 15 SM Illustration -12

Notebook Page No.

Sanziet Lifecare Ltd. operates in life insurance business. Last year it 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

Particular	(₹)
Policy development cost	11,25,000
Cost of marketing of the policy	45,20,000
Sales support expenses	11,45,000
Policy issuance cost	10,05,000
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

• Service Costing

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) Product development, Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.
- (ii) CALCULATE cost per policy.
- (iii) CALCULATE cost per rupee of insured value.

COSTING IN FINANCIAL INSTITUTIONS

- In the past two decade financial institutions have undergone major changes - in terms to increased regulations, competition from new entrants from both locally and globally, innovation of new products and services, technological advancement and increased expectations of new generation customers, etc.
- Manpower cost, other than interest cost and finance charges, is one of the largest single cost components in financial institutions. Hence, it is needless to say, that financial institutions are more interested in understanding and discovering the ways to more accurately allocate such costs to various product ranges offered by them and its customers.
- Concept of ABC applies in FI also.

Que 16

SM Illustration 13

Notebook Page No.

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 :-

Particular	(₹)
Home Loan processor monthly salary: (4 employees @ Rs.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.

COSTING FOR POWER HOUSES

- Power houses are engaged either in electricity generation or steam generation use the concepts of service costing i.e. 'Power House Costing.'
- Service cost statement can be prepared by identifying the costs associated with the power generation or steam generation.
- The cost unit for electricity generation organization is cost per kilowatt-hour (kWh) - that means cost of generating one kilowatt of power per hour.

Standing Charges	Rent, Rates, Taxes ; Insurance ; Depreciation ; Salaries Administration Exp etc. ;
Running Costs	Fuel Charges ; Water Charges ; Wages ; Other ;
Maintenance Costs	Meters ; Furnaces ; Service Materials ;

Que 17 SM Illustration -14

Notebook Page No.

PREPARE the cost statement of Ignus Thermal Power Station showing the cost of electricity generated per kWh, from the data provided below pertaining to the year 2020-21.

Total units generated 20,00,000 kWh

	Amount (₹)
Operating labour	30,00,000
Repairs & maintenance	10,00,000
Lubricants, spares and stores	8,00,000
Plant supervision	6,00,000
Administration overheads	40,00,000

• Service Costing

5 kWh. of electricity generated per kg of coal consumed @ ₹ 4.25 per kg. Depreciation charges @ 5% on capital cost of ₹ 5,00,00,000.

Chapter 6

COST SHEET

COST SHEET

- One of the objectives of cost accounting system is ascertainment of cost for a cost object.
- Ascertainment of cost includes elementwise collection of costs, accumulation of the costs so collected for a certain volume or period and then arrange all these accumulated costs into a sheet to calculate total cost for the cost object.
- **A Cost Sheet or Cost Statement** is "a document which provides a **detailed cost information**."
- In a typical cost sheet, cost information are presented on the basis of functional classification. However, other classification may also be adopted as per the requirements of users of the information.

FUNCTIONAL CLASSIFICATION OF ELEMENTS OF COST

- Direct Material Cost
- Direct Employee (labour) Cost
- Direct Expenses
- Production/ Manufacturing Overheads
- Administration Overheads .
- Selling Overheads
- Distribution Overheads
- Research and Development costs etc

COST HEADS IN A COST SHEET

- The costs as classified on the basis of functions are grouped into the following cost heads in a cost sheet:
 - ☐ Prime Cost.
 - ☐ Cost of Production.
 - ☐ Cost of Goods Sold.
 - ☐ Cost of Sales.

PRIME COST

- Prime cost represents the total of direct materials costs, direct employee (labour) costs and direct expenses.

• Cost-Sheet

- The total of cost for each element has to be calculated separately.

Direct Material Cost	xxx
Direct Labour (Employee) Cost	xxx
Direct Expenses	xxx
Prime Cost	xxx

DIRECT MATERIAL COST

- It is the cost of direct material consumed. The cost of direct material consumed is calculated as follows:-

Opening stock of material	xxx
Add: purchases/additions	xxx
Less: closing stock of material	xxx
Direct Material Consumed	xxx

- Additions:

- ☐ Cost of material;
- ☐ Freight inwards;
- ☐ Insurance and other expenditure directly attributable to procurement;
- ☐ Trade discounts or rebates (to be deducted);
- ☐ Duties & Taxes (if input tax credit is not available/ availed) etc.
- ☐ Realised Value of material scrapped (to be deducted)

DIRECT EMPLOYEE COST

- It is the total of payment made to the employees who are engaged in the production of goods and provision of services. Employee cost is also known as labour cost; it includes the following:
 - ☐ Wages and salary;
 - ☐ Allowances and incentives;
 - ☐ Payment for overtimes;
 - ☐ Bonus/ ex-gratia;
 - ☐ Employer's contribution to welfare funds such as Provident fund and other similar funds;
 - ☐ Other benefits (medical, leave with pay, free or subsidised food, leave travel concession)

DIRECT EXPENSES

- Expenses 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:-
 - ☐ Cost of utilities such as power & fuel, steam etc.;
 - ☐ Royalty paid/ payable for production or provision of service;
 - ☐ Hire charges paid for hiring specific equipment;
 - ☐ Fee for technical assistance and know-how;
 - ☐ Amortized cost of moulds, patterns, patents etc.;
 - ☐ Cost for product/ service specific design or drawing;
 - ☐ Cost of product/ service specific software;
 - ☐ Other expenses which are directly related with the production of goods or provision of service.

COST OF PRODUCTION

In a conventional cost sheet, this item of cost can be seen. It is the total of prime cost and factory related costs and overheads.

Prime Cost	xxx
add: Factory Overheads	xxx
Gross Work Cost	xxx
Add: Opening stock of Work-in-process	xxx
Less: Closing Stock of work-in-process	xxx
Factory/Works Cost	xxx
Add: Quality Control Cost	
Add: Research & Development Cost (Process related)	xxx
Add: Administration overheads related with Production	xxx
Less: Credit for recoveries (miscellaneous income)	(xx)
Add: Packing Cost (Primary Packing)	xxx
Cost of Production	xxx

STOCK OF WIP

- The cost of opening and closing stock of work-in-process (WIP) is adjusted to arrive at factory/ works cost.
- The WIP stock is valued on the basis of percentage of completion in respect of each element of cost. Refer the 'Chapter- Process & Operation Costing'.

FACTORY OVERHEADS

- It is also known as works/ production/ manufacturing overheads
- It includes following:
 - ☐ Consumable stores and spares;
 - ☐ Depreciation of plant and machinery, factory building etc.
 - ☐ Lease rent of production assets;
 - ☐ Repair and maintenance of plant and machinery, factory building etc.
 - ☐ Indirect employees cost related with production activities;
 - ☐ Drawing and Designing department cost;
 - ☐ Insurance of plant and machinery, factory building, stock of raw material & WIP etc.
 - ☐ Amortized cost of jigs, fixtures, tooling etc.
 - ☐ Service department cost such as Tool Room, Engineering & Maintenance, Pollution Control etc.

OTHER ITEMS OF COP

- **Quality Control Cost:** This is the cost of resources consumed towards quality control procedures.
- **Research & Development cost:** It includes only those research and development related cost which is incurred for the improvement of process, system, product or services.
- **Administrative Overheads (Production):** It includes only those administration overheads which are related to production. The general administration overhead is not included in production cost.
- **Credit for recoveries:** The realised or realisable value of scrap or waste is deducted as it reduces the cost of production.
- **Packing Cost (primary):** Packing material which is essential to hold and preserve the product for its use by the customer.

COST OF GOODS SOLD

- It is the cost of production for goods sold. It is calculated after adjusting the values of opening and closing stocks of finished goods. It can be calculated as below:

Cost of Production	xxx
Add: Cost of opening stock of finished goods	xxx
Less: Cost of closing stock of finished goods	(xx)
Cost of goods sold	xxx

COST OF SALES

- It is the total cost of a product incurred to make the product available to the customer or consumer. It includes Cost of goods sold, administration and marketing expenses. It is calculated as below:-

Cost of goods sold	xxx
Add:- Administrative Overheads (General)	xxx
Add:- Selling overheads	xxx
Add:- Packing Cost (Secondary)	xxx
Add:- Distribution Overheads	xxx
Add:- Interest and Finance Charges	xxx
Cost of Sales	xxx

ADMINISTRATIVE OVERHEADS

- It is the cost related with general administration of the entity. It includes the followings:
 - Depreciation and maintenance of, building, furniture etc. of corporate or general management.
 - Salary of administrative employees, accountants, directors, secretaries etc.
 - Rent, rates & taxes, insurance, lighting, office expenses etc.
 - Indirect materials- printing and stationery, office supplies etc.
 - Legal charges, audit fees, corporate office expenses like directors' sitting fees, remuneration and commission, meeting expenses etc.

SELLING OVERHEADS

- It is the cost related with sale of products or services. It includes the following costs:
 - Salary and wages related with directly related with selling of goods.
 - Rent, depreciation, maintenance and other cost related with sales department.
 - Cost of advertisement, maintenance of website for online sales, market research etc.

PACKING COST - SECONDARY

- Packing cost (secondary): Packing material that enables to store, transport, inform the customer, promote and otherwise make the product marketable.

DISTRIBUTION OVERHEADS

- It includes the cost related with making the goods available to the customers. The costs are:
 - ☐ Salary and wages of employees engaged in distribution of goods.
 - ☐ Transportation and insurance costs related with distribution.
 - ☐ Depreciation, hire charges, maintenance and other operating costs related with distribution vehicles etc.

COST SHEET - FORMAT

S.No.	Particular	Total Cost
1.	Direct material Consumed:	
	Opening stock of Raw material	xxx
	Add: Additions/ Purchases	xxx
	Less: Closing stock of raw material	(xx)
		xxx
2.	Direct Employee (labour) Cost	xx
3.	Direct Expenses	xx
4.	Prime Cost (1+2+3)	xxx
5.	Add: Works/Factory overheads	xx
6.	Gross Works Cost (4+5)	xxx
7.	Add: Opening Work-in-Process	xx
8.	Less: Closing Work-in-Process	(xx)
9.	Works/ Factory Cost (6+7+8)	xxx
10.	Add: Quality Control Cost	xx
11.	Add: Research & Development Cost (Process Related)	xx
12.	Add: Administrative overheads related with production	xx
13.	Less: Credit for recoveries/scrap / by-product	(xx)
14.	Add: Packing Cost (Primary Packing)	xx
15.	Cost of Production (9+10+11+12-13+14)	xxx
16.	Add: Cost of Opening stock of finished goods	xx
17.	Less: Cost of Closing stock of finished goods	(xx)
18.	Cost of Goods Sold (15+16-17)	xxx

19.	Add; Administrative overheads (General)	xx
20.	Add: Selling overheads	xx
21.	Add: Packing Cost (Secondary)	xx
22.	Add: Distribution Overheads	xx
23.	Add: Interest & Finance Charges	xx
24.	Cost of Sales (18+19+20+21+22+23)	xxx

TREATMENT OF OTHER ITEMS

- **Abnormal costs** - Any abnormal cost, where it is material and quantifiable, shall not form part of cost of production or acquisition or supply of goods or provision of service.
Examples of abnormal costs are:
 - ☐ Cost pertaining to or arising out of a pandemic e.g. COVID-19
 - ☐ Cost associated with employees due to sudden lockdown.
- **Subsidy/ Grant/ Incentives** - Any such type of payment received/ receivable are reduced from the cost objects to which such amount pertains.
- **Penalty, fine, damages, and demurrage** - These types of expenses are not form part of cost.
- **Interest and other finance costs** - Interest, including any payment in the nature of interest for use of non- equity funds and incidental cost that an entity incurs in arranging those funds. Interest and finance charges are not included in cost sheet.

Que 1 SM Illustration 2 Notebook Page no.

The following data relates to the manufacture of a standard product during the month of April, 20X8:

	On June 1 2020	On June 30,2020
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 Rs. 20X8		4,80,000
Wages paid		2,40,000
Factory overheads		1,00,000

• Cost-Sheet

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.

Que 2 SM Exercise Que 1

Notebook Page no.

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

- Direct labour cost Rs. 17,500 being 175% of works overheads
- Cost of goods sold excluding administrative expenses Rs. 56,000
- Inventory accounts showed the following opening and closing balances:

	April 1 (Rs.)	April 30 (Rs.)
Raw Material	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 & 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.

Que 3 SM Illustration 1

Notebook Page no.

The following data relates to the manufacture of a standard product during the month of April, 20X8:

Particular	Amount
Raw material	₹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

Que 4

SM Illustration 3

Notebook Page no.

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

S.No.		Amt(₹)	Amt (₹)
(i)	Raw Material purchased		10,00,00,000
(ii)	GST paid on the above purchases @18% (eligible for ITC)		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 and Fuel		4,62,000
(ix)	Amount paid for purchase of moulds and pattern	(2 yrs.)	8,96,000
(x)	Job charges paid to job workers		8,12,000
(xi)	Stores & Spares consumed		1,12,000
(xii)	Depreciation on;		
	Factory building	84,000	
	Office building	56,000	
	Plant & Machinery	1,26,000	

• Cost-Sheet

		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 material & 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 production control & Engineering & maintenance		26,600	
	(xx)	Expenses paid for administration of Factory work			
	(xxi)	Salary paid to function managers:			
		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)	Wages of employees engaged in distribution of goods.		7,20,000	
	(xxv)	Fee paid to auditor		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 1 st April, 2019			
		Raw material	18,00,000		
		Work-in-Progress	9,20,000		
		Finished goods	11,00,000	38,20,000	

(xxx)	Value of stock as on 31 st March,2020:		
	Raw material	9,60,000	
	Work-in-progress	8,70,000	
	Finished Goods	18,00,000	36,30,000

Amount realized by selling of scrap and waste generated during manufacturing process:-
Rs.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.

Que 5 SM Exercise Que 2

Notebook Page no.

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

Particular	Amount (₹)
Opening Inventories	
- Raw material	12,00,000
- Work-in-process	18,00,000
- Finished goods (10,000 units)	9,60,000
Closing Inventories	
- Raw Material	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 eligible)	7,20,000
Wages paid to production workers	36,64,000
Expenses paid to utilities	1,45,600
Office & 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

Que 6 SM Exercise Que 3

Notebook Page no.

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

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

- (a) It gives gift items costing Rs. 30 per unit of sale;
- (b) It has lucky draws every month giving the first prize of Rs. 50,000; 2nd prize of Rs. 25,000, 3rd prize of Rs. 10,000 and three consolation prizes of Rs. 5,000 each to customers buying the product.
- (c) It spends Rs. 1,00,000 on refreshments served every month to its customers;
- (d) It sponsors a television programme every week at a cost of Rs. 20,00,000 per month.

It can market 30% of its output at Rs. 550 per unit without incurring any of the expenses referred to in (a) to (d) above.

Prepare a cost sheet for the month showing total cost and profit at 30% and 100% capacity level.

Que 7 PYQ Que 2(a) Nov 20

Notebook Page no.

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 follows:

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

- (i) Cost per unit and Total Cost.
- (ii) Profit per unit and Total Profit.

Que 8 PYQ Que 2(a) May 19

Notebook Page no.

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 p.a.
 - (b) Variable ₹ 10 per unit
 - (c) Semi-Variable ₹ 1,08,000 p.a. up to 50% capacity and additional ₹46,800 for every 20% increase in capacity or any part thereof.
- (iv) Administrative Overheads ₹ 5,18,400 p.a. (fixed)
- (v) Selling overheads are incurred at ₹ 8 per unit.

• Cost-Sheet

- (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.

Que 9 PYQ Que 3(b) Nov-19

Notebook Page no.

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

	1 st September	30 th September
	₹	₹
Raw Materials	2,42,000	2,92,000
Works-in-Process	2,00,000	5,00,000

The firm incurred following expenses for a targeted production of 1,00,000 units during the month:

Particular	₹
Consumable Stores and spares of factory	3,50,000
Research & 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)	5,000 units

Defective output which is 4% of targeted production , realizes ₹ 61 per unit.

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

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

Direct employees cost is $\frac{1}{2}$ 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.

Chapter 15

BUDGET

May18	Nov18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May22
5	10	10	5	10	5	10	10	10

BUDGET MEANING

- It is a Planning Document
- Quantitative expression of a plan for a defined period of time

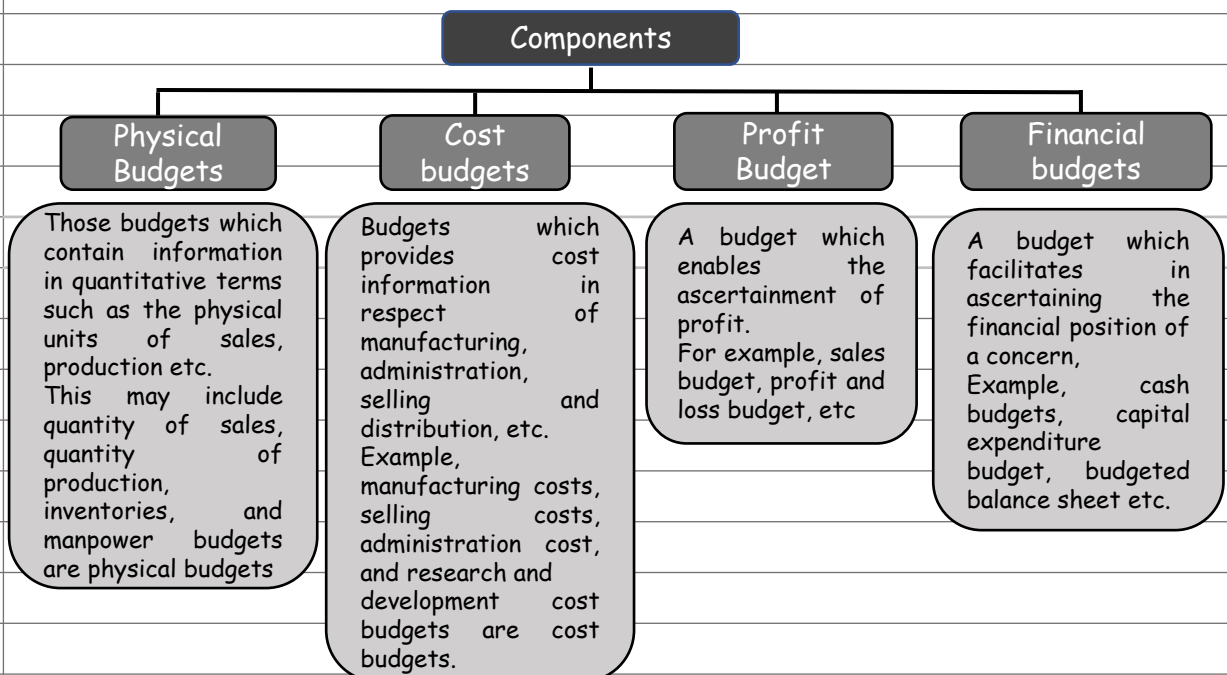
BUDGETING

- Entire process of preparation, execution and evaluation of budget system

ESSENTIALS OF BUDGETING

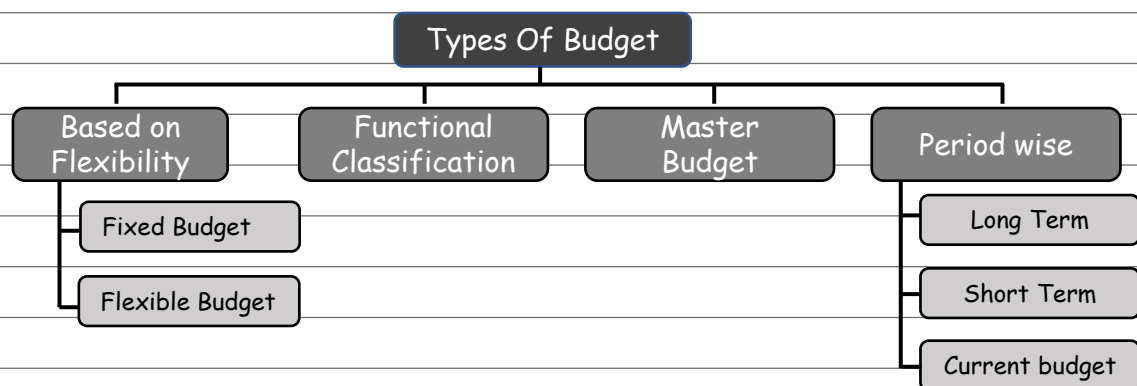
- Clear Organisation Structure
- In Line with Co's Vision
- Clear Responsibility
- Flexible and Adjustable
- Commitment of All
- Linkage with Reward System
- Periodic Monitoring

COMPONENTS OF BUDGETARY CONTROL SYSTEM



Budget

TYPES OF BUDGET



BUDGET BASED ON FLEXIBILITY

Fixed Budget:

- A budget prepared on the basis of standard or fixed level of activity is known as fixed budget. It does not change with a change in the level of activities.
- A fixed budget shows the expected results of a responsibility center for only one activity level.
- Once the budget is prepared , it is not changed, even if the level of activity changes.
- Fixed budgeting is used by many service companies and for some administrative functions of manufacturing companies, such as purchasing, engineering, and accounting.
- Fixed budget is suitable for fixed expenses. It is also known as a static budget.
- **Demerits:** It does not suite a dynamic organization and may give misleading results

Flexible Budget

- A flexible budget is a budget which, by recognizing the difference in behavior between fixed and variable costs in relation to fluctuations in output, turnover, or other variable factors, is designed to change appropriately with such fluctuations.
- Unlike static (fixed) budgets, the flexible budgets show the expected results of a responsibility center for different activity levels.

- Unlike static (fixed) budgets, the flexible budgets show the expected results of a responsibility center for different activity levels.
- One can view a flexible budget as a series of static budgets for different levels of activity.
- Such budgets are especially useful in estimating and controlling factory costs and operating expenses.
- It is more realistic and practicable because it gives due consideration to behaviour of revenue and cost at different levels of activity.

SPLIT OF SEMI VARIABLE COST INTO FIXED AND VARIABLE

- In case of semi-variable cost, we can calculate variable cost per unit by using below formula:

$$\text{Variable Cost p.u.} = \frac{\text{Change in Cost}}{\text{Change in Units}}$$

- Once the variable cost per unit is obtained, use total cost of any level and subtract variable cost from it to obtain Fixed Cost

Que 1

SM Illustration 3

Notebook Page no.

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:

Budget

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.

Que 2 SM Exercise Que 4

Notebook Page no.

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 2021-22. The cost details are as follows:

Particular	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 2021-22 at 85% level of capacity. Also ascertain profit and contribution.		
Que 3	SM Illustration 1	Notebook Page no.	
	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.		
Que 4	SM Illustration 2	Notebook Page no.	
	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.		

Que 5 SM Exercise Que 5

Notebook Page no.

The accountant of manufacturing company provides you the following details for year 2020-21:

Particular	(₹)	Particular	(₹)
Direct material	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:

Particular	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹2.00	₹3.50
Direct material 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 2021-22, 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 is estimated as follows:

Particular	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 2021-22. Comment on the comparative results

Que 6 SM Exercise Que 6

Notebook Page no.

TQM Ltd. has furnished the following information for the month ending 30th June:

	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 Overheads (₹)	40,000	39,200	800(F)
Total Cost	2,80,000	2,55,200	

The Standard costs of the products are as follows:

Particular	Per Unit (₹)
Direct Materials (1 kg at the rate of 1 per kg.)	1.00
Direct wages (1 hour at he 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:

- PREPARE Flexible budget for the month and compare with actual results.
- CALCULATE Material, Labour, Sales Price, Variable Overhead and Fixed Overhead Expenditure variances and Sales Volume (Profit) variance.

Que 7 SM Exercise Que 2

Notebook Page no.

During the FY 2020-21, P Limited has produced 60,000 units operating at 50% capacity level. The cost structure at the 50% level of activity is as under

	(₹)
Direct Materail	300 per unit
Direct Wages	100 per uit
Variable overheads	100 per unit
Direct Expenses	60 per unit
Factory Expenses (25% fixed)	80 per unit
Selling and distribution Expenses (80% variable)	40 per unit
Office and administrative Expenses (100% fixed)	20 per unit

● Budget

The company anticipates that in FY 2021-22, the variable costs will go up by 20% and fixed costs will go up by 15%.

The selling price per unit will increase by 10% to ₹ 880 Required:

- (i) CALCULATE the budgeted profit/ loss for the FY 2020-21.
- (ii) PREPARE an Expense budget on marginal cost basis for the FY 2021-22 for the company at 50% and 60% level of activity and FIND OUT the profits at respective levels.

FUNCTIONAL BUDGETS

- A functional budget is one which is related to function of the business
- For Example, production budget relating to the manufacturing function.
- Functional budgets are prepared for each function and they are subsidiary to the Master budget of the business.
- They are also called as Schedules to Master Budget
- The various types of functional budgets to be prepared will vary according to the size and nature of the business.
- The various commonly used functional budgets are:
 - ☐ Sales Budget
 - ☐ Production Budget
 - ☐ Plant Utilisation Budget
 - ☐ Direct Material Usage Budget
 - ☐ Direct Material Purchase Budget
 - ☐ Direct Labour Budget
 - ☐ Factory Overhead Budget
 - ☐ Production Cost Budget
 - ☐ Ending-Inventory Budget
 - ☐ Cost of Goods Sold Budget
 - ☐ Selling and Distribution Cost Budget
 - ☐ Administration Expenses Budget
 - ☐ Research and Development Cost Budget
 - ☐ Capital Expenditure Budget
 - ☐ Cash Budget

SALES BUDGET

- Sales forecast is the commencement of budgeting and hence sales budget assumes primary importance.
- The quantity which can be sold may be the principal budget factor in many business

undertakings.

- Once an estimate of the sales volume is obtained, the expected sales revenue can be determined by multiplying the volume by the expected unit sales price.
- The sales budget may be prepared under the following classification or combination of classifications:
 - ☐ Product wise
 - ☐ Areas, Agents, Salesman
 - ☐ Types of Customers - Govt, Export, Home Sales
 - ☐ Period wise - Quarterly, Monthly, Weekly etc.

Illustrative Format of Sales Budget

The illustrative format of a sales budget is as under :

	Last Year		Budgeted Year Total		Northern Region		Southern Region		Central Region	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
Product X										
1 st Qtr.										
2 nd Qtr.										
3 rd Qtr.										
4 th Qtr.										
Product Y										
1 st Qtr.										
:										
Total										

XYZ COMPANY

Sales Budget for the year ending March, 20....

	Units	Selling price Per unit (₹)	Total (₹)
Product A	5,000	75	3,75,000
Product B	10,000	80	8,00,000
			11,75,000

PRODUCTION BUDGET

- Production Budget is a forecast of the production for the budget period of an organization.
- It is a physical budget, so number of units to be manufactured to meet budgeted sales and inventory needs for each product is set forth in the production budget.

Budget

It is based on:

- Sales Budget
- Production Capacity
- Planned Inventories

Example of production budget:

XYZ COMPANY

Production budget in units for the year ending March 31, 20....

	Products	
	A	B
Budgeted sales	5,000	10,000
Add : Desired closing stock	500	1,000
Total quantity required	5,500	11,000
Less : Opening stock	1,500	2,000
Units to be produced	4,000	9,000

PLAN UTILIZATION BUDGET

- Plant utilisation budget represents, in terms of working hours, weight or other convenient units of plant facilities required to carry out the programme laid down in the production budget.

Purpose:

- ☐ To determine the load on each process, cost or groups of machines for the budget period.
- ☐ To indicate the processes or cost centres which are overloaded so that corrective action may be taken such as: (i) working overtime (ii) sub-contracting (iii) expansion of production facility, etc.

DIRECT MATERIAL USAGE BUDGET

- It includes the physical units of each Raw Material based on the production budget and corresponding rate to also show the cost.
- While setting standard quantity, normal loss should be considered.
- Standard prices for each item of materials should be set after giving consideration to stock and contracts entered into.

XYZ COMPANY

Direct material usage in units and in amount for the year ending March 31, 20...

Direct Materials

Type of material	Product A (4,000 units)	Product B (9,000 units)	Total direct material usage (Units)	Material cost per unit (₹)	Total cost of material used (₹)
X (12 units per finished product)	48,000	1,08,000	1,56,000	1.50	2,34,000
Y (4 units per product A & 2 units per product B)	16,000	18,000	34,000	2.50	85,000
				Total	3,19,000

MATERIAL PURCHASE BUDGET

- This Budget is a forecast of the material purchase requirements for the budget period of an organization.

- It is based on material usage budget and adjusted with planned inventories to get budgeted purchase quantities.

An example of material purchase budget is as under:

XYZ Company Direct material purchase budget for the year ending March 31, 20.....			
	Material X	Material Y	Total
Desired closing stock (units)	3,000	500	
Units required for production	1,56,000	34,000	
Add:			
Total Requirement	1,59,000	34,500	
Less: Opening stock (units)	4,000	300	
Units to be purchased	1,55,000	34,200	
Unit price (₹)	1.50	2.50	
Purchase cost (₹)	2,32,500	85,500	3,18,000

LABOUR COST BUDGET

- Once sales budget and Production budget are compiled and plant utilisation budget is decided detailed amount of the various machine operations involved and services required can be calculated .
- This will facilitate preparation of an estimate of different grades of labour required.

Example of direct-labour cost budget:

XYZ COMPANY Direct-labour cost budget for the year ending March 31, 20...				
	Units to be produced	Direct labour hour, per unit	Total hours	Total budget cost (₹) @ ₹ 2 per hour
Product A	4,000	7	28,000	56,000
Product B	9,000	10	90,000	1,80,000
			1,18,000	2,36,000

OTHER BUDGETS

COGS Budget	This budget covers direct material cost, direct labour cost, manufacturing expenses and cost of ending inventory of finished products.
Selling Cost Budget	Selling cost is defined as the cost of seeking to create and stimulate demand and of securing orders. While making this budget, selling costs are divided into fixed and variable.
Distribution Cost Budget	Distribution cost has been defined as the cost of the sequence of operations which begins with making the packet of product available for despatch and ends with making the re-conditioned return of empty package, if any available for re-use
Administrative expenses Budget	Examples of such expenses are: audit fees, depreciation of office equipment, insurance, subscriptions, postage, stationery, telephone, telegrams, office supplies, etc The most practical method to follow in preparing estimate of these expenses is to follow the past experience with due regard to anticipated changes either in general policy or the volume of business.

● Budget

R&D Budget	Research is required in order to develop and/or improve products and methods. When research results in definite benefit to the company, development function begins.
Capex Budget	The capital expenditure budget represents the planned outlay on fixed assets like land, building, plant and machinery, etc.
Cash Budget	Cash budget represents the cash requirements of the business during the budget period. It is the plan of receipts and payments of cash for the budget period, It is analysed to show the monthly flow of cash drawn up in such a way that the balance can be forecasted at regular intervals.

Que 8 SM Exercise Que 3 Notebook Page no.

K Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2020-21.

The following information are made available for this purpose:

- (i) It expects to sell 1,50,000 bags of 'X' during the second quarter of 2020- 21 at the selling price of ₹ 1,200 per bag.
- (ii) Each bag of 'X' requires 2.5 mtr. of raw - material 'Y' and 7.5 mtr. of raw - material 'Z'.
- (iii) Stock levels are planned as follows

Particular	Beginning of Quarter	End of Quarter
Finished bags of 'X' (Nos.)	45,000	33,000
Raw Material "Y" (mtr.)	96,000	78,000
Raw Material "Z" (mtr.)	1,71,000	1,41,000
Empty bag (Nos.)	1,11,000	84,000

- (iv) 'Y' cost ₹160 per mtr., 'Z' costs ₹30 per mtr. and 'Empty Bag' costs ₹110 each.
- (v) It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is ₹ 70 per hour.
- (vi) Variable manufacturing costs are ₹ 60 per bag. Fixed manufacturing costs ₹ 40,00,000 per quarter.
- (vii) Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are ₹ 3,75,000 per quarter.

Required:

- (i) PREPARE a production budget for the said quarter in quantity.

- (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'.

Que 9

SM Exercise Que 1

Notebook Page no.

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 2020-21:

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 Managers) 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 2021-22 after incorporating above . estimates and also SHOW the Budgeted Sales and Actual Sales of 2020-21.

● Budget

Que 10

SM Illustration 4

Notebook Page no.

A single product company estimated its quarter-wise sales for the next year as under:

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 6,000 units and the company expects to maintain the closing stock of finished goods at 12,250 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 company maintains this 20% of sales of next quarter as closing stock of current 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 material % to toatal annual requirements 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.

Que 11

SM Exercise que 7

Notebook Page no.

Jigyasa Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 2021-22. 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:

Particular	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 2021- 22 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 month-wise.

Que 12 SM Illustration 5

Notebook Page no.

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, the sales will be 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
	Grade A	Grade B	Overheads (₹)
ACB	8	16	36
MCB	6	12	24
DP	4	8	24
Direct wage rate per hour (₹)	5	4	-

● Budget

The labourers work 8 hours a day for 25 days a month.

The opening stocks of sub-assemblies and components for December 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 the month of December of sub-assemblies and components by 10% of quantity as compared to the opening stock.

PREPARE the following budgets for the month of December:

- (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.

Que 13 SM Exercise Que 8

Notebook Page no.

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	Product
	A	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

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.

MASTER BUDGET

- The summary budget, incorporating its component functional budgets, which is finally approved, adopted and employed.
- When all the necessary functional budgets have been prepared, the budget officer will prepare the master budget which may consist of budgeted profit and loss account and budgeted balance sheet.

Que 14 SM Illustration 6

Notebook Page no.

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
-----------------	------------

● Budget

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

BUDGET CLASSIFICATION BASED ON TIE PERIOD

▪ Long Term Budget:

- Long Term Budget is a budget prepared covering a period of more than a year.
- The Budgets are prepared to depict long term planning of the business.
- The period of long term Budgets varies between three to ten years.
- These budgets are useful for those industries where gestation period is long i.e. the business entities manufacturing machinery, electricity etc.

▪ Short Term Budget:

- These budgets are generally for one or two years and are in the form of monetary terms.
- The consumer's good industries like Sugar, Cotton, and textile use short term budgets.

▪ Current Budget:

- The period of current budgets is generally of months and weeks.
- These budgets relate to the current activities of the business

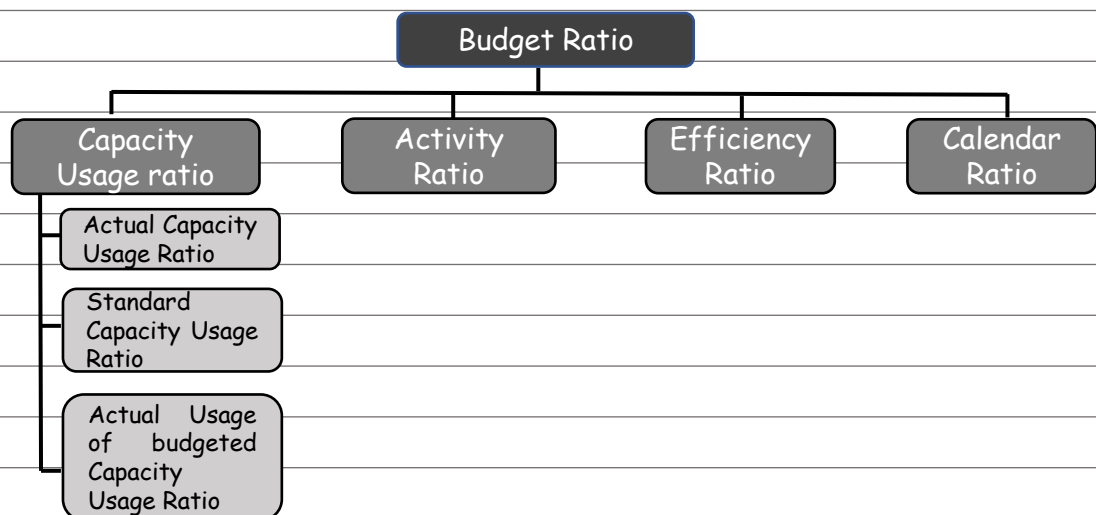
ZERO BASED BUDGETING (ZBB)

- Zero-based Budgeting (ZBB) is defined as a method of budgeting which requires each cost element to be specifically justified, though the activities to which the budget relates are not being undertaken for the first time.

- The cost of each activity has to be justified and without justification, the budget allowance is zero.
- Zero based budgeting differs from the conventional system of budgeting because it mainly starts from scratch or zero and not on the basis of trends or historical levels of expenditure.
- ZBB is an activity based budgeting system where budgets are prepared for each activities rather than functional department.

BUDGET RATIO

- Budget ratios provide information about the performance level, i.e., the extent of deviation of actual performance from the budgeted performance and whether the actual performance is favourable or unfavorable.
- If the ratio is 100% or more, the performance is considered as favourable and if ratio is less than 100% the performance is considered as unfavourable.



Budget Ratio

$$(i) \text{ Efficiency Ratio} = \frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100$$

$$(ii) \text{ Activity Ratio} = \frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100$$

$$(iii) \text{ Calendar Ratio} = \frac{\text{Available Working Days}}{\text{Budgeted Working Days}} \times 100$$

● Budget

$$(iv) \text{ Standard Capacity Usage Ratio} = \frac{\text{Budgeted Hours}}{\text{Max possible Hours}} \times 100$$

$$(v) \text{ Actual Capacity Usage Ratio} = \frac{\text{Budgeted Hours}}{\text{Max possible Hours}} \times 100$$

$$(vi) \text{ Actual Usage of Budgeted Capacity Ratio} = \frac{\text{Actual Working Hours}}{\text{Budgeted Hours}} \times 100$$

Que 15

SM Illustration 7

Notebook Page no.

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

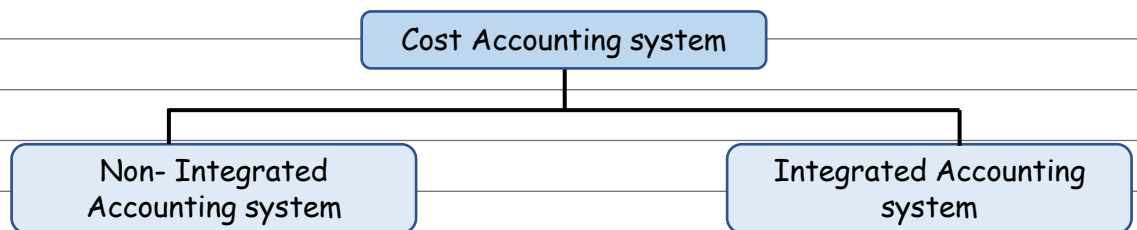
Chapter 7

COST ACCOUNTING SYSTEM

May18	Nov18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May22
15	10	10	5	5	0	10	5	10

COST ACCOUNTING SYSTEMS

- To operate business operations **efficiently and successfully**, it is necessary to make use of an **appropriate accounting system**.
- Such a system should state in clear terms whether cost and financial transactions should **be integrated or kept separately**.



NON- INTEGRATED ACCOUNTING SYSTEM

- It is a system of accounting under which separate ledgers are maintained for both cost and financial accounts
- This system is also known as cost ledger accounting system.
- Under this system the cost accounts restrict itself to recording only those transactions which relate to the product or service being supplied.
- Items of expenses which are related to sales, production or other matters of factory management are the ones dealt with in such accounts.
- This leads to the **exclusion** of certain expenses like interest, bad debts and **revenue/income** from 'other than the sale of product or service' and all the Balance Sheet items like fixed assets, debtors, creditors.
- Items of accounts which are excluded are represented by an account known as Cost ledger control account.

• Cost Accounting System

▪ Main Accounts under Non-Integrated System :

- ☐ Cost Ledger Control Account
- ☐ Stores Ledger Control Account
- ☐ Wages Control Account
- ☐ Manufacturing/Production/Works/ Factory Overhead Control Account
- ☐ Work-in-Process Control Account
- ☐ Administrative Overhead Control Account
- ☐ Finished Goods Control Accounts
- ☐ Selling and Distribution Overhead Control Account
- ☐ Cost of Sales Account
- ☐ Costing Profit & Loss Account
- ☐ Overhead Adjustment Account

COST LEDGER CONTROL ACCOUNT

- This account is also known as *General Ledger Adjustment Account*.
- This account is made to complete double entry.
- All items of expenditure are credited to this account.
- Sales are debited to this account and net profit/loss from Costing Profit & Loss Account is transferred to this account.
- The balance in this account at the end of the particular period represents the net total of all the balances of the impersonal accounts

STORES LEDGER CONTROL ACCOUNT

- This account is debited for the purchase of material and credited for issue of materials from the stores.
- The balance in this account indicates the total balance of all the individual stores accounts.
- Abnormal losses or gains if any in this account are transferred to Costing Profit & Loss Account.
- Entries are made on the basis of goods received notes and stores requisitions etc.

WAGES CONTROL ACCOUNT

- This account is debited with total wages paid (direct and indirect).
- Direct wages are further transferred to Work-in-Process Control Account and
- Indirect wages to Production Overhead; Administration Overhead or Selling & Distribution Overhead Control Accounts, as the case may be.
- Wages paid for abnormal idle time is transferred to Costing Profit & Loss Account either directly or through Abnormal Loss Account

MFG.\ PROD.\WORKS\FACTORY OH CONTROL ACCOUNT

- This account is debited with indirect costs of production such as indirect material, indirect employee, indirect expenses (carriage inward etc.).
- Overhead recovered (absorbed) is credited to this Account.
- The difference between overhead incurred and overhead recovered (i.e. Under Absorption or Over Absorption of Overheads) is transferred to P&L through Overheads Adjustment Account.
- However, if in any problem there is a opening balance of overheads account we should carry the same in closing instead of transferring to P&L

WORK-IN-PROCESS CONTROL ACCOUNT

- This account is debited with the total cost of production, which includes—direct materials, direct employee, direct expenses, production overhead recovered,
- It is credited with the amount of finished goods completed and transferred.
- The balance in this account represents total balances of jobs/works-in-process, as shown by several job accounts

ADMINISTRATIVE OVERHEAD CONTROL ACCOUNT

- This account is debited with overheads incurred and credited with overhead recovered.

• Cost Accounting System

- The overhead recovered are debited to Finished Goods Control Account, if administrative overhead is related with production activities otherwise to Cost of Sales A/c.
- The difference between administrative overheads incurred and recovered is transferred to Overhead Adjustment Account.

FINISHED GOODS CONTROL ACCOUNTS

- This account is debited with the value of goods transferred from Work-in-process Control Account and administration costs recovered (if relates to production activities).
- This account is credited with Cost of Sales Account.
- The balance of this account represents the value of goods unsold at the end of the period.

SELLING & DISTRIBUTION OVERHEAD CONTROL ACCOUNT

- This account is debited with selling and distribution overheads incurred and credited with the selling and distribution overheads recovered.
- The difference between overheads incurred and recovered is transferred usually to . Overhead Adjustment Account

COST OF SALES ACCOUNT

- This account is debited with the cost of finished goods transferred from Finished Goods Control Account for sale, General Administrative overhead recovered, Selling and distribution overhead recovered.
- The balance of this account is ultimately transferred to Costing Profit & Loss Account.

COSTING PROFIT \ LOSS ACCOUNT

- This account is debited with cost of sales, under-absorbed overheads and abnormal losses and is credited with sales value, over-absorbed overhead and abnormal gains.
- The net profit or loss in this account is transferred to Cost Ledger Control Account.

OVERHEAD ADJUSTMENT ACCOUNT

- This account is to be debited for under recovery of overhead and credited with

over-recovery of overhead amount.

- The net balance in this account is transferred to Costing Profit & Loss Account.
- Sometimes, Overhead Adjustment Account is dispensed with and under/over absorbed overheads is directly transferred to Costing Profit & Loss Account from the respective overhead accounts.

JOURNAL ENTRIES

▪ Material:

(a) Purchase -- ₹5,000 (credit or cash)

(i) Material Control A/c	Dr.	5,000	
To Cost Ledger Control A/c			5,000

(ii) Stores Ledger Control A/c	Dr.	5,000	
To material Control A/c			5,000

Note: Sometimes Material Control Account is dispensed with and entries are directly made into Stores Ledger Control A/c giving a credit to Cost Ledger Control A/c.

(b) Purchases worth ₹500 for special job

Work-in-Progress Ledger Control A/c	Dr.	500	
To Cost Ledger Control A/c			500

(c) Material returned to vendor ₹ 500

Cost Ledger Control A/c	Dr.	500	
To Store Ledger Control A/c			500

(d) (i) Material (Direct) issued to production-- ₹1,000

Work-in-Progress Control A/c	Dr.	1,000	
To Store Ledger Control A/c			1,000

(ii) Material (indirect) issued to production -- ₹200

Production Overhead Control A/c	Dr.	200	
To Store Ledger Control A/c			200

• Cost Accounting System

(e) (i) Material worth ₹ 200 returned from shop to stores

Stores Ledger Control A/c	Dr.	200	
To Work-in-Progress Control A/c			200

(ii) Material worth ₹ 100 is transferred from Job-1 to Job-2

Job-2 A/c	Dr.	100	
To Job-1 A/c			100

▪ Labour

(g) Direct wages paid to workers--- ₹1,000

Wages Control A/c	Dr.	700	
To Cost Ledger Control A/c			700

(h) Indirect wages paid to workers in the production --₹700

(i) Wages Control A/c	Dr.	700	
To Wages Control A/c			700

(i) Indirect wages paid to workers in Administration --₹500

(i) Wages Control A/c	Dr.	500	
To Cost Ledger Control A/c			500

(ii) Administration Overhead A/c	Dr.	500	
To Wages Control A/c			500

(j) Indirect wages paid to workers in Selling & Distribution Dept. ₹ 300

(i) Wages Control A/c	Dr.	300	
To Cost Ledger Control A/c			300

(ii) Selling & Distribution Overhead A/c	Dr.	300	
To Wages Control A/c			300

▪ Direct Expenses:

(a) Direct expenses incurred ₹500 for Job No. 12

Job No.12 A/c (WIP Control A/c)	Dr.	500	
To Cost Ledger Control A/c			500

▪ **Overheads:**

(l) **Overhead expenses incurred ₹ 500 (Prod. ₹150 ; Admin. ₹150; Selling & Dist. ₹200)**

Production Overhead Control A/c	Dr.	150	
Administrative Overhead Control A/c	Dr.	150	
Selling & Distribution Overhead Control A/c	Dr.	200	
To Cost Ledger Control A/c			500

(m) **Carriage Inward (direct to factory) -- ₹100**

Production Overhead Control A/c	Dr.	100	
To Cost Ledger Control A/c			100

(n) **Production Overhead Recovered -- ₹ 1,000**

Work-in-Progress Ledger Control A/c	Dr.	1000	
To Production Overhead Control A/c			1,000

(o) **Administrative Overhead recovered ₹ 500 from finished goods**

Finished Goods Ledger Control A/c	Dr.	500	
To Administrative Overhead Control A/c			500

(p) **Selling & Distribution overhead ₹100 recovered from sales**

Cost of Sales A/c	Dr.	100	
To Selling & Distribution Overhead Control A/c			100

(q) **Under recovery of overheads**

Costing Profit & Loss A/c	Dr.	xxx	
To Administrative Overhead Control A/c			xxx

(r) **Over recovery of overheads:**

Production overhead control A/c	Dr.	xxx	
To Costing Profit/ Loss A/c			xxx

▪ **Sales:**

(s) Cost Ledger Control A/c	Dr.	xxx	
To Costing Profit & loss A/c			xxx

▪ **Profit/ Loss:**

(t) **In case of Profit**

• Cost Accounting System

(i) Costing Profit & Loss A/c

Dr. xxx

To Cost Ledger Control A/c

xxx

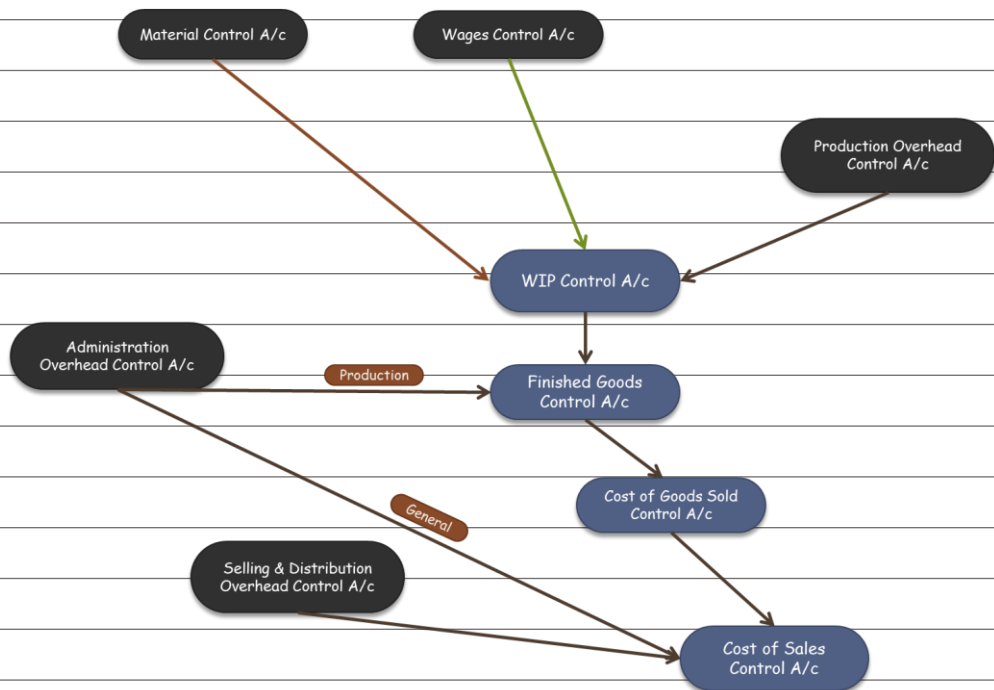
(u) In case of Loss

(ii) Cost Ledger Control A/c

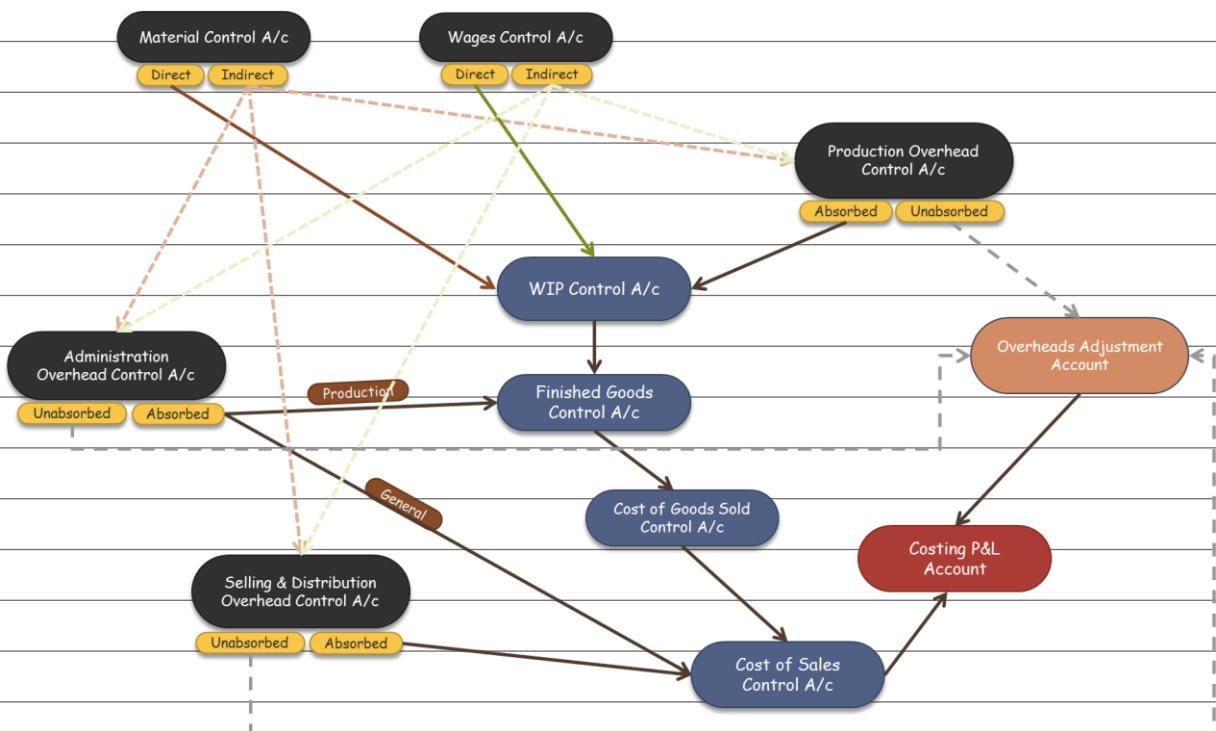
Dr. xxx

To Costing Profit/Loss A/c

xxx



▪ Treatment of Direct/ Indirect expenses & Absorbed/ Unabsorbed Overheads



Que 1 SM Illustration 2

Notebook Page no.

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July as follows:

	(₹)	(₹)
Material control A/c	1,24,000	
Work-in-progress 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:

	(₹)
Material purchased	4,80,100
Material issued to jobs	4,77,400
Materials to works maintenance	41,200
Materials to administrative office	3,400
Materials to sales department	7,200
Wages direct	1,49,300
Wages indirect	65,000
Transportation for indirect materials	8,400
Production overheads incurred	2,42,250
Absorbed Production Overhead	3,59,100
Administrative Overheads incurred	74,000
Administrative overheads allocated to production	52,900
Administrative overheads allocated to sales department	14,800
Selling & distribution overheads incurred	64,200
Selling & Distribution 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.

• Cost Accounting System

Que 2 SM Illustration 1 Notebook Page no.

As on 31st March, the following balances existed in a firm's Cost Ledger:

	Dr. (₹)	Cr. (₹₹)
Stores Ledger Control A/c	3,01,435	
Work-in-progress 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

During the next three months the following items arose:

	(₹)
Finished Product (at cost)	2,10,835
Manufacturing Overhead incurred	91,510
Raw material Purchased	1,23,000
Factory Wages	50,530
Indirect Labour	21,665
Cost of Sales	1,85,890
Material issued at 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.

Que 3 SM Exercise Que 2 Notebook Page no.

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-Progress Control Account	20
Finished Goods Control Account	430
Building Construction Account	10
Cost Ledge Control Account	540

During the month , the following transactions took place :

(Amounts in lakh)	
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	160
(excluding items shown above)	
Absorbed in building construction	20
Under absorbed	8
Royalty paid (related to production)	5
Selling, distribution and administration overheads	25
Sales	450
At the end of the month, the stock of raw material and work-in-Process was ₹ 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.	

INTEGRATED ACCOUNTING SYSTEM

▪ What is Integrated Accounting ?

- ❑ Integrated Accounts is the name given to a system of accounting, whereby cost and financial accounts are kept in the same set of books.
- ❑ Integrated accounts provide or meet out fully the information requirement for Costing as well as for Financial Accounts.

▪ Advantages:

- ❑ **No need for Reconciliation** - The question of reconciling costing profit and financial profit does not arise, as there is only one figure of profit.
- ❑ **Less efforts** - Due to use of one set of books, there is a significant saving in efforts made.

• Cost Accounting System

❑ **Less time consuming** - No delay is caused in obtaining information as it is provided from books of original entry.

❑ **Economical process** - It is economical also as it is based on the concept of "Centralization of Accounting function".

▪ **Features:**

❑ In the integrated accounting system, general ledger adjustment account/ CLC is eliminated and detailed accounts for assets and liabilities are maintained.

❑ The Cost ledger control account of non-integrated accounting is replaced by use of following accounts:

- Bank account
- Receivables (Debtors) account
- Payables (Creditors) account
- Provision for depreciation account
- Fixed assets account
- Share capital account

Que 4 SM Illustration 3

Notebook Page no.

JOURNALISE the following transactions assuming that cost and financial transactions are integrated:

	(₹)
Raw material purchased	2,00,000
Direct Material 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

Que 5 SM Exercise Que 3

Notebook Page no.

Dutta Enterprises operates an Integral system of accounting. You are required to PASS the Journal Entries for the following transactions that took place for the year ended 31st March.

(Narrations are not required.)

	(₹)
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

Que 6 SM Illustration 4

Notebook Page no.

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-progress Control Account		20,000
Finished Goods Control Account		35,000
Prepaid production Overheads brought forward from previous month		3,000
Transaction during the month		
Materials purchased		75,000
Materials transferred between batches		5,000
Material issued:		
To Production	30,000	
To factory maintenance	4,000	34,000
Total wages paid:		

• Cost Accounting System

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 worker		5,000
Selling & 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 transformed into finished goods during the month		65,000
Physical value of WIP 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:

- Stores Ledger Control Account.
- Work-in-Process Control Account.
- Finished Goods Control Account.
- Production Overhead Control Account.
- Costing Profit and Loss Account

Que 7 SM Illustration 5 Notebook Page no.

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 for the month of January:

(i) Incomplete Ledger Entries:

Materials Control A/c

	(₹)		(₹)
To balance b/d	32,000		

Work-in-progress Control A/c

	(₹)		(₹)
To balance b/d	9,200	By finished Goods	1,51,000
		Control A/c	

Payables (Creditors) A/c

	(₹)		(₹)
		By balance b/d	16,400
To balance c/d	19,200		

Manufacturing Overheads Control A/c

	(₹)		(₹)
To bank A/c	29,600		
(Amount spent)			

Finished Goods Control A/c

	(₹)		(₹)
To balance b/d	24,000		
		By balance c/d	30,000

(ii) Additional Information:

- (1) The bank-book showed that ₹ 89,200 have been paid to creditors for raw-material.
- (2) Ending inventory of work-in-process included materials of ₹ 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

Que 8

SM Exercise Que 1

Notebook Page no.

The following incomplete accounts are furnished to you for the month ended 31st October, 2021.

Stores ledger Control Account

1.10.2021 To Balance ₹54,000

Work in progress Control Account

1.10.2021 To Balance ₹6,000

Finished Goods Control Account

1.10.2021 To balance ₹75,000

• Cost Accounting System

Factory Overheads Control Account

Total debts for October ,2021 ₹45,000

Factory overheads Applied Account

?

Cost of Good Sold Account

?

Creditors for Purchase Account

1.10.21 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 2021 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 31.10.2021 is ₹ 15,000 and the payments made to creditors in October, 2021 amount to ₹ 1,05,000

(iii) The finished goods inventory as on 31st October, 2021 is ₹ 66,000.

(iv) The cost of goods sold during the month was ₹ 1,95,000.

(v) On 31st October, 2021 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, 2021. All factory workers earn same rate of pay.

(vii) All actual factory overheads incurred in October, 2021 have been posted.

You are required to FIND:

- Materials purchased during October, 2021.
- Cost of goods completed in October, 2021.
- Overheads applied to production in October, 2021.
- Balance of Work-in-process Control A/c on 31st October, 2021.
- Direct materials consumed during October, 2021.
- Balance of Stores Ledger Control Account on 31st October, 2021.
- Over absorbed or under absorbed overheads for October, 2021

RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

- Causes of differences in Financial and Cost Accounts:

- Items included only in Financial Accounts:

- (a) Purely Financial Expenses :

- (i) Interest on loans or bank mortgages.

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

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

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

- (v) Goodwill written off

- (vi) Preliminary expenses written off

- (vii) Incomes tax, donations, subscriptions

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

- (b) Purely Financial income:

- (i) interest received on bank deposits, loans and investments.

- (ii) Dividend received

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

- (iv) Transfer fee received

- (v) Rent receivables

- Item included in Cost Accounts only (notional expenses):

- (i) Charges in lieu of rent where premises are owned

- (ii) interest on capital at notional figure though not incurred

- (iii) Salary for the proprietor at notional figure though not incurred.

- (iv) notional Depreciation on the assets fully depreciated for which book value is nil.

- Items whose treatment is different in the two sets of accounts:

- The objective of cost accounting is to provide information to management for decision making and control purposes while financial accounting conforms to external reporting requirements. Hence there are chances that certain items are treated differently in the two sets of accounts. For example, LIFO method is not allowed for inventory valuation in India as per the Accounting Standard 2 issued by the Council of the ICAI. However, this method may be adopted for cost accounts as it is more suitable for arriving at costs which may be used as a base for deciding selling prices. Similarly cost accounting may use a different method of depreciation than what is allowed under financial accounting.

• Cost Accounting System

▪ Varying basis of Valuation:

- It is another factor which sometimes is responsible for the difference. It is well known that in financial accounts stock are valued either at cost or market price, whichever is lower. But in Cost Accounts, stocks are only valued at cost.

Que 9

SM Illustration 6

Notebook Page no.

The following figures are available from the financial records of ABC Manufacturing Co. Ltd. for the year ended 31st March.

	(₹)
Sales (20,000 units)	25,00,000
Materials	10,00,000
Wages	5,00,000
Factory overheads	4,50,000
Administrative Overhead (production related)	2,60,000
Selling and distribution overheads	1,80,000
Finished goods (1,230 units)	1,50,000

	(₹)	(₹)
Work-in-Progress:		
Materials	30,000	
Labour	20,000	
Factory overheads	20,000	70,000
Goodwill written off		2,00,000
Interest on loan taken		20,000

In the Costing records, factory overhead is charged at 100% of wages, administrative 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.

Que 10

SM Illustration 7

Notebook Page no.

Following are the figures extracted from the Cost Ledger of a manufacturing unit

	(₹)
Stores:	
Opening balance	15,000

Purchase	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-Progress :	
Opening Inventory	30,000
Direct Laboir 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.

Que 11

SM Illustration 8

Notebook Page no.

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 Overheads	16,00,000
General Administrative overheads	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

• Cost Accounting System

Closing stock:	
Finished goods (4,000 units)	3,20,000
Work-in-Progress	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 goods sold. 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.

Que 12 SM Exercise Que 5 Notebook Page no.

The following information is available from the financial books of a company having a normal production capacity of 60,000 units for the year ended 31st March:

- (i) Sales ₹ 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;
- (b) PREPARE the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March assuming that the indirect expenses are absorbed on the basis of normal production capacity; and
- (c) PREPARE a statement reconciling profits shown by financial and cost books

Que 13 SM Exercise Que 6 Notebook Page no.

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. 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

	(₹)
Factory Overheads under-recovered	6,000
Administration overheads over-recovered	4,000
Depreciation charged in financial accounts	1,20,000
Depreciation recovered in costs	1,30,000
Interest on investment not included in costs	20,000
Income-tax provided	1,20,000
Transfer fees (credit in financial books)	2,000
Stores adjustment (credit in financial books)	2,000

PREPARE a Memorandum reconciliation account.

Que 14 SM Exercise Que 4

Notebook Page no.

The following figures are extracted from the Trial Balance of Go-getter Co. on 31st March:

	Dr. (₹)	Cr. (₹)
Inventories:		
Finished Goods	80,000	
Raw materials	1,40,000	
Work-in-progress	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 & factory up-keeping expenses	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	

• Cost Accounting System

Sales Promotion	22,500	
Distribution Deptt.- Salaries & 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) Outstanding 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 31st March along with supporting schedules of:

- (i) Cost of sales
- (ii) Selling and Distribution Expenses.
- (iii) Administration Expenses.

Chapter 10

PROCESS COST

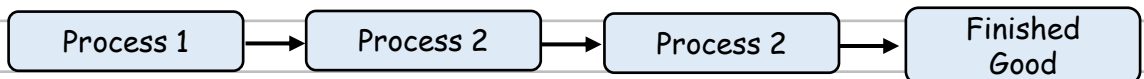
May18	Nov18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May22
10	5	10	10	10	5	15	5	10

MEANING

- Process Costing is a method of costing used in industries where the material has to pass through **two or more processes** for being converted into a final product.
- It is a method of Cost Accounting whereby **costs are charged to processes** or operations and **averaged** over units produced
- A separate **account** for **each process** is opened and all expenditure pertaining to a process is **charged** to that process account.
- Examples of Industries where Process Costing is used:
 - Steel
 - Paper
 - Medicines
 - Soaps
 - Chemicals
 - Rubber
 - Paints etc.

Where production process is continuous

Where output of one process becomes input of the next process



Process I Account

Particular	Unit	Cost	Particulars	Unit	Cost
To Bal b/d					
Material			By Process II		
Wages					
Expenses					
Overheads					
			By Bal c/d		

• Process Costing

Process II Account

Particular	Unit	Cost	Particulars	Unit	Cost
To Bal b/d					
To Process I			By FG Control		
Material					
Wages					
Expenses					
Overheads			By Bal c/d		

FG Control Account

Particular	Unit	Cost	Particulars	Unit	Cost
To Bal b/d			By COGS		
To Process II			By Bal c/d		

Que 1 SM Illustration 1 Notebook Page no.

From the following 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.

	Process I (₹)	Process II (₹)	Process III (₹)
Material	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.

NORMAL LOSS IN PROCESS

▪ Normal Process Loss:

- It is also known as normal wastage.
- It is defined as the loss of material which is inherent in the nature of work.
- Such a loss can be reasonably anticipated from the nature of the material, nature of operation, the experience and technical data.

- It is unavoidable because of nature of the material or the process.
- It also includes units withdrawn from the process for test or sampling.

▪ **Treatment in Cost Accounts:**

- The cost of normal process loss in practice is absorbed by good units produced under the process.
- The amount realized by the sale of normal process loss units should be credited to the process account.

Example 1

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 realizable value.

You are required to PREPARE Process- I account, value of normal loss and units transferred to Process-II

Example 2

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.

ABNORMAL LOSS IN PROCESS

▪ **Abnormal Process Loss:**

- It is also known as abnormal wastage.
- It is defined as the loss in excess of the pre-determined loss (Normal process loss).
- This type of loss may occur due to the carelessness of workers, a bad plant design or operation, sabotage etc.
- Such a loss cannot obviously be estimated in advance. But it can be kept under

• Process Costing

control by taking suitable measures.

▪ Treatment in Cost Accounts :

- The cost of an abnormal process loss unit is equal to the cost of a good unit.
- The total cost of abnormal process loss is credited to the process account from which it arises.
- Cost of abnormal process loss is not treated as a part of the cost of the product.
- In fact, the total cost of abnormal process loss is debited to costing profit and loss account.

Example 3

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.

ABNORMAL GAIN IN PROCESS

▪ Abnormal Process Gain :

- Abnormal gain may be defined as an unexpected gain in production under the normal conditions.
- This arises due to over- estimation of process loss, improvements in work efficiency of workers, use of better technology in production etc.

▪ Treatment in Cost Accounts :

- The process account under which abnormal gain arises is debited with the abnormal gain and credited to abnormal gain account which will be closed by transferring to the Costing Profit and Loss account only with the amount of net actual gain.
- The value of abnormal gain is computed on the basis of normal production.

Example 4

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.

Que 2 SM Illustration 2 Notebook Page no.

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.

(Amount in ₹)

	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.

Que 3 SM Illustration 3 Notebook Page no.

RST Limited processes Product Z through two distinct processes - Process- I and Process-II. On completion, it is transferred to finished stock. From the following information for the current year, PREPARE Process- I, Process- II and Finished StockA/c

Particular	Process-I	Process-II
Raw Materials used	7,500 units	--
Raw Materials cost per unit	₹60	--
Transfer to next process/		
Finished stock	7,050 units	6,525 units
Normal loss (on inputs)	5%	10%
Direct wages	₹1,35,750	₹1,29,250

• Process Costing

Direct expense	60% of direct wage	65% of direct wages
Manufacturing Overheads	20% of direct wage	15% of direct wages
Realisable value of scrap p.u.	₹12.50	₹37.50

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-process.

VALUATION OF WORK-IN-PROGRESS

- As done in earlier examples, Average Cost per unit can be determined easily by dividing the total cost incurred during a given period of time by the total number of units produced during the same period.
- But, in reality in most of the process type industries where manufacturing is a continuous activity cost incurred represents the cost of work carried on opening work-in-process, closing work-in-process and completed units.
- The valuation of work-in-process presents a good deal of difficulty because it has units under different stages of completion from those in which work has just begun to those which are only a step short of completion.
- We can crack this difficulty by converting partly finished units into equivalent finished units.

CONCEPT OF 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.

EQUIVALENT COMPLETED UNITS -

- Actual Number of units in the process of manufacture x percentage of work completed.

10.7

FIFO AND WEIGHTED AVERAGE IN PROCESS COSTING

FIFO

- Under this method the units completed and transferred are taken from both opening work-in-process (WIP) and freshly introduced materials/inputs.
- The cost to complete the opening WIP and other completed units are calculated separately.
- The cost of opening WIP is added to cost incurred on completing the incomplete (WIP) units into complete one.
- The total cost of units completed and transferred is calculated by adding opening WIP cost to cost on freshly introduced inputs.
- In this method the closing stock of work in process is valued at current cost.

Weighted Average

- Under this method, the cost of opening work-in-process and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units.
- The equivalent production in this case consists of work-load already contained in opening work-in-process and work-load of current period.
- The main difference between FIFO method and average method is that units of opening work in process and their cost are taken in full under average method
- Under FIFO method only the remaining work done now is considered.

Que 5

SM Illustration 5

Notebook Page no.

Refer to information provided in Illustration 4 above and solve this by Weighted Average Method:

EXPLANATION OF STEPS IN ILLUS-5

- Total Units completed and Transferred is 9,000 units. All the 9,000 units has been considered as equally complete in respected of cost.
- Total cost for cost elements for the period and opening WIP is accumulated.
- The realizable value of scrap (i.e. normal loss) is deducted from the total cost as accumulated above.
- Total cost less realizable value is divided by equivalent units to get cost per equivalent unit.
- The equivalent cost as calculated above is multiplied by the equivalent units of completely processed goods, abnormal loss and closing WIP to get the value.

Que 6 SM Exercise Que 4

Notebook Page no.

Following details are related to the work done in Process-I by XYZ Company during the month of March:

Particular	(₹)
Opening wok-in-progress (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

Que 7 SM Exercise Que 2

Notebook Page no.

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.

Particular	Units
Beginning Wip, may 1	16,000
Started production during May	1,00,000
Completed production during May	92,000

• Process Costing

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.

Que 8

SM Exercise Que 1

Notebook Page no.

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.

Que 9	SM Exercise Que 3	Notebook Page no.
	February:	
	Production Record:	
	Units in process as on 1st February	
	(All materials used, 25% complete for labour and overhead)	4,000
	New units introduced	16,000
	Units completed	14,000
	Units in process as on 28th February	
	(All materials used, 33-1/3% complete for labour and overhead)	6,000
	Cost Records:	
	Work-in-process as on 1st February	(₹)
	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.	
Que 10	SM Exercise Que 5	Notebook Page no.
	A company produces a component, which passes through two processes. During the month of April, materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100% complete as to materials cost and 50% complete as to labour and overheads cost.	
	The Process I costs incurred were as follows:	
	Direct material	₹ 15,000
	Direct wages	₹ 18,000
	Factory overheads	₹ 12,000

● Process Costing

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.

INTER PROCESS PROFITS

- 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

ADVANTAGES:

- Comparison between the cost of output and its market price at the stage of completion is facilitated.
- Each process is made to stand by itself as to the profitability.

DISADVANTAGES:

- The use of inter-process profits involves complication.
- The system shows profits which are not realised because of stock not sold out

Que 11

SM Illustration 6

Notebook Page no.

A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate for the month of October

	Process-I	Process-II	Finished
	(₹)	(₹)	Stock (₹)
Opening Stock	7,500	9,000	22,500
Direct Material	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 processes 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

Que 12

SM Exercise Que 6

Notebook page no.

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

	(₹)
Opening work-in-progress (4,500 units)	
Sugarcane	50,000
Labour	15,000

• Process Costing

Overheads	45,000
Sugarcane introduced for juice extraction (1,00,000kg)	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.

Chapter 9

JOB AND CONTRACT COST

May 18	Nov 18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May22
10	5	10	5	5	0	5	10	5

CONTRACT COSTING

- Contract costing is a form of **specific order** costing where
 - **job** undertaken is relatively **large** and
 - normally takes period **longer than a year** to complete
- Contract costing is usually adopted by the contractors engaged in any type of contracts like
 - construction of building, road, bridge,
 - erection of tower, setting up of plant etc.



FEATURE OF CONTRACT COSTING

- The major part of the work in connection with each contract is ordinarily carried out at the site of the contract.
- The bulk of the expenses incurred by the contractor are considered as direct.
- The indirect expenses mostly consist of office expenses, stores and works.
- A separate account is usually maintained for each contract.
- The number of contracts undertaken by a contractor at a time is usually few.
- The cost unit in contract costing is the contract itself.

● Job & Contract Costing

PROFIT ACCOUNTING IN CONTRACT COSTING

- A contract takes longer period to complete and the result of the contract can be known only after the completion of the contract.
- To have a better control over the contract and cost, it is necessary to have an idea of profitability of contracts at regular intervals or at least in a year.
- For this purpose, a contractor needs to calculate expected profit or notional profit for a known contract.
- It also helps in profit comparison for a period and provide a good basis for performance measurement and evaluation of those who are engaged in the contract.
- The expected or notional profit in respect of each contract in progress (i.e. incomplete contracts) is transferred to the costing profit and loss account (consolidated) for the year to determine overall profitability of the contractor.

ACCOUNTING OF CONTRACT COSTS

- For all the costs incurred on contract, Contract Account is debited instead of WIP Control Account.
- **Material:** There can be issue from store or direct purchase
- **Plant and Machinery:**
 - The value of the plant in a contract may be either debited to contract account and the written down value thereof at the end of the year entered on the credit closing the contract account, or
 - only a charge (depreciation) for use of the plant may be debited to the contract account.

(i) Contract A/c Dr.

To Plant & Machinery A/c (with Cost) OR Contract A/c Dr.

(ii) Plant & Machinery A/c Dr. (with WDV)

To Depreciation on Plant & Machinery

To Contract A/c

Contract Account - Year 1

Particular	Amount	Particular	Amount
To materials		By Work-in-Progress c/d	
To wages		-Value of Work certified	
To Expenses		- Cost of work Uncertified	
To Plant		By material at site c/d	
		By Plant at site c/d	
To Costing P&L			
(Notional Profit)			

Contract Account -Year 2

Particular	Amount	Particular	Amount
To Material at site b/d		By Work- in-Progress c/d	
To Plant at site b/d		- Value of work certified	
To Work-in-progress b/d		- Cost of Work uncertified	
To Material		By Material at site c/d	
To Wages		By plant at site c/d	
To Expenses			
To Costing P&L			
(Notional Profit)			

Contract Account -Year 3

Particular	Amt.	Particular	Amt.
To Material at site b/d		By Contractee A/c	
To Plant at site b/d		By Material c/d	
To work-in-progresss		By Plant c/d	
To Material			
To Wages			
To Expenses			
To Costing P&L			
(Notional Profit)			

P.T.O

● Job & Contract Costing

Special Terms:

▪ Work-in-Progress :

- in contract costing, it refers to the contract which is not complete at the reporting date. In Contract Accounts, the work-in-progress consists of
- the cost of work completed, both certified and uncertified;
- the cost of work not yet completed; and
- the amount of estimated/notional profit.

▪ Cost of Work Certified or value of Work certified:

- A contract is a continuous process and to know the cost or value of the work completed as on a particular date, assessment of the completion of work is carried out by an expert (it may be any professional like surveyor, architect, engineer etc.).
- The expert, based on his assessment, certifies the work completion in terms of percentage of total work.

$$\text{Cost of work certified} = \text{Cost incurred till date} - (\text{Cost of Work uncertified} + \text{Material in hand} + \text{Plant in Hand})$$

$$\text{Value of work certified} = \text{Value of Contract} \times \text{Work Certified \%}$$

▪ Cost of Work Uncertified

- It represents the cost of the work which has been carried out by the contractor but has not been certified by the expert.
- It is always shown at cost price.

	(₹)	(₹)
Total Cost to date		xxx
Less: Cost of work certified	xxx	
Material in hand	xxx	
Plant at site	xxx	(xxx)
Cost of work ucertified		xxx

▪ Notional Profit

- It represents the difference between the value of work certified and cost of : work certified. It is determined

$$\text{Notional Profit} = \text{Value of Work Certified} - \text{Cost of Work Certified}$$

▪ **Estimated Profit**

- It is the excess of the contract price over the estimated total cost of the contract.

Que 1 SM Illustration 4 Notebook Page no.

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 April 1, 2020. The value of the work completed and certified upto 28th February, 2021 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 March, 2021 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 March, 2021 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 March, 2021.

Que 2 SM Illustration 3 Notebook Page no.

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

• Job & Contract Costing

Que 3	SM Exercise Que 2	Notebook Page no.		
	COMPUTE Notional profit and estimated profit on a contract (which has been 90% complete) from the following particulars. (₹)			
	Total expenditure to date	4,50,000		
	Estimated further expenditure to complete the contract (including contingencies)	25,000		
	Contract price	6,12,000		
	Work certified	5,50,800		
	Work uncertified	34,000		
	Cash received	4,40,640		
Que 4	SM Illustration 5	Notebook Page no.		
	A contractor prepares his accounts for the year ending 31st March each year. He commenced a contract on 1st July, 2020.			
	The following information relates to the contract as on 31st March, 2021:			
		(₹)		
	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 March, 2021.			
	The contract price is ₹ 20,00,000. On 31st March, 2021 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 March, 2021			
Que 5	SM Illustration 6	Notebook Page no.		
	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:			
		2018-19 (₹)	2019-20 (₹)	2020-21 (₹)
	Materials	6,75,000	10,50,000	9,00,000
	Wages	6,20,000	9,00,00	7,50,000

Transportation	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.

▪ **Progress Payment :**

- A Contractor gets payments for work done on a contract based on work completion. Since, a contract takes longer period to complete and requires large investment in working capital to progress the contract work,
- It is desirable by the contractor to have periodic payments from the contractee against the work done to avoid working capital shortage.
- For this a contractor enters into an agreement with the contractee and agrees on payment on some reasonable basis, which generally, includes percentage of work completion as certified by an expert.

▪ **Retention Money**

- In a contract, a contractee generally keeps some amount payable to contractor with himself as security deposit.
- To have a cushion against any defect or undesirable work, the contractee upholds some money payable to contractor. This security money upheld by the contractee is known as retention money.

- **Earnest Money:** In some contracts the contractor has to deposit some security money before starting of the contract as a term of contract.

$$\text{Retention Money} = \text{Value of Work Certified} - \text{Payment Actually Made}$$

● Job & Contract Costing

▪ Cost Plus Contract

- Cost- plus contract is a contract where the value of the contract is determined by adding an agreed percentage of profit to the total cost.
- These types of contracts are entered into when it is not possible to estimate the contract cost with reasonable accuracy due to unstable condition of factors that affect the cost of material, employees, etc.

Cost plus contracts have the following advantages and disadvantages:

- The Contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.
- It is useful specially when the work to be done is not definitely **fixed** at the time of making the estimate.
- 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.
- **Disadvantages:** The contractor may not have any inducement to avoid wastages and effect economy in production to reduce cost

ESCALATION CLAUSE CONTRACT

- 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 macroeconomic 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".

Que 6 SM Illustration 7

Notebook Page no.

A contractor has entered into a long term contract at an agreed price of ₹ 17,50,000 subject to an escalation clause for materials and wages as spelt out in the contract and corresponding actual are as follows:

	Standard		Actual	
Material	Qty (tons)	Rate (₹)	Qty (tons)	Rate (₹)
A	5,000	50	5,050	48
B	3,500	80	3,450	79
C	2,500	60	2,600	66

Wages	Hours	Hourly Rate (₹)	Hours	Hourly rate (₹)
X	2,000	70	2,100	72
Y	2,500	75	2,450	75
Z	3,000	65	3,100	66

Reckoning the full actual consumption of material and wages, the company has claimed a final price of ₹ 17,73,600. Give your ANALYSIS of admissible escalation claim and indicate the final price payable.

Que 7 SM Exercise Que 3

Notebook Page no.

AKP Builders Ltd. commenced a contract on April 1, 2020. The total contract was for ₹ 5,00,000. Actual expenditure for the period April 1, 2020 to March 31, 2021 and estimated expenditure for April 1, 2021 to December 31, 2021 are given below:

Particular	2020-21	2021-22
	(actual)	(9 months (estimated))
Materials issued	90,000	85,750
Wage: 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	-

• Job & Contract Costing

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, 2021 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, 2021.
- 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, 2021, and CALCULATE estimated total profit on this contract.

Que 8 SM Exercise Que 4

Notebook Page no.

RST Construction Ltd. commenced a contract on April 1, 2020. The total contract was for ₹ 49,21,875. Actual expenditure for the period April 1, 2020 to March 31, 2021 and estimated expenditure for April 1, 2021 to September 30, 2021 are given below

	April 1, 2020 to March 31, 2021 (Actual) (₹)	April 1, 2021 to March 31, 2021 (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	3,00,000
	(Set.30,2020)	(Sept. 30 ,2021)

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, 2021.

Required:

PREPARE the Contract A/c for the year ended 31st March, 2021 and determine the estimated profit on the contract

JOB COSTING

- Job costing is carried out for the purpose of ascertaining cost of each job and takes into account the cost of materials, employees and overhead etc.

PROCESS OF JOB COSTING

- Disclose Cost of Materials issued for the Job
- Employee Cost Incurred
- When Job is completed Charging of OH
- Prepare a separate cost sheet for each Job

SUITABILITY OF JOB COSTING

- When jobs are executed for different customers according to their specifications
- When no two orders are alike and each order/job needs special treatment.
- Where the work-in-progress differs from period to period on the basis of the number of jobs in hand.

Que 9 SM Exercise Que 1

Notebook Page no.

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 Over- head applied (₹)
115	1325	400hrs.	800	640
118	810	250hrs.	500	400
120	765	300 hrs.	475	380
	2900		1775	1420

• Job & Contract Costing

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 materials	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

Que 10 SM Illustration 2

Notebook Page no.

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 (Dept x 8 hours, Dept. x 6 hours , Dept Z x 4 hours)	45
Chargeable expenses	5
	120
Add: 33-1/3% for expenses cost	40
	160

Analysis of the Profit / Loss Account
(for the current financial year)

	(₹)		(₹)
Material 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 x/d	50,000		
	2,50,000		2,50,000
Selling expenses	30,000	Gross profit b/d	50,000
Net profit	50,000		
	50,000		50,000

It is also noted that average hourly rates for the three Departments X, Y and Z are . similar

● Job & Contract Costing

You are required to:

- (i) PREPARE a job cost sheet.
- (ii) CALCULATE the entire revised cost using current financial year actual figures as basis.
- (iii) Add 20% to total cost to DETERMINE selling price.

Que 11

SM Illustration 1

Notebook Page no.

The manufacturing cost of a work order is 1,00,000; 8% of the production against that order 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.

Chapter 11

JOINT PRODUCT & BY PRODUCT

May 18	Nov 18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May 22
0	5	5	5	5	10	0	5	5

INTRODUCTION AND NEED

- Agricultural product industries, chemical process industries, sugar industries, and extractive industries are some of the industries where two or more products of equal or unequal importance are produced either simultaneously or in the course of processing operation of a main product.
- In all such industries, the management is faced with the problems such as, valuation of inventory, pricing of product and income determination, problem of taking decision in matters of further processing of by-products and/or joint products after a certain stage etc.
- In fact, the various problems relate to
 - apportionment of common costs incurred for various products and
 - aspects other than mere apportionment of costs incurred up to the point of separation.

JOINT PRODUCTS

- **Joint Products:** 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.

BY PRODUCTS

- **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.

● Joint Product & By Product

- In short a by-product is a secondary or subsidiary product which emanates (originate) as a result of manufacture of the main product.
- Examples: molasses in the manufacture of sugar, tar, ammonia and benzole obtained on carbonization of coal and glycerin obtained in the manufacture of soap.

CO-PRODUCTS

- Joint products and co-products are used synonymously in common parlance, but strictly speaking a **distinction can be made** between two.
- Co-products may be defined as **two or more products** which are **contemporary** but do not emerge necessarily from the same material in the same process.
- **For example**, wheat and gram produced in two separate farms with separate processing of cultivation are the co-products. Similarly, timber boards made from different trees are co-products.

SPLIT OFF POINT

- Point of Separation of two or more products (joint/by) from the common process in the production line.

JOINT COST

- Joint costs are the expenditures incurred up to the point of separation i.e. split-off point.
- The main problem faced in the case of joint products/ byproducts is the apportionment of this joint costs to joint products/ or by products.
- For costs incurred after the split off point there is no problem, as these costs can be directly allocated to individual joint products or by-products.

METHODS OF APPORTIONMENT OF JOINT COST

- **Main Methods:**
 - Physical Units Method
 - Net Realizable Value at split-off point
 - Using Technical Estimates

▪ **Other Methods:**

- Market value at the point of separation
- Market value after further processing
- Average unit cost method
- Contribution margin method

PHYSICAL UNIT METHOD

- This method is based on the assumption that the joint products are capable of being measured in the same units. Accordingly, joint costs here are apportioned on the basis of some physical base, such as weight, numbers etc.
- Any loss arises during the joint production process is also apportioned over the products on the same basis.
- This method cannot be applied if the physical units of the two joint products are different.
- The main defect of this method is that it gives equal importance and value to all the joint products.

Que 1

SM Illustration 1

Notebook Page No.

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.

NET REALISABLE VALUE AT SPILT-OFF POINT METHOD

- In this method of joint cost apportionment the followings are deducted from the sales value of joint products at final stage i.e. after processing:
 - › Estimated profit margins ;
 - › Selling and distribution expenses, if any, and

● Joint Product & By Product

- Post split- off costs/ Further Processing Costs
- The net realizable value at split-off point method is widely used in the industries.

	Product-A	Product-B	Product-C
	Amount (₹)	Amount (₹)	Amount (₹)
Sales Value (units after processing x Selling price)	xxx	xxx	xxx
Less: Selling & Distribution costs	(xx)	(xx)	(xx)
Less: Post split off cost	(xx)	(xx)	(xx)
Net Realizable Value	xxx	xxx	xxx

Example 1

Notebook Page no.

An entity incurs a joint cost of ₹ 64,500 in producing two products A (200 units) and B (200 units) and earns a sales revenue of ₹86,000 by selling @ ₹ 170 per unit of product A and product B @ ₹ 260 per unit. Further processing costs for products A and B are ₹ 4,000 and ₹32,000 respectively. How the Joint cost can be apportioned to products A and B by net realizable value ?

Que 2

SM Illustration 4

Notebook Page no.

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	Sales Quantity	Selling price
	(in ton)	(in ton)	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 realizable 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 ?

METHOD- USING TECHNICAL ESTIMATES

- This method uses technical estimates to apportion the joint costs over the joint products.
- This method is used when the result obtained by the above methods does not match with the resources consumed by joint products or the realisable value of the joint products are not readily available.

OTHER METHODS:

MARKET VALUE AT THE POINT OF SEPARATION

- This method is used for the apportionment of joint costs to joint products upto the split off point.
- It is difficult to apply this method if the market value of the products at the point of separation is not available.
- It is a useful method where further processing costs are incurred disproportionately.
- To determine the apportionment of joint costs over joint products, a factor known as **multiplying factor** is determined. This multiplying factor on multiplication with the sales values of each joint product gives rise to the **proportion of joint cost**.

● Joint Product & By Product

Example 2

An entity incurs a joint cost of ₹ 64,500 in producing two products A (200 units) and B (200 units) and earns a sales revenue of ₹86,000 by selling @ ₹ 170 per unit of product A and product B @ ₹260 per unit.

MARKET VALUE AFTER FURTHER PROCESSING

- Here the basis of apportionment of joint cost is the total sales value of finished products and involves the same principle as discussed above.
- The use of this method is unfair where further processing costs after the point of separation are disproportionate or when all the joint products are not subjected to further processing.
- The net realizable value method which is discussed as above overcomes the shortcoming of this method.

Example 3

Suppose that in the example - 2 given above, if sales prices of products A and B after further processing are ₹ 200 and ₹300 respectively the joint cost apportioned over Products A and B is as follows:

AVERAGE UNIT COST METHOD

- Under this method, total process cost (upto the point of separation) is divided by total units of joint products produced.
- On division average cost per unit of production is obtained.
- This is a simple method. The effect of application of this method is that all joint products will have uniform cost per unit. If this method is used as the basis for price fixation, then all the products may have more or less the same price.
- Under this method customers of high quality items are benefitted as they have to pay less price on their purchase.

Que 3

SM Illustration 2

Notebook Page No.

FIND OUT the cost of joint products A, B and C using average unit cost method from the following data:

(a) Pre-separation Joint Cost ₹ 60,000

(b) Production data:

Products	Units produced
A	500
B	200
C	300

CONTRIBUTION MARGIN METHOD

- According to this method, joint costs are segregated into two parts - variable and fixed.
- The variable costs are apportioned over the joint products on the basis of units produced (average method) or physical quantities.
- In case the products are further processed after the point of separation, then all variable cost incurred be added to the variable costs determined earlier.
- In this way total variable cost is arrived which is deducted from their respective sales values to ascertain their contribution.
- The fixed costs are then apportioned over the joint products on the basis of the contribution ratios.

Que 4

SM Illustration 3

Notebook Page No.

FIND OUT the cost of joint products A and B using contribution margin method from the following data :

Sales :

A : 100 kg @ ₹ 60 per kg.

B : 120 kg @ ₹ 30 per kg.

Joint costs :

Marginal cost ₹ 4,400

Fixed cost ₹ 3,900

● Joint Product & By Product

Que 5

SM Exercise Que 2

Notebook Page No.

Sun-moon Ltd. produces and sells the following products:

Products	Units	Selling price at Split-of 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 realizable 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 maximize its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

TREATMENT OF BY PRODUCTS

By-product cost can be dealt in cost accounting in the following ways:

- **When they are of small total value:** When the by-products are of small total value, the amount realized from their sale may be dealt in any one the following two ways:
 - ❑ 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.
 - ❑ 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.

- **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.

Special Point: If bye product requires further processing:

In this case, the net realizable value of the by-product at the split-off point may be arrived at by subtracting the further processing cost from the realizable value of by-products.

METHODS TO VALUE BY PRODUCTS

- **Net Realizable Value method:**

- ☐ The realisation on the disposal of the byproduct may be deducted from the total cost of production so as to arrive at the cost of the main product.

- ☐ These expenses should be deducted to arrive at NRV : Further processing cost if any, selling expenses if any.

- **Standard cost in Technical Estimates:**

- ☐ By-products may be valued at standard costs.

- ☐ The standard may be determined by averaging costs recorded in the past and making technical estimates of the number of units of original raw material going into the main product and the number forming the byproduct or by adopting some other consistent basis.

- ☐ This method may be adopted where the by-product is not saleable in the condition in which it emerges or comparative prices of similar products are not available.

- **Comparative price:**

- ☐ Under this method, the value of the by-product is ascertained with reference to the price of a similar or an alternative material. Suppose in a large automobile plant, a blast furnace not only produces the steel required for the car bodies but also produces gas which is utilised in the factory. This gas can be valued at the price which would have been paid to a gas company if the factory were to buy it

● Joint Product & By Product

from outside sources.

▪ Re-use basis:

- ❑ In some cases, the by-product may be of such a nature that it can be reprocessed in the same process as part of the input of the process.
- ❑ In that case the value put on the by-product should be same as that of the materials introduced into the process. If, however, the by-product can be put into an earlier process only, the value should be the same as for the materials introduced into the process.

Que 6

SM Exercise Que 1

Notebook Page No.

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 pr 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?

Que 7

SM Exercise Que 3

Notebook Page No.

'Buttery Butter' is engaged in the production of Buttermilk, Butter and Ghee. It purchases processed cream and let it through the process of churning until it separates into buttermilk and butter. For the month of January, 'Buttery Butter' purchased 50 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 production and sales information is as follows:

Products	Production (in Kl /ton)	Sales quantity (in kl / ton)	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 the month of January.

Required:

- (i) SHOW how joint cost would be apportioned between Buttermilk and Butter under estimated net Realizable Value Method.
- (ii) 'Healthy Bones' offers to purchase 20 tonne of butter in February at ₹ 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

Que 8 SM Exercise Question 4

Notebook Page no.

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
Unit produced	1,500	3,000	4,500
Units sold	2,000	6,000	7,500
Sales price:			
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?

● Joint Product & By Product

Chapter 8

UNIT AND BATCH COSTING

May 18	Nov 18	May19	Nov19	Nov20	Jan21	Jul21	Dec21	May22
5	10	0	0	0	5	5	0	0

GROUPING OF MANUFACTURING INDUSTRIES

❖ Industry doing job work:

- An entity which is engaged in the execution of special orders, each order being distinguishable from each other, such a concern is thought of involved in performing job works.
- Jobs are worked strictly in accordance with the customer's specifications and requirements, thus, each job order is unique.
- Examples of job order types of production are: ship building, construction of road and bridges, manufacturing of heavy electrical machineries and tools, wood and furniture works etc.
- Here, each job or unit of production is treated as a separate identity for the purpose of costing.
- The methods of costing for ascertaining cost of each job are known as a job costing, contract costing and batch costing.

❖ Continuous or process type of industries

- The continuous or process type of industries are characterised by the continuous production of uniform products according to the standard specifications.
- In such a case the successive lots are generally indistinguishable as to size and form and, even if there is some variation in specifications, it is of a minor character.
- Examples of continuous type of industries are chemical and pharmaceutical products, paper/food products, canning, paints and varnish oil, rubber, textile etc.
- Here the methods of costing used for the purpose of ascertaining costs are: process costing; single output costing; operating costing etc.

● Unit & Batch Costing

UNIT COSTING

- Unit costing is that method of costing where the output produced is identical and each unit of output requires identical cost.
- Unit costing is synonymously known as single or output costing, but these are sub-division of unit costing method.
- This method of costing is followed by industries which produce single output or few variants of a single output.
- Under this method, costs are collected and analysed element wise and then total cost per unit is ascertained by dividing the total cost with the number of units produced.
- This method of costing, therefore finds its application in industries like paper, cement, steel works, mining, breweries etc. These types of industries produce identical products and therefore have identical costs.

$$\text{Cost per unit} = \frac{\text{Total cost of production}}{\text{No. of units produced}}$$

Que 1 SM Illustration 1

Notebook Page no.

The following data relate to the manufacture of a standard product during the 4- week ended 28th February:

Raw Material 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.

Que 2 SM Illustration 2

Notebook Page no.

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	Units	Direct	Direct	Factory
Number	manufactured	Material (₹)	Wages (₹)	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

BATCH COSTING

- Batch Costing is a type of specific order costing where articles are manufactured in predetermined lots, known as batch.
- Under this costing method, the cost object for cost determination is a batch for production rather output as seen in unit costing method.
- A batch consists of certain number of units which are processed simultaneously to be for manufacturing operation.
- Under this method of manufacturing, the inputs are accumulated in the assembly line till it reaches minimum batch size. Soon after a batch size is reached, all inputs in a batch is processed for further operations.
- Reasons for batch manufacturing may be either technical or economical or both.
- For example, in pen manufacturing industry, it would be too costly to manufacture one per of a particular design at a time to meet the demand of one customer. On the other hand, the production, of say 10,000 pens, of the same design will reduce the cost to a sizeable extent.
- **Special Point:**
To initiate production process, an entity has to incur expenditures on engaging workers for production and supervision, setting-up of machine to run for production etc. These are the minimum level of expenditures which have to be incurred each time a batch is run irrespective of number of units produced.

Unit & Batch Costing

Que 3 SM Illustration 3

Notebook Page no.

Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake at most 50 units of any item at a time. A customer has given an order for 600 muffins. To process a batch of 50 muffins, the following cost would be incurred:

Direct materials- ₹ 500

Direct wages- ₹ 50

Oven set- up cost ₹ 150

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.

DETERMINE the selling price for 600 muffins.

Que 4 SM Illustration 4

Notebook Page no.

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 equal to 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 (₹)
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	Overheads (₹)	Direct labour (₹)
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

ECONOMIC BATCH QUANTITY

- As the product is produced in batches or lots, the lot size chosen will be critical in achieving least cost of operation.
- Primarily, the total production cost under batch production comprises of two main costs, namely,
 - ❑ Machine Set-Up Costs
 - ❑ Inventory Holding Costs
- Analysis:
 - ❑ If the size is higher, the set up cost may decline due to lesser number of set ups required; but units in inventory will go up leading to higher holding costs.
 - ❑ If the lot size is lower, lower inventory holding costs are accomplished but only with higher set up costs.
- How to decided Batch Quantity?
 - ❑ Economic Batch Quantity

ECONOMIC BATCH QUANTITY

- **Economic** Batch Quantity is the size of a batch where total cost of set-up and holding costs are at minimum.
- **Formula:**

$$EBQ = \sqrt{\frac{2DS}{C}}$$

D = Annual Demand for the product

S = Setting Up Cost per Batch

C = Carrying Cost p.u. of production

Que 5 SM Illustration 5 Notebook Page no.

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.	

● Unit & Batch Costing

Que 6 SM Illustration 6 Notebook Page no.

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

- (i) DETERMINE the optimum run size of bearing manufacture?
- (ii) STATE what would be the interval between two consecutive optimum runs?
- (iii) FIND OUT the minimum inventory holding cost?

DIFFERENCE BETWEEN BATCH COSTING AND JOB COSTING

S.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.

Que 7 SM Illustration 7 Notebook Page no.

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 minimize total cost.

Que 8 SM Exercise Que 1

Notebook Page no.

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 up to 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.

Que 8 SM Exercise Que 2

Notebook Page no.

Rio Limited undertakes to supply 1000 units of a component per month for the months of January, February and March. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at ₹ 15 per unit.

From the following data, CALCULATE the profit per unit of each batch order and the overall position of the order for the 3,000 units.

● Unit & Batch Costing

Month	Batch Output (Numbers)	Material Cost (₹)	Labour Cost (₹)
January,2020	1,250	6,250	2,500
February,2020	1,500	9,000	3,000
March,2020	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,2020	12,000	4,000
February,2020	9,000	4,500
March,2020	15,000	5,000

Que 9 SM Exercise Que 3 Notebook Page no.

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is ₹ 324.

- COMPUTE what would be the optimum run size for bearing manufacture?
- Assuming that the company has a policy of manufacturing 6,000 bearings per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?
- CALCULATE the holding cost at optimum inventory level?

Que 10 SM Exercise Que 4 Notebook Page no.

A customer has been ordering 90,000 special design metal columns at the rate of 18,000 columns per order during the past years. The production cost per unit comprises ₹ 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%.

- FIND the most economic production run.
- CALCULATE the extra cost that company incur due to processing of 18,000 columns in a batch.