CA INTER - **COSTING**

PAST YEAR COMPILER

SEP -2024

Prepared By :

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Applicable For:

SEP 24 EXAMS

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Preface

It is perhaps the growing significance of Cost Accounting in today's Global Business that our institute has emphasized this subject at CA Inter Level.

Costing Paper is considered one of the most difficult paper to master but with the help of 100% updated material and learning tips of concept as provided by Purushottam Sir makes the subject very easy.

This present book is humble attempt to provide expertise knowledge of Costing and to ignite the passion for continuous study and revision from the examination point of view.

Now-a-days, ICMAI keeps on including new concepts, new questions and even sometimes changes the assumptions considered while solving questions so to study from recently fully updated book is of most importance to get success in exams.

It has been advised to students to use always updated books containing all material required for examination. This book is purely based on examination.
It is suggested that student should follow **following steps to master** 100% questions of costing:-

1) Understand all the concepts deeply with the help of examples as taught in classes.
2) Understand practical questions and solve them thoroughly in the classes.
3) After Step-2, Now is the time to solve all the questions yourself at home by hiding its solution.
4) Write down typical points you came across while solving question under Step-3.
5) Now verify solutions to questions point-by-point with the help of pencil and revise all typical points as noted down under step 4.
6) Repeat step 5 continuously after a certain time to become master of all practical concepts and questions.

About CA Purushottam Aggarwal Sir

Purushottam Aggarwal is a throughout first class graduate from Delhi University in the Year 2005. He is a Fellow member of The Institute of Chartered Accountants of India. **He Qualified CA in November 2007**.

a) **Presence All Over India** - CA Purushottam Sir is most respected, loved & well known faculty of India. Currently Purushottam Sir Costing Classes has **113 satellite centers** All Over India.

b) **Rankers & Toppers in Every attempt** - Our students always gets ranks in every attempt of ICAI & ICMAI e.g. **Arjun Mehra got All India Rank 1**, **Diksha Goyal got All Indian Rank 1** etc. Hundreds of students gets 90+ Marks in costing paper in every attempt under guidance of Purushottam Sir. Thousands of students gets exemptions in every attempt of CA & CMA exams under guidance of CA Purushottam Sir.

c) **Practical Exposure of Sir** - After professional education, he worked in a reputed CA firm and later on worked in "**Bharat Heavy Electricals Limited**" (A Mahanavratna Company) in managerial capacity handling the **Costing Department**.

d) **Teaching is Sir's first Love** - After getting professional practical experience of Business Environment. He started doing what he loves i.e.Teaching. He has been faculty of Cost and Management Accounting in various Management and Professional Institutes.

e) **Vast Experience of Sir** - His technique of approaching the subject matter, strategy for preparation of examination and scientific method of teaching are quite popular among the students.

He is teaching costing paper at various levels for more than 10 Years.

His **arrears of specialization** include Costing Paper.
At Present he is a professional financial consultant and faculty of Costing Paper at various professional levels e.g. CMA Final, CMA Inter, CA Final & CA Inter.

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RTP & PAST YEAR QUESTIONS OF
COST & MANAGEMENT ACCOUNTING

For Sept 2024

NOV 2020 RTP

Purushottam Sir Costing Classes

CA Purushottam Sir Teaches Costing Subject to Students of CA Inter, CMA Inter, CA Final & CMA Final

Question 1

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

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

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

(i) Minimum Stock of A?

(ii) Maximum Stock of B?

(iii) Re-order level of C?

(iv) Average stock level of A?

(v) Re-order level of D?

(vi) Minimum Stock level of D?

ANSWER :-

Minimum stock of A

Average consumption of FG = 550 + 1250 / 2 = 900 Units

Formula 1:- Re-order level – (Average Usage × Average Lead Time)

60000 kg. – (900 units × 12 kg. × 3 weeks) = 27600 kg.

Maximum stock of B

Formula 1:- Re-order level – (Min. Consumption of raw material × Min. Lead Time) + Re-order quantity

= 70000 kg. – (550 units × 8 kg. × 5 weeks) + 8000 kg.

= 56000 kg.

Re-order level of C

Formula 1:- Maximum Lead Time × Maximum Usage of raw material

= 7 weeks × (1250 units × 6 kg.) = 52500 kg.

OR

Formula 2:- Minimum stock of C + (Average consumption × Average delivery time)
= 25500 kg. + [(900 units × 6 kg.) × 5 weeks] = 52500 kg.

Average stock level of A

Formula 1:- $\frac{Max.Level\ (W.N.1)+Min.Level}{2}$ = $\frac{58800+27600}{2}$ = 43,200 Kg

W.N.1 Max. Level of A =
Formula 1:- ROL + ROQ – Min. Usage of raw material X Min. Lead Time
= 60000 kg + 12000 kg – [(550 units X 12Kg) X 2 week) = 58800 Kg

Re-Order Level of D

Formula 1:- Maximum Lead Time × Maximum Usage of raw material
= 3 weeks × (1250 units × 5 kg.) = 18750 kg.

Minimum stock of D

Average consumption of FG = 550 + 1250 / 2 = 900 Units

Formula 1:- Re-order level – (Average Usage × Average Lead Time)

18750 kg. – (900 units × 5 kg. × 2 weeks) = 9750 kg.

Question 2

GZ Ld. pays the following to a skilled worker engaged in production works. The following are the employee benefits paid to the employee:

(a)	Basic salary per day	Rs.1,000
(b)	Dearness allowance (DA)	20% of basic salary
(c)	House rent allowance	16% of basic salary
(d)	Transport allowance	Rs.50 per day of actual work
(e)	Overtime	Twice the hourly rate (considers basic and DA), only if works more than 9 hours a day otherwise no overtime allowance. If works for more than 9 hours a day then overtime is considered after 8th hours.
(f)	Work of holiday	Double of per day basic rate provided works atleast 4 hours. The holiday and Sunday basic is eligible for all allowances and statutory deductions.
(h)	Earned leave & Casual leave	These are paid leave.
(h)	Employer's contribution to Provident fund	12% of basic and DA
(i)	Employer's contribution to Pension fund	7% of basic and DA

The company normally works 8-hour a day and 26-day in a month. The company provides 30 minutes lunch break in between.

During the month of August 2020, Mr.Z works for 23 days including 15 th August and a Sunday and applied for 3 days of casual leave. On 15th August and Sunday he worked for 5 and 6 hours respectively without lunch break.

On 5th and 13th August he worked for 10 and 9 hours respectively. During the month Mr. Z worked for 100 hours on Job no.HT200. You are required to CALCULATE:

(i) Earnings per day

(ii) Effective wages rate per hour of Mr. Z.

(iii) Wages to be charged to Job no.HT200.

ANSWER :-

First of all we need to understand meaning and implication of lines given in question so we can understand each point from practical point of view

Line Given in Question	Its meaning & Implication
Transport Allowance as Rs.50 per **day of Actual Work**	If employees comes to Office then he shall be paid Rs.50 per day. This 50 rupees shall be paid even if it is Sunday, it is holiday. It also means that If employee does not come on any day in office then he shall not be paid this Rs.50
Overtime Line (Read from Question)	If worker works for more than 9 hours in a day then he shall be eligible for overtime payment. Overtime rate = Twice the hourly rate (Basic salary Plus DA) Overtime = Actual time worked – 8 hours
Working on holiday (Read From Question)	Holiday Means Sunday and Public Holiday e.g. 15th August. Overtime rate = Double per day basic Rate Condition = Works at least 4 hours. Above Pymt shall be added in Basic as given in Question.
Earned Leave & Casual Leave. These are paid leaves	Company allow some leaves in year for which salary is not deducted. It means if a worker takes CL then his salary shall not be deducted.

Out of Normal Working Days

- On 5th Date – He worked for 10 hours – It means he is eligible for Overtime Payment – He shall be paid Overtime for 2 hours
- On 13th August – He worked for 9 hours – It means he is not eligible for Overtime Payment since this is not more than 9 hours.

Extra Above Normal Working Days

- On 15th August – He worked for 5 hours – it means he is eligible for "Payment for working on holiday" since he worked more than 4 hours

- On 23th August (Sunday) – he worked for 6 hours – It means he is eligible for "Payment for working on holiday" since he worked more than 4 hours

		Time Worked
Actual Worked Days	23 Days	21 days X 7.50 Hour Per Day + 10 Hour – 0.50 hour (Lunch Time) + 9 hour – 0.50 hour (Lunch Time) = 175.50 Hours
2 Days Extra Worked	2 Days	5 hours + 6 Hours = 11 Hour **(Lunch Time not included in this as per Qn.)**
	Total	**186.50 hour**

Required Calculations

1. Overtime Rate per hour = Twice the hourly rate (Consider basic & DA)

$$= 2 \times \frac{\text{Rs.1000 + Rs.2,000 [20\% of Basic (DA)]}}{\text{8 hours per day} - \text{0.50 hour per day (Lunch Time)}} = 2 \times \text{Rs.160} = \text{Rs.320}$$

(1) . Statement showing Earnings Per Day

Particulars	Amount (Rs.)
Basic Salary Per Day	Rs.1000
DA (20% of Basic Salary)	Rs.200
HRA (16% of Basic Salary)	Rs.160
Transport Allowance	Rs.50
Employer's Contribution to PF (12% of Basic Salary Plus DA)	Rs.144
Employer's Contribution to Pension Fund (7% of Basic Salary Plus DA)	Rs.84
Total Earnings Per Day	**Rs.1638**

a) Calculation of effective wage rate per hour of Mr. Z:

Particulars	Amount (Rs.)
Basic salary (Rs.1,000 × 26 days) (Normal Working Days - 26)	26,000
Additional basic salary for Sunday & holiday (Rs.1,000 × 2 days)	2,000
Dearness allowance (20% of basic salary)	5,600
	33,600
House rent allowance (16% of basic salary)	4,480
Transport allowance (Rs.50 × 23 days)	1,150
Overtime allowance (Rs.160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × Rs.33,600)	4,032
Employer's contribution to Pension fund (7% × Rs.33,600)	2,352
Total monthly wages	46,254
Hours worked by Mr. Z (hours)	186.5
Effective wage rate per hour	**248**

*(Daily Basic + DA) ÷ 7.5 hours

= (1,000+200) ÷ 7.5 = Rs.160 per hour

(i) Calculation of wages to be charged to Job no. HT200

= Rs. 248 × 100 hours = Rs. 24,800

Question 3

You are given the following information of the three machines of a manufacturing department of X Ltd.:

	Preliminary estimates of expenses (per annum)			
	Total (Rs.)	Machines		
		A (Rs.)	B (Rs.)	C (Rs.)
Depreciation	2,00,000	75,000	75,000	50,000
Spare parts	1,00,000	40,000	40,000	20,000
Power	4,00,000			
Consumable stores	80,000	30,000	25,000	25,000
Insurance of machinery	80,000			
Indirect labour	2,00,000			
Building maintenance expenses	2,00,000			
Annual interest on capital outlay	1,00,000	40,000	40,000	20,000
Monthly charge for rent and rates	20,000			
Salary of foreman (per month)	42,000			
Salary of Attendant (per month)	12,000			

(The foreman and the attendant control all the three machines and spend equal time on them.)

The following additional information is also available:

	Machines		
	A	B	C
Estimated Direct Labour Hours	1,00,000	1,50,000	1,50,000
Ratio of K.W. Rating	3	2	3
Floor space (sq. ft.)	40,000	40,000	20,000

There are 12 holidays besides Sundays in the year, of which two were on Saturdays. The manufacturing department works 8 hours in a day but Saturdays are half days. All machines work at 90% capacity throughout the year and 2% is reasonable for breakdown.

You are required to :

CALCULATE predetermined machine hour rates for the above machines after taking into consideration the following factors:

- An increase of 15% in the price of spare parts.
- An increase of 25% in the consumption of spare parts for machine 'B' & 'C' only.

- 20% general increase in wages rates.

ANSWER :-

1. (a) Computation of Machine Hour Rate

	Basis of apportionment	Total (Rs.)	Machines		
			A (Rs.)	B (Rs.)	C (Rs.)
(A) (A) Standing Charges					
Insurance	Depreciation Basis (3:3:2)	80,000	30,000	30,000	20,000
Indirect Labour	Direct Labour (2:3:3)	2,40,000	60,000	90,000	90,000
Building maintenance expenses	Floor Space (2:2:1)	2,00,000	80,000	80,000	40,000
Rent and Rates	Floor Space (2:2:1)	2,40,000	96,000	96,000	48,000
Salary of foreman	Equal	5,04,000	1,68,000	1,68,000	1,68,000
Salary of attendant	Equal	1,44,000	48,000	48,000	48,000
Total standing charges		14,08,000	4,82,000	5,12,000	4,14,000
Hourly rate for standing charges			247.43	262.83	212.53
(B) Machine Expenses:					
Depreciation	Direct	2,00,000	75,000	75,000	50,000
Spare parts	Final estimates	1,32,250	46,000	57,500	28,750
Power	K.W. rating (3:2:3)	4,00,000	1,50,000	1,00,000	1,50,000
Consumable Stores	Direct	80,000	30,000	25,000	25,000
Total Machine expenses		8,12,250	3,01,000	2,57,500	2,53,750
Hourly Rate for Machine expenses			154.52	132.19	130.26
Total (A + B)		22,20,250	7,83,000	7,69,500	6,67,750
Machine Hour rate			**401.95**	**395.02**	**342.79**

Working Notes:

(i) Calculation of effective working hours:

No. of full off-days = No. of Sunday + No. of holidays

= 52 + 12 = 64 days

No. of half working days = 52 days – 2 holidays = 50 days

No. of full working days = 365 days – 64 days – 50 days = 251 days Total working Hours = {(251 days × 8 hours) + (50 days × 4 hours)}

= 2,008 hours + 200 = 2,208 hours.

Total effective hours = Total working hours × 90% - 2% for break-down

= 2,208 hours × 90% - 2% (2,208 hours × 90%)

= 1,987.2 hours – 39.74 hours

= 1947.46 or Rounded up to 1948 hours.

(ii) Amount of spare parts is calculated as under:

	A (Rs.)	B (Rs.)	C (Rs.)
Preliminary estimates	40,000	40,000	20,000
Add: Increase in price @ 15%	6,000	6,000	3,000
	46,000	46,000	23,000
Add: Increase in consumption @ 25%	-	11,500	5,750
Estimated cost	46,000	57,500	28,750

(iii) Amount of Indirect Labour is calculated as under:

	(Rs.)
Preliminary estimates	2,00,000
Add: Increase in wages @ 20%	40,000
	2,40,000

(iv) Interest on capital outlay is a finance cost, therefore it has been excluded from the cost accounts.

Special Notes

a) Depreciation is assumed as variable in this question but logically it should be treated as fixed.

b) Insurance of machine should be apportioned on the basis of value of machines but value of machines is not given in question hence it is apportioned on the basis of depreciation of machines

c) Interest on capital is a financial expenses and we know that this should not be added while calculating cost hence it has not been added as cost while calculating machine rate per hour.

d) Pl. Note Rent is given on monthly basis hence should be multiplied by 12 to convert in yearly.

Question 4

KD Ltd. is following Activity based costing. Budgeted overheads, cost drivers and volume are as follows:

Cost pool	Budgeted overheads (Rs.)	Cost driver	Budgeted volume
Material procurement	18,42,000	No. or orders	1,200
Material handling	8,50,000	No. of movement	1,240
Maintenance	24,56,000	Maintenance hours	17,550
Set-up	9,12,000	No. of set-ups	1,450
Quality control	4,42,000	No. of inspection	1,820

The company has produced a batch of 7,600 units, its material cost was Rs.24,62,000 and wages Rs.4,68,500. Usage activities of the said batch are as follows:

Material orders	56
Material movements	84
Maintenance hours	1,420 hours
Set-ups	60
No. of inspections	18

Required:

(i) CALCULATE cost driver rates.

(ii) CALCULATE the total and unit cost for the batch.

ANSWER :-

(i) Calculation of cost driver rate:

Cost pool	Budgeted overheads (Rs.)	Cost driver	Cost driver rate (Rs.)
Material procurement	18,42,000	1,200	1,535.00
Material handling	8,50,000	1,240	685.48
Maintenance	24,56,000	17,550	139.94
Set-up	9,12,000	1,450	628.97
Quality control	4,42,000	1,820	242.86

(ii) Calculation of cost for the batch:

Particulars	Amount (Rs.)	Amount (Rs.)
Material cost		24,62,000.00
Wages		4,68,500.00

Overheads:		
- Material procurement (Rs.1,535×56 orders)	85,960.00	
Material handling (Rs.685.48×84 movements)	57,580.32	
- Maintenance (Rs.139.94×1,420 hours)	1,98,714.80	
- Set-up (Rs.628.97×60 set-ups)	37,738.20	
- Quality control (Rs.242.86×18 inspections)	4,371.48	3,84,364.80
Total Cost		33,14,864.80
No. of units		7,600
Cost per units		436.17

Question 5

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

Particulars	**Amount (Rs.)**
Purchase of raw materials	84,00,000
Consumable materials	4,80,000
Direct wages	60,00,000
Carriage inward	1,72,600
Wages to foreman and store keeper	8,40,000
Other indirect wages to factory staffs	1,35,000
Expenditure on research and development on new production technology	9,60,000
Salary to accountants	7,20,000
Employer's contribution to EPF & ESI	7,20,000
Cost of power & fuel	28,00,000
Production planning office expenses	12,60,000
Salary to delivery staffs	14,30,000
Income tax for the assessment year 2019-20	2,80,000
Fees to statutory auditor	1,80,000
Fees to cost auditor	80,000
Fees to independent directors	9,40,000
Donation to PM-national relief fund	1,10,000
Value of sales	2,82,60,000
Position of inventories as on 01-04-2019:	
- Raw Material	6,20,000

- W-I-P	7,84,000
- Finished goods	14,40,000
Position of inventories as on 31-03-2020:	
- Raw Material	4,60,000
- W-I-P	6,64,000
- Finished goods	9,80,000

From the above information PREPARE a cost sheet for the year ended 31 st March 2020.

ANSWER :-

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

Sl. No.	Particulars	Amount (Rs.)	Amount (Rs.)
(i)	Material Consumed:		
	- Raw materials purchased	84,00,000	
	- Carriage inward	1,72,600	
	Add: Opening stock of raw materials	6,20,000	
	Less: Closing stock of raw materials	(4,60,000)	87,32,600
(ii)	Direct employee (labour) cost:		
	- Direct wages	60,00,000	
	- Employer's Contribution towards PF & ESIS	7,20,000	67,20,000
(iii)	Direct expenses:		
	- Consumable materials	4,80,000	
	- Cost of power & fuel	28,00,000	32,80,000
	Prime Cost		1,87,32,600
(iv)	Works/ Factory overheads:		
	- Wages to foreman and store keeper	8,40,000	
	Other indirect wages to factory staffs	1,35,000	9,75,000
	Gross factory cost		1,97,07,600
	Add: Opening value of W-I-P		7,84,000
	Less: Closing value of W-I-P		(6,64,000)
	Factory Cost		1,98,27,600
(v)	Research & development cost paid for improvement in production process		9,60,000

(vi)	Production planning office expenses		12,60,000
	Cost of Production		2,20,47,600
	Add: Opening stock of finished goods		14,40,000
	Less: Closing stock of finished goods		(9,80,000)
	Cost of Goods Sold		2,25,07,600
(vii)	Administrative overheads:		
	- Salary to accountants	7,20,000	
	- Fees to statutory auditor	1,80,000	
	- Fees to cost auditor	80,000	
	- Fee paid to independent directors	9,40,000	19,20,000
(viii)	Selling overheads& Distribution overheads:		
	- Salary to delivery staffs		14,30,000
	Cost of Sales		2,58,57,600
	Profit (balancing figure)		24,02,400
	Sales		2,82,60,000

Note: Income tax and Donation to PM National Relief Fund is avoided in the cost sheet.

Question 6

A manufacturing company disclosed a net loss of Rs.6,94,000 as per their cost accounts for the year ended March 31,2020. The financial accounts however disclosed a net loss of Rs.10,20,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

	(Rs.)
(i) Factory Overheads under-absorbed	80,000
(ii) Administration Overheads over-absorbed	1,20,000
(iii) Depreciation charged in Financial Accounts	6,50,000
(iv) Depreciation charged in Cost Accounts	5,50,000
(v) Interest on investments not included in Cost Accounts	1,92,000
(vi) Income-tax provided	1,08,000
(vii) Interest on loan funds in Financial Accounts	4,90,000
(viii) Transfer fees (credit in financial books)	48,000
(ix) Stores adjustment (credit in financial books)	28,000
(x) Dividend received	64,000

PREPARE a memorandum Reconciliation Account.

ANSWER:-

Memorandum Reconciliation Accounts

Dr. Cr.

	(Rs.)		(Rs.)
To Net Loss as per Costing books	6,94,000	Administration overheads over recovered in cost accounts	1,20,000
To Factory overheads under absorbed in Cost Accounts	80,000	By Interest on investment not included in Cost Accounts	1,92,000
To Depreciation under charged in Cost Accounts	1,00,000	By Transfer fees in Financial books	48,000
To Income-Tax not provided in Cost Accounts	1,08,000	By Stores adjustment (Credit in financial books)	28,000
To Interest on Loan Funds in Financial Accounts	4,90,000	By Dividend received in financial books	64,000
		By Net loss as per Financial books	10,20,000
	14,72,000		14,72,000

Question 7

A Ltd. manufactures mother boards used in smart phones. A smart phone requires one mother board. As per the study conducted by the Indian Cellular Association, there will be a demand of 180 million smart phones in the coming year. A Ltd. is expected to have a market share of 5.5% of the total market demand of the mother boards in the coming year. It is estimated that it costs Rs.6.25 as inventory holding cost per board per month and that the set-up cost per run of board manufacture is Rs.33,500.

(i) COMPUTE the optimum run size for board manufacturing?

(ii) Assuming that the company has a policy of manufacturing 80,000 boards per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

ANSWER :-

(i) Computation of optimum run size

Optimum run size or Economic Batch Quantity (EBQ) = $\frac{\sqrt{2xDxS}}{C}$

Where, D = Annual demand i.e. 5.5% of 18,00,00,000 = 99,00,000 units S = Set-up cost per run = Rs.33,500

C = Inventory holding cost per unit per annum

= Rs.6.25 × 12 months = Rs.75

EBQ = $\frac{\sqrt{2x99,00,000units\ x\ Rs\ 33,500}}{Rs\ 75}$ = 94,042.5 units or 94,043 units

(ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set- ups	Set-up Cost (Rs.)	Inventory holding cost (Rs.)	TotalCost (Rs.)
A	80,000 units	124 $\left(\frac{99,00,000}{80,000}\right)$	41,54,000 (124 × Rs.33,500)	30,00,000 $\left(\frac{80,000\ x\ Rs.75}{2}\right)$	71,54,000
B	94,043 units	106 $\left(\frac{99,00,000}{94,043}\right)$	35,51,000 (106 × Rs.33,500)	35,26,612.5 $\left(\frac{94,043\ x\ Rs.75}{2}\right)$	70,77,612.50
	Extra Cost (A – B)				76,387.50

Question 8

AP Ltd. received a job order for supply and fitting of plumbing materials. Following are the details related with the job work:

Direct Materials

AP Ltd. uses a weighted average method for the pricing of materials issues. Opening stock of materials as on 12th August 2020:

- 15mm GI Pipe, 12 units of (15 feet size) @ Rs.600 each
- 20mm GI Pipe, 10 units of (15 feet size) @ Rs. 660 each
- Other fitting materials, 60 units @ Rs. 26 each
- Stainless Steel Faucet, 6 units @ Rs. 204 each
- Valve, 8 units @ Rs. 404 each Purchases:

On 16th August 2020:

- 20mm GI Pipe, 30 units of (15 feet size) @ Rs. 610 each
- 10 units of Valve @ Rs. 402 each On 18th August 2020:
- Other fitting materials, 150 units @ Rs. 28 each
- Stainless Steel Faucet, 15 units @ Rs. 209 each On 27th August 2020:
- 15mm GI Pipe, 35 units of (15 feet size) @ Rs. 628 each
- 20mm GI Pipe, 20 units of (15 feet size) @ Rs. 660 each
- Valve, 14 units @ Rs. 424 each Issues for the hostel job:

On 12th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)

- Other fitting materials, 18 units On 17th August 2020:
- 15mm GI Pipe, 8 units of (15 feet size)
- Other fitting materials, 30 units On 28th August 2020:
- 20mm GI Pipe, 2 units of (15 feet size)
- 15mm GI Pipe, 10 units of (15 feet size)
- Other fitting materials, 34 units
- Valve, 6 units On 30th August 2020:
- Other fitting materials, 60 units
- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ Rs.100 per hour (includes 12 hours overtime) Helper: 192 hours @ Rs.70 per hour (includes 24 hours overtime) Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ Rs.26 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

(a) CALCULATE the total cost of the job.

(b) CALCULATE the price to be charged from the customer.

ANSWER :-

(a) Calculation of Total Cost for the Job:

Particulars	Amount (Rs.)	Amount (Rs.)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	
- Stainless steel faucet 15 units x $\left(\frac{6 \text{ x Rs.}204 + 15 \text{ x Rs.}209}{21 \text{ units}}\right)$	3,113.57	

- Valve 15 units x $\left(\frac{6 \text{ x Rs.204} + 15 \text{ x Rs.209}}{21 \text{ units}}\right)$	2,472.75	23,091.95
Direct Labour:		
-Plumber [(180 hours × Rs.100) + (12 hours × Rs.50)]	18,600.00	
-Helper [(192 hours × Rs.70) + (24 hours × Rs.35)]	14,280.00	32,880.00
- Overheads[Rs.26 × (180 + 192) hours]		9,672.00
Total Cost		**65,643.95**

(b) Price to be charged for the job work:

	Amount (Rs.)
Total Cost incurred on the job	65,643.95
Add: 25% Profit on Job Price x $\left(\frac{65,643.95}{75\%} \text{ x } 25\%\right)$	21,881.32
	87,525.27

W. Note 1 – Calculation of Cost of 15mm material used

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							12	600	7200
17th Aug				8	600	4800	4	600	2400
27th Aug	35	628	21980				39	625.1282	24380
28th Aug				10	625.1282	6251.282	29	625.1282	18128.718
Total						**11051.282**			

W. Note 2 – Calculation of Cost of 20mm material used

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							10	660	6600
12th Aug				2	660	1320	8	660	5280
16th	30	610	18300				38	620.526	23580

Aug									
27th Aug	20	660	13200				58	634.1379	36780
28th Aug				2	634.1379	1268.28			
Total						**2588.28**			

W. Note 3 – Calculation of Cost of Other Fittings material

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							60	26	1560
12th Aug				18	26	468	42	26	1092
17th Aug				30	26	780	12	26	312
18th Aug	150	28	4200				162	27.85	4512
28th Aug				34	27.85	946.96	128	27.85	3565.03
30th Aug				60	27.85	1671.11	68	27.85	1893.92
Total						**3866.07**			

W. Note 4 – Calculation of Cost of Stainless Steel

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							6	204	1224
16th Aug	15	209	3135				21	207.5714	4359
30th Aug				15	207.5714	3113.57			
Total						**3113.57**			

W. Note 5 – Calculation of Cost of Valve

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							8	404	3232
16th Aug	10	402	4020				18	402.8888	7252

27th Aug	14	424	5936				32	412.125	13188
28th Aug				6	412.125	2472.75	26	412.125	10715.25
Total						**2472.75**			

Question 9

M Ltd. produces a product-X, which passes through three processes, I, II and III. In Process-III a by-product arises, which after further processing at a cost of Rs.85 per unit, product Z is produced. The information related for the month of August 2020 is as follows:

	Process-I	Process-II	Process-III
Normal loss	5%	10%	5%
Materials introduced (7,000 units)	1,40,000	-	-
Other materials added	62,000	1,36,000	84,200
Direct wages	42,000	54,000	48,000
Direct expenses	14,000	16,000	14,000

Production overhead for the month is Rs.2,88,000, which is absorbed as a percentage of direct wages.

The scrapes are sold at Rs.10 per unit

Product-Z can be sold at Rs.135 per unit with a selling cost of Rs.15 per unit No. of units produced:

Process-I- 6,600; Process-II- 5,200, Process-III- 4,800 and Product-Z- 600 There is not stock at the beginning and end of the month.

You are required to PREPARE accounts for:

(vii) Process-I, II and III

(viii) By-product process.

ANSWER :-

(i) **Process-I A/c**

Particulars	Units	Amt.(Rs.)	Particulars	Units	Amt.(Rs.)
To Materials	7,000	1,40,000	By Normal loss (5% of 7,000)	350	3,500
To Other materials	-	62,000	By Process-II*	6,600	3,35,955
To Direct wages	-	42,000	By Abnormal loss*	50	2,545
To Direct expenses	-	14,000			
To Production OH (200% of Rs.42,000)	-	84,000			
	7,000	3,42,000		7,000	3,42,000

$\frac{Rs.(3,42,000-3,500)}{(7,000-350)units}$ = Rs.50.9022

Process-II A/c

Particulars	Units	Amt.(Rs.)	Particulars	Units	Amt.(Rs.)
To Process-I A/c	6,600	3,35,955	By Normal loss (10% of 6,600)	660	6,600
To Other materials	-	1,36,000	By Process-III**	5,200	5,63,206
To Direct wages	-	54,000	By Abnormal loss**	740	80,149
To Direct expenses	-	16,000			
To Production OH (200% of Rs.54,000)	-	1,08,000			
	6,600	6,49,955		6,600	6,49,955

$\frac{Rs.(6,49,955-6,600)}{(6,600-660)units}$ = Rs.108.3089

Process-III A/c

Particulars	Units	Amt.(Rs.)	Particulars	Units	Amt.(Rs.)
To Process-I A/c	5,200	5,63,206	By Normal loss (5% of 5,200)	260	2,600
To Other materials	-	84,200	By Product-X***	4,800	8,64,670
To Direct wages	-	48,000			
To Direct expenses	-	14,000	By Product-Z# (Rs.35×600)	600	21,000
To Production OH (200% of Rs.48,000)	-	96,000			
To Abnormal gain***	460	82,864			
	5,660	8,88,270		5,660	8,88,270

$\frac{Rs.(8,05,406-2,600-21,000)}{(6,600-660)units}$ = Rs.180.1396

Realisable value = Rs.135 – (85+15) = Rs.35

(ii) **By-Product Process A/c**

Particulars	Units	Amt.(Rs.)	Particulars	Units	Amt.(Rs.)
To Process-III A/c	600	21,000	By Product-Z	600	81,000
To Processing cost	-	51,000			
To Selling expenses	-	9,000			
	600	81,000		600	81,000

Question 10

ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split off without further processing or any other additional costs. Product Z, however, is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2019-20, the selling prices of the items and the total amounts sold were:

X – 186 tons sold for Rs.3,000 per ton Y – 527 tons sold for Rs.2,250 per ton

Z – 736 tons sold for Rs.1,500 per ton

The total joint manufacturing costs for the year were Rs.12,50,000. An additional Rs. 6,20,000 was spent to finish product Z.

There were no opening inventories of X, Y or Z at the end of the year. The following inventories of complete units were on hand:

X 180 tons

Y 60 Tons

Z 25 tons

There was no opening or closing work-in-progress. Required:

COMPUTE the cost of inventories of X, Y and Z and cost of goods sold for year ended March 31, 2020, using Net realizable value (NRV) method of joint cost allocation.

ANSWER :-

(i) (a) Statement of Joint Cost allocation of inventories of X, Y and Z
(By using Net Realisable Value Method)

	Products			Total
	X	Y	Z	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Final sales value of total production (Working Note 1)	10,98,000 (366 × Rs.3,000)	13,20,750 (587 × Rs.2,250)	11,41,500 (761 × Rs.1,500)	35,60,250

Less: Additional cost	--	--	(6,20,000)	(6,20,000)
Net realisable value (at split-off point)	10,98,000	13,20,750	5,21,500	29,40,250
Joint cost allocated (Working Note 2)	4,66,797	5,61,496	2,21,707	12,50,000

Cost of goods sold as on March 31, 2020 (By using Net Realisable Value Method)

	Products			Total
	X	Y	Z	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Allocated joint cost	4,66,797	5,61,496	2,21,707	12,50,000
Additional costs	--	--	6,20,000	6,20,000
Cost of goods available for sale (CGAS)	4,66,797	5,61,496	8,41,707	18,70,000
Less: Cost of ending inventory (Working Note 1)	2,29,571 (CGAS×49.18%)	57,385 (CGAS × 10.22%)	27,692 (CGAS × .29%)	3,14,648
Cost of goods sold	2,37,226	5,04,111	8,14,015	15,55,352

Working Notes

1. **Total production of three products for the year 2019-2020**

Products	Quantity sold in tones	Quantity of ending inventory in tons	Total production	Ending inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)}	(5) = (3)/ (4)
X	186	180	366	49.18
Y	527	60	587	10.22
Z	736	25	761	3.29

2. **Joint cost apportioned to each product:**

$$\frac{TOTAL\ JOINT\ COST}{TOTAL\ NET\ REALISABLE\ VALUE}$$ X Net Realisable Value of each product

Total cos t of Product X = $\frac{Rs.12,50,000}{Rs.29,40,250}$ x Rs.10,98,000 = Rs. 4,66,797

Total cos t of Product Y = $\frac{Rs.12,50,000}{Rs.29,40,250}$ x Rs.13,20,750 = Rs.5,61,496

Total cos t of Product Z = $\frac{Rs.12,50,000}{Rs.29,40,250}$ x Rs.5,21,500 = Rs.2,21,707

Question 11

A transport company has 20 vehicles, the capacities are as follows:

No. of Vehicles	Capacity per vehicle
5	9 MT
6	12 MT
7	15 MT
2	20 MT

The company provides the goods transport service between stations 'A' to station 'B'. Distance between these stations is 100 kilometers. Each vehicle makes one round trip per day on an average. Vehicles are loaded with an average of 90 per cent of capacity at the time of departure from station 'A' to station 'B' and at the time of return back loaded with 70 per cent of capacity. 10 per cent of vehicles are laid up for repairs every day. The following information is related to the month of August, 2020:

Salary of Transport Manager	Rs. 60,000
Salary of 30 drivers	Rs. 20,000 each driver
Wages of 25 Helpers	Rs. 12,000 each helper
Loading and unloading charges	Rs. 850 each trip
Consumable stores (depends on running of vehicles)	Rs. 1,35,000
Insurance (Annual)	Rs. 8,40,000
Road Licence (Annual)	Rs. 6,00,000
Cost of Diesel per litre	Rs. 78
Kilometres run per litre each vehicle	5 Km.
Lubricant, Oil etc.	Rs. 1,15,000
Cost of replacement of Tyres, Tubes, other parts etc. (on running basis)	Rs. 4,25,000
Garage rent (Annual)	Rs. 9,00,000
Routine mechanical services	Rs. 3,00,000
Electricity charges (for office, garage and washing station)	Rs. 55,000
Depreciation of vehicles (on time basis)	Rs. 6,00,000

There is a workshop attached to transport department which repairs these vehicles and other vehicles also. 40 per cent of transport manager's salary is debited to the workshop. The transport department has been apportioned Rs.88,000 by the workshop during the month. During the month operation was for 25 days.

You are required:

(i) CALCULATE per ton-km operating cost.

(ii) DETERMINE the freight to be charged per ton-km, if the company earned a profit of 25 per cent on freight.

ANSWER :-

(i) Operating Cost Sheet for the month of August, 2020

	Particulars	Amount (Rs.)
A.	**Fixed Charges:**	
	Manager's salary (Rs.60,000 × 60%)	36,000
	Drivers' Salary (Rs.20,000 × 30 drivers)	6,00,000
	Helpers' wages (Rs.12,000 × 25 helpers)	3,00,000
	Insurance (Rs.8,40,000 ÷ 12 months)	70,000
	Road licence (Rs.6,00,000 ÷ 12 months)	50,000
	Garage rent (Rs.9,00,000 ÷ 12 months)	75,000
	Routine mechanical services	3,00,000
	Electricity charges (for office, garage and washing station)	55,000
	Depreciation of vehicles	6,00,000
	Apportioned workshop expenses	88,000
	Total (A)	21,74,000
B.	**Variable Charges:**	
	Loading and unloading charges (Working Note 1)	7,65,000
	Consumable Stores	1,35,000
	Cost of diesel (Working Note 2)	14,04,000
	Lubricant, Oil etc.	1,15,000
	Replacement of Tyres, Tubes & other parts	4,25,000
	Total (B)	28,44,000
C.	**Total Cost (A + B)**	**50,18,000**
D.	Total Ton-Kms. (Working Note 3)	9,43,200
E.	**Cost per ton-km. (C ÷ D)**	**5.32**

(ii) Calculation of Chargeable Freight

Cost per ton-km.	Rs.5.32
Add: Profit @ 25% on freight or 33⅓% on cost	Rs. 1.77
Chargeable freight per ton-km.	**Rs. 7.09**

Working Notes:

1. **Wages paid to loading and unloading labours**

   Numbers of vehicles available per day × No. of days × trips × wages per trip

(20 vehicles × 90%) × 25 days × 2 trips × Rs.850

18 × 25 × 2 × 850 = Rs.7,65,000

2. Cost of Diesel:

Distance covered by each vehicle during August, 2020

= 100 k.m. × 2 × 25 days × 90% = 4,500 km.

$$\text{Consumption of diesel} = \frac{4{,}500\text{k.m.} \times 20\text{vehicles}}{5\text{k.m.}}$$

$$= 18{,}000 \text{ litres.}$$

Cost of diesel = 18,000 litres × Rs. 78 = Rs.14,04,000.

3. Calculation of total ton-km:

Total Ton-Km. = Total Capacity × Distance covered by each vehicle × Average Capacity Utilisation ratio.

$$= \left[(5 \times 9\,\text{MT}) + (6 \times 12\text{MT}) + (7 \times 15\,\text{MT}) + (2 \times 20\,\text{MT})\right] \times 4{,}500\text{k.m.} \times \frac{(90\% + 70\%)}{2}$$

$$= (45 + 72 + 105 + 40)$$

= 262 × 4,500 × 80%.

= 9,43,200 ton-km.

Question 12

Following are the standard cost for a product-X:

	(Rs.)
Direct materials 10 kg @ Rs. 90 per kg	900
Direct labour 8 hours @ Rs.100 per hour	800
Variable Overhead 8 hours @ Rs.15 per hour	120
Fixed Overhead	400
	2,220

Budgeted output for the year was 2,000 units. Actual output is 1,800 units. Actual cost for year is as follows:

	(Rs.)
Direct Materials 17,800 Kg @ Rs. 92 per Kg.	16,37,600
Direct Labour 14,000 hours @ Rs. 104 per hour	14,56,000
Variable Overhead incurred	2,17,500
Fixed Overhead incurred	7,68,000

You are required to CALCULATE:

(i) Material Usage Variance
(ii) Material Price Variance
(iii) Material Cost Variance
(iv) Labour Efficiency Variance
(v) Labour Rate Variance
(vi) Labour Cost Variance
(vii) Variable Overhead Cost Variance
(viii) Fixed Overhead Cost Variance.

ANSWER:-

(i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
= Rs. 90 (18,000 kg. – 17,800 kg.)
= Rs. 18,000 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 17,800 kg. (Rs. 90 – Rs. 92)
= Rs. 35,600 (Adverse)

(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost
= (SQ × SP) – (AQ × AP)
= (18,000 kg. × Rs. 90) – (17,800 kg. × Rs. 92)
= Rs. 16,20,000 – Rs. 16,37,600
= Rs.17,600 (Adverse)

(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
= Rs. 100 (1,800 units × 8 – 14,000 hrs.)
= Rs. 100 (14,400 hrs. – 14,000 hrs.)
= Rs. 40,000 (Favourable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 14,000 hrs. (Rs. 100 – Rs.104)
= Rs. 56,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost
= (SH × SR) – (AH × AR)
= (14,400 hrs. × Rs. 100) – (14,000 hrs. × Rs. 104)
= Rs. 14,40,000 – Rs. 14,56,000
= Rs.16,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost

= (14,400 hrs. × Rs. 15) – Rs. 2,17,500

= Rs. 1,500 (Adverse)

(viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead – Actual Fixed Overhead
= (1,800 units x Rs.400) – Rs.7,68,000
= Rs.7,20,000 – Rs.7,68,000 = Rs.48,000 (Adverse)

Question 13

J Ltd. manufactures a Product-Y. Analysis of income statement indicated a profit of Rs. 250 lakhs on a sales volume of 5,00,000 units. Fixed costs are Rs.1,000 lakhs which appears to be high. Existing selling price is Rs.680 per unit. The company is considering revising the profit target to Rs. 700 lakhs. You are required to COMPUTE –

(i) Break- even point at existing levels in units and in rupees.

(ii) The number of units required to be sold to earn the target profit.

(iii) Profit with 10% increase in selling price and drop in sales volume by 10%.

(iv) Volume to be achieved to earn target profit at the revised selling price as calculated in (ii) above, if a reduction of 10% in the variable costs and Rs. 170 lakhs in the fixed cost is envisaged.

ANSWER:-

Sales Volume 5,00,000 Units

Computation of existing contribution

Particulars	Per unit (Rs.)	Total (Rs. In lakhs)
Sales	680	3,400
Fixed Cost	200	1,000
Profit	50	250
Contribution	250	1,250
Variable Cost (Sales – Contribution)	430	2,150

(i) Break even sales in units = $\frac{\text{fixed cost}}{\text{contribution per unit}} = \frac{Rs.10,00,00,000}{Rs.250}$ = 4,00,000 units

Break even sales in rupees = 4,00,000 units × Rs. 680 = Rs. 2,720 lakhs

OR

P/V Ratio = $\frac{250}{680} \times 100 = 36.76\%$

B.EP (Rupees) = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{10,00,00,000}{36.76\%}$ = Rs. 2,720 lakhs (approx.)

(ii) Number of units sold to achieve a target profit of Rs.700 lakhs:

Desired Contribution = Fixed Cost + Target Profit

= 1,000 L + 700 L = 1,700 L

Number of units to be sold = $\frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{17,00,00,000}{250}$ = 6,80,000 units

(iii) Profit if selling price is increased by 10% and sales volume drops by 10%:

Existing Selling Price per unit = Rs. 680

Revised selling price per unit = Rs. 680 × 110% = Rs.748

Existing Sales Volume = 5,00,000 units

Revised sales volume = 5,00,000 units – 10% of 5,00,000 = 4,50,000 units.

Statement of profit at sales volume of 4,50,000 units @ Rs. 748 per unit

Particulars	Per unit (Rs.)	Total (Rs. In lakhs)
Sales	748	3,366
Less: Variable Costs	430	1,935
Contribution	318	1,431
Less: Fixed Cost		1,000
Profit		**431**

(iv) Volume to be achieved to earn target profit of Rs.700 lakhs with revised selling price and reduction of 10% in variable costs and Rs.170 lakhs in fixed cost:

Revised selling price per unit = Rs.748

Variable costs per unit existing = Rs.430

Revised Variable Costs

Reduction of 10% in variable costs = Rs. 430 – 10% of 430

= Rs. 430 – Rs.43

= Rs.387

Total Fixed Cost (existing) = Rs. 1,000

lakhs Reduction in fixed cost = Rs. 170 lakhs

Revised fixed cost = Rs. 1,000 lakhs – Rs. 170 lakhs = Rs.830 lakhs

Revised Contribution (unit) = Revised selling price per unit – Revised Variable Costs per units

Revised Contribution per unit = Rs. 748 – Rs. 387 = Rs. 361

Desired Contribution = Revised Fixed Cost + Target Profit

= Rs. 830 lakhs + Rs.700 lakhs = Rs.1,530 lakhs

No. of units to be sold $= \frac{Desired\ contribution}{contribution\ per\ unit} = \frac{Rs.15,30,00,000}{Rs.361} =$ 4,23,823 units

Question 14

The information of Z Ltd. for the year ended 31st March 2020 is as below:

	Amount (Rs.)
Direct materials	17,50,000
Direct wages	12,50,000
Variable factory overhead	9,50,000
Fixed factory overhead	12,00,000
Other variable costs	6,00,000
Other fixed costs	4,00,000
Profit	8,50,000
Sales	70,00,000

During the year, the company manufactured two products, X and Y, and the output and cost were:

	X	Y
Output (units)	8,000	4,000
Selling price per unit (Rs.)	600	550
Direct material per unit (Rs.)	140	157.50
Direct wages per unit (Rs.)	90	132.50

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as:

Product X – Rs.40 per unit and Product Y- Rs.70 per unit.

For the FY 2020-21, due to a pandemic, it is expected that demand for product X and Y will fall by 20% & 10% respectively. It is also expected that direct wages cost will raise by 20% and other fixed costs by 10%. Products will be required to be sold at a discount of 20%.

You are required to:

(i) PREPARE product- wise profitability statement on marginal costing method for the FY 2019-20 and

(ii) PREPARE a budget for the FY 2020-21.

ANSWER:-

(i) Product-wise Profitability Statement for the FY 2019-20:

Particulars	Product-X (Rs.)	Product-Y (Rs.)	Total (Rs.)
Output (units)	8,000	4,000	
Selling price per unit	600	550	
Sales value	48,00,000	22,00,000	70,00,000

Direct material	11,20,000 (Rs.140×8,000)	6,30,000 (Rs.157.50×4,000)	17,50,000
Direct wages	7,20,000 (Rs.90×8,000)	5,30,000 (Rs.132.5×4,000)	12,50,000
Variable factory overheads	5,47,200 (76%of 7,20,000)	4,02,800 (76%of 5,30,000)	9,50,000
Other variable costs	3,20,000 (Rs.40×8,000)	2,80,000 (Rs.70×4,000)	6,00,000
Contribution	20,92,800	3,57,200	24,50,000
Fixed factory overheads	-	-	12,00,000
Other fixed costs	-	-	4,00,000
Profit			**8,50,000**

(ii) Preparation of Budget for the FY 2020-21:

Particulars	Product-X (Rs.)	Product-Y (Rs.)	Total (Rs.)
Output (units)	6,400 (8,000×80%)	3,600 (4,000×90%)	
Selling price per unit	480 (600×80%)	440 (550×80%)	
Sales value	30,72,000	15,84,000	46,56,000
Direct material	8,96,000 (Rs.140×6,400)	5,67,000 (Rs.157.50×3,600)	14,63,000
Direct wages per unit	6,91,200 (Rs.108×6,400)	5,72,400 (Rs.159×3,600)	12,63,600
Variable factory overheads	5,25,312 (76%of 6,91,200)	4,35,024 (76%of 5,72,400)	9,60,336
Other variable costs	2,56,000 (Rs.40×6,400)	2,52,000 (Rs.70×3,600)	5,08,000
Contribution	7,03,488	(2,42,424)	4,61,064
Fixed factory overheads	-	-	12,00,000
Other fixed costs (110%of Rs.4,00,000)	-	-	4,40,000
Profit/ (Loss)			**(11,78,936)**

Question 15

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

(b) DESCRIBE the three advantages of Cost-plus contract.

(c) STATE the advantages of Zero-based budgeting.

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

ANSWER :-

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

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

(b) Advantages of Cost plus contracts are as follows:

(i) The Contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.

(ii) It is useful specially when the work to be done is not definitely fixed at the time of making the estimate.

(iii) 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.

(c) The advantages of zero-based budgeting are as follows:

- It provides a systematic approach for the evaluation of different activities and ranks them in order of preference for the allocation of scarce resources.
- It ensures that the various functions undertaken by the organization are critica l for the achievement of its objectives and are being performed in the best possible way.
- It provides an opportunity to the management to allocate resources for various activities only after having a thorough cost-benefit-analysis. The chances of arbitrary cuts and enhancement are thus avoided.
- The areas of wasteful expenditure can be easily identified and eliminated.
- Departmental budgets are closely linked with corporation objectives.
- The technique can also be used for the introduction and implementation of the system of 'management by objective.' Thus, it cannot only be used for fulfillment of the objectives of traditional budgeting but it can also be used for a variety of other purposes.

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

The two examples of industries are Ready made garments and Jewellery making.

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Material Cost

1. A Ltd. produces a product 'X' using a raw material 'D'. To produce one unit of X, 4 kg of D is required. As per the sales forecast conducted by the company, it will be able to sale 20,000 units of X in the coming year.

   The following are the information related to the raw material D:

   (i) The Re-order quantity is 400 kg. less than the Economic Order Quantity (EOQ).

   (ii) Maximum consumption per day is 40 kg. more than the average consumption per day.

   (iii) There is an opening stock of 2,000 kg.

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

   (v) The purchase price is ₹ 250 per kg.

   There is an opening stock of 1,800 units of the finished product X.

   The carrying cost of inventory is 14% p.a.

   To place an order company has to incur ₹ 1,340 on paper and documentation work.

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

   (a) Re-order Quantity

   (b) Maximum Stock level

   (c) Minimum Stock level

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

   [Take 300 days for a year]

Employee Cost

2. JBL Sisters operates a boutique which works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 8 hours for boutique work on a piece of garment. In the month of December 2020, two workers M and J were given 15 pieces and 21 pieces of garments respectively for boutique work. The following are the details of their work:

	M	J
Work assigned	15 pcs.	21 pcs.
Time taken	100 hours	140 hours

   Workers are paid bonus as per Halsey System. The existing rate of wages is ₹ 60 per hour. As per the new wages agreement the workers will be paid ₹ 72 per hour w.e.f. 1st January

2021. At the end of the month December 2020, the accountant of the company has wrongly calculated wages to these two workers taking ₹ 72 per hour.

Required:

(i) CALCULATE the loss incurred due to incorrect rate selection.

(ii) CALCULATE the loss incurred due to incorrect rate selection, had Rowan scheme of bonus payment followed.

(iii) CALCULATE the loss/ savings if Rowan scheme of bonus payment had followed.

(iv) DISCUSS the suitability of Rowan scheme of bonus payment for JBL Sisters?

Overheads: Absorption Costing Method

3. A manufacturing unit has purchased and installed a new machine at a cost of ₹ 24,90,000 to its fleet of 5 existing machines. The new machine has an estimated life of 12 years and is expected to realise ₹ 90,000 as scrap value at the end of its working life.

Other relevant data are as follows:

(i) Budgeted working hours are 2,496 based on 8 hours per day for 312 days. Plant maintenance work is carried out on weekends when production is totally halted. The estimated maintenance hours are 416. During the production hours machine set-up and change over works are carried out. During the set-up hours no production is done. A total 312 hours are required for machine set-ups and change overs.

(ii) An estimated cost of maintenance of the machine is ₹ 2,40,000 p.a.

(iii) The machine requires a component to be replaced every week at a cost of ₹ 2,400.

(iv) There are three operators to control the operations of all the 6 machines. Each operator is paid ₹ 30,000 per month plus 20% fringe benefits.

(v) Electricity: During the production hours including set-up hours, the machine consumes 60 units per hour. During the maintenance the machine consumes only 10 units per hour. Rate of electricity per unit of consumption is ₹ 6.

(vi) Departmental and general works overhead allocated to the operation during last year was ₹ 5,00,000. During the current year it is estimated to increase by 10%.

Required:

COMPUTE the machine hour rate.

Activity Based Costing

4. The following budgeted information relates to N Ltd. for the year 2021:

	Products		
	X	Y	Z
Production and Sales (units)	1,00,000	80,000	60,000
	(₹)	(₹)	(₹)
Selling price per unit	90	180	140
Direct cost per unit	50	90	95
	Hours	Hours	Hours
Machine department (machine hours per unit)	3	4	5
Assembly department (direct labour hours per unit)	6	4	3

The estimated overhead expenses for the year 2021 will be as below:

Machine Department ₹ 73,60,000

Assembly Department ₹ 55,00,000

Overhead expenses are apportioned to the products on the following basis:

Machine Department On the basis of machine hours

Assembly Department On the basis of labour hours

After a detailed study of the activities the following cost pools and their respective cost drivers are found:

Cost Pool	Amount (₹)	Cost Driver	Quantity
Machining services	64,40,000	Machine hours	9,20,000 hours
Assembly services	44,00,000	Direct labour hours	11,00,000 hours
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups
Order processing	7,20,000	Customer orders	7,200 orders
Purchasing	4,00,000	Purchase orders	800 orders

As per an estimate the activities will be used by the three products:

	Products		
	X	Y	Z
Machine set-ups	4,500	3,000	1,500

Customer orders	2,200	2,400	2,600
Purchase orders	300	350	150

You are required to PREPARE a product-wise profit statement using:

(i) Absorption costing method;

(ii) Activity-based method.

Cost Sheet

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

Sl. No.		Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	Freight inward		9,20,600
(iii)	Wages paid to factory workers		25,20,000
(iv)	Royalty paid for production		1,80,000
(v)	Amount paid for power & fuel		3,50,000
(vi)	Job charges paid to job workers		3,10,000
(vii)	Stores and spares consumed		1,10,000
(viii)	Depreciation on office building		50,000
(ix)	Repairs & Maintenance paid for:		
	- Plant & Machinery	40,000	
	- Sales office building	20,000	60,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	28,200	
	- Factory building	18,800	47,000
(xi)	Expenses paid for quality control check activities		18,000
(xii)	Research & development cost paid for improvement in production process		20,000
(xiii)	Expenses paid for pollution control and engineering & maintenance		36,000
(xiv)	Salary paid to Sales & Marketing mangers		5,60,000
(xv)	Salary paid to General Manager		6,40,000
(xvi)	Packing cost paid for:		

	- Primary packing necessary to maintain quality	46,000	
	- For re-distribution of finished goods	80,000	1,26,000
(xvii)	Fee paid to independent directors		1,20,000
(xviii)	Performance bonus paid to sales staffs		1,20,000
(xix)	Value of stock as on 1st January, 2020:		
	- Raw materials	10,00,000	
	- Work-in-process	8,60,000	
	- Finished goods	12,00,000	30,60,000
(xx)	Value of stock as on 31st December, 2020:		
	- Raw materials	8,40,000	
	- Work-in-process	6,60,000	
	- Finished goods	10,50,000	25,50,000

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

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

Cost Accounting System

6. The financial books of a company reveal the following data for the year ended 31st March, 2020:

	(₹)
Opening Stock:	
Finished goods 625 units	1,06,250
Work-in-process	92,000
01.04.2019 to 31.03.2020	
Raw materials consumed	16,80,000
Direct Labour	12,20,000
Factory overheads	8,44,000
Administration overheads (production related)	3,96,000
Dividend paid	2,44,000
Bad Debts	36,000
Selling and Distribution Overheads	1,44,000

Interest received	76,000
Rent received	92,000
Sales 12,615 units	45,60,000
Closing Stock: Finished goods 415 units	91,300
Work-in-process	82,400

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹ 6 per unit sold.
- Opening Stock of finished goods is valued at ₹ 240 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(i) PREPARE statements for the year ended 31st March, 2020 showing:
- the profit as per financial records
- the profit as per costing records.

(ii) PREPARE a statement reconciling the profit as per costing records with the profit as per financial records.

Job Costing

7. SM Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2019-20:

		(₹)
(i)	Opening Stock of Material	15,00,000
(ii)	Closing Stock of Material	20,00,000
(iii)	Purchase of Material	1,80,50,000
(iv)	Direct Labour	90,50,000
(v)	Factory Overhead	30,80,000
(vi)	Administrative Overhead	20,50,400

During the FY 2020-21, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 40,50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost.

Cost of delivery of the components at customer's premises is estimated at ₹ 4,50,000.

You are required to:

(i) CALCULATE the overhead recovery rates based on actual costs for 2019-20.

(ii) PREPARE a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

Process Costing

8. A company produces a component, which passes through two processes. During the month of November, 2020, materials for 40,000 components were put into Process- I of which 30,000 were completed and transferred to Process- II. Those not transferred to Process- II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process- I costs incurred were as follows:

Direct Materials	₹ 3,00,000
Direct Wages	₹ 3,50,000
Factory Overheads	₹ 2,45,000

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

Costs incurred in Process-II are as follows:

Packing Materials	₹ 80,000
Direct Wages	₹ 71,125
Factory Overheads	₹ 85,350

Packing material cost is incurred at the end of the second process as protective packing to the completed units of production.

Required:

(i) PREPARE Statement of Equivalent Production, Cost per unit and Process I A/c.

(ii) PREPARE statement of Equivalent Production, Cost per unit and Process II A/c.

Service Costing

9. VPS is a public school having 25 buses each plying in different directions for the transport of its school students. In view of large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The workload of the students has been so arranged that in the morning, the first trip picks up senior students and the second trip plying an hour later picks

up junior students. Similarly, in the afternoon, the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus, one way is 8 km. The school works 22 days in a month and remains closed for vacation in May and June. The bus fee, however, is payable by the students for all the 12 months in a year.

The details of expenses for a year are as under:

Driver's salary – payable for all the 12 in months	₹ 12,000 per month per driver
Cleaner's salary payable for all the 12 months	₹ 8,000 per month per cleaner
License fees, taxes etc.	₹ 8,400 per bus per annum
Insurance Premium	₹ 15,600 per bus per annum
Repairs and Maintenance	₹ 20,500 per bus per annum
Purchase price of the bus	₹ 20,00,000 each
Life of the bus	16 years
Scrap value	₹ 1,60,000
Diesel Cost	₹ 78.50 per litre

Each bus gives an average of 5 km. per litre of diesel. The seating capacity of each bus is 40 students.

The school follows differential transportation fees based on distance travelled as under:

Students picked up and dropped within the range of distance from the school	Transportation fee	Percentage of students availing this facility
2 km.	25% of Full	15%
4 km.	50% of Full	30%
8 km.	Full	55%

Due to a pandemic, lockdown imposed on schools and the school remained closed from April 2020 to December 2020. Drivers and cleaners were paid 75% of their salary during the lockdown period. Repairing cost reduced to 75% for the year 2020.

Ignore the interest cost.

Required:

(i) PREPARE a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

(ii) FIND OUT transportation fee per student per month in respect of:

(a) Students coming from a distance of upto 2 km. from the school.

(b) Students coming from a distance of upto 4 km. from the school; and

(c) Students coming from a distance of upto 8 km. from the school.

(iii) CALCULATE the minimum bus fare that has to be recovered from the students for the year 2020.

Standard Costing

10. LM Limited produces a product 'SX4' which is sold in a 10 Kg. packet. The standard cost card per packet of 'SX4' is as follows:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹ 80 per hour	640
Variable Overhead 8 hours @ ₹ 20 per hour	160
Fixed Overhead	250
	1,950

Budgeted output for a quarter of a year was 10,000 Kg. Actual output is 9,000 Kg.

Actual costs for this quarter are as follows:

	(₹)
Direct Materials 8,900 Kg @ ₹ 92 per Kg.	8,18,800
Direct Labour 7,000 hours @ ₹ 84 per hour	5,88,000
Variable Overhead incurred	1,40,000
Fixed Overhead incurred	2,60,000

You are required to CALCULATE:

(i) Material Usage Variance

(ii) Material Price Variance

(iii) Material Cost Variance

(iv) Labour Efficiency Variance

(v) Labour Rate Variance

(vi) Labour Cost Variance

(vii) Variable Overhead Cost Variance

(viii) Fixed Overhead Cost Variance

Marginal Costing (Short- term Decision making)

11. Aditya Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	S	T	U
Sales Mix	35%	35%	30%
Selling Price	₹ 300	₹ 400	₹ 200
Variable Cost	₹ 150	₹ 200	₹ 120
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 60,00,000

The company has currently under discussion, a proposal to discontinue the manufacture of Product U and replace it with Product M, when the following results are anticipated:

	Products		
	S	T	M
Sales Mix	50%	25%	25%
Selling Price	₹ 300	₹ 400	₹ 300
Variable Cost	₹ 150	₹ 200	₹ 150
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 64,00,000

Required

(i) COMPUTE the PV ratio, total contribution, profit and Break-even sales for the existing product mix.

(ii) COMPUTE the PV ratio, total contribution, profit and Break-even sales for the proposed product mix.

Budget and Budgetary Control

12. RS Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 302.4 lakh during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹ 60 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 69,12,000.

The other relevant details are as under:

Purchase Price:	Material A	₹ 160 per kg
	Materials B	₹ 100 per kg
Labour Rate:	Machine Shop	₹ 140 per hour
	Assembly Shop	₹ 70 per hour

	Finished Stock	Material A	Material B
Opening Stock	2,500 units	7,500 kg	4,000 kg
Closing Stock	3,000 units	8,000 kg	5,500 kg

Required:

(i) CALCULATE number of units of product proposed to be sold and selling price per unit,

(ii) PREPARE Production Budget in units, and

(iii) PREPARE Material Purchase Budget in units.

Miscellaneous

13. (a) WRITE note on cost-plus-contracts.

(b) HOW apportionment of joint costs upto the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? DISCUSS.

(c) DISCUSS cost classification based on variability and controllability.

(d) DESCRIBE the salient features of budget manual.

SUGGESTED HINTS/ANSWERS

1. Working Notes:

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

Sales forecast of the product 'X'	20,000 units
Less: Opening stock of 'X'	1,800 units
Fresh units of 'X' to be produced	18,200 units
Raw material required to produce 18,200 units of 'X' (18,200 units × 4 kg.)	72,800 kg.
Less: Opening Stock of 'D'	2,000 kg.
Annual demand for raw material 'D'	70,800 kg.

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

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

$$= \sqrt{\frac{2\times 70,800\,\text{kg.}\times ₹1,340}{₹250\times 14\%}} = \sqrt{\frac{2\times 70,800\,\text{kg.}\times ₹1,340}{₹35}} = 2,328\ \text{kg.}$$

(iii) Re- Order level:

= (Maximum consumption per day × Maximum lead time)

$$= \left\{\left(\frac{\text{Annual Consumption of 'D'}}{300\,\text{days}} + 40\,\text{kg.}\right)\times 8\ \text{days}\right\}$$

$$= \left\{\left(\frac{70,800\,\text{kg.}}{300\,\text{days}} + 40\,\text{kg.}\right)\times 8\ \text{days}\right\} = 2,208\ \text{kg.}$$

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

Average Consumption per day = 236 Kg.

Hence, Maximum Consumption per day = 236 kg. + 40 kg. = 276 kg.

So Minimum consumption per day will be

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

Or, 236 kg. $= \frac{\text{Min. consumption} + 276\ \text{kg.}}{2}$

Or, Min. consumption = 472 kg – 276 kg. = 196 kg.

(a) Re-order Quantity :

EOQ – 400 kg. = 2,328 kg. – 400 kg.= 1,928 kg.

(b) Maximum Stock level:

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

= 2,208 kg. + 1,928 kg. – (196 kg. × 4 days) = 4,136 kg. – 784 kg. = 3,352 kg.

(c) Minimum Stock level:

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

= 2,208 kg. – (236 kg. × 6 days) = 792 kg.

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

		When purchasing the ROQ	When purchasing the EOQ
I	Order quantity	1,928 kg.	2,328 kg.
II	No. of orders a year	$\frac{70,800\,\text{kg.}}{1,928\,\text{kg.}} = 36.72$ or 37 orders	$\frac{70,800\,\text{kg.}}{2,328\,\text{kg.}} = 30.41$ or 31 orders

III	Ordering Cost	37 orders × ₹ 1,340 = ₹ 49,580	31 orders × ₹ 1,340 = ₹ 41,540
IV	Average Inventory	$\frac{1,928 kg.}{2} = 964 kg.$	$\frac{2,328 kg.}{2} = 1,164 kg.$
V	Carrying Cost	964 kg. × ₹ 35 = ₹ 33,740	1,164 kg. × ₹ 35 = ₹ 40,740
VI	Total Cost	₹ 83,320	₹ 82,280

Extra Cost incurred due to not ordering EOQ = ₹83,320 - ₹82,280 = ₹1,040

2. Workings Notes:

Calculation of Total hours saved:

	M	J
No. of garments assigned (Pieces.)	15	21
Hour allowed per piece (Hours)	8	8
Total hours allowed (Hours)	120	168
Hours Taken (Hours)	100	140
Hours Saved (Hours)	20	28

(i) Calculation of loss incurred due to incorrect rate selection:

(While calculating loss only excess rate per hour has been taken)

	M (₹)	J (₹)	Total (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	120 (50% of 20 Hrs. × ₹12)	168 (50% of 28 Hrs. × ₹12)	288
Excess Wages Paid	1,320	1,848	3,168

(ii) Calculation of loss incurred due to incorrect rate selection had Rowan scheme of bonus payment followed:

	M (₹)	J (₹)	Total (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880

Bonus (as per Rowan Scheme) $\left(\frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Excess Rate}\right)$	200 $\left(\frac{100}{120} \times 20 \times ₹12\right)$	280 $\left(\frac{140}{168} \times 28 \times ₹12\right)$	480
Excess Wages Paid	1,400	1,960	3,360

(iii) Calculation of amount that could have been saved if Rowan Scheme were followed

	M (₹)	J (₹)	Total (₹)
Wages paid under Halsey Scheme	1,320	1,848	3,168
Wages paid under Rowan Scheme	1,400	1,960	3,360
Difference (loss)	(80)	(112)	(192)

(iv) Rowan Scheme of incentive payment has the following benefits, which is suitable with the nature of business in which JBL Sisters operates:

(a) Under Rowan Scheme of bonus payment, workers cannot increase their earnings or bonus by merely increasing its work speed. Bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.

(b) If the rate setting department commits any mistake in setting standards for time to be taken to complete the works, the loss incurred will be relatively low.

3. Working Note:

1. Effective machine hour:

   = Budgeted working hours – Machine Set-up time

   = 2,496 hours – 312 hours = 2,184 hours.

2. Operators' salary per annum:

Salary (3 operators × ₹30,000 × 12 months)	₹ 10,80,000
Add: Fringe benefits (20% of ₹10,80,000)	₹ 2,16,000
	₹ 12,96,000

3. Depreciation per annum

$$\frac{₹24,90,000 - ₹90,000}{12 \text{ years}} = ₹\ 2,00,000$$

Computation of Machine hour Rate

	Amount p.a. (₹)	Amount per hour (₹)
Standing charges		
Operators' Salary $\left(\frac{₹12,96,000}{6\,\text{machines}} \times \frac{1}{2,184\,\text{hours}}\right)$	12,96,000	98.90
Departmental and general overheads: (₹ 5,00,000 × 110%) $\left(\frac{₹5,50,000}{6\,\text{machines}} \times \frac{1}{2,184\,\text{hours}}\right)$	5,50,000	41.97
(A)	18,46,000	140.87
Machine Expenses		
Depreciation $\left(\frac{₹2,00,000}{2,184\,\text{hours}}\right)$	2,00,000	91.58
Electricity:		
During working hours (2,496 hours × 60 units ×₹6)	8,98,560	411.43
During maintenance hours (416 hours × 10 units ×₹6)	24,960	11.43
Component replacement cost (2,400 × 52 weeks)	1,24,800	57.14
Machine maintenance cost	2,40,000	109.89
(B)	14,88,320	681.47
Machine Hour Rate (A + B)		822.34

4. (i) Profit Statement using Absorption costing method:

	Particulars	Product			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	2,40,000
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads:				

(i)	Machine department (₹) (Working note-1)	24,00,000	25,60,000	24,00,000	73,60,000
(ii)	Assembly department (₹) (Working note-1)	30,00,000	16,00,000	9,00,000	55,00,000
G.	Total Cost (₹) [E+F]	1,04,00,000	1,13,60,000	90,00,000	3,07,60,000
H.	Profit (C-G)	(14,00,000)	30,40,000	(6,00,000)	10,40,000

(ii) Profit Statement using Activity based costing (ABC) method:

	Particulars	Product			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads: (Refer working note-3)				
(i)	Machining services (₹)	21,00,000	22,40,000	21,00,000	64,40,000
(ii)	Assembly services (₹)	24,00,000	12,80,000	7,20,000	44,00,000
(iii)	Set-up costs (₹)	4,50,000	3,00,000	1,50,000	9,00,000
(iv)	Order processing (₹)	2,20,000	2,40,000	2,60,000	7,20,000
(v)	Purchasing (₹)	1,50,000	1,75,000	75,000	4,00,000
G.	Total Cost (₹) [E+F]	1,03,20,000	1,14,35,000	90,05,000	3,07,60,000
H.	Profit (₹) (C-G)	(13,20,000)	29,65,000	(6,05,000)	10,40,000

Working Notes:

1.

		Products			
		X	Y	Z	Total
A.	Production (units)	1,00,000	80,000	60,000	
B.	Machine hours per unit	3	4	5	
C.	Total Machine hours [A×B]	3,00,000	3,20,000	3,00,000	9,20,000

D.	Rate per hour (₹)	8	8	8	
E.	**Machine Dept. cost [C×D]**	**24,00,000**	**25,60,000**	**24,00,000**	**73,60,000**
F.	Labour hours per unit	6	4	3	
G.	Total labour hours [A×F]	6,00,000	3,20,000	1,80,000	11,00,000
H.	Rate per hour (₹)	5	5	5	
I	**Assembly Dept. cost [G×H]**	**30,00,000**	**16,00,000**	**9,00,000**	**55,00,000**

$$\text{Machine hour rate} = \frac{₹73,60,000}{9,20,000 \text{ hours}} = ₹\ 8$$

$$\text{Labour hour rate} = \frac{₹55,00,000}{11,00,000 \text{ hours}} = ₹\ 5$$

2. Calculation of cost driver rate

Cost Pool	Amount (₹)	Cost Driver	Quantity	Driver rate (₹)
Machining services	64,40,000	Machine hours	9,20,000 hours	7.00
Assembly services	44,00,000	Direct labour hours	11,00,000 hours	4.00
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups	100.00
Order processing	7,20,000	Customer orders	7,200 orders	100.00
Purchasing	4,00,000	Purchase orders	800 orders	500.00

3. Calculation of activity-wise cost

		Products			
		X	**Y**	**Z**	**Total**
A.	Machining hours (Refer Working note-1)	3,00,000	3,20,000	3,00,000	9,20,000
B.	Machine hour rate (₹) (Refer Working note-2)	7	7	7	
C.	**Machining services cost (₹) [A×B]**	**21,00,000**	**22,40,000**	**21,00,000**	**64,40,000**

D.	Labour hours (Refer Working note-1)	6,00,000	3,20,000	1,80,000	11,00,000
E.	Labour hour rate (₹) (Refer Working note-2)	4	4	4	
F.	**Assembly services cost (₹) [D×E]**	**24,00,000**	**12,80,000**	**7,20,000**	**44,00,000**
G.	Machine set-ups	4,500	3,000	1,500	9,000
H.	Rate per set-up (₹) (Refer Working note-2)	100	100	100	
I.	**Set-up cost (₹) [G×H]**	**4,50,000**	**3,00,000**	**1,50,000**	**9,00,000**
J.	Customer orders	2,200	2,400	2,600	7,200
K.	Rate per order (₹) (Refer Working note-2)	100	100	100	
L.	**Order processing cost (₹) [J×K]**	**2,20,000**	**2,40,000**	**2,60,000**	**7,20,000**
M.	Purchase orders	300	350	150	800
N.	Rate per order (₹) (Refer Working note-2)	500	500	500	
O.	**Purchasing cost (₹) [M×N]**	**1,50,000**	**1,75,000**	**75,000**	**4,00,000**

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

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	- Raw materials purchased	5,00,00,000	
	- Freight inward	9,20,600	
	Add: Opening stock of raw materials	10,00,000	
	Less: Closing stock of raw materials	(8,40,000)	5,10,80,600
(ii)	Direct employee (labour) cost:		
	- Wages paid to factory workers		25,20,000
(iii)	Direct expenses:		
	- Royalty paid for production	1,80,000	
	- Amount paid for power & fuel	3,50,000	
	- Job charges paid to job workers	3,10,000	8,40,000

	Prime Cost		5,44,40,600
(iv)	Works/ Factory overheads:		
	- Stores and spares consumed	1,10,000	
	- Repairs & Maintenance paid for plant & machinery	40,000	
	- Insurance premium paid for plant & machinery	28,200	
	- Insurance premium paid for factory building	18,800	
	- Expenses paid for pollution control and engineering & maintenance	36,000	2,33,000
	Gross factory cost		5,46,73,600
	Add: Opening value of W-I-P		8,60,000
	Less: Closing value of W-I-P		(6,60,000)
	Factory Cost		5,48,73,600
(v)	Quality control cost:		
	- Expenses paid for quality control check activities		18,000
(vi)	Research & development cost paid for improvement in production process		20,000
(vii)	Less: Realisable value on sale of scrap and waste		(48,000)
(viii)	Add: Primary packing cost		46,000
	Cost of Production		5,49,09,600
	Add: Opening stock of finished goods		12,00,000
	Less: Closing stock of finished goods		(10,50,000)
	Cost of Goods Sold		5,50,59,600
(ix)	Administrative overheads:		
	- Depreciation on office building	50,000	
	- Salary paid to General Manager	6,40,000	
	- Fee paid to independent directors	1,20,000	8,10,000
(x)	Selling overheads:		
	- Repairs & Maintenance paid for sales office building	20,000	

	- Salary paid to Manager- Sales & Marketing	5,60,000	
	- Performance bonus paid to sales staffs	1,20,000	7,00,000
(xi)	Distribution overheads:		
	- Packing cost paid for re-distribution of finished goods		80,000
	Cost of Sales		5,66,49,600

6. (i) Statement of Profit as per financial records

(for the year ended March 31, 2020)

	(₹)		(₹)
To Opening stock of Finished Goods	1,06,250	By Sales	45,60,000
To Work-in-process	92,000	By Closing stock of finished Goods	91,300
To Raw materials consumed	16,80,000	By Work-in-Process	82,400
To Direct labour	12,20,000	By Rent received	92,000
To Factory overheads	8,44,000	By Interest received	76,000
To Administration overheads	3,96,000		
To Selling & distribution overheads	1,44,000		
To Dividend paid	2,44,000		
To Bad debts	36,000		
To Profit	1,39,450		
	49,01,700		49,01,700

Statement of Profit as per costing records

(for the year ended March 31,2020)

	(₹)
Sales revenue (A) (12,615 units)	45,60,000
Cost of sales:	
Opening stock (625 units × ₹ 240)	1,50,000
Add: Cost of production of 12,405 units	43,28,140

(Refer to working note 2)	
Less: Closing stock $\left(\frac{₹\,43,28,140 \times 415 \text{ units}}{12,405 \text{ units}}\right)$	(1,44,795)
Production cost of goods sold (12,615 units)	43,33,345
Selling & distribution overheads (12,615 units × ₹ 6)	75,690
Cost of sales: (B)	44,09,035
Profit: {(A) – (B)}	1,50,965

(ii) Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		1,50,965
Add: Administration overheads over absorbed (₹ 5,64,540 – ₹ 3,96,000)	1,68,540	
Opening stock overvalued (₹1,50,000 – ₹ 1,06,250)	43,750	
Interest received	76,000	
Rent received	92,000	
Factory overheads over recovered (₹ 8,54,000 – ₹ 8,44,000)	10,000	3,90,290
		5,41,255
Less: Selling & distribution overheads under recovery (₹ 1,44,000 – ₹ 75,690)	68,310	
Closing stock overvalued (₹1,44,795 – ₹ 91,300)	53,495	
Dividend	2,44,000	
Bad debts	36,000	(4,01,805)
Profit as per financial accounts		1,39,450

Working notes:

1. Number of units produced

	Units
Sales	12,615
Add: Closing stock	415
Total	13,030
Less: Opening stock	(625)
Number of units produced	12,405

2. Cost Sheet

	(₹)
Raw materials consumed	16,80,000
Direct labour	12,20,000
Prime cost	29,00,000
Factory overheads (70% of direct wages)	8,54,000
Factory cost	37,54,000
Add: Opening work-in-process	92,000
Less: Closing work-in-process	(82,400)
Factory cost of goods produced	37,63,600
Administration overheads (15% of factory cost)	5,64,540
Cost of production of 12,405 units (Refer to working note 1)	43,28,140
Cost of production per unit: $= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹43,28,140}{12,405 \text{ units}} = ₹348.90$	

7. (i) Calculation of Overhead Recovery Rate:

$$\text{Factory Overhead Recovery Rate} = \frac{\text{Factory Overhead in } 2019-20}{\text{Direct Labour Costs in } 2019-20} \times 100$$

$$= \frac{₹\ 30,80,000}{₹90,50,000} \times 100 = 34\% \text{ of Direct labour}$$

Administrative Overhead Recovery Rate

$$= \frac{\text{Administrative Overhead in } 2019-20}{\text{Factory Costs in } 2019-20 \text{ (W.N.)}} \times 100$$

$$= \frac{₹\ 20,50,400}{₹\ 2,96,80,000} \times 100 = 6.91\% \text{ of Factory Cost}$$

Working Note:

Calculation of Factory Cost in 2019-20

Particulars	Amount (₹)
Opening Stock of Material	15,00,000
Add: Purchase of Material	1,80,50,000
Less: Closing Stock of Material	(20,00,000)
Material Consumed	1,75,50,000
Direct Labour	90,50,000
Prime Cost	2,66,00,000
Factory Overhead	30,80,000
Factory Cost	2,96,80,000

(ii) Job Cost Sheet for the order received in 2020-21

Particulars	Amount (₹)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of ₹ 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of ₹ 1,34,27,000)	9,27,806
Cost of delivery	4,50,000
Total Cost	1,48,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	49,34,935
Sales value (Price to be quoted for the order)	1,97,39,741

Hence the price to be quoted is ₹ 1,97,39,741

8. **Process I**

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
40,000	Completed	30,000	100	30,000	100	30,000	100	30,000
	Closing WIP	10,000	100	10,000	50	5,000	50	5,000
40,000		40,000		40,000		35,000		35,000

Particulars	Materials	Labour	Overhead	Total
Cost incurred (₹)	3,00,000	3,50,000	2,45,000	8,95,000
Equivalent units	40,000	35,000	35,000	
Cost per equivalent unit (₹)	7.50	10.00	7.00	24.50

Process-I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Materials	40,000	3,00,000	By Process-II A/c (30,000 units × ₹24.5)	30,000	7,35,000
To Labour		3,50,000	By Closing WIP*	10,000	1,60,000
To Overhead		2,45,000			
	40,000	8,95,000		40,000	8,95,000

***** (Material 10,000 units × ₹ 7.5) + (Labour 5,000 units × ₹ 10) + (Overheads 5,000 units × ₹7)

= ₹ 75,000 + ₹ 50,000 + ₹ 35,000 = ₹ 1,60,000

Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--
	Closing WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

Particulars	Materials	Labour	Overhead	Total
Process-I Cost	7,35,000	--	--	7,35,000
Cost incurred (₹)	--	71,125	85,350	1,56,475
Equivalent units	29,800	28,450	28,450	--
Cost per equivalent unit (₹)	24.6644	2.5000	3.0000	30.1644

Process-II Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	30,000	7,35,000	By Normal loss A/c	200	--
To Packing Material	--	80,000	By Finished Goods Stock A/c	28,000*	9,24,604
To Direct Wages	--	71,125	By Closing WIP	1,800**	46,871
To Factory Overhead	--	85,350			
	30,000	9,71,475		30,000	9,71,475

* 28,000 × ₹ 30.1644 = ₹ 8,44,603 + ₹ 80,000 (Packing Material Cost) = ₹ 9,24,604

** 1,800 units × ₹ 24.6644 + 450 units × (₹ 2.5 + ₹3) = ₹ 46,871

9. (i) Statement showing the expenses of operating a single bus and the fleet of 25 buses for a year

Particulars	Per bus per annum (₹)	Fleet of 25 buses per annum (₹)
Running costs : (A)		
Diesel (Refer to working note 1)	2,21,056	55,26,400
Repairs & maintenance costs: (B)	20,500	5,12,500
Fixed charges:		
Driver's salary (₹ 12,000 × 12 months)	1,44,000	36,00,000
Cleaners salary (₹ 8,000 × 12 months)	96,000	24,00,000
Licence fee, taxes etc.	8,400	2,10,000
Insurance	15,600	3,90,000
Depreciation $\left(\frac{₹\ 20,00,000 - ₹1,60,000}{16 \text{ years}}\right)$	1,15,000	28,75,000

Total fixed charges: (C)	3,79,000	94,75,000
Total expenses: (A+B+C)	6,20,556	1,55,13,900

(ii) Average cost per student per month in respect of students coming from a distance of:

(a) 2 km. from the school {₹ 6,20,556 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 219.12
(b) 4 km. from the school (₹ 219.12 × 2)	₹ 438.24
(c) 8 km. from the school (₹ 219.12 × 4)	₹ 876.48

(iii) Calculation of minimum bus fare to be recovered from the students during the year 2020:

Statement showing the expenses of operating a single bus in year 2020

Particulars	Per bus per annum (₹)
Running costs : (A)	
Diesel (Refer to working note 3)	66,316.80
Repairs & maintenance costs: (B) (₹ 20,500 x 0.75)	15,375
Fixed charges:	
Driver's salary {₹ 12,000 × 3 months + (75% of ₹ 12,000 × 9 months)}	1,17,000
Cleaners salary {₹ 8,000 × 3 months + (75% of ₹ 8,000 × 9 months)}	78,000
Licence fee, taxes etc.	8,400
Insurance	15,600
Depreciation $\left(\frac{₹\ 20,00,000 - ₹1,60,000}{16\ \text{years}}\right)$	1,15,000
Total fixed charges: (C)	3,34,000
Total expenses: (A+B+C)	4,15,691.80

Minimum bus fare to be recovered:

(a) 2 km. from the school {₹ 4,15,691.8 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 146.78
(b) 4 km. from the school (₹ 146.78 × 2)	₹ 293.56
(c) 8 km. from the school (₹146.78 × 4)	₹ 587.12

Working Notes:

1. Calculation of diesel cost per bus:

No. of trips made by a bus each day	4
Distance travelled in one trip both ways (8 km. × 2 trips)	16 km.
Distance travelled per day by a bus (16 km. × 4 shifts)	64 km.
Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled per year (1,408 × 10 months)	14,080 km.
No. of litres of diesel required per bus per year (14,080 km. ÷ 5 km.)	2,816 litres
Cost of diesel per bus per year (2,816 litres × ₹ 78.50)	₹ 2,21,056

2. Calculation of equivalent number of students per bus:

Bus capacity of 2 trips (40 students × 2 trips)	80 students
$^1/_4{}^{th}$ fare students (15% × 80 students)	12 students
½ fare students (30% × 80 students × 2) (equivalent to $^1/_4{}^{th}$ fare students)	48 students
Full fare students (55% × 80 students × 4) (equivalent to $^1/_4{}^{th}$ fare students)	176 students
Total students equivalent to $^1/_4{}^{th}$ fare students	236 students

3. Calculation of diesel cost per bus in Year 2020:

Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled during the year 2020 (1,408 × 3 months)	4,224 km.
No. of litres of diesel required per bus per year (4,224 km. ÷ 5 km.)	844.8 litres
Cost of diesel per bus per year (844.8 litres × ₹ 78.50)	₹ 66,316.80

10. (i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
= ₹ 90 (9,000 kg. – 8,900 kg.)
= ₹ 9,000 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 8,900 kg. (₹ 90 – ₹ 92) = ₹ 17,800 (Adverse)

(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost
= (SQ × SP) – (AQ × AP)

= (9,000 kg. × ₹ 90) – (8,900 kg. × ₹ 92)

= ₹ 8,10,000 – ₹ 8,18,800

= ₹ 8,800 (Adverse)

(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)

$= ₹\ 80\ (\frac{9,000}{10} \times 8 \text{hours} - 7,000 \text{ hrs.})$

= ₹ 80 (7,200 hrs. – 7,000 hrs.)

= ₹ 16,000 (Favourable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= 7,000 hrs. (₹ 80 – ₹ 84)

= ₹ 28,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost

= (SH × SR) – (AH × AR)

= (7,200 hrs. × ₹ 80) – (7,000 hrs. × ₹ 84)

= ₹ 5,76,000 – ₹ 5,88,000

= ₹ 12,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost

= (7,200 hrs. × ₹ 20) – ₹ 1,40,000

= ₹ 4,000 (Adverse)

(viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead – Actual Fixed Overhead

$= \frac{₹\ 250}{10 \text{ kgs.}} \times 9,000 \text{kgs.} - ₹\ 2,60,000$

= ₹ 2,25,000 – ₹ 2,60,000 = ₹ 35,000 (Adverse)

11. (i) Computation of PV ratio, contribution and break-even sales for existing product mix

	Products			Total
	S	T	U	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	

Contribution per unit (₹)	150	200	80	
P/V Ratio (Contribution/Selling price)	50%	50%	40%	
Sales Mix	35%	35%	30%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	17.5%	17.5%	12%	47%
Present Total Contribution (₹60,00,000 × 47%)				₹ 28,20,000
Less: Fixed Costs				₹ 18,00,000
Present Profit				₹ 10,20,000
Present Break Even Sales (₹18,00,000/0.47)				₹ 38,29,787

(ii) Computation of PV ratio, contribution and break-even sale for proposed product mix

	Products			
	S	T	M	Total
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	150	
P/V Ratio (Contribution/Selling price)	50%	50%	50%	
Sales Mix	50%	25%	25%	
Contribution per rupee of sales (P/V Ratio x Sales Mix)	25%	12.5%	12.5%	50%
Proposed Total Contribution (₹64,00,000 x 50%)				₹ 32,00,000
Less: Fixed Costs				₹ 18,00,000
Proposed Profit				₹ 14,00,000
Proposed Break Even Sales (₹18,00,000/0.50)				₹ 36,00,000

12. Workings:

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000

Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs. @ ₹ 140 per hour	560
Assembly Shop: 2 hrs. @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold = Total Variable Cost / Variable Cost per unit
= ₹ 1,72,80,000 / ₹ 2,160
= 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold
= ₹ 3,02,40,000 / 8,000 units
= ₹ 3,780

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000
Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	51,000	25,500
	(8,500 units × 6 Kg.)	(8,500 units × 3 Kg.)
Add: Desired Closing Stock	8,000	5,500
Total Requirements	59,000	31,000
Less: Opening Stock	(7,500)	(4,000)
Quantity to be purchased	51,500	27,000

13. (a) These contracts provide for the payment by the contractee of the actual cost of construction plus a stipulated profit, mutually decided between the two parties.

The main features of these contracts are as follows:

(i) The practice of cost-plus contracts is adopted in the case of those contracts where the probable cost of the contracts cannot be ascertained in advance with a reasonable accuracy.

(ii) These contracts are preferred when the cost of material and labour is not steady and the contract completion may take number of years.

(iii) The different costs to be included in the execution of the contract are mutually agreed, so that no dispute may arise in future in this respect. Under such type of contracts, contractee is allowed to check or scrutinize the concerned books, documents and accounts.

(iv) Such a contract offers a fair price to the contractee and also a reasonable profit to the contractor.

The contract price here is ascertained by adding a fixed and mutually pre-decided component of profit to the total cost of the work.

(b) Apportionment of Joint Cost amongst Joint Products using:

Market value at the point of separation: This method is used for apportionment of joint costs to joint products upto the split off point. It is difficult to apply if the market value of the product at the point of separation is not available. It is useful method where further processing costs are incurred disproportionately.

Net realizable value Method: From the sales value of joint products (at finished stage) the followings are deducted:

- Estimated profit margins
- Selling & distribution expenses, if any
- Post split off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

(c) Cost classification based on variability

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

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

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

Cost classification based on controllability

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

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

(d) Salient features of Budget Manual

- Budget manual contains much information which is required for effective budgetary planning.
- A budget manual is a collection of documents that contains key information for those involved in the planning process.
- An introductory explanation of the budgetary planning and control process, including a statement of the budgetary objective and desired results is included in Budget Manual.
- Budget Manual contains a form of organisation chart to show who is responsible for the preparation of each functional budget and the way in which the budgets are interrelated.
- In contains a timetable for the preparation of each budget.
- Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion is included in Budget Manual.

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Material Cost

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

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

(i) CALCULATE:

(a) Inventory turnover ratio, and

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

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

Employee Cost

2. Textile Ltd. pays following overtime premium for its labour beside normal wages of ₹ 100 per hour:

Before and after normal working hours	80% of basic wage rate
Sundays and holidays	150% of basic wage rate

During the previous year 2019-20, the following hours were worked:

Normal time	3,00,000 hours
Overtime before and after normal working hours	60,000 hours
Overtime on Sundays and holidays	15,000 hours
Total	3,75,000 hours

During the current year 2020-21, the following hours have been worked on job 'Spinning':

Normal	4,000 hours
Overtime before and after normal working hours	400 hours
Overtime on Sundays and holidays	100 hours
Total	4,500 hours

You are required to CALCULATE the labour cost chargeable to job 'Spinning' and overhead in each of the following instances:

(a) Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.

(b) Where overtime is worked irregularly to meet the requirements of production.

(c) Where overtime is worked at the request of the customer to expedite the job.

Overheads: Absorption Costing Method

3. PL Ltd. has three production departments P_1, P_2 and P_3 and two service departments S_1 and S_2. The following data are extracted from the records of the company for the month of October, 2020:

	(₹)
Rent and rates	12,50,000
General lighting	1,50,000
Indirect Wages	3,75,000
Power	5,00,000
Depreciation on machinery	10,00,000
Insurance of machinery	4,00,000

Other Information:

	P_1	P_2	P_3	S_1	S_2
Direct wages (₹)	7,50,000	5,00,000	7,50,000	3,75,000	1,25,000
Horse Power of Machines used	60	30	50	10	–
Cost of machinery (₹)	60,00,000	80,00,000	1,00,00,000	5,00,000	5,00,000
Floor space (Sq. ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	–	–

Expenses of the service departments S_1 and S_2 are reapportioned as below:

	P_1	P_2	P_3	S_1	S_2
S_1	20%	30%	40%	–	10%
S_2	40%	20%	30%	10%	–

Required:

(i) COMPUTE overhead absorption rate per production hour of each production department.

(ii) DETERMINE the total cost of product X which is processed for manufacture in department P_1, P_2 and P_3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is ₹ 12,500 and direct labour cost is ₹ 7,500.

Activity Based Costing

4. Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 2020-21 for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 0
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000

Family store also provides the following information for the year 2020-21:

Activity	Description of activity	Total Cost (₹)	Cost-allocation base
Bottles returns	Returning of empty bottles	60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	15,36,000	15,36,000 items sold

Required:

(i) Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. CALCULATE the operating income and operating income as a % of revenues for each product line.

(ii) If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using and activity-based costing system, CALCULATE the operating income and operating income as a % of revenues for each product line.

Cost Sheet

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

S. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	GST paid under Composition scheme		10,00,000
(iii)	Freight inwards		5,20,600
(iv)	Trade discounts received		10,00,000
(v)	Wages paid to factory workers		15,20,000
(vi)	Contribution made towards employees' PF & ESIS		1,90,000
(vii)	Production bonus paid to factory workers		1,50,000
(viii)	Fee for technical assistance		1,12,000
(ix)	Amount paid for power & fuel		2,62,000
(x)	Job charges paid to job workers		4,50,000
(xi)	Stores and spares consumed		1,10,000
(xii)	Depreciation on:		
	Factory building	64,000	
	Office building	46,000	
	Plant & Machinery	86,000	1,96,000
(xiii)	Salary paid to supervisors		1,20,000
(xiv)	Repairs & Maintenance paid for:		
	Plant & Machinery	58,000	
	Sales office building	50,000	
	Vehicles used by directors	20,600	1,28,600

(xv)	Insurance premium paid for:		
	Plant & Machinery	31,200	
	Factory building	28,100	59,300
(xvi)	Expenses paid for quality control check activities		25,000
(xvii)	Research & development cost paid for improvement in production process		48,200
(xviii)	Expenses paid for administration of factory work		1,38,000
(xix)	Salary paid to functional mangers:		
	Production control	4,80,000	
	Finance & Accounts	9,60,000	
	Sales & Marketing	12,00,000	26,40,000
(xx)	Salary paid to General Manager		13,20,000
(xxi)	Packing cost paid for:		
	Primary packing necessary to maintain quality	1,06,000	
	For re-distribution of finished goods	1,12,000	2,18,000
(xxii)	Interest and finance charges paid (for usage of non- equity fund)		3,50,000
(xxiii)	Fee paid to auditors		1,80,000
(xxiv)	Fee paid to legal advisors		1,20,000
(xxv)	Fee paid to independent directors		2,40,000
(xxvi)	Payment for maintenance of website for online sales		1,80,000
(xxvii)	Performance bonus paid to sales staffs		2,40,000
(xxviii)	Value of stock as on 1st April, 2020:		
	Raw materials	9,00,000	
	Work-in-process	4,00,000	
	Finished goods	7,00,000	20,00,000
(xxix)	Value of stock as on 31st March, 2021:		
	Raw materials	5,60,000	
	Work-in-process	2,50,000	
	Finished goods	11,90,000	20,00,000

Amount realized by selling of waste generated during manufacturing process – ₹ 66,000/-

From the above data, you are required to PREPARE Statement of cost of Impact Ltd. for the year ended 31st March, 2021, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

Cost Accounting System

6. XYZ Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2020-21:

Particulars	**(₹ in '000)**
Opening balances:	
- Stores ledger control A/c	24,000
- Work-in-process control A/c	6,000
- Finished goods control A/c	1,29,000
- Building construction A/c	3,000
- Cost ledger control A/c	1,62,000
During the year following transactions took place:	
Materials:	
- Purchased	12,000
- Issued to production	15,000
- Issued to general maintenance	1,800
- Issued to building construction	1,200
Wages:	
- Gross wages paid	45,000
- Indirect wages paid	12,000
- For building construction	3,000
Factory overheads:	
- Actual amount incurred (excluding items shown above)	48,000
- Absorbed in building construction	6,000
- Under-absorbed	2,400
Royalty paid	1,500
Selling, distribution and administration overheads	7,500
Sales	1,35,000

At the end of the year, the stock of raw material and work-in-process was ₹ 1,65,00,000

and ₹ 75,00,000 respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales.

Required:

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

Batch Costing

7. Rollon Ltd. is committed to supply 96,800 bearings per annum to Racing Ltd. on steady basis. It is estimated that it costs 25 paise as inventory carrying cost per bearing per month and the set-up cost per run of bearing manufacture is ₹ 588.

   (a) COMPUTE what would be the optimum run size for bearing manufacture?

   (b) Assuming that the company has a policy of manufacturing 8,800 bearings per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?

Contract Costing

8. RN Builders Ltd. entered into a contract on April 1, 2019. The total contract was for ₹ 2,00,00,000. Actual expenditure for the period April 1, 2019 to March 31, 2020 and estimated expenditure for April 1, 2020 to December 31, 2020 are given below:

Particulars	2019-20 (actual) (₹)	2020-21 (9 months) (estimated) (₹)
Materials issued	36,00,000	34,30,000
Wages: Paid	30,00,000	34,93,000
Outstanding at the end	2,50,000	3,32,000
Plant purchased	10,00,000	-
Sundry expenses: Paid	2,90,000	2,75,000
Prepaid at the end	25,000	-
Establishment charges	5,85,000	-

A part of the material was unsuitable and thus sold for ₹ 7,25,000 (cost being ₹ 6,00,000) and a part of plant was scrapped and disposed-off for ₹ 1,15,000. The value of plant at site on 31 March, 2020 was ₹ 3,10,000 and the value of material at site was ₹ 1,70,000. Cash received on account to date was ₹ 70,00,000, representing 80% of the work certified. The cost of work uncertified was valued at ₹ 10,95,000.

The contract would be completed by 31st December, 2020 and the contractor estimated further expenditure that would be incurred in completion of the contract:

- A sum of ₹ 12,50,000 would have to be spent on the plant and the residual value of the plant on the completion of the contract would be ₹ 1,50,000.
- Establishment charges would cost the same amount per month as in the previous year.
- ₹ 4,32,000 would be sufficient to provide for contingencies.

Required:

PREPARE a Contract Account for the year ended 31st March, 2020, and CALCULATE estimated total profit on this contract.

Process Costing

9. Following information is available regarding Process-I of a manufacturing company for the month of February:

Production Record:	
Units in process as on 1st February (All materials used, 1/4th complete for labour and overhead)	8,000
New units introduced	32,000
Units completed	28,000
Units in process as on 28th February (All materials used, 1/3rd complete for labour and overhead)	12,000
Cost Records:	(₹)
Work-in-process as on 1st February	
Materials	1,20,000
Labour	20,000
Overhead	20,000
	1,60,000
Cost during the month:	
Materials	5,12,000
Labour	3,00,000
Overhead	3,00,000
	11,12,000

Presuming that average method of inventory is used, PREPARE the following:

(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.

Joint Products & By Products

10. A company produces two joint products A and B from the same basic materials. The processing is completed in three departments.

Materials are mixed in Department I. At the end of this process, A and B get separated. After separation, A is completed in the Department II and B in Department III. During a period, 4,00,000 kg of raw material was processed in Department I at a total cost of ₹ 17,50,000, and the resultant 50% becomes A and 40% becomes B and 10% normally lost in processing.

In Department II, 1/5th of the quantity received from Department I is lost in processing. A is further processed in Department II at a cost of ₹ 2,60,000.

In Department III, further new material is added to the material received from Department I and weight mixture is doubled, there is no quantity loss in the department III. Further processing cost (with material cost) in Department III is ₹ 3,00,000.

The details of sales during the said period are:

	Product A	Product B
Quantity sold (kg)	1,50,000	3,00,000
Sales price per kg (₹)	10	4

There were no opening stocks. If these products sold at split-off-point, the selling price of A and B would be ₹ 8 and ₹ 4 per kg respectively.

Required:

(i) PREPARE a statement showing the apportionment of joint cost to A and B in proportion of sales value at split off point.

(ii) PREPARE a statement showing the cost per kg of each product indicating joint cost, processing cost and total cost separately.

(iii) PREPARE a statement showing the product wise profit for the year.

(iv) On the basis of profits before and after further processing of product A and B, give your COMMENT that products should be further processed or not.

Service Costing

11. Mr. PS owns a bus which runs according to the following schedule:

(i)	Delhi to Hisar and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	9
	Seating capacity occupied	90%.
(ii)	Delhi to Aligarh and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	12
	Seating capacity occupied	95%
(iii)	Delhi to Alwar and back, the same day	
	Distance covered:	170 km. one way
	Number of days run each month:	6
	Seating capacity occupied	100%
(iv)	Following are the other details:	
	Cost of the bus	₹ 15,00,000
	Salary of the Driver	₹ 30,000 p.m.
	Salary of the Conductor	₹ 26,000 p.m.
	Salary of the part-time Accountant	₹ 7,000 p.m.
	Insurance of the bus	₹ 6,000 p.a.
	Diesel consumption 5 km. per litre at	₹ 90 per litre
	Road tax	₹ 21,912 p.a.
	Lubricant oil	₹ 30 per 100 km.
	Permit fee	₹ 500 p.m.
	Repairs and maintenance	₹ 5,000 p.m.
	Depreciation of the bus	@ 30% p.a.
	Seating capacity of the bus	50 persons

Passenger tax is 20% of the total takings.

CALCULATE the bus fare to be charged from each passenger to earn a profit of 30% on total takings.

The fares are to be indicated per passenger for the journeys: (i) Delhi to Hisar (ii) Delhi to Aligarh and (iii) Delhi to Alwar.

Standard Costing

12. BabyMoon Ltd. uses standard costing system in manufacturing one of its product 'Baby Cap'. The details are as follows:

Direct Material 1 Meter @ ₹ 60 per meter	₹ 60
Direct Labour 2 hour @ ₹ 20 per hour	₹ 40
Variable overhead 2 hour @ ₹ 10 per hour	₹ 20
Total	₹ 120

During the month of August, 10,000 units of 'Baby Cap' were manufactured. Details are as follows:

Direct material consumed	11,400 meters	@	₹ 58 per meter	
Direct labour Hours	?	@	?	₹ 4,48,800
Variable overhead incurred				₹ 2,24,400

Variable overhead efficiency variance is ₹ 4,000 A. Variable overheads are based on Direct Labour Hours.

You are required to CALCULATE the following Variances:

(a) Material Variances- Material Cost Variance, Material Price Variance and Material Usage Variance.

(b) Variable Overheads variances- Variable overhead Cost Variance, Variable overhead Efficiency Variance and Variable overhead Expenditure Variance.

(c) Labour variances- Labour Cost Variance, Labour Rate Variance and Labour Efficiency Variance.

Marginal Costing

13. A company has three factories situated in North, East and South with its Head Office in Mumbai. The Management has received the following summary report on the operations of each factory for a period:

(₹ in '000)

Factory	Sales		Profit	
	Actual	Over / (Under) Budget	Actual	Over / (Under) Budget
North	1,100	(400)	135	(180)
East	1,450	150	210	90
South	1,200	(200)	330	(110)

CALCULATE the following for each factory and for the company as a whole for the period:

(i) Fixed Cost

(ii) Break-even Sales

Budget and Budgetary Control

14. The accountant of manufacturing company provides you the following details for year 2019-20:

Particulars	(₹)
Direct materials	28,00,000
Direct Wages	16,00,000
Fixed factory overheads	16,00,000
Variable factory overheads	16,00,000
Other variable costs	12,80,000
Other fixed costs	12,80,000
Profit	18,40,000
Sales	1,20,00,000

During the year, the company manufactured two products A and B and the output and costs were:

Particulars	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹ 32.00	₹ 56.00
Direct materials per unit	₹ 8.00	₹ 12.00
Direct wages per unit	₹ 4.00	₹ 8.00

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹ 4.00 per unit; and B ₹ 4.80 per unit.

During 2020-21, it is expected that the demand for product A will fall by 25% and for B by 50%. It is decided to manufacture a new product C, the cost for which is estimated as follows:

Particulars	Product C
Output (units)	2,00,000
Selling price per unit	₹ 28.00
Direct materials per unit	₹ 6.40
Direct wages per unit	₹ 4.00

It is anticipated that the other variable costs per unit of Product C will be same as for product A.

PREPARE a budget to present to the management, showing the current position and the position for 2020-21. COMMENT on the comparative results.

Miscellaneous

15. (a) DIFFERENTIATE between Cost Control and Cost Reduction.

(b) 'Like other branches of accounting, cost accounting also has certain limitations'. EXPLAIN the limitations.

(c) DIFFERENTIATE between Job Costing and Batch Costing.

(d) DISCUSS the treatment of by-product cost in Cost Accounting when they are of small total value.

SUGGESTED HINTS/ANSWERS

1. (i) (a) Inventory turnover ratio (Refer to working note)

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

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

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

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

Working Note:

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

(ii) The Inventory turnover ratio for material X is 16.8 which mean an inventory item takes only 21.73 or 22 days to issue from stores for production process. The rate is better than the industry rate which is 10 time or 36.5 days. This inventory turnover ratio

indicates better inventory management system and good demand for the final product in market.

2. Workings:

Basic wage rate = ₹ 100 per hour

Overtime wage rate before and after working hours = ₹ 100 + (₹ 100 × 80%)
= ₹ 180 per hour

Overtime wage rate for Sundays and holidays = ₹ 100 + (₹ 100 × 150%)
= ₹ 250 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	Amount (₹)
Annual wages for the previous year for normal time (3,00,000 hrs. × ₹ 100)	3,00,00,000
Wages for overtime before and after normal working hours (60,000 hrs. × ₹ 180)	108,00,000
Wages for overtime on Sundays and holidays (15,000 hrs. × ₹ 250)	37,50,000
Total wages for 3,75,000 hrs.	**4,45,50,000**

Average inflated wage rate = $\frac{₹\ 4,45,50,000}{3,75,000\ \text{hours}}$ = ₹ 118.80

(a) Where overtime is worked regularly as a policy due to workers' shortage

The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate. Hence, employee cost chargeable to job 'Spinning'

= Total hours × Inflated wage rate = 4,500hrs. × ₹ 118.80 = ₹ **5,34,600**

(b) Where overtime is worked irregularly to meet the requirements of production

Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:

Employee cost chargeable to Job 'Spinning' = 4,500hours @ ₹ 100 per hour
= ₹ **4,50,000**

Factory overhead = {400 hrs. × (₹ 100 × 80%)} + {100 hrs. × (₹ 100 × 150%)}
= {₹ 32,000 + ₹ 15,000} = ₹ **47,000**

(c) Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under: **(₹)**

Job 'Spinning' Employee cost: 4,500hrs. @ ₹ 100	=	4,50,000
Overtime premium: 400 hrs. @ (₹ 100 × 80%)	=	32,000
100 hrs. @ (₹ 100 × 150%)	=	15,000
Total		**4,97,000**

3. Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)	S_1 (₹)	S_2 (₹)
Direct wages	Actual	5,00,000	--	--	--	3,75,000	1,25,000
Rent and Rates	Floor area (4 : 5 : 6 : 4 : 1)	12,50,000	2,50,000	3,12,500	3,75,000	2,50,000	62,500
General lighting	Light points (2 : 3 : 4 : 2 : 1)	1,50,000	25,000	37,500	50,000	25,000	12,500
Indirect wages	Direct wages (6 : 4 : 6 : 3 : 1)	3,75,000	1,12,500	75,000	1,12,500	56,250	18,750
Power	Horse Power of machines used (6 : 3 : 5 : 1)	5,00,000	2,00,000	1,00,000	1,66,667	33,333	–
Depreciation of machinery	Value of machinery (12 : 16 : 20 : 1 : 1)	10,00,000	2,40,000	3,20,000	4,00,000	20,000	20,000
Insurance of machinery	Value of machinery (12 : 16 : 20 : 1 : 1)	4,00,000	96,000	1,28,000	1,60,000	8,000	8,000
		41,75,000	**9,23,500**	**9,73,000**	**12,64,167**	**7,67,583**	**2,46,750**

Overheads of service cost centres

Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2.

$S_1 = 7,67,583 + 0.10\ S_2$

$S_2 = 2,46,750 + 0.10\ S_1$

Substituting the value of S_2 in S_1 we get

$S_1 = 7,67,583 + 0.10\ (2,46,750 + 0.10\ S_1)$

$S_1 = 7,67,583 + 24,675 + 0.01\ S_1$

$0.99\ S_1 = 7,92,258$

$\therefore S_1$ = ₹ 8,00,260

$\therefore S_2$ = 2,46,750 + 0.10 × 8,00,260

= ₹ 3,26,776

Secondary Distribution Summary

Particulars	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)
Allocated and Apportioned over-heads as per primary distribution	31,60,667	9,23,500	9,73,000	12,64,167
S_1	8,00,260	1,60,052	2,40,078	3,20,104
S_2	3,26,776	1,30,710	65,355	98,033
		12,14,262	**12,78,433**	**16,82,304**

(i) Overhead rate per hour

	P_1	P_2	P_3
Total overheads cost (₹)	12,14,262	12,78,433	16,82,304
Production hours worked	6,225	4,050	4,100
Rate per hour (₹)	**195.06**	**315.67**	**410.32**

(ii) Cost of Product X

	(₹)
Direct material	12,500.00
Direct labour	7,500.00
Prime cost	**20,000.00**
Production on overheads	
P_1 5 hours × ₹ 195.06 = 975.30	
P_2 3 hours × ₹ 315.67 = 947.01	
P_3 4 hours × ₹ 410.32 = 1,641.28	3,563.59
Factory cost	**23,563.59**

4. Working notes:

1. Total support cost:

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{₹\ 45,00,000}{₹\ 1,50,00,000} \times 100 = 30\%$$

3. Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	7,80,000	1,560 purchase orders	₹ 500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹ 400 per delivery
Shelf-stocking	8,64,000	8,640 hours	₹ 100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹ 1 per item sold

(i) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS): (B)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS): (C) (Refer working notes)	9,00,000	22,50,000	13,50,000	45,00,000
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: (E) = {(A)-(D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (F)= {(E)/(A) × 100}	1.70%	7.17%	3.30%	4.97%

(ii) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity-based costing system)

	Soft drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2,190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5,400:2,700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income: (C) = {(A)- (B)}	4,27,500	63,000	5,29,500	10,20,000
Operating income as a % of revenues: (D) = {(C)/(A) × 100}	10.78%	0.60%	8.75%	4.97%

* Refer to working note 3

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

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	Raw materials purchased	5,00,00,000	
	GST paid under Composition scheme*	10,00,000	
	Freight inwards	5,20,600	
	Less: Trade discounts received	(10,00,000)	

	Add: Opening stock of raw materials	9,00,000	
	Less: Closing stock of raw materials	(5,60,000)	5,08,60,600
(ii)	Direct employee (labour) cost:		
	Wages paid to factory workers	15,20,000	
	Contribution made towards employees' PF & ESIS	1,90,000	
	Production bonus paid to factory workers	1,50,000	18,60,000
(iii)	Direct expenses:		
	Fee for technical assistance	1,12,000	
	Amount paid for power & fuel	2,62,000	
	Job charges paid to job workers	4,50,000	8,24,000
	Prime Cost		**5,35,44,600**
(iv)	Works/ Factory overheads:		
	Stores and spares consumed	1,10,000	
	Depreciation on factory building	64,000	
	Depreciation on plant & machinery	86,000	
	Repairs & Maintenance paid for plant & machinery	58,000	
	Insurance premium paid for plant & machinery	31,200	
	Insurance premium paid for factory building	28,100	
	Salary paid to supervisors	1,20,000	4,97,300
	Gross factory cost		**5,40,41,900**
	Add: Opening value of W-I-P		4,00,000
	Less: Closing value of W-I-P		(2,50,000)
	Factory Cost		**5,41,91,900**
(v)	Quality control cost:		
	Expenses paid for quality control check activities		25,000
(vi)	Research & development cost paid for improvement in production process		48,200
(vii)	Administration cost related with production:		
	-Expenses paid for administration of factory work	1,38,000	
	-Salary paid to Production control manager	4,80,000	6,18,000

(viii)	Less: Realisable value on sale of scrap and waste		(66,000)
(ix)	Add: Primary packing cost		1,06,000
	Cost of Production		**5,49,23,100**
	Add: Opening stock of finished goods		7,00,000
	Less: Closing stock of finished goods		(11,90,000)
	Cost of Goods Sold		**5,44,33,100**
(x)	Administrative overheads:		
	Depreciation on office building	46,000	
	Repairs & Maintenance paid for vehicles used by directors	20,600	
	Salary paid to Manager- Finance & Accounts	9,60,000	
	Salary paid to General Manager	13,20,000	
	Fee paid to auditors	1,80,000	
	Fee paid to legal advisors	1,20,000	
	Fee paid to independent directors	2,40,000	28,86,600
(xi)	Selling overheads:		
	Repairs & Maintenance paid for sales office building	50,000	
	Salary paid to Manager- Sales & Marketing	12,00,000	
	Payment for maintenance of website for online sales	1,80,000	
	Performance bonus paid to sales staffs	2,40,000	16,70,000
(xii)	Packing cost paid for re-distribution of finished goods		1,12,000
(xiii)	Interest and finance charges paid		3,50,000
	Cost of Sales		**5,94,51,700**

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

6. Cost Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Costing P&L A/c	1,35,000	By Balance b/d	1,62,000
To Building Construction A/c	13,200	By Stores Ledger control A/c	12,000

To Balance c/d	1,44,900	By Wages Control A/c	45,000
		By Factory overhead control A/c	48,000
		By Royalty A/c	1,500
		By Selling, Distribution and Administration overheads	7,500
		By Costing P&L A/c	17,100
	2,93,100		2,93,100

Stores Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	24,000	By WIP control A/c	15,000
To Cost Ledger control A/c	12,000	By Factory overheads control A/c	1,800
		By Building construction A/c	1,200
		By Factory overhead control A/c (bal. fig.) (loss)	1,500
		By Balance c/d	16,500
	36,000		36,000

Wages Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	45,000	By Factory overhead control A/c	12,000
		By Building Construction A/c	3,000
		By WIP Control A/c (bal. fig.)	30,000
	45,000		45,000

Factory Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Stores Ledger control A/c	1,800	By Building Construction A/c	6,000
To Wages Control A/c	12,000	By WIP Control A/c (bal. fig.)	54,900
To Cost Ledger control A/c	48,000	By Costing P&L A/c (under-absorption)	2,400

To Stores Ledger control A/c (loss)	1,500		
	63,300		63,300

Royalty Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	1,500	By WIP Control A/c	1,500
	1,500		1,500

Work-in-process Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	6,000	By Finished goods control A/c (bal. fig.)	99,900
To Stores Ledger control A/c	15,000		
To Wages Control A/c	30,000		
To Factory overhead control A/c	54,900		
To Royalty A/c	1,500	By Balance c/d	7,500
	1,07,400		1,07,400

Finished Goods Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	1,29,000	By Cost of Goods Sold A/c (Refer working note)	1,08,000
To WIP control A/c	99,900	By Balance c/d	1,20,900
	2,28,900		2,28,900

Cost of Goods Sold Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Finished Goods control A/c	1,08,000	By Cost of sales A/c	1,08,000
	1,08,000		1,08,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	7,500	By Cost of sales A/c	7,500
	7,500		7,500

Cost of Sales Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Goods Sold A/c	1,08,000	By Costing P&L A/c	1,15,500
To Selling, Distribution and Administration A/c	7,500		
	1,15,500		1,15,500

Costing P&L Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Sales A/c	1,15,500	By Cost Ledger control A/c	1,35,000
To Factory overhead control A/c	2,400		
To Cost Ledger control A/c (bal. fig.) (Profit)	17,100		
	1,35,000		1,35,000

Building Construction Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	3,000	By Cost Ledger control A/c	13,200
To Stores Ledger control A/c	1,200		
To Wages Control A/c	3,000		
To Factory overhead control A/c	6,000		
	13,200		13,200

Trial Balance

Particulars	Dr. (₹ in '000)	Cr. (₹ in '000)
Stores Ledger Control A/c	16,500	
WIP Control A/c	7,500	
Finished Goods Control A/c	1,20,900	
Cost Ledger Control A/c		1,44,900
	1,44,900	1,44,900

Workings:

Cost of Goods sold = $\frac{₹\ 13,50,00,000 \times 80}{100}$ = ₹ 10,80,00,000

7. (a) Optimum production run size (Q)

$= \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 96,800 \times ₹\ 588}{0.25 \times 12}}$ = 6,160 bearings.

(b) Calculation of Extra Cost

Total Cost (of maintaining the inventories) when production run size (Q) are 6,160 and 8,800 bearings respectively.

Total cost = Total set-up cost + Total carrying cost.

Particulars	When run size is 6,160 bearings	When run size is 8,800 bearings
Total set up cost	$= \frac{96,800}{6,160} \times$ ₹ 588 = ₹ 9,240 Or, No. of setups = 15.71 (16 setups) = 16 x ₹ 588 = ₹ 9,408	$= \frac{96,800}{8,800} \times$ ₹ 588 = ₹ 6,468
Total Carrying cost	½ × 6,160 × 0.25 × 12 = ₹ 9,240	½ × 8,800 × 0.25 × 12 = ₹ 13,200
Total Cost	**₹ 18,480/ ₹ 18,648**	**₹ 19,668**

₹ 1,188/ ₹ 1,020 is the extra cost incurred by the company due to run size not being optimum run size.

8. RN Builders Ltd.

Contract Account (2019-20)

Particulars		(₹)	Particulars		(₹)
To Materials issued		36,00,000	By Material sold		7,25,000
To Wages paid	30,00,000		By Plant sold		1,15,000
Add: Outstanding	2,50,000	32,50,000	By Plant at site c/d		3,10,000
To Plant		10,00,000	By Material at site c/d		1,70,000
To Sundry Expenses	2,90,000		By Work-in-progress c/d		
Less: Prepaid	(25,000)	2,65,000	Work certified (₹ 70,00,000 ÷ 80%)	87,50,000	
To Establishment charges		5,85,000	Work uncertified	10,95,000	98,45,000
To Costing P & L A/c (₹ 7,25,000 – ₹ 6,00,000)		1,25,000			
To Notional profit (Profit for the year)		23,40,000			
		1,11,65,000			**1,11,65,000**

Calculation of Estimated Profit

	Particulars		(₹)	(₹)
(1)	Material consumed	(36,00,000+ 1,25,000– 7,25,000)	30,00,000	
	Add: Further consumption		34,30,000	64,30,000
(2)	Wages:		32,50,000	
	Add: Further cost	(34,93,000 – 2,50,000)	32,43,000	
	Add: Outstanding		3,32,000	68,25,000
(3)	Plant used	(10,00,000– 1,15,000)	8,85,000	
	Add: Further plant introduced		12,50,000	
	Less: Closing balance of plant		(1,50,000)	19,85,000
(4)	Establishment charges		5,85,000	

	Add: Further charges for nine months (5,85,000 × 9/12)	4,38,750	10,23,750
(5)	Sundry expenses	2,90,000	
	Add: Further expenses	2,75,000	5,65,000
(6)	Reserve for contingencies		4,32,000
Estimated profit (balancing figure)			**27,39,250**
Contract price			2,00,00,000

9. (i) Statement of equivalent production (Average cost method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	8,000	Completed and transferred	28,000	100	28,000	100	28,000
Units introduced	32,000	Closing WIP	12,000	100	12,000	1/3rd	4,000
	40,000		40,000		40,000		32,000

(ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	1,20,000	20,000	20,000	1,60,000
Cost incurred during the month	5,12,000	3,00,000	3,00,000	11,12,000
Total cost: (A)	6,32,000	3,20,000	3,20,000	12,72,000
Equivalent units: (B)	40,000	32,000	32,000	
Cost per equivalent unit: (C) = (A ÷ B)	15.8	10	10	35.8

(iii) Statement of apportionment of cost

	Particulars	Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (28,000 units × ₹ 35.8)		10,02,400
2.	Value of Closing W-I-P:		
	- Materials (12,000 units × ₹ 15.8)	1,89,600	

- Labour (4,000 units × ₹ 10)	40,000	
- Overheads (4,000 units × ₹ 10)	40,000	2,69,600

(iv) Process-I Cost Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W-I-P	8,000	1,60,000	By Completed units	28,000	10,02,400
To Materials	32,000	5,12,000	By Closing W-I-P	12,000	2,69,600
To Labour	--	3,00,000			
To Overhead	--	3,00,000			
	40,000	12,72,000		40,000	12,72,000

10. Calculation of quantity produced

	Dept I (kg)	Dept II (kg)	Dept III (kg)
Input	4,00,000	2,00,000 (50% of 4,00,000 kg.)	1,60,000 (40% of 4,00,000 kg.)
Weight (lost) or added	(40,000) (10% of 4,00,000 kg.)	(40,000) (1/5th of 2,00,000 kg.)	1,60,000
	3,60,000	1,60,000	3,20,000
Production of A	2,00,000	1,60,000	--
Production of B	1,60,000	--	3,20,000

(i) Statement of apportionment of joint cost of dept I

	Product A	Product B
Output (kg)	2,00,000	1,60,000
Selling price per kg (₹)	8	4
Sales value (₹)	16,00,000	6,40,000
Share in Joint cost (5:2)	12,50,000 (₹ 17,50,000 × 5 ÷ 7)	5,00,000 (₹ 17,50,000 × 2 ÷ 7)

(ii) Statement of cost per kg

	Product A	Product B
Output (kg)	1,60,000	3,20,000
Share in joint cost (₹)	12,50,000	5,00,000
Joint Cost per kg (₹) (A)	7.8125	1.5625

Further processing cost (₹)	2,60,000	3,00,000
Further processing cost per kg (₹) (B)	1.625	0.9375
Total cost per kg (₹) {(A)+(B)}	9.4375	2.5000

(iii) Statement of profit

	Product A	Product B
Output (kg)	1,60,000	3,20,000
Sales (kg)	(1,50,000)	(3,00,000)
Closing stock (kg)	10,000	20,000
	(₹)	(₹)
Sales	15,00,000 (1,50,000 kg × ₹ 10)	12,00,000 (3,00,000 kg × ₹ 4)
Add: closing stock (at full cost)	94,375 (10,000 kg × ₹ 9.4375)	50,000 (20,000 kg × ₹ 2.5)
Value of production	15,94,375	12,50,000
Less: Share in joint cost	12,50,000	5,00,000
Further processing cost	2,60,000	3,00,000
Profit	84,375	4,50,000

(iv) Profitability statement before and after processing

	Product A		Product B	
	Before (₹)	After (₹)	Before (₹)	After (₹)
Sales Value	16,00,000		6,40,000	
Share in joint costs	12,50,000		5,00,000	
Profit	3,50,000	84,375 (as per iii above)	1,40,000	4,50,000 (as per iii above)

Product A should be sold at split off point and product B after processing because of higher profitability.

11. Working Notes:

1. Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Hisar	160	2	9	2,880

Delhi to Aligarh	160	2	12	3,840
Delhi to Alwar	170	2	6	2,040
Total				8,760

2. Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger-Km. per month
		(%)	Seats		
Delhi to Hisar & Back	900 (50 seats × 2 trips × 9 days)	90	810	160	1,29,600 (810 seats × 160 km.)
Delhi to Aligarh & Back	1,200 (50 seats × 2 trips × 12 days)	95	1,140	160	1,82,400 (1,140 seats × 160 km.)
Delhi to Alwar & Back	600 (50 seats × 2 trips × 6 days)	100	600	170	1,02,000 (600 seats × 170 km.)
Total					4,14,000

Monthly Operating Cost Statement

Particulars	(₹)	(₹)
(i) Running Costs		
Diesel {(8,760 km ÷ 5 km) × ₹ 90}	1,57,680.00	
Lubricant oil {(8,760 km ÷ 100) × ₹ 30}	2,628.00	1,60,308.00
(ii) Maintenance Costs		
Repairs & Maintenance		5,000.00
(iii) Standing charges		
Salary to driver	30,000.00	
Salary to conductor	26,000.00	
Salary of part-time accountant	7,000.00	
Insurance (₹ 6,000 ÷12)	500.00	
Road tax (₹ 21,912 ÷12)	1,826.00	
Permit fee	500.00	

Depreciation {(₹ 15,00,000 × 30%) ÷ 12}	37,500.00	1,03,326.00
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,68,634.00
Passenger Tax*		1,07,453.60
Total Cost		3,76,087.60
Add: Profit*		1,61,180.40
Total takings per month		5,37,268.00

*Let total takings be X then,

X = Total costs per month before passenger tax + 0.2 X (passenger tax) + 0.3 X (profit)

X = ₹ 2,68,634 + 0.2 X + 0.3 X

0.5 X = ₹ 2,68,634 or, X = ₹ 5,37,268

Passenger Tax = 20% of ₹ 5,37,268 = ₹ 1,07,453.60

Profit = 30% of ₹ 5,37,268 = ₹ 1,61,180.40

Calculation of Rate per passenger km. and fares to be charged for different routes

Rate per Passenger-Km. $= \frac{\text{Total takings per month}}{\text{Total Passenger-Km. per month}}$

$= \frac{₹\ 5,37,268}{4,14,000 \text{ Passenger-Km.}} = ₹\ 1.30$ (approx.)

Bus fare to be charged per passenger:

Delhi to Hisar	=	₹ 1.30 × 160 km	=	₹ 208.00
Delhi to Aligarh	=	₹ 1.30 × 160 km	=	₹ 208.00
Delhi to Alwar	=	₹ 1.30 × 170 km	=	₹ 221.00

12. (i) Material Variances

Budget			Std. for actual			Actual		
Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)
1	60	60	10,000	60	6,00,000	11,400	58	6,61,200

Material Cost Variance = (SQ × SP – AQ × AP)

= 6,00,000 – 6,61,200 = ₹ 61,200 (A)

Material Price Variance = (SP – AP) AQ

= (60 - 58) 11,400 = ₹ 22,800 (F)

Material Usage Variance = (SQ – AQ) SP

= (10,000 – 11,400) 60 = ₹ 84,000 (A)

(ii) Variable Overheads variances

Variable overhead cost Variance

= Standard variable overhead – Actual Variable Overhead

= (10,000 units × 2 hours × ₹ 10) – 2,24,400 = ₹ 24,400 (A)

Variable overhead Efficiency Variance

= (Standard Hours – Actual Hours) × Standard Rate per Hour

Let Actual Hours be 'X', then:

(20,000 – X) × 10 = 4,000 (A)

2,00,000 – 10X = - 4,000

X = 2,04,000 ÷ 10

Therefore, Actual Hours (X) = 20,400

Variable overhead Expenditure Variance

= Variable Overhead at Actual Hours - Actual Variable Overheads

= 20,400 × ₹ 10 – 2,24,400 = ₹ 20,400 (A)

(iii) Labour variances

Budget			Std. for actual			Actual		
Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
2	20	40	20,000	20	4,00,000	20,400	22*	4,48,800

*Actual Rate = ₹ 4,48,800 ÷ 20,400 hours = ₹ 22

Labour Cost Variance = (SH × SR) – (AH × AR)

= 4,00,000 – 4,48,800 = ₹ 48,800 (A)

Labour Rate Variance = (SR – AR) × AH

= (20 – 22) × 20,400 = ₹ 40,800 (A)

Labour Efficiency Variance = (SH – AH) × SR

= (20,000 – 20,400) × 20 = ₹ 8,000 (A)

13. Computation of Profit Volume Ratio

(₹ in '000)

Factory	Sales			Profit			P/V Ratio
	Actual	Over / (Under) Budget	Budgeted Sales	Actual	Over / (Under) Budget	Budget Profit	(Change in Profit / Change in Sales)
North	1,100	(400)	1,500	135	(180)	315	45%
East	1,450	150	1,300	210	90	120	60%
South	1,200	(200)	1,400	330	(110)	440	55%

(i) Computation of Fixed Costs (₹ in '000)

Factory	Actual Sales	P/V Ratio	Contribution	Actual Profit	Fixed Cost
	(1)	(2)	(3) = (1) × (2)	(4)	(5) = (3) - (4)
North	1,100	45%	495	135	**360**
East	1,450	60%	870	210	**660**
South	1,200	55%	660	330	**330**
Total	3,750		2,025	675	**1,350**

(ii) Computation of Break-Even Sales

Factory	Fixed Cost (a)	P/V Ratio (b)	Break-even Sales (a) / (b)
North	360	45%	**800**
East	660	60%	**1,100**
South	330	55%	**600**
			2,500

Break-even Sales (Company as Whole) $= \frac{\text{Fixed Cost}}{\text{Composite P / V Ratio *}}$

$= \frac{₹\ 13,50,000}{54\%}$

$= ₹\ 25,00,000$

*Composite P/V Ratio $= \frac{\text{Total Contribution}}{\text{Total Actual sales}} = \frac{2,025}{3,750} = 54\%$

14. Budget Showing Current Position and Position for 2020-21

	Position for 2019-20			Position for 2020-21			
	A	B	Total (A+B)	A	B	C	Total (A+B+C)
Sales (units)	2,00,000	1,00,000	–	1,50,000	50,000	2,00,000	–
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
(A) Sales	**64,00,000**	**56,00,000**	**1,20,00,000**	**48,00,000**	**28,00,000**	**56,00,000**	**1,32,00,000**
Direct Material	16,00,000	12,00,000	28,00,000	12,00,000	6,00,000	12,80,000	30,80,000
Direct wages	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Factory overhead (variable)	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Other variable costs	800,000	4,80,000	12,80,000	6,00,000	240,000	8,00,000	16,40,000
(B) Marginal Cost	40,00,000	32,80,000	72,80,000	30,00,000	16,40,000	36,80,000	83,20,000
(C) Contribution (A-B)	**24,00,000**	**23,20,000**	**47,20,000**	**18,00,000**	**11,60,000**	**19,20,000**	**48,80,000**
Fixed costs							
– Factory			16,00,000				16,00,000
– Others			12,80,000				12,80,000
(D) Total fixed cost			28,80,000				28,80,000
Profit (C – D)			**18,40,000**				**20,00,000**

Comments: Introduction of Product C is likely to increase profit by ₹ 1,60,000 (i.e. from ₹ 18,40,000 to ₹ 20,00,000) in 2020-21 as compared to 2019-20 even if the demand for Product A & B falls. Therefore, introduction of product C is recommended.

15. (a)

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

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

(b) "Like other branches of accounting, cost accounting also has certain limitations". The limitations of cost accounting are as follows:

(i) Expensive: It is expensive because analysis, allocation and absorption of overheads requires considerable amount of additional work, and hence additional money.

(ii) Requirement of reconciliation: The results shown by cost accounts differ from those shown by financial accounts. Thus, preparation of reconciliation statements is necessary to verify their accuracy.

(iii) Duplication of work: It involves duplication of work as organization has to maintain two sets of accounts i.e. Financial Accounts and Cost Accounts.

(c)

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.

(d) When the by-products are of small total value, the amount realised from their sale may be dealt in any one the following two ways:

(i) The sales value of the by-products may be **credited to the Costing Profit and Loss Account** and no credit be given in the Cost Accounts. The credit to the Costing Profit and Loss Account here is treated either as miscellaneous income or as additional sales revenue.

(ii) The sale proceeds of the by-product may be **treated as deductions from the total costs**. The sale proceeds in fact should be deducted either from the production cost or from the cost of sales.

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Material Cost

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

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

20% of material shortage is due to normal reasons.

The payment to the supplier was made within 21 days of the purchases.

You are required to CALCULATE cost per unit of material purchased by Sky & Co.

Employee Cost

2. A total of 108 labour hours have been put in a particular job card for repair work engaging a semi-skilled and skilled labour (Mr. Deep and Mr. Sam respectively).

The hours devoted by both the workers individually on daily basis for this particular job are given below:

Monday	Tuesday	Wednesday	Thursday	Friday
10.5	8.0	10.5	9.5	10.5

The skilled labour also worked on Saturday for 10 hours.

Sunday is a weekly holiday and each worker has to work for 8 hours on all week days and 5 hours on Saturdays; the workers are however paid full wages for Saturday (8 hours for 5 hours worked).

Semi-skilled and skilled worker is paid ordinary wage @ ₹ 400 and ₹ 600 respectively per day of 8 hours labour. Further, the workers are also paid dearness allowance @ 20%.

Extra hours worked over and above 8 hours are also paid at ordinary wage rate however, overtime premium of 100% of ordinary wage rate is paid if a worker works for more than 9 hours in a day AND 48 hours in a week.

You are required to COMPUTE the wages payable to Mr. Deep (Semi-skilled) and Mr. Sam (Skilled).

Overheads: Absorption Costing Method

3. Pretz Ltd. is a manufacturing company having two production departments, 'A' & 'B' and two service departments 'X' & 'Y'. The following is the budget for March, 2022:

	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
Direct material		2,00,000	4,00,000	4,00,000	2,00,000
Direct wages		10,00,000	4,00,000	2,00,000	4,00,000
Factory rent	9,00,000				
Power (Machine)	5,10,000				
Depreciation	2,00,000				
General Lighting	3,00,000				
Perquisites	4,00,000				
Additional information:					
Area (Sq. ft.)		500	250	250	500
Capital value of assets (₹ lakhs)		40	80	20	20
Light Points		10	20	10	10
Machine hours		1,000	2,000	1,000	1,000
Horse power of machines		50	40	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	X	Y
Service Dept. 'X' (%)	55	25	–	20
Service Dept. 'Y' (%)	60	35	5	–

You are required to:

(a) PREPARE a statement showing distribution of overheads to various departments.

(b) PREPARE a statement showing re-distribution of service departments expenses to production departments using-

(i) Simultaneous equation method

(ii) Trial and error method

(iii) Repeated Distribution Method.

Activity Based Costing

4. PCP Limited belongs to the apparel industry. It specializes in the distribution of fashionable garments. It buys from the industry and resells the same to the following two different supermarkets:

(i) Supermarket A dealing in Adults' garments (Age group 15 - 30)

(ii) Supermarket B dealing in Kids' garments (Age group 5 - 10)

The following data for the month of April in respect of PCP Limited has been reported:

	Supermarket A (₹)	Supermarket B (₹)
Average revenue per delivery	1,69,950	57,750
Average cost of goods sold per delivery	1,65,000	55,000
Number of deliveries	660	1,650

In the past, PCP Limited has used gross margin percentage to evaluate the relative profitability of its supermarket segments.

The company plans to use activity –based costing for analysing the profitability of its supermarket segments.

The April month's operating costs (other than cost of goods sold) of PCP Limited are ₹ 16,55,995. These operating costs are assigned to five activity areas. The cost in each area and Activity analysis including cost driver for the month of April are as follows:

Activity Area	Total costs (₹)	Cost Driver
Store delivery	3,90,500	Store deliveries
Cartons dispatched to store	4,15,250	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	64,845	Hours of shelf-stocking
Line-item ordering	3,45,400	Line-items per purchase order
Customer purchase order processing	4,40,000	Purchase orders by customers

Other data for the month of April include the following:

	Supermarket A	Supermarket B
Total number of store deliveries	1,100	2,805
Average number of cartons shipped per store delivery	250	50
Average number of hours of shelf-stocking per store delivery	6	1.5
Average number of line items per order	14	12
Total number of orders	770	1,980

Required:

(i) COMPUTE gross-margin percentage for each of its supermarket segments and compute PCP Limited's operating income.

(ii) COMPUTE the operating income of each supermarket segments using the activity-based costing information.

Cost Sheet

5. A Ltd. produces a single product X. During the month of December 2021, the company has produced 14,560 tonnes of X. The details for the month of December 2021 are as follows:

(i) Materials consumed ₹ 15,00,000

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

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

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

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

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

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

(viii) Reimbursement of diesel cost for the cars – ₹ 20,000

(ix) The hiring of cars attracts GST under RCM @5% without credit.

(x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of despatch) – ₹ 7,000

(xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of despatch) and factory premises is ₹ 6,000 and ₹ 18,000 per month respectively.

(xii) TA/ DA and hotel bill paid for sales manager- ₹ 16,000

(xiii) The company has 180 employees works for 26 days in a month.

Required:

(a) PREPARE a Cost sheet for the month of December 2021.

(b) COMPUTE Earnings per manshift (EMS) and Output per manshift (OMS) for the month of December 2021.

Cost Accounting System

6. X Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2021-22:

Particulars	Amount ('000)
Opening balances:	
- Stores ledger control A/c	48,000
- Work-in-process control A/c	12,000
- Finished goods control A/c	2,58,000
- Building construction A/c	6,000
- Cost ledger control A/c	3,24,000
During the year following transactions took place:	
Materials:	
- Purchased	24,000
- Issued to production	30,000
- Issued to general maintenance	3,600
- Issued to building construction	2,400
Wages:	
- Gross wages paid	90,000
- Indirect wages paid	24,000
- For building construction	6,000
Factory overheads:	
- Actual amount incurred (excluding items shown above)	96,000
- Absorbed in building construction	12,000
- Under-absorbed	4,800
Royalty paid	3,000
Selling distribution and administration overheads	15,000
Sales	2,70,000

At the end of the year, the stock of raw material and work-in-process was ₹3,30,00,000 and ₹15,00,000 respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales.

Required:

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

Batch Costing

7. Brostom Ltd. manufactures 'Stent' that is used by hospitals in angioplasty, a procedure used to open blocked coronary arteries without open-heart surgery. As per the estimates provided by Pharmaceutical Industry Bureau, there will be a demand of 1 crore 'Stents' in the coming year. Brostom Ltd. is having a market share of 10% of the total market demand of the Stents. It is estimated that it costs ₹ 3.00 as inventory holding cost per stent per month and that the set-up cost per run of stent manufacture is ₹ 450.

   Required:

   (i) WHAT would be the optimum run size for Stent manufacture?

   (ii) WHAT is the minimum inventory holding cost?

Job Costing

8. KJ Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2020-21:

		(₹)
(i)	Opening Stock of Material	15,00,000
(ii)	Closing Stock of Material	20,00,000
(iii)	Purchase of Material	1,80,50,000
(iv)	Direct Labour	90,50,000
(v)	Factory Overhead	30,80,000
(vi)	Administrative Overhead	20,50,400

During the FY 2021-22, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 40,50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost.

Cost of delivery of the components at customer's premises is estimated at ₹ 9,50,000.

You are required to:

(i) CALCULATE the overhead recovery rates based on actual costs for 2020-21.

(ii) PREPARE a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

Process Costing

9. A company produces a component, which passes through two processes. During the month of December, 2021, materials for 40,000 components were put into Process-I of which 30,000 were completed and transferred to Process-II. Those not transferred to Process- II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process- I costs incurred were as follows:

Direct Materials	₹ 6,00,000
Direct Wages	₹ 7,00,000
Factory Overheads	₹ 4,90,000

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

Costs incurred in Process-II are as follows:

Packing Materials	₹ 1,60,000
Direct Wages	₹ 1,42,250
Factory Overheads	₹ 1,70,700

Packing material cost is incurred at the end of the second process as protective packing to the completed units of production.

Required:

(i) PREPARE Statement of Equivalent Production, Cost per unit and Process I A/c.

(ii) PREPARE statement of Equivalent Production, Cost per unit and Process II A/c.

Service Costing

10. Navya LMV Pvt. Ltd, operates cab/ car rental service in Delhi/NCR. It provides its service to the offices of Noida, Gurugram and Faridabad. At present it operates CNG fuelled cars but it is also considering to upgrade these into Electric vehicle (EV). The details related with the owning of CNG & EV propelled cars are as tabulated below:

Particulars	CNG Car	EV Car
Car purchase price (₹)	9,20,000	15,20,000
Govt. subsidy on purchase of car (₹)	--	1,50,000
Life of the car	15 years	10 years

Residual value (₹)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (₹)	60	--
Power cost per Kwh (₹)	--	7.60
Annual Maintenance cost (₹)	8,000	5,200
Annual insurance cost (₹)	7,600	14,600
Tyre replacement cost in every 5 -year (₹)	16,000	16,000
Battery replacement cost in every 8- year (₹)	12,000	5,40,000

Apart from the above, the following are the additional information:

Particulars	
Average distance covered by a car in a month	1,500 km
Driver's salary (₹)	20,000 p.m
Garage rent per car (₹)	4,500 p.m
Share of Office & Administration cost per car (₹)	1,500 p.m

Required:

CALCULATE the operating cost of vehicle per month per car for both CNG & EV options.

Standard Costing

11. The standard output of a Product 'D' is 50 units per hour in manufacturing department of a Company employing 100 workers. In a 40 hours week, the department produced 1,920 units of product 'D' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹ 12.40, ₹ 12.00 and ₹ 11.40 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹ 480 (F).

    You are required to COMPUTE:

    (i) Total Labour Cost Variance.

    (ii) Total Labour Rate Variance.

    (iii) Total Labour Gang Variance.

    (iv) Total Labour Yield Variance, and

    (v) Total Labour Idle Time Variance.

Marginal Costing

12. A Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	S	T	U
Sales Mix	25%	35%	40%
Selling Price	₹ 600	₹800	₹400
Variable Cost	₹ 300	₹400	₹240
Total Fixed Costs			₹ 36,00,000
Total Sales			₹ 1,20,00,000

The company has currently under discussion, a proposal to discontinue the manufacture of Product U and replace it with Product M, when the following results are anticipated:

	Products		
	S	T	M
Sales Mix	40%	35%	25%
Selling Price	₹ 600	₹ 800	₹ 600
Variable Cost	₹ 300	₹ 400	₹ 300
Total Fixed Costs			₹ 36,00,000
Total Sales			₹ 1,28,00,000

Required:

(i) COMPUTE the PV ratio, total contribution, profit and Break-even sales for the existing product mix.

(ii) COMPUTE the PV ratio, total contribution, profit and Break-even sales for the proposed product mix

Budget and Budgetary Control

13. Maharatna Ltd., a public sector undertaking (PSU), produces product A. The company is in process of preparing its revenue budget for the year 2022. The company has the following information which can be useful in preparing the budget:

(i) It has anticipated 12% growth in sales volume from the year 2021 of 4,20,000 tonnes.

(ii) The sales price of ₹23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.

(iii) To produce one tonne of product A, 2.3 tonnes of raw material are required. The raw material cost is ₹4,500 per tonne. The price of raw material will also increase by 10% if WPI increase by 5%.

(iv) The projected increase in WPI for 2022 is 4%

(v) A total of 6,000 employees works for the company. The company works 26 days in a month.

(vi) 85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is ₹ 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2022 and it is expected that a 15% increase in pay will be given.

(vii) The casual employees are getting a daily wage of ₹ 850. The wages in linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2022.

(viii) Power cost for the year 2021 is ₹ 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.

(ix) During the year 2021, the company has paid ₹ 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.

(x) During the year 2021, the company has paid ₹ 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2022.

(xi) During the year 2021, the company has paid ₹ 6,00,000 for car hire charges (excluding fuel cost). In year 2022, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.

(xii) Depreciation on fixed assets for the year 2021 is ₹ 80,40,00,000 and it will be 15% lower in 2022.

Required:

From the above information PREPARE Revenue (Flexible) budget for the year 2022 and also show the budgeted profit/ loss for the year.

Miscellaneous

14. (a) EXPLAIN the difference between controllable & uncontrollable costs?

(b) DEFINE cost plus contract? STATE its advantages.

(c) "Is reconciliation of cost accounts and financial accounts necessary in case of integrated accounting system?" EXPLAIN.

(d) DISCUSS the impact of Information Technology in Cost Accounting.

SUGGESTED HINTS/ANSWERS

1. Calculation of cost per unit:

Particulars			Units	(₹)
Listed Price of Materials			5,000	2,50,000
Less: Trade discount @ 10% on invoice price				(25,000)
				2,25,000
Add: CGST @ 6% of ₹ 2,25,000				13,500
Add: SGST @ 6% of ₹ 2,25,000				13,500
				2,52,000
Add:	Toll Tax			5,000
	Freight and Insurance			17,000
	Commission and Brokerage Paid			10,000
Add:	Cost of returnable containers:			
	Amount deposited	₹ 30,000		
	Less: Amount refunded	₹ 20,000		10,000
				2,94,000
Add: Other Expenses @ 2% of Total Cost $\left(\frac{₹\ 2,94,000}{98} \times 2\right)$				6,000
Total cost of material				3,00,000
Less: Shortage material due to normal reasons @ 20%			1,000	-
Total cost of material of good units			4,000	3,00,000
Cost per unit (₹ 3,00,000/4,000 units)				75

Note:

1. GST is payable on net price i.e., listed price less discount.
2. Cash discount is treated as interest and finance charges; hence it is ignored.
3. Demurrage is penalty imposed by the transporter for delay in uploading or off-loading of materials. It is an abnormal cost and not included.
4. Shortage due to normal reasons should not be deducted from cost to ascertain total cost of good units.

2. Calculation of total normal hours to be paid for Mr. Deep (Semi-skilled):

Day	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
	A	B	C	D = C×2	E = A+B+D
Monday	8	1	1½	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	--	--	--	--	--
Total	40	4	5	10	54

Calculation of total normal hours to be paid for Mr. Sam (Skilled):

Day	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
	A	B	C	D = C×2	E = A+B+D
Monday	8	1	1½	3	12
Tuesday	8	---	---	---	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	5	3* + 1	1**	2	11
Total	**45**	**8**	**6**	**12**	**65**

*Mr. Sam will be paid for equivalent 8 normal working hours at ordinary wage rate, though 5 hours of working is required on Saturday. Further, extra 9th hour worked will also be paid at ordinary wage rate.

** Overtime of 1 hour worked over and above 9 hours will be paid at overtime rate.

Wages payable:

	Mr. Deep	Mr. Sam
Basic Wages per hour (₹ 400/8, ₹ 600/8) (₹)	50	75
Dearness allowance per hour (@ 20%) (₹)	10	15
Hourly rate (₹)	60	90
Total equivalent normal hours	54	65
Total Wages payable (₹)	**3,240**	**5,850**

3. (a) Primary Distribution of Overheads

	Basis	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
Direct materials	Direct	6,00,000	–	–	4,00,000	2,00,000
Direct wages	Direct	6,00,000	–	–	2,00,000	4,00,000
Factory rent (2:1:1:2)	Area	9,00,000	3,00,000	1,50,000	1,50,000	3,00,000
Power (Machine) (10:16:3:5)*	H.P. × Machine Hrs.	5,10,000	1,50,000	2,40,000	45,000	75,000
Depreciation (2:4:1:1)	Capital value	2,00,000	50,000	1,00,000	25,000	25,000
General Lighting (1:2:1:1)	Light Points	3,00,000	60,000	1,20,000	60,000	60,000
Perquisites (5:2:1:2)	Direct Wages	4,00,000	2,00,000	80,000	40,000	80,000
		35,10,000	**7,60,000**	**6,90,000**	**9,20,000**	**11,40,000**

*{(1000×50) : (2000×40) : (1000×15) : (1000×25)}

(50000 : 80000 : 15000 : 25000)

(10 : 16 : 3 : 5)

(b) (i) Redistribution of Service Department's expenses using 'Simultaneous equation method'

X = 9,20,000 + 0.05 Y

Y = 11,40,000 + 0.20 X

Substituting the value of X,

Y = 11,40,000 + 0.20 (9,20,000 + 0.05 Y)

= 13,24,000 + 0.01 Y

Y - 0.01Y = 13,24,000

$Y = \frac{13,24,000}{0.99}$

Y = ₹ 13,37,374

The total expense of **Y is ₹ 13,37,374** and that of **X is ₹ 9,86,869** *i.e.,* ₹ 9,20,000 + (0.05 × ₹ 13,37,374).

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	**B (₹)**
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 13,37,374)	8,02,424	4,68,081
	21,05,202	**14,04,798**

(ii) Redistribution of Service Department's expenses using 'Trial and Error Method':

	Service Departments	
	X (₹)	**Y (₹)**
Overheads as per primary distribution	9,20,000	11,40,000
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 9,20,000)	---	1,84,000
	---	13,24,000
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,24,000)	66,200	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 66,200)	---	13,240
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,240)	662	---

(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 662)	7	132
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 132)		
Total	**9,86,869**	**13,37,372**

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	**B (₹)**
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 13,37,372)	8,02,423	4,68,080
	21,05,201	**14,04,797**

(iii) Redistribution of Service Department's expenses using 'repeated distribution method':

	A (₹)	**B (₹)**	**X (₹)**	**Y (₹)**
Overhead as per primary distribution	7,60,000	6,90,000	9,20,000	11,40,000
Dept. X overhead apportioned in the ratio (55:25:—:20)	5,06,000	2,30,000	(9,20,000)	1,84,000
Dept. Y overhead apportioned in the ratio (60:35:5: —)	7,94,400	4,63,400	66,200	(13,24,000)
Dept. X overhead apportioned in the ratio (55:25:—:20)	36,410	16,550	(66,200)	13,240
Dept. Y overhead apportioned in the ratio (60:35:5: —)	7,944	4,634	662	(13,240)
Dept. X overhead apportioned in the ratio (55:25:—:20)	364	166	(662)	132

Dept. Y overhead apportioned in the ratio (60:35:5: —)	79	46	7	(132)
Dept. X overhead apportioned in the ratio (55:25:—:20)	4	3	(7)	-
	21,05,201	**14,04,799**	–	–

4. (i) PCP Limited's

Statement of operating income and gross margin percentage for each of its supermarket segments

Particulars	Supermarket A	Supermarket B	Total
Revenues: (₹)	11,21,67,000 (660 × ₹ 1,69,950)	9,52,87,500 (1,650 × ₹ 57,750)	20,74,54,500
Less: Cost of goods sold: (₹)	10,89,00,000 (660 × ₹ 1,65,000)	9,07,50,000 (1650 × ₹ 55,000)	19,96,50,000
Gross Margin: (₹)	**32,67,000**	**45,37,500**	**78,04,500**
Less: Other operating costs: (₹)			16,55,995
Operating income: (₹)			**61,48,505**
Gross Margin	**2.91%**	**4.76 %**	**3.76%**
Operating income %			**2.96%**

(ii) Operating Income Statement of each distribution channel in April (Using the Activity based Costing information)

	Supermarket A	Supermarket B
Gross margin (₹) : (A) (Refer to (i) part of the answer)	32,67,000	45,37,500
Operating cost (₹): (B) (Refer to working note)	6,55,600	10,00,395
Operating income (₹): (A–B)	**26,11,400**	**35,37,105**
Operating income (in %) (Operating income/Revenue) ×100	**2.33**	**3.71**

Working note:

Computation of rate per unit of the cost allocation base for each of the five activity areas for the month of April

	(₹)
Store delivery [₹ 3,90,500/ (1,100 + 2,805 store deliveries)]	100 per delivery
Cartons dispatched [₹ 4,15,250/ {(250×1,100) +(50×2,805)} carton dispatches]	1 per carton dispatch
Shelf-stocking at customer store (₹) [₹ 64,845/ {(6×1,100) + (1.5×2,805)} hours]	6 per hour
Line item ordering [₹ 3,45,400/ {(14×770) + (12×1,980)} line items]	10 per line item order
Customer purchase order processing [₹ 4,40,000/ (770 + 1,980 orders)]	160 per order

Computation of operating cost of each distribution channel:

	Supermarket A (₹)	Supermarket B (₹)
Store delivery	1,10,000 (₹ 100 × 1,100 deliveries)	2,80,500 (₹ 100 × 2,805 deliveries)
Cartons dispatched	2,75,000 (₹ 1× 250 cartons × 1,100 deliveries)	1,40,250 (₹ 1 × 50 cartons × 2,805 deliveries)
Shelf stocking	39,600 (₹ 6 × 1,100 deliveries × 6 Av. hrs.)	25,245 (₹ 6 × 2,805 deliveries × 1.5 Av. hrs)
Line item ordering	1,07,800 (₹ 10 × 14 line item x 770 orders)	2,37,600 (₹ 10 × 12 line item x 1,980 orders)
Customer purchase order processing	1,23,200 (₹ 160 × 770 orders)	3,16,800 (₹ 160 × 1,980 orders)
Operating cost	**6,55,600**	**10,00,395**

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

Particulars	Amount (₹)	Amount (₹)
Materials consumed		15,00,000
Wages & Salary	64,00,000	
Gratuity & leave encashment	44,20,000	1,08,20,000
Power cost (13,000 kwh × ₹ 7)	91,000	
Diesel cost (1,000 ltr × ₹ 93)	93,000	1,84,000
HEMM hiring charges		13,00,000
Prime Cost		**1,38,04,000**
AMC cost of CCTV installed at factory premises		18,000
Cost of Production/ Cost of Goods Sold		**1,38,22,000**
Hiring charges of cars	80,000	
Reimbursement of diesel cost	20,000	
	1,00,000	
Add: GST @5% on RCM basis	5,000	1,05,000
Maintenance cost for weighing bridge	7,000	
AMC cost of CCTV installed at weigh bridge	6,000	13,000
TA/ DA & hotel bill of sales manager		16,000
Cost of Sales		**1,39,56,000**

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

Computation of earnings per manshift (EMS):

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

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

Computation of Output per manshift (OMS):

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

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

6. **Cost Ledger Control Account**

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Costing P&L A/c	2,70,000	By Balance b/d	3,24,000
To Building Construction A/c	26,400	By Stores Ledger Control A/c	24,000
To Balance c/d	2,89,800	By Wages Control A/c	90,000
		By Factory overhead control A/c	96,000
		By Royalty A/c	3,000
		By Selling, Distribution and Administration overheads	15,000
		By Costing P&L A/c	34,200
	5,86,200		5,86,200

Stores Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	48,000	By WIP control A/c	30,000
To Cost Ledger control A/c	24,000	By Factory overheads control A/c	3,600
		By Building construction A/c	2,400
		By Factory overhead control A/c (loss) (Bal. fig)	3,000
		By Balance c/d	33,000
	72,000		72,000

Work-in-process Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	12,000	By Finished goods control A/c	1,99,800
To Stores Ledger control A/c	30,000		
To Wages Control A/c	60,000		
To Factory overhead control A/c	1,09,800		
To Royalty A/c	3,000	By Balance c/d	15,000
	2,14,800		2,14,800

Finished Goods Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	2,58,000	By Cost of Goods Sold A/c (Refer working note)	2,16,000
To WIP control A/c	1,99,800	By Balance c/d	2,41,800
	4,57,800		4,57,800

Cost of Sales Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Goods Sold A/c	2,16,000	By Costing P&L A/c	2,31,000
To Selling, Distribution and Administration A/c	15,000		
	2,31,000		2,31,000

Costing P&L Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Sales A/c	2,31,000	By Cost Ledger control A/c	2,70,000
To Factory overhead control A/c	4,800		
To Cost Ledger control A/c	34,200		
	2,70,000		2,70,000

Building Construction Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	6,000	By Cost Ledger control A/c	26,400
To Stores Ledger control A/c	2,400		
To Wages Control A/c	6,000		
To Factory overhead control A/c	12,000		
	26,400		26,400

Factory Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Stores Ledger control A/c	3,600	By Building Construction A/c	12,000
To Wages Control A/c	24,000	By WIP Control A/c	1,09,800
To Cost Ledger control A/c	96,000	By Costing P&L A/c	4,800

To Stores Ledger control A/c (loss)	3,000		
	1,26,600		1,26,600

Wages Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	90,000	By Factory overhead control A/c	24,000
		By Building Construction A/c	6,000
		By WIP Control A/c	60,000
	90,000		90,000

Royalty Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	3,000	By WIP Control A/c	3,000
	3,000		3,000

Cost of Goods Sold Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Finished Goods control A/c	2,16,000	By Cost of sales A/c	2,16,000
	2,16,000		2,16,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	15,000	By Cost of sales A/c	15,000
	15,000		15,000

Trial Balance

Particulars	Dr.	Cr.
	(₹ in '000)	(₹ in '000)
Stores Ledger Control A/c	33,000	
WIP Control A/c	15,000	
Finished Goods Control A/c	2,41,800	
Cost Ledger Control A/c		2,89,800
	2,89,800	2,89,800

Working Note:

Cost of Goods sold = 2,70,000 × 80/100 = ₹ 2,16,000

7. (i) Computation of Optimum Run size of 'Stents' or Economic Batch Quantity (EBQ)

Economic Batch Quantity (EBQ) = $\sqrt{\frac{2DS}{C}}$

Where, D = Annual demand for the Stents

= 1,00,00,000 × 10% = 10,00,000 units

S = Set- up cost per run

= ₹ 450

C = Carrying cost per unit per annum

= ₹ 3 × 12 = ₹ 36

EBQ = $\sqrt{\frac{2 \times 10,00,000 \times ₹\ 450}{₹\ 36}}$

= 5,000 units of Stents

(ii) Minimum inventory holding cost

Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum

= (5,000 ÷ 2) × ₹ 36

= ₹ 90,000

(iii) Calculation of the extra cost due to manufacturing policy

	When run size is 6,000 units	When run size is 5,000 units i.e. at EBQ
Total set up cost	$=\frac{10,00,000}{6,000} \times$ ₹ 450 = ₹ 75,000	$\frac{10,00,000}{5,000} \times$ ₹ 450 = ₹ 90,000
Total Carrying cost	½ × 6,000 × ₹ 36 = ₹ 1,08,000	½ × 5,000 × ₹ 36 = ₹ 90,000
Total Cost	**₹ 1,83,000**	**₹ 1,80,000**

Extra cost = ₹ 1,83,000 - ₹ 1,80,000 = **₹ 3,000**

8. (i) Calculation of Overhead Recovery Rate:

$$\text{Factory Overhead Recovery Rate} = \frac{\text{Factory Overhead in 2020-21}}{\text{Direct labour cost in 2020-21}} \times 100$$

$$= \frac{₹\ 30,80,000}{₹ 90,50,000} \times 100 = 34\% \text{ of Direct labour}$$

$$\text{Administrative Overhead Recovery Rate} = \frac{\text{Administrative Overhead in 2020-21}}{\text{Factory cost in 2020-21 (W.N)}} \times 100$$

$$= \frac{₹\ 20,50,400}{₹\ 2,96,80,000} \times 100 = 6.91\% \text{ of Factory Cost}$$

Working Note: Calculation of Factory Cost in 2020-21

Particulars	Amount (₹)
Opening Stock of Material	15,00,000
Add: Purchase of Material	1,80,50,000
Less: Closing Stock of Material	(20,00,000)
Material Consumed	1,75,50,000
Direct Labour	90,50,000
Prime Cost	2,66,00,000
Factory Overhead	30,80,000
Factory Cost	2,96,80,000

(ii) Job Cost Sheet for the order received in 2021-22

Particulars	Amount (₹)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of ₹ 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of ₹ 1,34,27,000)	9,27,806
Cost of delivery	9,50,000
Total Cost	1,53,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	51,01,602
Sales value (Price to be quoted for the order)	2,04,06,408

Hence the price to be quoted is ₹ 2,04,06,408.

9. (i) Process I

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
40,000	Completed	30,000	100	30,000	100	30,000	100	30,000
	Closing WIP	10,000	100	10,000	50	5,000	50	5,000
40,000		40,000		40,000		35,000		35,000

Particulars	Materials	Labour	Overhead	Total
Cost incurred (₹)	6,00,000	7,00,000	4,90,000	17,90,000
Equivalent units	40,000	35,000	35,000	
Cost per equivalent unit (₹)	15	20	14	49

Process-I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Materials	40,000	6,00,000	By Process-II A/c (30,000 units × ₹49)	30,000	14,70,000
To Labour		7,00,000	By Closing WIP*	10,000	3,20,000
To Overhead		4,90,000			
	40,000	17,90,000		40,000	17,90,000

* (Material 10,000 units × ₹ 15) + (Labour 5,000 units × ₹ 20) + (Overheads 5,000 units × ₹ 14)

= ₹ 1,50,000 + ₹ 1,00,000 + ₹ 70,000 = ₹ 3,20,000

(ii) Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--
	Closing WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

Particulars	Materials	Labour	Overhead	Total
Process-I Cost	14,70,000	--	--	14,70,000
Cost incurred (₹)	--	1,42,250	1,70,700	3,12,950
Equivalent units	29,800	28,450	28,450	--
Cost per equivalent unit (₹)	49.3289	5.00	6.00	60.3289

Process-II Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	30,000	14,70,000	By Normal loss A/c	200	--
To Packing Material	--	1,60,000	By Finished Goods Stock A/c	28,000*	18,49,209
To Direct Wages	--	1,42,250	By Closing WIP	1,800**	93,741
To Factory Overhead	--	1,70,700			
	30,000	19,42,950		30,000	19,42,950

* 28,000 × ₹ 60.3289 = ₹ 16,89,209 + ₹1,60,000 (Packing Material Cost) = ₹ 18,49,209

** 1,800 units × ₹ 49.3289 + 450 units × (₹ 5 + ₹6) = ₹ 93,741

10. Working Notes:

1. Calculation of Depreciation per month:

	Particulars	CNG Car	EV Car
A	Car purchase price (₹)	9,20,000	15,20,000
B	*Less:* Govt. subsidy (₹)	--	(1,50,000)
C	*Less:* Residual value (₹)	(95,000)	(1,70,000)
D	Depreciable value of car (₹) [A-B-C]	8,25,000	12,00,000
E	Life of the car	15 years	10 years
F	Annual depreciation (₹) [D÷E]	55,000	1,20,000
G	**Depreciation per month (₹) [F÷12]**	**4,583.33**	**10,000**

2. Fuel/ Electricity consumption cost per month:

	Particulars	CNG Car	EV Car
A	Average distance covered in a month (KM)	1,500	1,500
B	Mileage (KM)	20	240

C	Qty. of CNG/ Full charge required [A÷B]	75 kg.	6.25
D	Electricity Consumption [C×30kwh]	-	187.5
E	Cost of CNG per kg (₹)	60	-
F	Power cost per Kwh (₹)	-	7.60
G	**CNG Cost per month (₹) [C×E]**	**4,500**	**-**
H	**Power cost per month (₹) [D×F]**	**-**	**1,425**

3. Amortised cost of Tyre replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	5 years	5 years
C	No. of time replacement required	2 times	1 time
D	Cost of tyres for each replacement (₹)	16,000	16,000
E	Total replacement cost (₹) [C×D]	32,000	16,000
F	Amortised cost per year (₹) [E÷A]	2,133.33	1,600
E	**Cost per month (₹) [F÷12]**	**177.78**	**133.33**

4. Amortised cost of Battery replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	8 years	8 years
C	No. of time replacement required	1 time	1 time
D	Cost of battery for each replacement (₹)	12,000	5,40,000
E	Total replacement cost (₹) [C×D]	12,000	5,40,000
F	Amortised cost per year (₹) [E÷A]	800	54,000
E	**Cost per month (₹) [F÷12]**	**66.67**	**4,500**

Calculation of Operating cost per month:

	Particulars	CNG Car (₹)	EV Car (₹)
A	**Running cost:**		
	Fuel cost/ Power consumption cost [Refer WN-2]	4,500	1,425

B	**Maintenance cost:**		
	Annual Maintenance cost [Annual cost ÷12]	666.67	433.33
	Annual Insurance cost [Annual cost ÷12]	633.33	1,216.67
	Amortised cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortised cost of Battery replacement [Refer WN-4]	66.67	4,500
		1,544.45	6,283.33
C	**Fixed cost:**		
	Depreciation [Refer WN-1]	4,583.33	10,000
	Driver's salary	20,000	20,000
	Garage rent	4,500	4,500
	Share of Office & Administration cost	1,500	1,500
		30,583.33	36,000
D	**Operating cost per month [A+B+C]**	**36,627.78**	**43,708.33**

11. Working Notes:

1. Calculation of Standard Man hours

When 100 workers work for 1 hour, the standard output is 50 units.

Standard man hours per unit $= \frac{100 \text{ hours}}{50 \text{ units}}$ **= 2 hours per unit**

2. Calculation of standard man hours for actual output:

= 1,920units x 2 hours **= 3,840 hours.**

3. Calculation of actual cost

Type of Workers	No of Workers	Actual Hours Paid	Rate (₹)	Amount (₹)	Idle Hours (5% of hours paid)	Actual hours Worked
Group 'A'	10	400	12.40	4,960	20	380
Group 'B'	30	1,200	12	14,400	60	1,140
Group 'C'	60	2,400	11.40	27,360	120	2,280
	100	**4,000**		**46,720**	**200**	**3,800**

4. Calculation of Standard wage Rate:

Labour Efficiency Variance	= 480F
(Standard hours for Actual production – Actual Hours) x SR	= 480F
(3,840 – 3,800) x SR	= 480
Standard Rate (SR)	**= ₹ 12 per hour**

(i) Total Labour Cost Variance

= (Standard hours x Standard Rate) – (Actual Hours x Actual rate)

= (3,840 x 12) – 46,720 **= 640A**

(ii) Total Labour Rate Variance

= (Standard Rate – Actual Rate) x Actual Hours

Group 'A' = (12 - 12.40) 400	=	160A
Group 'B' = (12 - 12) 1,200	=	0
Group 'C' = (12 – 11.40) 2,400	=	1,440F
		1,280F

(iii) Total Labour Gang Variance

= Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang -Average Standard Rate per hour of Actual Gang@}

@ on the basis of hours worked

$= 3,800 \times \left(12-\frac{3,840\times12}{3,800}\right)$

= 0

[Note: As the number of workers in standard and actual is the same, there is no difference in mix ratio, so labour gang variance will be NIL]

(iv) Total Labour Yield Variance

= Average Standard Rate per hour of Standard Gang × {Total Standard Time (hours) - Total Actual Time worked (hours)}

= 12 x (3,840 – 3,800)

= **480F**

(v) Total Labour idle time variance

= Total Idle hours x standard rate per hour

= 200 hours x 12

= 2,400A

12. (i) Computation of PV ratio, contribution, profit and break-even sales for existing product mix

	Products			Total
	S	T	U	
Selling Price (₹)	600	800	400	
Less: Variable Cost (₹)	300	400	240	
Contribution per unit (₹)	300	400	160	
P/V Ratio (Contribution/Selling price)	50%	50%	40%	
Sales Mix	25%	35%	40%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	12.5%	17.5%	16%	46%
Present Total Contribution (₹1,20,00,000 × 46%)				₹ 55,20,000
Less: Fixed Costs				₹ 36,00,000
Present Profit				₹ 19,20,000
Present Break Even Sales (₹ 36,00,000/0.46)				₹ 78,26,087

(ii) Computation of PV ratio, contribution, profit and break-even sale for proposed product mix

	Products			
	S	T	M	Total
Selling Price (₹)	600	800	600	
Less: Variable Cost (₹)	300	400	300	
Contribution per unit (₹)	300	400	300	
P/V Ratio (Contribution/Selling price)	50%	50%	50%	
Sales Mix	40%	35%	25%	
Contribution per rupee of sales (P/V Ratio x Sales Mix)	20%	17.5%	12.5%	50%
Proposed Total Contribution (₹ 1,28,00,000 x 50%)				₹ 64,00,000
Less: Fixed Costs				₹ 36,00,000
Proposed Profit				₹ 28,00,000
Proposed Break- Even Sales (₹ 36,00,000/0.50)				₹ 72,00,000

13. Revenue Budget (Flexible Budget) of Maharatna Ltd. for the Year 2022

	Particulars	PY 2021	CY 2022
A	Sales Volume (Tonnes)	4,20,000	4,70,400 [112%×4,20,000]
B	Selling Price per tonne (₹)	23,000	23,000
		(₹ in lakh)	**(₹ in lakh)**
C	**Sales value [A×B]**	**96,600**	**1,08,192**
D	**Raw material Cost:**		
(i)	Qty. of Material [2.3 tonnes × A] (tonnes)	9,66,000	10,81,920
(ii)	Price per tonne (₹)	4,500	4,500
(iii)	**Total raw material cost (₹ in lakh) [(i)×(ii)]**	**43,470**	**48,686.40**
E	**Wages & Salary Cost:**		
(i)	Wages to casual employees (15% × 6,000 = 900 employees)	2,386.80 [900 × 26 × 12 × ₹ 850]	2,508.47 [900 × 26 × 12 × ₹ 893.33]
(ii)	Salary to permanent employees (85% × 6,000 = 5,100 employees)	47,736 [5100 × 26 × 12 × ₹ 3,000]	51,316.20 [(5100 × 26 × 6 × ₹ 3,000) + (5100 × 26 × 6 × ₹ 3,450)]
(iii)	**Total wages & salary [(i)+(ii)]**	**50,122.80**	**53,824.67**
F	**Power cost:**		
(i)	For production (units)	4,20,000 [60% × 7,00,000]	4,70,400 [112% × 4,20,000]
(ii)	For employees & offices (units) [40% × 7,00.000]	2,80,000	2,80,000
(iii)	Total Power consumption (units) [(i)+(ii)]	7,00,000	7,50,400
(iv)	Power rate per unit (₹) [₹42,00,000 ÷ 7,00,000]	6.00	6.00
(v)	Total power cost [(iii)×(iv)]	**42**	**45.024**
G	**Safety and maintenance Cost**	**60**	**67.20 [112% × 60,00,000]**
H	**Diesel cost**	**1.2**	**-**

I	**Car Hire charge:**		
(i)	Car hire charge	6	6
(ii)	Fuel reimbursement cost	-	1.38 [115% × 1.2]
(iii)	GST@5% on RCM basis [5%×(i+ii)]	-	0.369
(iv)	**Total Car hire charge cost [(i)+(ii)+(iii)]**	**6**	**7.749**
J	**Depreciation**	**8,040**	**6,834** **[85% × 8040]**
K	Total Cost [Sum of D to J]	1,01,742	1,09,465.043
L	**Profit/ (Loss) [C-L]**	**(5,142)**	**(1273.043)**

14. (a) **Controllable costs and Uncontrollable costs***:* Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre.

Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs.

(b) **Cost plus contract:** Under cost plus contract, the contract price is ascertained by adding a percentage of profit to the total cost of the work. Such types of contracts are entered into when it is not possible to estimate the contract cost with reasonable accuracy due to unstable condition of material, labour services etc.

Following are the advantages of cost plus contract:

(i) The contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.

(ii) It is useful specially when the work to be done is not definitely fixed at the time of making the estimate.

(iii) Contractee can ensure himself about the 'cost of contract' as he is empowered to examine the books and documents of the contractor to ascertain the veracity of the cost of contract.

(c) In integrated accounting system cost and financial accounts are kept in the same set of books. Such a system will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains. In fact all information that management requires from a

system of Costing for doing its work properly is made available. The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and the management maintains full control over the liabilities and assets of its business.

Since, only one set of books are kept for both cost accounting and financial accounting purpose so there is no necessity of reconciliation of cost and financial accounts.

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

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

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

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

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

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

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

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

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

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Material Cost

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

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

Consider 365 days a year.

You are required to CALCULATE:

(a) Economic Order Quantity

(b) Re-Order Level (ROL)

(c) Maximum Stock Level

(d) Minimum Stock Level

(e) Average Stock Level

(f) Number of Orders to be placed per year

(g) Total Inventory Cost

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

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

Employee Cost

2. HR Ltd. is progressing in its legal industry. One of its trainee executives, Mr. H, in the Personnel department has calculated labour turnover rate 24.92% for the last year using Flux method.

Following is the data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Records clerk	810	1,620	90	2,340
Human Resource Manager	?	30	90	60
Legal Secretary	?	90	---	?

Staff Attorney	?	30	30	?
Associate Attorney	?	30	---	45
Senior Staff Attorney	6	---	---	18
Senior Records clerk	12	---	---	51
Litigation attorney	?	---	---	?
Employees transferred from the Subsidiary Company				
Senior Staff Attorney	---	12	---	---
Senior Records clerk	---	39	---	---
Employees transferred to the Subsidiary Company				
Litigation attorney	---	---	90	---
Associate Attorney	---	---	15	---

At the beginning of the year there were total 1,158 employees on the payroll of the company. The opening strength of the Legal Secretary, Staff Attorney and Associate Attorney were in the ratio of 3 : 3 : 2.

The company has decided to abandon the post of Litigation attorney and consequently all the Litigation attorneys were transferred to the subsidiary company.

The company and its subsidiary are maintaining separate set of books of account and separate Personnel Department.

You are required to:

(a) CALCULATE Labour Turnover rate using Replacement method and Separation method.

(b) VERIFY the Labour turnover rate calculated under Flux method by Mr. H

Overheads: Absorption Costing Method

3. SE Limited manufactures two products- A and B. The company had budgeted factory overheads amounting to ₹ 36,72,000 and budgeted direct labour hour of 1,80,000 hours. The company uses pre-determined overhead recovery rate for product costing purposes.

The department-wise break-up of the overheads and direct labour hours were as follows:

Particulars	Budgeted overheads	Budgeted direct labour hours	Rate per direct labour hour
Department Pie	₹ 25,92,000	90,000 hours	₹ 28.80
Department Qui	₹ 10,80,000	90,000 hours	₹ 12.00
Total	₹ 36,72,000	1,80,000 hours	

Additional Information:

Each unit of product A requires 4 hours in department Pie and 1 hour in department Qui. Also, each unit of product B requires 1 hour in department Pie and 4 hours in department Qui.

This was the first year of the company's operation. There was no WIP at the end of the year. However, 1,800 and 5,400 units of Products A and B were on hand at the end of the year.

The budgeted activity has been attained by the company. You are required to:

(i) DETERMINE the production and sales quantities of both products 'A' and 'B' for the above year.

(ii) ASCERTAIN the effect of using a pre-determined overhead rate instead of department-wise overhead rates on the company's income due to its effect on stock value.

(iii) CALCULATE the difference in the selling price due to the use of pre-determined overhead rate instead of using department-wise overhead rates. Assume that the direct costs (material and labour costs) per unit of products A and B were ` 25 and ` 40 respectively and the selling price is fixed by adding 40% over and above these costs to cover profit and selling and administration overhead.

Activity Based Costing

4. The profit margin of BABY Hairclips Company were over 20% of sales producing BROWN and BLACK hairclips.

During the last year, GREEN hairclips had been introduced at 10% premium in selling price after the introduction of YELLOW hairclips earlier five years back at 10/3% premium. However, the manager of the company is disheartened with the sales figure for the current financial year as follows:

Traditional Income Statement **(in ₹)**

	Brown	Black	Yellow	Green	Total
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Direct Labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Overhead (3 times of direct labour)	60,00,000	48,00,000	10,80,000	1,20,000	1,20,00,000
Total Operating Income	20,00,000	16,00,000	4,14,000	60,000	40,74,000
Return on Sales (in %)	13.3%	13.3%	14.8%	18.2%	13.5%

It is a known fact that customers are ready to pay premium amount for YELLOW and GREEN hairclips for their attractiveness; and the percentage returns are also high on new products.

At present, all of the Plant's indirect expenses are allocated to the products at 3 times of the direct labour expenses. However, the manager is interested in allocating indirect expenses on the basis of activity cost to reveal real earner.

He provides support expenses category-wise as follows:

Support Expenses	**(₹)**
Indirect Labour	40,00,000
Labour Incentives	32,00,000
Computer Systems	20,00,000
Machinery depreciation	16,00,000
Machine maintenance	8,00,000
Energy for machinery	4,00,000
Total	1,20,00,000

He provides following **additional information** for accomplishment of his interest:

Incentives to be allocated @ 40% of labour expenses (both direct and indirect).

Indirect labours are involved mainly in three activities. About half of indirect labour is involved in handling production runs. Another 40% is required just for the physical changeover from one color hairclip to another because YELLOW hairclips require substantial labour for preparing the machine as compared to other colour hairclips. Remaining 10% of the time is spend for maintaining records of the products in four parts.

Another amount spent on computer system of ₹ 20,00,000 is for maintenance of documents relating to production runs and record keeping of the four products. In aggregate, approx.. 80% of the amount expend is involved in the production run activity and approx.. 20% is used to keep records of the products in four parts.

Other overhead expenses i.e. machinery depreciation, machine maintenance and energy for machinery are incurred to supply machine capacity to produce all the hairclips (practical capability of 20,000 hours).

Activity Cost Drivers:

Particulars	**Brown**	**Black**	**Yellow**	**Green**	**Total**
Sales Volume (units)	1,00,000	80,000	18,000	2,000	2,00,000
Selling Price (₹)	150	150	155	165	
Material cost (₹)	50	50	52	55	

Machine hours per unit (Hrs)	0.10	0.10	0.10	0.10	20,000
Production runs	100	100	76	24	300
Setup time per run (Hrs)	4	1	6	4	

You are required to –

(i) CALCULATE operating income and operating income as per percentage of sales using activity-based costing system.

(ii) STATE the reasons for different operating income under traditional income system and activity-based costing system.

Cost Sheet

5. CT Limited is engaged in producing medical equipment. It has furnished following details related to its products produced during a month:

	Units	Amount (₹)
Raw materials		
Opening stock	1,000	90,00,000
Purchases	49,000	44,10,00,000
Closing stock	1,750	1,57,50,000
Works-in-progress		
Opening	2,000	1,75,50,000
Closing	1,000	94,50,000
Direct employees' wages, allowances etc.		6,88,50,000
Primary packaging cost (per unit)		1,440
R&D expenses & Quality control expenses		2,10,60,000
Consumable stores, depreciation on plant		3,42,00,000
Administrative overheads related to production		3,15,00,000
Selling expenses		4,84,30,800
Royalty paid for production		3,64,50,000
Cost of web-site (for online sale) maintenance		60,75,000
Secondary packaging cost (per unit)		225

There was a normal scrap of 250 units of direct material which realized ₹ 5,400 per unit. The entire finished product was sold at a profit margin of 20% on sales.

You are required to PREPARE a cost sheet showing:

(i) Prime cost

(ii) Gross works cost

(iii) Factory costs

(iv) Cost of production

(v) Profit

(vi) Sales

Cost Accounting System

6. The financial books of a company reveal the following data for the financial year ending on 31st March, 2022:

	(₹)
Opening Stock:	
Finished goods 875 units	1,48,750
Work-in-process	64,000
01.04.2021 to 31.3.2022	
Raw materials consumed	15,60,000
Direct Labour	9,00,000
Factory overheads	6,00,000
Goodwill written off	2,00,000
Administration overheads	5,90,000
Dividend paid	1,70,000
Bad Debts	24,000
Selling and Distribution Overheads	1,22,000
Interest received	90,000
Rent received	36,000
Sales 14,500 units	41,60,000
Closing Stock: Finished goods 375 units	82,500
Work-in-process	77,334

The cost records provide as under:

- Factory overheads are absorbed at 60% of direct wages.
- Administration overheads are recovered at 20% of factory cost.
- Selling and distribution overheads are charged at ₹ 8 per unit sold.
- Opening Stock of finished goods is valued at ₹ 208 per unit.

- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(i) PREPARE statements for the year ended 31st March, 2022 showing-

- the profit as per financial records
- the profit as per costing records.

(ii) PRESENT a statement reconciling the profit as per costing records with the profit as per Financial Records.

Batch Costing

7. PS Ltd. manufactures articles in predetermined lots simultaneously. The following costs have been incurred for Batch No. 'PS143' in the month of March, 2022:

Units produced	1,000 units
Direct materials cost	₹ 2,00,000
Direct Labour -	
Department A	800 labour hours @ ₹ 100 per hour.
Department B	1,400 labour hours @ ₹ 120 per hour.

Factory overheads are absorbed on labour hour basis and the rates are:

Department A	@ ₹ 140 per hour.
Department B	@ ₹ 80 per hour.

Administrative overheads are absorbed at 10% of selling price.

The firm expects 25% gross profit (sales value minus factory cost) for determining the selling price.

You are required to CALCULATE the selling price per unit of Batch No. 'PS143'.

Contract Costing

8. A contractor prepares his accounts for the year ending 31st March each year. He commenced a contract on 1st July, 2021.

The following information relates to the contract as on 31st March, 2022:

	(₹)
Material issued	12,55,000
Wages	28,28,000
Salary to Foreman	4,06,500

A machine costing ₹ 13,00,000 has been on the site for 4.8 months, its working life is estimated at 7 years and its final scrap value at ₹ 75,000.

A supervisor, who is paid ₹ 40,000 p.m. has devoted one-half of his time to this contract.

All other expenses and administration charges amount to ₹ 6,82,500.

Material in hand at site costs ₹ 1,77,000 on 31st March, 2022.

The contract price is ₹ 1,00,00,000. On 31st March, 2022 2/3rd of the contract was completed. The architect issued certificates covering 50% of the contract price, and the contractor had been paid ₹ 37,50,000 on account.

PREPARE Contract A/c and show the notional profit or loss as on 31st March, 2022.

Process Costing

9. SM Pvt. Ltd. manufactures their products in three consecutive processes. The details are as below:

	Process A	Process B	Process C
Transferred to next Process	60%	50%	
Transferred to warehouse for sale	40%	50%	100%

In each process, there is a weight loss of 2% and scrap of 8% of input of each process. The realizable value of scrap of each process is as below:

Process A @ ₹ 2 per ton

Process B @ ₹ 4 per ton

Process C @ ₹ 6 per ton.

The following particulars relate to April, 2022:

	Process A	Process B	Process C
Materials used (in Tons)	1,000	260	140
Rate per ton	₹ 20	₹ 15	₹ 10
Direct Wages	₹ 4,000	₹ 3,000	₹ 2,000
Direct Expenses	₹ 3,160	₹ 2,356	₹ 1,340

PREPARE Process Accounts- A, B and C & calculate cost per ton at each process.

Joint Products & By Products

10. JP Ltd. uses joint production process that produces three products at the split-off point. Joint production costs during the month of July, 2022 were ₹ 33,60,000.

Product information for the month of July is as follows:

Particulars	Product A	Product B	Product C
Units produced	3,000	6,000	9,000
Sales prices:			
At the split-off	₹ 200		
After further processing	₹ 300	₹ 350	₹ 100
Costs to process after split-off	₹ 6,00,000	₹ 6,00,000	₹ 6,00,000

Other information is as follows:

Product C is a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Further, Product B & C must be processed further before they can be sold. FIND OUT the joint cost allocated to Product A in the month of July if joint cost allocation is based on Net Realizable Value.

Service Costing

11. Royal Transport Services runs fleet of buses within the limits of Jaipur city. The following are the details which were incurred by the company during October, 2021:

	(₹)
Cost of each Bus	24,00,000
Garage Rent	1,00,000
Insurance	25,000
Road tax	20,000
Manager's Salary	60,000
Assistant's Salary (Two)	32,000 each
Supervisor's Salary (Three)	24,000 each
Driver's Salary (Twenty-Five)	20,000 each
Cleaner's Salary (Twenty)	5,000 each
Office Staff's Salary	1,00,000
Consumables	1,20,000
Repairs & Maintenance	90,000
Other Fixed Expenses	72,000
Diesel (10 Kms per Litre)	80 per litre
Oils & Lubricants	1,45,000

Tyres and tubes	35,000
Depreciation	10% p.a. on Cost

Other details are as below:

	Capacity
12 Buses	60 Passengers
13 Buses	50 Passengers

Each bus makes 4 round trips a day covering a distance of 10 Kilometers in each trip (One Way) on an average. During the trips 80% of the seats are occupied. The annual records show that 5 buses are generally required to be kept away from roods each day for repairs.

You are required to CALCULATE cost per passenger-km.

Cost sheet to be prepared on the basis of 25 buses.

Standard Costing

12. Ahaan Limited operates a system of standard costing in respect of one of its products 'AH1' which is manufactured within a single cost centre. Details of standard per unit are as follows:

- The standard material input is 20 kilograms at a standard price of ₹ 24 per kilogram.
- The standard wage rate is ₹ 72 per hour and 5 hours are allowed to produce one unit.
- Fixed production overhead is absorbed at the rate of 100% of wages cost.

During the month of April 2022, the following was incurred:

- Actual price paid for material purchased @ ₹ 22 per kilogram.
- Total direct wages cost was ₹ 43,92,000
- Fixed production overhead cost incurred was ₹ 45,00,000

Analysis of variances was as follows:

Variances	Favourable	Adverse
Direct material price	₹ 4,80,000	-
Direct material usage	₹ 48,000	
Direct labour rate	-	₹ 69,120
Direct labour efficiency	₹ 33,120	-
Fixed production overhead expenditure		₹ 1,80,000

You are required to CALCULATE the following for the month of April, 2022

(i) Material cost variance

(ii) Budgeted output (in units)

(iii) Quantity of raw materials purchased (in kilograms)

(iv) Actual output (in units)

(v) Actual hours worked

(vi) Actual wage rate per labour hour

(vii) Labour cost variance

(viii) Production overhead cost variance

Marginal Costing

13. (a) RPP Manufacturers is approached by an international customer for one-time special order similar to one offered to its domestic customers. Per unit data for sales to regular customers is provided below:

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Fixed manufacturing support	₹ 1092
Total manufacturing costs	₹ 2604
Markup (50%)	₹ 1302
Targeted selling price	₹ 3906

It is provided that RPP Manufacturers has excess capacity.

Required:

(i) WHAT is the full cost of the product per unit?

(ii) WHAT is the contribution margin per unit?

(iii) WHICH costs are relevant for making the decision regarding this one-time special order? WHY?

(iv) For RPP Manufacturers, WHAT is the minimum acceptable price of this one-time-special order only

(v) For this one-time-only special order, SHOULD RPP Manufacturers consider a price of ₹ 2100 per unit? WHY or why not?

(b) The lab corner of Newlife Hospital Trust operates two types of specialist MRI scanning machine- MR10 and MR59. Following details are estimated for the next period:

Machine	MR10	MR59
Running hours	1,100	2,000
	(₹)	(₹)
Variable running costs excluding special technology	68,750	1,60,000
Fixed Costs	50,000	2,43,750

A brain scan is normally carried out on machine type MR10. This task uses special technology costing ₹ 100 each and takes four hours of machine time. Because of the nature of the process, around 10% of the scans produce blurred and therefore useless results.

Required:

(i) CALCULATE the total cost of a satisfactory brain scan on machine type MR10.

(ii) Brain scans can also be done on machine type MR59 and would take only 1.8 hours per scan with a reduced reject rate of 6%. However, the cost of the special technology would be ₹ 137.50 per scan. ADVISE which type should be used, assuming sufficient capacity is available on both types of machines. Consider fixed costs will remain unchanged.

Budget and Budgetary Control

14. Following information is available for DK and Co.:

Standard working hours	9 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	7,200 hours
Std. hours expected to be earned per four weeks	9,000 hours
Actual hours worked in the four- week period	6,750 hours
Standard hours earned in the four- week period	7,875 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

You are required to CALCULATE the following ratios:

(i) Efficiency Ratio

(ii) Activity Ratio

(iii) Calendar Ratio

(iv) Standard Capacity Usage Ratio

(v) Actual Capacity Usage Ratio

(vi) Actual Usage of Budgeted Capacity Ratio

Miscellaneous

15. (a) Health Wealth Hospital is interested in estimating the cost for each patient stay. The hospital offers general health care facility i.e. only basic services.

You are required to:

(i) CLASSIFY each of the following costs as either direct or indirect with respect to each patient.

(ii) CLASSIFY each of the following costs as either fixed or variable with respect to hospital costs per day.

	Direct	Indirect	Fixed	Variable
Electronic monitoring	____	____	____	____
Meals for patients	____	____	____	____
Nurses' salaries	____	____	____	____
Parking maintenance	____	____	____	____
Security	____	____	____	____

(b) Differentiate between Cost Control and Cost Reduction.

(c) Though Cost Accounting and Management Accounting is used synonymously but there are a few differences. Elaborate those differences.

(d) What are cost units? Write the cost unit basis against each of the following Industry/Product-Automobile, Steel, Cement, Chemicals, Power and Transport.

SUGGESTED ANSWERS

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

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

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

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

CA Inter RTP Nov 2022 - Solution

Question 1 – Material costing

Consumption per Day

- Max. = 350 kg/ 7 Day = 50 kg
- Min. = 210kg / 7 Day = 30 Kg
- Avg. = 50 Kg + 30 Kg / 2 = 40 Kg

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

A = Annual Requirement of Material = 40 Kg x 365 Day = 14600 Kg
O = Ordering Cost per Order = Rs.200
C = Carrying Cost p.u.p.a. = Rs.100 x 1% x 12 month + Rs.2 = Rs.14

EOQ = $\sqrt{\frac{2 \times 14600\,kg \times Rs.200}{Rs.14}}$ = 646 kg

(b) ROL = Max. Cons. per Day X Max. Lead Time = 50 KG x 9 Day = 450 Kg

(c) Max. Stock Level = ROL + ROQ – Min. Cons. Per day X Min Lead time
= 450 kg + 646 kg – 30 Kg x 5 Day = 946 kg

(d) Min. Stock Level = ROL – Avg. Cons. Per day X Avg. Lead time =
= 450 kg – 40 kg x 7 day = 170 kg

(e') Avg. Stock level = 946 Kg + 170 Kg / 2 = 558 Kg

(f') No. of orders to be placed per year = A / EOQ
= 14600 Kg / 646 Kg = 23 orders

(g') Total inventory Cost

Purchase Cost (14600 kg X Rs.100)	Rs.14,60,000
Ordering Cost (23 orders x Rs.200)	Rs.4600
C.Cost (EOQ/2 X C) (646 Kg / 2 X Rs.14)	Rs.4522
Total	**Rs.14,69,122**

(h') Restricted No. of Orders = 2 (Given)

New Carrying Cost = Rs.100 x 99% x 1% x 12 month + Rs.2 = 13.88

Purchase Cost (14600 kg X Rs.99)	Rs.14,45,400
Ordering Cost (2 orders x Rs.200)	Rs.400
C.Cost (EOQ/2 X C) (7300 Kg / 2 X Rs.14)	Rs.50622
Total	**Rs. 14,96,462**
Less Old Cost	**Rs. 14,69,122**
Extra cost	**Rs. 27,340**

Offer Not Acceptable

(I') Restricted No. of Orders = 2 (Given)

Let us assume new price to be Rs.P
New Carrying Cost = Rs.P x 1% x 12 month + Rs.2 = 0.12P + 2

Purchase Cost (14600 kg X Rs.P)	14600P
Ordering Cost (2 orders x Rs.200)	Rs.400
C.Cost (EOQ/2 X C) (7300 Kg / 2 X [0.12P + 2]	438P + 7300
Total	**15038P + 7700**

Company can accept placing of order on quarterly basis if total cost under Quarterly Order size level does not exceed EQO size level and if it exceeds cost then extra cost should be given as discount.

15038P + 7700 = Rs. 14,69,122
P = 97.18
Min. required discount = 2.82%

Question 2 – Labour costing

Working Note 1 - Calculation of Average number of employees

	At the beginning of year	At the end of year
Records Clerk	810	2340
HRM	= 60+90-30 = 120	60
Legal Secretary	45	135
Staff Attorney	45	45
Associate Attorney	30	45
Senior Staff Attorney	6	18

Senior Records Clerk	12	51
Litigation Attorney	90	0
Total	**1158**	**2694**

At the beginning of year
Strength of legal secretary, staff attorney & associate attorney
= 1158 – 810 – 120 – 6 – 12 – 90 = 120
Divide 120 in 3:3:2
Hence
Legal secretary = 45
Staff attorney = 45
Associate attorney = 30

At the beginning of year
Legal secretary = 45 + 90 = 135
Staff attorney = 45 +30 – 30= 45
Associate attorney = 45 (Given)

Avg. No. of Workers = 1158+2694/2 = 1926

Working Note 2 – Calculation of Separation, Replacement & Fresh Recruitment

	Separation Left	Replacement	Fresh Recruitment
Records Clerk	90	90	= 1620-90 = 1530
HRM	90	30	0
Legal Secretary	0	0	90
Staff Attorney	30	30	0
Associate Attorney	15	15	= 30-15 = 15
Senior Staff Attorney	0	0	12
Senior Records Clerk	0	0	39
Litigation Attorney	90	0	0
Total	**315**	**165**	**1686**

(a') Labour turnover under separation method:- $\frac{No.\ of\ separations \in a\ year}{Average\ no.\ of\ workers}$ x100
= 315/1926 = 16.36%

Labour turnover under replacement method = $\frac{No.\ of\ replacements}{Average\ no.\ of\ workers}$x100
= 165/1926 = 8.57%

(b') Labour turnover under Flux method = ¿¿ x 100

= (315+165+1686)/1926 = 112.46%

LTR calculated by Mr. H is 24.92% is incorrect Since he did not considered fresh recruitment.

Question 3

Requirement No. (i)
Let us assume A units product A was produced and B units of product B was produced.

	Product A	Product B	Total Available
Dept. Pie	4 Hour p.u.	1 Hour p.u.	90000 Hrs.
Dept. Qui	1 Hour p.u.	4 Hour p.u.	90000 Hrs.

Hence
4A + B = 90000-----Eq.1
A + 4B = 90000-----Eq. 2

Solve both Equation We get,
Product A Produced = 18000 units
Product B Produced = 18000 units

Sold Units

Product A = 18000 units – 1800 units = 16200 units
Product B = 18000 units – 5400 units = 12600 units

Requirement No. (ii)
Calculation of Effect on company's profit

Product	Closing Units	Overhead included using Single ORR	Overhead included using Departmental ORR	Effect on profit due to difference in cost of closing stock
A	1800 units	1800 x 5 hrs x	1800 x 4 hrs	(-) Rs.45360

		Rs.20.40 = Rs.1,83,600	x Rs.28.80 + 1800 x 1 hrs x Rs.12 = Rs.228960	
B	5400 units	5400 x 5 hrs x Rs.20.40 = Rs.5,50,800	5400 x 1 hrs x Rs.28.80 + 5400 x 4 hrs x Rs.12 = Rs.414720	(+) Rs.136080
Total		Rs.734400	Rs.643680	(+) Rs.90720

Use of pre-determined overhead recovery rate has resulted in over-valuation of closing stock by Rs.90720 due to which income of company would increase.

Requirement No. (iii)

W. Note 1 – Calculation of Selling price if pre-determined ORR is used

	Product A	Product B
Material & Labour Cost	25	40
Overhead	5 hrs x Rs.20.40 = 102	5 hrs x Rs.20.40 = 102
Total Cost	127	142
Add Profit 40% of cost	50.80	56.80
SPPU	177.80	198.80

W. Note 2 – Calculation of Selling price if Department wise ORR is used

	Product A	Product B
Material & Labour Cost	25	40
Overhead	4 hr x Rs.28.80 + 1 hr x Rs.12 = Rs.127.20	1 hr x Rs.28.80 + 4 hr x Rs.12 = Rs.76.80
Total Cost	152.20	116.80
Add Profit 40% of cost	60.88	46.72
SPPU	213.08	163.52

Effect of using Different ORR on SPPU

	Product A	Product B
SPPU		
If Pre-determined ORR Used	177.80	198.80
If Departmental ORR Used	213.08	163.52
Difference	35.28 Under Priced	35.28 Over Priced

Question 4

Requirement No. (i)

Statement of Cost Pool (Showing Cost Driver Rate)

Overhead	**Amount**	**Basis**	**No. of Activities**	**Cost per activity (Rs.)**
Indirect Labour Cost (ILC)	Rs.4000000 + Rs.1600000 (40% of ILC) = Rs.56,00,000	2800000 (50%) – Prod Runs	300	9333.33
		2240000 (40%) – Set Up Hours	1052	2129.28
		560000 (10%) – No. of Parts	4	140000
Computer system	2000000	1600000 (80%) – Prod Runs	300	5333.33
		400000 (20%) – No. of Parts	4	1,00,000
Machinery Depreciation	1600000	Machine hours	20000	80
Machine Maintenance	800000	Machine hours	20000	40
Energy for Machinery	400000	Machine hours	20000	20

W.Note – Set Up hrs = 100 x 4 + 100 x 1 + 76 x 6 + 24x 4 = 1052 Set Ups

Statement showing operating income using ABC

	Brown	Black	Yellow	Green	Total
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Less DMC	(50,00,000)	(40,00,000)	(9,36,000)	(1,10,000)	(1,00,46,000)
Less DLC	(20,00,000)	(16,00,000)	(3,60,000)	(40,000)	(40,00,000)
Less Incentive	(8,00,000)	(6,40,000)	(1,44,000)	(16,000)	(16,00,000)

(40% of DLC)					
Less Overheads					
Indirect Labour - 50%	9333.33 x 100 = (933333)	9333.33 x 100 = (933333)	9333.33 x 76 = (709334)	9333.33 x 24 = (224000)	(28,00,000)
Indirect Labour - 40%	2129.28 x 400 = (851711)	2129.28 x 100 = (212928)	2129.28 x 76x6 = (970951)	2129.28 x 24x4 = (204410)	(22,40,000)
Indirect Labour - 10%	140000 x x1 = (140000)	140000 x x1 = (140000)	140000 x x1 = (140000)	140000 x x1 = (140000)	(560000)
Computer system – 80%	5333.33 x 100 = (533333)	5333.33 x 100 = (533333)	5333.33 x 76 = (405334)	5333.33 x 24 = (128000)	(1600000)
Computer system – 20%	100000 x 1 = (100000)	100000 x 1 = (100000)	100000 x 1 = (100000)	100000 x 1 = (100000)	(400000)
Machinery Depreciation	80 x 100000 x 0.10 = (8,00,000)	80 x 80000 x 0.10 = (6,40,000)	80 x 18000 x 0.10 = (1,44,000)	80 x 2000 x 0.10 = (16000)	(1600000)
Machine Maintenance	40 x 100000 x 0.10 = (4,00,000)	40 x 80000 x 0.10 = (3,20,000)	40 x 18000 x 0.10 = (72,000)	40 x 2000 x 0.10 = (8000)	(800000)
Energy for Machinery	20 x 100000 x 0.10 = (2,00,000)	20 x 80000 x 0.10 = (1,60,000)	20 x 18000 x 0.10 = (36,000)	20 x 2000 x 0.10 = (4000)	(400000)
Operating Income	3241623	2720406	(1227619)	(660410)	4074000
Operating income as % of Sales	21.61%	22.67%	(44%)	(200.12 %)	13.53%

Requirement No.(ii)

Only main difference between traditional operating income & income calculated under ABC is due to difference in overhead cost of each product. ABC is more accurate way of allocating overhead cost to each product.

Question 5

Particulars	Amt (Rs.)	Total units
Opening stock of raw material	90,00,000	1000
Add:- Purchase of raw material	44,10,00,000	49000
Less:- Closing stock of raw material	(1,57,50,000)	(1750)
Less Normal Loss (250 units x Rs.5400)	(13,50,000)	(250)
Direct material consumed / DMC	43,29,00,000	48000
Direct Labour Cost	6,88,50,000	
Direct Expenses (Royalty Paid)	3,64,50,000	
Prime Cost/Direct Cost	53,82,00,000	
Factory/works/Manufacturing/Production overhead	3,42,00,000	
Gross Factory Cost	**57,24,00,000**	
Plus Opening stock of WIP	1,75,50,000	2000
Less closing stock of WIP	(94,50,000)	(1000)
Factory Cost	58,05,00,000	49000
Quality Control Cost	-	
Research & Development Cost (Process Related)	2,10,60,000	
Adm. Overheads (Related to Production Activity)	3,15,00,000	
Less:- Credit for Recoveries / Scrap / By –Products / Misc. Income	-	
Primary Packing Cost (49000 units x Rs.1440)	7,05,60,000	
Office and administration overhead	-	
Cost of Production (For FG Produced)	**70,36,20,000**	**49000**
Plus opening stock of finished goods		
Less closing stock of finished goods		
Cost of goods Sold (For FG Sold)	**70,36,20,000**	**49000**

Selling and distribution overhead • Selling Expenses • Cost of Website maintenance • Secondary Packing Cost (49000 units x Rs.225)	 4,84,30,800 60,75,000 1,10,25,000	
General Admin Overheads		
Total cost / Cost of sales	**76,91,50,800**	
Profit (20% of Sales Or 25% on Cost)	19,22,87,700	
Total Sales	**96,14,38,500**	

Question 6

Requirement No. (i)

Statement showing profit as per financial records

	Amount (Rs.)		Amount (Rs.)
To Opening Stock FG WIP	 148750 64000	By Sales	41,60,000
Raw material consumed	1560000	By Closing Stock FG WIP	 82500 77334
DLC	900000	By Rent Received	36000
Factory Overhead	600000	Interest Received	90000
Goodwill W/o	200000		
Adm. OH	590000		
Dividend Paid	170000		
Bad debts	24000		
Selling & Dist. OH	122000		
To Profit	67084		
	44,45,834		**44,45,834**

Statement showing Cost & profit as per Costs records

Particulars	Amt (Rs.)	Total units
Opening stock of raw material		

Add:- Purchase of raw material		
Less:- Closing stock of raw material		
Less Normal Loss (250 units x Rs.5400)		
Direct material consumed / DMC	1560000	
Direct Labour Cost	900000	
Direct Expenses (Royalty Paid)		
Prime Cost/Direct Cost	**2460000**	
Factory overhead (60% of DLC)	540000	
Gross Factory Cost	**3000000**	
Plus Opening stock of WIP	64000	
Less closing stock of WIP	(77334)	
Factory Cost	**2986666**	
Quality Control Cost		
Research & Development Cost (Process Related)		
Adm. Overheads (Related to Production Activity) (20% of Factory Cost)	597334	
Less:- Credit for Recoveries / Scrap / By –Products / Misc. Income		
Primary Packing Cost (49000 units x Rs.1440)		
Office and administration overhead		
Cost of Production (For FG Produced) Sales + Closing Stock – Opening Stock 14500 units + 375 units – 875 units = 14000 units	**3584000**	**14000**
Plus opening stock of finished goods (875 units x Rs.208)	182000	875
Less closing stock of finished goods (375 units x Rs.3584000/14000 units)	(96000)	
Cost of goods Sold (For FG Sold)	**3670000**	
Selling and distribution overhead (Rs.8 x 14500 units)	116000	
General Admin Overheads		
Total cost / Cost of sales	**3786000**	
Total Sales	**4160000**	

Total Profit (Sales – Total cost)	**374000**	

Requirement No. (ii)

Reconciliation statement

Particulars	Amount	
Profit / Loss as per cost Records	374000	
Plus Items Opening FG Adm. OH Interest Received Rent Received	 33250 7334 90000 36000	
Less Items Factory Overheads Goodwill Dividend Paid Bad Debts Selling & Dis. OH Closing Stock of FG	 60000 200000 170000 24000 6000 13500	
Profit/Loss as per financial records	67084	

Question 7 Statement showing Selling price per unit of batch

Particulars	Amount (Rs)
DMC	200000
DLC Dept. A – 800 hrs x Rs.100 Dept. B – 1400 hrs x Rs.120	 80000 168000
Factory Overheads Dept. A – 800 hrs x Rs.140 Dept. B – 1400 hrs x Rs.80	 112000 112000
Factory Cost	**672000**
Adm. OH (10% of Sales)	89600
Total Cost of Production	**761600**
Add Total Profit (Diff.)	134400
Total Sales	**896000**
SPPU (1000 units)	Rs.896

Gross Profit % = $\frac{Sales - Factory\ Cost}{Sales}$

25% = $\frac{X-672000}{X}$

0.25X = X – 672000
0.75X = 672000
X = 896000

Question 8

Particulars	Amt (Rs.)	Particulars	Amt (Rs.)
To material issued	1255000	By material in hand	177000
To labour	2828000	By work certified	50,00,000
To foreman salary	406500	By work uncertified	1311250
To dep. On machine	70000		
To supervisor salary (Rs. 40000 x 9 x 50%)	180000		
To Adm. Changes	682500		
To Notional Profit (Costing P&L A/c)	**1066250**		
	6488250		**6488250**

Working Notes :

1. Dep. On Machine : [(Rs.13,00,000 –Rs.75,000)÷7] x $\frac{4.80\,month}{84\,months}$ = Rs.70000
2. 2/3rd contract completed hence cost incurred to complete 2/3rd contract = Rs. 52,45,000

   Estimated total cost for full contract = $\frac{5245000}{2/3}$ = 7867500
   Cost of 50% certified contract = 7867500 x 50% = Rs. 3933750
   Balance 50% uncertified cost = 5245000 – 3933750 = Rs. 1311250

Question 9

Process A Account

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Material	1000	20000	By Weight loss 2%	20	-
To wages		4000	By Scrap 8%	80	160
To Direct Exp.		3160	By Process B 60%	540	16200
			By Warehouse40%	360	10800
	1000	**27160**		**1000**	**27160**

Cost per good unit = $\frac{Rs.27160-160}{1000\,units-20-80}$ = Rs.30 per unit

Process B Account

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process A	540	16200	By Weight loss 2%	16	
To Material	260	3900	By Scrap 8%	64	256
To wages		3000	By Process B 50%	360	12600
To Direct Exp.		2356	By Warehouse 50%	360	12600
	800	**25456**		**800**	**25456**

Cost per good unit = $\frac{Rs.25456-256}{800\,units-16-64}$ = Rs.35 per unit

Process C Account

Particulars	Units	Total (Rs.)	Particulars	Units	Total (Rs.)
To Process B	360	12600	By Weight loss 2%	10	-
To Material	140	1400	By Scrap 8%	40	240
To wages		2000	By Process B 100%	450	17100
To Direct Exp.		1340	By Warehouse	-	
	500	**17340**		**500**	**17340**

Cost per good unit = $\frac{Rs.17340-240}{500\,units-10-40}$ = Rs.38 per unit

Question 10

As given in Question

- Product C is by product. It means Product A & B are main products.
- Product B & C must be further processed before sale. It means Product A Must be analysed as to whether to process further or not.

Statement showing Incremental benefit of further processing of Product A

Particulars	Amount
Incremental Sales due to further processing (3000 units x (Rs.300-Rs.200)	300000
Less Further Processing Cost	(600000)
Loss due to Further processing	**(300000)**

Conclusion:- Product A Should **not** be processed further.

Calculation of joint cost of main products and by-products

Step 1:- Calculate Joint cost of by-product using following formula

Particulars	Amount (Rs.)
Sales value of by products C	900000
Less:- Cost incurred after separation	(600000)
Joint Cost of Product C	300000

Step 2:- Calculate Joint cost of main product = Total joint cost of all products -Net joint cost of all by-product = 33,60,000 – 3,00,000 = 30,60,000

Statement showing NRV of Product A & B

Particulars	Amount (Rs.)
NRV of Product A	3000 units x RS.200 = Rs.6,00,000
NRV of Product B	6000 units x Rs.350 – Rs.600000 = 15,00,000

Now apportion Joint Cost of Rs.30,60,000 in ratio of 6:15

Joint Cost for Product A = Rs30,60,000 x 6/21 = Rs.8,74,286

Question 11

Statement Showing Total Cost of Operating 25 buses in a month

Particulars	Amount (Rs.)
Fixed Cost	
Depreciation (Rs.24,00,000 x 10% x 25 buses x 1/12)	5,00,000
Garage Rent	1,00,000
Insurance	25,000
Road Tax	20,000
Manager's Salary	60,000
Assistant Salary (Rs.32000 x 2)	64,000
Supervisor's Salary (Rs.24,000 x 3)	72,000
Driver's Salary (Rs.20,000 x 25)	5,00,000
Cleaner's Salary (Rs.5,000 x 20)	1,00,000
Office Staff's Salary	1,00,000
Consumables	1,20,000

Other Fixed Expenses	72,000
Total Fixed Cost	**17,33,000**
Variable Exp.	
Diesel Cost (49600 Km / 10 KMPL) x Rs.80	3,96,800
Oil & Lubricants	1,45,000
Tyres & Tubes	35,000
Total Variable cost	**5,76,800**
Repair & Maintenance Cost	**90,000**
Total operating Cost	**23,99,800**

Calculation of Total Km & Total Passengers Km

Particulars	Total Km	Total Passengers Km
12 Buses (60 Passenger Capacity)	4 Trip x 2 (1 Round Trip) x 10 Km x 31 Days x 12 Buses = 29760 Km	29760 Km x 60 Pax. X 80% = 14,28,480 P. Km
13 Buses (50 Passenger Capacity)	4 Trip x 2 (1 Round Trip) x 10 Km x 31 Days x 13 Buses = 32240 Km	32240 Km x 50 Pax. X 80% = 12,89,600 P.Km
	62000 Km	27,18,080 P.Km
5 Buses Remains on Repair Every Day	62000 Km X 20/25 = 49600 Km	27,18,080 P. km x 20/25 = 21,74,464 P.Km

Cost Per Passenger Km = $\frac{Rs.23,99,800}{2174464\,P.\,Km}$ = Rs.1.10

Question 12

(a') DMCV = DMPV + DMUV = Rs.480000(F) + Rs.48000(F) = Rs.528000(F)

(b') FO Exp. V = Budgeted F.OH – Actual F.OH

Budgeted O/P x Budgeted OH p.u. – Actoa FOH = (180000)
Budgeted O/P x [5 hours x Rs.72 per hour] – 45,00,000= -180000

Budgeted O/P = [45,00,000 – 1,80,000] / 360 = 12000 units

(c') DMPV = SP X AQ – AP X AQ

480000 = AQ x Rs.24 – AQ x Rs.22

AQ = 480000 / 2 = 2,40,000 Kgs

(d') DMCV = SQ X SP – AP X AQ

Let us assume that actual quantity of output be **'X'** units
Then SQ required for Actual Output = **'X'** units x 20Kg = 20**'X'**

20**'X'** x Rs.24 – Rs.22 x 240000 Kg = 528000

'X' = [528000 + 52,80,000] / [20 x 24] = 12100 Kg

Hence Actual output of Product is 12100 Kg

(e') DL. Efficiency Variance = SR X SHAO – SR X AH

Rs.72 x (12100 kg x 5 hours) – Rs.72 X AH = 33120

43,56,000 – 72 x AH = 33120

AH = 60040 hours

(f') Actual wages paid = AH x AR

60040 hours x AR = 43,92,000

AR = Rs.73.15 per hour

(g') DLCV = DLRV + DLEV = (69120) + 33120 = 36000(A)

(h') Production Overhead Cost Variance

= Budgeted OH for Actual O/P – Actual OH for Actual O/P

= 12100 units x [5 hours x Rs.72) – Rs.45,00,000 = Rs.1,44,000(A)

Question 13(a)

(a') Full Cost per unit = Rs.2604 (Already Given in Question)

(b') Contribution per unit = SPPV – VCPU = Rs.3906 – (693+315+504) = 2394

(c') Cost which will incurred on producing additional unit shall be Relevant cost while making decision.

- DMC – Rs.693
- DLC – Rs.315
- Var. Mfd. Support – Rs.504
- Total – Rs.1512

(d') Minimum acceptable price shall be Rs.1512 per unit

(e') Yes should manufacture since Rs.2100 is higher than Rs.1512

Question 13(b)

(i) Statement showing cost per brain scan

Particulars	Amount (Rs.)
Variable cost per 4 hour scan (Rs.68750 / 1100 hours x 4 hours)	250
Special technology cost	100
Fixed cost per 4 hour scan (Rs.50,000/1100 hours x 4 hours)	181.82
Total cost per scan	531.82
Total cost per scan (Considering 10% Normal Loss) Rs.531.82 / 90%	590.92

(i) Statement showing cost per brain scan

Particulars	Amount (Rs.)
Machine – MR10	
Variable cost per 4 hour scan (Rs.68750 / 1100 hours x 4 hours)	250
Special technology cost	100
Fixed cost per 4 hour scan	Irrelevant
Total cost per scan	350
Total cost per scan (Considering 10% Normal Loss) Rs.350*90%	**388.89**
Machine – MR59	
Variable cost per 1.80 hour scan (Rs.1,60,000 / 2,000 hours x 1.80 hours	144
Special technology cost	137.50
Fixed cost per 1.80 hour scan	Irrelevant

Total cost per scan	281.50
Total cost per scan (Considering 6% Normal Loss) Rs.281.50*94%	**299.47**

Advise:- Machine MR 59 is advised to be used since cheaper.

Question No.14

(i) Efficiency Ratio = $\frac{Standard\ Hours}{Actual\ Hours}$ x 100 = $\frac{7875\ Hours}{6750\ Hours}$ x 100 = 116.67%

(ii) Activity Ratio = $\frac{Standard\ Hours}{Budgeted\ Hours}$ x 100 = $\frac{7875\ Hours}{7200\ Hours}$ x 100 = 109.375%

(iii) Standard Capacity Usage Ratio =

$\frac{Budgeted\ Hours}{Maximum\ possible\ hours \in the\ budget\ period}$ x 100 = $\frac{7200\ Hours}{9000\ Hours}$ x 100 = 80%

(iv) Actual Capacity Usage Ratio =

$\frac{Actual\ Hours\ Worked}{Max.\ Possible\ working\ hours \in a\ period}$ x 100 = $\frac{6750\ Hours}{9000\ Hours}$ x 100 = 75%

(v) Actual Usage of Budgeted Capacity Ratio

= $\frac{Actual\ Working\ Hours}{Budgeted\ Hours}$ x 100 = $\frac{6750\ Hours}{7200\ Hours}$ x 100 = 93.75%

(vi) Calendar Ratio = $\frac{Available\ working\ days}{Budgeted\ working\ days}$ x 100 = 19 days / 20 days = 95%

Question 15(a)

Exp.	Direct	Indirect	Fixed	Variable
Electronic Monitoring	Yes			Yes
Meals for Patients	Yes			Yes
Nurses' Salaries		Yes	Yes	
Packing Maintenance		Yes	Yes	
Security		Yes	Yes	

Question 15(b)

Cost Control	Cost Reduction

Actual cost should not exceed standard cost If it exceeds, investigation is needed.	Reducing cost further from standard cost level without impairing product quality.
Main objective - Control cost so as not to exceed the standard limits.	Main objective - Achieve real and permanent reduction in cost p.u. of goods mfd.
Standards are treated as milestone	Standards are assumed to have much extra cost.
Preventive function	Corrective function.
Emphasis on past and present.	Emphasis on present and future.

Question 15(c)

	Basis	Cost Accounting	Management Accounting
1 1	Nature	It records the quantitative aspect only	It records both qualitative and quantitative aspect.
2	Objective	It records the cost of producing a product and providing a service	lt Provides information to management for planning and co-ordination
3	Area	It only deals with cost Ascertainment.	It is wider in scope as it includes F.A., budgeting, Tax, Planning.
4	Recording of data	It uses both past and present figures.	lt is focused with the projection of figures for future.
5	Development	It's development is related to industrial revolution.	It develops in accordance to the need of modern business world.
6	Rules and Regulation	It follows certain principles and procedures for recording costs of different products	It does not follow any specific rules and regulations.

Question 15(d)

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

Automobile	Number
Steel	Ton
Cement	Ton / Per bag
Chemicals	Ton, Kilogram
Power	Per KWH
Transport	Per km, Per passenger, Per passenger per km

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Material Cost

1. Reliable India Pvt Ltd is a startup company engaged in manufacturing of Agro Tech product from a raw material, which is purchased at ₹190 per kg. The company incurs a handling cost of ₹1,470 plus, freight of ₹770 per order. The incremental carrying cost of inventory of raw material is ₹3 per kg per month. In addition, the cost of working capital finance on the investment in inventory of raw material is ₹20 per kg per annum. The annual production of the product is 1,50,000 units and 3 units are obtained from one kg. of raw material. Assume 360 days in a year.

   Required:

   (i) Calculate the economic order quantity of raw materials.

   (ii) Determine, how frequently company should order for procurement be placed.

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

Employee Cost

2. Following information are available from the cost records of BMR Limited, CALCULATE Labour turnover rate and Labour flux rate:

   No. of Employees as on 01.04.2021 = 9,400

   No. of Employees as on 31.03.2022 = 10,600

   During the year, 160 Employees left while 640 Employees were discharged and 1,500 Employees were recruited during the year; of these, 400 Employees were recruited because of exits and the rest were recruited in accordance with expansion plans.

Overhead

3. SANDY Ltd. is a manufacturing company having three production departments, 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December 2022:

	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct material		1,60,000	3,20,000	6,40,000	3,20,000	1,60,000
Direct wages		8,00,000	3,20,000	12,80,000	1,60,000	3,20,000
Factory rent	6,40,000					
Power	4,00,000					
Depreciation	1,60,000					

Other overheads	14,40,000					
Additional information:						
Area (Sq. ft.)		800	400	800	400	800
Capital value of assets (₹) lakhs)		32	64	32	16	16
Machine hours		1,600	3,200	6,400	1,600	1,600
Horsepower of machines		80	64	32	24	40

Apportionment of expenses of service departments is as under:

	A	B	C	X	Y
Service Dept. 'X'	72	24	48	–	16
Service Dept. 'Y'	96	56	–	8	–

Required:

(i) PREPARE a statement showing distribution of overheads to various departments.

(ii) PREPARE a statement showing re-distribution of service departments expenses to production departments using Repeated Distribution method. Also CALCULATE machine hour rate of the production departments 'A', 'B', 'C'.

ABC Costing

4. Hygiene Care Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Hand Wash	Detergent Powder	Dishwasher
Direct Materials (₹ / Pu)	150	120	120
Direct Labour @₹10/ hour (₹ / Pu)	45	60	75
Production Overheads (₹ / Pu)	40	50	40
Total Cost (₹ / Pu)	235	230	235
Quantity Produced (Units)	30,000	60,000	90,000

Hygiene Care Ltd. was absorbing overheads on the basis of direct labour hours. Management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost (₹)
Goods Receiving	Number of Dispatch Order	8,88,000
Inspecting and Testing costs	Number of Production Runs	26,82,000
Dispatching	Number of dispatch order	6,30,000
Storage Cost	Number of Batches of material	36,00,000

The following information is also supplied:

Details	Hand Wash	Detergent Powder	Dishwasher
Batches of material	720	780	900
Number of dispatch order	360	540	600
No. of Production Runs	1,500	2,100	2,400
Number of Dispatch Orders	600	900	1,000

Required:

CALCULATE activity-based production cost of all the three products.

Cost Sheet

5. From the following data of Motilal Ltd., CALCULATE Cost of production:

		(₹)
(i)	Repair & maintenance paid for plant & machinery	9,80,500
(ii)	Insurance premium paid for inventories	26,000
(iii)	Insurance premium paid for plant & machinery	96,000
(iv)	Raw materials purchased	64,00,000
(v)	Opening stock of raw materials	2,88,000
(vi)	Closing stock of raw materials	4,46,000
(vii)	Wages paid	23,20,000
(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100
(x)	Quality control cost for the products in manufacturing process	86,000
(xi)	Research & development cost for improvement in production process	92,600
(xii)	Administrative cost for:	
	- Factory & production	9,00,000
	- Others	11,60,000

(xiii)	Amount realised by selling scrap generated during the manufacturing process	9,200
(xiv)	Packing cost necessary to preserve the goods for further processing	10,200
(xv)	Salary paid to Director (Technical)	8,90,000

Reconciliation

6. The financial records of Riva Private Limited showed a net profit of ₹1,69,500 for the year ended 31st March, 2022. The cost accounts, however, disclosed a net loss of ₹ 88,500 for the same period. The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:

		(₹)
(i)	(Administrative overhead under recovered	63,750.0
(ii)	Factory overhead over recovered	3,37,500.0
(iii)	Depreciation under charged in Cost Accounts	65,000.0
(iv)	Dividend received	50,000.0
(v)	Loss due to obsolescence charged in Financial Accounts	42,000.0
(vi)	Income tax provided	1,09,000.0
(vii)	Bank interest credited in Financial Accounts	34,000.0
(viii)	Value of opening stock:	
	In Cost Accounts	4,12,500.0
	In Financial Accounts	3,62,500.0
(ix)	Value of closing stock:	
	In Cost Accounts	3,13,750.0
	In Financial Accounts	3,30,000.0
(x)	Goodwill written-off in Financial Accounts	62,500.0
(xi)	Notional rent of own premises charged in Cost Accounts	1,50,000.0
(xii)	Provision for doubtful debts in Financial Accounts	37,500.0

Prepare a reconciliation statement by taking costing net loss as base.

Job and Batch Costing

7. A jobbing factory has undertaken to supply 200 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is ₹ 80 per piece. From the following data.

COMPUTE the cost and profit per piece of each batch order and overall position of the order for 1,200 pieces.

Month	Batch Output (Pieces)	Material cost (₹)	Direct wages (₹)	Direct labour (Hours)
January	210	6,500	1,200	240
February	200	6,400	1,400	280
March	220	6,800	1,500	280
April	180	6,300	1,400	270
May	200	7,000	1,500	300
June	220	7,200	1,600	320

The other details are:

Month	Chargeable expenses (₹)	Direct labour Hours
January	1,20,000	4,800
February	1,05,600	4,400
March	1,20,000	5,000
April	1,05,800	4,600
May	1,30,000	5,000
June	1,20,000	4,800

Contract Costing

8. XYZ LLP, contractors and civil engineers, are building a new wing to a school. The quoted fixed price for the contract is ₹30,00,000. Work commenced on 1st January 20X2 and is expected to be completed on schedule by 30 June 20X3.

Data relating to the contract at the year ended 31st March 20X3 is as follows.

	(₹)
Plant sent to site at commencement of contract	2,40,000
Hire of plant and equipment	77,000
Materials sent to site	6,62,000
Materials returned from site	47,000
Direct wages paid	9,60,000
Wage related costs	1,32,000
Direct expenses incurred	34,000

Supervisory staff salaries - Direct	90,000
- Indirect	20,000
Regional office expenses apportioned to contract	50,000
Head office expenses apportioned to contract	30,000
Surveyor's fees	27,000
Progress payments received from school	18,00,000

Additional information:

1. Plant is to be depreciated at the rate of 25 % per annum following straight line method, with no residual value.
2. Unused materials on site at 31st March are estimated at ₹ 50,000.
3. Wages owed to direct workers total ₹ 40,000
4. Budgeted profit on the contract is ₹ 8,00,000
5. Value of work certified by the surveyor is ₹ 24,00,000.
6. The surveyor has not certified the work costing ₹ 1,80,000

You are required to PREPARE the account for the school contract for the fifteen months ended 31st March 20X3, and CALCULATE the notional profit to date.

Process Costing

9. 'Dairy Wala Private limited' is engaged in the production of flavoured milk. Its process involve filtration and boiling of milk after that some sugar, flavour, colour is added and then letting it cool to fill the product into clean and sterile bottles. For Producing 10 litre of flavour milk, 100 litre of Raw milk is required, which extracts only 45 litres of standardized milk.

Following information regarding Process – I has been obtained from the manufacturing department of Dairy Wala Private limited for the month of December 2022:

Items	**(₹)**
Opening work-in process (13,500 litre)	
Milk	1,50,000
Labour	45,000
Overheads	1,35,000
Milk introduced for filtration and boiling (3,00,000 litre)	15,00,000
Direct Labour	6,00,000
Overheads	18,00,000
Abnormal Loss: 3,000 litres	

Degree of completion:	
Milk	100%
Labour and overheads	80%
Closing work-in process: 27,000 litres	
Degree of completion:	
Milk	100%
Labour and overheads	80%
Milk transferred for Packing: 1,18,500 litres	
You are required to PREPARE using average method:	
(i) Statement of equivalent production,	
(ii) Statement of cost,	
(iii) Statement of distribution cost, and	
(iv) Process-I Account.	

Joint Product by Product

10. Key Pee Limited produces and sells the following products:

Products	Units	Selling price at split-off point (₹)	Selling price after further processing (₹)
A	500000	42.5	62.5
B	75000	32.5	42.5
C	62500	20	30
D	50000	25	-
E	187500	35	50

Cost of raw material ₹ 89,75,000 and other manufacturing ex-penses cost ₹13,67,500 in the manufacturing process which are absorbed on the products on the basis of their 'Net realisable value'. The further processing costs of A, B, C and E are ₹31,25,000; ₹ 3,75,000; ₹1,25,000 and ₹3,75,000 respectively. Fixed costs are ₹11,82,500.

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.

Service Costing

11. PREPARE cost statement of Panipat Thermal Power Station showing the cost of electricity generated per kwh, from the following data.

Total units generated	16,50,000 kWh
	(₹)
Operating labour	21,75,000
Repairs & maintenance	7,25,000
Lubricants, spares and stores	5,80,000
Plant supervision	4,35,000
Administration overheads	29,00,000
Insurance Charges	15,00,000
Fuel Charges	8,00,000

7 kWh. of electricity generated per kg. of coal consumed @ ₹4.75 per kg. Depreciation charges @ 5% on capital cost of ₹3,10,00,000.

Standard Costing

12. XYZ Manufacturing Ltd. had prepared the following estimation for the month of January:

	Quantity	Rate (₹)	(₹)
Raw Material-DF	1,600 kg.	50	80,000
Raw Material-CE	1,200 kg.	35	42,000
Skilled labour	2,000 hours	40	80,000
Semiskilled labour	1,600 hours	25	40,000

Standard loss in the process was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

The company has produced 2,960 kg. finished product by using the followings:

	Quantity	Rate (₹)	(₹)
Raw Material-DF	1,800 kg.	40	72,000
Raw Material-CE	1,300 kg.	30	39,000
Skilled labour	2,400 hours	35	84,000
Semiskilled labour	1,720 hours	20	34,400

You are required to CALCULATE:

(a)	Material Cost Variance;
(b)	Material Price Variance;
(c)	Material Mix Variance;
(d)	Material Yield Variance;
(e)	Labour Cost Variance;
(f)	Labour Efficiency Variance and
(g)	Labour Yield Variance

Marginal Costing

13. The following data are available from the budget records of Finesign Women's Handbag Company for the forthcoming budget period.

	₹
Selling Price per unit	1000
Variable cost per unit:	
Cost of Material used	750.00
Sales commission	50.00
Total Variable Cost	800.00
Annual fixed expenses:	
Rent	7,00,000
Salaries	11,00,000
Other fixed expenses	5,00,000
Total Fixed Cost	23,00,000

Although the firm manufactures Bags with different styles, they have identical purchase costs and selling price.

Requirement:

(a) What is the annual break-even point both in terms of units and value?

(b) If the store manager is paid 1 per cent commission on sales, what would be the annual break-even point both in terms of units and value?

(c) If the firm decides to pay a fixed salary of ₹ 9,00,000 in lieu of sales commission, what would be the annual break-even point in terms of units and value.

Considering break-even point in requirement (a), If the stores manager is paid 2 per cent commission on each bag sold in excess of the break-even point, what would be the profit if 20000 bags were sold.

Budget and Budgetary Control

14. EDF Ltd. produces two products using Skilled labour and two types of materials. Shown below the information for the next month's budget:

	Product- A	Product-B
Budgeted sales (in units)	4,080	6,120
Budgeted material consumption per unit (in kg):		
Material-X	8.5	5.1
Material-Y	6.8	10.2
Standard labour hours allowed per unit of product	5.1	8.5

Material-X and Material-Y cost ₹8 and ₹10 per kg and labours are paid ₹30 per hour. Overtime premium is 75% and is payable, if a worker works for more than 45 hours a week. There are 400 direct workers.

The target efficiency ratio for the productive hours worked by the direct workers in actually manufacturing the products is 85%. In addition the non-productive down-time is budgeted at 15% of the productive hours worked.

There are four 6-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	550 units
Product-B	350 units
Material-X	1,200 kgs.
Material-Y	600 kgs.

The anticipated closing stocks for budget period are as below:

Product-A	5 days sales
Product-B	5 days sales
Material-X	10 days consumption
Material-Y	5 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.

Miscellaneous

15. (a) SUGGEST the unit of cost for following industries:
    (a) Transport
    (b) Power
    (c) Hotel
    (d) Hospital
    (e) Steel
    (f) Coal mining
    (g) Professional Services
    (h) Gas
    (i) Engineering
    (j) Oil

    (b) DISCUSS the difference between Job costing and Batch costing.

    (c) EXPLAIN what are the essential pre-requisite for Integrated Accounting system?

    (d) DISCUSS the difference between cost control and cost reduction.

ANSWERS

1. (i) Calculation of Economic Order Quantity (E.O.Q)

Annual requirement (usage) of raw material in kg. (A) = $\frac{1,50,000 \text{units}}{3 \text{unitsperkg.}} = 50,000 \text{kg.}$

Ordering Cost (Handling & freight cost) (O) = ₹1,470 + ₹770 = ₹2,240

Carrying cost per unit per annum (C) i.e. inventory carrying cost + working capital cost= (₹3 × 12 months) + ₹20 = ₹56 per kg.

$$E.O.Q = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 50,000 \text{ kg.} \times ₹ 2,240}{₹ 56}} = 2,000 \text{ kg.}$$

(ii) Frequency of placing orders for procurement :

Annual consumption (A) = 50,000 kg.

Quantity per order (E.O.Q) = 2,000 kg.

No. of orders per annum = $\frac{A}{E.O.Q} = \frac{50,000 \text{kg.}}{2,000 \text{kg.}} = 25$ orders

Frequency of placing orders (in days) = $\frac{360\text{days}}{25\text{orders}}$ = 14.4 Days

(iii) Percentage of discount in the price of raw materials to be negotiated:

Particulars		On Quarterly Basis	On E.O.Q Basis
1.	Annual Usage (in Kg.)	50,000 kg.	50,000 kg.
2.	Size of the order	12,500 kg.	2,000 kg.
3.	No. of orders (1 ÷ 2)	4	25
4.	Cost of placing orders or Ordering cost	₹ 8,960	₹ 56,000
	(No. of orders × Cost per order)	(4 order × ₹ 2,240)	(25 orders × ₹ 2,240)
5.	Inventory carrying cost	₹3,50,000	₹56,000
	(Average inventory × Carrying cost per unit)	(12,500 kg. × ½ × ₹ 56)	(2,000 kg. × ½ × ₹ 56)
6.	Total Cost (4 + 5)	₹ 3,58,960	₹ 1,12,000

When order is placed on quarterly basis the ordering cost and carrying cost increased by ₹2,46,960 (₹3,58,960 - ₹1,12,000). So, discount required = ₹ 2,46,960

Total annual purchase = 50,000 kg. × ₹190 = ₹95,00,000 So, Percentage of discount to be negotiated = $= \frac{₹\ 2,46,960}{₹\ 95,00,000} \times 100$ = 2.60%

2. Employee turnover rate:

It comprises of computation of Employee turnover by using following methods:

(i) Separate Method: $= \frac{\text{Number of employees seperated during the period}}{\text{Average number of employees during the period on roll}} \times 100$

OR, $= \frac{\text{Number of employees left + Number of employees discharged}}{\text{Average number of employees during the period on roll}} \times 100$

$= \frac{(160 + 640)}{(9,400 + 10,600) \div} \times 100$

$= \frac{800}{10,000} \times 100 \quad = 8\%$

(ii) Replacement Method $= \frac{\text{Number of employees replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$

$$= \frac{400}{10,000} \times 100 \quad = 4\%$$

(iii) New Recruitment $= \frac{\text{Number of employees joining in a period (excluding replacement)}}{\text{Average number of employees during the period on roll}} \times 100$

$$= \frac{\text{Number of Recruitments - Number of Replacements}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{1500 - 400}{10,000} \times 100$$

$$= \frac{1,100}{10,000}\ x\ 100 = 11\%$$

Flux Method $= \frac{\text{Number of separation + Number of replacement + Number of new joining}}{\text{Average number of employees during the period on roll}} \times 100$

$$= \frac{(800 + 400 + 1,100)}{(9,400 + 10,600) \div 2} \times 100$$

$$= \frac{2,300}{10,000} \times 100 \quad = 23\%$$

3. (i) Overhead Distribution Summary

	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct materials	Direct	–	–	–	–	3,20,000	1,60,000
Direct wages	Direct	–	–	–	–	1,60,000	3,20,000
Factory rent (2:1:2:1:2)	Area	6,40,000	1,60,000	80,000	1,60,000	80,000	1,60,000
Power (10:16:16:3:5)*	H.P. × Machine Hrs.	4,00,000	80,000	1,28,000	1,28,000	24,000	40,000
Depreciation (2:4:2:1:1)	Capital value of assets	1,60,000	32,000	64,000	32,000	16,000	16,000
Other overheads (1:2:4:1:1)	Machine hrs.	14,40,000	1,60,000	3,20,000	6,40,000	1,60,000	1,60,000
Total		26,40,000	4,32,000	5,92,000	9,60,000	7,60,000	8,56,000

*{(1600×80) : (3200×64) : (6400×32) : (1600×24) : (1600×40)}

(1,28,000 : 2,04,800 : 2,04,800 : 38,400 : 64,000)

(10:16:16:3:5)

(ii) Redistribution of service department's expense using repeated distribution Method:

	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Total overheads	4,32,000	5,92,000	9,60,000	7,60,000	8,56,000
Dept. X overhead apportioned in the ratio (72:24:48: —:16)	3,42,000	1,14,000	2,28,000	-7,60,000	76,000
Dept. Y overhead apportioned in the ratio (96:56: —:8: —)	5,59,200	3,26,200	-	46,600	-9,32,000
Dept. X overhead apportioned in the ratio (72:24:48: —:16)	20,970	6,990	13,980	-46,600	4,660
Dept. Y overhead apportioned in the ratio (96:56: —:8: —)	2,796	1,631	-	233	-4,660
Dept. X overhead apportioned in the ratio (72:24:48: —:16)	105	35	70	-233	23
Dept. Y overhead apportioned in the ratio (96:56: —:8: —)	15	8	-	-	-23
	13,57,086	10,40,864	12,02,050	-	-

Calculation of machine hour rate

		A	B	C
A	Total overheads (₹)	13,57,086	10,40,864	12,02,050
B	Machine hours	1,600	3,200	6,400
C	**Machine hour rate (₹) [A ÷ B]**	**848.18**	**325.27**	**187.82**

4. 1. The Total Production Overhead are 78,00,000

Items	Labour Hour	Overheads allocation on the basis of direct Labour Hour (₹)
Labour Hour Ratio	(4.5:6:7.5)	
Hand Wash	1,35,000	9,00,000
Detergent Powder	3,60,000	24,00,000

Dishwasher	6,75,000	45,00,000
Total	**11,70,000**	**78,00,000**

2. On the basis of ABC analysis this amount will be apportioned as follows:

Statement Showing "Activity Based Production Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	Hand Wash (₹)	Detergent Powder (₹)	Dishwasher (₹)
Goods Receiving	Dispatch order	06:09:10	8,88,000	2,13,120	3,19,680	3,55,200
Inspecting and Testing costs	Production Runs	05:07:08	26,82,000	6,70,500	9,38,700	10,72,800
Dispatching	Dispatch Order	06:09:10	6,30,000	1,51,200	2,26,800	2,52,000
Storage Cost	Batches of material	12:13:15	36,00,000	10,80,000	11,70,000	13,50,000
Total Activity Cost				**21,14,820**	**26,55,180**	**30,30,000**
Quantity Produces				30,000	60,000	90,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				195	180	195
Total				**265.49**	**224.25**	**228.67**

Note: This question can also be solved by using cost driver rate

5. Calculation of Cost of Production of Motilal Ltd for the period…..

Particulars	(₹)
Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)
Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for inventories	26,000
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000

Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,43,100
Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,47,000
Less: Amount realised by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,48,000

Notes:

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

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

6. Statement of Reconciliation

Sl. No.	Particulars	(₹)	(₹)
	Net loss as per Cost Accounts		(88,500)
	Additions		
1	Factory O/H over recovered	3,37,500	
2	Dividend Received	50,000	
3	Bank Interest received	34,000	
4	Difference in Value of Opening Stock (4,12,500 – 3,62,500)	50,000	
5	Difference in Value of Closing Stock (3,30,000 – 3,13,7500)	16,250	
6	Notional Rent of own Premises	1,50,000	6,37,750
	Deductions		
1	Administration O/H under recovered	63,750	
2	Depreciation under charged	65,000	
3	Loss due to obsolescence	42,000	
4	Income tax Provided	1,09,000	
5	Goodwill written-off	62,500	
6	Provision for doubtful debts	37,500	(3,79,750)
	Net Profit as per Financial A/c.		1,69,500

7.

Particulars	Jan. (₹)	Feb. (₹)	March (₹)	April (₹)	May (₹)	June (₹)	Total (₹)
Batch output (in pieces)	210	200	220	180	200	220	1,230
Sale value @ ₹80	16,80	16,00	17,60	14,40	16,00	17,60	98,40
Material cost	6,500	6,400	6,800	6,300	7,000	7,200	40,20
Direct wages	1,200	1,400	1,500	1,400	1,500	1,600	8,600
Chargeable expenses*	6,000	6,720	6,720	6,210	7,800	8,000	41,45
Total cost	13,70	14,52	15,02	13,91	16,30	16,80	90,25
Profit per batch	3,100	1,480	2,580	490	(300)	800	8,150
Total cost per piece	65.2	72.6	68.3	77.3	81.5	76.4	73.4
Profit per piece	14.8	7.4	11.7	2.7	(1.5)	3.6	6.6

Overall position of the order for 1,200 pieces

Sales value of 1,200 pieces @ ₹ 80 per piece	₹ 96,000
Total cost of 1,200 pieces @ ₹ 73.4 per piece	₹ 88,080
Profit	₹ 7,920

$$* \frac{\text{Chargeable expenses}}{\text{Direct labour hour for the month}} \times \text{Direct labour hours for batch}$$

8. School Contract Account

Particulars	(₹)	Particulars	(₹)
To Plant	2,40,000	By Material returned	47,000
To Hire of plant	77,000	By Plant c/d	1,65,000
To Materials	6,62,000	By Materials c/d	50,000
To Direct wages 9,60,000		By WIP c/d:	
Add: Accrued 40,000	10,00,000	Value of work certified	24,00,000
To Wages related costs	1,32,000	Cost of work not certified	1,80,000
To Direct expenses	34,000		
To Supervisory staff: Direct 90,000			

Indirect 20,000	1,10,000		
To Regional office expenses	50,000		
To Head office expenses	30,000		
To Surveyors' fees	27,000		
To Notional profit c/d	4,80,000		
	28,42,000		28,42,000

9. (i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Milk		Labour & O.H.	
				%	Units	%	Units
Opening WIP	13,500	Completed and transferred to Process-II	1,18,500	100	1,18,500	100	1,18,500
Units introduced	3,00,000	Normal Loss (55%* of 3,00,000)	1,65,000	--	--	--	--
		Abnormal loss	3,000	100	3,000	80	2400
		Closing WIP	27,000	100	27,000	80	21,600
	3,13,500		3,13,500		1,48,500		1,42,500

* 100 litre of milk extracts only 45 litre of standardized milk. Thus, normal loss = 100 – 45 = 55%

(ii) Statement showing cost for each element

Particulars	Milk (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	1,50,000	45,000	1,35,000	3,30,000
Cost incurred during the month	15,00,000	6,00,000	18,00,000	39,00,000
Total cost: (A)	16,50,000	6,45,000	19,35,000	42,30,000
Equivalent units: (B)	1,48,500	1,42,500	1,42,500	
Cost per equivalent unit: (C) = (A ÷ B)	11.111	4.526	13.578	29.216

(iii) Statement of Distribution of cost

	(₹)	(₹)
1. Value of units completed and transferred (1,18,500 units × ₹ 29.216)		34,62,096

2. Value of Abnormal Loss: -		
Milk (3,000 units × ₹ 11.111)	33,333	
Labour (2400 units × ₹ 4.526)	10,863	
Overheads (2400 units × ₹ 13.579)	32,590	76,786
3. Value of Closing W-I-P:		
Milk (27,000 units × ₹ 11.111)	299997	
Labour (21,600 units × ₹ 4.526)	97,762	
Overheads (21,600 units × ₹ 13.579)	2,93,306	6,91,065

(iv) Process-I A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Opening W.I.P:			By Normal Loss	1,65,000	--
Milk	13,500	1,50,000	By Abnormal Loss (₹.44 difference due to approximation)	3,000	76,839
Labour	--	45,000	By Process-II A/c	1,18,500	34,62,096
Overheads	--	1,35,000	By Closing WIP	27,000	6,91,065
To Milk introduced	3,00,000	15,00,000			
To Direct Labour		6,00,000			
To Overheads		18,00,000			
	3,13,500	42,30,000		3,13,500	42,30,000

10. Working Note:

Apportionment of joint costs on the basis of Net Realisable Value method

Products	Sales Value (₹)	Post separation Cost (₹)	Net Realisable Value (₹)	Apportioned Cost (₹)
A	3,12,50,000 (5,00,000 units x ₹ 62.50)	31,25,000	2,81,25,000	67,74,563
B	31,87,500 (75,000 units x ₹ 42.5)	3,75,000	28,12,500	6,77,456
C	18,75,000 (62,500 units x ₹ 30)	1,25,000	17,50,000	4,21,528
D	12,50,000 (50,000 units x ₹ 25)	---	12,50,000	3,01,092

E	93,75,000 (1,87,500 units x ₹ 50)	3,75,000	90,00,000	21,67,860
			4,29,37,500	1,03,42,500

Total joint cost =Raw material costs + Manufacturing expenses = ₹89,75,000 + ₹13,67,500 = ₹1,03,42,500

Apportioned joint cost = (Total Joint Cost/ Total Net Realisable value of each X Net Realisable value of each product)

Apportioned joint cost for Product A = (1,03,42,500 / 4,29,37,500 X 2,81,25,000) = ₹67,74,563.32

Similarly, the apportioned joint cost for products B, C, D and E are ₹6,77,456, ₹4,21,528, ₹3,01,092 and ₹21,67,860 respectively.

(a) Statement showing income forecast of the company assum-ing that none of its products are further processed.

	Products					
	A (₹)	**B (₹)**	**C (₹)**	**D (₹)**	**E (₹)**	**Total (₹)**
Sales revenue	2,12,50,000 (₹42.5 × 5,00,000)	24,37,500 (₹ 32.5 × 75,000)	12,50,000 (₹ 20 × 62,500)	12,50,000 (₹ 25 × 50,000)	65,62,500 (₹ 35 × 1,87,500)	3,27,50,000
Less: Apportioned Costs (Refer Working note)	67,74,563	6,77,456	4,21,528	3,01,092	21,67,860	1,03,42,500
	1,44,75,437	17,60,044	8,28,472	9,48,908	43,94,640	2,24,07,500
Less: Fixed Cost						11,82,500
Profit						2,12,25,000

(b) Statement showing income forecast of the company: assuming that products A, B, C and E are further processed (Refer to working note)

	Products					
	A (₹)	**B (₹)**	**C (₹)**	**D (₹)**	**E (₹)**	**Total (₹)**
A. Sales revenue	3,12,50,000	31,87,500	18,75,000	12,50,000	93,75,000	4,69,37,500
B. Apportioned Costs	67,74,563	6,77,456	4,21,528	3,01,092	21,67,860	1,03,42,500
C. Further processing cost	31,25,000	3,75,000	1,25,000	-	3,75,000	40,00,000

D. Total processing cost (B+ C)	98,99,563	10,52,456	5,46,528	3,01,092	25,42,860	1,43,42,500
E. Excess of sales revenue (A-D)	2,13,50,437	21,35,044	13,28,472	9,48,908	68,32,140	3,25,95,000
F. Fixed Cost						11,82,500
G. Profit (E - F)						3,14,12,500

11. Total units generated 16,50,000 kWh.

Cost Statement of Panipat Thermal Power Station

	Per annum (₹)	Per kWh. (₹)
Fixed costs:		
Plant supervision	4,35,000	
Administration overheads	29,00,000	
Insurance Charges	15,00,000	
Depreciation (5% of ₹ 3,10,00,000 p.a.)	15,50,000	
Total fixed cost: (A)	63,85,000	3.87
Variable costs:		
Operating labour	21,75,000	
Fuel Charges	8,00,000	
Lubricants, spares and stores	5,80,000	
Repairs & maintenance	7,25,000	
Coal cost (Refer to working note)	11,19,643	
Total variable cost: (B)	53,99,643	3.27
Total cost [(A) + (B)]	1,17,84,643	7.14

Working Note:

Coal cost (16,50,000 kWh. ÷ 7 kWh) × ₹4.75 per kg. = ₹11,19,643

12. Material Variance

Raw Material	SQ (kg.)	SP	SQ × SP	RSQ (WN-2) (kg.)	RSQ × SP	AQ	AQ × SP	AP	AQ × AP
	(WN-1)	(₹)	(₹)		(₹)		(₹)	(₹)	(₹)
DF	1879	50	93,950	1771	88,550	1800	90,000	40	72,000
CE	1410	35	49,350	1329	46,515	1300	45,500	30	39,000
	3289		1,43,300	3,100	1,35,065	3100	1,35,500		1,11,000

WN-1: Standard Quantity (SQ):

1879.365 or 1879 kg. = $\left(\frac{1,600\,kg.}{0.9 \times 2,800\,kg.} \times 2,960\,kg.\right)$

Raw Material DF = $\left(\frac{1,200\,kg.}{0.9 \times 2,800\,kg.} \times 2,960\,kg.\right)$

Raw Material CE = 1409.52 or 1410 kg. $\left(\frac{1,200\,kg.}{2,800\,kg.} \times 3,100\,kg.\right)$

WN- 2: Revised Standard Quantity (RSQ):

Raw Material DF = 1,771.43 or 1,771 kg. $\left(\frac{1,200\,kg.}{2,800\,kg.} \times 3,100\,kg.\right)$

Raw Material CE = 1,328.57 or 1,329 kg.

(a) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
{1,43,300 –1,11,000 = 32,300(F) (F)

(b) Material Price Variance (A + B) = {(AQ × SP) – (AQ ×AP)
{1,35,500 – 1,11,000} = 24,500(F)

(c) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
{1,35,065 – 1,35,500} = 435 (A)

(d) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
{1,43,300 – 1,35,065} = 8,235 (F)

Labour Variances:

Labour	SH	SR	SH × SR	RSH	RSH × SR	AH	AH × SR	AR	AH × AR
	(WN-3)	(₹)	(₹)	(WN-4)	(₹)		(₹)	(₹)	(₹)
Skilled	2232	40	89,280	2289	91,560	2,400	96,000	35	84,000
Semiskilled	1785	25	44,625	1831	45,775	1720	43,000	20	34,400
	4,017 hrs		1,33,905	4,120	1,37,335	4,120	1,39,000		1,18,400

WN- 3: Standard Hours (SH):

Skilled labour = 2,231.746 or 2,232 hrs $\left(\frac{0.95 \times 2,000\,hr}{0.90 \times 2,800\,kg} \times 2,960\,kg\right)$

Semiskilled labour $= 1785.397 \text{ or } 1785 \text{ hrs} \left(\frac{0.95 \times 1600 \text{ hr}}{0.90 \times 2,800 \text{ kg}} \times 2,960 \text{ kg} \right)$

WN- 4: Revised Standard Hours (RSH):

Skilled labour = 2,288.889 or 2,289 hrs. $= \left(\frac{2,000 \text{ hrs}}{3,600 \text{ kg}} \times 4,120 \text{ hrs} \right)$

Semiskilled labour = 1831.11 or 1831 hrs. $= \left(\frac{1,600 \text{ hrs}}{3,600 \text{ kg}} \times 4,120 \text{ hrs} \right)$

(e) Labour Cost Variance (Skilled + Semiskilled) = {(SH × SR) – (AH × AR)}

{1,33,905 – 1,18,400} =15,505 (F)

(f) Labour Efficiency Variance (Skilled + Semiskilled) = {(SH × SR) – (AH × SR)}

{1,33,905 – 1,39,000} = 5,095 (A)

(g) Labour Yield Variance (Skilled + Semiskilled) = {(SH × SR) – (RSH × SR)}

= {1,33,905 – 1,37,335} = 3,430 (A)

13. (a) P/V ratio: $\frac{\text{Sales per unit - Variable Cost per unit}}{\text{Selling price per unit}} \times 100$

$= \frac{1000 - 800}{1000} \times 100$

$= \frac{200}{1000} \times 100 = 20\%$

Annual BEP in units: $\frac{\text{Annual fixed cost}}{\text{Contribution per unit}}$

$= \frac{₹\ 23,00,000}{₹\ 200} = 11,500 \text{ units}$

Annual BEP in value: $\frac{\text{Annual fixed cost}}{\text{P / V ratio}}$

$\frac{₹\ 23,00,000}{₹\ 20\%} = ₹1,15,00,000$

(b) Revised P/V ratio and BEP :

commission on sales per unit= 1% of 1,000= ₹10

So, P/V ratio : $\frac{1000-(750+50+10)}{1000}$

$= \frac{190}{1000} \times 100 = 19\%$

BEP in terms of units: $\frac{\text{Annual fixed cost}}{\text{Contribution per unit}}$

$= \frac{23,00,000}{190} = 12,106$ units

BEP in terms of value: $\frac{\text{Annual fixed cost}}{P/V}$

$= \frac{23,00,000}{19\%} = ₹1,21,05,263$

(c) Break-even point under fixed salary plan:

P/V ratio $= \frac{\text{Contribution per unit}}{\text{Selling price per unit}} = \frac{1000-750}{1000} \times 100 = \frac{250}{1000} \times 100 = 25\%$

Revised fixed cost :

Original fixed cost	₹ 23,00,000
Proposed fixed salary	₹ 9,00,000
Total	₹ 32,00,000

BEP in terms of units: $\frac{\text{Annual fixed cost}}{\text{Contribution per unit}} = \frac{32,00,000}{250} = 12,800$ units

BEP in terms of value: $\frac{\text{Annual fixed cost}}{P/v \text{ ratio}} = \frac{32,00,000}{25\%} = 1,28,00,000$

(d) Annual break-even point under requirement (a) is 11,500 units.

Margin of safety at sales volume of 20,000 unit of bags (20,000 – 11,500) = 8500 units

Contribution on sales beyond break-even sales:

Revised contribution per unit: 200 – (2% of 1000) = 180

Profit = Margin of safety (in units) × Contribution per unit

= 8500 × 180 = ₹ 15,30,000

14. Number of days in budget period = 4 weeks × 6 days = 24 days

Number of units to be produced

	Product-A (units)	**Product-B (units)**
Budgeted Sales	4,080	6,120
Add: Closing stock	850	1275
	$\left(\frac{4,080 \text{ units}}{24 \text{ days}} \times 5 \text{ days}\right)$	$\left(\frac{6,120 \text{ units}}{24 \text{ days}} \times 5 \text{ days}\right)$
Less: Opening stock	550	350
	4,380	7,045
(i) Material Purchase Budget		
	Material-X (Kg.)	**Material-Y (Kg.)**
Material required:		
Product-A	37,230	29,784
	(4,380 units × 8.5 kg.)	(4,380 units × 6.8 kg.)
Product-B	35,930	71,859
	(7,045 units × 5.1 kg.)	(7,045 units × 10.2 kg.)
	73,160	1,01,643
Add: Closing stock	30,483	21,176
	$\left(\frac{73,160 \text{ kgs.}}{24 \text{ days}} \times 10 \text{ days}\right)$	$\left(\frac{1,01,643 \text{ kgs.}}{24 \text{ days}} \times 5 \text{ days}\right)$
Less: Opening stock	1,200	600
Quantity to be purchased	1,02,443	1,22,219
Rate per kg. of Material	8	10
Total Cost	8,19,541	12,22,186
(ii) Wages Budget		
	Product-A (Hours)	**Product-B (Hours)**
Units to be produced	4,380	7,045
Standard hours allowed per unit	5.1	8.5
Total Standard Hours allowed	22,338	59,883

Productive hours required for production	$\frac{22,338 \text{ hours}}{85\%} \times 26,280$	$\frac{59,883 \text{ hours}}{85\%} \times 70,450$
Add: Non-Productive down time hours	3942 (15% of 26,280 hours)	10568 (15% of 70,450 hours)
Hours to be paid	30,222	81,018
Total Hours to be paid =	1,11,240	
Hours to be paid at normal rate (4 weeks × 45 hours × 400 workers) =	72000	
Hours to be paid at premium rate	39,240	
Total wages to be paid = (72,000 hours × ₹30 + 39,240 hours × ₹ 52.5)	= ₹ 21,60,000 + ₹ 20,60,100 = ₹ 42,20,100	

15. (a) Cost units are as follows:

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

(b) Differences between Job costing and Batch costing:

Sr. No	Job Costing	Batch Costing
1.	Method of costing used for non-standard and non- repetitive products produced as per customer	Homogeneous products produced in a continuous production flow in lots.

	specifications and against specific orders.	
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.

(c) Essential pre-requisites for Integrated Accounts: The essential pre-requisites for integrated accounts include the following steps-

1. The management's decision about the extent of integration of the two sets of books. Some concerns find it useful to integrate up to the stage of prime cost or factory cost while other prefers full integration of the entire accounting records.
2. A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
3. An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.
4. Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.

(d)

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

CA Inter Cost RTP – For May 2024

Easy Explanation & Solution For Our Students

Question 1 – Case Scenario – Unique Question

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

The purchase price of per kilogram of raw material A and B is Rs.30 and Rs.44 respectively exclusive of taxes. To place an order, the company has to incur an administrative cost of Rs.1,200. Carrying cost for Material A and B is 15% and 5% respectively. At present material A is purchased in a lot of 15,000 kg. to avail 10% discount on market price. GST applicable for both the materials is 18% and the input tax credit is availed.

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

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

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

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

- (a) 9,000 kg & 6,000 kg respectively
- (b) 18,000 kg & 12,000 kg respectively
- (c) 27,000 kg & 18,000 kg respectively
- (d) 30,000 kg & 20,000 kg respectively

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

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

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

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

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

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

(a) 18,200 kg.

(b) 12,000 kg.

(c) 16,000 kg.

(d) 16,200 kg.

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

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

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

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

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

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

(a) 1,800 kg.

(b) 1,200 kg.

(c) 600 kg.

(d) 2,400 kg.

Solution

(i) Input output ratio is 5:3 Hence for an output of 30,000 Kg, Entity needs to use 50,000 kg as input (30,000 kg $\frac{5}{3}$).

Material A:B Ratio is 3:2 hence
Material A is required 30,000 kg per month.
Material B is required 20,000 Kg per month.
Hint – Apportion 50,000 kg total material in 3:2

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

	Material A	Material B
A (Annual Purchase Requirement)	30,000 kg x 12 months = 3,60,000 KG	20,000 kg x 12 Months = 2,40,000 KG

O (Ordering Cost per Order)	Rs.1200	Rs.1200
C (Carrying Cost per unit per annum)	Rs.30 x 15% = Rs.4.50	Rs.44 x 5% = Rs.2.20
EOQ $\sqrt{\frac{2 \times A \times O}{C}}$	$\sqrt{\frac{2 \times 360000 \times 1200}{4.50}}$ = 13856 KG	$\sqrt{\frac{2 \times 240000 \times 1200}{2.20}}$ = 16181 KG

(iii) **Unique Point**

Max. Stock Level = Re-order Level + Re-order quantity – Minimum Usage X Minimum Lead Time

ROL = Max. Consumption per day x Max. Lead time (in Days)
ROL = 30,000Kg / 25 Days X 2 Day = 2400 Kg
Note:- Production is carried out evenly – It means Min. & Max. Consumption shall be same as Avg. Consumption.

Max. Stock Level = 2400 Kg + 15000 KG (Given) – 30,000 kg / 25 Days x 1 Day = 16200 Kg
But Note Material A is Perishable after 10 days hence Entity would not maintain stock more than 10 days consumption Since it would become loss after that.
10 days consumption = 30000 kg / 25 days X 10 Days = 12000 Kg
Hence Finally Max. Stock level shall be 12000 Kg (Not 16200 Kg).

(iv) **Unique Point**

Statement showing Total cost of Material A when purchased at 15000 Kg per order & at EOQ Level.

When Order Size is	**15,000 Kg**	**13856 KG (EOQ)**
Annual Purchase Requirement (A)	30000 Kg x 12 months = 360000 Kg	30000 Kg x 12 months = 360000 Kg
Purchase price per kg	Rs.30 – Rs.30 x 10% Discount = Rs.27	Rs.30
Total Purchased Qty	450000 kg (Note 1)	415680 Kg (Note 2)
Total No. of Orders	30 (Note 1)	30 (Note 2)
Total Purchase Cost – (A)	450000 kg x Rs.27 = Rs.1,21,50,000	415680 kg x Rs.30 = Rs.1,24,70,400
Total Ordering Cost – (B)	30 Orders x Rs.1200 = Rs.36,000	30 Orders x Rs.1200 = Rs.36,000
Total Carrying Cost – (C) – C% x Purchase Price x Q/2	15% x Rs.27 x 15000kg/2 = 30,375	15% x Rs.30 x 13856Kg/2 = Rs.31,176
Total Cost	**Rs.1,22,16,375**	**Rs.1,25,37,576**

Note 1 – 15000 kg is purchased in single order to get 10% discount but

company is able to use only 12000 kg in 10 days since it is perishable after 10 days (30000 kg / 25 days x 10 Days = 12000 Kg) hence 3000 kg gets wasted on every order.
Company has to place 30 orders to use 360000 kg material (360000 kg / 12000 kg).
Hence Total Material Purchased = 30 orders x 15000 kg = 450000 kg

Note 2 – 13856 kg is purchased in single order as EOQ but company is able to use only 12000 kg in 10 days since it is perishable after 10 days (30000 kg / 25 days x 10 Days = 12000 Kg) hence 1856 kg gets wasted on every order.
Company has to place 30 orders to use 360000 kg material (360000 kg / 12000 kg).
Hence Total Material Purchased = 30 orders x 15000 kg = 415680 Kg
Answer – If material is purchased at EOQ then entity would loss equal to Rs.3,20,201.

(v) Minimum Stock Level Material A
= ROL – Avg. Consumption x Avg. Lead Time

Min. Stock Level = 2400 KG (Calculated Earlier) – 30000Kg / 25 Days x 1.50 Days = 600 KG

Question 2 – Nothing New in this Question

The board of the J Ltd. has been appraised by the General Manager (HR) that the employee attrition rate in the company has increased. The following facts has been presented by the GM(HR):

(1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.

(2) 20% of the output during training period was defective. Cost of rectification of a defective unit was Rs. 25.

(3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.

(4) Selling price per unit is Rs. 180 and P/V ratio is 20%.

(5) Settlement cost of the workers leaving the organization was
Rs. 1,83,480.

(6) Recruitment cost was Rs. 1,56,340

(7) Training cost was Rs. 1,13,180

You being an associate finance to GM(HR), has been asked the following questions:

(i) How much quantity of output is lost due to labour turnover?

(a) 10,000 units

(b) 8,000 units

(c) 12,000 units

(d) 12,600 units

(ii) How much loss in the form of contribution, the company incurred due to labour turnover?

(a) Rs. 4,32,000

(b) Rs. 4,20,000

(c) Rs. 4,36,000

(d) Rs. 4,28,000

(iii) What is the cost repairing of defective units?

(a) Rs. 75,000

(b) Rs. 15,000

(c) Rs. 50,000

d) Rs. 25,000

(iv) Calculate the profit lost by the company due to increased labour turnover.

(a) Rs. 7,50,000

(b) Rs. 15,00,000

(c) Rs. 5,00,000

(d) Rs. 9,00,000

(v) How much quantity of output is lost due to inexperience of the new worker?

(a) 1,000 units

(b) 2,600 units

(c) 2,000 units

(d) 12,600 units

Solution

(i) **Note**: If company had experienced employee available in company so training period hours would not have been lost. Employer must have obtained production from these lost hours. Same applies to hours to due to delay in recruitment process.

Output by experienced workers in 50,000 hours = $\frac{50\,000\ hours}{10\ hr\ per\ unit}$ = 5000 units

But actual output by new recruits = 5000 units x 60% = 3000 units

Hence loss of output = 5000 units – 3000 units = 2000 units

Loss of output due to delay in recruitment process = $\frac{100000\ hours}{10\ hour\ per\ day}$ = 10,000 units

Total loss of output = 10000 units + 2000 units = 12000 units

(ii) Contribution per unit = Selling price x P/V ratio = Rs. 180 x 20% = Rs. 36

(iii) Cost of repairing defective units = 3000 units x 20% x Rs. 25 = Rs. 15,000

(iv) Profit forgone due to labour turnover

Particulars	Amount (Rs.)
Contribution lost (12000 units x Rs. 36)	4,32,000
Cost of repairing of defectives	15,000
Recruitment Cost	1,56,430
Training Cost	1,13,180
Settlement Cost	1,83,480
Profit Forgone	9,00,000

(v) Output by experienced workers in 50,000 hours = $\frac{50\,000\ \text{hours}}{10\ \text{hr per unit}}$ = 5000 units

But actual output by new recruits = 5000 units x 60% = 3000 units

Hence loss of output = 5000 units – 3000 units = 2000 units

Question 3 – Nothing New in This Question

During half year ending inter departmental review meeting of P Ltd., cost variance report was discussed and the performance of the departments were assessed. The following figures were presented.

For a period of first six months of the financial year, following information were extracted from the books:

Actual production overheads	Rs 34,08,000
The above amount is inclusive of the following payments made:	
Paid as per court's order	Rs 4,50,000
Expenses of previous year booked in current year	Rs 1,00,000
Paid to workers for strike period under an award	Rs 4,20,000
Obsolete stores written off	Rs 36,000

Production and sales data for the six months are as under:

Production:	
Finished goods	1,10,000 units
Works-in-progress	
(50% complete in every respect)	80,000 units
Sale:	
Finished goods	90,000 units

Machine worked during the period was 3,000 hours.

At the of preparation of revenue budget, it was estimated that a total of Rs 50,40,000 would be required for budgeted machine hours of 6,000 as production overheads for the entire year.

During the meeting, a data analytic report revealed that 40% of the over/under-absorption was due to defective production policies and the balance was attributable to increase in costs.

You were also present at the meeting; the chairperson of the meeting has asked you to be ready with the followings for the performance appraisal of the departmental heads:

(i) How much was the budgeted machine hour rate used to recover overhead?

a) Rs 760

b) Rs 820

c) Rs 780

d) Rs 840

(ii) How much amount of production overhead has been recovered (absorbed) upto the end of half year end?

(a) Rs 25,20,000

(b) Rs 34,08,000

(c) Rs 24,00,000

(d) Rs 24,60,000

(iii) What is the amount of overhead under/ over absorbed?

(a) 1,18,000 over-absorbed

(b) 1,18,000 under- absorbed

(c) 18,000 over-absorbed

(d) 18,000 under-absorbed

(iv) What is the supplementary rate for apportionment of over/under

absorbed overheads over WIP, Finished goods and Cost of sales?

(a) Rs 0.315 per unit

(b) Rs 0.472 per unit

(c) Rs 0.787 per unit

(d) Rs 1 per unit

(v) What is the amount of over/under absorbed overhead apportioned to Work in Progress?

(a) Rs 9,440

(b) Rs 42,480

(c) Rs 18,880

(d) Rs 70,800

Solution

(i) Budgeted machine hour rate = Total budgeted Overhead / Total budgeted Machine Hours = Rs.50,40,000 / 6,000 M. Hours = Rs.840 per machine hour

(ii) Recovered Production overhead amount = Actual machine hours x Budgeted machine hour rate = 3000 M. Hours x Rs.840 = Rs.25,20,000

(iii) Calc. of Under / Over Recovery of Overheads Amount

	Amount (Rs.)
Actual Overhead Incurred	34,08,000
Less Court Order Exp.	(4,50,000)
Less Previous Year Exp.	(1,00,000)
Less Strike period wages	(4,20,000)
Less Obsolete W/Off	(36,000)
Overhead Incurred	**24,02,000**
Recovered Overhead Amount	25,20,000
Over Recovered Amount	1,18,000

(iv) supplementary rate = $\frac{unabsorbed\ or\ over\ absorbed\ OH}{Total\ production\ in\ units\ including\ equivalent\ units\ of\ WIP}$

40% Over Recovered Overhead is due to defective policy hence only 60% shall be charged to FG, WIP using supplementary rate.

Chargeable Over Recovered OH = Rs.118000 x 60% = Rs.70,800

Equivalent Units of FG & WIP = 110000 units + 80000 units x 50% = 150000 units

S. Rate = Rs.70800 / 150000 units = Rs.0.472

(v) Over Recovery chargeable to WIP = Equivalent Units of WIP x S. Rate = 80000 units x 50% x Rs.0.472 = Rs.18,880

Question 4 – Nothing New in This Question

The sales department of A Limited is analysing the customer profitability for its Product Z. It has decided to analyse the profitability of its five new customers using activity-based costing method. It buys Product Z at Rs 5,400 per unit and sells to retail customers at a listed price of Rs 6,480 per unit. The data pertaining to five customers are:

	Customers				
	A	B	C	D	E
Units sold	4,500	6,000	9,500	7,500	12,750
Listed Selling Price	Rs.6,480	Rs.6,480	Rs.6,480	Rs.6,480	Rs.6,480
Actual Selling Price	Rs.6,480	Rs.6,372	Rs.5,940	Rs.6,264	Rs.5,832
Number of Purchase orders	15	25	30	25	30
Number of Customer visits	2	3	6	2	3
Number of deliveries	10	30	60	40	20
Kilometers travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

After a detailed analysis and computation, the following activities has been identified and respective cost has been calculated:

Activity	Cost Driver Rate
Order taking	Rs 4,500 per purchase order
Customer visits	Rs 3,600 per customer visit
Deliveries	Rs 7.50 per delivery Km travelled
Product handling	Rs 22.50 per case sold
Expedited deliveries	Rs 13,500 per expedited delivery

You are required to COMPUTE the customer-level operating income of each of five retail customers.

Solution

Computation of Customer level operating income

	Customers				
	A	**B**	**C**	**D**	**E**
Cases sold	4500	6000	9500	7500	12750
Actual Selling Price	6480	6372	5940	6264	5832

(Rs.)					
Revenue (Rs.)	**29160000**	**38232000**	**56430000**	**46980000**	**74358000**
Cost of goods sold @ Rs.5400	24300000	32400000	51300000	40500000	68850000
Gross margin	**4860000**	**5832000**	**5130000**	**6480000**	**5508000**
Less: Customer level operating activities costs	177450	259650	372600	291450	450675
Customer level operating income	**4682550**	**5572320**	**4757400**	**6188550**	**5057325**

Customer level operating activities costs

	Customers				
	A	**B**	**C**	**D**	**E**
Order taking costs (Rs.): (No. of purchase × Rs.4500	67500	112500	135000	112500	135000
Customer visits costs (Rs.) (No. of customer visits × Rs. 3600	7200	10800	21600	7200	10800
Delivery vehicles travel costs (Rs.) (Kms travelled by delivery vehicles × Rs. 7.50 per km.)	1500 (7.50 x 10x20)	1350 (7.50 x 30 x 6)	2250 (7.50 x 60x 5)	3000 (7.50 x 40 x 10)	4500 (7.50 x 20 x 30)
Product handling costs (Rs.) {(a) ×Rs. 22.50}	101250	135000	213750	168750	286875
Cost of expediting deliveries (Rs.) {No. of expedited deliveries × Rs. 13500}	-	-	-	-	13500
Total cost of customer level Operating activities (Rs.)	**177450**	**259650**	**372600**	**291450**	**450675**

Question 5 – Cost Head Selection in this Question

P Ltd. has gathered cost information from ledgers and other sources for the year ended 31st December 2023. The information are tabulated below:

Sl. No.		Amount (Rs)	Amount (Rs)
(i)	Raw materials purchased		5,00,00,000
(ii)	Freight inward		9,20,600
(iii)	Wages paid to factory workers		25,20,000
(iv)	Royalty paid for production		1,80,000
(v)	Amount paid for power & fuel		3,50,000
(vi)	Job charges paid to job workers		3,10,000

(vii)	Stores and spares consumed		1,10,000
(vii)	Depreciation on office building		50,000
(ix)	Repairs & Maintenance paid for: - Plant & Machinery	40,000	
	- Sales office building	20,000	60,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	28,200	
	- Factory building	18,800	47,000
(xi)	Expenses paid for quality control check activities		18,000
(xii)	Research & development cost paid for improvement in production process		20,000
(xii)	Expenses paid for pollution control and engineering & maintenance		36,000
(xi)	Salary paid to Sales & Marketing managers		5,60,000
(xv)	Salary paid to General Manager		6,40,000
(xv)	Packing cost paid for:		
	- Primary packing necessary to maintain quality	46,000	
	- For re-distribution of finished goods	80,000	1,26,000
(xvi)	Fee paid to independent directors		1,20,000
(xvii)	Performance bonus paid to sales staffs		1,20,000
(xix)	Value of stock as on 1stJanuary, 2023:		
	- Raw materials	10,00,000	
	- Work-in-process	8,60,000	
	- Finished goods	12,00,000	30,60,000
(xx)	Value of stock as on 31stDecember, 2023:		
	- Raw materials	8,40,000	
	- Work-in-process	6,60,000	
	- Finished goods	10,50,000	25,50,000

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

The board meeting is scheduled to be held in next week and you being an associate to the chief cost controller of the company, has been asked to PREPARE a cost sheet.

Solution – Hint

Sl. No.		Amount (Rs)	Amount (Rs)	**Head**
(i)	Raw materials purchased		5,00,00,000	DMC
(ii)	Freight inward		9,20,600	DMC
(iii)	**Wages paid to factory workers**		**25,20,000**	**DLC**
(iv)	Royalty paid for production		1,80,000	**D. Exp.**
(v)	Amount paid for power & fuel		3,50,000	**D. Exp.**
(vi)	Job charges paid to job workers		3,10,000	**D. Exp.**
(vii)	Stores and spares consumed		1,10,000	F. OH
(vii)	Depreciation on office building		50,000	Office & Adm. OH
(ix)	Repairs & Maintenance paid for: - Plant & Machinery	40,000		F. OH
	- Sales office building	20,000	60,000	Selling OH
(x)	Insurance premium paid for:			
	- Plant & Machinery	28,200		F. OH
	- Factory building	18,800	47,000	F. OH
(xi)	Expenses paid for quality control check activities		18,000	Quality Control
(xii)	Research & development cost paid for improvement in production process		20,000	R & D
(xii)	Expenses paid for pollution control and engineering & maintenance		36,000	**F. OH**
(xi)	Salary paid to Sales & Marketing managers		5,60,000	S. OH
(xv)	Salary paid to General Manager		6,40,000	Gen. Adm. OH
(xv)	Packing cost paid for:			
	- Primary packing necessary to maintain quality	46,000		Primary Packing Cost
	- For re-distribution of finished goods	80,000	1,26,000	Dist. OH
(xvi)	Fee paid to independent directors		1,20,000	Gen. Adm. OH

(xvii)	Performance bonus paid to sales staffs		1,20,000	Selling OH
(xix)	Value of stock as on 1stJanuary, 2023:			
	- Raw materials	10,00,000		
	- Work-in-process	8,60,000		
	- Finished goods	12,00,000	30,60,000	
(xx)	Value of stock as on 31stDecember, 2023:			
	- Raw materials	8,40,000		
	- Work-in-process	6,60,000		
	- Finished goods	10,50,000	25,50,000	

Scrap and waste generated during manufacturing process – Rs. 48,000/-

Cost Sheet

Particulars	Amt (Rs.)
Opening stock of raw material	1000000
Add:- Purchase of raw material including carriage inwards • Raw Material Purchased • Freight Inward	 5,00,00,000 9,20,600
Less:- Closing stock of raw material	(840000)
Direct Material Cost	**5,10,80,600**
Direct Labour Cost • Wages paid to factory workers	 2520000
Direct Expenses / Chargeable Expenses • Royalty paid for production • Amount paid for power & Fuel • Job charges to job workers	 180000 350000 310000
Prime Cost/Direct Cost	**5,44,40,600**
Factory Overheads • Stores & Spares Consumed • Repair & Maintenance for P&M • Insurance Premium for P&M • Insurance Premium for Factory building • Exp. Paid for pollution control	 110000 40000 28200 18800 36000
Gross Factory Cost	**5,46,73,600**
Plus Opening stock of WIP	860000
Less closing stock of WIP	(660000)
Factory Cost / Net Factory Cost	**5,48,73,600**

Quality Control Cost	18000
Research & Development Cost (Process Related)	20000
Adm. Overheads (Related to Production Activity)	NIL
Less:- Credit for Recoveries / Scrap / By – Products / Misc. Income	(48000)
Primary Packing Cost	46000
Cost of Production (For FG Produced)	**5,49,09,600**
Plus opening stock of finished goods	1200000
Less closing stock of finished goods	(1050000)
Cost of goods Sold (For FG Sold)	**5,50,59,600**
Selling Overhead • Repair & Maintenance for Sales Office • Salary paid to sales & Marketing manager • Performance bonus paid to sales staff **Distribution Overhead** • Packing cost for re-distribution of FG	 20000 560000 120000 80000
General Admin Overheads • Dep. On Office building • Salary to General Manager • Fee Paid to independent directors	 50000 640000 120000
Total cost / Cost of sales	**5,66,49,600**

Question 6 – Nothing New in This Question

The financial books of a company reveal the following data for the year ended 31st March, 2023:

	(Rs)
Opening Stock:	
Finished goods 875 units	76,525
Work-in-process	33,000
01.04.2022 to 31.03.2023	
Raw materials consumed	7,84,000
Direct labour	4,65,000
Factory overheads	2,65,000
Goodwill written off	95,000
Administration overheads	3,15,000
Income tax paid	72,000
Bad debts	21,000

Selling and distribution overheads	65,000
Interest received	18,500
Rent received	72,000
Sales 14,500 units	20,80,000
Closing Stock: Finished goods 375 units	43,250
Work-in-process	48,200

The management of the company, for preparing cost sheet and variance analysis uses the following cost recovery basis which has been elaborated by the cost controller of the company:

Factory overheads are absorbed at 60% of direct wages.

Administration overheads (production related) are recovered at 20% of factory cost.

Selling and distribution overheads are charged at Rs 5 per unit sold. Opening Stock of finished goods is valued at Rs105 per unit.

The company values work-in-process at factory cost for both financial and cost accounting purpose.

You being an associate to the cost controller of the company has been asked to:

(i) PREPARE a statement of profit as per costing records and financial records.

(ii) CALCULATE cost of production per unit.

(iii) PREPARE a statement reconciling the profit as per costing records with the profit as per financial records.

Solution

(i) Statement showing Profit as per financial records

Particulars	**Amount**	**Particulars**	**Amount**
To Opening stock • FG • WIP	 76525 33000	By Sales	2080000
To Raw material	784000	ByClosing Stock • FG • WIP	 43250 48200
To Direct labour	465000	By Interest	18500
To F. Overhead	265000	By Rent	72000
To Goodwill W/Off	95000		
To Adm. OH	315000		
To Income Tax	72000		
To Bad Debts	21000		
To S & D OH	65000		
To Profit	70425		
	2261950		**2261950**

Statement of profit as per cost records

Particulars	Amt (Rs.)
Direct Material Cost	784000
Direct Labour Cost	465000
Direct Expenses / Chargeable Expenses	NIL
Prime Cost/Direct Cost	**1249000**
Factory Overheads (60% of DLC)	279000
Gross Factory Cost	**1528000**
Plus Opening stock of WIP	33000
Less closing stock of WIP	(48200)
Factory Cost / Net Factory Cost	**1512800**
Quality Control Cost	NIL
Research & Development Cost (Process Related)	NIL
Adm. Overheads (Related to Production Activity) 20% of Factory Cost	302560
Less:- Credit for Recoveries / Scrap / By – Products / Misc. Income	NIL
Primary Packing Cost	NIL
Cost of Production (FG Produced - 14000 unit	**1815360**
Plus opening stock of finished goods (875 units x Rs.105)	91875
Less closing stock of finished goods (375 units x Rs.1815360/14000 units)	(48626)
Cost of goods Sold (For FG Sold)	**1858609**
Selling & Distribution OH (14500 units x Rs.5)	72500
General Admin Overheads	NIL
Total cost / Cost of sales	**1931109**
Total Sales	**2080000**
Total Profit	**148891**

(ii) Cost of production per unit = Rs.1815360 / 14000 units = Rs.129.67

(iii) Reconciliation Statement

Particulars	**Amount (Rs.)**
Costing Profit	148891
Add • Factory Overhead (Rs.279000 – 265000) • S & D OH (Rs.72500 – 65000) • Opening Stock (Rs.91875 – Rs.76525) • Interest	 14000 7500 15350 18500

• Rent	72000
Less • Adm. OH (Rs.315000 – 302560) • Closing Stock (Rs.48626 – 43250) • Goodwill • Income Tax • Bad debts	 12440 5376 95000 72000 21000
Financial Profit	**70425**

Question 7 – Good Question – Must Do

Arnav Ltd. operates in beverages industry where it manufactures soft- drink in three sizes of Large (3 litres), Medium (1.5 litres) and Small (600 ml) bottles. The products are processed in batches. The 5,000 litres capacity processing plant consumes electricity of 90 Kilowatts per hour and a batch takes 1 hour 45 minutes to complete. Only symmetric size of products can be processed at a time. The machine set-up takes 15 minutes to get ready for next batch processing. During the set-up power consumption is only 20%.

(i) The current price of Large, Medium and Small are Rs 150, Rs 90 and Rs 50 respectively.

(ii) To produce a litre of beverage, 14 litres of raw material-W and 25 ml of Material-C are required which costs Rs 0.50 and Rs 1,000 per litre respectively.

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

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

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

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

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

(viii) The holding cost is Rs 1 per bottle per annum.

The marketing team has surveyed the following demand (bottle) of the product:

Large	Medium	Small
3,00,000	7,50,000	20,00,000

You are required to CALCULATE profit/ loss per batch and also COMPUTE Economic Batch Quantity (EBQ).

Solution

(i) Calculation of Profit / Loss

Particulars	Large	Medium	Small
Total Sales (Demand of Bottles x Price per bottle)	300000 bottles x Rs.150 = 450,00,000	750000 bottles x Rs.90 = 675,00,000	2000000 bottles x Rs.50 = 1000,00,000
Less Variable Cost			
Material W Cost	300000 bottles x 3 litre per bottle x 14 litre RM per litre x Rs.0.50 per litre = 63,00,000	750000 bottles x 1.50 litre per bottle x 14 litre RM per litre x Rs.0.50 per litre = 78,75,000	2000000 bottles x 0.60 litre per bottle x 14 litre RM per litre x Rs.0.50 per litre = 84,00,000
Material C Cost	300000 bottles x 3 litre per bottle x 0.025 litre RM per litre x Rs.1000 per litre = 225,00,000	750000 bottles x 1.50 litre per bottle x 0.025 litre RM per litre x Rs.1000 per litre = 281,25,000	2000000 bottles x 0.60 litre per bottle x 0.025 litre RM per litre x Rs.1000 per litre = 300,00,000
Labour Cost	180 batches x 2 Hours x Rs.2200 = 792000	225 batches x 2 Hours x Rs.2200 = 990000	240 batches x 2 Hours x Rs.2200 = 1056000
Packing Cost	300000 bottles x Rs.3 = 900000	750000 bottles x Rs.3 = 2250000	2000000 bottles x Rs.3 = 6000000
Power Cost in Processing	180 batches x 1.75 Hour per batch x 90 KWH per hour x Rs.7 per KWH = 198450	225 batches x 1.75 Hour per batch x 90 KWH per hour x Rs.7 per KWH = 248062.50	240 batches x 1.75 Hour per batch x 90 KWH per hour x Rs.7 per KWH = 264600
Power Cost in Set Up Time	180 batches x 0.25 Hour per batch x 90 KWH per hour x Rs.7 per KWH x 20% = 5670	225 batches x 0.25 Hour per batch x 90 KWH per hour x Rs.7 per KWH x 20% = 7087.50	240 batches x 0.25 Hour per batch x 90 KWH per hour x Rs.7 per KWH x 20% = 7560
Other variable cost	180 batches x Rs.30000 = 54,00,000	225 batches x Rs.30000 = 67,50,000	240 batches x Rs.30000 = Rs.72,00,000
Profit / Loss before Fixed Cost	**89,03,880**	**212,54,850**	**470,71,840**

Gross Profit = Total Profit before Fixed Cost – Fixed Cost
= 8903880 + 21254850 + 47071840 – 49000000 = 282,30,570

Notes

(i) Total Sales = Demand of Bottles x Price per bottle

(ii) Material W Cost = Demand of bottles x Beverage per bottle (in litre) x Raw material W required per litre x Raw material cost per litre

(iii) Material C Cost = Demand of bottles x Beverage per bottle (in litre) x Raw material C required per litre x Raw material cost per litre

(iv) Labour Cost = No. of Batches Required x Hours Required per batch x Wages per hour

a) No. of Batches = Demand of bottles x Size of each bottle in Litre / 5000 Litres per batch

b) Hours required per batch (Processing + Waiting Time) = 2 Hours Each

c) Wages per hour – 20 workers get Rs.880 each for 8 hours shift. It means workers are paid Rs.17600 for 8 hours shift Hence Rs.2200 per hour is wage rate.

	Large Size	Medium Size	Small Size
No. of batches	300000 bottles x 3 litre Each / 5000 Litres = 180 batches	750000 bottles x 1.50 litre Each / 5000 Litres = 225 batches	2000000 bottles x 0.60 litre Each / 5000 Litres = 240 batches

(v) Power Cost in Processing = No. of batches required x Processing hours per batch x Power consumed per hour x Rs.7 per hour

(vi) Power Cost in Set Up = No. of batches required x Set up hours per batch x Power Consumed per hour x Rs.7 per hour x 20%

(ii) $E.B.Q = \sqrt{\frac{2 \times \text{Annual production} \times \text{Set up cost per batch}}{\text{Cost of carrying per unit of production per annum}}}$

	Large Size	Medium Size	Small Size
Annual Production	300000 bottles	750000 bottles	2000000 bottles
Set up cost per batch • Set up time	0.25 Hour per batch x 90 KWH per hour x Rs.7 per KWH x 20% = Rs.31.50	0.25 Hour per batch x 90 KWH per hour x Rs.7 per KWH x 20% = Rs.31.50	0.25 Hour per batch x 90 KWH per hour x Rs.7 per KWH x 20% = Rs.31.50
Set up cost per batch • Other Variable Cost (**Assumed as set up Cost**)	30,000	30,000	30,000
Set up cost per batch	**Rs.30,031.50**	**Rs.30,031.50**	**Rs.30,031.50**
Carrying cost per unit per annum	Rs.1	Rs.1	Rs.1
EBQ	**134234**	**212243**	**346592**

Question 8

The following data are available in respect of Process-I for January 2024:

(1) Opening stock of work in process: 600 units at a total cost of Rs. 4,200.

(2) Degree of completion of opening work in process:

Material	100%
Labour	60%
Overheads	60%

(3) Input of materials at a total cost of Rs 55,200 for 9,200 units.

(4) Direct wages incurred Rs 18,600

(5) Overheads Rs 8,630.

(6) Units scrapped 200 units. The stage of completion of these units was:

Materials	100%
Labour	80%
Overheads	80%

(7) Closing work in process; 700 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overheads	70%

(8) 8,900 units were completed and transferred to the next process.

(9) Normal loss is 4% of the total input (opening stock plus units put in)

(10) Scrap value is Rs 6 per unit.

You are required to:

(i) PREPARE using FIFO method, Statement of equivalent production,

(ii) PREPARE Statement of cost,

(iii) CALCULATE cost of closing WIP,

(iv) CALCULATE the cost of the units to be transferred to the next process.

Solution

(i) **Statement 1 -> Statement of Equivalent Production:-**

Input		Output		Material		Labour		Overheads	
Particulars	Units	Particulars	Units	% Completion	Units	% Completion	Units	% Completion	Units
Opening WIP	600	Opening WIP completed	600	0%	0	40%	240	40%	240
Units introduced	9200	Units completed [8900-600]	8300	100%	8300	100%	8300	100%	8300
		Closing **WIP**	700	100%	700	70%	490	70%	490
		Normal loss	392	---	----	----	----	----	----
		Abnormal Gain	(192)	100%	(192)	100%	(192)	100%	(192)
Total	**9800**	**Total**	**9800**		**8808**		**8838**		**8838**

(ii) Statement 2 - Statement of Cost per Equivalent unit

Particulars	Net Material cost (Rs) *	Labour Cost (Rs.)	Overheads (Rs.)
Cost (Rs.) (A)	55200 – 392 units x Rs.6 = 52848	18600	8630
Equivalent units (B)	8808	8838	8838
Cost per equivalent unit (A/B)	6	2.10	0.98

* Net Material Cost = Material Cost – Scrap Value of Normal Loss

(iii) & (iv)

Statement3 Statement of Evaluation:

Particulars	Cost Elements	Equivalent Units A	Cost per Equivalent UnitRs. B	Cost of Equivalent UnitsRs (A x B)	TotalRs. (A X B)
Opening WIP					
Cost incurred in previous period				4200	
Cost incurred in current period :	Material	0	6.00	0	
	Labour	240	2.10	504	
	Overhead	240	0.98	235.20	
Units introduced & completed	Material	8300	6.00	49800	
	Labour	8300	2.10	17430	
	Overhead	8300	0.98	8134	
Total Cost of Units t/f to next process:					80303.20
Closing WIP	Material	700	6.00	4200	
	Labour	490	2.10	1029	
	Overhead	490	0.98	480.20	5709.20

Question 9 – Nothing New but Good for Practice

A LMV Pvt. Ltd, operates cab/ car rental service in Delhi/NCR. It provides its service to the offices of Noida, Gurugram and Faridabad. At present it operates CNG fuelled cars but it is also considering to upgrade these into Electric vehicle (EV). The following details related with the owning of CNG & EV propelled cars are as tabulated below:

Particulars	CNG Car	EV Car
Car purchase price (Rs)	9,20,000	15,20,000
Govt. subsidy on purchase of car (Rs)	--	1,50,000
Life of the car	15 years	10 years

Residual value (Rs)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (Rs)	60	--
Power cost per Kwh (Rs)	--	7.60
Annual Maintenance cost (Rs)	8,000	5,200
Annual insurance cost (Rs)	7,600	14,600
Tyre replacement cost in every 5 - year (Rs)	16,000	16,000
Battery replacement cost in every 8- year (Rs)	12,000	5,40,000

Apart from the above, the following are the additional information:

Particulars	
Average distance covered by a car in a month	1,500 km
Driver's salary (Rs)	20,000 p.m
Garage rent per car (Rs)	4,500 p.m
Share of Office & Administration cost per car (Rs)	1,500 p.m

You have been approached by the management of A LMV Pvt. Ltd. for consultation on the two options of operating the cab service.

CALCULATE the operating cost of vehicle per month per car for both CNG & EV options.

Solution Statement showing operating Cost per vehicle per Month

Particulars	**CNG Car (Rs.)**	**EV Car (Rs.)**
Fixed Cost		
Depreciation	(920000-95000)/(15 Year x 12 months) = 4583.33	(1520000-150000-170000) / (10 Year x 12 Month) = 10000
Driver Salary	20000	20000
Garage Rent	4500	4500
Adm. Cost Share	1500	1500
Total (A)	30583.33	36000
Variable Cost		
CNG Cost / Electricity	1500 KM x (Rs.60 per Kg / 20 Km per KG)	1500 KM x (Rs.30 KWH x Rs.7.60 per

Total (B)	= 4500	KWH / 240 KM per charge) = 1425
Repair & Maintenance		
Maintenance Cost	8000/12 Month = 666.66	5200/12 Month = 433.33
Insurance Cost	7600 / 12 Month = 633.33	14600 / 12 Month = 1216.67
Tyre Cost	(To Be replaced at 5Th & 10th Year) 16000 x 2 Times / (15 Years x 12 Month) = 177.78	(To Be replaced at 5Th Year Only) 16000 x 1 Time / (10 Years x 12 Month) = 133.33
Battery Cost	(To Be replaced at 8th Year) 12000 x 1 Time / (15 Years x 12 Month) = 66.67	(To Be replaced at 8th Year) 540000 x 1 Time / (10 Years x 12 Month) = 4500
Total (C')	**1544.44**	**6283.33**
Total (A+B+C)	**36627.78**	**43708.33**

Consultation to Management – Using CNG Option is cheaper as of now

Question 10

EML operates in coal mining through open cast mining method. Explosives and detonators are used for excavation of coal from the mines. The following are the details of standard quantity of explosives materials used for mining:

Particulars	Rate (Rs.)	Standard Qty. for Iron One	Standard Qty. for Overburden (OB)
SME	40 per Kg	2.4 Kg per tonne	1.9 Kg per cubic meter
Detonators	20 per piece	2 pcs per tonne	2 pcs per cubic meter

The standard stripping ratio is 3:1 (means 3 cubic- meter of overburden soil to be removed to get one tonne of coal).

During the month of December 2023, the company produces 20,000 tonnes of coal and 58,000 cubic- meter of OB. The quantity of explosive materials used and paid for the month is as below:

Material	Quantity	Amount (Rs)
SME	1,67,200 kg.	63,53,600

Detonators	1,18,400 pcs	24,27,200

Explosive suppliers are paid for the explosive materials on the basis of performance of the explosives which is termed as powder factor. One of the suppliers has presented their bill for explosive supplied for the month of December 2023. You being a bill passing officer of EML is required to COMPUTE the material price variance, material quantity variance and material cost variance.

Solution FOR MATERIAL VARIANCES

Particulars	SP X SQAO	SP X RSQ	SP X AQ	AP X AQ
SME	Rs.40 X 158200 = 6328000	Not Required	Rs.40 X 167200 kg = 6688000	Rs.63,53,600
Detonators	Rs.20 X 156000 = 3120000	Not Required	Rs.20 X 118400 pcs = 2368000	Rs.24,27,200
Total	**94,48,000**		**90,56,000**	**87,80,800**
	M1	M2	M3	M4

SP = Std. Price, AP = Actual Price, AQ = Actual Quantity consumed,
Note – We are directly given AP X AQ i.e. Actual cost of material

SQAO = Std quantity for actual output

- SME = 20000 Tonnes x 2.4 Kg per tonne + 58000 cubic meter x 1.9 kg = 158200 kg
- Detonators = 20000 Tonnes x 2 pcs per tonne + 58000 cubic meter x 2 pcs = 156000 pcs

DMCV = M1 – M4 = Rs.667200 (F)
DMUV (Material Qty Variance) = M1 – M3 = Rs.392000 (F)
DMPV = M3 – M4 = Rs.275200 (A)

Question 11

The analysis of cost sheet of A Ltd. for the last financial year has revealed the following information for it's product R:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of Cost of Goods Sold	--
Direct Labour	15% of Cost of Goods Sold	--
Factory Overhead	10% of Cost of Goods Sold	Rs. 2,30,000
Administration Overhead (Related to Production)	2% of Cost of Goods Sold	Rs. 71,000
Selling & Distribution Overhead	4% of Cost of Sales	Rs. 68,000

Last Year 5,000 units were sold at Rs. 185 per unit. From the given data find the followings:

(a) Break-even Sales(in rupees)
(b) Profit earned during last year
(c) Margin of safety (in %)
(d) Profit if the sales were 10% less than the actual sales.

Solution

Working Note 1:- Calculation of COGS

COGS= DM + DL+ Fixed O/H + Adm. OH (Production Related)

x= 0.3x + 0.15x + 0.10x +2,30,000 + 0.02x +71,000

x= 7,00,000

Working Note 2:- Calculation of COS

COS = COGS + Selling & Distribution O/H

x = 7,00,000 +0.04x +68,000

x= 8,00,000

Working Note 3:- Calculation of Variable & Fixed Cost

Elements of Cost	Variable Cost	Fixed Cost
Direct Material	2,10,000	-
Direct Labour	1,05,000	-
Fixed O/H	70,000	2,30,000
General & Administrative O/H	14,000	71,000
Selling & Distribution O/H	32,000	68,000
Total	**4,31,000**	**3,69,000**

Working Note 4:- Marginal Cost Equation & PV Ratio

Sales	9,25,000
- Variable cost	(4,31,000)
Contribution	4,94,000
- Fixed Cost	(3,69,000)
Profit	1,25,000

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}}$ X 100

= $\frac{4,94,000}{9,25,000}$ X 100 = 53.41%

(a) BEP Sales = $\frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{3,69,000}{53.41\%}$ = 6,90,882

(b) Profit = Rs. 1,25,000 (as per Working Note 4)

(c) MOS (%) = $\frac{\text{MOS}}{\text{Sales}}$ X 100

= $\frac{9,25,000 - 6,90,882}{9,25,000}$ X 100

= 25.31%

(d) Profit at less than 10% sales = Contribution – Fixed cost

= Sales x P/v Ratio - Fixed cost

= 9,25,000 X $\frac{90}{100}$ X $\frac{53.41}{100}$ – 3,69,000

= 75,638

Question 12 – Nothing New but Good for Practice

M Ltd. is a public sector undertaking (PSU), produces a product A. The company is in process of preparing its revenue budget for the year 2024. The company has the following information which can be useful in preparing the budget:

(i) It has anticipated 12% growth in sales volume from the year 2023 of 4,20,000 tonnes.

(ii) The sales price of Rs 23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.

(iii) To produce one tonne of product A, 2.3 tonnes of raw material are required. The raw material cost is Rs 4,500 per tonne. The price of raw material will also increase by 10% if WPI increase by 5%.

(iv) The projected increase in WPI for 2024 is 4%

(v) A total of 6,000 employees works for the company. The company works 26 days in a month.

(vi) 85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is Rs 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2024 and it is expected that a 15% increase in pay will be given.

(vii) The casual employees are getting a daily wage of Rs 850. The wages in linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2024.

(viii) Power cost for the year 2023 is Rs 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.

(ix) During the year 2023, the company has paid Rs 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.

(x) During the year 2023, the company has paid Rs 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2024.

(xi) During the year 2023, the company has paid Rs 6,00,000 for car hire charges (excluding fuel cost). In year 2024, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.

(xii) Depreciation on fixed assets for the year 2023 is Rs 80,40,00,000 and it will be 15% lower in 2024.

You being an associate to the budget controller of the company, PREPARE Revenue (Flexible) budget for the year 2024 and also show the budgeted profit/ loss for the year.

Solution

Particulars	**Amount (Rs. In Lakhs)**
Sales • Sales Qty – 420000 x 112% = 470400 • Sale Price – Rs.23000 per tonne	108192
Less Cost	
Raw Material Cost [470400 Tonne x 2.30 Tonne p.u. x Rs.4500]	48686.40
Permanent Employee Cost • 6000 employees x 85% x 26 days x 6 months x Rs.3000 **Plus** • 6000 employees x 85% x 26 days x 6 months x Rs.3000 x 115%	51316.20
Causal Employee Cost • 6000 employees x 15% x 26 days x 12 months x Rs.850 x [173.59 / 165.17]	2508.47
Power Cost • Power Units = 700000 units x 60% x 112% + 700000 units x 40% = 750400 units • Power cost per unit = Rs.42,00,000 / 7,00,000 units = Rs.6	45.024
Maintenance Cost (Rs.60,00,000 x 112%]	67.20
Diesel Cost (Rs.120000 x 115%]	1.38
Car Hiring Charges (Rs.6,00,000)	6.00
GST on RCM (138000 + 600000) x 5%	0.369
Dep. (Rs.8040,00,000 x 85%)	6834
Total Cost	**109465.043**
Total Budgeted Profit	**(1273.043)**

Question 13

(a) "Is reconciliation of cost accounts and financial accounts necessary in case of integrated accounting system?" explain.
(b) Discuss the impact of Information Technology in Cost Accounting.
(c) Explain the difference between controllable & uncontrollable costs?

(d) How apportionment of joint costs upto the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? Discuss.

Solution

(a) In integrated accounting system cost and financial accounts are kept in the same set of books. Such a system will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains. In fact, all information that management requires from a system of Costing for doing its work properly is made available. The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and the management maintains full control over the liabilities and assets of its business.

Since, only one set of books are kept for both cost accounting and financial accounting purpose so there is no necessity of reconciliation of cost and financial accounts.

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

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

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

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

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

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

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

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

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

(c) Controllable costs and Uncontrollable costs*:* Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre.

Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs.

(d) Apportionment of Joint Cost amongst Joint Products using: Market value at the point of separation: This method is used for apportionment of joint costs to joint products upto the split off point. It is difficult to apply if the market value of the product at the point of separation is not available. It is useful method where further processing costs are incurred disproportionately.

Net realizable value Method: From the sales value of joint products (at finished stage) the followings are deducted:

- Estimated profit margins
- Selling & distribution expenses, if any
- Post split off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

PAPER – 4: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Division A: Case Scenario

Material Cost

1. 'Axe Trade', an unregistered supplier under GST, purchased material from Vye Ltd. which is registered supplier under GST. During the month of June 2024, the Axe Traders has purchased a lot of 5,000 units on credit from Vye Ltd. The information related to the purchase are as follows:

Listed price of one lot of 5,000 units	- ₹ 2,50,000
Trade discount	- @ 10% on listed price
CGST and SGST (Credit available)	- 18% (9% CGST + 9% SGST)
Cash discount	- @ 10%

(Will be given only if payment is made within 30 days.)

Toll Tax paid	₹ 5,000
Freight and Insurance	₹ 17,220
Demurrage paid to transporter	₹ 5,000
Commission and brokerage on purchases	₹ 10,000
Amount deposited for returnable containers	₹ 30,000
Amount of refund on returning the container	₹ 20,000
Other Expenses	@ 2% of total cost

A 20% shortage in material on receipt is expected considering the nature of the raw material.

The payment to the supplier was made within 21 days of the purchases.

(i) If Axe Traders pays the supplier within 30 days of purchase, then, what is the total amount of cash discount received from the supplier and how it is treated to calculate material cost?

(a) ₹ 25,000 & it will not be deducted from the material cost

(b) ₹ 26,550 & it will be deducted from the material cost

(c) ₹ 26,550 & it will not be deducted from the material cost

(d) ₹ 22,500 & it will not be deducted from the material cost

(ii) What will be the amount of other expenses and how it is treated in material cost?

(a) ₹ 6,154.40 & it will be added with the material cost

(b) ₹ 6,280.00 & it will be added with the material cost

(c) ₹ 5,344.40 & it will be added with the material cost

(d) ₹ 5,453.47 & it will not be added with the material cost

(iii) What is the amount of GST and how will it be treated in cost sheet of Axe Traders?

(a) ₹ 40,500 & it will not be added with material cost

(b) ₹ 40,500 & it will be added with material cost

(c) ₹ 45,000 & it will not be added with material cost

(d) ₹ 45,000 & it will be added with material cost

(iv) What is the total material cost chargeable in the cost sheet of Axe Traders?

(a) ₹ 3,14,000

(b) ₹ 2,73,500

(c) ₹ 2,72,673

(d) ₹ 3,13,874

(v) The number of good units and cost per unit of the materials received are:

(a) 5,000 units & ₹ 62.80

(b) 5,000 units & ₹ 54.70

(c) 4,000 units & ₹ 78.50

(d) 4,000 units & ₹ 68.38

Standard Costing

2. ABC Pvt Ltd is engaged in the manufacture of a Product Q. The product has the following standard production requirements determined by the technical team of the company post satisfactory completion of test run.

Raw Material Z – 2 units @ ₹ 2 per unit

Skilled labour of – 2.5 hours@ ₹ 5 per hour

Fixed Overheads – ₹ 7.5 per unit

The input of Raw material Z has a yield of 80% everytime when infused into production. The actual quantity of Raw material Z consumed for production during the year was 24,000 units. The Usage variance of Material Z was 2,000 Favourable. Further the actual amount of material cost for the material consumed amounted to ₹ 45,000.

During the said year, the actual working hours were 30,000 for which the labour cost paid by the company amounted to ₹1,20,000. The idle time variance amounted to 10,000 Adverse.

The actual fixed overheads incurred for the year amounted to ₹ 1,50,000 and the expenditure variance was ₹25,000 Favourable.

In the context of the above, the following needs to be determined:

(i) The Actual output of Product Q produced during the year is:

(a) 10,000 units

(b) 12,500 units

(c) 25,000 units

(d) 15,000 units

(ii) The Material price and material cost variance are:

(a) Price variance – 3,000 Adverse, Cost Variance – 5,000 Adverse

(b) Price variance – 3,000 Favourable, Cost Variance – 5,000 Favourable

(c) Price variance – 3,000 Favourable, Cost Variance – 8,000 Adverse

(d) Price variance – 5,000 Adverse, Cost Variance – 3,000 Favourable

(iii) The Standard Hours, Net Actual hours and the idle time are:

(a) Standard Hours – 27,500 Net Actual Hours – 28,000 hours Idle Time – 2,000 hours

(b) Standard Hours – 22,500 Net Actual Hours – 28,500 hours Idle Time – 1,500 hours

(c) Standard Hours – 24,000 Net Actual Hours – 29,000 hours Idle Time – 1,000 hours

(d) Standard Hours – 25,000 hours Net Actual Hours –28,000 hours Idle Time – 2,000 hours

(iv) Labour Efficiency variance and Labour rate variance are:

(a) Labour Efficiency Variance – 30,000 Favourable Labour rate Variance – 25,000 Adverse

(b) Labour Efficiency Variance – 25,000 Favourable, Labour rate Variance – 30,000 Adverse

(c) Labour Efficiency Variance – 25,000 Adverse, Labour rate Variance – 30,000 Favourable

(d) Labour Efficiency Variance – 30,000 Adverse Labour rate Variance – 25,000 Favourable

(v) Fixed Overhead volume variance is:

(a) Fixed Overhead volume variance – 1,00,000 Favourable

(b) Fixed Overhead volume variance – 50,000 Adverse

(c) Fixed Overhead volume variance – 1,00,000 Adverse

(d) Fixed Overhead volume variance – 50,000 Favourable

Overheads: Absorption Costing Method

3. The accountant for Brilliant Tools Ltd applies overhead based on machine hours. The budgeted overhead and machine hours for the year are ₹ 1,30,000 and 8,000 hours, respectively. The actual overhead and machine hours incurred were ₹ 1,37,500 and 10,000 hours. The cost of goods sold and inventory data compiled for the year is as follows:

Direct Material ₹ 25,000

Cost of Goods Sold ₹ 2,25,000

Units: WIP 50,000 and Finished Goods 75,000

What is the amount of over/under absorbed overhead for the year?

(a) Over absorbed by ₹ 25,000

(b) Under absorbed by ₹ 25,000

(c) Over a absorbed by ₹ 32,500

(d) Under absorbed by ₹ 32,500

Process Costing

4. The following information is available in respect of Process I: Raw material purchased and introduced 10,000 units @ 5 per unit Raw Material received from store 4000 units @ 6 per unit Direct Labour 40,000 Overheads 28,000 Output of Process is 13,500 units, Normal wastage 5% of inputs Scrap value of wastage 4 per unit The value of Abnormal Gain is:

(a) ₹ 2062.68

(b) ₹ 2135.34

(c) ₹ 2103.70

(d) ₹ 2093.2

Service Costing

5. A hotel has 200 rooms (120 Deluxe rooms and 80 Premium rooms). The normal occupancy in summer is 80% and winter 60%. The period of summer and winter is taken as 8 months and 4 months respectively. Assume 30 days in each month. Room rent of Premium room will be double of Deluxe room. Hotel is expecting a profit of 20% on total revenue, total cost for the year is 2,66,11,200. Calculate the room rent to be charged for Premium room.

   (a) ₹ 450 per room day

   (b) ₹ 900 per room day

   (c) ₹ 380 per room day

   (d) ₹ 760 per room day

6. ALC Ltd. is a insurance company. It launched a new term insurance policy Names as Protection Plus. The total cost for the policy during the year is ₹ 1,60,00,000. Total number of policies sold is 410 and total insured value of policies is ₹ 920 crore.

   What is the cost per rupee of insured value?

   (a) ₹ 0.0017

   (b) ₹ 0.18

   (c) ₹ 575

   (d) ₹ 2.24

Budget and Budgetary Control

7. A business manufactures a single product and is preparing its production budget for the year ahead. It is estimated that 2,00,000 units of the product can be sold in the year and the opening inventory is currently 25,000 units. The inventory level is to be reduced by 40% by the end of the year. What is production budget in units?

   (a) 1,95,000 units

   (b) 1,90,000 units

   (c) 1,84,000 units

(d) 1,75,000 units

Employee Cost

8. The labour turnover rates for the quarter ended 30th June, 2024 are computed as 14%, 8% and 6% under Flux method, Replacement method and Separation method respectively. If the number of workers replaced during 1st quarter of the financial year 2024-25 is 36, COMPUTE the following:

(i) The number of workers recruited and joined; and

(ii) The number of workers left and discharged.

Overheads: Absorption Costing Method

9. From the details furnished below you are required to compute a comprehensive machine-hour rate:

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)	₹ 12,96,000
Normal working hours for the month (The machine works for only 75% of normal capacity)	200 hours
Wages to Machine-man	₹ 800 per day (of 8 hours)
Wages to Helper (machine attendant)	₹ 500 per day (of 8 hours)
Power cost for the month for the time worked	₹ 1,30,000
Supervision charges apportioned for the machine centre for the month	₹ 18,000
Electricity & Lighting (fixed in nature) for the month	₹ 9,500
Repairs & maintenance (machine) including consumable stores per month	₹ 17,500
Insurance of Plant & Building (apportioned) for the year	₹ 18,000
Other general expense per annum	₹ 18,000

The workers are paid a fixed dearness allowance of ₹ 4,500 per month. Production bonus payable to workers in terms of an award is equal to 10% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production.

Activity Based Costing

10. SOFTHUG is a global brand created by Green-lush Ltd. The company manufactures three range of beauty soaps i.e. SOFTHUG- Gold, SOFTHUG- Pearl, and SOFTHUG- Diamond. The budgeted costs and production for the month of May, 2024 are as follows:

	SOFTHUG- Gold		**SOFTHUG- Pearl**		**SOFTHUG- Diamond**	
Production of soaps (Units)	**4,000**		**3,000**		**2,000**	
Resources per Unit:	**Qty**	**Rate**	**Qty**	**Rate**	**Qty**	**Rate**
- Essential Oils	60 ml	₹ 200/100 ml	55 ml	₹ 300/100 ml	65 ml	₹ 300/100 ml
- Cocoa Butter	20 g	₹ 200/100 g	20 g	₹ 200/100 g	20 g	₹ 200/100 g
- Filtered Water	30 ml	₹ 15/100 ml	30 ml	₹ 15/100 ml	30 ml	₹ 15/100 ml
- Chemicals	10 g	₹ 30/100 g	12 g	₹ 50/100 g	15 g	₹ 60/100 g
- Direct Labour	30 minutes	₹ 10/hour	40 minutes	₹ 10/hour	60 minutes	₹ 10 / hour

Green-lush Ltd. followed an Absorption Costing System and absorbed its production overheads, to its products using direct labour hour rate, which were budgeted at ₹ 1,98,000.

Now, Green-lush Ltd. is considering adopting an Activity Based Costing system. For this, additional information regarding budgeted overheads and their cost drivers is provided below:

Particulars	(₹)	Cost drivers
Forklifting cost	58,000	Weight of material lifted
Supervising cost	60,000	Direct labour hours
Utility cost	80,000	Number of Machine operations

The number of machine operators per unit of production are 5, 5, and 6 for SOFTHUG- Gold, SOFTHUG- Pearl, and SOFTHUG- Diamond respectively.

(Consider (i) Mass of 1 litre of Essential Oils and Filtered Water equivalent to 0.8 kg and 1 kg respectively (ii) Mass of output produced is equivalent to the mass of input materials taken together.)

You are required to:

(i) PREPARE a statement showing the unit costs and total costs of each product using the absorption costing method.

(ii) PREPARE a statement showing the product costs of each product using the ABC approach.

(iii) STATE what are the reasons for the different product costs under the two approaches?

Cost Sheet

11. From the following data of Appu Ltd., CALCULATE (i) Material Consumed; (ii) Prime Cost and (iii) Cost of production.

		Amount (₹)
(i)	Repair & maintenance paid for plant & machinery	9,80,500
(ii)	Insurance premium paid for inventories	26,000
(iii)	Insurance premium paid for plant & machinery	96,000
(iv)	Raw materials purchased	64,00,000
(v)	Opening stock of raw materials	2,88,000
(vi)	Closing stock of raw materials	4,46,000
(vii)	Wages paid	23,20,000
(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100

(x)	Quality control cost for the products in manufacturing process	86,000
(xi)	Research & development cost for improvement in production process	92,600
(xii)	Administrative cost for:	
	- Factory & production	9,00,000
	- Others	11,60,000
(xiii)	Amount realised by selling scrap generated during the manufacturing process	9,200
(xiv)	Packing cost necessary to preserve the goods for further processing	10,200
(xv)	Salary paid to Director (Technical)	8,90,000

Cost Accounting System

12. A manufacturing company disclosed a net loss of ₹ 3,47,000 as per their cost accounts for the year ended March 31,2024. The financial accounts however disclosed a net loss of ₹ 5,10,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

		(₹)
(i)	Factory Overheads under-absorbed	40,000
(ii)	Administration Overheads over-absorbed	60,000
(iii)	Depreciation charged in Financial Accounts	3,25,000
(iv)	Depreciation charged in Cost Accounts	2,75,000
(v)	Interest on investments not included in Cost Accounts	96,000
(vi)	Income-tax provided	54,000
(vii)	Interest on loan funds in Financial Accounts	2,45,000
(viii)	Transfer fees (credit in financial books)	24,000
(ix)	Stores adjustment (credit in financial books)	14,000
(x)	Dividend received	32,000

PREPARE a memorandum Reconciliation Account

Batch Costing

13. A jobbing factory has undertaken to supply 300 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is ₹ 8 per piece. From the following data CALCULATE the cost and profit per piece of each batch order and overall position of the order for 1,800 pieces.

Month	Batch Output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	310	1150	120	240
February	300	1140	140	280
March	320	1180	150	280
April	280	1130	140	270
May	300	1200	150	300
June	320	1220	160	320

The other details are:

Month	Chargeable expenses (₹)	Direct labour (Hours)
January	12,000	4,800
February	10,560	4,400
March	12,000	5,000
April	10,580	4,600
May	13,000	5,000
June	12,000	4,800

Process Costing

14. The following data are available in respect of Process-I for June 2024:

(1) Opening stock of work in process: 600 units at a total cost of ₹ 4,20,000.

(2) Degree of completion of opening work in process:

Material	100%
Labour	60%
Overheads	60%

(3) Input of materials at a total cost of ₹ 55,20,000 for 9,200 units.

(4) Direct wages incurred ₹ 18,60,000

(5) Production overhead ₹ 8,63,000.

(6) Units scrapped 200 units. The stage of completion of these units was:

Materials	100%
Labour	80%
Overheads	80%

(7) Closing work in process; 700 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overheads	70%

(8) 8,900 units were completed and transferred to the next process.

(9) Normal loss is 4% of the total input (opening stock plus units put in)

(10) Scrap value is ₹ 60 per unit.

You are required to:

(i) COMPUTE equivalent production,

(ii) CALCULATE the cost per equivalent unit for each element.

(iii) CALCULATE the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method.

Joint Products & By-Products

15. Three products X, Y and Z alongwith a byproduct B are obtained again in a crude state which require further processing at a cost of ₹ 5 for X; ₹ 4 for Y; and ₹ 2.50 for Z per unit before sale. The byproduct is however saleable as such to a nearby factory. The selling prices for the three main products and byproduct, assuming they should yield a net margin of 25 percent of cost, are fixed at ₹ 13.75 ₹ 8.75 and ₹ 7.50 and ₹ 1.00 respectively – all per unit quantity sold.

During a period, the joint input cost including the material cost was ₹ 90,800 and the respective outputs were:

X	8,000 units
Y	6,000 units
Z	4,000 units
B	1,000 units

By product should be credited to the joint cost and only the net joint costs are to be allocated to the main products.

CALCULATE the joint cost per unit of each product and the margin available as a percentage on cost.

Service Costing

16. BK Infra Ltd. built and operates a 110 k.m. long highway on the basis of Built-Operate-Transfer (BOT) model for a period of 25 year. A traffic assessment has been carried out to estimate the traffic flow per day. The details are as below:

Sl. No.	Type of vehicle	Daily traffic volume
1.	Two wheelers	44,500
2.	Car and SUVs	3,450
3.	Bus and LCV	1,800
4.	Heavy commercial vehicles	816

The following is the estimated cost of the project:

Sl. No.	Activities	Amount (₹ in lakh)
1	Site clearance	170.70
2	Land development and filling work	9,080.35
3	Sub base and base courses	10,260.70
4	Bituminous work	35,070.80
5	Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	29,055.60
6	Drainage and protection work	9,040.50
7	Traffic sign, marking and road appurtenance	8,405.00
8	Maintenance, repairing and rehabilitation	12,429.60
9	Environmental management	982.00
	Total Project cost	114,495.25

An average cost of ₹ 1,120 lakh has to be incurred on administration and toll plaza operation.

On the basis of the vehicle specifications (i.e. weight, size, time saving etc.), the following weights has been assigned to the passing vehicles:

Sl. No.	Type of vehicle	
1.	Two wheelers	5%
2.	Car and SUVs	20%
3.	Bus and LCV	30%
4.	Heavy commercial vehicles	45%

Required:

(i) 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]

Marginal Costing

17. RS Ltd. manufactures and sells a single product X whose selling price is ₹ 100 per unit and the variable cost is ₹ 60 per unit.

(i) If the Fixed Costs for this year are ₹ 24,00,000 and the annual sales are at 60% margin of safety, CALCULATE the rate of net return on sales, assuming an income tax level of 40%

(ii) For the next year, it is proposed to add another product line Y whose selling price would be ₹ 150 per unit and the variable cost ₹ 100 per unit. The total fixed costs are estimated at ₹ 28,00,000. The sales mix of X : Y would be 5 : 3. COMPUTE the break-even sales in units for both the products.

Budget and Budgetary Control

18. Raja Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 302.4 lakh during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹ 60 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 69,12,000.

The other relevant details are as under:

Purchase Price:	Material A	₹ 160 per kg
	Materials B	₹ 100 per kg
Labour Rate:	Machine Shop	₹ 140 per hour
	Assembly Shop	₹ 70 per hour

	Finished Stock	Material A	Material B
Opening Stock	2,500 units	7,500 kg	4,000 kg
Closing Stock	3,000 units	8,000 kg	5,500 kg

Required

(i) CALCULATE number of units of product proposed to be sold and selling price per unit,

(ii) PREPARE Production Budget in units and

(iii) PREPARE Material Purchase Budget in units.

Miscellaneous

19. (a) DISCUSS the Net Realisable Value (NRV) method of apportioning joint costs to by-products.

(b) DIFFERENTIATE between Service costing and Product costing.

(c) DISCUSS the Controllable and un-controllable variances.

(d) DISCUSS the Standard and Discretionary Cost Centres.

SUGGESTED ANSWERS/HINTS

1. (i) (d) Cash discount is received when credit amount is paid within the stipulated period of 30 days. The amount of cash discount to be received from the supplier is:

	Particulars	Amount (₹)
A.	Listed price	2,50,000
B.	Less: Trade Discount @10%	(25,000)
C.	Taxable value (A-B)	2.25,000
D.	Add: GST@18% (18% of C)	40,500
E.	Total amount payable to the supplier	2,65,500
F.	Cash discount @10% (10% of C)	**(22,500)**
G.	Net amount to be paid to the supplier (E-F)	2,43,000

(ii) (b)

Particulars	Units	(₹)
Listed Price of Materials	5,000	2,50,000
Less: Trade discount @ 10% on invoice price		(25,000)
		2,25,000
Add: GST @ 18% of ₹ 2,25,000		40,500
		2,65,500
Add: Toll Tax		5,000
Freight and Insurance		17,220
Commission and Brokerage Paid		10,000
Add: Cost of returnable containers:		
Amount deposited ₹ 30,000		
Less: Amount refunded ₹ 20,000		10,000
		3,07,720
Add: Other Expenses @ 2% of Total Cost $\left(\frac{₹\ 3,07,720}{98} \times 2\right)$		6,280
Total cost of material		3,14,000
Less: Shortage material due to normal reasons @ 20%	1,000	-
Total cost of material of good units	4,000	3,14,000
Cost per unit (₹ 3,14,000/4,000 units)		78.5

(iii) (b) Axe Traders is an unregistered supplier in the GST; thus, GST credit is not applicable for it. GST paid on the purchase of the material will be the part of the material cost.

(iv) (a) Please refer the solution above

(v) (c) Please refer the solution above

2. **(i)** **(a)** 10,000 units

Usage variance of Material Z = 2,000 F

Usage Variance = SQ x SP – AQ x SP

SP = ₹ 2

AQ = 24,000 units

2 x (SQ – 24,000) = 2,000

2SQ = 50,000

Therefore SQ = 25,000

No of units of Input required per output = 2

Yield of input = 80%

= (25000/2) x 80% = 10,000 units.

(ii) **(b)** Price variance – 3,000 Favourable,

Cost Variance – 5,000 Favourable

Price variance = AQ x (SP-AP)

24,000 x (2-1.875) = 3,000 Favourable.

Cost variance = SQ x SP – AQ x AP

= 50,000–45,000=5,000 Favourable.

(iii) **(d)** Standard Hours – 25,000 hours Net Actual Hours –28,000 hours
Idle Time – 2,000 hours

Actual output = 10,000 units

Standard hours per unit = 2.5

Therefore standard hours = 10,000 x 2.5 = 25,000 hours.

Idle time variance = SR x (Net AH – AH)

5 x (Net AH – 30,000) = 10,000 Adverse

5 Net AH – 1,50,000 = -10,000

5 Net AH = 1,40,000

Net AH = 28,000 hours

Idle time = 2,000 hours

(iv) (c) Labour Efficiency Variance – 25,000 Adverse,

Labour rate Variance – 30,000 Favourable

Efficiency Variance = SR x (SH-AH)

= 5 x (25,000 – 30,000)

= 25,000 Adverse

Rate Variance = AH x (SR – AR)

= 30,000 (5 – 4) [1,20,000/30,000]

= 30,000 Favourable.

(v) (c) Fixed Overhead Volume variance – 1,00,000 Adverse

Overhead Volume variance = Actual OutputxSR per unit – Budgeted FOH

Budgeted FOH = Actual FOH (+/-) Expenditure variance

1,50,000 + 25,000 = 1,75,000

AO x SR = 10,000 x 7.5 = 75,000

Therefore volume variance = 75,000 – 1,75,000

=1,00,000 Adverse.

3. (a) Overabsorbed by ₹ 25,000

Predetermined Overhead Rate = Budgeted Overhead / Budgeted hours i.e. 130,000 / 8,000 = ₹ 16.25 per hour.

Hence, absorbed overhead = 10,000 X 16.25 = ₹ 1,62,500.

Since actual overhead incurred were ₹ 1,37,500

Hence the overhead were over absorbed by 1,62,500 – 1,37,500 = ₹ 25,000.

4. (d) ₹ 2093.2

Process a/c

Particulars	Units	Amount	Particulars	units	Amount
Raw material	10,000	50,000	Normal loss	700	2,800
Stores	4,000	24,000	Units transferred	13,500	1,41,293.2
Direct Wages		40,000			
Production overheads		28,000			
Abnormal gain	200	2,093.2			
		1,44,093.2			1,44,093.2

Cost per unit= $\frac{1,42,000-2,800}{14,000-700}$ = 10.466 per unit

5. (b) ₹ 900 per room day

Total Revenue (2,66,11,200/80%) = 3,32,64,000

Calculation of Room Days:

	Deluxe	Premium
Summer	120 rooms x 80% x 30 days x 8 months = 23,040	80 rooms x 80% x 30 days x 8 months = 15,360
Winter	120 rooms x 60% x 30 days x 4 months = 8,640	80 rooms x 60% x 30 days x 4 months = 5,760
Total room days	31,680	21,120

Let's assume the room rent of Deluxe room be 'x'

Then rent of Premium room will be '2x'

Therefore: 31,680x + 42,240x = 3,32,64,000

X = 450

Rent of Premium room will be 450 x 2 = ₹ 900 per room day

6. **(a)** ₹ 0.0017

Cost per rupee of insured value

= Total Cost/ Total Insured Value

= 1.6 cr/920 cr = ₹ 0.0017

7. **(b)** 1,90,000 units

	Units
Sales budget	2,00,000
Add: Closing Inventory (25,000 x 0.6)	15,000
Less: Opening Inventory	(25,000)
Production Budget	1,90,000

8. Labour Turnover Rate (Replacement method) $= \frac{\text{No. of workers replaced}}{\text{Average No. of workers}}$

Or, $\frac{8}{100} = \frac{36}{\text{Average No. of workers}}$

Or, Average No. of workers = 450

Labour Turnover Rate (Separation method) $= \frac{\text{No. of workers separated}}{\text{Average No. of workers}}$

Or, $\frac{6}{100} = \frac{\text{No. of workers separated}}{450}$

Or, No. of workers separated = 27

Labour Turnover Rate (Flux Method) $= \frac{\text{No. of Separations} + \text{No. of accession (Joinings)}}{\text{Average No. of workers}}$

Or, $\frac{14}{100} = \frac{27 + \text{No. of accessions (Joinings)}}{450}$

Or, 100 (27 + No. of Accessions) = 6,300

Or, No. of Accessions = 36

(i) The No. of workers recruited and Joined = 36

(ii) The No. of workers left and discharged = 27

9. Effective machine hours = 200 hours × 75% = 150 hours

Computation of Comprehensive Machine Hour Rate

	Per month (₹)	Per hour (₹)
Fixed cost		
Supervision charges	18,000.00	
Electricity and lighting	9,500.00	
Insurance of Plant and building (₹ 18,000 ÷12)	1,500.00	
Other General Expenses (₹ 18,000÷12)	1,500.00	
Depreciation (₹ 1,29,600÷12)	10,800.00	
	41,300.00	275.33
Direct Cost		
Repairs and maintenance	17,500.00	116.67
Power	1,30,000.00	866.67
Wages of machine man		196.00
Wages of Helper		136.00
Machine Hour rate (Comprehensive)		**1,590.67**

Wages per machine hour

	Machine man	Helper
Wages for 200 hours		
Machine-man (₹ 800 × 25)	₹ 20,000.00	---
Helper (₹ 500 × 25)	---	₹ 12,500.00
Dearness Allowance (DA)	₹ 4,500.00	₹ 4,500.00
	₹ 24,500.00	₹ 17,000.00

Production bonus (10% of Basic and DA)	2,450.00	1,700.00
Leave wages (10% of Basic and DA)	2,450.00	1,700.00
	29,400.00	20,400.00
Effective wage rate per machine hour	**196.00**	**136.00**

10. (i) Traditional Absorption Costing

	SOFTHUG-Gold	SOFTHUG - Pearl	SOFTHUG - Diamond	Total
(a) Production of soaps (Units)	4,000	3,000	2,000	9,000
(b) Direct labour (minutes)	30	40	60	-
(c) Direct labour hours (a × b)/60 minutes	2,000	2,000	2,000	6,000

Overhead rate per direct labour hour:

= Budgeted overheads ÷ Budgeted labour hours

= ₹ 1,98,000 ÷ 6,000 hours

= ₹ 33 per direct labour hour

Unit Costs:

	SOFTHUG-Gold (₹)	SOFTHUG-Pearl (₹)	SOFTHUG-Diamond (₹)
Direct Costs:			
- Direct Labour	5.00 $\left(\frac{10\times30}{60}\right)$	6.67 $\left(\frac{10\times40}{60}\right)$	10.00 $\left(\frac{10\times60}{60}\right)$
- Direct Material (Refer working note 1)	167.50	215.50	248.50

Production Overhead:	16.50 $\left(\frac{33\times30}{60}\right)$	22.00 $\left(\frac{33\times40}{60}\right)$	33.00 $\left(\frac{33\times60}{60}\right)$
Total unit costs	189.00	244.17	291.50
Number of units	4,000	3,000	2,000
Total costs	**7,56,000**	**7,32,510**	**5,83,000**

Working note -1

Calculation of Direct material cost

	SOFTHUG - Gold (₹)	SOFTHUG - Pearl (₹)	SOFTHUG - Diamond (₹)
Essential oils	120.00 $\left(\frac{200\times60}{100}\right)$	165.00 $\left(\frac{300\times55}{100}\right)$	195.00 $\left(\frac{300\times65}{100}\right)$
Cocoa Butter	40.00 $\left(\frac{200\times20}{100}\right)$	40.00 $\left(\frac{200\times20}{100}\right)$	40.00 $\left(\frac{200\times20}{100}\right)$
Filtered water	4.50 $\left(\frac{15\times30}{100}\right)$	4.50 $\left(\frac{15\times30}{100}\right)$	4.50 $\left(\frac{15\times30}{100}\right)$
Chemicals	3.00 $\left(\frac{30\times10}{100}\right)$	6.00 $\left(\frac{50\times12}{100}\right)$	9.00 $\left(\frac{60\times15}{100}\right)$
Total costs	**167.50**	**215.50**	**248.50**

(ii) Activity Based Costing

	SOFTHUG-Gold	SOFTHUG-Pearl	SOFTHUG-Diamond	Total
Quantity (units)	4,000	3,000	2,000	-
Weight per unit (grams)	108 {(60 × 0.8) + 20 + 30 + 10}	106 {(55 × 0.8) + 20 + 30 + 12}	117 {(65 × 0.8) + 20 + 30 + 15}	-

Total weight (grams)	4,32,000	3,18,000	2,34,000	9,84,000
Direct labour (minutes)	30	40	60	-
Direct labour hours	2,000 $\left(\frac{4,000\times30}{60}\right)$	2,000 $\left(\frac{3,000\times40}{60}\right)$	2,000 $\left(\frac{2,000\times60}{60}\right)$	6,000
Machine operations per unit	5	5	6	-
Total operations	20,000	15,000	12,000	47,000

Forklifting rate per gram = ₹ 58,000 ÷ 9,84,000 grams = ₹ 0.06 per gram

Supervising rate per direct labour hour = ₹ 60,000 ÷ 6,000 hours = ₹ 10 per labour hour

Utilities rate per machine operations = ₹ 80,000 ÷ 47,000 machine operations

= ₹ 1.70 per machine operations

Unit Costs under ABC:

	SOFTHUG - Gold (₹)	**SOFTHUG - Pearl (₹)**	**SOFTHUG - Diamond (₹)**
Direct Costs:			
- Direct Labour	5.00	6.67	10.00
- Direct material	167.50	215.50	248.50
Production Overheads:			
Forklifting cost	6.48 (0.06 × 108)	6.36 (0.06 × 106)	7.02 (0.06 × 117)

Supervising cost	5.00 $\left(\frac{10\times30}{60}\right)$	6.67 $\left(\frac{10\times40}{60}\right)$	10.00 $\left(\frac{10\times60}{60}\right)$
Utilities	8.50 (1.70 × 5)	8.50 (1.70 × 5)	10.20 (1.70 × 6)
Total unit costs	192.48	243.70	285.72
Number of units	4,000	3,000	2,000
Total costs	**7,69,920**	**7,31,100**	**5,71,440**

(iii) **Comments:** The difference in the total costs under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more precise.

11. Calculation of Cost of Production of Appu Ltd.

Particulars	**Amount (₹)**
Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)
Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for inventories	26,000
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,43,100

Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,47,000
Less: Amount realised by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,48,000

Notes:

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

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

12. Memorandum Reconciliation Accounts

Dr. Cr.

	(₹)		(₹)
To Net Loss as per Costing books	3,47,000	By Administration overheads over recovered in cost accounts	60,000
To Factory overheads under absorbed in Cost Accounts	40,000	By Interest on investment not included in Cost Accounts	96,000
To Depreciation under charged in Cost Accounts	50,000	By Transfer fees in financial books	24,000
To Income-Tax not provided in Cost Accounts	54,000	By Stores adjustment (Credit in financial books)	14,000
To Interest on Loan Funds in Financial Accounts	2,45,000	By Dividend received in financial books	32,000
		By Net loss as per financial books	5,10,000
	7,36,000		7,36,000

13. Statement of Cost and Profit per batch

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	310	300	320	280	300	320	1,830
Sale value (₹)	2,480	2,400	2,560	2,240	2,400	2,560	14,640
Material cost (₹)	1,150	1,140	1,180	1,130	1,200	1,220	7,020
Direct wages (₹)	120	140	150	140	150	160	860
Chargeable expenses* (₹)	600	672	672	621	780	800	4,145
Total cost (₹)	1,870	1,952	2,002	1,891	2,130	2,180	12,025
Profit per batch (₹)	610	448	558	349	270	380	2,615
Total cost per unit (₹)	6.03	6.51	6.26	6.75	7.10	6.81	6.57
Profit per unit (₹)	1.97	1.49	1.74	1.25	0.90	1.19	1.43

Overall position of the order for 1,800 units

Sales value of 1,800 units @ ₹ 8 per unit	₹ 14,400
Total cost of 1,800 units @ ₹ 6.57 per unit	₹ 11,826
Profit	₹ 2,574

$$* \frac{\text{Chargeable expenses}}{\text{Direct labour hour for the month}} \times \text{Direct labour hours for batch}$$

14. (i) Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production					
				Materials		Labour		Production Overhead	
Details	Units	Details	Units	%	Units	%	Units	%	Units
Opening Stock	600	From opening stock	600	-	-	40	240	40	240

		- From fresh materials	8,300	100	8,300	100	8,300	100	8,300
		Closing W-I-P	700	100	700	70	490	70	490
Fresh inputs	9,200	Normal loss	392	-	-	-	-	-	-
			9,992		9,000		9,030		9,030
		Less: Abnormal Gain	(192)	100	(192)	100	(192)	100	(192)
	9,800		9,800		8,808		8,838		8,838

(ii) Statement of Cost per equivalent units

Elements	**(₹)**	**Cost (₹)**	**Equivalent units (EU)**	**Cost per EU (₹)**
Material Cost	55,20,000			
Less: Scrap realisation 392 units @ ₹ 60/- p.u.	(23,520)	54,96,480	8,808	624.03
Labour cost		18,60,000	8,838	210.45
Production OH Cost		8,63,000	8,838	97.65
Total Cost		82,19,480		932.13

(iii) Cost of Abnormal Gain – 192 Units

	(₹)	**(₹)**
Material cost of 192 units @ ₹ 624.03 p.u.	1,19,813.76	
Labour cost of 192 units @ ₹ 210.45 p.u.	40,406.40	
Production OH cost of 192 units @ ₹ 97.65 p.u.	18,748.80	1,78,968.96
Cost of closing WIP – 700 Units		
Material cost of 700 equivalent units @ ₹ 624.03 p.u.	4,36,821.00	
Labour cost of 490 equivalent units @ ₹ 210.45 p.u.	1,03,120.50	
Production OH cost of 490 equivalent @ ₹ 97.65 p.u.	47,848.50	5,87,790.00

Cost of 8,900 units transferred to next process		₹
(i)	Cost of opening W-I-P Stock b/f – 600 units	4,20,000.00
(ii)	Cost incurred on opening W-I-P stock	
	Material cost	—
	Labour cost 240 equivalent units @ ₹ 210.45 p.u.	50,508.00
	Production OH cost 240 equivalent units @ ₹ 97.65 p.u.	23,436.00
		4,93,944.00
(iii)	Cost of 8,300 completed units	
	8,300 units @ ₹ 932.13 p.u.	77,36,679.00
	Total cost [(i) + (ii) + (iii))]	82,30,623.00

15. Working Notes:

(i) Computation of Allocation Ratio for Joint Costs

	Products		
	X ₹	Y ₹	Z. ₹
Selling Price	13.75	8.75	7.50
Less: anticipated margin@ 25% on cost of 20% on sales	2.75	1.75	1.50
Cost of sales	11.00	7.00	6.00
Less: post split off cost	5.00	4.00	2.50
Joint cost per unit	6.00	3.00	3.50
Output (units)	8,000	6,000	4,000
Total output cost	48,000	18,000	14,000
Allocation ratio for joint costs	24	9	7

(ii) Computation of net allocable joint costs

	₹	₹
Joint input cost including material cost		90,800
Less: Credit for realization from by-product B: Sales revenue (1,000 × Re. 1)	1,000	
Less: profit @ 25% on cost or 20% on sales	200	800
Net joint costs to be allocated		90,000

Determination of joint cost per unit of each product

Product	Net joint costs allocation ₹	Output (units) ₹	Joint cost per unit ₹
X	54,000 (Note: 1)	8,000	6.75
Y	20,250	6,000	3.38
Z	15,750	4,000	3.94
	90,000		

Profit margin available on each product as a percentage on cost

Product	Joint Cost ₹	Post spilt-off cost ₹	Total Cost ₹	Selling Price ₹	Margin ₹	Margin % on cost ₹
X	6.75	5.00	11.75	13.75	2.00	17.02
Y	3.38	4.00	7.38	8.75	1.37	18.56
Z	3.94	2.50	6.44	7.50	1.06	16.46

Note: 1

$$\mathbf{X} = \frac{24}{40} \times 90{,}000 = \mathbf{54{,}000}$$

$$Y = \frac{9}{40} \times 90{,}000 = 20{,}250$$

$$Z = \frac{7}{40} \times 90{,}000 = \underline{15{,}750}$$
$$\underline{90{,}000}$$

16. (i) Calculation of total project cost per day of concession period:

Activities	**Amount (₹ in lakh)**
Site clearance	170.70
Land development and filling work	9,080.35
Sub base and base courses	10,260.70
Bituminous work	35,070.80
Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	29,055.60
Drainage and protection work	9,040.50
Traffic sign, marking and road appurtenance	8,405.00
Maintenance, repairing and rehabilitation	12,429.60
Environmental management	982.00
Total Project cost	**114,495.25**
Administration and toll plaza operation cost	1,120.00
Total Cost	115,615.25
Concession period in days (25 years × 365 days)	9,125
Cost per day of concession period (₹ in lakh)	**12.67**

(ii) Computation of toll fee:

Cost to be recovered per day = Cost per day of concession period + 15% profit on cost

= ₹ 12,67,000 + ₹ 1,90,050

= ₹ 14,57,050

$$\text{Cost per equivalent vehicle} = \frac{₹14{,}57{,}050}{76{,}444 \text{ units (Refer working note)}}$$

= ₹ 19.06 per equivalent vehicle

Vehicle type-wise toll fee:

Sl. No.	Type of vehicle	Equivalent cost [A]	Weight [B]	Toll fee per vehicle [A×B]
1.	Two wheelers	₹ 19.06	1	19.06
2.	Car and SUVs	₹ 19.06	4	76.24
3.	Bus and LCV	₹ 19.06	6	114.36
4.	Heavy commercial vehicles	₹ 19.06	9	171.54

Working Note:

The cost per day has to be recovered from the daily traffic. Each type of vehicle is to be converted into equivalent unit. Let's convert all vehicle types equivalent to Two-wheeler

Sl. No.	Type of vehicle	Daily traffic volume [A]	Weight	Ratio [B]	Equivalent Two-wheeler [A×B]
1.	Two wheelers	44,500	0.05	1	44,500
2.	Car and SUVs	3,450	0.20	4	13,800
3.	Bus and LCV	1,800	0.30	6	10,800
4.	Heavy commercial vehicles	816	0.45	9	7,344
	Total				76,444

17. (i) Contribution per unit = Selling price – Variable cost

= ₹ 100 – ₹ 60

= ₹ 40

Break-even Point = $\frac{₹\ 24,00,000}{₹\ 40}$

= 60,000 units

Percentage Margin of Safety = $\frac{\text{Actual Sales} - \text{Break - even Sales}}{\text{Actual Sales}}$

Or, 60% = $\frac{\text{Actual Sales} - 60{,}000 \text{ units}}{\text{Actual Sales}}$

∴ Actual Sales = 1,50,000 units

	(₹)
Sales Value (1,50,000 units × ₹ 100)	1,50,00,000
Less: Variable Cost (1,50,000 units × ₹ 60)	(90,00,000)
Contribution	60,00,000
Less: Fixed Cost	(24,00,000)
Profit	36,00,000
Less: Income Tax @ 40%	(14,40,000)
Net Return	21,60,000

Rate of Net Return on Sales = 14.40% $\left(\frac{₹\,21{,}60{,}000}{₹\,1{,}50{,}00{,}000} \times 100\right)$

(ii) Products

	X (₹)	Y (₹)
Selling Price *per unit*	100	150
Variable Cost *per unit*	60	100
Contribution *per unit*	40	50

Composite contribution will be as follows:

Contribution per unit = $\left(\frac{40}{8} \times 5\right) + \left(\frac{50}{8} \times 3\right)$

= 25 + 18.75 = ₹ 43.75

Break-even Sale = 64,000 units $\left(\frac{₹28{,}00{,}000}{₹43.75}\right)$

Break-even Sales Mix:

X (64,000 units × 5/8) = 40,000 units

Y (64,000 units × 3/8) = 24,000 units

18. Workings

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs @ ₹ 140 per hour	560
Assembly Shop: 2 hrs @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold = Total Variable Cost/Variable Cost per unit

= ₹ 1,72,80,000 / ₹ 2,160

= 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold

= ₹ 3,02,40,000 / 8,000 units

= ₹ 3,780

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000
Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	51,000 (8,500 units × 6 Kg.)	25,500 (8,500 units × 3 Kg.)
Add: Desired Closing Stock	8,000	5,500
Total Requirements	59,000	31,000
Less: Opening Stock	(7,500)	(4,000)
Quantity to be purchased	51,500	27,000

19. (a) **Net Realisable Value method:** The realisation on the disposal of the by-product may be deducted from the total cost of production so as to arrive at the cost of the main product. For example, the amount realised by the sale of molasses in a sugar factory goes to reduce the cost of sugar produced in the factory.

When the by-product requires some additional processing and expenses are incurred in making it saleable to the best advantage of the concern, the expenses so incurred should be deducted from the total value realised from the sale of the by-product and only the net realisations should be deducted from the total cost of production to arrive at the cost of production of the main product. Separate accounts should be maintained for collecting additional expenses incurred on:

(i) further processing of the by-product, and

(ii) selling, distribution and administration expenses attributable to the by-product.

(b) Service costing differs from product costing (such as job or process costing) in the following ways due to some basic and peculiar nature.

(i) Unlike products, services are intangible and cannot be stored, hence, there is no inventory for the services.

(ii) Use of Composite cost units for cost measurement and to express the volume of outputs.

(iii) Unlike a product manufacturing, employee (labour) cost constitutes a major cost element than material cost.

(iv) Indirect costs like administration overheads are generally have a significant proportion in total cost of a service as unlike manufacturing sector, service sector heavily depends on support services and traceability of costs to a service may not economically feasible

(c) **Controllable and un-controllable variances:** The purpose of the standard costing reports is to investigate the reasons for significant variances so as to identify the problems and take corrective action.

Variances are broadly of two types, namely, controllable and uncontrollable. Controllable variances are those which can be controlled by the departmental heads whereas uncontrollable variances are those which are beyond their control. Responsibility centres are answerable for all adverse variances which are controllable and are appreciated for favourable variances. Controllability is a subjective matter and varies from situation to situation. If the uncontrollable variances are of significant nature and are persistent, the standard may need revision.

(d) **(i)** **Standards Cost Centres:** Cost Centre where output is measurable and input required for the output can be specified. Based on a well-established study, an estimate of standard units of input to produce a unit of output is set. The actual cost for inputs is compared with the standard cost. Any deviation

(variance) in cost is measured and analysed into controllable and uncontrollable cost. The manager of the cost centre is supposed to comply with the standard and held responsible for adverse cost variances. The input-output ratio for a standard cost centre is clearly identifiable.

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

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answers.

Question 1

Answer the following:

(a) G Ltd. manufactures a single product for which market demand exists for additional quantity. Present sales of ₹6,00,000 utilises only 60% capacity of the plant. The following data are available:

(1)	*Selling price*	*:*	*₹100 per unit*
(2)	*Variable cost*	*:*	*₹30 per unit*
(3)	*Semi-variable expenses*	*:*	*₹60,000 fixed + ₹5 per unit*
(4)	*Fixed expenses*	*:*	*₹ 1,00,000 at present level, estimated to increase by 25% at and above 80% capacity.*

You are required to prepare a flexible budget so as to arrive at the operating profit at 60%, 80% and 100% levels.

(b) Moon Ltd. produces products 'X', 'Y' and 'Z' and has decided to analyse it's production mix in respect of these three products - 'X', 'Y' and 'Z'.

You have the following information :

	X	*Y*	*Z*
Direct Materials ₹ (per unit)	*160*	*120*	*80*
Variable Overheads ₹ (per unit)	*8*	*20*	*12*

Direct labour :

Departments:	*Rate per Hour (₹)*	*Hours per unit*	*Hours per unit*	*Hours per unit*
		X	*Y*	*Z*
Department-A	*4*	*6*	*10*	*5*
Department-B	*8*	*6*	*15*	*11*

From the current budget, further details are as below :

	X	Y	Z
Annual Production at present (in units)	*10,000*	*12,000*	*20,000*
Estimated Selling Price per unit (₹)	*312*	*400*	*240*
Sales departments estimate of possible sales in the coming year (in units)	*12,000*	*16,000*	*24,000*

There is a constraint on supply of labour in Department-A and its manpower cannot be increased beyond its present level.

Required:

(i) Identify the best possible product mix of Moon Ltd.

(ii) Calculate the total contribution from the best possible product mix.

(c) A company's plant processes 6,750 units of a raw material in a month to produce two products 'M' and 'N'.

The process yield is as under:

Product M 80%

Product N 12%

Process Loss 8%

The cost of raw material is ₹ 80 per unit.

Processing cost is ₹ 2,25,000 of which labour cost is accounted for 66%. Labour is chargeable to products 'M' and 'N' in the ratio of 100:80.

Prepare a Comprehensive Cost Statement for each product showing:

(i) Apportionment of joint cost among products 'M' and 'N' and

(ii) Total cost of the products 'M' and 'N'.

(d) W Limited undertook a contract for ₹ 5,00,000 on 1st July, 2019. On 30th June, 2020 when the accounts were closed, the following details about the contract were gathered:

	Amount (₹)
Materials purchased	*1,00,000*
Wages paid	*45,000*
General expenses	*10,000*
Materials on hand (30-6-2020)	*25,000*
Wages accrued (30-6-2020)	*5,000*
Work certified	*2,00,000*

Cash received *1,50,000*

Work uncertified *15,000*

The above contract contained "Escalation clause" which read as follows :

"In the event of increase in the prices of materials and rates of wages by more than 5%, the contract price would be increased accordingly by 25% of the rise in the cost of materials and wages beyond 5% in each case."

It was found that since the date of signing the agreement, the prices of materials and wage rates increased by 25%. The value of the work certified does not take into account the effect of the above clause.

Calculate the 'value of work certified' after taking the effect of 'Escalation Clause' as on 30th June, 2020. ***(4 x 5 = 20 Marks)***

Answer

(a) **Flexible Budget**

Activity Level	**60%**	**80%**	**100%**
Production (units)	**6,000**	**8,000**	**10,000**
	(₹)	**(₹)**	**(₹)**
Sales @ ₹ 100 per unit	6,00,000	**8,00,000**	**10,00,000**
Variable Cost (@ ₹ 35 (₹ 30 + ₹ 5) per unit)	2,10,000	2,80,000	3,50,000
Contribution (A)	3,90,000	5,20,000	6,50,000
Fixed Cost (part of semi-variable cost)	60,000	60,000	60,000
Other Fixed Cost	1,00,000	**1,25,000**	**1,25,000**
Total Fixed Cost (B)	1,60,000	1,85,000	1,85,000
Operating Profit (A – B)	**2,30,000**	**3,35,000**	**4,65,000**

(b) (i) **Statement Showing "Calculation of Contribution/ unit"**

Particulars	**X (₹)**	**Y (₹)**	**Z (₹)**
Selling Price (A)	312	400	240
Variable Cost:			
Direct Material	160	120	80
Direct Labour			
Dept. A (Rate x Hours)	24	40	20

Dept. B (Rate x Hours)	48	120	88
Variable Overheads	8	20	12
Total Variable Cost (B)	240	300	200
Contribution per unit (A - B)	**72**	**100**	**40**
Hours in Dept. A	6	10	5
Contribution per hour	12	10	8
Rank	I	II	III

Existing Hours = 10,000 x 6hrs. + 12,000 x 10 hrs. + 20,000 x 5 hrs. = 2,80,000 hrs.

Best possible product mix (Allocation of Hours on the basis of ranking)

Produce 'X' = 12,000 units

Hours Required = 72,000 hrs (12,000 units × 6 hrs.)

Balance Hours Available = 2,08,000 hrs (2,80,000 hrs. – 72,000 hrs.)

Produce 'Y' (the Next Best) = 16,000 units

Hours Required = 1,60,000 hrs (16,000 units × 10 hrs.)

Balance Hours Available = 48,000 hrs (2,08,000 hrs. – 1,60,000 hrs.)

Produce 'Z' (balance) = 9,600 units (48,000 hrs./ 5 hrs.)

(ii) Statement Showing "Contribution"

Product	Units	Contribution/ Unit (₹)	Total Contribution (₹)
X	12,000	72	8,64,000
Y	16,000	100	16,00,000
Z	9,600	40	3,84,000
		Total	**28,48,000**

(c) Comprehensive Cost Statement

Particulars	Total Cost (₹)	Product-M (₹)	Product-N (₹)
No. of units produced *		5,400 units	810 units
Cost of raw material (₹ 80 × 6,750 units)	5,40,000		
Processing cost:			

- Labour cost (₹ 2,25,000 × 66%)	1,48,500		
- Other costs (₹ 2,25,000 - 1,48,500)	76,500		
Total joint cost	**7,65,000**		
(i) Apportionment of joint costs between the joint products			
Labour cost in the ratio of 100:80	1,48,500	**82,500** $\left(\frac{1,48,500\times100}{180}\right)$	**66,000** $\left(\frac{1,48,500\times80}{180}\right)$
Other joint costs (including material) in the ratio of output (5,400:810)	6,16,500	**5,36,087** $\left(\frac{6,16,500\times5,400}{6,210}\right)$	**80,413** $\left(\frac{6,16,500\times810}{6,210}\right)$
(ii) Total product cost	7,65,000	**6,18,587**	**1,46,413**

* No. of units produced of Product M = 6750 units x 80% = 5400 units

No. of units produced of Product N = 6750 units x 12% = 810 units

(d) Workings:

(i) Percentage of work certified:

$$\frac{\text{Value of work certified}}{\text{Contract price}}\times100 = \frac{₹\,2,00,000}{₹\,5,00,000}\times100 = 40\%$$

(ii) Value of material and labour used in the contract:

Particulars	Amount (₹)	Amount (₹)
Material purchased	1,00,000	
Less: Material on hand (30-06-2020)	(25,000)	75,000
Wages paid	45,000	
Add: Wages accrued (30-06-2020)	5,000	50,000
		1,25,000

Price of materials and wages has been increased by 25%, the value before price increase is:

$$\frac{₹\,1,25,000}{125}\times100 = ₹\,1,00,000$$

(iii) Calculation of Value of work certified:

The value of the contract would be increased by 25% of the price increased beyond 5%.

Price increased beyond 5% = ₹ 25,000 – 5% of ₹ 1,00,000 = ₹ 20,000

Value of contract would be increased by 25% of ₹ 20,000 = ₹ 5,000

Therefore, the revised contract value = ₹ 5,00,000 + ₹ 5,000 = ₹ 5,05,000

Calculation of the Value of work certified after taking the effect of escalation clause:

Revised contract value × Percentage of work certified

= ₹ 5,05,000 × 40% = ₹ 2,02,000

Question 2

(a) X Ltd. manufactures two types of pens 'Super Pen' and 'Normal Pen'.

The cost data for the year ended 30th September, 2019 is as follows:

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

It is further ascertained that :

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

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

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

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

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

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

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

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

Prepare a Cost Sheet for 'Super Pen' showing:

(i) Cost per unit and Total Cost

(ii) Profit per unit and Total Profit ***(10 Marks)***

(b) TEE Ltd. is a manufacturing company having three production departments 'P', 'Q' and 'R' and two service departments 'X' and 'Y' details pertaining to which are as under :

	P	Q	R	X	Y
Direct wages (₹)	5,000	1,500	4,500	2,000	800
Working hours	13,191	7,598	14,995	-	-
Value of machine (₹)	1,00,000	80,000	1,00,000	20,000	50,000
H.P. of machines	100	80	100	20	50
Light points (Nos.)	20	10	15	5	10
Floor space (sq. ft.)	2,000	2,500	3,500	1,000	1,000

The expenses are as follows:

	(₹)
Rent and Rates	10,000
General Lighting	600
Indirect Wages	3,450
Power	3,500
Depreciation on Machines	70,000
Sundries (apportionment on the basis of direct wages)	13,800

The expenses of Service Departments are allocated as under :

	P	Q	R	X	Y
X	45%	15%	30%	-	10%
Y	35%	25%	30%	10%	-

Product 'A' is processed for manufacture in Departments P, Q and R for 6, 5 and 2 hours respectively.

Direct Costs of Product A are :

Direct material cost is ₹ 65 per unit and Direct labour cost is ₹ 40 per unit.

You are Required to:

(i) Prepare a statement showing distribution of overheads among the production and service departments.

(ii) Calculate recovery rate per hour of each production department after redistributing the service departments costs.

(iii) Find out the Total Cost of a 'Product A'. ***(10 Marks)***

Answer

(a) Preparation of Cost Sheet for Super Pen

No. of units produced = 40,000 units

No. of units sold = 36,000 units

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

Working Notes:

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

Direct material cost per unit of Super pen = 2M

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

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

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

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

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

Direct wages per unit for Normal Pen = 0.6W

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

W = ₹ 4 per unit

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

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

* Administration overhead is specific to the product as it is directly related to direct labour as mentioned in the question and hence to be considered in cost of production only.

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

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

(b) (i) Statement showing distribution of Overheads

Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P (₹)	Q (₹)	R (₹)	X (₹)	Y (₹)
Direct wages	Actual	2,800	--	--	--	2,000	800
Rent and Rates	Floor area (4:5:7:2:2)	10,000	2,000	2,500	3,500	1,000	1,000
General lighting	Light points (4:2:3:1:2)	600	200	100	150	50	100
Indirect wages	Direct wages (50:15:45:20:8)	3,450	1,250	375	1,125	500	200
Power	Horse Power of machines used (10:8:10:2:5)	3,500	1,000	800	1,000	200	500
Depreciation of machinery	Value of machinery (10:8:10:2:5)	70,000	20,000	16,000	20,000	4,000	10,000
Sundries	Direct wages (50:15:45:20:8)	13,800	5,000	1,500	4,500	2,000	800
Total		**1,04,150**	**29,450**	**21,275**	**30,275**	**9,750**	**13,400**

Secondary Distribution using simultaneous equation method:

Overheads of service cost centres

Let, X be the overhead of service cost centre X

Y be the overhead of service cost centre Y

X = 9,750 + 0.10 Y

Y = 13,400 + 0.10 X

Substituting the value of Y in X we get

X = 9,750 + 0.10 (13,400 + 0.10 X)

X = 9,750 + 1,340 + 0.01 X

0.99 X = 11,090

∴ **X** = ₹ 11,202

∴ **Y** = 13,400 + 0.10 × 11,202

= ₹ 14,520.20

Secondary Distribution Summary

Particulars	**Total (₹)**	**P (₹)**	**Q (₹)**	**R (₹)**
Allocated and Apportioned over-heads as per primary distribution		29,450.00	21,275.00	30,275.00
X	11,202.00	5,040.90	1,680.30	3,360.60
Y	14,520.20	5,082.07	3,630.05	4,356.06
Total		39,572.97	26,585.35	37,991.66

(ii) Calculation of Overhead recovery rate per hour

	P (₹)	**Q (₹)**	**R (₹)**
Total overheads cost	**39,572.97**	**26,585.35**	**37,991.66**
Working hours	13,191	7,598	14,995
Rate per hour (₹)	**3**	**3.50**	**2.53**

(iii) Cost of Product A

	(₹)
Direct material	65.00
Direct labour	40.00
Prime cost	105.00
Production on overheads	

P 6 hours × ₹ 3 = ₹ 18	
Q 5 hours × ₹ 3.50 = ₹ 17.50	
R 2 hours × ₹ 2.53 = ₹ 5.06	40.56
Total cost	**145.56**

Note: Secondary Distribution can also be done using repeated distribution Method

Question 3

(a) ABC Ltd. has furnished the following information regarding the overheads for the month of June 2020 :

(i)	*Fixed Overhead Cost Variance*	*₹ 2,800 (Adverse)*
(ii)	*Fixed Overhead Volume Variance*	*₹ 2,000 (Adverse)*
(iii)	*Budgeted Hours for June, 2020*	*2,400 hours*
(iv)	*Budgeted Overheads for June,2020*	*₹ 12,000*
(v)	*Actual rate of recovery of overheads*	*₹ 8 Per Hour*

From the above given information

Calculate:

(1) Fixed Overhead Expenditure Variance

(2) Actual Overheads Incurred

(3) Actual Hours for Actual Production

(4) Fixed Overhead Capacity Variance

(5) Standard hours for Actual Production

(6) Fixed Overhead Efficiency Variance ***(10 Marks)***

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

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

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

Find out:

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

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

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

(10 Marks)

Answer

(a) (1) Fixed Overhead Expenditure Variance

= Budgeted Fixed Overheads – Actual Fixed Overheads

= ₹ 12,000 – ₹ 12,800 (as calculated below) **= ₹ 800 (A)**

(2) Fixed Overhead Cost Variance= Absorbed Fixed Overheads – Actual Fixed Overheads

2,800 (A) = ₹ 10,000 – Actual Overheads

Actual Overheads **= ₹ 12,800**

(3) Actual Hours for Actual Production = ₹ 12,800/ ₹8 **= 1,600 hrs**.

(4) Fixed Overhead capacity Variance

= Budgeted Fixed Overheads for Actual Hours– Budgeted Fixed Overheads

= ₹ 5 x 1600 hrs. – ₹ 12,000 **= ₹ 4,000 (A)**

(5) Standard Hours for Actual Production

= Absorbed Overheads/ Std. Rate

= ₹ 10,000/ ₹ 5 **= 2,000 hrs.**

(6) Fixed Overhead Efficiency Variance

= Absorbed Fixed Overheads – Budgeted Fixed Overheads for Actual Hours

= ₹ 10,000 – ₹ 5 x 1,600 hrs. **= ₹ 2,000 (F)**

Working Note:

(i) Fixed Overhead Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads

2,000 (A) = Absorbed Fixed Overheads – ₹12,000

Absorbed Fixed Overheads = ₹ 10,000

(ii) Standard Rate/ Hour = ₹ 5 (₹ 12,000/2,400 hrs.)

(b) Working Notes:

Annual requirement (A)	= 27,000 units
Cost per order (O)	= ₹ 240
Inventory carrying cost (i)	= 12.5%
Cost per unit of spare (c)	= ₹ 50
Carrying cost per unit (i × c)	= ₹ 50 × 12.5% = **₹ 6.25**

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

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

(i) Calculation of saving by opting EOQ:

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

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

(ii) Re-order point under EOQ:

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

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

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

(iii) Frequency of Orders (in days):

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

Question 4

(a) Following details are related to the work done in Process-I by ABC Ltd. during the month of May 2019 :

	(₹)
Opening work in process (3,000 units)	
Materials	*1,80,500*

Labour	*32,400*
Overheads	*90,000*
Materials introduced in Process-I (42,000 units)	*36,04,000*
Labour	*4,50,000*
Overheads	*15,18,000*

Units Scrapped : 4,800 units

Degree of completion :

Materials : 100%

Labour & overhead : 70%

Closing Work-in-process : 4,200 units

Degree of completion :

Materials : 100%

Labour & overhead : 50%

Units finished and transferred to Process-II : 36,000 units

Normal loss:

4% of total input including opening work-in-process

Scrapped units fetch ₹62.50 per piece.

Prepare:

(i) Statement of equivalent production.

(ii) Statement of cost per equivalent unit.

(iii) Process-I A/c

(iv) Normal Loss Account and

(v) Abnormal Loss Account ***(10 Marks)***

(b) Following are the particulars of two workers 'R' and 'S' for a month:

Particulars	*R*	*S*
(i) Basic Wages (₹)	*15,000*	*30,000*
(ii) Dearness Allowance	*50%*	*50%*
(iii) Contribution to EPF (on basic wages)	*7%*	*7.5%*
(iv) Contribution to ESI (on basic wages)	*2%*	*2%*
(v) Overtime (hours)	*20*	*-*

The normal working hours for the month are 200 hrs. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to State Insurance and Provident Fund are at equal rates with employees' contributions.

Both workers were employed on jobs A, B and C in the following proportions :

Jobs	*A*	*B*	*C*
R	*75%*	*10%*	*15%*
S	*40%*	*20%*	*40%*

Overtime was done on job 'A'.

You are required to :

(i) Calculate ordinary wage rate per hour of 'R' and 'S'.

(ii) Allocate the worker's cost to each job 'A', 'B' and 'C'. ***(6 Marks)***

(c) Discuss any four objectives of 'Time keeping' in relation to attendance and payroll procedures. ***(4 Marks)***

Answer

(a) (i) Statement of Equivalent Production (Weighted Average method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	3,000	Completed and transferred to Process-II	36,000	100	36,000	100	36,000
Units introduced	42,000	Normal Loss (4% of 45,000 units)	1,800	--	--	--	--
		Abnormal loss (Balancing figure)	3,000	100	3,000	70	2,100
		Closing WIP	4,200	100	4,200	50	2,100
	45,000		45,000		**43,200**		**40,200**

(ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	1,80,500	32,400	90,000	3,02,900
Cost incurred during the month	36,04,000	4,50,000	15,18,000	55,72,000

Less: Realisable Value of normal scrap (₹ 62.50 × 1,800 units)	(1,12,500)	--	--	(1,12,500)
Total cost: (A)	**36,72,000**	**4,82,400**	**16,08,000**	57,62,400
Equivalent units: (B)	43,200	40,200	40,200	
Cost per equivalent unit: (C) = (A ÷ B)	**85.00**	**12.00**	**40.00**	137.00

Statement of Distribution of cost

	Particulars	Amount (₹)	Amount (₹)
1.	Value of units completed and transferred: (36,000 units × ₹ 137)		49,32,000
2.	Value of Abnormal Loss:		
	- Materials (3,000 units × ₹ 85)	2,55,000	
	- Labour (2,100 units × ₹ 12)	25,200	
	- Overheads (2,100 units × ₹ 40)	84,000	3,64,200
3.	Value of Closing W-I-P:		
	- Materials (4,200 units × ₹ 85)	3,57,000	
	- Labour (2,100 units × ₹ 12)	25,200	
	- Overheads (2,100 units × ₹ 40)	84,000	4,66,200

(iii) Process-I A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W.I.P:					
– Materials	3,000	1,80,500	By Normal Loss	1,800	1,12,500
– Labour	--	32,400	(₹ 62.5 × 1,800		
– Overheads	--	90,000	units)		
To Materials introduced	42,000	36,04,000	By Abnormal loss	3,000	**3,64,200**
To Labour		4,50,000	By Process-I A/c	36,000	49,32,000
To Overheads		15,18,000	By Closing WIP	4,200	**4,66,200**
	45,000	**58,74,900**		45,000	**58,74,900**

(iv) Normal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	1,800	1,12,500	By Cost Ledger Control A/c	1,800	1,12,500
	1,800	**1,12,500**		1,800	**1,12,500**

(v) Abnormal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	3,000	3,64,200	By Cost Ledger Control A/c (₹ 62.5 × 3,000 units)	3,000	**1,87,500**
			By Costing Profit & Loss A/c (Bal. Figure)		**1,76,700**
	3,000	**3,64,200**		3,000	**3,64,200**

(b) (i) Calculation of Net Wages paid to Worker 'R' and 'S'

Particulars	R (₹)	S (₹)
Basic Wages	15,000.00	30,000.00
Dearness Allowance (DA) (50% of Basic Wages)	7,500.00	15,000.00
Overtime Wages (Refer to Working Note 1)	4,500.00	----
Gross Wages earned	27,000.00	45,000.00
Less: Provident Fund (7% × ₹ 15,000); (7.5% × ₹ 30,000)	(1,050.00)	(2,250.00)
Less: ESI (2% × ₹ 15,000); (2% × ₹ 30,000)	(300.00)	(600.00)
Net Wages paid	**25,650.00**	**42,150.00**

Calculation of ordinary wage rate per hour of Worker 'R' and 'S'

	R (₹)	S (₹)
Gross Wages (Basic Wages + DA) (excluding overtime)	22,500.00	45,000.00
Employer's contribution to P.F. and E.S.I.	1,350.00	2,850.00
	23,850.00	47,850.00
Ordinary wages Labour Rate per hour (₹ 23,850 ÷ 200 hours); (₹ 47,850 ÷ 200 hours)	**119.25**	**239.25**

(ii) Statement Showing Allocation of workers cost to each Job

	Total Wages	Jobs		
		A	B	C
Worker R				
Ordinary Wages (15:2:3)	23,850.00	17,887.50	2,385.00	3577.50
Overtime	4500.00	**4500.00**	-	--
Worker S				
Ordinary Wages (2:1:2)	47,850.00	19,140.00	9,570.00	19,140.00
	76,200.00	**41,527.50**	**11,955.00**	**22,717.50**

Working Note:

Normal Wages are considered as basic wages.

$$\text{Over time} = \frac{2 \times (\text{Basic wage} + \text{D.A.}) \times 20 \text{ hours}}{200 \text{ hours}}$$

$$= 2 \times \frac{₹22,500}{200} \times 20 \text{ hours}$$

$$= ₹\ 4,500$$

(c) The objectives of time-keeping in relation to attendance and payroll procedures are as follows:

(i) For the preparation of payrolls.

(ii) For calculating overtime.

(iii) For ascertaining and controlling employee cost.

(iv) For ascertaining idle time.

(v) For disciplinary purposes.

(vi) For overhead distribution

Question 5

(a) SEZ Ltd. built a 120 km. long highway and now operates a toll road to collect tolls. The company has invested ₹ 900 crore to build the road and has estimated that a total of 120 crore vehicles will be using the highway during the 10 years toll collection tenure. The other costs for the month of "June 2020" are as follows:

(i) Salary:

- *Collection personnel (3 shifts and 5 persons per shift) - ₹ 200 per day per person.*

- *Supervisor (3 shifts and 2 persons per shift) - ₹ 350 per day per person.*
- *Security personnel (2 shifts and 2 persons per shift) - ₹ 200 per day per person.*
- *Toll Booth Manager (3 shifts and 1 person per shift) - ₹ 500 per day per person.*

(ii) Electricity - ₹ 1,50,000

(iii) Telephone - ₹ 1,00,000

(iv) Maintenance cost - ₹ 50 lakhs

(v) The company needs 30% profit over total cost.

Required:

(1) Calculate cost per kilometre.

(2) Calculate the toll rate per vehicle. ***(10 Marks)***

(b) ABC Ltd. is engaged in production of three types of Fruit Juices:

Apple, Orange and Mixed Fruit.

The following cost data for the month of March 2020 are as under:

Particulars	*Apple*	*Orange*	*Mixed Fruit*
Units produced and sold	*10,000*	*15,000*	*20,000*
Material per unit (₹)	*8*	*6*	*5*
Direct Labour per unit (₹)	*5*	*4*	*3*
No. of Purchase Orders	*34*	*32*	*14*
No. of Deliveries	*110*	*64*	*52*
Shelf Stocking Hours	*110*	*160*	*170*

Overheads incurred by the company during the month are as under :

	(₹)
Ordering costs	*64,000*
Delivery costs	*1,58,200*
Shelf Stocking costs	*87,560*

Required:

(i) Calculate cost driver's rate.

(ii) Calculate total cost of each product using Activity Based Costing. ***(6 Marks)***

(c) Describe the various levels of activities under 'ABC' methodology. ***(4 Marks)***

Answer

(a) **Statement of Cost**

Particulars		**(₹)**
A. Apportionment of capital cost	$\left(\frac{₹\ 900\text{crore}}{10\text{years}} \times \frac{1}{12\text{months}}\right)$	**7,50,00,000**
B. Other Costs		
Salary to Collection Personnel	(3 Shifts × 5 persons per shift × 30 days × ₹ 200 per day)	**90,000**
Salary to Supervisor	(3 Shifts × 2 persons per shift × 30 days × ₹ 350 per day)	**63,000**
Salary to Security Personnel	(2 Shifts × 2 persons per shift × 30 days × ₹ 200 per day)	**24,000**
Salary to Toll Booth Manager	(3 Shifts × 1 person per shift × 30 days × ₹ 500 per day)	**45,000**
Electricity		1,50,000
Telephone		1,00,000
		4,72,000
C. Maintenance cost		50,00,000
Total (A + B + C)		**8,04,72,000**

(1) Calculation of cost per kilometre:

$$= \frac{\text{Total Cost}}{\text{Total km.}} = \frac{₹\ 8,04,72,000}{120\text{km.}} = ₹\ 6,70,600$$

(2) Calculation of toll rate per vehicle:

$$= \frac{\text{Total Cost} + 25\%\ \text{profit}}{\text{Vehicles per month}} = \frac{₹\ 8,04,72,000 + ₹\ 2,41,41,600}{1,00,00,000\ \text{vehicles}} = ₹\ \mathbf{10.46}$$

Working:

$$\text{Vehicles per month} = \frac{\text{Total estimated vehicles}}{10\ \text{years}} \times \frac{1\ \text{month}}{12\ \text{months}}$$

$$= \frac{120\,\text{crore}}{10\,\text{years}} \times \frac{1\,\text{month}}{12\,\text{months}} = 1\ \text{Crore vehicles}$$

(b) (i) Calculation Cost-Driver's rate

Activity	Overhead cost (₹)	Cost-driver level	Cost driver rate (₹)
	(A)	(B)	(C) = (A)/(B)
Ordering	64,000	34 + 32 + 14 = 80 no. of purchase orders	**800**
Delivery	1,58,200	110 + 64 + 52 = 226 no. of deliveries	**700**
Shelf stocking	87,560	110 + 160 + 170 = 440 shelf stocking hours	**199**

(ii) Calculation of total cost of products using Activity Based Costing

Particulars	Fruit Juices		
	Apple (₹)	Orange (₹)	Mixed Fruit (₹)
Material cost	80,000 (10,000 x ₹ 8)	90,000 (15,000 x ₹ 6)	1,00,000 (20,000 x ₹ 5)
Direct labour cost	50,000 (10,000 x ₹ 5)	60,000 (15,000 x ₹ 4)	60,000 (20,000 x ₹ 3)
Prime Cost (A)	1,30,000	1,50,000	1,60,000
Ordering cost	**27,200** (800 x 34)	**25,600** (800 x 32)	**11,200** (800 x 14)
Delivery cost	**77,000** (700 x 110)	**44,800** (700 x 64)	**36,400** (700 x 52)
Shelf stocking cost	**21,890** (199 x 110)	**31,840** (199 x 160)	**33,830** (199 x 170)
Overhead Cost (B)	1,26,090	1,02,240	81,430
Total Cost (A + B)	**2,56,090**	**2,52,240**	**2,41,430**

(c) Various Level of Activities under ABC Methodology

Level of Activities	Meaning
1. Unit level activities	These are those activities for which the consumption of resources can be identified with the number of units produced.
2. Batch level activities	The activities such as setting up of a machine or processing a purchase order are performed each time a batch of goods is produced. The cost of batch related

	activities varies with number of batches made, but is common (or fixed) for all units within the batch.
3. Product level activities	These are the activities which are performed to support different products in product line.
4. Facilities level activities	These are the activities which cannot be directly attributed to individual products. These activities are necessary to sustain the manufacturing process and are common and joint to all products manufactured.

Question 6

Answer any four of the following:

(a) Differentiate between "Cost Accounting and Management Accounting".

(b) What are the important points an organization should consider if it wants to adopt Performance Budgeting?

(c) Explain what are the pre-requisites of integrated accounting.

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

(i) Real Estate

(ii) Motor repairing workshop

(iii) Chemical Industry

(iv) Transport service

(v) Assembly of bicycles

(vi) Biscuits manufacturing Industry

(vii) Power supply Companies

(viii) Car manufacturing Industry

(ix) Cement Industry

(x) Printing Press

(e) Differentiate between "Marginal and Absorption Costing". ***(4 x 5 = 20 Marks)***

Answer

(a) Difference between Cost Accounting and Management Accounting

	Basis	Cost Accounting	Management Accounting
(i)	**Nature**	It records the quantitative aspect only.	It records both qualitative and quantitative aspect.
(ii)	**Objective**	It records the cost of producing a product and providing a service.	It Provides information to management for planning and co-ordination.

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

(b) For an enterprise that wants to adopt Performance Budgeting, it is thus imperative that:

- the objectives of the enterprise are spelt out in concrete terms.
- the objectives are then translated into specific functions, programmes, activities and tasks for different levels of management within the realities of fiscal constraints.
- realistic and acceptable norms, yardsticks or standards and performance indicators should be evolved and expressed in quantifiable physical units.
- a style of management based upon decentralised responsibility structure should be adopted, and
- an accounting and reporting system should be developed to facilities monitoring, analysis and review of actual performance in relation to budgets.

(c) The essential pre-requisites for integrated accounts include the following steps:

- The management's decision about the extent of integration of the two sets of books. Some concerns find it useful to integrate up to the stage of prime cost or factory cost while other prefer full integration of the entire accounting records.
- A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
- An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.
- Perfect coordination should exist between the staff responsible for the financial and cost aspects of the accounts and an efficient processing of accounting documents should be ensured.
- Under this system there is no need for a separate cost ledger. Of course, there will be a number of subsidiary ledgers; in addition to the useful Customers' Ledger and the Bought Ledger, there will be: (a) Stores Ledger; (b) Stock Ledger and (c) Job Ledger.

(d) Method of costing used in different industries:

S. No.	Industries	Method of Costing
(i)	Real Estate	Contract Costing
(ii)	Motor Repairing Workshop	Job Costing
(iii)	Chemical Industry	Process Costing
(iv)	Transport Service	Service/Operating Costing
(v)	Assembly of Bicycles	Unit/ Single/Output/Multiple Costing
(vi)	Biscuits Manufacturing Industry	Batch Costing
(vii)	Power Supply Companies	Service/Operating Costing
(viii)	Car Manufacturing Industry	Multiple Costing
(ix)	Cement Industry	Unit/Single/Output Costing
(x)	Printing Press	Job Costing

(e) Difference between Marginal costing and Absorption costing

S. No.	Marginal costing	Absorption costing
1.	Only variable costs are considered for product costing and inventory valuation.	Both fixed and variable costs are considered for product costing and inventory valuation.
2.	Fixed costs are regarded as period costs. The Profitability of different products is judged by their P/V ratio.	Fixed costs are charged to the cost of production. Each product bears a reasonable share of fixed cost and thus the profitability of a product is influenced by the apportionment of fixed costs.
3.	Cost data presented highlight the total contribution of each product.	Cost data are presented in conventional pattern. Net profit of each product is determined after subtracting fixed cost along with their variable costs.
4.	The difference in the magnitude of opening stock and closing stock does not affect the unit cost of production.	The difference in the magnitude of opening stock and closing stock affects the unit cost of production due to the impact of related fixed cost.
5.	In case of marginal costing the cost per unit remains the same, irrespective of the production as it is valued at variable cost	In case of absorption costing the cost per unit reduces, as the production increases as it is fixed cost which reduces, whereas, the variable cost remains the same per unit.

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer

Question 1

Answer the following:

(a) During a particular period ABC Ltd has furnished the following data:

Sales ₹10,00,000

Contribution to sales ratio 37% and

Margin of safety is 25% of sales.

A decrease in selling price and decrease in the fixed cost could change the "contribution to sales ratio" to 30% and "margin of safety" to 40% of the revised sales. Calculate:

(i) Revised Fixed Cost.

(ii) Revised Sales and

(iii) New Break-Even Point.

(b) A machine shop has 8 identical machines manned by 6 operators. The machine cannot work without an operator wholly engaged on it. The original cost of all the 8 machines works out to ₹32,00,000. The following particulars are furnished for a six months period:

Normal available hours per month per operator	*208*
Absenteeism (without pay) hours per operator	*18*
Leave (with pay) hours per operator	*20*
Normal unavoidable idle time-hours per operator	*10*
Average rate of wages per day of 8 hours per operator	*₹100*
Production bonus estimated	*10% on wages*
Power consumed	*₹40,250*
Supervision and Indirect Labour	*₹16,500*
Lighting and Electricity	*₹6,000*

The following particulars are given for a year:

Insurance	*₹ 3,60,000*
Sundry work Expenses	*₹ 50,000*
Management Expenses allocated	*₹ 5,00,000*
Depreciation	*10% on the original cost*

Repairs and Maintenance (including consumables): 5% of the value of all the machines.

Prepare a statement showing the comprehensive machine hour rate for the machine shop.

(c) *MNO Ltd has provided following details:*

- *Opening work in progress is 10,000 units at ₹ 50,000 (Material 100%, Labour and overheads 70% complete).*
- *Input of materials is 55,000 units at ₹ 2,20,000. Amount spent on Labour and Overheads is ₹ 26,500 and ₹ 61,500 respectively.*
- *9,500 units were scrapped; degree of completion for material 100% and for labour & overheads 60%.*
- *Closing work in progress is 12,000 units; degree of completion for material 100% and for labour & overheads 90%.*
- *Finished units transferred to next process are 43,500 units.*

  Normal loss is 5% of total input including opening work in progress. Scrapped units would fetch ₹ 8.50 per unit.

You are required to prepare using FIFO method:

(i) Statement of Equivalent production

(ii) Abnormal Loss Account

(d) *GHI Ltd. manufactures 'Stent' that is used by hospitals in heart surgery. As per the estimates provided by Pharmaceutical Industry Bureau, there will be a demand of 40 Million 'Stents' in the coming year. GHI Ltd. is expected to have a market share of 2.5% of the total market demand of the Stents in the coming year. It is estimated that it costs ₹ 1.50 as inventory holding cost per stent per month and that the set-up cost per run of stent manufacture is ₹ 225.*

Required:

(i) What would be the optimum run size for Stent manufacture?

(ii) What is the minimum inventory holding cost?

(iii) Assuming that the company has a policy of manufacturing 4,000 stents per run, how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above? ***(4 x 5 = 20 Marks)***

Answer

(a) Contribution to sales ratio (P/V ratio) = 37%

Variable cost ratio = 100% - 37% = 63%

Variable cost = ₹ 10,00,000 x 63% = ₹ 6,30,000

After decrease in selling price and fixed cost, sales quantity has not changed. Thus, variable cost is ₹ 6,30,000.

Revised Contribution to sales = 30%

Thus, Variable cost ratio = 100% – 30% = 70%

Thus, Revised sales = $\frac{₹\ 6,30,000}{70\%}$ = ₹ 9,00,000

Revised, Break-even sales ratio = 100% – 40% (revised Margin of safety) = 60%

(i) Revised fixed cost = revised breakeven sales x revised contribution to sales ratio

= ₹ 5,40,000 (₹ 9,00,000 x 60%) x 30%

= ₹ 1,62,000

(ii) Revised sales = ₹ 9,00,000 (as calculated above)

(iii) Revised Break-even point = Revised sales x Revised break-even sales ratio

= ₹ 9,00,000 x 60%

= ₹ 5,40,000

(b) Workings:

Particulars	**Six months 6 operators (Hours)**
Normal available hours per month (208 x 6 months x 6 operators)	7,488
Less: Absenteeism hours (18 x 6 operators)	(108)
Paid hours (A)	7,380
Less: Leave hours (20 x 6 operators)	(120)
Less: Normal idle time (10 x 6 operators)	(60)
Effective working hours	**7,200**

Computation of Comprehensive Machine Hour Rate

Particulars	Amount for six months (₹)
Operators' wages (7,380/8 x100)	92,250
Production bonus (10% on wages)	9,225
Power consumed	40,250
Supervision and indirect labour	16,500
Lighting and Electricity	6,000
Repair and maintenance {(5% × ₹ 32,00,000)/2}	80,000
Insurance (₹ 3,60,000/2)	1,80,000
Depreciation {(₹ 32,00,000 × 10%)/2}	1,60,000
Sundry Work expenses (₹ 50,000/2)	25,000
Management expenses (₹ 5,00,000/2)	2,50,000
Total Overheads for 6 months	**8,59,225**
Comprehensive Machine Hour Rate = ₹ 8,59,225/7,200 hours	**₹ 119.33**

(Note: Machine hour rate may be calculated alternatively. Further, presentation of figures may also be done on monthly or annual basis.)

(c) (i) Statement of Equivalent Production (Using FIFO method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	10,000	Completed and transferred to Process-II					
Units introduced	55,000	- From opening WIP	10,000	-		30	3,000
		- From fresh inputs	33,500	100	33,500	100	33,500
			43,500		33,500		36,500
		Normal Loss {5% (10,000 + 55,000 units)}	3,250	-			-
		Abnormal loss (9,500 – 3,250)	6,250	100	6,250	60	3,750

		Closing WIP	12,000	100	12,000	90	10,800
	65,000		**65,000**		**51,750**		**51,050**

(ii) Abnormal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c (Refer Working Note-2)	6,250	29,698	By Cost Ledger Control A/c (6,250 units × ₹ 8.5)	6,250	53,125
To Costing Profit & Loss A/c	-	23,427			
	6,250	**53,125**		**6,250**	**53,125**

Working Notes:

1. Computation of Cost per unit

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)
Input costs	2,20,000	26,500	61,500
Less: Realisable value of normal scrap (3,250 units x ₹ 8.5)	(27,625)	--	--
Net cost	1,92,375	26,500	61,500
Equivalent Units	51,750	51,050	51,050
Cost Per Unit	**3.7174**	**0.5191**	**1.2047**

Total cost per unit = ₹ (3.7174 + 0.5191 + 1.2047) = ₹ 5.4412

2. Valuation of Abnormal Loss

	(₹)
Materials (6,250 units × ₹ 3.7174)	23,233.75
Labour (3,750 units × ₹ 0.5191)	1,946.63
Overheads (3,750 units × ₹ 1.2047)	4,517.62
	29,698

(d) (i) Computation of Optimum Run size of 'Stents' or Economic Batch Quantity (EBQ)

Economic Batch Quantity (EBQ) = $\sqrt{\frac{2DS}{C}}$

Where, D = Annual demand for the Stents

= 4,00,00,000 × 2.5% = 10,00,000 units

S = Set- up cost per run

= ₹ 225

C = Carrying cost per unit per annum

= ₹ 1.50 × 12 = ₹ 18

$$\text{EBQ} = \sqrt{\frac{2 \times 10,00,000 \times ₹\ 225}{₹\ 18}}$$

= 5,000 units of Stents

(ii) Minimum inventory holding cost

Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum

= (5,000 ÷ 2) × ₹ 18

= ₹ 45,000

(iii) Calculation of the extra cost due to manufacturing policy

	When run size is 4,000 units	When run size is 5,000 units i.e. at EBQ
Total set up cost	$= \frac{10,00,000}{4,000} \times$ ₹ 225 = ₹ 56,250	$\frac{10,00,000}{5,000} \times$ ₹ 225 = ₹ 45,000
Total Carrying cost	½ × 4,000 × ₹ 18 = ₹ 36,000	½ × 5,000 × ₹ 18 = ₹ 45,000
Total Cost	**₹ 92,250**	**₹ 90,000**

Extra cost = ₹ 92,250 - ₹ 90,000 = **₹ 2,250**

Question 2

(a) Z Ltd is working by employing 50 skilled workers. It is considering the introduction of an incentive scheme - either Halsey Scheme (with 50% Bonus) or Rowan Scheme - of wage payment for increasing the labour productivity to adjust with the increasing demand for its products by 40%. The company feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient incentive for them to produce more and the company has accordingly given assurance to the workers.

Because of this assurance, an increase in productivity has been observed as revealed by the figures for the month of April, 2020:

Hourly rate of wages (guaranteed)	*₹ 50*
Average time for producing one unit by one worker at the previous performance (this may be taken as time allowed)	*1.975 hours*
Number of working days in a month	*24*
Number of working hours per day of each worker	*8*
Actual production during the month	*6,120 units*

Required:

(i) Calculate the effective increase in earnings of workers in percentage terms under Halsey and Rowan scheme.

(ii) Calculate the savings to Z Ltd in terms of direct labour cost per unit under both the schemes.

(iii) Advise Z Ltd about the selection of the scheme that would fulfil its assurance of incentivising workers and also to adjust with the increase in demand. ***(10 Marks)***

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

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

Cost of Sales = ₹ 4,00,000

Sales = ₹ 5,00,000

Accounts show the following figures:

	1st April, 2020 (₹)	*30th April, 2020 (₹)*
Inventory:		
Raw material	*20,000*	*25,000*
Work-in-progress	*20,000*	*30,000*
Finished goods	*50,000*	*60,000*
Other details:		
Selling expenses		*22,000*
General & Admin. expenses		*18,000*

You are required to prepare a cost sheet for the month of April 2020 showing:

(i) Prime Cost

(ii) Works Cost

(iii) Cost of Production

(iv) Cost of Goods sold

(v) Cost of Sales and Profit earned. ***(10 Marks)***

Answer

(a) Working Notes:

1. Total time wages of 50 workers per month:

   = No. of working days in the month × No. of working hours per day of each worker × Hourly rate of wages × No. of workers

   = 24 days × 8 hrs. × ₹ 50 × 50 workers = ₹ 4,80,000

2. Time saved per month:

Time allowed per unit to a worker	1.975 hours
No. of units produced during the month by 50 workers	6,120 units
Total time allowed to produce 6,120 units (6,120 × 1.975 hrs)	12,087 hours
Actual time taken to produce 6,120 units (24 days × 8 hrs. × 50 workers)	9,600 hours
Time saved (12,087 hours – 9,600 hours)	2,487 hours

3. Bonus under Halsey scheme to be paid to 50 workers:

   Bonus = (50% of time saved) × hourly rate of wages

   = 50/100 × 2,487 hours × ₹ 50 = ₹ 62,175

   Total wages to be paid to 50 workers are (₹ 4,80,000 + ₹ 62,175) ₹ 5,42,175, if Z Ltd. considers the introduction of Halsey Incentive Scheme to increase the worker productivity.

4. Bonus under Rowan Scheme to be paid to 50 workers:

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{hourly rate}$$

$$= \frac{9{,}600 \text{ hours}}{12{,}087 \text{ hours}} \times 2{,}487 \text{ hours} \times ₹\ 50 = ₹\ 98{,}764$$

Total wages to be paid to 50 workers are (₹ 4,80,000 + ₹ 98,764) ₹ 5,78,764, if Z Ltd. considers the introduction of Rowan Incentive Scheme to increase the worker productivity.

(i) (a) Effective hourly rate of earnings under Halsey scheme:

(Refer to Working Notes 1, 2 and 3)

$$= \frac{\text{Total time wages of 50 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$= \frac{₹\,4,80,000 + ₹\,62,175}{9,600 \text{ hours}} = \textbf{₹ 56.48}$$

Effective increase in earnings of worker (in %) $= \frac{₹\,56.48 - ₹\,50}{₹\,50} \times 100 =$ **2.96%**

(b) Effective hourly rate of earnings under Rowan scheme:

(Refer to Working Notes 1, 2 and 4)

$$= \frac{\text{Total time wages of 50 workers} + \text{Total bonus under Rowan scheme}}{\text{Total hours worked}}$$

$$= \frac{₹\,4,80,000 + ₹\,96,875}{9,600 \text{ hours}} = \textbf{₹ 60.29}$$

Effective increase in earnings of worker (in %)$= \frac{₹\,60.29 - ₹\,50}{₹\,50} \times 100 =$**20.58%**

(ii) (a) Saving in terms of direct labour cost per unit under Halsey scheme:

(Refer to Working Note 3)

Labour cost per unit (under time wage scheme)

= 1.975 hours × ₹ 50 = ₹ 98.75

Labour cost per unit (under Halsey scheme)

$$= \frac{\text{Total wages paid under the schem}}{\text{Total number of units produced}} = \frac{₹\,5,42,175}{6,120} = s₹\ 88.60$$

Saving per unit = ₹ 98.75 – ₹ 88.60 **= ₹ 10.15**

(b) Saving in terms of direct worker cost per unit under Rowan Scheme:

(Refer to Working Note 4)

Labour cost per unit under Rowan scheme = ₹ 5,78,764/6,120 units= ₹ 94.57

Saving per unit = ₹ 98.75 – ₹ 94.57 = **₹ 4.18**

(iii) Calculation of Productivity:

Normal Production Hours worked/Unit per Hour (9,600/1.975)	4,861
Actual Production Units	6,120
Increase in labour productivity	1,259
% Productivity i.e. increase in production/Normal production	**25.9%**

Advice: Rowan plan fulfils the company's assurance of 20% increase over the present earnings of workers. This would increase productivity by 25.9% only. It will not adjust with the increase in demand by 40%.

(b) Cost Sheet for the Month of April 2020

Particulars	**(₹)**
Opening stock of Raw Material	20,000
Add: Purchases [Refer Working Note-2]	1,65,000
Less: Closing stock of Raw Material	(25,000)
Raw material consumed	1,60,000
Add: Direct labour cost	1,20,000
Prime cost	**2,80,000**
Add: Factory overheads	1,00,000
Gross Works cost	**3,80,000**
Add: Opening work-in-progress	20,000
Less: Closing work-in-progress	(30,000)
Works Cost	**3,70,000**
Cost of Production	**3,70,000**
Add: Opening stock of finished goods	50,000
Less: Closing stock of finished goods	(60,000)
Cost of goods sold	**3,60,000**
Add: General and administration expenses*	18,000
Add: Selling expenses	22,000
Cost of sales	**4,00,000**
Profit {Balancing figure (₹ 5,00,000 – ₹ 4,00,000)}	1,00,000
Sales	5,00,000

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

Working Note:

1. Computation of the raw material consumed

Particulars	(₹)
Cost of Sales	4,00,000
Less: General and administration expenses	(18,000)
Less: Selling expenses	(22,000)
Cost of goods sold	3,60,000
Add: Closing stock of finished goods	60,000
Less: Opening stock of finished goods	(50,000)
Cost of production/Gross works cost	3,70,000
Add: Closing stock of work-in-progress	30,000
Less: Opening stock of work-in-progress	(20,000)
Works cost	3,80,000
Less: Factory overheads $\left(\frac{₹1,20,000}{120}\times 100\right)$	(1,00,000)
Prime cost	2,80,000
Less: Direct labour	(1,20,000)
Raw material consumed	1,60,000

2. Computation of the raw material purchased

Particulars	(₹)
Closing stock of Raw Material	25,000
Add: Raw Material consumed	1,60,000
Less: Opening stock of Raw Material	(20,000)
Raw Material purchased	1,65,000

Question 3

(a) Two manufacturing companies A and B are planning to merge. The details are as follows:

	A	*B*
Capacity utilisation (%)	*90*	*60*
Sales (₹)	*63,00,000*	*48,00,000*
Variable Cost (₹)	*39,60,000*	*22,50,000*
Fixed Cost (₹)	*13,00,000*	*15,00,000*

Assuming that the proposal is implemented, calculate:

(i) Break-Even sales of the merged plant and the capacity utilization at that stage.

(ii) Profitability of the merged plant at 80% capacity utilization.

(iii) Sales Turnover of the merged plant to earn a profit of ₹ 60,00,000.

(iv) When the merged plant is working at a capacity to earn a profit of ₹ 60,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads. ***(10 Marks)***

(b) XYZ Ltd. is engaged in the manufacturing of toys. It can produce 4,20,000 toys at its 70% capacity on per annum basis. Company is in the process of determining sales price for the financial year 2020-21. It has provided the following information:

Direct Material	*₹ 60 per unit*
Direct Labour	*₹ 30 per unit*
Indirect Overheads:	
Fixed	*₹ 65,50,000 per annum*
Variable	*₹ 15 per unit*
Semi-variable	*₹ 5,00,000 per annum up to 60% capacity and ₹ 50,000 for every 5% increase in capacity or part thereof up to 80% capacity and thereafter ₹ 75,000 for every 10% increase in capacity or part thereof.*

Company desires to earn a profit of ₹ 25,00,000 for the year. Company has planned that the factory will operate at 50% of capacity for first six months of the year and at 75% of capacity for further three months and for the balance three months, factory will operate at full capacity.

You are required to :

(1) Determine the average selling price at which each of the toy should be sold to earn the desired profit.

(2) Given the above scenario, advise whether company should accept an offer to sell each Toy at:

(a) ₹ 130 per Toy

(b) ₹ 129 per Toy ***(10 Marks)***

Answer

(a) Workings:

1. Statement showing computation of Breakeven of merged plant and other required information

S. No.	Particulars	Plan A		Plant B		Merged Plant (100%) (₹)
		Before (90%) (₹)	After (100%) (₹)	Before (60%) (₹)	After (100%) (₹)	
(i)	Sales	63,00,000	70,00,000	48,00,000	80,00,000	1,50,00,000
(ii)	Variable cost	39,60,000	44,00,000	22,50,000	37,50,000	81,50,000
(iii)	Contribution (i - ii)	23,40,000	26,00,000	25,50,000	42,50,000	68,50,000
(iv)	Fixed Cost	13,00,000	13,00,000	15,00,000	15,00,000	28,00,000
(v)	Profit (iii - iv)	10,40,000	13,00,000	10,50,000	27,50,000	40,50,000

2. PV ratio of merged plant $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= \frac{₹\ 68,50,000}{₹\ 1,50,00,000} \times 100 = 45.67\ \%$

(i) Break even sales of merged plant $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$= \frac{₹\ 28,00,000}{45.67\%}$

$= ₹\ 61,30,939.34$ (approx.)

Capacity utilisation $= \frac{₹\ 61,30,939.34}{₹\ 1,50,00,000} \times 100 = 40.88\%$

(ii) Profitability of the merged plant at 80% capacity utilisation

= (₹ 1,50,00,000 x 80%) x P/v ratio – fixed cost

= ₹ 1,20,00,000 x 45.67% – ₹ 28,00,000

= ₹ 26,80,400

(iii) Sales to earn a profit of ₹ 60,00,000

Desired sales $= \frac{\text{Fixed Cost + desired profit}}{\text{P/V Ratio}}$

$= \frac{₹\ 28,00,000 + ₹\ 60,00,000}{45.67\%}$

= ₹ 1,92,68,666 (approx.)

(iv) Increase in fixed cost

= ₹ 28,00,000 x 5% = ₹ 1,40,000

Therefore, percentage increase in sales price

$= \frac{₹\,1,40,000}{₹\,1,92,68,666} \times 100 = 0.726\%$ (approx.)

(b) (1) Statement of Cost

	For first 6 months	For further 3 months	For remaining 3 months	Total
	6,00,000 x 6/12 x 50% = 1,50,000 units	**6,00,000 x 3/12 x 75% = 1,12,500 units**	**6,00,000 x 3/12 = 1,50,000 units**	**4,12,500 units**
Direct Material	90,00,000	67,50,000	90,00,000	2,47,50,000
Direct labour	45,00,000	33,75,000	45,00,000	1,23,75,000
Indirect – Variable Expenses	22,50,000	16,87,500	22,50,000	61,87,500
Indirect – Fixed Expenses	32,75,000	16,37,500	16,37,500	65,50,000
Indirect Semi-variable expenses				
- For first six months @ 5,00,000 per annum	2,50,000			
- For further three months @ 6,50,000* per annum		1,62,500		
- For further three months @ 8,50,000** per annum			2,12,500	6,25,000
Total Cost	1,92,75,000	1,36,12,500	1,76,00,000	5,04,87,500
Desired Profit				25,00,000
Sales value				5,29,87,500
Average Sales price per Toy				**128.45**

* ₹ 5,00,000+ [3 times (from 60% to 75%) x 50,000] = ₹ 6,50,000

** ₹ 6,50,000+ [1 time (from 75% to 80%) x 50,000] + [2 times (from 80% to 100%) × 75,000] = ₹ 8,50,000

(2) (a) Company Should accept the offer as it is above its targeted sales price of ₹ 128.45 per toy.

(b) Company Should accept the offer as it is above its targeted sales price of ₹ 128.45 per toy.

Question 4

(a) Mayura Chemicals Ltd buys a particular raw material at ₹ 8 per litre. At the end of the processing in Department- I, this raw material splits-off into products X, Y and Z. Product X is sold at the split-off point, with no further processing. Products Y and Z require further processing before they can be sold. Product Y is processed in Department-2, and Product Z is processed in Department-3. Following is a summary of the costs and other related data for the year 2019-20:

Particulars	***Department***		
	1	***2***	***3***
Cost of Raw Material	*₹ 4,80,000*	*-*	*-*
Direct Labour	*₹ 70,000*	*₹ 4,50,000*	*₹ 6,50,000*
Manufacturing Overhead	*₹ 48,000*	*₹ 2,10,000*	*₹ 4,50,000*
	Products		
	X	***Y***	***Z***
Sales (litres)	*10,000*	*15,000*	*22,500*
Closing inventory (litres)	*5,000*	*-*	*7,500*
Sale price per litre (₹)	*30*	*64*	*50*

There were no opening and closing inventories of basic raw materials at the beginning as well as at the end of the year. All finished goods inventory in litres was complete as to processing. The company uses the Net-realisable value method of allocating joint costs.

You are required to prepare:

(i) Schedule showing the allocation of joint costs.

(ii) Calculate the Cost of goods sold of each product and the cost of each item in Inventory.

(iii) A comparative statement of Gross profit. ***(10 Marks)***

(b) ABC Ltd. manufactures three products X, Y and Z using the same plant and resources. It has given the following information for the year ended on 31st March, 2020:

	X	*Y*	*Z*
Production Quantity (units)	*1200*	*1440*	*1968*
Cost per unit:			

Direct Material (₹)	*90*	*84*	*176*
Direct Labour (₹)	*18*	*20*	*30*

Budgeted direct labour rate was ₹ 4 per hour and the production overheads, shown in table below, were absorbed to products using direct labour hour rate. Company followed Absorption Costing Method. However, the company is now considering adopting Activity Based Costing Method.

	Budgeted Overheads (₹)	***Cost Driver***	***Remarks***
Material Procurement	*50,000*	*No. of orders*	*No. of orders was 25 units for each product.*
Set-up	*40,000*	*No. of production Runs*	*All the three products are produced in production runs of 48 units.*
Quality Control	*28,240*	*No. of Inspections*	*Done for each production run.*
Maintenance	*1,28,000*	*Maintenance hours*	*Total maintenance hours were 6,400 and was allocated in the ratio of 1:1:2 between X, Y & Z.*

Required:

1. *Calculate the total cost per unit of each product using the Absorption Costing Method.*
2. *Calculate the total cost per unit of each product using the Activity Based Costing Method.* ***(10 Marks)***

Answer

(a) (i) Statement of Joint Cost allocation of inventories of X, Y and Z

	Products			**Total (₹)**
	X (₹)	**Y (₹)**	**Z (₹)**	
Final sales value of total production (Working Note 1)	4,50,000 (15,000 x ₹ 30)	9,60,000 (15,000 x ₹ 64)	15,00,000 (30,000 x ₹ 50)	29,10,000
Less: Additional cost	--	6,60,000	11,00,000	17,60,000

Net realisable value (at split-off point)	4,50,000	3,00,000	4,00,000	11,50,000
Joint cost allocated (Working Note 2)	2,34,000	1,56,000	2,08,000	5,98,000

(ii) Calculation of Cost of goods sold and Closing inventory

	Products			Total
	X (₹)	Y (₹)	Z (₹)	(₹)
Allocated joint cost	2,34,000	1,56,000	2,08,000	5,98,000
Add: Additional costs	--	6,60,000	11,00,000	17,60,000
Cost of goods sold (COGS)	2,34,000	8,16,000	13,08,000	23,58,000
Less: Cost of closing inventory (Working Note 1)	78,000 (COGS × 100/3%)	--	3,27,000 (COGS × 25%)	4,05,000
Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000

(iii) Comparative Statement of Gross Profit

	Products			Total
	X (₹)	Y (₹)	Z (₹)	(₹)
Sales revenue	3,00,000 (10,000 x ₹ 30)	9,60,000 (15,000 x ₹ 64)	11,25,000 (22,500 x ₹ 50)	23,85,000
Less: Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000
Gross Profit	**1,44,000**	**1,44,000**	**1,44,000**	4,32,000

Working Notes:

1. Total production of three products for the year 2019-2020

Products	Quantity sold in litres	Quantity of closing inventory in litres	Total production	Closing inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)}	(5) = (3)/ (4)
X	10,000	5,000	15,000	100/3
Y	15,000	--	15,000	--
Z	22,500	7,500	30,000	25

2. Joint cost apportioned to each product:

$$= \frac{\text{Total Joint cost}}{\text{Total Net Realisable Value}} \times \text{Net Realisable Value of each product}$$

$$\text{Joint cost of product X} = \frac{₹\ 5,98,000}{₹\ 11,50,000} \times ₹\ 4,50,000 = ₹\ 2,34,000$$

$$\text{Joint cost of product Y} = \frac{₹\ 5,98,000}{₹\ 11,50,000} \times ₹\ 3,00,000 = ₹\ 1,56,000$$

$$\text{Joint cost of product Z} = \frac{₹\ 5,98,000}{₹\ 11,50,000} \times ₹\ 4,00,000 = ₹\ 2,08,000$$

(b) 1. Traditional Absorption Costing

	X	Y	Z	Total
(a) Quantity (units)	1,200	1,440	1,968	4608
(b) Direct labour per unit (₹)	18	20	30	-
(c) Direct labour hours (a × b)/₹ 4	5,400	7,200	14,760	27,360

Overhead rate per direct labour hour:

= Budgeted overheads ÷Budgeted labour hours

= (₹ 50,000 + ₹ 40,000 + ₹ 28,240 + ₹ 1,28,000) ÷ 27,360 hours

= ₹ 2,46,240 ÷ 27,360 hours

= ₹ 9 per direct labour hour

Unit Costs:

	X	Y	Z
Direct Costs:			
- Direct Labour (₹)	18.00	20.00	30.00
- Direct Material (₹)	90.00	84.00	176.00
Production Overhead: (₹)	40.50 $\left(\frac{9 \times 18}{4}\right)$	45.00 $\left(\frac{9 \times 20}{4}\right)$	67.50 $\left(\frac{9 \times 30}{4}\right)$
Total cost per unit (₹)	**148.50**	**149.00**	**273.50**

2. Calculation of Cost-Driver level under Activity Based Costing

	X	Y	Z	Total
Quantity (units)	1,200	1,440	1,968	-
No. of orders (to be rounded off for fraction)	48 (1200 / 25)	58 (1440 / 25)	79 (1968 / 25)	185
No. of production runs	25 (1200 / 48)	30 (1440 / 48)	41 (1968 / 48)	96
No. of Inspections (done for each production run)	25	30	41	96
Maintenance hours	1,600	1,600	3,200	6400

Calculation of Cost-Driver rate

Activity	Budgeted Cost (₹) (a)	Cost-driver level (b)	Cost Driver rate (₹) (c) = (a) / (b)
Material procurement	50,000	185	270.27
Set-up	40,000	96	416.67
Quality control	28,240	96	294.17
Maintenance	1,28,000	6,400	20.00

Calculation of total cost of products using Activity Based Costing

Particulars	Product		
	X (₹)	Y (₹)	Z (₹)
Direct Labour	18.00	20.00	30.00
Direct Material	90.00	84.00	176.00
Prime Cost per unit (A)	108.00	104.00	206.00
Material procurement	10.81 [(48 x 270.27)/1200]	10.89 [(58 x 270.27)/1440]	10.85 [(79 x 270.27)/1968]
Set-up	8.68 [(25 x 416.67)/1200]	8.68 [(30 x 416.67)/ 1440]	8.68 [(41 x 416.67)/ 1968]
Quality control	6.13 [(25 x 294.17)/1200]	6.13 [(30 x 294.17)/ 1440]	6.13 [(41 x 294.17)/ 1968]
Maintenance	26.67 [(1,600 x 20)/1200]	22.22 [(1,600 x 20)/ 1440]	32.52 [(3,200 x 20)/ 1968]

Overhead Cost per unit (B)	52.29	47.92	58.18
Total Cost per unit (A + B)	**160.29**	**151.92**	**264.18**

Note: Question may also be solved assuming no. of orders for material procurement to be 25 for each product.

Question 5

(a) ABC Health care runs an Intensive Medical Care Unit. For this purpose, it has hired a building at a rent of ₹ 50,000 per month with the agreement to bear the repairs and maintenance charges also.

The unit consists of 100 beds and 5 more beds can comfortably be accommodated when the situation demands. Though the unit is open for patients all the 365 days in a year, scrutiny of accounts for the year 2020 reveals that only for 120 days in the year, the unit had the full capacity of 100 patients per day and for another 80 days, it had, on an average only 40 beds occupied per day. But, there were occasions when the beds were full, extra beds were hired at a charge of ₹ 50 per bed per day. This did not come to more than 5 beds above the normal capacity on any one day. The total hire charges for the extra beds incurred for the whole year amounted to ₹ 20,000.

The unit engaged expert doctors from outside to attend on the patients and the fees were paid on the basis of the number of patients attended and time spent by them which on an average worked out to ₹ 30,000 per month in the year 2020.

The permanent staff expenses and other expenses of the unit were as follows:

	₹
2 Supervisors each at a per month salary of	*5,000*
4 Nurses each at a per month salary of	*3,000*
2 Ward boys each at a per month salary of	*1,500*
Other Expenses for the year were as under:	
Repairs and Maintenance	*28,000*
Food supplied to patients	*4,40,000*
Caretaker and Other services for patients	*1,25,000*
Laundry charges for bed linen	*1,40,000*
Medicines supplied	*2,80,000*
Cost of Oxygen etc. other than directly borne for treatment of patients	*75,000*
General Administration Charges allocated to the unit	*71,000*

Required:

(i) What is the profit per patient day made by the unit in the year 2020, if the unit recovered an overall amount of ₹ 200 per day on an average from each patient.

(ii) The unit wants to work on a budget for the year 2021, but the number of patients requiring medical care is a very uncertain factor. Assuming that same revenue and expenses prevail in the year 2021 in the first instance, work out the number of patient days required by the unit to break even. ***(10 Marks)***

(b) Premier Industries has a small factory where 52 workers are employed on an average for 25 days a month and they work 8 hours per day. The normal down time is 15%. The firm has introduced standard costing for cost control. Its monthly budget for November, 2020 shows that the budgeted variable and fixed overhead are ₹ 1,06,080 and ₹ 2,21,000 respectively.

The firm reports the following details of actual performance for November, 2020, after the end of the month:

Actual hours worked	*8,100 hrs.*
Actual production expressed in standard hours	*8,800 hrs.*
Actual Variable Overheads	₹ 1,02,000
Actual Fixed Overheads	₹ 2,00,000

You are required to calculate:

(i) Variable Overhead Variances:

(a) Variable overhead expenditure variance.

(b) Variable overhead efficiency variance.

(ii) Fixed Overhead Variances:

(a) Fixed overhead budget variance.

(b) Fixed overhead capacity variance.

(c) Fixed overhead efficiency variance.

(iii) Control Ratios:

(a) Capacity ratio.

(b) Efficiency ratio.

(c) Activity ratio. ***(10 Marks)***

Answer

(a) Workings:

Calculation of number of Patient days

100 Beds × 120 days	=	12000
40 Beds × 80 days	=	3,200
Extra beds	=	400
Total	=	15,600

(i) Statement of Profitability

Particulars	Amount (₹)	Amount (₹)
Income for the year (₹ 200 per patient per day × 15,600 patient days)		31,20,000
Variable Costs:		
Doctor Fees (₹ 30,000 per month × 12)	3,60,000	
Food to Patients (Variable)	4,40,000	
Caretaker Other services to patients (Variable)	1,25,000	
Laundry charges (Variable)	1,40,000	
Medicines (Variable)	2,80,000	
Bed Hire Charges (₹ 50 × 400 Beds)	20,000	
Total Variable costs		(13,65,000)
Contribution		17,55,000
Fixed Costs:		
Rent (₹ 50,000 per month × 12)	6,00,000	
Supervisor (2 persons × ₹ 5,000 × 12)	1,20,000	
Nurses (4 persons × ₹ 3,000 × 12)	1,44,000	
Ward Boys (2 persons x ₹ 1500 x12)	36,000	
Repairs (Fixed)	28,000	
Cost of Oxygen	75,000	
Administration expenses allocated	71,000	
Total Fixed Costs		(10,74,000)
Profit		**6,81,000**

Calculation of Contribution and profit per Patient day

Total Contribution	= ₹ 17,55,000
Total Patient days	= 15,600 days
Contribution per Patient day	= ₹ 17,55,000 / 15,600 days = ₹ 112.50
Total Profit	= ₹ 6,81,000
Total Patient days	= 15,600 days
Profit per Patient day	= ₹ 6,81,000 / 15,600 days = ₹ 43.65

(ii) Breakeven Point = Fixed Cost / Contribution per Patient day

= ₹ 10,74,000 / ₹ 112.50

= 9,547 patient days

(b) Workings:

Calculation of budgeted hours

Budgeted hours = (52 x 25 x 8) x 85% = 8,840 hours

(i) Variable overheads variance

(a) Variable overhead expenditure variance

= Std. overhead for Actual hours – Actual variable Overhead

$$= \left(\frac{₹\,1,06,080}{8,840} \times 8,100\right) - ₹\,1,02,000$$

= **4800 A**

(b) Variable overhead efficiency variance

Std. rate per hour × (Std. hours for actual production – Actual hours)

$$= \frac{₹\,1,06,080}{8,840} \text{ (8,800 hours – 8,100 hours)}$$

= 8400 F

(ii) Fixed overhead variances

(a) Fixed overhead budget variance

= Budgeted overhead – Actual overhead

= ₹ 2,21,000 – ₹ 2,00,000

= 21,000 F

(b) Fixed overhead capacity variance

= Std rate x (Actual hours – budgeted hours)

$= \frac{₹\ 2,21,000}{8,840}$ x (8,100 – 8,840)

= 18,500 A

(c) Fixed overhead efficiency variance

= Std rate x (Std hours for actual production – Actual hours)

$= \frac{₹\ 2,21,000}{8,840}$ x (8,800 – 8,100)

= **17,500 F**

(iii) Control Ratios

(a) Capacity Ratio

$= \frac{\text{Actual hours}}{\text{Budgeted hours}} \times 100$

$= \frac{8,100}{8,840} \times 100$ **= 91.63%**

(b) Efficiency Ratio

$= \frac{\text{Standard hours}}{\text{Actual hours}} \times 100$

$= \frac{8,800}{8,100} \times 100$ = **108.64 %**

(c) Activity Ratio

$= \frac{\text{Standard hours}}{\text{Budgted hours}} \times 100$

$= \frac{8,800}{8,840} \times 100$ **= 99.55%**

Question 6

Answer any four of the following:

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

(i) Detention Charges/Fines

(ii) Demurrage

(iii) Cost of Returnable containers

(iv) Central Goods and Service Tax (CGST)

(v) Shortage due to abnormal reasons.

(b) State the limitations of Budgetary Control System.

(c) Explain Blanket Overhead Rate and Departmental Overhead Rate. How they are calculated? State the conditions required for the application of Blanket Overhead Rate.

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

(i) Oil Refinery

(ii) Interior Decoration

(iii) Airlines Company

(iv) Advertising

(v) Car Assembly

(e) Give any five examples of the impact of use of Information Technology in Cost Accounting. ***(4 x 5 = 20 Marks)***

Answer

(a) Treatment of items in arriving at the value of cost of material Purchased

S. No.	Items	Treatment
(i)	**Detention charges/ Fine**	Detention charges/ fines imposed for non-compliance of rule or law by any statutory authority. It is an abnormal cost and **not included** with cost of purchase.
(ii)	**Demurrage**	Demurrage is a penalty imposed by the transporter for delay in uploading or offloading of materials. It is an abnormal cost and **not included** with cost of purchase.
(iii)	**Cost of returnable containers**	Treatment of cost of returnable containers are as follows: Returnable Containers: If the containers are returned and their costs are refunded, then cost of containers should not be considered in the cost of purchase. If the amount of refund on returning the container is less than the amount paid, then, only the short fall is added with the cost of purchase.

(iv)	**Central Goods and Service Tax (CGST)**	Central Goods and Service Tax (CGST) is paid on manufacture and supply of goods and collected from the buyer. It **is excluded** from the cost of purchase if the input credit is available for the same. Unless mentioned specifically CGST is not added with the cost of purchase.
(v)	**Shortage due to abnormal reasons**	Shortage arises due to abnormal reasons such as material mishandling, pilferage, or due to any avoidable reasons are not absorbed by the good units. Losses due to abnormal reasons are debited to costing profit and loss account.

(b) Limitations of Budgetary Control System

Points	Description
1. Based on Estimates	Budgets are based on a series of estimates, which are based on the conditions prevalent or expected at the time budget is established. It requires revision in plan if conditions change.
2. Time factor	Budgets cannot be executed automatically. Some preliminary steps are required to be accomplished before budgets are implemented. It requires proper attention and time of management. Management must not expect too much during the initial development period.
3. Co-operation Required	Staff co-operation is usually not available during the initial budgetary control exercise. In a decentralised organisation, each unit has its own objective and these units enjoy some degree of discretion. In this type of organisation structure, coordination among different units is required. The success of the budgetary control depends upon willing co-operation and teamwork,
4. Expensive	The implementation of budget is somewhat expensive. For successful implementation of the budgetary control, proper organisation structure with responsibility is prerequisite. Budgeting process start from the collection of information to for preparing the budget and performance analysis. It consumes valuable resources (in terms of qualified manpower, equipment, etc.) for this purpose; hence, it is an expensive process.

5. Not a substitute for management	Budget is only a managerial tool and must be intelligently applied for management to get benefited. Budgets are not a substitute for good management.
6. Rigid document	Budgets are sometime considered as rigid documents. But in reality, an organisation is exposed to various uncertain internal and external factors. Budget should be flexible enough to incorporate ongoing developments in the internal and external factors affecting the very purpose of the budget.

(c) Blanket Overhead Rate: Blanket overhead rate refers to the computation of one single overhead rate for the whole factory.

This overhead rate is computed as follows:

$$\text{Blanket Rate} = \frac{\text{Total overheads for the factory}}{\text{Total number of units of base for the factory}}$$

Departmental Overhead Rate: It refers to the computation of one single overhead rate for a particular production unit or department.

This overhead rate is determined by the following formula:

$$\text{Departmental overhead Rate} = \frac{\text{Overheads of department or cost centre}}{\text{Corresponding base}}$$

Conditions required for the Application of Blanket Overhead:

A blanket rate should be applied in the following cases:

(1) Where only one major product is being produced.

(2) Where several products are produced, but

(a) All products pass through all departments; and

(b) All products are processed for the same length of time in each department.

(d) Method of Costing

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

(e) Example of Impact of Information Technology in cost accounting may include the following:

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

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

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

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

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

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

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

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer

Question 1

Answer the following:

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

Item Code Number	*Units*	*Unit Cost (₹)*
101	*25*	*50*
102	*300*	*01*
103	*50*	*80*
104	*75*	*08*
105	*225*	*02*
106	*75*	*12*

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

You are required to:

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

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

(b) SNS Trading Company has three Main Departments and two Service Departments. The data for each department is given below:

Departments / *Main Department:*	*Expenses (in ₹)*	*Area in (Sq. Mtr)*	*Number of Employees*
Purchase Department	*5,00,000*	*12*	*800*
Packing Department	*8,00,000*	*15*	*1700*
Distribution Department	*3,50,000*	*7*	*700*

Service Departments:			
Maintenance Department	*6,40,000*	*4*	*200*
Personnel Department	*3,20,000*	*6*	*250*

The cost of Maintenance Department and Personnel Department is distributed on the basis of 'Area in Square Metres' and 'Number of Employees' respectively.

You are required to:

(i) Prepare a Statement showing the distribution of expenses of Service Departments to the Main Departments using the "Step Ladder method" of Overhead Distribution.

(ii) Compute the Rate per hour of each Main Department, given that, the Purchase Department, Packing Department and Distribution Department works for 12 hours a day, 24 hours a day and 8 hours a day respectively. Assume that there are 365 days in a year and there are no holidays.

(c) AUX Ltd. has an Annual demand from a single customer for 60,000 Covid-19 vaccines. The customer prefers to order in the lot of 15,000 vaccines per order. The production cost of vaccine is ₹5,000 per vaccine. The set-up cost per production run of Covid-19 vaccines is ₹4,800. The carrying cost is ₹12 per vaccine per month.

You are required to:

(i) Find the most Economical Production Run.

(ii) Calculate the extra cost that company incurs due to production of 15,000 vaccines in a batch.

(d) LR Ltd. is considering two alternative methods to manufacture a new product it intends to market. The two methods have a maximum output of 50,000 units each and produce identical items with a selling price of ₹25 each. The costs are:

	Method-1 Semi-Automatic (₹)	*Method-2 Fully-Automatic (₹)*
Variable cost per unit	*15*	*10*
Fixed costs	*1,00,000*	*3,00,000*

You are required to calculate:

(1) Cost Indifference Point in units. Interpret your results.

(2) The Break-even Point of each method in terms of units. ***(4 x 5 = 20 Marks)***

Answer

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

Item code no.	Units	% of Total units	Unit cost (₹)	Total Inventory cost (₹)	% of Total Inventory cost	Ranking
101	25	3.33	50	1,250	16.67	**2**
102	300	40.00	1	300	4.00	**6**
103	50	6.67	80	4,000	53.33	**1**
104	75	10.00	8	600	8.00	**4**
105	225	30.00	2	450	6.00	**5**
106	75	10.00	12	900	12.00	**3**
	750	100	153	7,500	100	

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

Basis for ABC Classification as % of Total Inventory Cost

15% & above	--	'A' items
7% to 14%	--	'B' items
6% & Less	--	'C' items

Ranking	Item code No.	% of Total units	Total Inventory cost (₹)	% of Total Inventory Cost	Category
1	103	6.67	4,000	53.33	
2	101	3.33	1,250	16.67	
Total	2	10.00	5,250	70.00	A
3	106	10.00	900	12.00	
4	104	10.00	600	8.00	
Total	2	20.00	1,500	20.00	B
5	105	30.00	450	6.00	
6	102	40.00	300	4.00	
Total	2	70.00	750	10.00	C
Grand Total	6	100	7,500	100	

(b) (i) Schedule Showing the Distribution of Expenses of Service Departments using Step ladder method.

	Main Department			Service Department	
	Purchase (₹)	Packing (₹)	Distribution (₹)	Maintenance (₹)	Personnel (₹)
Expenses	5,00,000	8,00,000	3,50,000	6,40,000	3,20,000
Distribution of Maintenance Department (12:15:7:-:6)	1,92,000	2,40,000	1,12,000	(6,40,000)	96,000
Distribution of Personnel Department (800:1700:700:-:-)	1,04,000	2,21,000	91,000	-	(4,16,000)
Total	7,96,000	12,61,000	5,53,000	**-**	**-**

(ii) Calculation of Expenses rate per hour of Main Department

	Purchase	Packing	Distribution
Total apportioned expenses (₹)	7,96,000	12,61,000	5,53,000
Total Hours worked	4,380 (12 x 365)	8,760 (24 x 365)	2,920 (8 x 365)
Expenses rate per hour (₹)	**181.74**	**143.95**	**189.38**

(c) (i) Calculation of most Economical Production Run

$$= \sqrt{\frac{2 \times 60,000 \times ₹\ 4,800}{12 \times 12}} = 2,000 \text{ Vaccine}$$

(ii) Calculation of Extra Cost due to processing of 15,000 vaccines in a batch

	When run size is 2,000 vaccines	When run size is 15,000 vaccines
Total set up cost	$= \frac{60,000}{2,000} \times ₹\ 4,800$ = ₹ 1,44,000	$= \frac{60,000}{15,000} \times ₹\ 4,800$ = ₹ 19,200
Total Carrying cost	½ × 2,000 × ₹ 144 = ₹ 1,44,000	½ × 15,000 × ₹ 144 = ₹ 10,80,000
Total Cost	₹ 2,88,000	₹ 10,99,200

Thus, extra cost = ₹ 10,99,200 – ₹ 2,88,000 = ₹ **8,11,200**

(d) (i) Cost Indifference Point

	Method-1 and Method-2 (₹)
Differential Fixed Cost (I)	₹ 2,00,000 (₹ 3,00,000 – ₹ 1,00,000)
Differential Variable Costs (II)	₹ 5 (₹ 15 – ₹ 10)
Cost Indifference Point (I/II) (Differential Fixed Cost / Differential Variable Costs *per unit*)	**40,000**

Interpretation of Results

At activity level below the indifference points, the alternative **with lower fixed costs and higher variable costs should be used.** At activity level above the indifference point, alternative with **higher fixed costs and lower variable costs should be used.**

No. of Product	Alternative to be Chosen
Product ≤ 40,000 units	Method-1, Semi-Automatic
Product ≥ 40,000 units	Method-2, Automatic

(ii) Break Even point (in units)

	Method-1	Method-2
BEP (in units) = $\frac{\text{Fixed cost}}{\text{Contribution per unit}}$	$\frac{1,00,000}{(25-15)}$ = 10,000	$\frac{3,00,000}{(25-10)}$ = 20,000

Question 2

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

Particulars	*Amount (in ₹)*
Stock of Raw material as on 01-03-2021	*80,000*
Work in Progress as on 01-03-2021	*50,000*
Purchase of Raw material	*2,00,000*
Carriage Inwards	*20,000*
Direct Wages	*1,20,000*
Cost of special drawing	*30,000*

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

- *Store overheads on materials are 10% of material consumed.*
- *Factory overheads are 20% of the Prime cost.*
- *10% of the output was rejected and a sum of ₹5,000 was realized on sale of scrap.*
- *10% of the finished product was found to be defective and the defective products were rectified at an additional expenditure which is equivalent to 20% of proportionate direct wages.*
- *The total output was 8000 units during the month.*

You are required to prepare a Cost Sheet for the above period showing the:

(i) Cost of Raw Material consumed.

(ii) Prime Cost

(iii) Work Cost

(iv) Cost of Production

(v) Cost of Sales ***(10 Marks)***

(b) OPR Ltd. purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the spilt-off point - S, P, N and A. Product 'A' is fully processed at the split-off point. Product S, P and N can be individually further refined into SK, PM, and NL respectively. The joint cost of purchasing the crude vegetable oil and processing it were ₹40,000. Other details are as follows:

Product	*Further processing costs (₹)*	*Sales at split-off point (₹)*	*Sales after further processing (₹)*
S	*80,000*	*20,000*	*1,20,000*

P	*32,000*	*12,000*	*40,000*
N	*36,000*	*28,000*	*48,000*
A	*-*	*20,000*	*-*

You are required to identify the products which can be further processed for maximizing profits and make suitable suggestions. ***(5 Marks)***

(c) Following information is given of a newly setup organization for the year ended on 31st March, 2021.

Number of workers replaced during the period	*50*
Number of workers left and discharged during the period	*25*
Average number of workers on the roll during the period	*500*

You are required to:

(i) Compute the Employee Turnover Rates using Separation Method and Flux Method.

(ii) Equivalent Employee Turnover Rates for (i) above, given that the organization was setup on 31st January, 2021. ***(5 Marks)***

Answer

(a) Statement of Cost for the month of March, 2021

Particulars		Amount (₹)	Amount (₹)
(i)	**Cost of Material Consumed:**		
	Raw materials purchased (₹ 2,00,000 – ₹ 40,000)	1,60,000	
	Carriage inwards	20,000	
	Add: Opening stock of raw materials	80,000	
	Less: Closing stock of raw materials	(30,000)	**2,30,000**
	Direct Wages		1,20,000
	Direct expenses:		
	Cost of special drawing	30,000	
	Hire charges paid for Plant	24,000	54,000
(ii)	**Prime Cost**		**4,04,000**
	Carriage on return	6,000	
	Store overheads (10% of material consumed)	23,000	
	Factory overheads (20% of Prime cost)	80,800	

	Additional expenditure for rectification of defective products (refer working note)	2,160	1,11,960
	Gross factory cost		5,15,960
	Add: Opening value of W-I-P		50,000
	Less: Closing value of W-I-P		(24,000)
(iii)	**Works/ Factory Cost**		**5,41,960**
	Less: Realisable value on sale of scrap		(5,000)
(iv)	**Cost of Production**		**5,36,960**
	Add: Opening stock of finished goods		-
	Less: Closing stock of finished goods		-
	Cost of Goods Sold		**5,36,960**
	Administrative overheads:		
	Maintenance of office building	2,000	
	Salary paid to Office staff	25,000	
	Legal Charges	2,500	29,500
	Selling overheads:		
	Expenses for participation in Industrial exhibition	8,000	8,000
	Distribution overheads:		
	Depreciation on delivery van	6,000	
	Warehousing charges	1,500	7,500
(v)	**Cost of Sales**		**5,81,960**

Alternative Solution
(considering Hire charges paid for Plant as indirect expenses)

Statement of Cost for the month of March, 2021

Particulars	**Amount (₹)**	**Amount (₹)**
Cost of Material Consumed:		
Raw materials purchased (₹ 2,00,000 – ₹ 40,000)	1,60,000	
Carriage inwards	20,000	
Add: Opening stock of raw materials	80,000	
Less: Closing stock of raw materials	(30,000)	**2,30,000**
Direct Wages		1,20,000

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

Working Notes:

1. Number of Rectified units

Total Output 8,000 units

Less: Rejected 10%	800 units
Finished product	7,200 units
Rectified units (10% of finished product)	**720 units**

2. Proportionate additional expenditure on 720 units

= 20% of proportionate direct wages

= 0.20 x (₹ 1,20,000/8,000) x 720

= ₹ 2,160

(b) Statement of Comparison of Profits before and after further processing

		S (₹)	P (₹)	N (₹)	A (₹)	Total (₹)
A.	Sales at split off point	20,000	12,000	28,000	20,000	80,000
B.	Apportioned Joint Costs (Refer Working Note)	**10,000**	**6,000**	**14,000**	**10,000**	40,000
C.	**Profit at split-off point**	10,000	6,000	14,000	10,000	40,000
D.	Sales after further processing	1,20,000	40,000	48,000	-	2,08,000
E.	Further processing cost	80,000	32,000	36,000	-	1,48,000
F.	Apportioned Joint Costs (Refer Working Note)	10,000	6,000	14,000	-	-
G.	**Profit if further processing (D – E + F)**	**30000**	**2,000**	**(-) 2,000**	-	-
H.	Increase/ decrease in profit after further processing (G-C)	20,000	- 4000	- 16,000	-	-

Suggested Product to be further processed for maximising profits:

On comparing the figures of "Profit if no further processing" and "Profits if further processing", one observes that OPR Ltd. is earning more after further processing of Product S only i.e. ₹ 20,000. Hence, for maximizing profits, only Product S should be further processed and Product P, N and A should be sold at split-off point.

Working Note:

Apportionment of joint costs on the basis of Sales Value at split-off point

$$\text{Apportioned joint cost} = \frac{\text{Total joint cost}}{\text{Total Sales value at split-off point}} \times \text{Sales value of each product}$$

Where,

Total Joint cost = ₹ 40,000

Total sales at split off point (S, P, N and A) = 20,000 + 12,000 + 28,000 + 20,000 = ₹ 80,000

Share of S in joint cost = $\frac{₹\,40,000}{₹\,80,000}$ x ₹ 20,000 = ₹ 10,000

Share of P in joint cost = $\frac{₹\,40,000}{₹\,80,000}$ x ₹ 12,000 = ₹ 6,000

Share of N in joint cost = $\frac{₹\,40,000}{₹\,80,000}$ x ₹ 28,000 = ₹ 14,000

Share of A in joint cost = $\frac{₹\,40,000}{₹\,80,000}$ x ₹ 20,000 = ₹ 10,000

Alternative Solution

Decision for further processing of Product S, P and N

Products	S (₹)	P (₹)	N (₹)
Sales revenue after further processing	1,20,000	40,000	48,000
Less: sales value at split-off point	20,000	12,000	28,000
Incremental Sales Revenue	**1,00,000**	**28,000**	**20,000**
Less: Further Processing cost	80,000	32,000	36,000
Profit/ loss arising due to further processing	**20,000**	**(-)4,000**	**(-)16,000**

Suggested Product to be further processed for maximising profits:

On comparing the figures of "Profit if no further processing" and "Profits if further processing", one observes that OPR Ltd. is earning more after further processing of Product S only i.e. ₹ 20,000. Hence, for maximizing profits, only Product S should be further processed and Product P, N and A should be sold at split-off point.

(c) (i) Employee Turnover rate

Using Separation method:

$$= \frac{\text{Number of employees Separated during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{25}{500} \times 100 = \mathbf{5\%}$$

Using Flux method:

$$= \frac{\text{Number of employees Separated} + \text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{50+25}{500} \times 100 = \mathbf{15\%}$$

(ii) Equivalent Employee Turnover rate:

$$= \frac{\text{Employee Turnover rate for the period}}{\text{Number of days in the period}} \times 365$$

Using Separation method $= \frac{5}{60} \times 365$ = 30.42%

Or, $= \frac{5}{60} \times 360$ = 30%

Or, $= \frac{5}{2} \times 12$ = 30%

Using Flux method $= \frac{15}{60} \times 365$ = 91.25%

Or, $= \frac{15}{60} \times 360$ = 90%

Or, $= \frac{15}{2} \times 12$ = 90%

Question 3

(a) The Profit and Loss account of ABC Ltd. for the year ended 31st March, 2021 is given below:

Profit and Loss account

(for the year ended 31st March, 2021)

To Direct Material	*6,50,000*	*By Sales (15000 units)*	*15,00,000*
To Direct Wages	*3,50,000*	*By Dividend received*	*9,000*
To Factory overheads	*2,60,000*		
To Administrative overheads	*1,05,000*		
To Selling overheads	*85,000*		
To Loss on sale of investments	*2,000*		
To Net Profit	*57,000*		
	15,09,000		*15,09,000*

- *Factory overheads are 50% fixed and 50% variable.*
- *Administrative overheads are 100% fixed.*
- *Selling overheads are completely variable.*
- *Normal production capacity of ABC Ltd. is 20,000 units.*
- *Indirect Expenses are absorbed in the cost accounts on the basis of normal production capacity.*
- *Notional rent of own premises charged in Cost Accounts is amounting to ₹12,000.*

You are required to:

(i) Prepare a Cost Sheet and ascertain the Profit as per Cost Records for the year ended 31st March, 2021.

(ii) Reconcile the Profit as per Financial Records with Profit as per Cost Records.

(10 Marks)

(b) PQR Ltd. is engaged in the production of three products P, Q and R. The company calculates Activity Cost Rates on the basis of Cost Driver capacity which is provided as below:

Activity	*Cost Driver*	*Cost Driver Capacity*	*Cost (₹)*
Direct Labour hours	*Labour hours*	*30,000 Labour hours*	*3,00,000*
Production runs	*No. of Production runs*	*600 Production runs*	*1,80,000*
Quality Inspections	*No. of Inspection*	*8000 Inspections*	*2,40,000*

The consumption of activities during the period is as under:

Activity / Products	*P*	*Q*	*R*
Direct Labour hours	*10,000*	*8,000*	*6,000*
Production runs	*200*	*180*	*160*
Quality Inspection	*3,000*	*2,500*	*1,500*

You are required to:

(i) Compute the costs allocated to each Product from each Activity.

(ii) Calculate the cost of unused capacity for each Activity.

(iii) A potential customer has approached the company for supply of 12,000 units of a new product. 'S' to be delivered in lots of 1500 units per quarter. This will involve an initial design cost of ₹30,000 and per quarter production will involve the following:

Direct Material	*₹18,000*
Direct Labour hours	*1,500 hours*

No. of Production runs	*15*
No. of Quality Inspection	*250*

Prepare cost sheet segregating Direct and Indirect costs and compute the Sales value per quarter of product 'S' using ABC system considering a markup of 20% on cost.

(10 Marks)

Answer

(a) (i) Cost Sheet

(for the year ended 31st March, 2021)

	(₹)	(₹)
Direct material		6,50,000
Direct wages		3,50,000
Prime cost		**10,00,000**
Factory Overheads:		
Variable (50% of ₹ 2,60,000)	1,30,000	
Fixed (₹ 1,30,000 × 15,000/20,000)	97,500	2,27,500
Works cost		**12,27,500**
Administrative Overheads (₹ 1,05,000 × 15,000/20,000)		78,750
Notional Rent		12,000
Cost of production		**13,18,250**
Selling Overheads		85,000
Cost of Sales		**14,03,250**
Profit (Balancing figure)		96,750
Sales revenue		**15,00,000**

(ii) Statement of Reconciliation

(Reconciling profit shown by Financial and Cost Accounts)

	(₹)	(₹)
Profit as per Cost Account		96,750
Add: Dividend received	9,000	
Add: Notional Rent	12,000	21,000
Less: Factory Overheads under-charged in Cost Accounts (₹ 2,60,000 – ₹ 2,27,500)	32,500	

Less: Administrative expenses under-charged in Cost Accounts (₹ 1,05,000 – ₹ 78,750)	26,250	
Less: Loss on sale of Investments	2,000	(60,750)
Profit as per Financial Accounts		**57,000**

(Note: Solution can be done considering base profit as per Financial Accounts)

(b) (i) Statement of cost allocation to each product from each activity

	Product			
	P (₹)	**Q (₹)**	**R (₹)**	**Total (₹)**
Direct Labour hours (Refer to working note)	1,00,000 (10,000 Labour hours × ₹10)	80,000 (8,000 Labour hours × ₹10)	60,000 (6,000 Labour hours × ₹10)	2,40,000
Production runs (Refer to working note)	60,000 (200 Production runs × ₹ 300)	54,000 (180 Production runs × ₹ 300)	48,000 (160 Production runs × ₹ 300)	1,62,000
Quality Inspections (Refer to working note)	90,000 (3,000 Inspections × ₹30)	75,000 (2,500 Inspections × ₹ 30)	45,000 (1,500 Inspections × ₹ 30)	2,10,000

Working note:

Rate per unit of cost driver

Direct Labour hours	(₹ 3,00,000/30,000 Labour hours)	₹ 10 per Labour hour
Production runs	(₹ 1,80,000/600 Production runs)	₹ 300 per Production run
Quality Inspection	(₹ 2,40,000/8,000 Inspections)	₹ 30 per Inspection

(ii) Computation of cost of unused capacity for each activity

Particulars	**(₹)**
Direct Labour hours [(₹ 3,00,000 – ₹ 2,40,000) or (6,000 x ₹ 10)]	60,000
Production runs [(₹ 1,80,000 – ₹ 1,62,000) or (60 x ₹ 300)]	18,000
Quality Inspection [(₹ 2,40,000 – ₹ 2,10,000) or (1,000 x ₹ 30)]	30,000
Total cost of unused capacity	**1,08,000**

(iii) Cost sheet and Computation of Sales value per quarter of product 'S' using ABC system

Particulars	**(₹)**
1500 units of product 'S' to be delivered per quarter	
Initial design cost per quarter (₹ 30,000 / 8 quarters)	3,750
Direct Material Cost	18,000
Direct Labour Cost (1,500 Labour hours x ₹ 10)	15,000
Direct Costs (A)	**36,750**
Set up Cost (15 Production runs × ₹ 300)	4,500
Inspection Cost (250 Inspections × ₹ 30)	7,500
Indirect Costs (B)	**12,000**
Total Cost (A + B)	48,750
Add: Mark-up (20% on cost)	**9,750**
Sale Value	**58,500**
Selling Price per unit 'S' (₹ 58,500/1500 units)	**39**

Question 4

(a) A Manufacturing unit manufactures a product 'XYZ' which passes through three distinct Processes - X, Y and Z. The following data is given:

	Process X	*Process Y*	*Process Z*
Material consumed (in ₹)	*2,600*	*2,250*	*2,000*
Direct wages (in ₹)	*4,000*	*3,500*	*3,000*

- *The total Production Overhead of ₹ 15,750 was recovered @ 150% of Direct wages.*
- *15,000 units at ₹ 2 each were introduced to Process 'X'.*
- *The output of each process passes to the next process and finally, 12,000 units were transferred to Finished Stock Account from Process 'Z'.*
- *No stock of materials or work in progress was left at the end.*

The following additional information is given:

Process	*% of wastage to normal input*	*Value of Scrap per unit (₹)*
X	*6%*	*1.10*
Y	*?*	*2.00*
Z	*5%*	*1.00*

You are required to:

(i) Find out the percentage of wastage in process 'Y', given that the output of Process 'Y' is transferred to Process 'Z' at ₹ 4 per unit.

(ii) Prepare Process accounts for all the three processes X, Y and Z. ***(10 Marks)***

(b) MRSL Healthcare Ltd. has incurred the following expenditure during the last year for its newly launched 'COVID-19' Insurance policy:

Office administration cost	*48,00,000*
Claim management cost	*3,80,000*
Employees cost	*16,20,000*
Postage and logistics	*32,40,000*
Policy issuance cost	*29,50,000*
Facilities cost	*46,75,000*
Cost of marketing of the policy	*1,38,90,000*
Policy development cost	*35,00,000*
Policy servicing cost	*96,45,000*
Sales support expenses	*32,00,000*
I.T. Cost	*?*

Number of Policy sold: 2,800

Total insured value of policies - ₹ 3,500 Crores

Cost per rupee of insured value - ₹ 0.002

You are required to:

(i) Calculate Total Cost for "COVID-19" Insurance policy segregating the costs into four main activities namely (a) Marketing and Sales support (b) Operations (c) I.T. Cost and (d) Support functions.

(ii) Calculate Cost Per Policy. ***(5 Marks)***

(c) Brick Constructions Ltd. commenced a contract on April 1,2020. The contract was for ₹ 10,00,000. The following information relates to the Contract as on 31st March, 2021:

- *The value of work completed up to Feb. 28, 2021 was certified by the architect and as a matter of policy, the Contractee has retained ₹ 1,30,000 as retention money which is 20% of the certified work and paid the balance amount.*
- *The cost of work completed subsequent to the architect's certificate was of ₹ 30,000.*

- *The expenditure incurred related to material purchase, wages and other chargeable expenses were ₹5,10,000*
- *Materials of the value of ₹20,000 were lying on the site.*
- *A special plant was purchased specifically for this contract at ₹40,000 and after use on this contract till 31st March, 2021, it was valued at ₹25,000.*

You are required to compute the value of Work Certified, Cash received for certified work and Notional profit of the contract for the year ended on 31st March, 2021. ***(5 Marks)***

Answer

(a)

Dr. **Process-X Account** *Cr.*

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Material introduced	15,000	30,000	By	Normal Loss A/c [(6% of 15,000 units) x ₹ 1.1]	900	990
”	Additional material	--	2,600	”	Process-Y A/c (₹ 2.951* × 14,100 units)	14,100	41,610
”	Direct wages	--	4,000				
”	Production OH	--	6,000				
		15,000	42,600			15,000	42,600

*Cost per unit of completed units

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\ 42,600 - ₹\ 990}{15,000 \text{ units} - 900 \text{ units}} = ₹\ 2.951$$

Dr. **Process-Y Account** *Cr.*

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process-X A/c	14,100	41,610	By	Normal Loss A/c [(#13.44% of 14,100 units) x ₹ 2]	1,895	3,790
”	Additional material	--	2,250	”	Process-Z A/c (₹ 4 × 12,205 units)	12,205	48,820
”	Direct wages	--	3,500				
”	Production OH	--	5,250				
		14,100	52,610			14,100	52,610

#Calculation for % of wastage in process ‘Y’:

Let's consider number of units lost under process 'Y' = A

Now, $\frac{\text{Total Cost - Realisable value from normal loss}}{\text{Inputs units - Normal loss units}} = 4$

$\frac{₹\ 52,610 - ₹\ 2A}{14,100 \text{ units} - A} = ₹\ 4$

₹ 52,610 - ₹ 2A = ₹ 56,400 - ₹ 4A

2A = ₹ 3,790 => A = 1,895 units

% of wastage = $\frac{1,895 \text{ units}}{14,100 \text{ units}}$ = **13.44%**

Dr. **Process-Z Account** *Cr.*

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-Y A/c	12,205	48,820	By Normal Loss A/c [(5% of 12,205 units) x ₹ 1]	610	610
" Additional material	--	2,000	" Finished Stock A/c (₹ 4.9771[$] × 12,000 units)	12,000	59,726
" Direct wages	--	3,000			
" Production OH	--	4,500			
" Abnormal gain (₹ 4.9771[$] × 405 units)	405	2,016			
	12,610	60,336		12,610	60,336

[$]Cost per unit of completed units

$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\ 58,320 - ₹\ 610}{12,205 \text{ units} - 610 \text{ units}} = ₹\ 4.9771$

Alternative Solution

Dr. **Process-X Account** *Cr.*

Particulars	Units	(₹)	Particulars	Units	(₹)
To Material introduced	15,000	30,000	By Normal Loss A/c [(6% of 15,000 units) x ₹ 1.1]	900	990

"	Additional material	--	2,600	"	Process-Y A/c (₹ 2.951* × 14,100 units)	14,100	41,610
"	Direct wages	--	4,000				
"	Production OH	--	6,000				
		15,000	**42,600**			**15,000**	**42,600**

*Cost per unit of completed units

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\ 42,600 - ₹\ 990}{15,000 \text{ units} - 900 \text{ units}} = ₹\ 2.951$$

Dr. **Process-Y Account** *Cr.*

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-X A/c	14,100	41,610	By Normal Loss A/c [(#13.44% of 14,100 units) x ₹ 2]	1,895	3,790
" Additional material	--	2,250	" Process-Z A/c (₹ 4 × 12,631@ units)	12,631	50,524
" Direct wages	--	3,500			
" Production OH	--	5,250			
" Abnormal gain (₹ 4 × 426 units)	426	1,704			
	14,526	54,314		14,526	54,314

Working Notes:

@1. Units Transferred from Process Z Account to Finished Stock = 12,000 Units i.e 95% of Inputs.

So, Input of Z or Output of Y is 12,000 x 100/95 = 12,631 Units and Normal Loss (5%) is 631 units.

2. Let's consider number of units lost under process 'Y' as:

For Normal loss = A

For Abnormal loss = B

Now, A + B = 1,469 [i.e. 14,100 – 12,631] …(I)

(A x ₹ 2 per unit) + (B x ₹ 4 per unit) = [52,610 – 50,524]

2A + 4B = 2,086 …(II)

Now, putting the values of (I) in (II), we get,

2(1,469 – B) + 4B = 2,086

2938 – 2B + 4B = 2,086

2B = - 852 => B = - 426 units

Since, the figure of B is in negative, it is an abnormal gain of 426 units.

Further, A (i.e. normal loss) = 1,469 + 426 = 1,895 units

#3. % of wastage in Process Y Account = $\frac{1,895 \text{ units}}{14,100 \text{ units}}$ = **13.44%**

Dr. **Process-Z Account** *Cr.*

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-Y A/c	12,631	50,524	By Normal Loss A/c [(5% of 12,631 units) x ₹ 1]	631	631
" Additional material	--	2,000			
" Direct wages	--	3,000			
" Production OH	--	4,500	" Finished Stock A/c (₹ 4.9494[$] × 12,000 units)	12,000	59,393
	12,631	60,024		12,631	60,024

[$]Cost per unit of completed units

$= \frac{\text{Total Cost - Realisable value from normal loss}}{\text{Inputs units - Normal loss units}} = \frac{₹ 60,024 - ₹ 631}{12,631 \text{ units} - 631 \text{ units}} = ₹ 4.9494$

(b) (i) Calculation of total cost for 'COVID-19' Insurance policy

	Particulars	Amount (₹)	Amount (₹)
a.	**Marketing and Sales support:**		
	- Policy development cost	35,00,000	
	- Cost of marketing	1,38,90,000	
	- Sales support expenses	32,00,000	**2,05,90,000**
b.	**Operations:**		
	- Policy issuance cost	29,50,000	
	- Policy servicing cost	96,45,000	
	- Claim management cost	3,80,000	**1,29,75,000**
c.	**IT Cost***		**2,21,00,000**

d.	**Support functions**		
	- Postage and logistics	32,40,000	
	- Facilities cost	46,75,000	
	- Employees cost	16,20,000	
	- Office administration cost	48,00,000	**1,43,35,000**
	Total Cost		**7,00,00,000**

*IT cost

= (₹ 3,500 crores x 0.002) – ₹ 4,79,00,000 = ₹ 2,21,00,000

(ii) Calculation of cost per policy = $\frac{\text{Total cost}}{\text{No. of policies}} = \frac{₹\ 7,00,00,000}{2,800}$ = **₹** 25,000

(c) 1. Value of Work Certified

= $\frac{₹\ 1,30,000}{20\%}$ = **₹ 6,50,000**

2. Cash Received

= Value of Work certified – Retention Money

= 6,50,000 – 1,30,000 = **₹ 5,20,000**

3. Notional Profit

= Value of Work certified – Cost of work certified

= 6,50,000 - 4,75,000* = **₹ 1,75,000**

***Working Note**

Cost of work certified = Work cost - Cost of work uncertified

= (Expenditure + Plant used – Material at site) - Cost of work uncertified

= [5,10,000 + (40,000 - 25,000) - 20,000] - 30,000 = **₹** 4,75,000

Question 5

(a) The standard output of a Product 'DJ' is 25 units per hour in manufacturing department of a Company employing 100 workers. In a 40 hours week, the department produced 960 units of product 'DJ' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹ 6.20, ₹ 6.00 and ₹ 5.70 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹ 240 (F).

You are required to compute:

(i) Total Labour Cost Variance.

(ii) Total Labour Rate Variance.

(iii) Total Labour Gang Variance.

(iv) Total Labour Yield Variance, and

(v) Total Labour Idle Time Variance. ***(10 Marks)***

(b) PSV Ltd. manufactures and sells a single product and estimated the following related information for the period November, 2020 to March, 2021.

Particulars	*November, 2020*	*December, 2020*	*January, 2021*	*February, 2021*	*March, 2021*
Opening Stock of Finished Goods (in Units)	*7,500*	*3,000*	*9,000*	*8,000*	*6,000*
Sales (in Units)	*30,000*	*35,000*	*38,000*	*25,000*	*40,000*
Selling Price per unit (in ₹)	*10*	*12*	*15*	*15*	*20*

Additional Information:

- *Closing stock of finished goods at the end of March, 2021 is 10,000 units.*
- *Each unit of finished output requires 2 kg of Raw Material 'A' and 3 kg of Raw Material 'B'.*

You are required to prepare the following budgets for the period November, 2020 to March, 2021 on monthly basis:

(i) Sales Budget (in ₹)

(ii) Production budget (in units) and

(iii) Raw material Budget for Raw material 'A' and 'B' separately (in units) ***(10 Marks)***

Answer

(a) Working Notes:

1. Calculation of Standard Man hours

When 100 workers work for 1 hour, the standard output is 25 units.

Standard man hours per unit $= \frac{100 \text{ hours}}{25 \text{ units}}$ **= 4 hours per unit**

2. Calculation of standard man hours for actual output:

= 960 units x 4 hours **= 3,840 hours.**

3. Calculation of actual cost

Type of Workers	No of Workers	Actual Hours Paid	Rate (₹)	Amount (₹)	Idle Hours (5% of hours paid)	Actual hours Worked
Group 'A'	10	400	6.2	2,480	20	380
Group 'B'	30	1,200	6	7,200	60	1,140
Group 'C'	60	2,400	5.7	13,680	120	2,280
	100	**4,000**		**23,360**	**200**	**3,800**

4. Calculation of Standard wage Rate:

Labour Efficiency Variance = 240F

(Standard hours for Actual production – Actual Hours) x SR = 240F

(3,840 – 3,800) x SR = 240

Standard Rate (SR) **= ₹ 6 per hour**

(i) Total Labour Cost Variance

= (Standard hours x Standard Rate) – (Actual Hours x Actual rate)

= (3,840 x 6) – 23,360 **= 320A**

(ii) Total Labour Rate Variance

= (Standard Rate – Actual Rate) x Actual Hours

Group 'A' = (6- 6.2) 400 = 80A

Group 'B' = (6- 6) 1,200 = 0

Group 'C' = (6 – 5.7) 2,400 = 720F

640F

(iii) Total Labour Gang Variance

= Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang -Average Standard Rate per hour of Actual Gang@}

@ on the basis of hours worked

$$= 3,800 \times \left(6 - \frac{3,840 \times 6}{3,800}\right)$$

= 0

(iv) Total Labour Yield Variance

= Average Standard Rate per hour of Standard Gang × {Total Standard Time (hours) - Total Actual Time worked (hours)}

= 6 x (3,840 – 3,800)

= **240F**

(v) Total Labour idle time variance

= Total Idle hours x standard rate per hour

= 200 hours x 6

= 1,200A

(b) (i) Sales Budget **(in ₹)**

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Sales (in Units)	30,000	35,000	38,000	25,000	40,000	1,68,000
Selling Price per unit (₹)	10	12	15	15	20	-
Total Sales (₹)	3,00,000	4,20,000	5,70,000	3,75,000	8,00,000	24,65,000

(ii) Production Budget (in units)

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Sales	30,000	35,000	38,000	25,000	40,000	1,68,000
Add: Closing stock of finished goods	3,000	9,000	8,000	6,000	10,000	36,000
Total quantity required	33,000	44,000	46,000	31,000	50,000	2,04,000
Less: Opening stock of finished goods	7,500	3,000	9,000	8,000	6,000	33,500
Units to be produced	**25,500**	**41,000**	**37,000**	**23,000**	**44,000**	1,70,500

(iii) Raw material budget (in units)

For Raw material 'A'

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500

Raw material consumption p.u. (kg.): (b)	2	2	2	2	2	-
Total raw material consumption (Kg.): (a × b)	**51,000**	**82,000**	**74,000**	**46,000**	**88,000**	3,41,000

For Raw material 'B'

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500
Raw material consumption p.u. (kg.): (b)	3	3	3	3	3	-
Total raw material consumption (Kg.): (a × b)	**76,500**	**1,23,000**	**1,11,000**	**69,000**	**1,32,000**	5,11,500

Question 6

Answer any four of the following:

(a) Specify the types of Responsibility centres under the following situations:

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

(ii) Ticket counter in a Railway station.

(iii) Decentralized branches of an organization.

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

(v) Sales Department of an organization.

(b) What is Margin of Safety? What does a large Margin of Safety indicates? How can you calculate Margin of Safety?

(c) Rowan Premium Bonus system does not motivate a highly efficient worker as a less efficient worker and a highly efficient worker can obtain same bonus under this system. Discuss with an example.

(d) What do you understand by Build-Operate-Transfer (BOT) approach in Service Costing? How is the Toll rate computed?

(e) Write a short note on VED analysis of Inventory Control. ***(4 x 5 = 20 Marks)***

Answer

(a)

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

(b) Margin of Safety: The margin of safety can be defined as the difference between the expected level of sale and the breakeven sales.

The larger the margin of safety, the higher is the chances of making profits.

The Margin of Safety can be **calculated by** identifying the difference between the projected sales and breakeven sales in units multiplied by the contribution per unit. This is possible because, at the breakeven point all the fixed costs are recovered and any further contribution goes into the making of profits.

Margin of Safety = (Projected sales – Breakeven sales) in units x contribution per unit

It also can be calculated as:

$$\text{Margin of Safety} = \frac{\text{Profit}}{\text{P / V Ratio}}$$

(c) Rowan Premium Plan: According to this system a standard time allowance is fixed for the performance of a job and bonus is paid if time is saved.

Under Rowan System, the bonus is that proportion of the time wages as time saved bears to the standard time**.**

$$\text{Bonus} = \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

Example explaining highly efficient worker and less efficient worker obtaining same bonus:

Time rate (per Hour)	₹ 60
Time allowed	8 hours.
Time taken by 'X'	6 hours.

Time taken by 'Y' 2 hours.

Bonus = $\frac{\text{Time Saved}}{\text{Time Allowed}}$ × Time taken × Rate per hour

For 'X' = $\frac{2 \text{ hours}}{8 \text{ hours}}$ × 6 hours × ₹ 60 **= ₹ 90**

For 'Y' = $\frac{6 \text{ hours}}{8 \text{ hours}}$ × 2 hours × ₹ 60 **= ₹ 90**

From the above example, it can be concluded that a highly efficient worker may obtain same bonus as less efficient worker under this system.

(d) Build-Operate-Transfer (BOT) Approach: In recent years a growing trend emerged among Governments in many countries to solicit investments for public projects from the private sector under BOT scheme. **BOT is an option for the Government to outsource public projects to the private sector.**

With BOT, the private sector designs, finances, constructs and operate the facility and eventually, after specified concession period, the ownership is transferred to the Government. Therefore, BOT can be seen as a developing technique for infrastructure projects by making them amenable to private sector participation.

Toll Rate: In general, the toll rate should have a direct relation with the benefits that the road users would gain from its improvements. The benefits to road users are likely to be in terms of fuel savings, improvement in travel time and good riding quality.

To compute the toll rate, following formula may be used

= $\frac{\text{Total Cost + Profit}}{\text{Number of Vehicles}}$

Or, to compute the toll rate following formula with rounding off to nearest multiple of five has been adopted: User fee = Total distance x Toll rate per km.

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

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

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

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

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer

Question 1

Answer the following:

(a) XYZ Ltd. uses two types of raw materials – 'Material A' and 'Material B' in the production process and has provided the following data for the year ended on 31st March, 2021:

Particulars	*Material A (₹)*	*Material B (₹)*
Opening stock as on 01.04.2020	*30,000*	*32,000*
Purchase during the year	*90,000*	*51,000*
Closing stock as on 31.03.2021	*20,000*	*14,000*

(i) You are required to calculate:

(a) The inventory turnover ratio of 'Material A' and 'Material B'.

(b) The number of days for which the average inventory is held for both materials 'A' and 'B'.

(ii) Based on above calculations, give your comments.

(Assume 360 days in a year.)

(b) The Accountant of KPMR Ltd. has prepared the following budget for the coming year 2022 for its two products 'AYE' and 'ZYE':

Particulars	*Product 'AYE'*	*Product 'ZYE'*
Production and Sales (in Units)	*4,000*	*3,000*
	Amount (in ₹)	*Amount (in ₹)*
Selling Price per unit	*200*	*180*
Direct Material per unit	*80*	*70*
Direct Labour per unit	*40*	*35*
Variable Overhead per unit	*20*	*25*
Fixed Overhead per unit	*10*	*10*

After reviewing the above budget, the management has called the marketing team for suggesting some measures for increasing the sales. The marketing team has suggested that by promoting the products on social media, the sales quantity of both the products can be increased by 5%. Also, the selling price per unit will go up by 10%. But this will result in increase in expenditure on variable overhead and fixed overhead by 20% and 5% respectively for both the products.

You are required to prepare flexible budget for both the products:

(i) Before promotion on social media,

(ii) After promotion on social media.

(c) A skilled worker is paid a guaranteed wage rate of ₹ 150 per hour. The standard time allowed for a job is 10 hours. He took 8 hours to complete the job. He has been paid the wages under Rowan Incentive Plan.

You are required to:

(i) Calculate an effective hourly rate of earnings under Rowan Incentive Plan.

(ii) Calculate the time in which he should complete the job, if the worker is placed under Halsey Incentive Scheme (50%) and he wants to maintain the same effective hourly rate of earnings.

(d) A product passes through Process-I and Process-II.

Particulars pertaining to the Process-I are:

Materials issued to Process-I amounted to ₹ 80,000, Wages ₹ 60,000 and manufacturing overheads were ₹ 52,500. Normal Loss anticipated was 5% of input, 9,650 units of output were produced and transferred out from Process-I to Process-II. Input raw materials issued to Process-I were 10,000 units.

There were no opening stocks.

Scrap has realizable value of ₹ 5 per unit.

You are required to prepare:

(i) Process-I Account

(ii) Abnormal Gain/Loss Account ***(4 x 5 = 20 Marks)***

Answer

(a) (i) Calculation of Inventory Turnover ratios and number of days:

	Material A (₹)	Material B (₹)
Opening stock	30,000	32,000
Add: Purchases	90,000	51,000
	1,20,000	83,000
Less: Closing stock	20,000	14,000

Materials consumed	1,00,000	69,000
Average inventory: (Opening Stock + Closing Stock) ÷ 2	25,000	23,000
(a) Inventory Turnover ratio: (Consumption ÷ Average inventory)	4 times	3 times
(b) Number of days for which the average inventory held (Number of Days in a year/IT ratio)	90 days	120 days

(ii) Comments: Material A is moving faster than Material B. Or Material A has a less holding period.

(b) (i) Flexible Budget (before promotion)

	Particulars	Product 'AYE'	Product 'ZYE'	Total
	Production & Sales (units)	4,000	3,000	
		Amount (₹)	**Amount (₹)**	**Amount (₹)**
A.	Sales Value	8,00,000 (₹ 200×4,000)	5,40,000 (₹ 180×3,000)	13,40,000
B.	Direct Materials	3,20,000 (₹ 80 × 4,000)	2,10,000 (₹70 × 3,000)	5,30,000
C.	Direct labour	1,60,000 (₹ 40 × 4,000)	1,05,000 (₹ 35 × 3,000)	2,65,000
D.	Variable Overheads	80,000 (₹ 20 × 4,000)	75,000 (₹ 25 × 3,000)	1,55,000
E.	Total Variable Cost (B+C+D)	5,60,000	3,90,000	9,50,000
F.	Contribution (A-E)	2,40,000	1,50,000	3,90,000
G.	Fixed Overhead	40,000 (₹10 × 4,000)	30,000 (₹10 × 3,000)	70,000
H.	Profit (F-G)	2,00,000	1,20,000	3,20,000
	Profit per unit	50	40	

(ii) Flexible Budget (after promotion)

	Particulars	Product 'AYE'	Product 'ZYE'	Total
	Production & Sales (units)	4,200 (4,000×105%)	3,150 (3,000×105%)	

		Amount (₹)	Amount (₹)	Amount (₹)
A.	Sales Value	9,24,000 (₹ 220 × 4,200)	6,23,700 (₹ 198 × 3,150)	15,47,700
B.	Direct Materials	3,36,000 (₹ 80 × 4,200)	2,20,500 (₹ 70 × 3,150)	5,56,500
C.	Direct labour	1,68,000 (₹ 40 × 4,200)	1,10,250 (₹ 35 × 3,150)	2,78,250
D.	Variable Overheads	1,00,800 (₹ 24 × 4,200)	94,500 (₹ 30 × 3,150)	1,95,300
E.	Total Variable Cost (B+C+D)	6,04,800	4,25,250	10,30,050
F.	Contribution (A-E)	3,19,200	1,98,450	5,17,650
G.	Fixed Overhead	42,000 (₹ 40,000 × 105%)	31,500 (₹ 30,000 × 105%)	73,500
H.	Profit (F-G)	2,77,200	1,66,950	4,44,150
	Profit per unit	66	53	

(c) (i) Calculation of Effective hourly rate of earnings under Rowan Incentive Plan:

Standard time allowed = 10 hours

Time taken = 8 hours; Time saved = 2 hours

	Particulars	Amount (₹)
A	Basic guaranteed wages (₹150×8 hours)	1,200
B	Add: Bonus for time saved ($\frac{2}{10}$ × 8 × ₹ 150)	240
C	Total earnings (A+B)	1,440
D	Hours worked	8 hours
E	Effective hourly rate (C÷D)	180

(ii) Let the time taken to complete the job is "T" and the time saved is 10-T

Effective hourly rate under the Halsey Incentive scheme

$$= \frac{\text{(Rate × Hours Worked) + (Rate × 50\% of Time Saved)}}{\text{Hours Worked}} = ₹\ 180$$

$$\frac{(₹150 \times T) + ₹150 \times 50\% (10 - T)}{T} = ₹ 180$$

$150T + 750 - 75T = 180T$

$180T - 75T = 750$

$T = \frac{750}{105} = 7.14$ hours

(d) (i) Process - I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Materials	10,000	80,000	By Normal loss (5%of 10,000)	500	2,500
To Wages	-	60,000	By Process-II A/c (₹20*×9,650units)	9,650	1,93,000
To Manufacturing OH		52,500			
To Abnormal Gain A/c (₹20*×150units)	150	3,000			
	10,150	1,95,500		10,150	1,95,500

$$* \frac{(80,000 + 60,000 + 52,500) - 2,500}{10,000 - 500} = ₹ 20$$

(ii) Abnormal Gain - Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Normal loss A/c	150	750	By Process-I A/c	150	3,000
To Costing P&L A/c	-	2,250			
	150	3,000		150	3,000

Question 2

(a) G Ltd. manufactures leather bags for office and school purposes.

The following information is related with the production of leather bags for the month of September, 2021.

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

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

(3) *Other direct costs of ₹ 10 per labour hour is incurred.*

(4) *G Ltd. have 4 machines at a total cost of ₹ 22,00,000. Machines have a life of 10 years with a scrap value of 10% of the original cost. Depreciation is charged on a straight-line method.*

(5) *The monthly cost of administration and sales office staffs are ₹ 45,000 and ₹ 72,000 respectively. G Ltd. pays ₹ 1,20,000 per month as rent for a 2,400 sq. feet factory premises. The administrative and sales office occupies 240 sq. feet and 200 sq. feet respectively of factory space.*

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

(7) *During the month, 35 kgs of scrap (cuttings of leather and cotton) are sold at ₹ 150 per kg.*

(8) *There are no opening and closing stocks of input materials. There is a finished stock of 100 bags in stock at the end of the month.*

You are required to prepare a cost sheet in respect of above for the month of September 2021 showing:

(i) *Cost of Raw Material Consumed*

(ii) *Prime Cost*

(iii) *Works/Factory Cost*

(iv) *Cost of Production*

(v) *Cost of Goods Sold*

(vi) *Cost of Sales* ***(10 Marks)***

(b) *AZ company has prepared its budget for the production of 2,00,000 units. The variable cost per unit is ₹ 16 and fixed cost is ₹ 4 per unit. The company fixes its selling price to fetch a profit of 20% on total cost.*

You are required to calculate:

(i) *Present break-even sales (in ₹ and in quantity).*

(ii) *Present profit-volume ratio.*

(iii) *Revised break-even sales in ₹ and the revised profit-volume ratio, if it reduces its selling price by 10%.*

(iv) *What would be revised sales- in quantity and the amount, if a company desires a profit increase of 20% more than the budgeted profit and selling price is reduced by 10% as above in point (iii).* ***(10 Marks)***

Answer

(a) No. of bags manufactured = 1,000 units

Cost sheet for the month of September 2021

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	- Leather sheets	3,20,000	320.00
	- Cotton cloths	15,000	15.00
	Add: Freight paid on purchase	8,500	8.50
	(i) Cost of material consumed	3,43,500	343.50
2.	Direct wages (₹80 × 2,000 hours)	1,60,000	160.00
3.	Direct expenses (₹10 × 2,000 hours)	20,000	20.00
4.	**(ii) Prime Cost**	5,23,500	523.50
5.	Factory Overheads: Depreciation on machines {(₹ 22,00,000 × 90%) ÷ 120 months}	16,500	16.50
	Apportioned cost of factory rent	98,000	98.00
6.	**(iii) Works/ Factory Cost**	6,38,000	638.00
7.	*Less:* Realisable value of cuttings (₹150×35 kg.)	(5,250)	(5.25)
8.	**(iv) Cost of Production**	6,32,750	632.75
9.	*Add:* Opening stock of bags	0	
10.	*Less:* Closing stock of bags (100 bags × ₹632.75)	(63,275)	
11.	**(v) Cost of Goods Sold**	5,69,475	632.75
12.	*Add:* Administrative Overheads:		
	- Staff salary	45,000	50.00
	- Apportioned rent for administrative office	12,000	13.33
13.	*Add:* Selling and Distribution Overheads		
	- Staff salary	72,000	80.00
	- Apportioned rent for sales office	10,000	11.11
	- Freight paid on delivery of bags	18,000	20.00
14.	**(vi) Cost of Sales**	7,26,475	807.19

Apportionment of Factory rent:

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

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

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

(b) Variable Cost per Unit=₹16

Fixed Cost per Unit =₹ 4, Total Fixed Cost= 2,00,000 units x ₹ 4 = ₹8,00,000

Total Cost per Unit =₹20

Selling Price per Unit=Total Cost+ Profit =₹ 20+₹ 4 =₹ 24

Contribution per Unit=₹ 24-₹16=₹ 8

(i) Present Break-even Sales (Quantity) = $\frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{₹\ 8,00,000}{₹\ 8}$

= 1,00,000 units

Present Break-even Sales (₹) = 1,00,000 units × ₹ 24 = ₹ 24,00,000

(ii) Present P/V Ratio = $\frac{8}{24} \times 100 = 33.33\%$

(iii) Revised Selling Price per Unit = ₹ 24 – 10% of ₹ 24 = ₹ 21.60

Revised Contribution per Unit=₹ 21.60-₹ 16 = ₹ 5.60

Revised P/V Ratio = $\frac{5.60}{21.60} \times 100 = 25.926\%$

Revised Break-even point (₹) = $\frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{8,00,000}{25.926\%} = ₹\ 30,85,705$

Or

Revised Break-even point (units) = $\frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{8,00,000}{5.60} = 1,42,857$ units

Revised Break-even point (₹) = 1,42,857 units x ₹ 21.60 = ₹ 30,85,711

(iv) Present profit =₹ 8,00,000

Desired Profit = 120% of ₹ 8,00,000 =₹ 9,60,000

Sales to earn a profit of ₹ 9,60,000

Total contribution required = 8.00.000 + 9,60,000 = ₹ 17,60,000

$$\frac{\text{Fixed cost + Desired profit}}{\text{Contribution per unit}} = \frac{8,00,000 + 9,60,000}{5.60} = 3,14,286 \text{ units}$$

Revised sales (in ₹) = 3,14,286 units x ₹ 21.60 = ₹ 67,88,578

Question 3

(a) Paras Travels provides mini buses to an IT company for carrying its employees from home to office and dropping back after office hours. It runs a fleet of 8 mini buses for this purpose. The buses are parked in a garage adjoining the company's premises. Company is operating in two shifts (one shift in the morning and one shift in the afternoon). The distance travelled by each mini bus one way is 30 kms. The company works for 20 days in a month.

The seating capacity of each mini bus is 30 persons. The seating capacity is normally 80% occupied during the year. The details of expenses incurred for a year are as under:

Particulars	
Driver's salary	*₹ 20,000 per driver per month*
Lady attendant's salary (mandatorily required for each mini bus)	*₹ 10,000 per attendant per month*
Cleaner's salary (One cleaner for 2 mini buses)	*₹ 15,000 per cleaner per month*
Diesel (Avg. 8 kms per litre)	*₹ 80 per litre*
Insurance charges (per annum)	*2% of Purchase Price*
License fees and taxes	*₹ 5,080 per mini bus per month*
Garage rent paid	*₹ 24,000 per month*
Repair & maintenance including engine oil and lubricants (for every 5,760 kms)	*₹ 2,856 per mini bus*
Purchase Price of mini bus	*₹ 15,00,000 each*
Residual life of mini bus	*8 Years*
Scrap value per mini bus at the end of residual life	*₹ 3,00,000*

Paras Travels charges two types of fare from the employees. Employees coming from a distance of beyond 15 kms away from the office are charged double the fare which is charged from employees coming from a distance of up-to 15 kms. away from the office. 50% of employees travelling in each trip are coming from a distance beyond 15 kms. from the office. The charges are to be based on average cost.

You are required to:

(i) Prepare a statement showing expenses of operating a single mini bus for a year,

(ii) *Calculate the average cost per employee per month in respect of:*

(a) *Employees coming from a distance upto 15 kms. from the office.*

(b) *Employees coming from a distance beyond 15 kms. from the office.* ***(10 Marks)***

(b) *A Drug Store is presently selling three types of drugs namely 'Drug A', 'Drug B' and 'Drug C'. Due to some constraints, it has decided to go for only one product line of drugs. It has provided the following data for year 2020-21 for each product line:*

	Drugs Types		
	A	B	C
Revenues (in ₹)	74,50,000	1,11,75,000	1,86,25,000
Cost of goods sold (in ₹)	41,44,500	68,16,750	1,20,63,750
Number of purchase orders placed (in nos.)	560	810	630
Number of deliveries received	950	1,000	850
Hours of shelf-stocking time	900	1,250	2,350
Units sold (in Nos.)	1,75,200	1,50,300	1,44,500

Following additional information is also provided:

Activity	Description of activity	Total Cost (₹)	Cost-allocation base
Drug Licence fee	Drug Licence fee	5,00,000	To be distributed in ratio 2:3:5 between A, B and C
Ordering	Placing of orders for purchases	8,30,000	2,000 purchase orders
Delivery	Physical delivery and receipt of foods	18,20,000	2,800 deliveries
Shelf stocking	Stocking of goods	32,40,000	4,500 hours of shelf-stocking time
Customer Support	Assistance provided to customers	28,20,000	4,70,000 units sold

You are required to:

(i) *Calculate the operating income and operating income as a percentage (%) of revenue of each product line if:*

(a) *All the support costs (Other than cost of goods sold) are allocated in the ratio of cost of goods sold.*

(b) All the support costs (Other than cost of goods sold) are allocated using activity-based costing system.

(ii) Give your opinion about choosing the product line on the basis of operating income as a percentage (%) of revenue of each product line under both the situations as above. ***(10 Marks)***

Answer

(a) (i) Statement of Expenses of operating a mini bus in a year

Particulars		Rate (₹)	Per Bus per annum (₹)
(A)	**Standing Charges:**		
	Driver's salary	20,000 p.m	2,40,000
	Lady attendant's salary	10,000 p.m	1,20,000
	Average Cleaner's salary (50%)	15,000 p.m	90,000
	Insurance charge	30,000 p.a.	30,000
	License fee, taxes etc.	5,080 p.m.	60,960
	Average Garage Rent	24,000 p.m	36,000
	Depreciation {(15,00,000 – 3,00,000) ÷ 8}	1,50,000 p.a.	1,50,000
(B)	**Maintenance Charges:**		
	Repairs & maintenance including engine oil and lubricants (Working Note 1)	28,560 p.a.	
(C)	**Operating Charges:**		
	Diesel (Working Note 2)		5,76,000
	Total Cost (A + B + C)		13,31,520
	Cost per month		1,10,960

(ii) Average cost per employee per month:

A. Employee coming from distance of upto 15 km

$$= \frac{\text{Total cost per month}}{\text{Total no. of equivalent employee}} = \frac{1,10,960}{72^*} = ₹\ 1,541.11$$

B. Employee coming from a distance beyond 15 km

= 1541.11 × 2 = ₹ 3,082.22

*** Considering half fare employees as a base**

Full fare employees (12 × 2) 24 employees

Add: Half fare employees (Working Note 3)	12 employees
Total Equivalent number of employees per month	36 employees
Total Equivalent number of employees per month (morning + afternoon shift of company)	72 employees

Working Notes:

1. Calculation of Repairs and maintenance cost of a bus :

Distance travelled in a year:

(4 trip × 2 shifts × 30 km. × 20 days × 12 months)

Distance travelled p.a.: 57,600 km.

Repairs and maintenance cost per Bus per annum:

$$= \frac{57,600 \text{ km.}}{5,760 \text{ km}} \times ₹ 2,856 \text{ per bus}$$

= ₹ 28,560 per annum

2. Calculation of diesel cost per bus per annum:

Distance travelled in a year = 57,600 km

Diesel cost per Bus per annum:

$$= \frac{57,600 \text{ km.}}{8 \text{ Km}} \times ₹ 80$$

= 5,76,000

3. Calculation of equivalent number of employees per bus:

Seating capacity of a bus	30 employees
Occupancy (80% of capacity)	24 employees
Half fare employees (50% of 24 employees)	12 employees
Full fare employees (50% of 24 employees)	12 employee

[**Note**: Total Equivalent number of employees per month (morning + afternoon shift of company can also be calculated considering full fare employees as a base. In that case the number will be 36. Then fare for employees coming from distance beyond 15km will be $\frac{1,10,960}{36}$ = ₹ 3,082.22 and employees coming from distance upto 15 km will be 3,082.22 / 2 = ₹ 1,541.11]

(b) (i) (a) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Revenues: (A)	74,50,000	1,11,75,000	1,86,25,000	3,72,50,000
Cost of Goods sold (COGS): (B)	41,44,500	68,16,750	1,20,63,750	2,30,25,000
Support cost (40% of COGS): (C) (Refer working notes)	16,57,800	27,26,700	48,25,500	92,10,000
Total cost: (D) = {(B) + (C)}	58,02,300	95,43,450	1,68,89,250	3,22,35,000
Operating income: E = {(A)-(D)}	16,47,700	16,31,550	17,35,750	50,15,000
Operating income as a % of revenues: (E/A) × 100)	22.12%	14.60%	9.32%	13.46%

Working notes:

1. Total support cost:

	(₹)
Drug Licence Fee	5,00,000
Ordering	8,30,000
Delivery	18,20,000
Shelf stocking	32,40,000
Customer support	28,20,000
Total support cost	92,10,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{₹\ 92,10,000}{₹\ 2,30,25,000} \times 100 = 40\%$$

3. Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	8,30,000	2,000 purchase orders	₹ 415 per purchase order

Delivery	18,20,000	2,800 deliveries	₹ 650 per delivery
Shelf-stocking	32,40,000	4,500 hours	₹ 720 per stocking hour
Customer support	28,20,000	4,70,000 units sold	₹ 6 per unit sold

(b) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity-based costing system)

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Revenues: (A)	74,50,000	1,11,75,000	1,86,25,000	3,72,50,000
Cost & Goods sold	41,44,500	68,16,750	1,20,63,750	2,30,25,000
Drug Licence Fee	1,00,000	1,50,000	2,50,000	5,00,000
Ordering cost* (560:810:630)	2,32,400	3,36,150	2,61,450	8,30,000
Delivery cost* (950:1000:850)	6,17,500	6,50,000	5,52,500	18,20,000
Shelf stocking cost* (900:1250:2350)	6,48,000	9,00,000	16,92,000	32,40,000
Customer Support cost* (175200:150300:144500)	10,51,200	9,01,800	8,67,000	28,20,000
Total cost: (B)	67,93,600	97,54,700	1,56,86,700	3,22,35,000
Operating income C: {(A) - (B)}	6,56,400	14,20,300	29,38,300	50,15,000
Operating income as a % of revenues	8.81%	12.71%	15.78%	13.46%

** Refer to working note 3*

(ii) Comparison on the basis of operating income as per the percentage (%) of revenue:

(a) When support costs are allocated to product lines on the basis of cost of goods sold of each product

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Operating income as a % of revenues	22.12%	14.60%	9.32%	13.46%

On comparing the operating income as a % of revenue of each product, Drug A is the most profitable product line, though its revenue is least but with highest units sold.

(b) When support costs are allocated to product lines using an activity-based costing system

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Operating income as a % of revenues	8.81%	12.71%	15.78%	13.46%

On comparing the operating income as a % of revenue of each product, Drug C is the most profitable product line, though its unit sold is least but with highest revenue.

Question 4

(a) A construction company has obtained a contract of ₹ 30 lakhs contract price.

The following details are available in respect of this contract for the year ended March 31, 2021:

Particulars	*(₹)*
Materials purchased	*2,00,000*
Materials issued from stores	*8,00,000*
Wages paid	*1,50,000*
Plant Supervisor Salary	*2,40,000*
Drawing and maps	*50,000*
Sundry expenses	*30,000*
Electricity charges	*40,000*
Plant hire expenses paid	*75,000*
Sub-contract cost	*40,000*
Materials returned to stores	*35,000*
Materials returned to suppliers	*50,000*

The following balances related to the contract for the year ended on March 31, 2020 and March 31, 2021 are available:

	As on 31st March, 2020 (₹)	*As on 31st March, 2021 (₹)*
Work certified	*2,50,000*	*70% of Contract Price*
Work uncertified	*10,000*	*?*
Materials at site	*35,000*	*25,000*
Wages outstanding	*15,000*	*22,000*
Plant hire charges outstanding	*20,000*	*15,000*

Further informations are as under:

1. *An additional plant was used for 270 days costing ₹ 5,00,000 with a residual value of ₹ 20,000 having life of 4 years.*
2. *During the year, material costing ₹ 40,000 was sold for ₹ 20,000.*
3. *Plant supervisor has devoted 1/3rd of his time to this contract.*
4. *As on 31.03-2021, 80% of the contract was completed.*

You are required to prepare Contract Account and show the notional profit or loss as on 31st March, 2021 (Assume 360 days in a year). ***(10 Marks)***

(b) *R Ltd. showed a Net Profit of ₹ 3,60,740 as per their cost accounts for the year ended 31st March, 2021.*

The following information was revealed as a result of scrutiny of the figures from the both sets of accounts:

Sr. No.	*Particulars*	*(₹)*
i.	*Over recovery of selling overheads in cost accounts*	*10,250*
ii.	*Over valuation of closing stock in cost accounts*	*7,300*
iii.	*Rent received credited in financial accounts*	*5,450*
iv.	*Bad debts provided in financial accounts*	*3,250*
v.	*Income tax provided in financial accounts*	*15,900*
vi.	*Loss on sale of capital asset debited in financial accounts*	*5,800*
vii.	*Under recovery of administration overheads in cost accounts*	*3,600*

Required:

Prepare a reconciliation statement showing the profit as per financial records. ***(5 Marks)***

(c) *What is Bill of Material? Describe the uses of Bill of Material in following departments:*

(i) Purchases Department

(ii) Production Department

(iii) Stores Department

(iv) Cost/Accounting Department ***(5 Marks)***

Answer

(a) **Contract A/c**

Dr. Cr.

Particulars		Amount (₹)	Particulars	Amount (₹)
To Opening Work in progress			By Material returned to store	35,000
- Work certified	2,50,000		By Material returned to suppliers	50,000
- Work uncertified	10,000	2,60,000	By Costing P&L (Loss on sale of material)	20,000
To Material at site		35,000	By Material Sold	20,000
To Material purchased		2,00,000	By Material at site	25,000
To Stores		8,00,000	By Works cost (Bal. fig.)	17,02,000
To Wages	1,50,000			
Add: Closing O/s wages	22,000			
Less: Opening O/s wages	(15,000)	1,57,000		
To Plant supervisor salary (2,40,000 × 1/3)		80,000		
To Drawing and maps		50,000		
To Sundry expenses		30,000		
To Electricity charges		40,000		
To Plant hire expenses	75,000			
Add: O/s at end	15,000			
Less: O/s at beginning	(20,000)	70,000		
To Sub-contract		40,000		
To Depreciation $\left[\frac{5,00,000-20,000}{4} \times \frac{270}{360}\right]$		90,000		
		18,52,000		18,52,000
To works cost		17,02,000	By work in progress:	
To Costing P& L (Notional profit)		6,10,750	Work certified 21,00,000	
			Work uncertified 2,12,750	23,12,750
		23,12,750		23,12,750

Working Note:

Calculation of Value of work uncertified

Cost incurred till date	17,02,000
Estimate total cost $\left[\frac{17,02,000}{80\%}\right]$	21,27,500
Cost of work certified till date (21,27,500 × 70%)	14,89,250
Cost of uncertified work (17,02,000 – 14,89,250)	2,12,750

(b) Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Net Profit as per Cost Accounts		3,60,740
Add:		
Over recovery of selling overheads in cost accounts	10,250	
Rent received credited in financial accounts	5,450	15,700
		376,440
Less:		
Over valuation of closing stock in cost accounts	7,300	
Bad debts provided in financial accounts	3,250	
Income tax provided in financial accounts	15,900	
Loss on sale of capital asset debited in financial accounts	5,800	
Under recovery of administration overheads in cost accounts	3,600	35,850
Profit as per Financial Accounts		3,40,590

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

Uses of Bill of Material in different department:

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

Question 5

(a) In a manufacturing company the standard units of production for the year were fixed at 1,20,000 units and overhead expenditures were estimated to be as follows:

Particulars	*Amount (₹)*
Fixed	*12,00,000*
Semi-variable (60% expenses are of fixed nature and 40% are of variable nature)	*1,80,000*
Variable	*6,00,000*

Actual production during the month of April, 2021 was 8,000 units. Each month has 20 working days. During the month there was one public holiday. The actual overheads were as follows:

Particulars	*Amount (₹)*
Fixed	*1,10,000*
Semi-variable (60% expenses are of fixed nature and 40% are of variable)	*19,200*
Variable	*48,000*

You are required to calculate the following variances for the month of April 2021:

i. Overhead Cost variance

ii. Fixed Overhead Cost variance

iii. Variable Overhead Cost variance

iv. Fixed Overhead Volume variance

v. Fixed Overhead Expenditure Variance

vi. Calendar Variance ***(10 Marks)***

(b) XYZ Ltd. manufactures a single product. It recovers factory overheads at a pre-determined rate of ₹ 20 per man-day.

During the year 2020-21, the total factory overheads incurred and the man-days actually worked were ₹ 35.50 lakhs and 1.50 lakh days respectively. Out of the amount of ₹ 35.50 lakhs, ₹ 2.00 lakhs were in respect of wages for stick period and ₹ 1.00 lakh was in respect of expenses of previous year booked in this current year. During the period, 50,000 units were sold. At the end of the period, 12,000 completed units were held in stock but there was no opening stock of finished goods. Similarly, there was no stock of uncompleted units at the beginning of the period but at the end of the period there were 20,000 uncompleted units which may be treated as 65% complete in all respects.

On investigation, it was found that 40% of the unabsorbed overheads were due to factory inefficiency and the rest were attributable to increase in the cost of indirect materials and indirect labour. You are required to:

(i) Calculate the amount of unabsorbed overheads during the year 2020-21.

(ii) Show the accounting treatment of unabsorbed overheads in cost accounts and pass journal entry. ***(10 Marks)***

Answer

(a) Working Notes

Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{₹\,12,00,000}{1,20,000\text{ units}}$	₹ 10
Fixed Overheads element in Semi-Variable Overheads i.e. 60% of ₹1,80,000	₹ 1,08,000
Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{₹\,1,08,000}{1,20,000\text{units}}$	₹ 0.90
Standard Rate of Absorption of Fixed Overheads *per unit* (₹10 + ₹0.90)	₹ 10.90
Fixed Overheads Absorbed on 8,000 units @ ₹ 10.90	₹ 87,200
Budgeted Variable Overheads	₹ 6,00,000
Add: Variable element in Semi-Variable Overheads 40% of ₹ 1,80,000	₹ 72,000
Total Budgeted Variable Overheads	₹ 6,72,000
Standard Variable Cost *per unit* = $\frac{\text{Budgeted Variable Overheads}}{\text{Budgeted Output}} = \frac{₹\,6,72,000}{1,20,000\text{ units}}$	₹5.60
Standard Variable Overheads for 8,000 units @ ₹5.60	₹ 44,800
Budgeted Annual Fixed Overheads (₹ 12,00,000 + 60% of ₹ 1,80,000)	₹ 13,08,000
Possible Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Days}} \times \text{Actual Days} = \left[\frac{₹\,1,09,000}{20\text{ Days}} \times 19\text{ Days}\right]$	₹ 1,03,550
Actual Fixed Overheads (₹1,10,000 + 60% of ₹ 19,200)	₹ 1,21,520
Actual Variable Overheads (₹48,000 + 40% of ₹19,200)	₹ 55,680

COMPUTATION OF VARIANCES

i. Overhead Cost Variance = Absorbed Overheads – Actual Overheads

= (₹ 87,200 + ₹ 44,800) – (₹ 1,21,520 + ₹ 55,680)

= ₹ 45,200 (A)

ii. Fixed Overhead Cost Variance = Absorbed Fixed Overheads – Actual Fixed Overheads

= ₹ 87,200 – ₹ 1,21,520

= ₹ 34,320 (A)

iii. Variable Overhead Cost Variance = Standard Variable Overheads for Production– Actual Variable Overheads

= ₹ 44,800 – ₹ 55,680

= ₹ 10,880 (A)

iv. Fixed Overhead Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads

= ₹ 87,200 – ₹1,09,000

= ₹ 21,800 (A)

v. Fixed Overhead Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads

= ₹ 10.90 × 10,000 units – ₹ 1,21,520

= ₹ 12,520 (A)

vi. Calendar Variance = Possible Fixed Overheads – Budgeted Fixed Overheads

= ₹ 1,03,550 – ₹ 1,09,000

= ₹ 5,450 (A)

OR

Calendar Variance = (Actual days – Budgeted days) x Standard fixed overhead rate per day

Standard fixed overhead rate per day = 1308000/20*12 = ₹ 5450

Fixed Overhead Calendar Variance = (19-20) x 5450 = 5450(A)

(b) (i) Amount of under-absorption of overheads during the year 2020-21

	(₹)
Total production overheads actually incurred during the year 2020-21	35,50,000
Less: Wages paid during strike period ₹2,00,000	
Wages of previous year booked in current year ₹ 1,00,000	3,00,000
Net production overheads actually incurred: (A)	32,50,000
Production overheads absorbed by 1.50 lakh man-days @ ₹ 20 per man-day: (B)	30,00,000
Amount of under-absorption of production overheads: [(A)–(B)]	2,50,000

(ii) Accounting treatment of under absorption of production overheads: It is given in the statement of the question that 62,000 units (50,000 sold + 12,000 closing stock – 0 opening stock) were completely finished and 20,000 units were 65% complete, 40% of the under-absorbed overheads were due to factory inefficiency and the rest were attributable to increase in cost of indirect materials and indirect labour.

	(₹)
1. (40% of ₹2,50,000) i.e. ₹ 1,00,000 of under – absorbed overheads were due to factory inefficiency. This being abnormal, should be debited to the Costing Profit and Loss A/c	1,00,000
2. Balance (60% of ₹ 2,50,000) i.e. ₹ 1,50,000 of under – absorbed overheads should be distributed over work-in-progress, finished goods and cost of sales by using supplementary rate	1,50,000
Total under-absorbed overheads	2,50,000

Apportionment of unabsorbed overheads of ₹1,50,000 over work-in-progress, finished goods and cost of sales.

	Equivalent Completed units	(₹)
Work-in-progress (13,000 units × ₹ 2) (Refer to Working Note)	20000 * 65% = 13,000	26,000
Finished goods (12,000 units × ₹ 2)	12,000	24,000
Cost of sales (50,000 units × ₹ 2)	50,000	1,00,000
	75,000	1,50,000

Journal entry:

Work-in-progress control A/c	Dr.	₹ 26,000	
Finished goods control A/c	Dr.	₹ 24,000	
Cost of Sales A/c	Dr.	₹ 1,00,000	
Costing Profit & Loss A/c	Dr.	₹ 1,00,000	
To Overhead control A/c			₹ 2,50,000

Working Note:

Supplementary overhead absorption rate $= \frac{₹\ 1,50,000}{75,000 \text{ units}} = ₹\ 2$ per unit

Question 6

Answer any four of the following:

(a) Briefly explain the 'techniques of costing'.

(b) Narrate the terms 'Joint Products' and 'By-Products' with an example of each term.

(c) Discuss the steps involved in setting labour time standards.

(d) What is 'Budgetary Control System' and discuss the components of the same.

(e) Describe the difference between 'Cost Control' and 'Cost Reduction'. ***(4 x 5 = 20 Marks)***

Answer

(a)

Techniques	Description
Uniform Costing	When a number of firms in an industry agree among themselves to follow the same system of costing in detail, adopting common terminology for various items and processes they are said to follow a system of uniform costing. Advantages of such a system are: i. A comparison of the performance of each of the firms can be made with that of another, or with the average performance in the industry. ii. Under such a system, it is also possible to determine the cost of production of goods which is true for the industry as a whole. It is found useful when tax-relief or protection is sought from the Government.
Marginal Costing	It is defined as the ascertainment of marginal cost by differentiating between fixed and variable costs. It is used to ascertain effect of changes in volume or type of output on profit.

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

(b) (i) **Joint Products** - Joint products represent "two or more products separated in the course of the same processing operation usually requiring further processing, each product being in such proportion that no single product can be designated as a major product".

In other words, two or more products of equal importance, produced, simultaneously from the same process, with each having a significant relative sale value are known as joint products.

For example, in the oil industry, gasoline, fuel oil, lubricants, paraffin, coal tar, asphalt and kerosene are all produced from crude petroleum. These are known as joint products.

(ii) **By-Products** - These are defined as "products recovered from material discarded in a main process, or from the production of some major products, where the material value is to be considered at the time of severance from the main product." Thus, by-products emerge as a result of processing operation of another product or they are produced from the scrap or waste of materials of a process. In short, a by-product is a secondary or subsidiary product which emanates as a result of manufacture of the main product.

The point at which they are separated from the main product or products is known as split-off point. The expenses of processing are joint till the split –off point.

Examples of by-products are molasses in the manufacture of sugar, tar, ammonia and benzole obtained on carbonisation of coal and glycerine obtained in the manufacture of soap.

(c) Procedure of Setting Labour Time Standards

The following are the steps involved in setting labour standards:

(a) **Standardisation:** Products to be produced are decided based on production plan and customer's order.

(b) **Labour specification:** Types of labour and labour time is specified. Labour time specification is based on past records and it takes into account normal wastage of time.

(c) **Standardisation of methods:** Selection of proper machines to use proper sequence and method of operations.

(d) **Manufacturing layout:** A plan of operation for each product listing the operations to be performed is prepared.

(e) **Time and motion study:** It is conducted for selecting the best way of completing the job or motions to be performed by workers and the standard time which an average worker will take for each job. This also takes into account the learning efficiency and learning effect.

(f) **Training and trial:** Workers are trained to do the work and time spent at the time of trial run is noted down.

(d) **Budgetary Control System:** It is the system of management control and accounting in which all the operations are forecasted and planned in advance to the extent possible and the actual results compared with the forecasted and planned results.

Components of Budgetary Control System: The policy of a business for a defined period is represented by the master budget, the detailed components of which are given in a number of individual budgets called functional budgets. These functional budgets are broadly grouped under the following heads:

1. **Physical budgets:** Those budgets which contain information in quantitative terms such as the physical units of sales, production etc. This may include quantity of sales, quantity of production, inventories, and manpower budgets are physical budgets.

2. **Cost budgets:** Budgets which provides cost information in respect of manufacturing, administration, selling and distribution, etc. for example, manufacturing costs, selling costs, administration cost, and research and development cost budgets are cost budgets.

3. **Profit budgets:** A budget which enables the ascertainment of profit. For example, sales budget, profit and loss budget, etc.

4. **Financial budgets:** A budget which facilitates in ascertaining the financial position of a concern, for example, cash budgets, capital expenditure budget, budgeted balance sheet etc.

(e)

Cost Control	Cost Reduction
1. Cost control aims at *maintaining* the costs in accordance with the established standards.	1. Cost reduction is concerned with *reducing* costs. It challenges all standards and endeavours to improvise them continuously
2. Cost control seeks to *attain lowest possible cost* under existing conditions.	2. Cost reduction recognises no condition as permanent, since a *change will result in lower cost.*
3. In case of cost control, emphasis is on *past and present*	3. In case of cost reduction, it is on *present and future.*
4. Cost control is a *preventive* function	4. Cost reduction is a *corrective* function. It operates even when an efficient cost control system exists.
5. Cost control ends when targets are achieved.	5. Cost reduction has no visible end and is a continuous process.

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer

Question 1

Answer the following:

(a) *A Limited a toy company purchases its requirement of raw material from S Limited at ₹120 per kg. The company incurs a handling cost of ₹400 plus freight of ₹350 per order. The incremental carrying cost of inventory of raw material is ₹0.25 per kg per month. In addition the cost of working capital finance on the investment in inventory of raw material is ₹15 per kg per annum. The annual production of the toys is 60,000 units and 5 units of toys are obtained from one kg. of raw material.*

Required:

(i) *Calculate the Economic Order Quantity (EOQ) of raw materials.*

(ii) *Advise, how frequently company should order to minimize its procurement cost. Assume 360 days in a year.*

(iii) *Calculate the total ordering cost and total inventory carrying cost per annum as per EOQ.*

(b) *PQR Limited has replaced 72 workers during the quarter ended 31st March 2022. The labour rates for the quarter are as follows:*

Flux method	*16%*
Replacement method	*8%*
Separation method	*5%*

You are required to ascertain:

(i) *Average number of workers on roll (for the quarter),*

(ii) *Number of workers left and discharged during the quarter,*

(iii) *Number of workers recruited and joined during the quarter,*

(iv) *Equivalent employee turnover rates for the year.*

(c) Top-tech a manufacturing company is presently evaluating two possible machines for the manufacture of superior Pen-drives. The following information is available:

Particulars	*Machine A*	*Machine B*
Selling price per unit	*₹ 400.00*	*₹ 400.00*
Variable cost per unit	*₹ 240.00*	*₹ 260.00*
Total fixed costs per year	*₹ 350 lakhs*	*₹ 200 lakhs*
Capacity (in units)	*8,00,000*	*10,00,000*

Required:

(i) Recommend which machine should be chosen?

(ii) Would you change your answer, if you were informed that in near future demand will be unlimited and the capacities of the two machines are as follows?

Machine A - 12,00,000 units

Machine B - 12,00,000 units

Why?

(d) Coal is transported from two mines X & Y and unloaded at plots in a railway station. X is at distance of 15 kms and Y is at a distance of 20 kms from the rail head plots. A fleet of lorries having carrying capacity of 4 tonnes is used to transport coal from the mines. Records reveal that average speed of the lorries is 40 kms per hour when running and regularly take 15 minutes to unload at the rail head.

At Mine X average loading time is 30 minutes per load, while at mine Y average loading time is 25 minutes per load.

Additional Information:

Drivers' wages, depreciation, insurance and taxes, etc. ₹ 12 per hour

Operated Fuel, oil tyres, repairs and maintenance, etc. ₹ 1.60 per km

You are required to prepare a statement showing the cost per tonne kilometre of carrying coal from each mine 'X' and 'Y'. ***(4 x 5 = 20 Marks)***

Answer

(a) Annual requirement of raw material in kg. (A) = $\frac{60{,}000 \text{ units}}{5 \text{ units per kg.}}$ = **12,000 kg.**

Ordering Cost (Handling & freight cost) (O) = ₹ 400 + ₹ 350 = ₹ 750

Carrying cost per unit per annum i.e. inventory carrying cost + working capital cost (c × i)

= (₹ 0.25 × 12 months) + ₹15

= ₹ 18 per kg.

(i) E.O.Q.= $\sqrt{\frac{2\times 12,000\text{kgs.}\times ₹\ 750}{₹\ 18}}$ **= 1,000 kg.**

(ii) Frequency of orders for procurement:

Annual consumption (A) = 12,000 kg.

Quantity per order (EOQ) = 1,000 kg.

No. of orders per annum $(\frac{A}{EOQ})$ = $\frac{12,000\text{kg.}}{1,000\text{kg.}}$ = 12

Frequency of placing orders (in months) = $\frac{12\text{months}}{12\text{orders}}$ **= 1 months**

Or, (in days) = $\frac{360\text{days}}{12\text{orders}}$ = **30 days**

(iii) Calculation of total ordering cost and total inventory carrying cost as per EOQ:

	Amount/Quantity
Size of the order	1,000 kg.
No. of orders	12
Cost of placing orders	**₹ 9,000** (12 orders × ₹ 750)
Inventory carrying cost	**₹ 9,000** (1,000 kg. × ½ × ₹ 18)
Total Cost	₹18,000

(b) Working Note:

(i) Average number of workers on roll (for the quarter):

Employee Turnover rate using Replacement method

$$=\frac{\text{No. of replacements}}{\text{Average number of workers on roll}}\times 100$$

Or, $\frac{8}{100}$ = $\frac{72}{\text{Average number of workers on roll}}$

Or, Average number of workers on roll = $\frac{72\times 100}{8}$ **= 900**

(ii) Number of workers left and discharged:

Employee turnover rate (Separation method)

$$= \frac{\text{No. of Separations(S)}}{\text{Average number of workers on roll}} \times 100 = \frac{5}{100} = \frac{S}{900} \text{ Or, } S = 45$$

Hence, number of workers left and discharged comes **to 45**

(iii) Number of workers recruited and joined:

Employee turnover rate (Flux method)

$$= \frac{\text{No. of Separations*(S)+No. of Accessions(A)}}{\text{Average number of workers on roll}}$$

$$\text{Or, } \frac{16}{100} = \frac{45+A}{900} \quad \text{Or, } A = \left\lfloor \frac{14400}{100} - 45 \right\rfloor = 99$$

No. of workers recruited and joined 99

(iv) Calculation of Equivalent employee turnover rates:

$$= \frac{\text{EmployeeTurnove rate for the quarter(s)}}{\text{Number of quarter(s)}} \times 4 \text{ quarters}$$

Using Flux method $= \frac{16\%}{1} \times 4 = 64\%$

Using Replacement method $= \frac{8\%}{1} \times 4 = 32\%$

Using Separation method $= \frac{5\%}{1} \times 4 = 20\%$

(c)

		Machine-A	Machine-B	Total
A	Selling price per unit (₹)	400	400	
B	Variable cost per cost (₹)	240	260	
C	Contribution per unit (₹) [A-B]	160	140	
D	Units	8,00,000	10,00,000	
E	Total contribution (₹ [C×D]	12,80,00,000	14,00,00,000	26,80,00,000
F	Fixed Cost (₹)	3,50,00,000	2,00,00,000	5,50,00,000
G	Profit [E-F] (₹)	9,30,00,000	12,00,00,000	21,30,00,000
H	Profit per unit [G÷D] (₹)	116.25	120.00	

(i) Machine B has the higher profit of ₹2,70,00,000 than the Machine-A. Further, Machine-B's fixed cost is less than the fixed cost of Machine-A and higher capacity. Hence, **Machine B be recommended.**

Note: This question can also be solved as below:

Indifferent point = Difference in fixed cost / difference in variable cost per unit

= 1,50,00,000 / 20 = 7,50,000 units

At the level of demand 7,50,000 units both machine options equally profitable.

If demand below 7,50,000 units, select machine B (with lower FC).

If demand above 7,50,000 units, select machine A (with lower VC).

(ii) When the capacities of both the machines are same and demand for the product is unlimited, calculation of profit will be as follows:

		Machine-A	Machine-B	Total
A	Contribution per unit (₹)	160	140	
B	Units	12,00,000	12,00,000	
C	Total contribution (₹) [A×B]	19,20,00,000	16,80,00,000	36,00,00,000
D	Fixed Cost (₹)	3,50,00,000	2,00,00,000	5,50,00,000
E	Profit [C-E] (₹)	15,70,00,000	14,80,00,000	30,50,00,000
F	Profit per unit [E÷B] (₹)	130.83	123.33	

Yes, the preference for the machine would change because now, Machine A is having higher contribution and higher profit, hence recommended.

(d) Statement showing the cost per tonne-kilometre of carrying mineral from each mine

	Mine X (₹)	Mine Y (₹)
Fixed cost per trip: (Refer to working note 1)		
(Driver's wages, depreciation, insurance and taxes)		
X: 1 hour 30 minutes @ ₹ 12 per hour	18.00	
Y: 1 hour 40 minutes @ ₹ 12 per hour		20.00
Running and maintenance cost:		
(Fuel, oil, tyres, repairs and maintenance)		
X: 30 km. ₹ 1.60 per km.	48.00	
Y: 40 km. ₹ 1.60 per km.		64.00

Total cost per trip (₹)	66.00	84.00
Cost per tonne – km (Refer to working note 2)	1.1 $\left(\frac{₹\ 66}{60\ \text{tonne - km}}\right)$	1.05 $\left(\frac{₹\ 84}{80\ \text{tonne - km}}\right)$

Working notes:

		Mine- X	Mine- Y
(1)	Total operated time taken per trip		
	Running time to & fro	**45 minutes** $\left(30\,\text{km.} \times \frac{60\,\text{minutes}}{40\,\text{km.}}\right)$	**60 minutes** $\left(40\,\text{km.} \times \frac{60\,\text{minutes}}{40\,\text{km.}}\right)$
	Un-loading time	15 minutes	15 minutes
	Loading time	30 minutes	25 minutes
	Total operated time	**90 minutes or** 1 hour 30 minutes	**100 minutes or** 1 hour 40 minutes
(2)	Effective tones – km.	60 (4 tonnes × 15 km.)	80 (4 tonnes × 20 km.)

Question 2

(a) In a manufacturing company, the overhead is recovered as follows:

Factory Overheads: a fixed percentage basis on direct wages and

Administrative overheads: a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period.

	Job 1 (₹)	*Job 2 (₹)*
Direct materials	*1,08,000*	*75,000*
Direct wages	*84,000*	*60,000*
Selling price	*3,33,312*	*2,52,000*
Profit percentage on total cost	*12%*	*20%*

You are required to:

(i) Compute the percentage recovery rates of factory overheads and administrative overheads.

(ii) Calculate the amount of factory overheads, administrative overheads and profit for each of the two jobs.

(iii) Using the above recovery rates, determine the selling price to be quoted for job 3. Additional data pertaining to Job 3 is as follows:

Direct materials	*₹ 68,750*
Direct wages	*₹ 22,500*
Profit percentage on selling price	*15%*

(10 Marks)

(b) Paramount Constructions Limited is engaged in construction and erection of bridges under long term contracts. It has entered into a big contract at an agreed price of ₹ 250 Lakhs subject to an escalation clause for material and labour as spelt out in the contract and corresponding actual are as follows:

	Standard		*Actual*	
Material	*Quantity Tonnes*	*Rate Per Tonne (₹)*	*Quantity Tonnes*	*Rate Per Tonne (₹)*
P	*2,800*	*1,500*	*3,000*	*1,750*
Q	*3,100*	*900*	*2,900*	*800*
R	*800*	*4,500*	*950*	*4,350*
S	*150*	*32,500*	*120*	*34,200*
Labour	*Hours*	*Hourly rate (₹)*	*Hours*	*Hourly rate (₹)*
LM	*65,000*	*60*	*61,500*	*70*
LN	*46,000*	*45*	*45,000*	*50*

Required:

(i) Prepare a statement showing admissible additional claim of material and labour due to escalation clause.

(ii) Determine the final price payable after admissible escalation claim. ***(5 Marks)***

(c) Distinguish between Job costing and Process Costing. (Any five points of differences)

(5 Marks)

Answer

(a) (i) Computation of percentage recovery rates of factory overheads and administrative overheads.

Let the factory overhead recovery rate as percentage of direct wages be F and administrative overheads recovery rate as percentage of factory cost be A.

Factory Cost of Jobs:

Direct materials + Direct wages + Factory overhead

For Job 1 = ₹ 1,08,000 +₹ 84,000 + ₹ 84,000F

For Job 2 = ₹ 75,000 +₹ 60,000 + ₹ 60,000F

Total Cost of Jobs:

Factory cost + Administrative overhead

For Job 1 = (₹ 1,92,000 + ₹ 84,000F) + (₹ 1,92,000 + ₹ 84,000F) A = ₹ 2,97,600*

For Job-2 = (₹ 1,35,000 + ₹ 60,000F) + (₹1,35,000+ ₹ 60,000F) A = ₹ 2,10,000**

The value of F & A can be found using following equations

1,92,000 + 84,000F + 1,92,000A + 84,000AF = ₹ 2,97,600 ……eqn (i)

1,35,000 + 60,000F + 1,35,000A + 60,000AF = ₹ 2,10,000 ……eqn (ii)

Multiply equation (i) by 5 and equation (ii) by 7

9,60,000 + 4,20,000F + 9,60,000A + 4,20,000AF = ₹14,88,000 ...eqn (iii)

9,45,000 + 4,20,000F + 9,45,000A + 4,20,000AF = ₹ 14,70,000 ...eqn (iv)

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15,000 + 15,000A = ₹18,000

15,000 A = 18,000 – 15,000

A = 0.20

Now putting the value of A in equation (i) to find the value of F

1,92,000 + 84,000F + (1,92,000 × 0.20) + (84,000 F × 0.20)= ₹ 2,97,600

Or

1,92,000 + 84,000F+38,400+16,800 F = ₹2,97,600

1,00,800 F = 67,200

F = 0.667

On solving the above relations: F = 0.667 and A = 0.20

Hence, percentage recovery rates of:

Factory overheads = 66.7% or 2/3rd of wages and

Administrative overheads = 20% of factory cost.

Working note:

$$\text{Total Cost} = \frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$$

$$\text{*For Job 1} = \frac{₹\ 3,33,312}{(100\% + 12\%)} = ₹\ 2,97,600$$

$$\text{**For Job 2} = \frac{₹2,52,000}{(100\% + 20\%)} = ₹\ 2,10,000$$

(ii) Statement of jobs, showing amount of factory overheads, administrative overheads and profit:

	Job 1	Job 2
	(₹)	(₹)
Direct materials	1,08,000	75,000
Direct wages	84,000	60,000
Prime cost	1,92,000	1,35,000
Factory overheads		
2/3rd of direct wages	**56,000**	**40,000**
Factory cost	2,48,000	1,75,000
Administrative overheads		
20% of factory cost	**49,600**	**35,000**
Total cost	**2,97,600**	**2,10,000**
Profit (12% & 20% respectively)	**35,712**	**42,000**
Selling price	3,33,312	2,52,000

(iii) Selling price of Job 3

	(₹)
Direct materials	68,750
Direct wages	22,500

Prime cost	91,250
Factory overheads (2/3rd of Direct Wages)	15,000
Factory cost	1,06,250
Administrative overheads (20% of factory cost)	21,250
Total cost	**1,27,500**
Profit margin (balancing figure)	22,500
Selling price $\left\lfloor \frac{\text{Total Cost}}{85\%} \right\rfloor$	**1,50,000**

(b) Statement showing Additional claim

	Standard Qty/Hrs.	Standard Rate (₹)	Actual Rate (₹)	Variation in Rate (₹)	Escalation Claim (₹)
	(a)	(b)	(c)	(d) = (c)–(b)	(e) =(a) × (d)
Materials					
P	2,800	1,500	1,750	250	7,00,000
Q	3,100	900	800	(100)	(3,10,000)
R	800	4,500	4,350	(150)	(1,20,000)
S	150	32,500	34,200	1,700	2,55,000
				Materials escalation claim: (A)	5,25,000
Wages					
LM	65,000	60	70	10	6,50,000
LN	46,000	45	50	5	2,30,000
				Wages escalation claim: (B)	8,80,000
				Final claim: (A + B)	14,05,000

Statement showing final price payable

	(₹)	(₹)
Agreed price		2,50,00,000
Add: Agreed escalation		
Material cost	5,25,000	
Labour cost	8,80,000	**14,05,000**
Final price payable		**2,64,05,000**

(c)

Job Costing	Process Costing
(i) A Job is carried out or a product is produced by specific orders.	The process of producing the product has a continuous flow and the product produced is homogeneous.
(ii) Costs are determined for each job.	Costs are compiled on time basis i.e., for production of a given accounting period for each process or department.
(iii) Each job is separate and independent of other jobs.	Products lose their individual identity as they are manufactured in a continuous flow.
(iv) Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
(v) Costs are computed when a job is completed. The cost of a job may be determined by adding all costs against the job.	Costs are calculated at the end of the cost period. The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
(vi) As production is not continuous and each job may be different, so more managerial attention is required for effective control.	Process of production is usually standardized and is therefore, quite stable. Hence control here is comparatively easier.

Question 3

(a) SR Ltd. is a manufacturer of Garments. For the first three months of financial year 2022-23 commencing on 1st April 2022, production will be constrained by direct labour. It is estimated that only 12,000 hours of direct labour hours will be available in each month.

For market reasons, production of either of the two garments must be at least 25% of the production of the other. Estimated cost and revenue per garment are as follows:

	Shirt (₹)	*Short (₹)*
Sales price	*60*	*44*
Raw Materials		
Fabric @12 per metre	*24*	*12*
Dyes and cotton	*6*	*4*
Direct labour @ 8 per hour	*8*	*4*
Fixed Overhead @ 4 per hour	*4*	*2*
Profit	*18*	*22*

From the month of July 2022 direct labour will no longer be a constraint. The company expects to be able to sell 15,000 shirts and 20,000 shorts in July, 2022. There will be no opening stock at the beginning of July 2022.

Sales volumes are expected to grow at 10% per month cumulatively thereafter throughout the year. Following additional information is available:

- *The company intends to carry stock of finished garments sufficient to meet 40% of the next month's sale from July 2022 onwards.*
- *The estimated selling price will be same as above.*

Required:

I. Calculate the number of shirts and shorts to be produced per month in the first quarter of financial year 2022-2023 to maximize company's profit.

II. Prepare the following budgets on a monthly basis for July, August and September 2022:

(i) Sales budget showing sales units and sales revenue for each product.

(ii) Production budget (in units) for each product. ***(10 Marks)***

(b) The following data are available from the books and records of A Ltd. for the month of April 2022:

Particulars	*Amount (₹)*
Stock of raw materials on 1st April 2022	*10,000*
Raw materials purchased	*2,80,000*
Manufacturing wages	*70,000*
Depreciation on plant	*15,000*
Expenses paid for quality control check activities	*4,000*
Lease Rent of Production Assets	*10,000*
Administrative Overheads (Production)	*15,000*
Expenses paid for pollution control and engineering & maintenance	*1,000*
Stock of raw materials on 30th April 2022	*40,000*
Primary packing cost	*8,000*
Research & development cost (Process related)	*5,000*
Packing cost for redistribution of finished goods	*1,500*
Advertisement expenses	*1,300*

Stock of finished goods as on 1st April 2022 was 200 units having a total cost of ₹ 28,000. The entire opening stock of finished goods has been sold during the month.

Production during the month of April, 2022 was 3,000 units. Closing stock of finished goods as on 30th April, 2022 was 400 units.

You are required to:

I. Prepare a Cost Sheet for the above period showing the:

(i) Cost of Raw Material consumed

(ii) Prime Cost

(iii) Factory Cost

(iv) Cost of Production

(v) Cost of goods sold

(vi) Cost of Sales

II. Calculate selling price per unit, if sale is made at a profit of 20% on sales.

(10 Marks)

Answer

(a) I. Calculation of number of shirts & shorts to be produced per month:

Contribution per labour hour:

		Shirts (₹)	Shorts (₹)
A	Sales Price per unit	60	44
B	Variable Cost:		
	- Raw materials	30	16
	- Direct labour	8	4
		38	20
C	Contribution per unit [A-B]	22	24
D	Labour hour per unit	1 hour	0.5 hour
E	Contribution per labour hour [C÷D]	**22**	**48**

Production plan for the first three months:

Since, Shorts has the higher Contribution per labour hour, it will be made first. Shirts will be 25% of Shorts. The quantity will be determined as below:

Let the Quantity of Shorts be X and Shirts will be 0.25 X, then

(Qty. of Shorts × labour hour per unit) + (Qty. of Shirts × labour hour per unit) = Total labour hours available

Or, (X × 0.5 hour) + (0.25X × 1 hour) = 12,000 hours

Or, 0.5X + 0.25X = 12,000

Or, 0.75X = 12,000

Or, X = 12,000÷0.75

= 16,000 units of Shorts

Therefore, for Shirts = 25% of 16,000 units

= 4,000 units

Production per month for the first quarter will be:

Shorts- 16,000 units &

Shirts- 4,000 units

II. (i) Sales Budget for the month of July, August & September 2022:

		July 2022		August 2022		September 2022	
		Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
A	Sales demand	15,000	20,000	16,500	22,000	18,150	24,200
B	Selling price per unit (₹)	60	44	60	44	60	44
C	Sales Revenue (₹)	9,00,000	8,80,000	9,90,000	9,68,000	10,89,000	10,64,800

(ii) Production budget for the month of July, August & September 2022:

		July 2022		August 2022		September 2022		October 2022	
		Shirts	Shorts	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
A	Opening stock	0	0	6,600	8,800	7,260	9,680		
B	Sales demand	15,000	20,000	16,500	22,000	18,150	24,200	19,965	26,620
C	Closing stock	6,600	8,800	7,260	9,680	7,986	10,648		
D	Production [B+C-A]	21,600	28,800	17,160	22,880	18,876	25,168		

(b) I. Statement of Cost (for the month of April, 2022)

S. No.	Particulars	Amount (₹)	Amount (₹)
	Opening stock of Raw material	10,000	
	Add: Purchase of Raw material	2,80,000	
	Less: Closing stock of raw materials	(40,000)	
(i)	**Raw material consumed**		**2,50,000**
	Manufacturing wages		70,000

(ii)	**Prime Cost**		**3,20,000**
	Factory/work overheads:		
	Depreciation on plant	15,000	
	Lease rent of production Asset	10,000	
	Expenses paid for pollution control and engineering & Maintenance	1,000	26,000
(iii)	**Factory/Work Cost**		**3,46,000**
	Expenses paid for quality control check activity		4,000
	Research and Development Cost		5,000
	Administration Overheads (Production)		15,000
	Primary Packing Cost		8,000
(iv)	**Cost of Production**		**3,78,000**
	Add: Opening stock of finished goods		28,000
	Less: Closing stock of finished goods		**(50,400**)
(v)	**Cost of Goods Sold**		**3,55,600**
	Advertisement expenses		1,300
	Packing cost for re-distribution of finished goods sold		1,500
(vi)	**Cost of Sales**		**3,58,400**

Note: Valuation of Closing stock of finished goods

$$= \frac{3,78,000}{3000 \text{ units}} \times 400 \text{ units}$$

$$= ₹50,400$$

II. Cost per unit sold $= \frac{3,58,400}{200+3,000-400} = ₹\ 128$ per unit

$\therefore$ Selling Price $= \frac{128}{80\%}$ = **₹160 per unit**

Question 4

(a) STG Limited is a manufacturer of Chemical 'GK', which is required for industrial use. The complete production operation requires two processes. The raw material first passes through Process I, where Chemical 'G' is produced. Following data is furnished for the month April 2022:

Particulars	*(in kgs.)*
Opening work-in-progress quantity (Material 100% and conversion 50% complete)	*9,500*
Material input quantity	*1,05,000*
Work Completed quantity	*83,000*
Closing work-in-progress quantity (Material 100% and conversion 60% complete)	*16,500*

You are further provided that:

Particulars	*(in ₹)*
Opening work-in-progress cost	
Material cost	*29,500*
Processing cost	*14,750*
Material input cost	*3,34,500*
Processing cost	*2,53,100*

Normal process loss may be estimated to be 10% of material input. It has no realizable value. Any loss over and above normal loss is considered to be 100% complete in material and processing.

The Company transfers 60,000 kgs. of output (Chemical G) from Process I to Process II for producing Chemical 'GK'. Further materials are added in Process II which yield 1.20 kg. of Chemical 'GK' for every kg. of Chemical 'G' introduced. The chemicals transferred to Process II for further processing are then sold as Chemical 'GK' for ₹ 10 per kg. Any quantity of output completed in Process I, are sold as Chemical 'G' @ ₹ 9 per kg.

The monthly costs incurred in Process II (other than the cost of Chemical 'G') are:

Input 60,000 kg. of Chemical 'G'

Materials Cost *₹ 85,000*

Processing Costs *₹ 50,000*

You are required:

(i) Prepare Statement of Equivalent production and determine the cost per kg. of Chemical 'G' in Process I using the weighted average cost method.

(ii) Prepare a statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in progress.

(iii) STG is considering the option to sell 60,000 kg. of Chemical 'G' of Process I without processing it further in Process-II. Will it be beneficial for the company over the current pattern of processing 60,000 kg in process-II? ***(10 Marks)***

(Note: You are not required to prepare Process Accounts)

(b) *UV Limited started a manufacturing unit from 1st October 2021. It produces designer lamps and sells its lamps at ₹ 450 per unit.*

During the quarter ending on 31st December, 2021, it produced and sold 12,000 units and suffered a loss of ₹ 35 per unit.

During the quarter ending on 31st March, 2022, it produced and sold 30,000 units and earned a profit of ₹ 40 per unit.

You are required to calculate:

(i) Total fixed cost incurred by UV ltd. per quarter.

(ii) Break Even sales value (in rupees)

(iii) Calculate Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30th June, 2022). ***(5 Marks)***

(c) *Journalize the following transactions assuming the cost and financial accounts are integrated:*

Particulars	*Amount (₹)*
Direct Materials issued to production	*₹ 5,88,000*
Allocation of Wages (Indirect)	*₹ 7,50,000*
Factory Overheads (Over absorbed)	*₹ 2,25,000*
Administrative Overheads (Under absorbed)	*₹ 1,55,000*
Deficiency found in stock of Raw material (Normal)	*₹ 2,00,000*

(5 Marks)

Answer

(a) (i) Statement of Equivalent Production

Particulars	Input quantity	Particulars	Total	Material		Processing Cost	
				%	Units	%	Units
Opening WIP	9,500	Units completed	83,000	100%	83,000	100%	83,000
Material Input	1,05,000	Normal loss (10% of 1,05,000)	10,500	-	-	-	-
		Abnormal loss (Bal. fig.)	4,500	100%	4,500	100%	4,500

		Closing WIP	16,500	100%	16,500	60%	9,900
	1,14,500		1,14,500		1,04,000		97,400

Statement of Cost for each element

Particulars	Material	Processing	Total cost
	(₹)	(₹)	(₹)
Cost of opening WIP	29,500	14,750	44,250
Cost incurred during the month	3,34,500	2,53,100	5,87,600
Total cost (A)	3,64,000	2,67,850	6,31,850
Equivalent production (B)	1,04,000	97,400	
Cost per kg of Chemical 'G' (A/B)	**3.5**	**2.75**	6.25

Alternative Presentation

Statement showing cost per kg of each statement

	(₹)	(₹)
Material	$\frac{29,500+3,34,500}{1,04,000}$	3.5
Processing cost	$\frac{14,750+2,53,100}{97,400}$	2.75
Total Cost per kg		6.25

(ii) Statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in- progress

	(₹)
Units transferred (60,000 × 6.25)	**3,75,000**
Abnormal loss (4,500 × 6.25)	**28,125**
Closing work in progress:	
Material (16,500 × 3.5)	**57,750**
Processing cost (9,900 × 2.75)	**27,225**
	84,975

(iii) Calculation of Incremental Profit / Loss after further processing

Particulars	(₹)	(₹)
Sales if further processed (A) (60,000 x 1.20 x ₹ 10)	7,20,000	

Calculation of cost in Process II		
Chemical transferred from Process I	3,75,000	
Add: Material cost	85,000	
Add: Process cost	50,000	
Total cost of finished stock (B)	5,10,000	
Profit, if further processed (C = A – B)		2,10,000
If sold without further processing then,		
Sales (60,000 x ₹ 9)	5,40,000	
Less: Cost of input without further processing	3,75,000	
Profit without further processing (D)		1,65,000
Incremental Profit after further processing (C – D)		45,000
Additional net profit on further processing in Process II is 45,000. Therefore, it is advisable to process further chemical 'G'.		

Alternative Presentation

Calculation of Incremental Profit / Loss after further processing

	(₹)
If 60,000 units are sold @ ₹ 9	5,40,000
If 60,000 units are processed in process II (60,000 × 1.2 × ₹ 10)	7,20,000
Incremental Revenue (A)	**1,80,000**
Incremental Cost: (B)	
Material Cost	85,000
Processing Cost	50,000
	1,35,000
Incremental Profit (A-B)	45,000

Additional net profit on further processing in Process II is 45,000. Therefore, it is advisable to process further chemical 'G'.

(b)

	Quarter ending 31st December, 2021 (₹)	**Quarter ending 31st March, 2022 (₹)**
Sales (No. of units sold x ₹ 450 per unit)	54,00,000	1,35,00,000

Profit (Loss)	(4,20,000) [12,000 × 35]	12,00,000 [30,000 × 40]

$$\text{P/V Ratio} = \frac{\text{Change in profit}}{\text{Change in Sales}} \times 100$$

$$\therefore \frac{16,20,000}{81,00,000} \times 100 = \mathbf{20\%}$$

(i) Fixed Cost = Sales × P/V ratio – profit

= ₹ 1,35,00,000 × 20% – 12,00,000

= ₹ 15,00,000

Alternative Presentation for the calculation of Fixed cost

	Quarter ending 31st December, 2021 (₹)	**Quarter ending 31st March, 2022 (₹)**
Sales (No. of units sold x ₹ 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000) [12,000 × 35]	12,00,000 [30,000 × 40]
Total cost	58,20,000	1,23,00,000

VC per unit = (1,23,00,000 – 58,20,000) / (30,000 – 12,000)

= 64,80,000 / 18,000 =₹ 360 per unit

Fixed cost = TC – VC , 58,20,000 (360 x12,000 units) ₹15,00,000

(ii) Break even sales value (in Rupees) $= \frac{\text{Fixed cost}}{\text{P/V ratio}} \times 100$

$$= \frac{15,00,000}{20\%} = \mathbf{₹75,00,000}$$

(iii) Profit, if sales reach 50,000 units for the quarter ending 30th June, 2022

	(₹)
Sales (50,000 × ₹ 450)	2,25,00,000
Less: Variable cost	1,80,00,000
Contribution	45,00,000
Less: Fixed cost	15,00,000
Profit	**30,00,000**

(c)

Particulars			(₹)	(₹)
(i)	Work-in-Progress Ledger Control A/c	Dr.	5,88,000	
	To Stores Ledger Control A/c			5,88,000
	(Being issue of direct materials to production)			
(ii)	Factory Overhead control A/c	Dr.	7,50,000	
	To Wages Control A/c			7,50,000
	(Being allocation of Indirect wages)			
(iii)	Factory Overhead Control A/c	Dr.	2,25,000	
	To Costing Profit & Loss A/c			2,25,000
	(Being transfer of over absorption of Factory overhead)			
(iv)	Costing Profit & Loss A/c	Dr.	1,55,000	
	To Administration Overhead Control A/c			1,55,000
	(Being transfer of under absorption of Administration overhead)			
(v)	Factory Overhead Control A/c	Dr.	2,00,000	
	To Stores Ledger Control A/c			2,00,000
	(Being transfer of deficiency in stock of raw material)			

(Note: Costing P/&/L = P/&/L and SLC = MLC)

Question 5

(a) Star Limited manufacture three products using the same production methods. A conventional product costing system is being used currently. Details of the three products for a typical period are:

Product	*Labour Hrs. per unit*	*Machine Hrs. per unit*	*Materials per Unit*[1]	*Volume in Units*
AX	*1.00*	*2.00*	*35*	*7,500*
BX	*0.90*	*1.50*	*25*	*12,500*
CX	*1.50*	*2.50*	*45*	*25,000*

Direct Labour costs ₹ 20 per hour and production overheads are absorbed on a machine hour basis. The overhead absorption rate for the period is ₹ 30 per machine hour.

[1] Material cost per unit

Management is considering using Activity Based Costing system to ascertain the cost of the products. Further analysis shows that the total production overheads can be divided as follows:

Particulars	*%*
Cost relating to set-ups	*40*
Cost relating to machinery	*10*
Cost relating to material handling	*30*
Costs relating to inspection	*20*
Total production overhead	*100*

The following activity volumes are associated with the product line for the period as a whole. Total activities for the period:

Product	*No. of set-ups*	*No. of movements of Materials*	*No. of inspections*
AX	*350*	*200*	*200*
BX	*450*	*280*	*400*
CX	*740*	*675*	*900*
Total	*1,540*	*1,155*	*1,500*

Required:

(i) Calculate the cost per unit for each product using the conventional method.

(ii) Calculate the cost per unit for each product using activity based costing method.

(10 Marks)

(b) A manufacturing department of a company has employed 120 workers. The standard output of product "NPX" is 20 units per hour and the standard wage rate is ₹ 25 per labour hour.

In a 48 hours week, the department produced 1,000 units of 'NPX' despite 5% of the time paid being lost due to an abnormal reason. The hourly wages actually paid were ₹ 25.70 per hour.

Calculate:

(i) Labour Cost Variance

(ii) Labour Rate Variance

(iii) Labour Efficiency Variance

(iv) Labour Idle time Variance ***(5 Marks)***

(c) RST Limited produces three joint products X, Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for the month of April, 2022.

Cost incurred up to separation point: ₹10,000

	Product X	*Product Y*	*Product Z*
Output (in Litre)	*100*	*70*	*80*
	₹	*₹*	*₹*
Cost incurred after separation point	*2,000*	*1,200*	*800*
Selling Price per Litre:			
After further processing	*50*	*80*	*60*
At pre-separation point (estimated)	*25*	*70*	*45*

You are required to:

(i) Prepare a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.

(ii) Advise the management whether, on purely financial consideration, the three products are to be processed further or not. ***(5 Marks)***

Answer

(a) (i) Statement showing "Cost per unit" using "conventional method"

Particulars of Costs	**AX (₹)**	**BX (₹)**	**CX (₹)**
Direct Materials	35	25	45
Direct Labour	20	18	30
Production Overheads	60	45	75
Cost *per unit*	**115**	**88**	**150**

(ii) Statement Showing "Cost *per unit* using "Activity Based Costing"

Products	**AX**	**BX**	**CX**
Production (units)	7,500	12,500	25,000
	(₹)	**(₹)**	**(₹)**
Direct Materials	2,62,500	3,12,500	11,25,000
Direct Labour	1,50,000	2,25,000	7,50,000
Machine Related Costs	**45,000**	**56,250**	**1,87,500**

Products	AX	BX	CX
Setup Costs	**2,62,500**	**3,37,500**	**5,55,000**
Material handling Cost	**1,50,000**	**2,10,000**	**5,06,250**
Inspection Costs	**77,000**	**1,54,000**	**3,46,500**
Total Costs	9,47,000	12,95,250	34,70,250
Cost *per unit* (Total Cost ÷ Units)	**126.267**	**103.62**	**138.81**

Working Notes:

Calculation of Total Machine hours

Particulars	AX	BX	CX
(A) Machine hours per unit	2	1.5	2.5
(B) Production (units)	7,500	12,500	25,000
(C) Total Machine hours (A× B)	15,000	18,750	62,500

Total Machine hours = 96,250

Total Production overheads = 96,250 × 30 = ₹ 28,87,500

Calculation of Cost Driver Rate

Cost Pool	%	Overheads (₹)	Cost Driver (Basis)	Cost Driver (Units)	Cost Driver Rate (₹)
Set up	40	11,55,000	No of set ups	1,540	750 per set up
Machine Operation	10	2,88,750	Machine hours	96,250	3 per machine hour
Material Handling	30	8,66,250	No of material movement	1,155	750 per material movement
Inspection	20	5,77,500	No of inspection	1,500	385 per inspection

(b) Working Notes:

1. Calculation of standard man hours

When 120 worker works for 1 hr., then the std. output is 20 units.

Std. man hour per unit = $\frac{120 \text{ hrs.}}{20 \text{ units}}$ = 6 hrs.

2. Calculation of std. man hours for actual output

Total std. man hours = 1,000 units × 6 hrs. = 6,000 hrs.

Standard for actual			Actual				
Hours	Rate (₹)	Amount (₹)	Actual hrs. paid	Idle time hrs.	Production hrs.	Rate (₹)	Amount paid (₹)
6,000	25	1,50,000	5,760 (48 hrs. x 120 workers)	288	5,472	25.70	1,48,032

(i) Labour cost variance

= Std. labour cost – Actual labour cost

= 1,50,000 – 1,48,032 = ₹ 1,968 F

(ii) Labour rate variance

= (SR – AR) × AH_{Paid}

= (25 - 25.70) × 5,760 = ₹ 4,032 A

(iii) Labour efficiency variance

= (SH – AH) × SR

= (6,000 – 5,472) × 25 = ₹ 13,200 F

(iv) Labour Idle time variance

= Idle Hours × SR

= 288 × 25 = ₹ 7,200 A

Note: Variances can also be calculated for one worker instead of 120.

(c) (i) Statement showing profit/loss by each product after further processing products

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)
Sales value after further processing	5,000	5,600	4,800
Less: Further processing cost	2,000	1,200	800
Less: Joint Cost* (as apportioned)	4,000	2,800	3,200
Profit/(loss)	(1,000)	1,600	800

* Statement showing apportionment of joint cost on the basis of physical units

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)	Total (₹)
Output (in litre)	100	70	80	250
Weight	0.4 (100/250)	0.28 (70/250)	0.32 (80/250)	
Joint cost apportioned	4,000	2,800	3,200	

(ii) Decision whether to process further or not

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)
Incremental Revenue	2,500 [(50-25) × 100]	700 [(80-70) × 70]	1,200 [(60-45) × 80]
Less: Further processing cost	2,000	1,200	800
Incremental profit /(loss)	**500**	**(500)**	**400**

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)	Total
Sales	2500	4900	3600	11000
Pre separation costs	4000	2800	3200	10000
Profit/(Loss)	(1500)	2100	400	1000

It is advisable to further process only product X and Z and to sale product Y at the point of separation.

Question 6

Answer any four of the following:

(a) Briefly explain the essential features of a good Cost Accounting System.

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

(i) Cash discount

(ii) IGST

(iii) Demurrage

(iv) Shortage

(v) Basic Custom Duty

(c) Explain the treatment of Overtime Premium in following situations:

(i) SV & Co. wants to grab some special orders, and overtime is required to meet the same.

(ii) Dept. X has to work overtime to make up a shortfall in production due to some fault of management in dept. Y.

(iii) S Ltd. has to work overtime regularly throughout the year as a policy due to the workers' shortage.

(iv) Due to flood in Odisha, RS Ltd. has to work overtime to complete the job.

(v) A customer requested the company MN Ltd. to expedite the job because of his urgency of work.

(d) Discuss briefly some of the criticism which may be levelled against the Standard Costing System.

(e) Identify the methods of costing from the following statements:

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

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

(iii) Costs ascertained for a single product.

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

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

(4 x 5 = 20 Marks)

Answer

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

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

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

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

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

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

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

(b) Treatment of items associated with purchase of materials is tabulated as below

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

(c) Treatment of Overtime premium in different situations

Situation	Treatment
(i) SV & Co. wants to grab some special orders, and overtime is required to meet the same.	If overtime is required to cope with general production programmes or for meeting urgent orders, **the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.**
(ii) Dept. X has to work overtime to make up a shortfall in production due to some fault of management in dept. Y.	If overtime is worked in a department due to the fault of another department, **the overtime premium should be charged to the latter department (Y).**
(iii) S Ltd. has to work overtime regularly throughout the year as a policy due to the workers' shortage.	The overtime premium is treated as a part of **employee cost and job is charged at an effective average wage rate.**
(iv) Due to flood in Odisha, RS Ltd. has to work overtime to complete the job.	Overtime worked on account of abnormal conditions such as flood, earthquake etc., should **not be charged to cost, but to Costing Profit and Loss Account.**
(v) A customer requested the company MN Ltd. to expedite the job because of his urgency of work.	Where overtime is worked at the request of the customer, overtime premium is also **charged to the job/ customer directly.**

(d) Criticism of Standard Costing

(i) Variation in price: One of the chief problem faced in the operation of the standard costing system is the precise estimation of likely prices or rate to be paid. The variability of prices is so great that even actual prices are not necessarily adequately representative of cost. But the use of sophisticated forecasting techniques should be able to cover the price fluctuation to some extent. Besides this, the system provides for isolating uncontrollable variances arising from variations to be dealt with separately.

(ii) Varying levels of output: If the standard level of output set for pre-determination of standard costs is not achieved, the standard costs are said to be not realised. However, the statement that the capacity utilisation cannot be precisely estimated for absorption of overheads may be true only in some industries of jobbing type. In vast majority of industries, use of forecasting techniques, market research, etc., help to estimate the output with reasonable accuracy and thus the variation is unlikely to be very large. Prime cost will not be affected by such variation and, moreover, variance analysis helps to measure the effects of idle time.

(iii) **Changing standard of technology:** In case of industries that have frequent technological changes affecting the conditions of production, standard costing may not be suitable. This criticism does not affect the system of standard costing. Cost reduction and cost control is a cardinal feature of standard costing because standards once set do not always remain stable. They have to be revised.

(iv) **Attitude of technical people:** Technical people are accustomed to think of standards as physical standards and, therefore, they will be misled by standard costs. Since technical people can be educated to adopt themselves to the system through orientation courses, it is not an insurmountable difficulty.

(v) **Mix of products:** Standard costing presupposes a pre-determined combination of products both in variety and quantity. The mixture of materials used to manufacture the products may vary in the long run but since standard costs are set normally for a short period, such changes can be taken care of by revision of standards.

(vi) **Level of Performance:** Standards may be either too strict or too liberal because they may be based on (a) theoretical maximum efficiency, (b) attainable good performance or (c) average past performance. To overcome this difficulty, the management should give thought to the selection of a suitable type of standard. The type of standard most effective in the control of costs is one which represents an attainable level of good performance.

(vii) **Standard costs cannot possibly reflect the true value in exchange:** If previous historical costs are amended roughly to arrive at estimates for ad hoc purposes, they are not standard costs in the strict sense of the term and hence they cannot also reflect true value in exchange. In arriving at standard costs, however, the economic and technical factors, internal and external, are brought together and analysed to arrive at quantities and prices which reflect optimum operations. The resulting costs, therefore, become realistic measures of the sacrifices involved.

(viii) **Fixation of standards may be costly:** It may require high order of skill and competency. Small concerns, therefore, feel difficulty in the operation of such system.

(e) Method of costing followed:

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

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer

Question 1

Answer the following:

(a) *A Ltd. is a pharmaceutical company which produces vaccines for diseases like Monkey Pox, Covid-19 and Chickenpox. A distributor had given an order for 1,600 Monkey Pox Vaccines. The company can produce 80 vaccines at a time. To process a batch of 80 Monkey Pox vaccines, the following costs would be incurred:*

	₹
Direct Materials	*4,250*
Direct wages	*500*
Lab set-up cost	*1,400*

The Production Overheads are absorbed at a rate of 20% of direct wages and 20% of total production cost is charged in each batch for Selling, distribution and administration Overheads. The company is willing to earn profit of 25% on sales value.

You are required to determine:

(i) Total Sales value for 1,600 Monkey Pox Vaccines

(ii) Selling price per unit of the Vaccine.

(b) *ABC Bank is having a branch which is engaged in processing of 'Vehicle Loan' and 'Education Loan' applications in addition to other services to customers. 30% of the overhead costs for the branch are estimated to be applicable to the processing of 'Vehicle Loan' applications and 'Education Loan' applications each.*

Branch is having four employees at a monthly salary of ₹ 50,000 each, exclusively for processing of Vehicle Loan applications and two employees at a monthly salary of ₹70,000 each, exclusively for processing of Education Loan applications.

In addition to above, following expense are incurred by the Branch:

- *Branch Manager who supervises all the activities of branch, is paid at ₹ 90,000 per month.*
- *Legal charges, Printing & stationery and Advertising Expenses are incurred at ₹ 30,000, ₹ 12,000 and ₹ 18,000 respectively for a month.*
- *Other expenses are ₹ 10,000 per month.*

You are required to:

(i) Compute the cost of processing a Vehicle Loan application on the assumption that 496 Vehicle Loan applications are processed each month.

(ii) Find out the number of Education Loan Applications processed, if the total processing cost per Education Loan Application is same as in the Vehicle Loan Application as computed in (i) above.

(c) MM Ltd. uses 7500 valves per month which is purchased at a price of ₹ 1.50 per unit. The carrying cost is estimated to be 20% of average inventory investment on an annual basis. The cost to place an order and getting the delivery is ₹ 15. It takes a period of 1.5 months to receive a delivery from the date of placing an order and a safety stock of 3200 valves is desired.

You are required to determine:

(i) The Economic Order Quantity (EOQ) and the frequency of orders.

(ii) The re-order point.

(iii) The Economic Order Quantity (EOQ) if the valve cost ₹ 4.50 each instead of 1.50 each.

(Assume a year consists of 360 days)

(d) ABC Ltd sells its Product 'Y' at a price of ₹ 300 per unit and its variable cost is ₹ 180 per unit. The fixed costs are ₹ 16,80,000 per year uniformly incurred throughout the year. The Profit for the year is ₹ 7,20,000.

You are required to calculate:

(i) BEP in value (₹) and units.

(ii) Margin of Safety

(iii) Profits made when sales are 24,000 units.

(iv) Sales in value (₹) to be made to earn a net profit of ₹ 10,00,000 for the year.

(4 x 5 = 20 Marks)

Answer

(a) (i) & (ii) Calculation of Sales value and Selling price per unit of Monkey Pox vaccine

Particulars	Amount (₹) per Batch	Amount (₹) for 1600 units or 20 batches	Amount (₹) per unit
Direct materials	4,250	85,000	53.125
Direct wages	500	10,000	6.250
Lab set-up cost	1,400	28,000	17.500
Production overheads (20% of direct wages)	100	2,000	1.250
Production Cost	6,250	1,25,000	78.125
Selling, distribution and administration cost (20% of Production cost)	1,250	25,000	15.625
Total Cost	7,500	1,50,000	93.75
Add: Profit (1/3rd of Total cost or 25% of Sales value)	2,500	50,000	31.25
Sales value	10,000	2,00,000	125.00

(b)

Particulars	Vehicle loan Applications (₹)	Education loan Application (₹)	Total (₹)
Employee Cost	2,00,000 (₹ 50,000 × 4)	1,40,000 (₹ 70,000 × 2)	3,40,000
Apportionment of Branch manager's salary	27,000	27,000	54,000
Legal charges, Printing & stationery and Advertising expenses	18,000	18,000	36,000
Other expenses	3,000	3,000	6,000
Total cost	2,48,000	1,88,000	4,36,000

(i) Computation of cost of processing a vehicle loan application:

Total Cost ÷ No. of applications

₹ 2,48,000 ÷ 496 = ₹ 500

(ii) Computation of no. of Education loan Processed

Total Cost = No. of applications × Processing cost per application

₹ 1,88,000 = No. of applications × ₹ 500

No. of education loan applications = ₹1,88,000 ÷ ₹500 = 376 applications

(c) (i) Calculation of Economic Order Quantity

Annual requirement (A) = 7500×12= 90,000 Valves

Cost per order (O) = ₹ 15

Inventory carrying cost (i) = 20%

Cost per unit of spare (c) = ₹ 1.5

Carrying cost per unit (i × c) = ₹ 1.5 × 20% = ₹ 0.30

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

$= \sqrt{\frac{2 \times 90,000 \times 15}{0.3}}$ = 3,000 Valves

Frequency of order or Number of Orders = 90,000/3,000 = 30 orders.

So Order can be placed in every 12 (360days/30) days

(ii) Re-order Quantity = {Maximum Consumption X Maximum lead time} + safety Stock

= {7500X1.5} + 3200 = 14,450 Valves

(iii) Calculation of Economic Order Quantity if valve costs ₹ 4.50

Carrying cost is 20% of ₹ 4.50 = ₹ 0.90

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

$= \sqrt{\frac{2 \times 90,000 \times 15}{0.9}}$

= 1732.0508 units or 1733 Valves

(d) (i) Calculation of BEP in value

$$P/V\ ratio = \frac{Sales\ price - Variable\ Cost}{Sales} = \frac{300 - 180}{300} = 40\%$$

$$Break\ Even\ Point\ in\ Value\ (₹) = \frac{Fixed\ Cost}{P/V\ ratio} = \frac{16,80,000}{40\%} = ₹\ 42,00,000$$

$$Break\ Even\ Point\ in\ Units = \frac{Fixed\ Cost}{Contribution} = \frac{16,80,000}{120} = 14,000\ Units$$

(Alternatively, $\frac{₹\ 42,00,000}{300}$ = 14000 units)

(ii) Margin of safety (In Amount) $= \frac{\text{Profit}}{\text{P / V ratio}} = \frac{7,20,000}{40\%} = ₹\ 18,00,000$

Margin of safety may also be calculated by deducting BEP sales from present sale. Present sale is ₹ 60,00,000 i.e. (16,80,000 + 7,20,000)/40%.

Margin of safety (In units) $= \frac{\text{Profit}}{\text{Contribution per unit}} = \frac{7,20,000}{120} = 6,000 \text{ units}$

(iii) Profit when sales are 24,000 units

Particular	**(₹)**
Contribution (24,000 × 120)	28,80,000
Less: Fixed cost	16,80,000
Profit	12,00,000

(iv) Sales in value to earn a net profit of ₹10,00,000

$$\frac{\text{Fixed Cost} + \text{Desired profit}}{\text{P / V Ratio}} = \frac{16,80,000 + 10,00,000}{40\%} = ₹\ 67,00,000$$

Question 2

(a) USP Ltd. is the manufacturer of 'double grip motorcycle tyres'. In the manufacturing process, it undertakes three different jobs namely, Vulcanising, Brushing and Striping. All of these jobs require the use of a special machine and also the aid of a robot when necessary. The robot is hired from outside and the hire charges paid for every six months is ₹ 2,70,000. An estimate of overhead expenses relating to the special machine is given below:

- *Rent for a quarter is ₹ 18,000.*
- *The cost of the special machine is ₹ 19,20,000 and depreciation is charged @10% per annum on straight line basis.*
- *Other indirect expenses are recovered at 20% of direct wages.*

The factory manager has informed that in the coming year, the total direct wages will be ₹ 12,00,000 which will be incurred evenly throughout the year.

During the first month of operation, the following details are available from the job book:

Number of hours the special machine was used

Jobs	***Without the aid of the robot***	***With the of the robot***
Vulcanising	*500*	*400*

Brushing	*1000*	*400*
Striping	*-*	*1200*

You are required to :

(i) Compute the Machine Hour Rate for the company as a whole for a month (A) when the robot is used and (B) when the robot is not used.

(ii) Compute the Machine Hour Rate for the individual jobs i.e. Vulcanising, Brushing and Striping. ***(10 Marks)***

(b) A skilled worker, in PK Ltd., is paid a guaranteed wage rate of ₹ 15.00 per hour in a 48-hour week. The standard time to produce a unit is 18 minutes. During a week, a skilled worker -Mr. 'A' has produced 200 units of the product. The Company has taken a drive for cost reduction and wants to reduce its labour cost.

You are required to:

(i) Calculate wages of Mr. 'A' under each of the following methods:

(A) Time rate,

(B) Piece -rete with a guaranteed weekly wage,

(C) Halsey Premium Plan

(D) Rowan Premium Plan

(ii) Suggest which bonus plan i.e. Halsey Premium Plan or Rowan Premium Plan, the company should follow. ***(6 Marks)***

(c) XYZ Ltd. is engaged in manufacturing two products- Express Coffee and Instant Coffee. It furnishes the following data for a year:

Product	***Actual Output (units)***	***Total Machine hours***	***Total Number of Purchase orders***	***Total Number of set ups***
Express Coffee	*5,000*	*20,000*	*160*	*20*
Instant Coffee	*60,000*	*1,20,000*	*384*	*44*

The annual overheads are as under:

Particulars	***₹***
Machine Processing costs	*7,00,000*
Set up related costs	*7,68,000*
Purchase related costs	*6,80,000*

You are required to:

(i) Compute the costs allocated to each product – Express Coffee and Instant Coffee from each activity on the basis of Activity- Based Costing (ABC) method.

(ii) Find out the overhead cost per unit of each product – Express coffee and Instant coffee based on (i) above. ***(4 Marks)***

Answer

(a) Working notes:

(I)	Total machine hours use (500 + 1,000 + 400 + 400 + 1,200)	3,500
(II)	Total machine hours without the use of robot (500 + 1,000)	1,500
(III)	Total machine hours with the use of robot (400 + 400 + 1,200)	2,000
(IV)	Total overheads of the machine per month	
	Rent (₹ 18,000 ÷ 3 months)	6,000
	Depreciation [(₹ 19,20,000 x 10%) ÷ 12 months]	16,000
	Indirect expenses [(₹ 12,00,000 x 20%) ÷ 12 months]	20,000
	Total	42,000
(V)	Robot hire charges for a month (₹ 2,70,000 ÷ 6 months)	₹ 45,000
(VI)	Overheads for using machines without robot $= \frac{₹\ 42,000}{3,500\ hrs.} \times 1,500$ hrs. =	₹ 18,000
(VII)	Overheads for using machines with robot $= \frac{₹\ 42,000}{3,500\ hrs.} \times 2,000$ hrs. + ₹ 45,000 =	₹ 69,000

(i) Computation of Machine hour rate for the firm as a whole for a month.

(A) When the robot was used: $\frac{₹\ 69,000}{2,000\ hours}$ = ₹ 34.50 per hour

(B) When the robot was not used: $\frac{₹\ 18,000}{1,500\ hrs.}$ = ₹ 12 per hour

(ii) Computation of Machine hour rate for the individual job

	Rate per hour	Job					
		Vulcanising		Brushing		Striping	
	(₹)	Hrs.	(₹)	Hrs.	(₹)	Hrs.	(₹)
Overheads							
Without robot	12.00	500	6,000	1,000	12,000	-	-
With robot	34.50	400	13,800	400	13,800	1,200	41,400
Total		900	19,800	1,400	25,800	1,200	41,400
Machine hour rate			22		18.43		34.50

(b) (i) Calculation of wages of Mr. 'A' under different wage schemes:

A. Time rate

Wages = Time Worked × Rate for the time

= 48 hours x ₹ 15

= ₹ 720

B. Piece rate with a guaranteed weekly wage

Wages = Number of units produced × Rate per unit

= 200 units x ₹ 4.50*

= ₹ 900

*(₹ 15 / 60 minutes) x 18 minutes = ₹ 4.50

C. Halsey Premium Plan

Wages = Time taken × Time rate + 50% of time saved × Time rate

Wages = Time taken × Time rate + 50% (Standard time – Actual time) × Time rate

= (48 hours x ₹ 15) + 50% of (60 hours# – 48 hours) x ₹ 15

= ₹ 720 + ₹ 90

= ₹ 810

#(200 units x 18 minutes) / 60 minutes = 60 hours

D. Rowan Premium Plan

$$\text{Wages} = \text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

$$= (48 \text{ hours} \times ₹ 15) + \left(\frac{60 - 48 \text{ hours}}{60 \text{ hours}} \times 48 \text{ hours} \times ₹ 15\right)$$

$$= ₹ 720 + ₹ 144$$

$$= ₹ 864$$

(ii) The company may follow Halsey Premium Plan over Rowan Premium Bonus Plan as the total wages paid is lower than that of Rowan Premium Bonus Plan.

(c) (i) Estimation of Cost-Driver rate

Activity	Overhead cost (₹)	Cost-driver level	Cost driver rate (₹)
Machine processing	7,00,000	1,40,000 Machine hours	5
Set up Costs	7,68,000	64 Number of set up	12,000
Purchase related Costs	6,80,000	544 Number of purchase order	1250

Cost Allocation under Activity based Costing

	Express Coffee (₹)	Instant Coffee (₹)
Overhead Cost		
Machine processing (Cost Driver rate - ₹ 5) (or 20,000:1,20,000)	5 × 20,000 = 1,00,000	5 × 1,20,000 = 6,00,000
Set up Costs (Cost Driver rate - ₹ 12,000)) (or 20:44)	12,000 × 20 = 2,40,000	12,000 × 44 = 5,28,000
Purchase related Costs (Cost Driver rate - ₹ 1250) (or 160:384)	1,250 × 160 = 2,00,000	1,250 × 384 = 4,80,000
Total overhead cost	5,40,000	16,08,000

(ii) Overhead Cost per unit

Per unit Overhead cost	(₹)	(₹)
5,40,000 /5,000	108	
16,08,000/60,000		26.80

Question 3

(a) *XYZ Construction Ltd. has obtained a contract of ₹ 25,00,000 in the Financial Year 2021-22. The work on the contract commenced immediately and it is expected that the contract will be completed by 31st March,2023. Chief accountant of the company has provided following information related to the Contract:*

Particulars	***2021-22 (Actual) (in ₹)***	***2022-23 (Estimated) (in ₹)***
Material issued	*4,00,000*	*3,50,000*
Wages: Paid	*2,50,000*	*1,40,000*
- Prepaid at the end of the Year	*15,000*	*-*
Plant	*2,00,000*	*-*
Sundry Expenses: Paid	*50,000*	*35,000*
- Outstanding at the end of the year	*7,500*	*5,000*
Office Expenses: Paid	*65,000*	*55,000*
- Outstanding at the end of the year	*12,500*	*15,000*
Contingency Expenses	*-*	*1,25,000*

Following additional information is also available:

- *A part of plant costing ₹ 12,000 was scrapped and written off in the F.Y.2021-22.*
- *The value of Plant-at-Site on 31st March,2022 was ₹ 18,000.*
- *Company would have to spend an additional sum of ₹ 80,000 on the plant in FY. 2022-23 and the residual value of the plant on the completion of contract would be ₹ 10,000.*
- *A part of material costing ₹ 30,000 was scrapped and sold for ₹ 20,000 in F.Y. 2021-22.*
- *The value of Material-at-Site on 31st March, 2022 was ₹ 17,000.*
- *Cash received on account till 31st March,2022 was ₹ 13,50,000 representing 90% of the work certified.*
- *The cost of work uncertified on 31st March, 2022 was valued at 20% of work certified.*

You are required to:

(i) Prepare a Contract Account for the year ended 31st March, 2022

(ii) Calculate Estimated Total Profit on this Contract. ***(10 Marks)***

(b) *N Ltd. produces a product which passes through two processes – Process – I and Process-II. The company has provided following information related to the Financial Year 2021-22:*

	Process-I	*Process -II*
Raw Material @₹65 per unit	*6,500 units*	-
Direct Wages	*₹1,40,000*	*₹1,30,000*
Direct Expenses	*30% of Direct Wages*	*35% of Direct Wages*
Manufacturing Overheads	*₹21,500*	*₹24,500*
Realisable value of scrap per unit	*₹4.00*	*₹16.00*
Normal Loss	*250 units*	*500 units*
Units transferred to Process-II / finished stock	*6,000 units*	*5,500 units*
Sales	-	*5,000 units*

There was no opening or closing stock of work-in progress.

You are required to prepare:

(i) Process-I Account

(ii) Process -II Account

(iii) Finished Stock Account ***(10 Marks)***

Answer

(a) Contract Account (2021-22)

	Particulars		(₹)		Particulars		(₹)
To	Materials issued		4,00,000	By	Costing P & L A/c		12,000
To	Wages paid	2,50,000		By	Material sold		20,000
	Less: Prepaid	15,000	2,35,000	By	Plant at site c/d		18,000
To	Plant		2,00,000	By	Material at site c/d		17,000
To	Sundry Expenses	50,000		By	Costing P & L A/c (₹ 30,000 – ₹ 20,000)		10,000
	Add: Outstanding	7,500	57,500	By	Work-in-progress c/d		
To	Office Expenses	65,000			Work certified (13,50,000 ÷ 90%)	15,00,000	
	Add: Outstanding	12,500	77,500		Work uncertified (15,00,000 x 20%)	3,00,000	18,00,000
To	Notional profit (Profit for the year)		9,07,000				
			18,77,000				18,77,000

Calculation of Estimated Profit

			(₹)	(₹)
(1)	Material consumed	(4,00,000-10,000-20,000)	3,70,000	
	Add: Further consumption		3,50,000	7,20,000
(2)	Wages:		2,35,000	
	Add: Further cost	(1,40,000+15,000)	1,55,000	3,90,000
(3)	Plant used	(2,00,000-12,000)	1,88,000	
	Add: Further plant introduced		80,000	
	Less: Closing balance of plant		(10,000)	2,58,000
(4)	Sundry expenses		57,500	
	Add: Further expenses	(35,000-7,500)	27,500	
	Add: Outstanding		5,000	90,000
(5)	Office expenses		77,500	
	Add: Further expenses	(55,000 – 12,500)	42,500	
	Add: Outstanding		15,000	1,35,000
(6)	Reserve for contingencies			1,25,000
Estimated profit (balancing figure)				7,82,000
Contract price				25,00,000

Estimated Profit can also be calculated showing cost as per Contract Account for the year 2021-22 and estimated cost for the year 2022-23 in the following manner

Calculation of Estimated Profit

Cost as per contract A/c 2021-22 (A)		8,93,000
Estimated cost for 2022-23		
Material (3,50,000 +17,000)	3,67,000	
Wages (1,40,000 +15,000)	1,55,000	
Sundry Expenses (3,5000-7,500 +5,000)	32,500	
Contingency Expenses	1,25,000	
Office expenses (55,000 +15,000-12,500)	57,500	
Plant (80,000+18,000-10,000)	88,000	
Total estimated cost of 2022-23(B)		8,25,000
C=(A)+(B)		17,18,000

Estimated Profit (D)-(C)		7,82,000
Contract Price(D)		25,00,000

(b) **Process-I A/c**

Particulars	Units	(₹)	Particulars	Units	(₹)
To Raw material used (₹ 65 × 6,500 units)	6,500	4,22,500	By Normal loss (250 units × ₹ 4)	250	1,000
To Direct wages	--	1,40,000	By Process- II A/c (₹ 100 × 6,000 units)	6,000	6,00,000
To Direct expenses (30% of ₹ 1,40,000)	--	42,000	By Abnormal loss (₹ 100 × 250 units)	250	25,000
To Manufacturing overhead		21,500			
	6,500	6,26,000		6,500	6,26,000

Cost per unit of completed units and abnormal loss: $\frac{\text{Total Cost-Realisable value from normal loss}}{\text{Inputs Units-Normal loss units}}$

$= \frac{₹\ 6,26,000 - ₹\ 1,000}{6,500 \text{ units} - 250 \text{ units}} = \frac{₹\ 6,25,000}{6,250 \text{ units}} = ₹\ 100$

Process- II A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process - I A/c	6,000	6,00,000	By Normal loss (500 units × ₹16)	500	**8,000**
To Direct wages	--	1,30,000	By Finished Stock A/c (₹144 × 5,500 units)	5,500	7,92,000
To Direct expenses (35% of ₹ 1,30,000)	--	45,500			
To Manufacturing overhead	--	24,500			
	6,000	8,00,000		6,000	8,00,000

Cost per unit of completed units and abnormal loss:

$$\frac{\text{Total Cost - Realisable value from normal loss}}{\text{Inputs units - Normal loss units}}$$

$$= \frac{₹\ 8,00,000 - ₹\ 8,000}{6,000 \text{ units} - 500 \text{ units}} = \frac{₹\ 7,92,000}{5,500 \text{ units}} = ₹144$$

Finished Goods Stock A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process II A/c	5,500	7,92,000	By Cost of Sales (₹144 × 5,000 units)	5,000	7,20,000
			By Balance c/d	500	72,000
	5,500	7,92,000		5,500	7,92,000

Question 4

(a) *An agriculture based company having 210 hectares of land is engaged in growing three different cereals namely, wheat, rice and maize annually. The yield of the different crops and their selling prices are given below:*

	Wheat	***Rice***	***Maize***
Yield (in kgs per hectare)	*2,000*	*500*	*100*
Selling Price (₹ per kg)	*20*	*40*	*250*

The variable cost data of different crops are given below:

(All figures in ₹ per kg)

Crop	***Labour charges***	***Packing Materials***	***Other variable expenses***
Wheat	*8*	*2*	*4*
Rice	*10*	*2*	*1*
Maize	*120*	*10*	*20*

The company has a policy to produce and sell all the three kinds of crops. The maximum and minimum area to be cultivated for each crop is as follows:

Crop	***Maximum Area (in hectares)***	***Minimum Area (in hectares)***
Wheat	*160*	*100*
Rice	*50*	*40*
Maize	*60*	*10*

You are required to:

(i) Rank the crops on the basis of contribution per hectare.

(ii) Determine the optimum product mix considering that all the three cereals are to be produced.

(iii) Calculate the maximum profit which can be achieved if the total fixed cost per annum is ₹ 21,45,000. ***(10 Marks)***

(Assume that there are no other constraints applicable to this company)

(b) PNME Ltd. manufactures two types of masks- 'Disposable Masks' and 'Cloth Masks'. The cost data for the year ended 31st March, 2022 is as follows:

	₹
Direct Materials	*12,50,000*
Direct Wages	*7,00,000*
Production Overhead	*4,00,000*
Total	*23,50,000*

It is further ascertained that:

- *Direct material cost per unit of Cloth Mask was twice as much of Direct material cost per unit of Disposable Mask.*
- *Direct wages per unit for Disposable Mask were 60% of those for Cloth Mask.*
- *Production overhead per unit was at same rate for both the types of the masks.*
- *Administration overhead was 50% of Production overhead for each type of mask.*
- *Selling cost was ₹ 2 per Cloth Mask.*
- *Selling Price was ₹ 35 per unit of Cloth Mask.*
- *No. of units of Cloth Masks sold- 45,000*
- *No. of units of Production of*

  Cloth Masks: 50,000

  Disposable Masks: 1,50,000

You are required to prepare a cost sheet for Cloth Masks showing:

(i) Cost per unit and Total Cost.

(ii) Profit per unit and Total Profit. ***(10 Marks)***

Answer

(a) (i) Statement showing Ranking of crops on the basis of Contribution per hectare

Sl. No	Particulars	Wheat	Rice	Maize
(I)	Sales price per kg (₹)	20	40	250
(II)	Variable cost* per kg (₹)	14	13	150
(III)	Contribution per kg (₹)	6	27	100
(IV)	Yield (in kgs per hectare)	2,000	500	100
(V)	Contribution per hectare (₹)	12,000	13,500	10,000
(VI)	Ranking	II	I	III

*Variable cost = Labour Charges +Packing Material+ Other Variable Expenses

Therefore, to maximize profits, the order of priority of production would be Rice, Wheat and Maize.

(ii) & (iii) Statement showing optimum product mix considering that all the three cereals are to be produced and maximum profit thereof

Sl. No.	Particulars	Wheat	Rice	Maize	Total
(i)	Minimum Area (in hectare)	100	40	10	150
(ii)	Remaining area (in hectare)				60
(iii)	Distribution of remaining area based on ranking considering Maximum area	50	10	-	60
(iv)	Optimum mix (in hectare)	150	50	10	210
(v)	Contribution per hectare (₹)	12,000	13,500	10,000	
(vi)	Total contribution (₹)	18,00,000	6,75,000	1,00,000	25,75,000
(vii)	Fixed cost (₹)				21,45,000
(viii)	Maximum Profit (₹)				4,30,000

Optimum Product Mix and calculation of maximum profit earned by company can also be presented as below

(ii) Optimum Product Mix:

Particular	Area (in hectares)	Yield (kg per hectare)	Total Production (in kgs)
(a) Maximum of Rice	50	500	25000
(b) Minimum of Maize	10	100	1000
(c) Balance of Wheat	150	2000	300000
	210		326000

(iii) Calculation of maximum profit earned by the company:

	Production (in kgs)	Contribution (₹ per kg)	Total contribution (₹)
(a) Rice	25,000	24	6,75,000
(b) Maize	1,000	100	1,00,000
(c) Wheat	3,00,000	6	18,00,000

Total contribution			25,75,000
Less: Total Fixed Cost per annum			(21,45,000)
Maximum profits earned by the company			4,30,000

(b) Preparation of Cost Sheet for Cloth Masks

No. of units produced = 50,000 units

No. of units sold = 45,000 units

Particulars	Per unit (₹)	Total (₹)
Direct materials (Working note- (i))	10.00	5,00,000
Direct wages (Working note- (ii))	5.00	2,50,000
Prime cost	15.00	7,50,000
Production overhead (Working note- (iii))	2.00	1,00,000
Factory Cost	17.00	8,50,000
Administration Overhead* (50% of Production Overhead)	1.00	50,000
Cost of production	18.00	9,00,000
Less: Closing stock (50,000 units – 45,000 units)	-	(90,000)
Cost of goods sold i.e. 45,000 units	18.00	8,10,000
Selling cost	2.00	90,000
Cost of sales/ Total cost	20.00	9,00,000
Profit	15.00	6,75,000
Sales value (₹ 35 × 45,000 units)	35.00	15,75,000

Working Notes:

(i) Direct material cost per unit of Disposable Mask = M

Direct material cost per unit of Cloth Mask = 2M

Total Direct Material cost = 2M × 50,000 units + M × 1,50,000 units

Or, ₹ 12,50,000 = 1,00,000 M + 1,50,000 M

Or, $M = \frac{₹\ 12,50,000}{2,50,000} = ₹\ 5$

Therefore, Direct material Cost per unit of Cloth Mask = 2 × ₹ 5 = ₹ 10

(ii) Direct wages per unit for Cloth Mask = W

Direct wages per unit for Disposable Mask= 0.6W

So, (W x 50,000) + (0.6W x 1,50,000) = ₹ 7,00,000

W = ₹5 per unit

Therefore, Direct material Cost per unit of Cloth Mask = ₹ 5

(iii) Production overhead per unit = $\frac{₹\ 4,00,000}{(50,000+1,50,000)}$ = ₹ 2

Production overhead for Cloth Mask = ₹ 2 × 50,000 units = ₹ 1,00,000

* Administration overhead is related to production overhead in the question and hence to be considered in cost of production only.

Question 5

(a) Y Lid manufactures "Product M" which requires three types of raw materials - "A", "B" & "C". Following information related to 1st quarter of the F.Y. 2022-23 has been collected from its books of accounts. The standard material input required for 1,000 kg of finished product 'M' are as under:

Material	*Quantity (Kg.)*	*Std. Rate per Kg. (₹)*
A	*500*	*25*
B	*350*	*45*
C	*250*	*55*
	1100	
Standard Loss	*100*	
Standard Output	*1000*	

During the period, the company produced 20,000 kg of product "M" for which the actual quantity of materials consumed and purchase prices are as under:

Material	*Quantity (Kg.)*	*Purchase price per Kg. (₹)*
A	*11,000*	*23*
B	*7,500*	*48*
C	*4,500*	*60*

You are required to calculate:

(i) Material Cost Variance

(ii) Material Price Variance for each raw material and Product 'M'

(iii) Material Usage Variance for each raw material and Product 'M'

(iv) Material Yield Variance ***(10 Marks)***

Note: Indicate the nature of variance i.e. Favourable or Adverse.

(b) *X Ltd. follows Non-Integrated Accounting System. Financial Accounts of the company show a Net Profit of ₹ 5,50,000 for the year ended 31st March, 2022. The chief accountant of the company has provided following information from the Financial Accounts and Cost Accounts:*

Sr. No	Particulars	(₹)
(i)	Legal Chargers Provided in Financial accounts	15,250
(ii)	Interim Dividend received credited in financial accounts	4,50,000
(iii)	Preliminary Expenses written off in financial accounts	25,750
(iv)	Over recovery of selling overheads in cost accounts	11,380
(v)	Profit on sale of capital asset credited in financial accounts	30,000
(vi)	Under valuation of closing stock in cost accounts	25,000
(vii)	Over recovery of production overheads in cost accounts	10,200
(viii)	Interest paid on Debentures shown in financial accounts	50,000

Required:

Find out the Profit (Loss) as per Cost Accounts by preparing a Reconciliation Statement.

(5 Marks)

(c) *ASR Ltd mainly produces Product 'L' and gets a by-Product 'M' out of a joint process. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main product. During the month of October 2022, company incurred joint production costs of ₹ 4,00,000. The main Product 'L' is not marketable at the split off point. Thus, it has to be processed further. Details of company's operation are as under:*

Particulars	Product L	By- Product M
Production (units)	10,000	200
Selling price per kg	₹ 45	₹ 5
Further processing cost	₹ 1,01,000	-

You are required to find out:

(i) Profit earned from Product 'L'.

(ii) Selling price per kg of product 'L', if the company wishes to earn a profit of ₹ 1,00,000 from the above production. ***(5 Marks)***

Answer

(a) Basic Calculations:

	Standard for 20,000 kg.			Actual for 20,000 kg.		
	Qty.	Rate	Amount	Qty.	Rate	Amount
	Kg.	(₹)	(₹)	Kg.	(₹)	(₹)
A	10,000	25	2,50,000	11,000	23	2,53,000
B	7,000	45	3,15,000	7,500	48	3,60,000
C	5,000	55	2,75,000	4,500	60	2,70,000
Total	22,000		8,40,000	23,000		8,83,000

Calculation of Variances:

(i) Material Cost Variance = Std. Cost for actual output–Actual cost

MCV=8,40,000– 8,83,000 = ₹ 43,000(A)

(ii) Material Price Variance = (SP–AP) × AQ

A = (25 - 23) x 11,000 = 22,000 (F)

B = (45 – 48) x 7,500 = 22,500 (A)

C = (55 – 60) x 4,500 = 22,500 (A)

23000 (A)

(iii) Material Usages Variance = (SQ–AQ) × SP

A = (10,000 – 11,000) x 25 = 25,000 (A)

B = (7,000 – 7,500) x 45 = 22,500 (A)

C = (5,000 – 4,500) x 55 = 27,500 (F)

20,000 (A)

(iv) Material Yield Variance = (SQ–RSQ*) × SP

A = (10,000 – 10,454.54) x 25 = 11,363.5(A)

B = (7,000 – 7,318.18) x 45 = 14,318.1(A)

C = (5,000 – 5,227.27) x 55 = 12,500(A)

38,181.6(A)

*Revised Standard Quantity (RSQ)

A = $\frac{10,000}{22,000} \times 23,000$ = 10,454.54

B = $\frac{7,000}{22,000} \times 23,000$ = 7,318.18

C $= \frac{5,000}{22,000} \times 23,000 = 5,227.27$

Material Yield Variance can also be Calculated as below

Material yield variance = Standard cost per unit (Actual yield – Standard yield)

Standard cost per unit = $\frac{₹\,8,40,000}{20,000} = ₹\,42$

New Standard Yield = $\frac{20,000}{22,000} \times 23,000 = 20,909$

Material yield variance = ₹ 42 (20,000 – 20,909)

= ₹ 38,178 (A)

(b) Reconciliation Statement

(Reconciliation the profit as per financial records with the profit as per costing records)

	Particulars	**(₹)**	**Total (₹)**
	Profit as per Financial Accounts		5,50,000
Add:	Legal Charges	15,250	
	Preliminary expenses written off	25,750	
	Interest paid	50,000	91,000
			6,41,000
Less:	Under-valuation of closing stock in cost book	25,000	
	Interim Dividend Received	4,50,000	
	Over recovery of selling overheads in cost accounts	11,380	
	Over recovery of production overhead in cost accounts	10,200	5,26,580
	Profit on sale of Assets	30,000	
	Profit as per Cost Accounts		1,14,420

(c) (i) Calculation of profit on product 'L'

Particular	**₹**
Sales	4,50,000
Less: Further processing cost	(1,01,000)
	3,49,000
Less: Joint Production Cost*	(3,99,000)
loss	(50,000)

*Joint Production Cost = [4,00,000 – (200 × 5)] = 3,99,000

(ii) Calculation of desired selling price of product 'L'

$$\text{Desired selling price} = \frac{\text{Desired Profit + Total Cost}}{\text{units measured}}$$

$$= \frac{1,00,000+1,01,000+3,99,000}{10,000} = ₹\ 60 \text{ per kg.}$$

Question 6

Answer any four of the following:

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

(b) Indicate, for following items, whether to be shown in the Cost Accounts or Financial Accounts:

(i) Preliminary expenses written off during the year

(ii) Interest received on bank deposits

(iii) Dividend, interest received on investments

(iv) Salary for the proprietor at notional figure though not incurred

(v) Charges in lieu of rent where premises are owned

(vi) Rent receivables

(vii) Loss on sale of Fixed Assets

(viii) Interest on capital at notional figure though not incurred

(ix) Goodwill written off

(x) Notional Depreciation on the assets fully depreciated for which book value is Nil.

(c) PP Limited is in the process of implementation of Activity Based Costing System in the organisation. For this purpose, it has identified the following Business Functions in its organisation:

(i) Research and Development

(ii) Design of Products, Services and Procedures

(iii) Customer Service

(iv) Marketing

(v) Distribution

You are required to specify two cost drivers for each Business Function Identified above.

(d) Define Budget Manual. What are the salient features of Budget Manual?

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

(i) Automobile

(ii) Gas

(iii) Brick works

(iv) Power

(v) Steel

(vi) Transport (by road)

(vii) Chemical

(viii) Oil

(ix) Brewing

(x) Cement ***(4 x 5 = 20 Marks)***

Answer

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

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

JIT is based on two principles

(i) Produce goods only when it is required and

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

(b)

S. No.	Items	Accounts
(i)	Preliminary expenses written off during the year	Financial Accounts
(ii)	Interest received on bank deposits	Financial Accounts
(iii)	Dividend, interest received on investments	Financial Accounts
(iv)	Salary for the proprietor at notional figure though not incurred	Cost Accounts

(v)	Charges in lieu of rent where premises are owned	Cost Accounts
(vi)	Rent receivables	Financial Accounts
(vii)	Loss on the sales of Fixed Assets	Financial Accounts
(viii)	Interest on capital at notional figure though not incurred	Cost Accounts
(ix)	Goodwill written off	Financial Accounts
(x)	Notional Depreciation on the assets fully depreciated for which book value is nil	Cost Accounts

(c)

Business functions	Cost Driver
Research and Development	• Number of research projects • Personnel hours on a project • Technical complexities of the project
Design of products, services and procedures	• Number of products in design • Number of parts per product • Number of engineering hours
Customer Service	• Number of service calls • Number of products serviced • Hours spent on servicing products
Marketing	• Number of advertisements • Number of sales personnel • Sales revenue
Distribution	• Number of units distributed • Number of customers • Weight of items distributed

(Any two cost drivers of each business function)

(d) **Budget Manual:** The budget manual is a booklet specifying the objectives of an organisation in relation to its strategy. The budget is made to decide how much an organisation would earn and spend and in what manner. In the budget, the organisation sets its priorities too.

Effective budgetary planning relies on the provision of adequate information to the individuals involved in the planning process. Many of these information needs are contained in the budget manual. A budget manual is a collection of documents that contains key information for those involved in the planning process.

CIMA London defines budget manual as, 'A document which sets out the responsibilities of the persons engaged in, the routines of, and the forms and records required for, budgetary control'.

Contents of a budget manual: Typical budget manual may include the following:

(i) A statement regarding the objectives of the organisation and how they can be achieved through budgetary control;

(ii) A statement about the functions and responsibilities of each executive, both regarding preparation and execution of budgets;

(iii) Procedures to be followed for obtaining the necessary approval of budgets. The authority of granting approval should be stated in explicit terms. Whether, one two or more signatures are required on each document should be clearly stated;

(iv) A form of organisation chart to show who are responsible for the preparation of each functional budget and the way in which the budgets are interrelated.

(v) A timetable for the preparation of each budget.

(vi) The manner of scrutiny and the personnel to carry it out;

(vii) Reports, statements, forms and other record to be maintained.

(viii) The accounts classification to be employed. It is necessary that the framework within which the costs, revenue and other financial accounts are classified must be identical both in the accounts and budget department.

(ix) The reporting of the remedial action.

(x) The manner in which budgets, after acceptance and issuance, are to be revised or amended, these are included in budgets and on which action can be taken only with the approval of top management

(xi) This will prevent the formation of a 'bottleneck' with the late preparation of one budget holding up the preparation of all others.

(xii) Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion.

(xiii) A list of the organization's account codes, with full explanations of how to use them.

(xiv) Information concerning key assumptions to be made by managers in their budgets, for example the rate of inflation, key exchange rates, etc.

(Any four points)

(e)

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

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer.

Question 1

Answer the following:

(a) *TSK Limited manufactures a variety of products. The annual demand for one of its products- Product 'X' is estimated as ₹1,35,000 units. Product 'X' is to be manufactured done in batches. Set up cost of each batch is ₹3,375 and inventory holding cost is ₹5 per unit. It is expected that demand of Product 'X' would be uniform throughout the year.*

Required:

(i) *Calculate the Economic Batch (EBQ) for Product 'X'.*

(ii) *Assuming that the company has a policy of manufacturing 7,500 units of Product 'X' per batch, calculate the additional cost incurred as compared to the cost incurred as per Economic Batch Quantity (EBQ) as computed in (i) above.* ***(5 Marks)***

(b) *SMC Company Limited is producing a particular design of toys under the following existing incentive system:*

Normal working hours in the week	*48 hours*
Late shift hours in the week	*12 hours*
Rate of payment	*Normal working: ₹150 per hour*
	Late shift: ₹300 per hour

Average output per operator for 60 hours per week (including late shift hours): 80 toys.

The company's management has now decided to implement a system of labour cost payment with either the Rowan Premium Plan or the Halsey Premium Plan in order to increase output, eliminate late shift overtime, and reduce the labour cost.

The following information is obtained:

The standard time allotted for ten toys is seven and half hours.

Time rate: ₹150 per hour (as usual).

Assuming that the operator works for 48-hours in a week and produces 100 toys, you are required to calculate the weekly earnings for one operator under-

(i) *The existing Time Rate,*

(ii) *Rowan Premium Plan and,*

(iii) *Halsey Premium Plan (50%).* ***(5 Marks)***

(c) *The following information pertains to ZB Limited for the year:*

Profit volume ratio	*30%*
Margin of Safety (as % of total sales	*25%*
Fixed cost	*₹ 12,60,000*

You are required to calculate:

(i) *Break even sales value (₹).*

(ii) *Total sales value (₹) at present,*

(iii) *Proposed sales value (₹) if company wants to earn the present profit after reduction of 10% in fixed cost,*

(iv) *Sales in value (₹) to be made to earn a profit of 20% on sales assuming fixed cost remains unchanged,*

(v) *New Margin of Safety if the sales value at present as computed in (ii) decreased by 12.5%.* ***(5 Marks)***

(d) *RST Toll Plaza Limited built an 80-kilometre-long highway between two cities and operates a toll plaza to collect tolls from passing vehicles using the highway. The company has estimated that 50,000 light weight, 12,000 medium weight and 10,000 heavy weight vehicles will be using the highway in one month in outward journey and the same number for return journey.*

As per government notification, vehicles used for medical emergencies, Members of Parliament, and essential services are exempt from toll charges. It is estimated that 10% of light weight vehicles will pass the highway for such use.

It is the policy of the company that if vehicles return within 24 hours of their outward journey, the toll fare will be reduced by 25 percent automatically. It is estimated that 30% of chargeable light weight vehicles return within the specified time frame.

The toll charges for medium weight vehicles is to be fixed as 2.5 times of the light weight vehicles and that of heavy weight vehicles as 2 times of the medium weight vehicles.

The toll and maintenance cost for a month is ₹ 59,09,090, The company requires a profit of 10% over the total cost to cover interest and other costs.

Required:

(i) *Calculate the toll rate for each type of vehicle if concession facilities are not available on the return journey.*

(ii) Calculate the toll rate that will be charged from light weight vehicles if a return journey concession facility is available, assuming that the revenue earned from light weight vehicles calculated in option (i) remains the same. ***(5 Marks)***

Answer

(a) (i) Economic Batch Quantity (EBQ) = $\sqrt{\frac{2DS}{C}}$

where,

D = Annual demand for the product

S = Set-up cost per batch

C = Carrying cost per unit per annum.

$$\sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 1,35,000 \times 3,375}{5}} = \textbf{13,500 units.}$$

(ii) Total Cost (of maintaining the inventories) when batch size (Q) are 13,500 and 7,500 units respectively

Total cost = Total set-up cost + Total carrying cost.

	When batch size is 13,500 units	**When batch size is 7,500 units**
Total set up cost	$= \frac{1,35,000}{13,500} \times$ ₹ 3,375 = ₹ 33,750 Or, No. of setups = 10 = 10 x ₹ 3,375 = ₹ 33,750	$= \frac{1,35,000}{7,500} \times$ ₹ 3,375 = ₹ 60,750
Total Carrying cost	1/2 × 13,500 × 5 = ₹ 33,750	1/2 × 7,500 × 5 = ₹ 18,750
Total Cost	₹ 67,500	₹ 79,500

₹ 12,000 is the excess cost borne by the company due to batch size not being economic batch quantity.

Alternative presentation

	EOQ 13,500	Batch size 7500	Extra cost	Saving
No of setup	10	18	8 x 3375 = 27,000	
Carrying cost	13,500 – 7500 = 6000/ 2 @ 5			15,000

Net extra cost = (27,000- 15,000) = ₹ 12,000

(b) Working Notes:

(1) Effective rate per hour:

Incentive for 60 hours = (₹ 150 × 48 hours + ₹ 300 × 12 hours)

= 7,200 + 3,600 = ₹ 10,800

= ₹ 10,800 ÷ 60 hours = ₹ 180 per hour

(2) Time taken/ Allowed to produce 100 toys:

= (60 hours ÷ 80 toys) × 100 toys = 75 hours

(3) Time saved = Time Allowed – Time Taken

= 75 hours – 48 hours = 27 hours

(i) Calculation of weekly earnings for one operator under the existing time rate:

= (48 hours x ₹ 150) + (12 hours x ₹ 300) **= ₹ 10,800**

Alternative solution

= Effective rate per hour (WN-1) × Time required for 100 toys (WN-2)

= ₹ 180 × 75 hours = **₹ 13,500**

(ii) Calculation of weekly earnings for one operator under Rowan Premium plan:

(Time taken × Rate per hour) + (Time Saved/ Time Allowed × Time taken × Rate per hour)

= (48 hours × ₹ 150) + [(27 ÷ 75) × 48 × ₹ 150]

= 7,200 + 2,592 = **₹ 9,792**

(iii) Calculation of weekly earnings for one operator under Halsey Premium plan:

(Time taken × Rate per hour) + (50% of Time Saved × Rate per hour)

= (48 hours × ₹ 150) + (50% of 27 hours × ₹ 150)

= ₹ 7,200 + ₹ 2,025 = **₹ 9,225**

(c) (i) Calculation of Break-even sales in value:

= Fixed Cost ÷ P/V Ratio

= ₹ 12,60,000 ÷ 30% **= ₹ 42,00,000**

(ii) Calculation of Total Sales value:

Sales value (S) = Break-even Sales + Margin of Safety

Or, S = 42,00,000 + 0.25 S

Or, 0.75 S = 42,00,000

Or, S = 42,00,000 ÷ 0.75

Or, Sales = **₹ 56,00,000**

(iii) Calculation of proposed sales value to earn present profit:

Present profit = Sales – Variable cost – Fixed Cost

= ₹ 56,00,000 – 70% of 56,00,000 – ₹ 12,60,000

= ₹ 56,00,000 – ₹ 39,20,000 – ₹ 12,60,000

= ₹ 4,20,000

Proposed Sales value (S) = 0.7S + (90% of ₹ 12,60,000) + 4,20,000

S = 0.7S + 11,34,000 + 4,20,000

S = 15,54,000 ÷ 0.3 = **₹ 51,80,000**

(iv) Calculation of sales value to earn 20% on sales:

Sales Value (S) = 0.7 S + 12,60,000 + 0.2S

S = 12,60,0000 ÷ 0.10 = **₹ 1,26,00,000**

(v) New Margin of Safety:

= (Sales – BES) ÷ Sales

= (87.5% of 56,00,000 – 42,00,000) ÷ (87.5% of 56,00,000)

= (49,00,000 – 42,00,000) ÷ 49,00,000

= 7,00,000 ÷ 49,00,000 **= 14.29%**

Or

= (Sales – BES)

= (87.5% of 56,00,000 – 42,00,000)

= ₹ 7,00,000

(d) Working Notes:

(1) Calculation of equivalent numbers of Light weight vehicles (when no concession is provided on return journey)

Type of vehicle	Monthly traffic (A)	Return traffic (B)	Ratio (C)	Equivalent light weight [(A + B) × C]
Light weight	45,000*	45,000	1	90,000
Medium weight	12,000	12,000	2.5	60,000
Heavy weight	10,000	10,000	5	1,00,000
				2,50,000

*50,000 light vehicles less 10% exempted vehicles

(2) Calculation of equivalent numbers of Light weight vehicles (when concession is provided on return journey)

Type of vehicle	Monthly traffic (A)	Return traffic (B)	Ratio (C)	Equivalent light weight [(A + B) × C]
Light weight	45,000*	41,625 [45,000- (45,000 × 30% × 25%)]	1	86,625
Medium weight	12,000	12,000	2.5	60,000
Heavy weight	10,000	10,000	5	1,00,000
				2,46,625

(i) Calculation of toll rate for each type of vehicle:

Total cost to cover ÷ Equivalent type of vehicles

(₹ 59,09,090 + 10% of ₹ 59,09,090) ÷ 2,50,000 equivalent vehicles (Refer working note 1)

= 65,00,000 ÷ 2,50,000 = ₹ 26

Toll rate for:

Light weight vehicle = ₹ 26

Medium weight vehicle = ₹ 26 × 2.5 = ₹ 65

Heavy weight vehicle = ₹ 26 × 5 = ₹ 130

(ii) Calculation of toll rate for each type of vehicle:

Revenue earned from Light weight vehicle in (i) above

= 90,000 vehicles × ₹ 26 = ₹ 23,40,000

New toll rate to maintain the same revenue from Light weight vehicle

= ₹ 23,40,000 ÷ 86,625 (Refer working note-2) = ₹ 27.01

Light weight vehicle = ₹ 27.01

Rate to be charged from 13,500 light weight vehicles = 27.01 × 0.75 = 20.26

Alternative presentation

(ii) Toll rate to be charged from light weight vehicles if concession applicable

Revenue share in light vehicles = 90,000 × 26 = ₹ 23,40,000

Suppose rate is x, then outward journey 45,000 x; return journey (45,000 - 30% of 45,000) + 13,500 (x - 0.25)

45,000x + 31,500x + 13500 (0.75x) = ₹ 23,40,000

Toll rate to be charged from light weight vehicles : 86,625x = ₹ 23,40,000 = ₹ 27.01

Rate to be charged from 76,500 light weight vehicles @ 27.01; revenue will be ₹ 20,66,494

Rate to be charged from 13,500 light weight vehicles = 27.01 × 0.75 = 20.26 revenue will be ₹ 2,73,506

Question 2

(a) A Limited has furnished the following information for the months from 1st January to 30th April, 2023:

	January	*February*	*March*	*April*
Number of Working days	*25*	*24*	*26*	*25*
Production (in units) per working day	*50*	*55*	*60*	*52*
Raw Material Purchases (% by weights to total of 4 months)	*21%*	*26%*	*30%*	*23%*
Purchase price of raw material (per kg)	*₹ 10*	*₹ 12*	*₹ 13*	*₹ 11*

Quantity of raw material per unit of product: 4 kg.

Opening stock of raw material on 1st January: 6,020 kg. (Cost ₹ 63, 210)

Closing stock of raw material on 30th April: 5,100 kg.

All the purchases of material are made at the start of each month.

Required:

(i) Calculate the consumption of raw materials (in kgs) month-by- month and in total.

(ii) Calculate the month-wise quantity and value of raw materials purchased.

(iii) Prepare the priced stores ledger for each month using the FIFO method.

(10 Marks)

(b) B Limited has taken a contract for ₹ 70,00,000 and furnishes the following information:

	1st Year	2nd Year
	(Amount in ₹)	(Amount in ₹)
Material	12,50,000	13,65,000
Wages	12,50,000	11,44,000
Direct Expenses	4,20,000	3,80,000
Indirect Expenses	2,70,000	2,60,000
Work Certified	32,00,000	70,00,000
Work Uncertified	2,19,000	-

Other Information:

- *Plant costing ₹ 3,40,000 was bought at the commencement of the contract.*
- *Depreciation of ₹ 85,000 per annum is charged on the plant on Straight Line Method (SLM) basis.*
- *There is a provision for escalation clause in the contract for increase in material rate and wage rate in the second year only.*
- *Standard material for the first and second year was ₹ 12,000 units each year @ ₹ 90 per unit whereas the actual consumption was 12,500 @ ₹ 100 per unit in the first year and 13,000 units @ ₹ 105 per unit in the 2nd year. Standard labour hours for first year were 10,000 hours and for the second year it was 9,000 hours. Standard wage rate was ₹ 120 per hour. The firm has paid for 10,000 hours @ ₹ 125 per hour in the first year and 8,800 hours @ ₹ 130 per hour in the second year.*

Required:

(i) Prepare Contract Account for both years without considering escalation clause.

(ii) Compute the total value of contract by considering the escalation clause.

(iii) Compute the total increase / (decrease) in the cost of material and wages for both the years. ***(10 Marks)***

Answer

(a) (i) Calculation of consumption of Raw Material (in kgs) month by month and total

Particulars	Jan	Feb	March	April	Total
No. of working days	25	24	26	25	-
Production (Per day)	50	55	60	52	-
Production	1,250	1,320	1,560	1,300	5,430
Raw Material Consumed (in kgs)	**5,000**	**5,280**	**6,240**	**5,200**	21,720

Calculation of Raw Material Purchased

Purchased	(Kg)
Closing stock on 30th April	5,100
Add: Raw Material consumed	21,720
Less: Opening stock on 1st January	(6,020)
Raw Material purchased	20,800

(ii) Calculation of month wise quantity and value of raw material purchased

	%	Purchased (Kg)	Price (₹)	Value (₹)
January	21	4,368	10	43,680
February	26	5,408	12	64,896
March	30	6,240	13	81,120
April	23	4,784	11	52,624
Total		20,800		2,42,320

(iii) Store Price Ledger by using FIFO method.

Months	Particulars	Receipts			Issue			Balance		
		Qty	Rate	Amount (₹)	Qty	Rate	Amount (₹)	Qty	Rate	Amount (₹)
Jan	Opening							6,020	10.5	63,210
	Purchases	4,368	10	43,680				6,020	10.5	63,210
								4,368	10	43,680
	Consumption				**5,000**	**10.5**	**52,500**	**1,020**	**10.5**	**10,710**
								4,368	**10**	**43,680**
Feb	Purchases	5,408	12	64,896				1,020	10.5	10,710

								4,368	10	43,680
								5,408	12	64,896
	Consumption				**1,020**	**10.5**	**10,710**	**108**	**10**	**1,080**
					4,260	**10**	**42,600**	**5,408**	**12**	**64,896**
March	Purchase	6,240	13	81,120				108	10	1,080
								5,408	12	64,896
								6,240	13	81,120
	Consumption				**108**	**10**	**1,080**			
					5,408	**12**	**64,896**			
					724	**13**	**9,412**	**5,516**	**13**	**71,708**
April	Purchases	4,784	11	52,624				5,516	13	71,708
								4,784	11	52,624
	Consumption				**5,200**	**13**	**67,600**	**316**	**13**	**4,108**
								4,784	**11**	**52,624**
										56,732

(b) (i) Contract Account (For 1st Year)

Particulars	(₹)	Particulars		(₹)
To Material	12,50,000	By work in Progress		
To Wages	12,50,000	Work certified	32,00,000	
To Direct expense	4,20,000	Work uncertified	2,19,000	34,19,000
To Indirect expense	2,70,000			
To Depreciation (₹3,40,000 – ₹2,55,000)	85,000			
To Costing P&L (Notional Profit b/f)	1,44,000			
	34,19,000			34,19,000

Contract Account (For 2nd Year)

Particulars		(₹)	Particulars	(₹)
To Opening Work in Progress:			By Contractee A/C	70,00,000
Work certified	32,00,000			
Work uncertified	2,19,000	34,19,000		
To Material		13,65,000		
To Wages		11,44,000		
To Direct expenses		3,80,000		

To Indirect expenses	2,60,000		
To Depreciation (₹ 2,55,000 – ₹ 1,70,000)	85,000		
To Costing P&L (b/f)	3,47,000		
	70,00,000		70,00,000

(ii) Computation of total value of contract after escalation clause

Particulars	(₹)
Contract Price	70,00,000
Increase in cost of material 12,000 (105 – 90)	1,80,000
Increase in cost of labour 9,000 (130-120)	90,000
	72,70,000

(iii) Calculation of Increase/Decrease in cost of material and wages

Year 1	Standard Cost	Actual Cost	Increase/Decrease
Material	10,80,000 (12,000 x 90)	12,50,000 (12,500 x 100)	1,70,000
Labour	12,00,000 (10,000 x 120)	12,50,000 (10,000 x 125)	50,000
			2,20,000
Year 2	**Standard Cost**	**Actual Cost**	**Increase/Decrease**
Material	10,80,000 (12,000 x 90)	13,65,000 (13,000 x 105)	2,85,000
Labour	10,80,000 (9,000 x 120)	11,44,000 (88,000 x 130)	64,000
			3,49,000

Question 3

(a) PQR Limited manufactures three products - Product X, Product Y and Product Z. The output for the current year is 2,50,000 units of Product X, 2,80,000 units of Product Y and 3,20,000 units of Product Z respectively.

Selling price of Product X is 1.25 times of Product Z whereas Product Y can be sold at double the price at which product Z can be sold. Product Z can be sold at a profit of 20% on its marginal cost.

Other information are as follows:

	Product X	*Product Y*	*Product Z*
Direct Material Cost (Per unit)	*₹ 20*	*₹ 20*	*₹ 20*
Direct Wages Cost (per unit)	*₹ 16*	*₹ 24*	*₹ 16*

Raw material used for manufacturing all the three products is the same. Direct Wages are paid @ ₹ 4 per labour hour,

Total overhead cost of the company is ₹ 52,80,000 for the year, out of which ₹ 1 per labour hour is variable and the rest is fixed.

In the next year it is expected that sales of product X and product Z will increase by 12% and 15% respectively and sale of product Y will decline by 5%. The total overhead cost of the company for the next year is estimated at ₹ 55,08,000. The variable cost of ₹ 1 per labour hour remains unchanged.

It is anticipated that all other costs will remain same for the next year and there is opening and closing stock. Selling Price per unit of each product will remain unchanged in the next year.

Required:

Prepare a budget showing the current position and the position for the next year clearly indicating the total product-wise contribution and profit for the company as a whole.

(10 Marks)

(b) The following information is available from SN Manufacturing Limited's for the month of April 2023.

	April 1	*April 30*
Opening and closing inventories data:		
Stock of finished goods	*2,500 units*	*?*
Stock of raw materials	*₹ 42,500*	*₹ 38,600*
Work-in progress	*₹ 42,500*	*₹ 42,800*
Other data are:		
Raw materials Purchased		*₹ 6,95,000*
Carriage inward		*₹ 36,200*
Direct wages paid		*₹ 3,22,800*
Royalty paid for production		*₹ 35,800*
Purchases of special designs, moulds and patterns (estimated life 12 Production cycles)		*₹ 1,53,600*
Power, fuel and haulage (factory)		*₹ 70,600*

Research and development costs for improving the production process (amortized)		*₹ 31,680*
Primary packing cost (necessary to maintain quality)		*₹ 6920*
Administrative Overhead		*₹ 46,765*
Salary and wages for supervisor and foremen		*₹ 28,000*

Other information:

- *Opening stock of finished goods is to be valued at ₹ 8.05 per unit.*
- *During the month of April, 1,52,000 units were produced and 1,52,600 units were sold. The closing stock of finished goods is to be valued at the relevant month's cost of production. The company follows the FIFO method.*
- *Selling and distribution expenses are to be charged at 20 paisa per unit.*
- *Assume that one production cycle is completed in one month.*

Required:

(i) Prepare a cost sheet for the month ended on April 30, 2023, showing the various elements of cost (raw material consumed, prime cost, factory cost, cost of production, cost of goods sold, and cost of sales).

(ii) Calculate the selling price per unit if profit is charged at 20 percent on sales.

(10 Marks)

Answer

(a) (i) Budget showing current position of total product wise contribution and profitability

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Direct material cost (per unit)	20	20	20	
B	Direct wages cost (per unit)	16	24	16	
C	Variable overhead per unit (Refer WN-1)	4	6	4	

D	Total variable cost/ Marginal cost per unit [A+B+C]	40	50	40	
E	Add: Profit [20% of D]	-	-	8	
F	Selling price unit [D+E]	-	-	48	
G	Price weight	1.25	2	1	
H	Selling price per unit [Selling price of Product Z × G]	60	96	48	
I	Contribution per unit [H-D]	20	46	8	
J	Quantity to be sold	2,50,000	2,80,000	3,20,000	
K	Total Contribution [J×I]	50,00,000	1,28,80,000	25,60,000	2,04,40,000
L	Fixed Overheads [Refer WN-1]				13,20,000
M	Profit				1,91,20,000

Working Notes:

1. Segregation of Overheads into variable and fixed in current year

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Total overhead cost	-	-	-	52,80,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,50,000	2,80,000	3,20,000	
D	Total variable overhead cost [B×C]	10,00,000	16,80,000	12,80,000	39,60,000
E	Fixed overhead cost [A-D]				13,20,000

(ii) Budget showing next year's position of total product wise contribution and profitability

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Selling price per unit	60	96	48	
B	Contribution per unit	20	46	8	
C	Quantity to be sold	2,80,000 [112% of 2,50,000]	2,66,000 [95% of 2,80,000]	3,68,000 [115% of 3,20,000]	
D	Total Contribution [B×C]	56,00,000	1,22,36,000	29,44,000	2,07,80,000
	Fixed Overheads [Refer WN-2]				13,20,000
	Profit				1,94,60,000

Working Notes:

2. Segregation of Overheads into variable and fixed in next year

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Total overhead cost	-	-	-	55,08,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,80,000	2,66,000	3,68,000	
D	Total variable overhead cost [B×C]	**11,20,000**	**15,96,000**	**14,72,000**	**41,88,000**
E	Fixed overhead cost [A-D]				13,20,000

(b) Cost Sheet for the month of April 2023

Particulars	Amount (₹)	Amount (₹)
Raw materials consumed:		
Raw materials purchased	6,95,000	

Add: Carriage inward	36,200	
Add: Value of opening stock of raw materials	42,500	
Less: Value of closing stock of raw materials	(38,600)	**7,35,100**
Direct wages paid		3,22,800
Royalty paid for production		35,800
Amortised cost of special designs, moulds and patterns (₹153,600 ÷ 12)		12,800
Power, fuel and haulage (factory)*		70,600
Prime Cost*		**11,77,100**
Salary and wages of supervisor and foremen		28,000
Gross Works Cost		12,05,100
Add: Opening stock of WIP		42,500
Less: Closing stock of WIP		(42,800)
Factory/ Works Cost		**12,04,800**
Research and development cost	31,680	
Primary packing cost	6,920	38,600
Cost of Production		**12,43,400**
Add: Opening stock of finished goods (₹ 8.05 × 2,500 units)		20,125
Less: Value of closing stock [(2,500+152,000 -1,52,600) × (12,43,400÷152000)		(15,542)
Cost of Goods Sold		**12,47,983**
Add: Administrative overheads		46,765
Add: Selling and distribution expenses (₹ 0.20 × 1,52,600)		30,520
Cost of Sales		**13,25,268**
Add: Profit (20% on Sales or 25% on cost of sales)		3,31,317
Sales value		16,56,585
Selling price per unit (₹ 16,56,585 ÷ 1,52,600 units)		**10.86**

*May be taken as part of Factory / Works cost, however Total Factory Cost will remain the same. If taken as part of factory cost then prime cost will be ₹ 11,06,500.

Alternative Solution (Based on work-in-progress figure of ₹ 45,500 as on 1st April 2023 as per Hindi part of Question paper)

Particulars	Amount (₹)	Amount (₹)
Raw materials consumed:		
Raw materials purchased	6,95,000	
Add: Carriage inward	36,200	
Add: Value of opening stock of raw materials	42,500	
Less: Value of closing stock of raw materials	(38,600)	7,35,100
Direct wages paid		3,22,800
Royalty paid for production		35,800
Amortised cost of special designs, moulds and patterns (₹ 153,600 ÷ 12)		12,800
Power, fuel and haulage (factory)*		70,600
Prime Cost		**11,77,100**
Salary and wages of supervisor and foremen		28,000
Gross Works Cost		12,05,100
Add: Opening stock of WIP		45,500
Less: Closing stock of WIP		(42,800)
Factory/ Works Cost		**12,07,800**
Research and development cost	31,680	
Primary packing cost	6,920	38,600
Cost of Production		**12,46,400**
Add: Opening stock of finished goods (₹ 8.05 × 2,500 units)		20,125
Less: Value of closing stock [(2,500+1,52,000 -1,52,600) × (12,46,400÷1,52,000)		(15,580)
Cost of Goods Sold		**12,50,945**
Add: Administrative overheads		46,765
Add: Selling and distribution expenses (₹ 0.20 × 1,52,600)		30,520
Cost of Sales		**13,28,230**
Add: Profit (20% on Sales or 25% on cost of sales)		3,32,058
Sales value		16,60,288
Selling price per unit (₹ 16,60,288 ÷ 1,52,600 units)		**10.88**

*May be taken as part of Factory / Works cost, however Total Factory Cost will remain the same. *If taken as part of factory cost then prime cost will be ₹ 11,06,500.*

Question 4

(a) *ABC Company produces a Product 'X' that passes through three processes: R, S and T. Three types of raw materials, viz., J, K, and L are used in the ratio of 40:40:20 in process R. The output of each process is transferred to next process. Process loss is 10% of total input in each process. At the stage of output in process T, a by-product 'Z' is emerging and the ratio of the main product 'X' to the by-product 'Z' is 80:20. The selling price of product 'X' is ₹60 per kg.*

The company produced 14,580 kgs of product 'X'

Material price : Material J @ ₹15 per kg; Material K @ ₹9 per kg.

Material L@ ₹7 per kg Process costs are as follows:

Process	Variable cost per kg (₹)	Fixed cost of Input (₹)
R	5.00	42,000
S	4.50	5,000
T	3.40	4,800

The by-product 'Z' cannot be processed further and can be sold at ₹30 per kg at the split-off stage. There is no realizable value of process losses at any stage.

Required:

Present a statement showing the apportionment of joint costs on the basis of the sales value of product 'X' and by-product 'Z' at the split- off point and the profitability of product 'X' and by-product 'Z. ***(10 Marks)***

(b) *Beta Limited produces 50,000 Units, 45,000 Units and 62,000 Units of product 'A', 'B' and 'C' respectively. At present the company follows absorption costing method and absorbs overhead on the basis of direct labour hours. Now, the company wants to adopt Activity Based Costing*

The information provided by Beta Limited is follows:

	Product A	Product B	Product C
Floor Space Occupied	5,000 Sq.Ft.	4,500 Sq.Ft.	6,200 Sq.Ft.
Direct Labour Hours	7,500 Hours	7,200 Hours	7,800 Hours
Direct Machine Hours	6,000 Hours	4,500 Hours	4,650 Hours
Power consumption	32%	28%	40%

Overhead for year are as follows:

	₹
Rent & Taxes	*8,63,500*
Electricity Expenses	*10,66,475*
Indirect labour	*13,16,250*
Repair & Maintenance	*1,28,775*
	33,75,000

Required:

(i) Calculate the overhead rate per labour hour under Absorption Costing.

(ii) Prepare a cost statement showing overhead cost per unit for each product - 'A', 'B' and 'C' as per Activity based Costing. ***(5 Marks)***

(c) MNP Company Limited produces two products 'A' and 'B'. The relevant cost and sales data per unit of output is as follows.

Particulars	***Product A***	***Product B***
	(₹)	***(₹)***
Direct material	*55*	*60*
Direct labour	*35*	*45*
Variable factory overheads	*40*	*20*
Selling Price	*180*	*175*

The availability of machine hours is limited to 55,000 hours for the month. The monthly demand for product 'A' and product 'B' is 5,000 units and 6,000 units, respectively. The fixed expenses of the company are ₹1,40,000 per month. Variable factory overheads are ₹ 4 per machine hour. The company can produce both products according to the market demand.

Required:

Calculate the product mix that generates maximum profit for the company in the situation and also calculate profit of the company. ***(5 Marks)***

Answer

(a) Working Notes:

1. Calculation of Input of Raw Material

Let assume total raw material in Process R be 100%

∴ Output of Process T will be equal to:

Input R	100%
- 10% Normal Loss	₹ 10
Input S	₹ 90%
- 10% Normal loss	₹ 9
Input T	81%
- 10% Normal loss	₹ 8.1
Output of T	72.9
Actual output of X	14,580 units

Which is 80% of the total output

∴ Output of Process T

$= \frac{14580}{80\%} = 18,225$

∴ Input of Process R = $\frac{18225}{72.9\%}$ = 25,000 kgs

Alternative presentation for Calculation of Input in Process R, S and T

Working notes:

Process T (Kg.)			
To Input (Transfer from process S)	20,250	By Normal loss	2,025
		By Output Product X	14,580
		By output of by-product Z	3,645
	20,250		20,250

Process S (kg.)			
To Input (Transfer from process S)	22,500	By Normal loss (10%)	2,250
		By Transfer to process T	20,250
	22,500		22,500

Process R (kg.)			
To Input	25,000	By Normal loss (10%)	2,500
		By Transfer to process S	22,500
	25,000		25,000

2. Calculation of Joint Cost

Process	Inputs	Variable cost per kg	Variable cost	Fixed Cost	Total Cost
		₹	₹	₹	₹
R	25,000	5	1,25,000	42,000	1,67,000
S	22,500	4.5	1,01,250	5,000	1,06,250
T	20,250	3.4	68,850	4,800	73,650
					3,46,900

Raw material	J	10000 x 15	₹ 1,50,000
	K	10000 x 9	₹ 90,000
	L	5000 x 7	₹ 35,000
			2,75,000
Add: Processing cost (as above)			₹ 3,46,900
Total Joint Cost			6,21,900

(i) Statement showing apportionment of Joint Cost

Particulars	Product X	By-Product Z	Total
Units	14,580	3,645	
Selling price (₹)	60	30	
Sales Value (₹)	8,74,800	1,09,350	9,84,150
(₹ 6,21,900 to apportioned in ratio of sales value at split off point)	5,52,800	69,100	6,21,900

(ii) Statement of Profitability

Particulars	Product X	By-Product Z	Total
Sales Value	8,74,800	1,09,350	9,84,150
Joint Cost (As apportioned above)	(5,52,800)	(69,100)	(6,21,900)
Profit	3,22,000	40,250	3,62,250

(b) (i) Calculation of Overhead rate per hour

$$\frac{\text{Total Overheads}}{\text{Total hours}}$$

$$\frac{33,75,000}{22,500} = ₹ \textbf{ 150 per hour}$$

(ii) Statement showing overhead cost per unit as per Activity Based Costing

			Product		
Overheads	**Cost Driver**	**Total**	**A**	**B**	**C**
		₹	₹	₹	₹
Rent & Taxes	Floor space (50:45:62)	8,63,500	2,75,000	2,47,500	3,41,000
Electricity	Power Consumption (32:28:40)	10,66,475	3,41,272	2,98,613	4,26,590
Indirect labour	Labour hours (75:72:78)	13,16,250	4,38,750	4,21,200	4,56,300
Repair & Maintenance	Machine hours (600:450:465)	1,28,775	51,000	38,250	39,525
Total Cost		33,75,000	11,06,022	10,05,563	12,63,415
Units			50,000	45,000	62,000
Cost per Unit			**22.12**	**22.35**	**20.38**

(c)

Particulars	**Product A** ₹	**Product B** ₹
Selling Price	180	175
Variable cost:		
Direct Material	55	60
Direct labour	35	45
Variable factory overheads	40	20
	130	125
Contribution	50	50
Machine hour (p.u.)	10	5
Contribution per hour	**5**	**10**
Rank	**II**	**I**

Calculation of Product Mix

Hours available	55,000
Product B (6000 x 5)	**30,000**
Balance Hours	25,000
Product A (2500 x 10)	**25,000**
Balance Hours	0

Calculation of Profit

		₹
Contribution		
A	2500 units x 50	
B	6000 units x 50	4,25,000
Less:	Fixed cost	(1,40,000)
	Profit	**2,85,000**

Question 5

(a) NC Limited uses a standard costing system for the manufacturing of its product 'X'. The following information is available for the last week of the month:

- *25,000 kg of raw material were actually purchased for ₹ 3,12,500. The expected output is 8 units of product 'X' from each one kg of raw material. There is no opening and closing inventories. The material price variance and material cost variance, as per cost records, are ₹ 12,500 (F) and ₹ 1800 (A), respectively.*
- *The standard time to produce a batch of 10 units of product 'X' is 15 minutes. The standard wage rate per labour hour is 50. The company employs 125 workers in two categories, skilled and semi-skilled, in a ratio of 60:40. The hourly wages actually paid were ₹ 50 per hour for skilled workers and ₹ 40 per hour for semi-skilled workers. The weekly working hours are 40 hours per worker. Standard wage rate is the same for skilled and semi- skilled workers.*
- *The monthly fixed overheads are budgeted at ₹ 76,480 Overheads are evenly distributed throughout the month and assume 4 weeks in a month. In the last week of the month, the actual fixed overhead expenses were ₹ 19,500.*

Required:

(i) Calculate the standard price per kg and the standard quantity of raw material.

(ii) Calculate the material usage variance, labour cost variance, and labour efficiency variance.

(iii) Calculate the fixed overhead cost variance, the fixed overhead expenditure variance and the fixed overhead volume variance.

Note: Indicate the nature of variance i.e Favourable or Adverse. ***(10 Marks)***

(b) The following information has been obtained from financial accounting and cost accounting records.

	Financial Accounting	***Cost Accounting***
	₹	***₹***
(i) Factory Overhead	*94,750*	*90,000*
(ii) Administrative Overhead	*60,000*	*57,000*
(iii) Selling Overhead	*55,000*	*61,000*
(iv) Opening Stock	*17,500*	*22,500*
(v) Closing Stock	*12,500*	*15,000*

Required:

Indicate under-recovery and over-recovery and their effects on cost accounting profit.

[Note: You are not required to prepare reconciliation statement.] ***(5 Marks)***

(c) How does the high employee turnover increase the cost of production? Explain. ***(5 Marks)***

Answer

(a) (i) Calculation of Standard price per kg and the standard quantity of raw material:

Standard Price

(a) Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

12,500 (F) = (SP × AQ) – ₹ 3,12,500

12,500 (F) = (SP × 25,000) – ₹ 3,12,500

SP = ₹ 13

Standard Quantity

(b) Material Cost Variance = Standard Cost – Actual Cost

1,800 (A) = SQ × ₹13 – ₹ 3,12,500

SQ = 23,900 kg.

(ii) Calculation of Material Usage Variance, Labour Cost Variance and Labour Efficiency Variance

(a)	**Material Usage Variance**	=	Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity
		=	SQ × SP – AQ × SP
			Or
		=	SP × (SQ – AQ)
		=	₹ 13 × (23,900 kg. – 25,000 kg.)
		=	**₹ 14,300 (A)**
(b)	**Labour Cost Variance**	=	Standard Cost – Actual Cost
		=	(SH × SR) – (AH × AR)
		=	₹ 2,39,000 – ₹ 2,30,000
		=	**₹ 9,000 (F)**
(c)	**Labour Efficiency Variance**	=	Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time
		=	(SH × SR) – (AH × SR)
			Or
		=	(SH – AH) × SR
		=	₹ 50 × [4,780 hrs. – 5,000 hrs.]
		=	**₹ 11,000 (A)**

(iii) Calculation of Fixed Overhead Cost Variance, Fixed Overhead Expenditure Variance and Fixed Overhead Volume Variance:

(a)	**Fixed overhead cost variance**	=	Standard Fixed Overheads – Actual Fixed Overheads
		=	18,279 – 19,500
		=	₹ 1,221(A)
(b)	**Fixed Overhead Expenditure**	=	Budgeted Fixed Overheads – Actual Fixed Overheads
	Variance	=	₹ 19,120 – ₹ 19,500
		=	**₹ 380 (A)**

(c) Fixed overhead volume variance = (Budgeted output – Actual Output) X Budgeted rate per unit

= (2,00,000 – 1,91,200) 0.0956

= ₹ 8,800 x 0.0956

= **₹ 841 (A)**

Alternative presentation to part (iii) (a) and (b)

(i) Fixed Overhead Cost Variance:

= Overhead absorbed for actual production – Actual overhead incurred

$= \frac{₹19,120}{2,00,000}$ x 1,91,200 – 19,500 = **₹ 1,221(A)**

(iii) Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted overhead

$= \frac{₹19,120}{2,00,000}$ x 1,91,200 – 19,120 = **₹ 841(A)**

Working Notes:

1. Standard time to produce 10 units of product X is 15 minutes. Therefore we can manufacture 40 units in an hour.

Hours available in a week

125 Workers x 40 Hours = 5,000 hours

Therefore budgeted output = 5,000 x 40 units per hour = 2,00,000 units

Alternatively

Budgeted time per unit = $\frac{15\,\text{units}}{10\,\text{units}} = 1.5$ minutes

So, Budgeted output = $\frac{5,000\,\text{Hours} \times 60\,\text{Minutes}}{1.5\,\text{Minutes}} = 2,00,000$ units

Actual output = 23,900 x 8 units = 1,91,200 units

Standard hour for actual output = $1,91,200 \times \frac{0.25\,\text{Hrs}}{10\,\text{units}} = 4,780\,\text{Hrs}$

2.

Labour									
Budget			Revised standard			Actual			
Hours	Rate	₹	Hours	Rate	₹		Hours	Rate	₹
5,000	50	2,50,000	4,780	50	2,39,000	Skilled	3000	50	1,50,000
						Semi-Skilled	2000	40	80,000
							5000		2,30,000

3.

	Budget	Actual
Units	2,00,000	1,91,200
Fixed Overheads	19,120	19,500

4. Standard Fixed overheads:

$$\frac{19,120}{2,00,000} \times 1,91,200 = ₹18,279$$

Budgeted rate per unit:

$$\frac{19,120}{2,00,000} = ₹\ 0.0956$$

(b)

	Financial Accounting	Cost Accounting	Difference	Under/Over-recovery	Effect on Cost Accounting Profit	Net Effect* on Cost Accounting Profit
	₹	₹	₹			
(i) Factory Overhead	94,750	90,000	4,750	Under-recovery	Increased	To be reduced/ deducted
(ii) Administrative Overhead	60,000	57,000	3,000	Under-recovery	Increased	To be reduced/ deducted
(iii) Selling Overhead	55,000	61,500	-6,500	Over-recovery	Decreased	To be added
(iv) Opening Stock	17,500	22,500	-5,000	Over valuation	Decreased	To be added
(v) Closing Stock	12,500	15,000	-2,500	Over valuation	Increased	To be reduced/ deducted

*Taking Cost Accounting Profit as base

(Under recovery and over recovery with effect are answered by the candidate, or if under recovery and over recovery with treatment (net effect) are answered, due credit shall be given in both cases)

(c) High Employee Turnover increases the cost of production

Replacement costs are the costs which arise due to employee turnover. If employees leave soon after they acquire the **necessary training and experience** of good work, additional costs will have to be incurred on new workers, i.e., **cost of recruitment, training and induction**, **abnormal breakage and scrap** and **extra wages and overheads due to the inefficiency** of new workers.

It is obvious that a company will incur very high replacement costs if the rate of employee turnover is high. Similarly, only adequate preventive costs can keep Employee turnover at a low level. Each company must, therefore, work out the optimum level of Employee turnover keeping in view its personnel policies and the behaviour of replacement cost and preventive costs at various levels of Employee turnover rates.

Question 6

*Answer any **four** of the following:*

(a) Define cost objects and give examples of any four cost objects,

(b) Explain what is meant by Practical capacity and Normal capacity. How is normal capacity determined?

(c) What is meant by Activity Based Management (ABM) and discuss how Activity Based Management can be used in the business?

(d) Suggest any one basis of re-apportionment of service department overheads over production departments in the following instances:

Cost of Service Department	***Basis***
(i) Maintenance and Repair Shop	
(ii) Hospital and Dispensary	
(iii) Fire Protection	
(iv) Stores Department	
(v) Transport Department	
(vi) Computer Section	
(vii) Power House (Electric Power Cost)	
(viii) Inspection	
(ix) Tool Room	
(x) Time- keeping	

(e) How will you treat normal loss, abnormal loss and abnormal gain in process costing? Explain ***(4 x 5 = 20 Marks)***

Answer

(a) Definition of cost objects

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

Examples of cost objects

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

(b) Meaning of Practical capacity and Normal capacity

Practical capacity is defined as actually utilised capacity of a plant. It is also known as operating capacity. This capacity takes into account loss of time due to repairs, maintenance, minor breakdown, idle time, set up time, normal delays, Sundays and holidays, stock taking etc. Generally, practical capacity is taken between 80 to 90% of the rated capacity. It is also used as a base for determining overhead rates. Practical capacity is also called net capacity or available capacity.

Normal capacity is the volume of production or services achieved or achievable on an average over a period under normal circumstances taking into account the reduction in capacity resulting from planned maintenance.

Normal capacity is determined as under:

Installed capacity			xxx
Adjustments for:			
(i)	Time lost due to scheduled preventive or planned maintenance	xxx	
(ii)	Number of shifts or machine hours or man hours		
(iii)	Holidays, normal shut down days, normal idle time	xxx	
(iv)	Normal time lost in batch change over	xxx	xxx
Normal Capacity			**xxx**

(c) Meaning of Activity Based Management (ABM)

The term Activity based management (ABM) is used to describe the cost management application of ABC. The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Cost Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers. ABM utilizes cost information gathered through ABC.

Activity based management can be used in the following ways:

(i) **Cost Reduction**: ABM helps the organisation to identify costs against activities and to find opportunities to streamline or reduce the costs or eliminate the entire activity, especially if there is no value added.

(ii) **Business Process Re-engineering**: Business process re-engineering involves examining business processes and making substantial changes to how organisation currently operates. ABM is a powerful tool for measuring business performance, determining the cost of business output and is used as a means of identifying opportunities to improve process efficiency and effectiveness.

(iii) **Benchmarking**: Benchmarking is a process of comparing of ABC-derived activity costs of one segment of company with those of other segments. It requires uniformity in the definition of activities and measurement of their costs.

(iv) **Performance Measurement:** Many organisations are now focusing on activity performance as a means of facing competitors and managing costs by monitoring the efficiency and effectiveness of activities.

(d) Basis of re-apportionment of service department overheads over production departments

Cost of the Service Departments:	Basis
(i) Maintenance and Repair shop	Direct labour hours, Machine hours, Direct labour wages, Asset value x Hours worked
(ii) Hospital and Dispensary	No. of employees, No. of direct workers etc.
(iii) Fire Protection	Capital values
(iv) Stores Department	No. of requisitions, Weight or value of Materials issued.
(v) Transport Department	Crane hours, Truck hours, Truck mileage, Truck tonnage, Truck ton- hours, Tonnage handled. No. of packages of Standard size
(vi) Computer Section	Computer hours, Specific allocation to departments

(vii) Power House (Electric Power Cost)	Horse power, Kwh, Horse power × Machine hours, Kwh × Machine hours
(viii) Inspection	Inspection hours, number of inspections.
(ix) Tool room	Direct labour hours, Machine hours, Direct labour wages, Asset value x Hours worked
(x) Time-keeping	No. of card punched, No. of employees

(e) Treatment of normal loss, abnormal loss and abnormal gain in process costing

Treatment of Normal loss in Cost Accounts: The cost of normal process loss in practice is **absorbed by good units produced under the process.** The amount realised by the sale of normal process loss units should be credited to the process account.

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

Treatment of Abnormal Gain 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. The cost of **abnormal gain is computed on the basis of normal production.**

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

*Question No. **1** is compulsory.*

*Attempt any **four** questions out of the remaining **five** questions.*

In case, any candidate answers extra question(s)/ sub-question(s) over and above the required number, then only the requisite number of questions first answered in the answer book shall be valued and subsequent extra question(s) answered shall be ignored.

Working notes should form part of the answer.

Question 1

Answer the following:

(a) ABC Limited manufactures a product 'AM25' using material 'CEE'.

The following information is available regarding material 'CEE':

Purchase price per unit	*₹ 300*
Cost of placing an order	*₹ 150*
Carrying cost per unit per annum	*6% of purchase price*
Consumption of material 'CEE' per annum	*1,94,400 units*
Lead time	*Average 6 days, Maximum 8 days, Minimum 4 days*

Maximum consumption of material 'CEE' per day is 200 kg more than the average consumption per day.

Required:

Calculate the following in relation to material 'CEE':

(i) Economic Order Quantity.

(ii) Reorder Level

(iii) Maximum Stock Level. (Assume 360 days in a year) ***(5 Marks)***

(b) A worker took 60 hours to complete a job in a factory. The normal rate of wages is ₹ 80 per hour. The worker is entitled to receive bonus according to the Halsey Premium Plan. Factory overhead is recovered on the job at ₹ 60 per man hour actually worked. The factory cost of the job is ₹ 37,280 and material cost of the job is ₹ 28,400.

Required:

(i) Calculate the standard time for completing the job and effective hourly rate under the Halsey Premium plan.

(ii) Calculate the effective rate of earnings per hour if wages would have been paid under the Rowan Plan. ***(5 Marks)***

(c) *XYZ Limited manufactures three joint products A, B and C from a joint process. Product B is sold at split off point whereas product A and C are sold after further processing. 10% of the quantity of product A is lost in further processing. Data regarding these products for the year ending 31st March,2023 are as follows:*

	A	B	C
Number of units produced and sold	3,60,000	2,10,000	4,50,000
Selling price per unit at split off point	-	₹ 6	-
Selling price per unit after further processing	₹ 9.50	-	₹ 12
Further processing costs	₹ 8,60,000	-	₹10,40,000

The joint production cost upto the split off point at which A, B and C become separable products is ₹ 57,26,000.

Required:

(i) *Prepare a statement showing apportionment of joint cost to the products using Net realizable value method.*

(ii) *Assume XYZ Limited has received an offer from D Limited to purchase product 'A' at the split off point at ₹ 7 per unit and another company PQR Limited has offered to purchase product 'C' at split off point at 9 per unit.*

Advise whether these offers should be accepted or not? ***(5 Marks)***

(d) *Unique Construction Limited commenced a contract on 01.08.2022. The total contract price was ₹ 96,00,000. The following information was available from their costing records as at 31.03.2023:*

Material consumed	₹ 35,91,000
Wages paid	₹ 9,65,000
Wages outstanding as on 31.03.2023	₹ 75,000
Plant issued to site on 01.08.2022	₹ 7,50,000
Direct expenses	₹ 1,96,650
General overheads	₹ 2,08,000

A supervisor who was paid ₹ 18,000 per month, had spent 40% of his time on this contract. Plant costing ₹ 60,000 was transferred to other contracts on 31.12.2022. Plant was to be depreciated at 15% per annum on straight line method (SLM) basis. On 31.03.2023, 60% of the contract was completed. The architect's certificate had been issued covering 50% of the contract price.

Prepare a Contract account and show the notional profit or loss as on 31.03.2023.

(5 Marks)

Answer

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

Where, A= Annual demand for the material CEE = 1,94,400 Kgs

O = Ordering cost = ₹ 150

C = Carrying cost per unit per annum = 6% of ₹ 300 = 18

EOQ = $\sqrt{\frac{2\times1,94,400\times150}{18}}$ = **1,800 Units (Kgs.)**

(ii) Re-order level (ROL) = Maximum consumption# × Maximum lead time

ROL = 740 × 8 = **5,920 Kg.**

Maximum Consumption = Average consumption +200 kg

= $\frac{1,94,400}{360}$ + 200 = 540 + 200 Kg = 740 Kg.

Maximum lead time = 8 days

(iii) Maximum Stock level = Re-order quantity + Re-order level – (Min. consumption* × Min. lead time)

= 1,800 + 5,920 – (340×4)

= 7,720 – 1,360 = **6,360 Kg**

*Minimum consumption = 2 × Average consumption – Maximum Consumption

= 2 × 540 – 740

= 1080 – 740 = 340 kg.

(b) (i) Calculation of standard time and effective hourly rate:

Standard time = Actual hours worked + time saved = 60 +12 = 72 hours

Effective hourly rate under Halsey premium plan = $\frac{\text{Total labour cost}}{\text{Actual hour worked}} = \frac{5,280}{60}$

= ₹ 88

(ii) Calculation of effective rate earnings under Rowan plan:

(Rate × Actual hours worked) + Rate × $\frac{\text{Time Saved}}{\text{Std. Time}}$ × Time taken

₹ 80 × 60 hours + ₹ 80 × $\frac{12}{72}$ × 60

₹ 4,800 + 800 = ₹ 5,600

Effective rate per hour = 5,600 ÷ 60 hour = ₹ 93.33

Working Note:

(1) Calculation of labour cost = Factory cost – Material cost – Factory Overhead

= 37,280 – 28,400 – (₹ 60 × 60 hours)

= 37,280 – 28,400 – 3,600 = ₹ 5,280

(2) Calculation of bonus and time saved

Total labour cost = Normal Rate × Actual hours worked + ½ time saved × normal rate

₹ 5,280 = (₹ 80 × 60 hours) + ½ (time saved × ₹ 80)

40 × time saved = ₹ 5,280 – ₹ 4,800

Time saved = (5,280 - 4,800) ÷ 40

Time saved = 12 hours

The solution can also be presented in following way:

(b)

Particulars	**(₹)**
Factory Cost	37,280
Less: Factory Overheads 60 x ₹ 60	3,600
Prime Cost	33,680
Direct material	28,400
Direct wages (Balancing Figure)	5,280

(i) Wages under Halsey Plan (Rate × Actual hours worked) + Rate × $\frac{\text{Time Saved}}{\text{Std. Time}}$ ×Time taken

₹ 5,280 = 60 x ₹ 80 + (S* – 60)/2 x ₹ 80

₹ 5,280 = ₹ 4,800 + 40S – 2,400

S = ₹ 2,880/40 = 72 hours

*Standard time

Effective rate of earnings per hour = 5,280/60 = ₹ 88

(ii) Wages under Rowan Plan: (Rate × Actual hours worked) + Rate × $\frac{\text{Time Saved}}{\text{Std. Time}}$×Time taken

= 60 x 80 + $\frac{72-60}{72}$ x 60 x 80 = ₹ 5,600

Effective rate of earnings per hour = 5,600/60 = ₹ 93.33

(c) (i) Statement showing apportionment of joint cost to the products using NRV method

Particulars	Product A (₹)	Product B (₹)	Product C (₹)
Sales value	34,20,000 (3,60,000 x ₹ 9.5)	12,60,000 (2,10,000 x ₹ 6)	54,00,000 (4,50,000 x ₹ 12)
Less: Further processing cost	8,60,000	-	10,40,000
Net Realisable Value	25,60,000	12,60,000	43,60,000
Apportionment of Joint cost of ₹ 57,26,000 in the ratio of 256:126:436	17,92,000	8,82,000	30,52,000

(ii) Decision whether to Process further or not

Particulars	Product A (₹)	Product C (₹)
Incremental Revenue	9,00,000 (₹ 9.5-₹ 7) x 3,60,000	13,50,000 (₹ 12- ₹ 9) x 4,50,000
Less: Further processing cost	8,60,000	10,40,000
Less: wastage if further processed	2,80,000 ₹ 7 x (3,60,000*10%/90%)	-
Incremental profit/(loss)	**(2,40,000)**	**3,10,000**

On comparing incremental sales revenue with further processing cost, there is net loss of ₹ 2,40,000 in case of product A and profit of ₹ 3,10,000 in case of product C. Hence **offer of D Ltd should be accepted and Product A should be sold at split off point** Whereas product C should be **sold after further processing.**

The solution can also be presented in following way:

Profit from further processing

Particulars	Product A (₹)	Product C (₹)
Sales Revenue	34,20,000 (3,60,000 x 9.5)	54,00,000 (4,50,000 x 12)
Less: Joint cost	17,92,000	30,52,000
Less: Further processing cost	8,60,0000	10,40,000
(i) Profit/(loss)	**7,68,000**	**13,08,000**

Profit from Accepting offer (Sale at separation point)

Particulars	Product A (₹) D Limited offer accepted	Product C (₹) PQR Limited offer accepted
Sales Revenue	28,00,000 (3,60,000/0.90) x 7	40,50,000 (4,50,000 x 9)
Less: Joint cost	17,92,000	30,52,000
(ii) Profit/(loss)	**10,08,000**	**9,98,000**
Incremental profit (loss) (i)-(ii)	**(2,40,000)**	**3,10,000**

On comparing profit at separation point with further processing profit, there is net loss of ₹ 2,40,000 in case of product A and profit of ₹ 3,10,000 in case of product C. Hence **offer of D Ltd should be accepted and Product A should be sold at split off point** Whereas product C should be **sold after further processing.**

(d) Contract A/c for the year ending 31/03/23

Particulars		(₹)	Particular		(₹)
To Material		35,91,000	By work in Progress:		
To Wages:			Work certified	48,00,000	
Current Wages	9,65,000		Work uncertified	8,61,000	56,61,000
Add: outstanding Wages	75,000	10,40,000	By Plant (Transferred)	60,000	
To Plant		7,50,000	Less: Dep @ 15% for 5 months	3,750	56,250
To Direct Expenses		1,96,650	By Plant at site		6,21,000
To General overheads		2,08,000	(7,50,000 - 60,000-69,000)		
To Supervision Salary (18,000 × 8 × 40%)		57,600			
To Notional profit c/d		4,95,000			
		63,38,250			**63,38,250**

Working Note:

Calculation of cost of work uncertified:

Particular	(₹)
Cost incurred till date	51,66,000
Estimated total cost (51,66,000/60%)	86,10,000
Cost of work certified (86,10,000 × 50%)	43,05,000
Cost of uncertified work (51,66,000 – 43,05,000)	**8,61,000**

The solution can also be presented in following way and depreciation can be calculated as shown below:

Contract A/c for the year ending 31/03/23

Particulars	(₹)	Particular	(₹)
To Material	35,91,000		
To Wages:			
Current Wages 9,65,000			
Add: outstanding Wages 75,000	10,40,000		
To Depreciation on plant	72,750		
To Direct Expenses	1,96,650		
To General overheads	2,08,000		
To Supervision Salary (18,000 × 8 × 40%)	57,600	By work Cost (Bal Fig.)	51,66,000
	51,66,000		**51,66,000**
To work cost	51,66,000	By work certified	48,00,000
To Notional profit c/d	4,95,000	By Work uncertified	8,61,000
	56,61,000		**56,61,000**

Working Note:

1. Calculation of cost of work uncertified:

Particular	(₹)
Cost incurred till date	51,66,000
Estimated total cost	86,10,000

(51,66,000/60%)	
Cost of work certified (86,10,000 × 50%)	43,05,000
Cost of uncertified work (51,66,000 – 43,05,000)	**8,61,000**

2. Calculation of Depreciation

Plant value (7,50,000 – 60,000) = ₹ 6,90,000 used for 8 months and plant value ₹ 60,000 used for 5 months.

Depreciation amount for 8 months = (6,90,000 x 15% x 8 months) /12 = ₹ 69,000

Depreciation amount for 5 months = (60,000 x 15% x 5 months) /12 = ₹ 3,750

Total depreciation amount = ₹ 72,750

Question 2

(a) The following data relates to the manufacture of product BXE for the year ended 31st March,2023:

	Amount (₹)
Value of stock as on 1st April,2022	
Raw materials	*27,00,000*
Work in progress	*10,60,000*
Finished Goods	*25,00,000*
Material purchased	*2,48,00,000*
Freight inward	*7,50,000*
Direct wages	*42,00,000*
Power & Fuel	*18,75,000*
Cost of special drawings	*3,60,000*
Trade Discount	*4,50,000*
Insurance on material procured	*15,000*
Rent of Factory Building (1/5th used for office purpose)	*7,00,000*
Depreciation on machinery	*6,25,000*
Depreciation on Delivery Vans	*1,20,000*
Consumable stores and indirect wages	*15,20,000*
Quality Control cost	*9,00,000*
Primary packing cost	*12,90,000*

General Administrative overheads (excluding rent of building)	*17,50,000*
Salary paid to Marketing Staff	*9,60,000*
Packing cost for transportation	*1,84,000*
Value of stock as on 31st March, 2023	
Raw materials	*32,60,000*
Work in progress	*11,80,000*
Finished Goods	*28,38,000*

Additional Information:

- *Further, some of the finished product was found defective and the defective products were rectified by incurring expenditure of additional factory overheads to the extent of ₹ 33,600. The cost of rectification is not included in details mentioned above.*
- *An amount of ₹ 1,20,600 was realised by selling scrap and waste generated during the year.*

Prepare Cost sheet for the year ended 31stMarch, 2023 showing:

(i) Prime cost,

(ii) Factory cost,

(iii) Cost of production.

(iv) Cost of goods sold, and

(v) Cost of sales. ***(10 Marks)***

(b) HL Limited produces and sells four varieties of beverage. The past data shows different demand patterns for various quarters during the year. The sales quantity and selling price for the month of September 2023 is as follows:

	Sales Quantity	***Selling Price per unit***
Hot Coffee	*1,40,000 Units*	*₹ 20/-*
Cold Coffee	*3,40,000 Units*	*₹ 40/-*
Fruit Juice	*4,20,000 Units*	*₹ 20/-*
Carbonated Soft Drink	*2,70,000 units*	*₹ 20/-*

For the quarter October to December 2023, it is estimated that due to climate changes the demand for Hot Coffee would increase every month by 50% of the previous month and the demand for Cold Coffee would decrease every month by 30% of the previous month. The demand for Fruit Juice would decrease by 20% in the month of October 2023 and thereafter it will remain constant. HL Limited would be able to sell only 60,000 units, 50,000 units and 30,000 units of Carbonated Soft Drink respectively during the months of October,

November and December 2023. There would be no change in the selling price of all the products during the next quarter.

Standard Quantity of closing stock for the period September 2023 to December 2023 is as follows: *(in units)*

	Hot Coffee	***Cold Coffee***	***Fruit Juice***	***Carbonated Soft Drink***
September 2023	*12,000*	*13,000*	*11,000*	*7,500*
October 2023	*15,000*	*14,000*	*12,000*	*5,500*
November 2023	*13,000*	*15,000*	*10,000*	*6,000*
December 2023	*11,000*	*16,000*	*13,000*	*7,000*

You are required to prepare a Production Budget (in units) and Sales Budget (in units and sales value) for the months of October, November and December 2023. ***(10 Marks)***

Answer

(a) **Cost Sheet for the product BXE**

Sl. No.	**Particulars**	**(₹)**	**(₹)**
(i)	Material Consumed:		
	Raw materials purchased	2,48,00,000	
	Freight inwards	7,50,000	
	Insurance on material procured	15,000	
	Less: Trade discount	(4,50,000)	
	Add: Opening stock of raw materials	27,00,000	
	Less: Closing stock of raw materials	(32,60,000)	2,45,55,000
(ii)	Direct wages		42,00,000
(iii)	Direct expenses:		
	Power & fuel	18,75,000	
	Cost of special drawings	3,60,000	22,35,000
	Prime Cost		**3,09,90,000**
(iv)	Works/ Factory overheads:		
	Rent of factory building (4/5th of 7,00,000)	5,60,000	
	Depreciation on machinery	6,25,000	
	Defective rectification cost	33,600	
	Consumable stores & indirect wages	15,20,000	27,38,600
	Gross works cost		3,37,28,600

	Add: Opening work in process		10,60,000
	Less: Closing work in process		(11,80,000)
	Factory cost		**3,36,08,600**
(v)	Quality control cost		9,00,000
(vi)	Primary packing cost		12,90,000
(vii)	Less: Amount realised from scrap sale		(1,20,600)
	Cost of production		**3,56,78,000**
	Add: Opening stock of finished goods		25,00,000
	Less: Closing stock of finished goods		(28,38,000)
	Cost of Goods Sold		**3,53,40,000**
	Administrative overheads:		
(viii)	Rent of factory building (1/5th of 7,00,000)		1,40,000
	General administrative overheads		17,50,000
	Selling and Distribution overheads:		
(x)	Salary paid to marketing staff		9,60,000
(xi)	Packing cost for transportation		1,84,000
(xii)	Depreciation on delivery vans		1,20,000
	Cost of Sales		**3,84,94,000**

Alternatively, Power and fuel expenses of ₹ 18,75,000 can be taken as a part of factory overhead. Accordingly, prime cost will be 2,91,15,000. However, there will be no change in factory cost, cost of production, cost of goods sold and cost of sales.

(b) **Production Budget (in units)**

Particulars	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
October 2023				
Sales*	2,10,000	2,38,000	3,36,000	60,000
Add: Closing stock	15,000	14,000	12,000	5,500
Total Quantity Required	2,25,000	2,52,000	3,48,000	65,500
Less: Opening stock	12,000	13,000	11,000	7,500
Production	**2,13,000**	**2,39,000**	**3,37,000**	**58,000**
November 2023				
Sales*	3,15,000	1,66,600	3,36,000	50,000
Add: Closing stock	13,000	15,000	10,000	6,000
Total Quantity Required	3,28,000	1,81,600	3,46,000	56,000

Less: Opening stock	15,000	14,000	12,000	5,500
Production	**3,13,000**	**1,67,600**	**3,34,000**	**50,500**
December 2023				
Sales*	4,72,500	1,16,620	3,36,000	30,000
Add: Closing stock	11,000	16,000	13,000	7,000
Total Quantity Required	4,83,500	1,32,620	3,49,000	37,000
Less: Opening stock	13,000	15,000	10,000	6,000
Production	**4,70,500**	**1,17,620**	**3,39,000**	**31,000**

*sales units are taken from sales budget

Sales Budget (in Units and sales value)

Particulars	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
October 2023 (in units)	2,10,000 [1,40,000 + (1,40,000 x 50%)]	2,38,000 [3,40,000 -(3,40,000 x 30%)]	3,36,000 [420000 -(4,20,000x20%)]	60,000
October 2023 (Sales Value in ₹)	42,00,000 (2,10,000 x ₹ 20)	95,20,000 (2,38,000 x ₹ 40)	67,20,000 (3,36,000 x ₹20)	12,00,000 (60,000 x ₹ 20)
November 2023 (in units)	3,15,000 [2,10,000 +(2,10,000 x 50%)]	1,66,600 [2,38,000 -(2,38,000 x 30%)]	3,36,000	50,000
November 2023 (Sales Value in ₹)	63,00,000 (3,15,000 x ₹ 20)	66,64,000 (1,66,600 x ₹ 40)	67,20,000 (3,36,000 x ₹ 20)	10,00,000 (50,000 x ₹ 20)
December 2023 (in units)	4,72,500 [3,15,000 +(3,15,000 x 50%)]	1,16,620 [1,66,600 -(1,66,600 x 30%)]	3,36,000	30,000
December 2023 (Sales Value in ₹)	94,50,000 (4,72,500 x ₹ 20)	46,64,800 (1,16,620 x ₹ 40)	67,20,000 (3,36,000 x ₹ 20)	6,00,000 (30,000 x ₹ 20)

Sales Budget can also be presented in following way:

	Oct 2023		Nov 2023		Dec 2023	
	Quantity (units)	Amount (₹)	Quantity (units)	Amount (₹)	Quantity (units)	Amount (₹)
Hot Coffee @ ₹ 20 per unit	2, 10,000	42,00,000	3,15,000	63,00,000	4,72,500	94,50,000
Cold Coffee @ ₹ 40 per unit	2,38,000	95,20,000	1,66,600	66,64,000	1,16,620	46,64,800
Fruit Juice @ ₹ 20 per unit	3,36,000	67,20,000	3,36,000	67,20,000	3,36,000	67,20,000
Carbonated Soft Drink @ ₹ 20 per unit	60,000	12,00,000	50,000	10,00,000	30,000	6,00,000
		2,16,40,000		**2,06,84,000**		**2,14,34,800**

Question 3

(a) *HCP Ltd. is a manufacturing company having two production departments, P and Q and two service departments, R and S. The budgeted cost information for the month of October 2023 is furnished below:*

		Production Departments		*Service Departments*	
	(₹)	*P (₹)*	*Q (₹)*	*R (₹)*	*S (₹)*
Indirect material	*1,77,500*	*94,750*	*49,750*	*18,270*	*14,730*
Indirect Labour	*1,55,000*	*35,000*	*75,000*		
Factory Rent	*75,000*				
Depreciation on machinery	*37,500*				
Power	*96,000*				
Security Expenses for Factory Premises	*24,000*				
Insurance- machinery	*12,000*				
Supervisor Expenses	*48,000*				
Additional information					
Floor Area (Sq. meters)		*1250*	*750*	*200*	*300*
Net book value of machinery (₹)		*21,00,000*	*5,00,000*	*1,00,000*	*3,00,000*
H.P. of machines		*800*	*200*	*80*	*120*

Machine hours	*4,000*	*1,000*	*600*	*800*
Number of employees	*10*	*30*	*6*	*4*
Labour hours	*2,000*	*6,000*	*1,200*	*600*

The overhead costs of the two service department are distributed using step method in the same order viz. R and S respectively on the following basis:

Department R *Number of employees*

Department S *Machine hours*

Required:

(i) Prepare a statement showing distribution of overheads to various departments, clearly showing the basis of distribution.

(ii) Calculate the total budgeted overheads for both production departments after the service departments have been re-apportioned to them.

(iii) Calculate the most appropriate overhead absorption rate for each of the production department. ***(10 Marks)***

(b) Royal Hotel offers three types of rooms to its guests - Deluxe Room, Executive Room and Suite Room. Other information is as follows:-

	Deluxe Room	***Executive Room***	***Suite Room***
Room Tariff per day	*₹ 1,500*	*₹ 2,400*	*₹ 3,800*
No. of rooms	*20*	*10*	*4*
Average occupancy during the year	*80%*	*60%*	*75%*
Housekeeping expenses per day	*₹280*	*₹320*	*₹425*

The hotel provides complimentary breakfast facility to its executive room and suite room guests while swimming pool facility is provided free of cost only to suite room guests.

The restaurant and swimming pool is run by a contractor. The contractor recovers charges of ₹ 150 per person for breakfast and ₹ 200 per person for using swimming pool facility from Royal Hotel.

Besides the above-mentioned charges, annual fixed expenses are as follows:

Salaries to staff *₹ 57,60,000*

Electricity Expenses *₹ 24,00,000*

Salaries to staff are apportioned to Deluxe Room. Executive Room and Suite Room in the ratio of 25:35:40 and electricity expenses are to be apportioned in proportion to occupancy.

You are required to calculate the total profit of each room type on annual basis.

Note: Assume 360 days in a year and double occupancy in each category of room.

(10 Marks)

Answer

(a) (i) Overhead Distribution Statement

Particular	Basis	Total Amount (₹)	Production Departments		Service Departments	
			P (₹)	Q (₹)	R (₹)	S (₹)
Indirect material	Direct	1,77,500	94,750	49,750	18,270	14,730
Indirect labour	Direct	1,55,000	35,000	75,000	15,000	30,000
Factory rent (125:75:20:30)	Floor Area	75,000	37,500	22,500	6,000	9,000
Depreciation of machinery (21:5:1:3)	Book value of machinery	37,500	26,250	6,250	1,250	3,750
Power (80:20:8:12)	H.P. of machines	96,000	64,000	16,000	6,400	9,600
Security expenses for factory premises (125:75:20:30)	Floor Area	24,000	12,000	7,200	1,920	2,880
Insurance-machinery (21:5:1:3)	Book value of machinery	12,000	8,400	2,000	400	1,200
Supervisor expenses (10:30:6:4)	Number of employees	48,000	9,600	28,800	5,760	3,840
Total		**6,25,000**	**2,87,500**	**2,07,500**	**55,000**	**75,000**

(ii) Redistribution of Service Department's Expenses

Particular	Production Departments		Service Departments	
	P (₹)	Q (₹)	R (₹)	S (₹)
Overhead as per primary distribution	2,87,500	2,07,500	55,000	75,000
Expenses of service department R is apportioned among other	12,500	37,500	(55,000)	5,000

departments P, Q & S in the ratio of number of employees (10:30:4)				
Expenses of service department S is apportioned among other departments P & Q in the ratio of Machine hours (40:10)	64,000	16,000	-	(80,000)
Total Budgeted overheads	**3,64,000**	**2,61,000**	**-**	**-**

(iii) Calculation of overhead rates for each of the production department

Particular	**Production Departments**	
	P (₹)	**Q (₹)**
Total Budgeted overheads	3,64,000	2,61,000
Actual machine hours	4000 hours	-
Actual labour hours	-	6000 hours
Actual machine/labour hour rate	**91**	**43.5**

Note: Department P is assumed to be machine oriented and Department Q is assumed to be labour oriented as per information available in the question

The solution 3(a) can also be presented in following way for Distribution of Power expenses:

Overhead Distribution Statement

Particular	**Basis**	**Total Amount (₹)**	**Production Departments**		**Service Departments**	
			P (₹)	**Q (₹)**	**R (₹)**	**S (₹)**
Indirect material	Direct	1,77,500	94,750	49,750	18,270	14,730
Indirect labour	Direct	1,55,000	35,000	75,000	15,000	30,000
Factory rent (125:75:20:30)	Floor Area	75,000	37,500	22,500	6,000	9,000
Depreciation of machinery (21:5:1:3)	Book value of machinery	37,500	26,250	6,250	1,250	3,750
Power (3200:200:48:96)	H.P. x machine hours	96,000	86,682	5,418	1,300	2,600
Security expenses for factory premises (125:75:20:30)	Floor Area	24,000	12,000	7,200	1,920	2,880

Insurance-machinery (21:5:1:3)	Book value of machinery	12,000	8,400	2,000	400	1,200
Supervisor expenses (10:30:6:4)	Number of employees	48,000	9,600	28,800	5,760	3,840
Total		**6,25,000**	**3,10,182**	**1,96,918**	**49,900**	**68,000**

Power can be distributed on the basis of HP of machines x machine hours

800 x 4000 = 32,00,000, 200 x 1000 = 2,00,000, 80 x 600 = 48,000, 120 x 800 = 96,000

Ratio is 3200:200:48:96

(ii) Redistribution of Service Department's Expenses

Particular	Production Departments		Service Departments	
	P (₹)	Q (₹)	R (₹)	S (₹)
Overhead as per primary distribution	**3,10,182**	**1,96,918**	**49,900**	**68,000**
Expenses of service department R is apportioned among other departments P, Q & S in the ratio of number of employees (10:30:4)	11,340.90	34,022.73	(49,900)	4,536.37
Expenses of service department S is apportioned among other departments P & Q in the ratio of Machine hours (40:10)	58,029.10	14,507.27	-	(72,536.37)
Total Budgeted overheads	**3,79,552**	**2,45,448**	**-**	**-**

(iii) Calculation of overhead rates for each of the production department

Particular	Production Departments	
	P (₹)	Q (₹)
Total Budgeted overheads	**3,79,552**	**2,45,448**
Actual machine hours	4000 hours	-
Actual labour hours	-	6000 hours
Actual machine/labour hour rate	**94.89**	**40.91**

Note: Department P is assumed to be machine oriented and Department Q is assumed to be labour oriented as per information available in the question

(b) Calculation of room days:

Nature of Room	Occupancy (Room-days)
Deluxe room	5760 (20 x 80% x 360)
Executive room	2160 (10 x 60% x 360)
Suite room	1080 (4 x 75% x 360)

Statement showing Total Profit for each room type

Elements	Deluxe room (₹)	Executive room (₹)	Suite room (₹)	Total (₹)
Room Days	**5760**	**2160**	**1080**	
Revenue	86,40,000	51,84,000	41,04,000	1,79,28,000
Cost				
Housekeeping @ ₹ 280 per room day	16,12,800	6,91,200	4,59,000	27,63,000
Breakfast @ ₹ 150 per person	-	6,48,000	3,24,000	9,72,000
Swimming pool @ ₹ 200 per person	-	-	4,32,000	4,32,000
Salaries to staff (25:35:40)	14,40,000	20,16,000	23,04,000	57,60,000
Electricity expenses (occupancy)	15,36,000	5,76,000	2,88,000	24,00,000
Total cost	45,88,800	39,31,200	38,07,000	1,23,27,000
Profit	**40,51,200**	**12,52,800**	**2,97,000**	**56,01,000**

The solution can also be presented in following way:

Calculation of room days

Particulars	Occupancy during the year		
	Deluxe Room	Executive Room	Suite Room
(i) No. of Rooms	20	10	4
(ii) Occupancy in %	80%	60%	75%

No. of rooms occupied per day	16	6	3
No. of rooms occupied per year	5,760	2,160	1,080

Statement showing Total Profit for each room type

Annual Room Rent	Deluxe Room	Executive Room	Suite Room
Room Rent per day per room	₹ 1,500	₹ 2,400	₹ 3,800
Annual Room Rent (A)	₹ 86,40,000	₹ 51,84,000	₹ 41,04,000
Annual Fixed Expenses			
Staff Salary (25:35:40)	₹ 14,40,000	₹ 20,16,000	₹ 23,04,000
Electricity Expenses (Occupancy)	₹ 15,36,000	₹ 5,76,000	₹ 2,88,000
Total (B)	₹ 29,76,000	₹ 25,92,000	₹ 25,92,000
Housekeeping Expenses	₹ 16,12,800	₹ 6,91,200	₹ 4,59,000
Breakfast Charges		₹ 6,48,000 (2,160 x 2 x 150)	₹ 3,24,000 (1,080 x 2 x 150)
Swimming Pool Charges			₹ 4,32,000 (1,080 x 2 x 200)
Total (C)	₹ 16,12,800	₹ 13,39,200	₹12,15,000
Total Cost (B+C)	₹ 45,88,800	₹ 39,31,200	₹ 38,07,000
Profit	**₹ 40,51,200**	**₹ 12,52,800**	**₹ 2,97,000**

Question 4

(a) JH Plastics Limited manufactures three products S, M and L. To date, simple traditional absorption costing system has been used to allocate overheads to products. Total production overheads are allocated on the basis of machine hours. The machine hour rate for allocating production overheads is ₹ 240 per machine hour under the traditional absorption costing system. Selling prices are calculated by adding mark up of 40% of the product cost. Information related to products for the most recent year is as under:

	Products		
	S	*M*	*L*
Units produced and sold	*7,500*	*12,500*	*9,000*
Direct material cost per unit (₹)	*158*	*179*	*250*
Direct labour cost per unit (₹)	*40*	*45*	*60*
Machine hours per unit	*0.30*	*0.45*	*0.50*

Number of Machine setups	*120*	*120*	*160*
Number of purchase orders	*90*	*135*	*125*
Number of inspections	*100*	*160*	*140*

The management wishes to introduce activity-based method (ABC) system of attributing production overheads to products and has identified major cost pools for production overheads and their associated cost drivers as follows:

Cost pool	Amount	Cost driver
Purchasing Department Cost	*₹ 7,00,000*	*Number of Purchase orders*
Machine setup Cost	*₹ 9,00,000*	*Number of Machine setups*
Quality Control Cost	*₹ 6,56,000*	*Number of inspections*
Machining Cost	*₹ 5,64,000*	*Machine hours*

Required:

(i) Calculate the total cost per unit and selling price per unit for each of the three products using:

(a) The traditional costing approach currently used by JH Plastics Limited;

(b) Activity based costing (ABC) approach.

(ii) Calculate the difference in selling price per unit as per (a) and (b) above and show which product is under-priced or over-priced. ***(10 Marks)***

(b) R Ltd. produces and sells 60,000 units of product 'AN', at its Noida Plant. The selling price of the product is ₹ 15 per unit. The variable cost is 80% of selling price per unit. Fixed cost during this period is ₹ 4,20,000. The company is continuously suffering losses, and management plans to shut down the Noida Plant.

The fixed cost is expected to be reduced by ₹ 2,50,000.

Additional costs of plant shut down are expected at ₹ 25,000.

You are required to comment on:

(i) Whether the Noida plant be shut down?

(ii) Find the shut-down point in units. ***(5 Marks)***

(c) A product passes through two processes; Process A and Process B.

The output of Process A is treated as input of Process B.

The following information has been furnished:

	Process A	Process B
Input Material	*₹ 3,90,000*	-

78,000 Kg.@ ₹ 5		
Indirect Material	*-*	*₹34,320*
Wages	*₹ 2,85,000*	*₹ 3,30,000*
Overhead	*₹ 1,67,400*	*₹ 1,11,600*
Output transferred to Process B	*68,640 kgs*	
Transfer to Finished Stock	*-*	*69,000 kgs*
Normal loss of input material (weight in kgs.)	*7,800 kgs*	*240 kgs*

There is no realisable value for normal loss. No stock of raw materials on work-in-process was left at the end.

You are required to prepare the Process account for each Process. ***(5 Marks)***

Answer

(a) (i) (a) Statement showing 'Cost per unit & Selling price per unit – Traditional Method'.

Particular	Products		
	S (₹)	M (₹)	L (₹)
Direct material cost per unit	158	179	250
Direct labour cost per unit	40	45	60
Production overhead @ ₹ 240 per machine hour	72 (₹ 240 x 0.3)	96 (₹ 240 x 0.4)	120 (₹ 240 x 0.5)
Cost per unit	**270**	**320**	**430**
Add: Profit @ 40%	108	128	172
Selling price per unit	**378**	**448**	**602**

(b) Statement showing 'Cost per unit & Selling price per unit – Activity Based Costing'.

Particular	Activity Drivers	Total Amount (₹)	Products		
			S	M	L
Production (units)	-	-	7500	12500	9000
Machine hours	-	-	2250 (7500 x 0.3)	5000 (12500 x 0.4)	4500 (9000 x 0.5)
			(₹)	(₹)	(₹)
Direct material cost per unit (i)			158	179	250

Direct labour cost per unit (ii)			40	45	60
Overheads					
Purchasing department cost (90:135:125)	Number of purchase orders	7,00,000	1,80,000	2,70,000	2,50,000
Machine setup cost (120:120:160)	Number of machine setups	9,00,000	2,70,000	2,70,000	3,60,000
Quality control cost (100:160:140)	Number of inspections	6,56,000	1,64,000	2,62,400	2,29,600
Machining cost (225:500:450)	Machine hours	5,64,000	1,08,000	2,40,000	2,16,000
Total Overhead			7,22,000	10,42,400	10,55,600
Overhead Cost per unit (iii)			96.27	83.39	117.29
Total Cost per unit (i+ii+iii)			**294.27**	**307.39**	**427.29**
Add: Profit @ 40%			117.71	122.96	170.92
Selling price per unit			**411.98**	**430.35**	**598.21**

Note: The question may also be solved by calculating cost driver rate & allocating various cost based on cost driver rate. However, there will be no change in any of the answer.

(ii)

Particular	**Products**		
	S (₹)	**M (₹)**	**L (₹)**
Selling price per unit as per Traditional Costing	378	448	602
Selling price per unit as per Activity Based Costing	411.98	430.35	598.21
Difference	**(33.98)**	**17.65**	**3.79**

Product S is underpriced while product M and L is overpriced using Traditional costing approach.

(b) **Statement of profit**

Particulars	**₹**
Selling Price	15 per unit
Less : Variable cost	12 per unit

Contribution	3 per unit
Capacity	60,000 units
Total contribution (60,000 units × ₹ 3)	1,80,000
Less: Fixed Cost	4,20,000
Loss	**(2,40,000)**

Shut down cost

Particular	₹
Fixed cost	1,70,000
Additional cost	25,000
Shut down cost	**1,95,000**

(i) Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

(ii) Shut down point: $\frac{\text{Total fixed cost - Shut down cost}}{\text{Contribution per unit}}$

$$\frac{4,20,000 - 1,95,000}{3} = 75,000 \text{ units}$$

The solution can also be presented in following way

Statement of profit

Particulars	If plant is continued ₹	If plant is shut down ₹
Selling Price	15 per unit	-
Less : Variable cost	12 per unit	-
Contribution	3 per unit	-
Capacity	60,000 units	-
Total contribution (60,000 units × ₹ 3)	1,80,000	
Less : Fixed Cost	4,20,000	1,70,000
Additional Fixed Cost	-	25,000
Loss	**2,40,000**	**1,95,000**

(i) Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

(ii) Shut down point: $\frac{\text{Total fixed cost - Shut down cost}}{\text{Contribution per unit}}$

$$\frac{4,20,000 - 1,95,000}{3} = 75,000 \text{ units}$$

(c) **Process A Account**

Particulars	Units	₹	Particulars	Units	₹
To Material	78,000	3,90,000	By Normal Loss	7,800	-
To Wages		2,85,000	By Abnormal Loss	1,560	18,720
To Overheads		1,67,400	By Process B A/c	68,640	8,23,680
Total	**78,000**	**8,42,400**	**Total**	**78,000**	**8,42,400**

Cost per unit of completed units and abnormal loss = $\frac{8,42,400}{78,000 \text{ units} - 7,800 \text{ units}}$ = ₹ 12 unit

Process B Account

Particulars	Units	₹	Particulars	Units	₹
To Process A A/c	68,640	8,23,680	By Normal loss	240	-
To Indirect Material		34,320	By Finished stock	69,000	13,11,000
To Wages		3,30,000			
To Overheads		1,11,600			
To Abnormal gain	600	11,400			
Total	**69,240**	**13,11,000**	**Total**	**69,240**	**13,11,000**

Cost per unit of completed units and abnormal gains:

$$\frac{\text{Total cost}}{\text{Inputs - Normal loss}} = \frac{₹12,99,600}{68,640 \text{ units} - 240 \text{ units}} = ₹19$$

Question 5

(a) PQR Alloys Ltd. uses a standard costing system.

Budgeted information for the year:

Budgeted output	*84,000 units*
Variable Factory Overhead per unit	*₹ 16*
Standard time for one unit of output	*0.80 machine hour*
Fixed factory overheads	*₹ 6,72,000*

Actual results for the year:

Actual output	*87,600 units*
Variable Overhead efficiency variance	*₹ 67,200 (A)*
Actual Fixed factory overheads	*₹ 7,05,000*
Actual variable factory overheads	*₹ 14,37,000*

Required:

Calculate the following variances clearly indicating Adverse(A) or Favourable (F):

(i) Variable factory overhead expenditure variance.

(ii) Fixed factory overhead expenditure variance.

(iii) Fixed factory overhead efficiency variance.

(iv) Fixed factory overhead capacity variance. ***(10 Marks)***

(b) The following data relate to the manufacture of a product 'VD-100 during the month of October 2023:*

Good units produced	*12,600*
Units Sold	*11,800*
Direct wages	*₹ 8,82,000*
Administrative Overheads	*₹ 4,72,000*
Selling price per unit	*₹ 416*

Each unit produced requires 2 kg. of material 'Z'. Cost of material 'Z' is ₹ 72 per kg. 10% of the production has been scrapped as bad and fetches ₹ 45 per unit. Factory overheads are 80% of wages. Selling and distribution overheads are ₹ 54 per unit sold. There is no opening or closing stock of material and work in progress.

You are required to find out total cost of sales and profit for the month of October 2023.

(6 Marks)

(c) Construct journal entries in the following situations assuming that cost and financial transactions are integrated:

(i)	*Purchase of raw material*	*₹ 4,40,000*
(ii)	*Direct Material issued to production*	*₹ 3,60,000*
(iii)	*Wages charged to production*	*₹ 80,000*
(iv)	*Manufacturing overheads charged to production*	*₹ 1,32,000*

(4 Marks)

Answer

(a) Calculation of actual hours

$$\text{Standard rate per hour} = \frac{\text{Variable factory overhead per unit}}{\text{Standard time for one unit of output}} = \frac{₹16}{0.8} = ₹\ 20$$

Variable Overhead Efficiency Variance:

(Standard hours for actual production – Actual hours) × Standard rate per hour

Let actual hours be x

[(87,600 × 0.8) – x] ×20 = -67,200

(70,080 – x) × 20 = -67,200

x = 73,440

(i) Variable Factory Overhead Expenditure Variance:

(Variable overhead at actual hours – Actual variable overheads)

$$\left[\left(\frac{13,44,000}{67,200} \times 73,440\right) - 14,37,000\right]$$

= 31,800 F

(ii) Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead – Actual fixed overhead.

(6,72,000 – 7,05,000)

= 33,000 A

(iii) Fixed Factory Overhead Efficiency Variance:

(Standard hours for actual production – Actual hours) × Standard rate per hour

(70,080 – 73,440) × 10 = 33,600 A

(iv) Fixed Overhead Capacity Variance:

(Actual hours - Budgeted hours) × Standard rate per hour

(73,440 - 67,200) ×10 = 62,400 F

The solution can also be presented in following way based on Quantity (units)

Calculation of standard quantity for actual hours:

Variable standard rate per unit (SR) = ₹ 16

Variable Overhead Efficiency Variance:

(SR x AQ) – (SR x standard quantity for Actual hours worked)

-67,200 = (16 x 87,600) – 16 x

-67200 = 14,01,600- 16 x

x = 14,68,800 / 16 = **91,800** (SQ for actual hours worked)

(i) Variable Factory Overhead Expenditure Variance:

(SR x SQ for actual hour worked – Actual variable overheads)

16 x 91,800 – 14,37,000 or 14,68,800 – 14,37,000

= 31,800 F

(ii) Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead – Actual fixed overhead.

(6,72,000 – 7,05,000)

= 33,000 A

(iii) Fixed Factory Overhead Efficiency Variance:

Standard rate per unit (SR) = 6,72,000 / 84,000 = ₹ 8 per unit

(SR x AQ) – (SR x standard quantity for Actual hours)

(8 x 87,600) – (8 x 91,800)

(7,00,800 – 7,34,400) = 33,600 A

(iv) Fixed Overhead Capacity Variance:

(SR x standard quantity for Actual hours - Budgeted fixed overheads)

(8 x 91800) – (6,72,000)

(7,34,400 – 6,72,000) = 62,400 F

(b) Since 10% units are scrapped.

Units produced (total) is 14,000 (12,600/90%)

Calculation of cost of sales and profit

Particulars	**₹**
Raw Material (28,000 × ₹ 72)	20,16,000
Wages	8,82,000
Prime Cost	**28,98,000**
Factory overheads	7,05,600
Factory Cost	**36,03,600**

Sale of Scrap (1,400 × ₹ 45)	(63,000)
Cost of Production	**35,40,600**
Less: Closing Stock of finished goods $\left(\frac{₹35,40,600}{12,600}\times 800\right)$	2,24,800
Cost of goods sold	33,15,800
Add: Administration overheads	4,72,000
Add: Selling & Distribution overheads (₹ 54 x 11,800)	6,37,200
Cost of Sales	**44,25,000**
Sales (11,800 × ₹ 416)	49,08,800
Profit	**4,83,800**

(c) Journal entries are as follows

		DR. (₹)	Cr. (₹)
Stores Ledger Control A/c To Payables (Creditors)/ Bank A/c (Materials purchased)	Dr.	4,40,000	4,40,000
Work-in-Process Control A/c To Stores Ledger Control A/c (Materials issued to production)	Dr.	3,60,000	3,60,000
Work-in-Process Control A/c To Wages Control A/c (Direct wages charged to production)	Dr.	80,000	80,000
Work-in-Process Control A/c To Factory Overhead Control A/c (Manufacturing overhead charged to production)	Dr.	1,32,000	1,32,000

Question 6

*Answer any **four** of the following:*

(a) Explain very briefly the following terms used in Cost and Management Accounting:

(i) Pre-determined Cost

(ii) Estimated Cost

(iii) Imputed Cost

(iv) Discretionary Cost ***(5 Marks)***

(b) State with reasons whether the following independent statements are ***true or false:***

(i) Under LIFO method, in the period of falling prices, lower income is reported and income-tax liability is reduced.

(ii) Under VED analysis, inventories are classified on the basis of cost of individual items.

(iii) Material requisition note is prepared by the store keeper.

(iv) Simple average pricing method is suitable when quantity purchased under each lot is different and prices fluctuate considerably.

(v) Bin card and stores ledger are maintained by the purchasing department. ***(5 Marks)***

(c) What do you mean by employee productivity? Point out the factors which must be taken into consideration for increasing employee productivity. ***(5 Marks)***

(d) Explain very briefly the following terms:

(i) Retention Money

(ii) Escalation Clause

(iii) Co-Products

(iv) Job Costing

(v) Process Costing ***(5 Marks)***

(e) What is meant by cost driver? Give its different categories. Suggest suitable cost drivers (at least two) in the following business functions:

(i) Distribution

(ii) Research and Development

(iii) Customer services ***(5 Marks)***

Answer

(a) (i) Pre- Determined Cost

A cost which is computed in advance before production or operations start, on the basis of specification of all the factors affecting cost, is known as a pre-determined cost.

(ii) Estimated Cost

Estimated cost is "the expected cost of manufacture, or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase". Estimated costs are prospective costs since they refer to prediction of costs.

(iii) Imputed Cost

Imputed costs do not involve any immediate cash payment. Implicit costs are not recorded in the books of account but yet, they are important for certain types of managerial decisions such as equipment replacement and relative profitability of two alternative courses of action. They are also known as economic costs. These cost are similar to opportunity cost.

(iv) Discretionary Cost

Discretionary costs are not tied to a clear cause and effect relationship between inputs and outputs. They arise from periodic decisions regarding the maximum outlay to be incurred. Examples are -advertising, public relations, training etc.

(b)

Statement No.	True/False	Reason
(i)	**False**	Under LIFO method, in case of falling prices profit tends to rise due to lower material cost, thus income tax liability is increased.
(ii)	**False**	Under VED Analysis, inventories are classified on the basis of its criticality for the production function and final product.
(iii)	**False**	Material Requisition Note is prepared by the production or other consuming department. It is a voucher used to get material issued from store.
(iv)	**False**	Simple average pricing method is suitable when the materials are received in uniform lots of similar quantity, and prices do not fluctuate considerably.
(v)	**False**	Bin card is maintained by the storekeeper in the store. While Stores ledger is maintained in cost accounting department.

(c) Meaning of employee productivity

Productivity is generally determined by the input/output ratio.

In case of employees, it is calculated as: $\frac{\text{Standard time for doing actual work}}{\text{Actual time taken}}$

Employee productivity is used for measuring the efficiency of individual workers. It is an index of efficiency in the utilisation of human resources, materials, capital, power and all kinds of services and facilities.

It is measured by the output in relation to input. Productivity can be improved by reducing the input for a certain quantity or value of output or by increasing the output from the same given quantity or value of input.

Factors for increasing Employee productivity: The important factors which must be taken into consideration for increasing employee productivity are as follows:

1. Employing only those workers who possess the right type of skill.
2. Placing a right type of person to a right job.
3. Training young and old workers by providing them the right types of opportunities.
4. Taking appropriate measures to avoid the situation of excess or shortage of employees.
5. Carrying out work study for fixation of wages and for the simplification and standardisation of work.

(d) **(i)** **Retention Money:** Retention money is a part of the value of work certified which though certified but is not paid by the contractee. Retention amount is kept by the contractee as security amount against any damage.

(ii) **Escalation Clause:** Escalation clause is a clause written in the agreement (contract) between the contractor and contractee which states that in case of increase in the prices of materials, wages or other supplies beyond a certain level the contract price will be increased by an agreed amount.

(iii) **Co-Products:** 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.

(iv) **Job Costing:** Job costing is the method of costing required to be done for unique products manufactured done against specific orders. In this method of costing, cost of each job is ascertained separately.

(v) **Process Costing:** Process costing is a method of costing used in industries where the material has to pass through two or more process for being converted into a final product. Here the cost of completing each stage of work is ascertained, like cost of making pulp and cost of making paper from pulp.

(e) **Meaning of Cost Driver:** A Cost driver is a factor or variable which effect level of cost. Generally, it is an activity which is responsible for cost incurrence. Level of activity or volume of production is the example of a cost driver. An activity may be an event, task, or unit of work etc.

There are two categories of cost driver.

- **Resource Cost Driver -** It is a measure of the quantity of resources consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool.

- **Activity Cost Driver -** It is a measure of the frequency and intensity of demand, placed on activities by cost objects. It is used to assign activity costs to cost objects.

Business Function	Cost drivers
Distribution	Number of units distributed, Number of customers
Research and Development	Number of research projects, personnel hours on a project, technical complexities of the projects.
Customer service	Number of service calls, number of products serviced, hours spent in servicing of products.

INTERMEDIATE EXAM
PAPER-4
Cost & Management Accounting

13 MAY 2024

DHG2(H)

Roll No. .....

11/05/2024
05:15 PM

Total No. of Questions – **6**

Total No. of Printed Pages – **24**

Maximum Marks – **70**

GENERAL INSTRUCTIONS TO CANDIDATES

1. The question paper comprises two parts, Part I and Part II.
2. Part I comprises Multiple Choice Questions (MCQs).
3. Part II comprises questions which require descriptive type answers.
4. Ensure that you receive the question paper relating to both the parts. If you have not received both, bring it to the notice of the invigilator.
5. Answers to MCQs in Part I are to be marked on the OMR answer sheet as given on the cover page of descriptive answer book only. Answers to questions in Part II are to be written in the same descriptive answer book. Answers to MCQs, if written inside the descriptive answer book or on Part-I Question paper will not be evaluated.
6. OMR answer sheet given on the cover page of descriptive answer book will be in English only for all candidates, including for Hindi medium candidates.
7. **The bar coded sticker provided in the attendance register, is to be affixed only on the descriptive answer book.**
8. You will be allowed to leave the examination hall only after the conclusion of the exam. If you have completed the paper before time, remain in your seat till the conclusion of the exam.
9. Duration of the examination is 3 hours. You will be required to submit (a) Part I of the question paper containing MCQs, and (b) the answer book in respect of descriptive answer book with OMR cover page to the invigilator before leaving the exam hall, after the conclusion of the exam.
10. The invigilator will give you acknowledgement on Page 2 of the admit card, upon receipt of the above-mentioned items.
11. Candidate found copying or receiving or giving any help or defying instructions of the invigilators will be expelled from the examination and will also be liable for further punitive action.

PART – II

70 Marks

1. Question paper comprises **6** questions. Answer Question No. **1** which is compulsory and any **4** out of the remaining **5** questions.
2. Working notes should form part of the answer.
3. Answers to the questions are to be given only in English except in the case of candidates who have opted for Hindi Medium. If a candidate has not opted for Hindi Medium, his/her answers in Hindi will not be evaluated.

PART – II

1. (a) Tesco Cycles Ltd. uses about 3,60,000 cycle locks per annum and the usage is fairly constant at 30,000 per month. The cycle lock costs ₹ 240 each at wholesale rates and carrying cost is estimated to be 10% of the annual average inventory value. The cost to place an order is ₹ 1200. It takes 45 days to receive delivery from the date of order. In order to avoid any kind of disruption in assembly line, safety stock of 6,500 cycle locks is always maintained by Tesco Cycles Ltd. 5

(Assume 360 days in a year).

Compute :

(i) E.O.Q.

(ii) The re-order level.

(iii) The company has been offered a quantity discount of 2% on the purchase of cycle locks provided the order size is 30,000 units at a time. Advise whether quantity discount offer can be accepted ?

(b) A company produces two products, A and B, through a joint production process. The total joint production cost incurred is as under : 5

Material	-	₹20,000
Labour	-	₹10,000
Variable Overheads	-	₹ 6,000
Fixed Overheads	-	₹ 24,000

Product A and B can be sold for ₹ 20 per unit and ₹15 per unit respectively at split off point. The produced quantities are Product A - 2,000 units and Product B - 4,000 units.

(i) You are required to calculate the joint production cost allocation for each product using the :

(a) Physical unit method.

(b) Contribution margin method.

(ii) Product B can be further processed by incurring expenditure of ₹12,000. Loss in further processing is 2%. It can be sold @ ₹18 per unit. Explain the impact on profitability if Product B is further processed.

(c) Following data is available for XYZ Ltd. for the month of February 2024 : **4**

Standard working hours	8 hours per day of 6 days per week
No. of weeks in the month	4
Maximum capacity	150 employees
Actual working	125 employees
Actual usage of Budgeted Capacity Ratio	86%
Efficiency Ratio	110 %

You are required to calculate the following :

(i) Actual Hours worked.

(ii) Standard Hours for actual output.

(iii) Activity Ratio.

(iv) Standard Capacity Usage Ratio.

2. (a) Luxury Designer Pvt. Ltd. is a manufacturing company, which manufactures readymade designer shirts. It has four customers: two wholesale category customers and two retail category customers. It has developed the following Activity-Based Costing system : **8**

(4)

DHG2(H)

Activity	Cost Driver Rate (₹)
Order Processing	1,260 per purchase order
Customer Visits	1,500 per customer visit
Regular Delivery	30 per delivery Km. travelled
Expedited Delivery	4,490 per expedited delivery

List selling price per shirt is ₹ 1,000 and average cost per shirt is ₹ 600. CEO of Luxury Designer Pvt. Ltd. wants to evaluate the profitability of each of the four customers for the year 2023, to explore opportunities for increasing profitability of his Company in the next year 2024. The following data in context of four customers are available for 2023 :

	Wholesale Customers		Retail Customers	
	WC-1	WC-2	RC-1	RC-2
Number of Purchase orders	50	65	224	245
Number of Customer visits	10	13	25	22
Regular Deliveries	46	52	175	198
Kilometers travelled per delivery	20	15	10	25
Expedited Deliveries	5	16	50	62
Average Number of Shirts per order	215	110	18	15
Average Selling Price per Shirt	₹ 700	₹ 800	₹ 900	₹ 950

You are required to :

Calculate the customer-level operating income and operating income as a % of revenues in 2023 and rank them on the basis of relative profitability.

(b) Star Airlines operates a single aircraft of 180 seats capacity between city 'ND' and 'GA'. The average normal occupancy is estimated at 70% per flight. The average one-way fare is ₹12,500 from city 'ND' to 'GA'. The costs of operation of the flight as collected by an expert analyst are : 6

Fuel cost (Variable) per flight from 'ND' to 'GA'	₹ 2,28,000 per flight
Food served on flight from 'ND' to 'GA' (no charge to passenger)	₹ 270 per passenger
Commission paid to Travel Agents (All ticket booking through agents)	7.5% of fare
Fixed costs :	
Lease & landing charges per flight 'ND' to 'GA'	₹ 9,12,000
Salaries of flight crew per flight 'ND' to 'GA'	₹ 90,000

Note : Assume that fuel costs are unaffected by the actual number of passengers on a flight.

You are required to :

(i) Calculate the net operating income that Star Airlines makes per flight from 'ND' to 'GA'.

(ii) Star Airlines expects that its occupancy will increase to 144 passengers per flight if the fare is reduced to ₹ 11,670. Advise whether this proposal should be implemented or not.

3. (a) A factory is currently working at 60% capacity and produces 12,000 units of a product. Management is thinking to increase the working capacity either to 70% or 90% level. It is estimated that at both the levels, it will be able to sell all the produced units. The other details are as under : 7

- At 70% capacity, the cost of raw materials increases by 4% and the selling price falls by 3%.
- At 90% capacity, the cost of raw materials increases by 5% and selling price falls by 4%.
- At 60% capacity, the product cost is ₹ 360 per unit and it is sold at ₹ 400 per unit.
- The unit cost of ₹ 360 consists of the following :

Material	- ₹ 200
Labour	- ₹ 60
Factory overhead	- ₹ 60 (50% fixed)
Administrative & Selling overhead	- ₹ 40 (60% fixed)

- Additional advertising cost of ₹ 20,000 is to be incurred for selling the product above 80% capacity.

You are required to :

(i) Calculate the profits of the company when the factory works at 60%, 70% and 90% capacity level.

(ii) Offer your comments regarding increase in the capacity based on profit calculated.

(b) S.K. Manufacturing Co. Ltd. showed a net profit of ₹ 5,40,400 as per their cost accounts for the year ended 31.03.2024. However, the financial books disclosed a net profit of ₹ 2,60,500 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books: 7

	₹
Factory overheads under absorbed	84,800
Administrative overheads over absorbed	24,000
Interest paid on bank borrowings	50,000
Interest & Dividend received	65,200
Notional rent of own premises charged in cost accounts	60,000
Losses on the sales of fixed assets and investments	48,000
Donations and subscriptions	18,800
Overvaluation of closing stock of finished goods in Cost accounts	1,25,000
Store adjustments (credited in financial books)	7,500
Depreciation over charged in cost accounts	40,000
Income tax provided	1,50,000

You are required to :

(i) Prepare a reconciliation statement taking net profit as per cost accounts as base.

(ii) State when is the reconciliation statement of Cost and Financial accounts not required ?

4. (a) Meta Company Ltd. is engaged in the production of product 'Trio' which passes through two different processes – Process P and Process Q. Other information obtained from books of account for the year is as follows : 8

(8)

DHG2(H)

Particulars	Process P	Process Q
Raw material used	10,000	--
Raw material cost per unit	₹ 80	--
Direct wages	₹ 52,000	₹ 78,000
Direct Expenses	₹ 8,600	₹ 11,100
Selling price per unit of output	₹ 130	₹ 190

Production overheads of ₹ 3,00,000 are recovered as percentage of direct wages.

Actual output of the two processes was :

P – 9,200 units and Q-6,400 units. 3/4th of the output of Process P was passed on to the Process Q and the balance was sold. The entire output of process Q was sold.

Management & Selling expenses during the year were ₹1,70,000. These are not allocable to the processes.

The normal loss of the two processes, calculated on the input of every process was :

Process P - 6% and Process Q -10%

The Loss of Process P was sold at ₹ 5 per unit and that of Q at ₹ 8 per unit. Assume that Process P and Process Q are not the responsibility centres.

You are required to prepare :

(i) Process P Account

(ii) Process Q Account

(iii) Abnormal Loss and Abnormal Gain Account

(iv) Costing Profit & Loss Account.

(b) The cost variance report was being discussed at a review meeting where in Cost Accountant of the company reported under-absorption of production overheads. 6

The following information was available from the cost records of the company at the end of financial year 2023-24 :

- Actual production overheads incurred were ₹ 4,50,000 which included ₹ 42,000 on account of 'written off' obsolete stores.
- 18,000 units were produced during the year out of which 10,000 units were sold and 8,000 units of finished goods were in stock.
- There were also 5,000 units in progress which may be reckoned as 40% complete.
- The actual machine hours worked during the period were 43,000.

ABC Ltd. absorbs the production overheads at a predetermined rate of ₹ 8 per machine hour.

On investigation, it has been found that 20% of the under-absorption of production overheads was due to defective planning and the rest was attributable to normal increase in costs of indirect materials and indirect labour.

You are required to :

(i) Calculate the amount of under-absorption of production overheads during the year 2023-24; and

(ii) Show the treatment of under-absorption of production overheads in cost accounts.

5. (a) Super Ltd, a manufacturing company is facing the problem of high labour turnover in the factory. Before analysing the causes and taking remedial steps, the management of the company wants to ascertain the profit lost for the year 2022-23 on account of labour turnover. For this purpose, it has given you the following information : 6

(i) Sales for the last year 2022-23 was ₹ 2,16,80,000 and P/V ratio was 15%.

(ii) The total number of actual hours worked by the direct labour force was 5,00,000 hours. The actual direct labour hours included 60,000 hours attributable to training new recruits, out of which 40% of the hours were unproductive.

(iii) Due to delays by the Personnel Department in filling vacancies on account of labour turnover, 95,000 potential productive hours (excluding unproductive training hours) were lost.

(iv) 1,500 units of the output produced during training period were defective. Cost of rectification of defective units was ₹ 40 per unit.

(v) Settlement cost of the workers leaving the organization was ₹ 2,37,880.

(vi) Recruitment and Selection cost was ₹ 1,40,000.

(vii) Cost of Training and Induction was ₹ 1,61,950.

Assuming that the potential production lost as a consequence of labour turnover could have been sold at prevailing prices, find the profit lost for the year 2022-23 on account of labour turnover.

(b) The following information is given by PQR Ltd : 4

Year	Sales (₹)	Profit/(Loss) (₹)
2022-23	1,80,00,000	(3,80,000)
2023-24	2,40,00,000	11,20,000

You are required to :

(i) Calculate the Break even sales.

(ii) In 2024-25, it is estimated that the variable cost will go up by 5% and fixed cost will reduce by ₹ 4,80,000. Selling price will remain same. Calculate the sales volume to earn a profit of ₹ 15,00,000.

(c) Discuss Feedback Control and Feedforward Control system of budgetary control. 4

6. (a) Distinguish between cost control and cost reduction. 5

(b) Distinguish between Waste and Scrap. Discuss the treatment of normal and abnormal scrap in Cost Accounts. 5

(c) Describe Unit Costing and Batch Costing. Give three examples of industries for each method where these are used. 4

OR

(c) Describe briefly idle time and explain the treatment of idle time in cost accounts in following situations : 4

(i) The setting up time for the machine in case of Direct Worker Mr. A.

(ii) Normal break time for lunch in case of Indirect Worker Mr. B.

(iii) Time lost due to breakdown of machine in case of Worker Mr. C.

DHG2(H)

PART – II

(Hindi Version)

1. (a) Tesco Cycles Ltd. प्रति वर्ष लगभग 3,60,000 साइकिल ताले उपयोग करती है तथा यह उपयोग 30,000 ताले प्रति माह पूर्णत: स्थिर है । थोक-बिक्री दर पर साइकिल ताले की लागत ₹ 240 प्रति ताला है तथा वहन लागत (carrying cost) वार्षिक औसत इन्वेन्ट्री मूल्य का 10% अनुमानित है । एक आदेश देने की लागत (ordering cost) ₹ 1,200 है । माल की सुपुर्दगी प्राप्त करने में आदेश तिथि से 45 दिन लगते हैं । असेम्बली लाइन में किसी प्रकार की बाधा से बचने हेतु कम्पनी द्वारा हमेशा 6,500 साइकिल तालों का सुरक्षा स्टॉक (safety stock) रखा जाता है । (एक वर्ष में 360 दिन मानिये) **5**

गणना कीजिए :

(i) आर्थिक आदेश मात्रा (E.O.Q.)

(ii) पुन:आदेश स्तर

(iii) कम्पनी को साइकिल तालों की खरीद पर 2% की मात्रा छूट की पेशकश की गई है, बेशर्ते आदेश का आकार एक समय में 30,000 इकाइयाँ है । सलाह दीजिए कि क्या मात्रा छूट की पेशकश स्वीकार की जा सकती है ।

(b) एक कम्पनी संयुक्त उत्पादन प्रक्रिया द्वारा दो उत्पादों A तथा B का उत्पादन करती है । कुल संयुक्त उत्पादन लागत निम्न प्रकार की गई : **5**

सामग्री	-	₹ 20,000
श्रम	-	₹ 10,000
परिवर्तनशील उपरिव्यय	-	₹ 6,000
स्थिर उपरिव्यय	-	₹ 24,000

उत्पाद A तथा B को क्रमश: ₹ 20 प्रति इकाई तथा ₹ 15 प्रति इकाई विभाजित बिन्दु (split off point) पर बेचा जा सकता है । उत्पादित की गई मात्राएँ हैं :

उत्पाद A – 2,000 इकाइयाँ एवं उत्पाद B – 4,000 इकाइयाँ

(i) आपसे अपेक्षित है कि निम्न द्वारा प्रत्येक उत्पाद के लिए संयुक्त उत्पादन लागत के विभाजन की गणना करें :

(a) भौतिक इकाई विधि

(b) अंशदान सीमान्त विधि

(ii) उत्पाद B को ₹ 12,000 खर्च कर आगे प्रक्रियाधीन (further processed) किया जा सकता है । आगे प्रक्रिया में 2% हानि है । बाद में, इसे @ ₹18 प्रति इकाई बेचा जा सकता है । यदि उत्पाद B को आगे प्रक्रियाधीन किया जाता है तो लाभदायकता पर प्रभाव को स्पष्ट कीजिए ।

(c) XYZ Ltd. के लिए निम्नलिखित आँकड़े माह फरवरी 2024 के लिए उपलब्ध हैं : 4

मानक कार्य-घण्टे	प्रति सप्ताह 6 दिन प्रति दिन 8 घण्टे
माह में सप्ताहों की संख्या	4
अधिकतम क्षमता	150 कर्मचारी
वास्तविक कार्य	125 कर्मचारी
बजट क्षमता अनुपात का वास्तविक उपयोग	86%
दक्षता अनुपात	110 %

आपसे निम्न की गणना अपेक्षित है :

(i) वास्तविक कार्य घंटे

(ii) वास्तविक उत्पादन हेतु मानक घंटे

(iii) क्रियाकलाप अनुपात

(iv) मानक क्षमता उपयोगिता अनुपात

2. (a) Luxury Designer Pvt. Ltd. एक विनिर्माणी कम्पनी है जो रेडीमेड डिजाइनर शर्ट्स का निर्माण करती है । इसके चार ग्राहक हैं : 8

दो थोक संवर्ग ग्राहक तथा दो खुदरा संवर्ग ग्राहक । कम्पनी ने निम्नलिखित गतिविधि आधारित लागत निर्धारण पद्धति विकसित की है :

गतिविधि	लागत संचालन दर (₹)
आदेश लेना	1,260 प्रति क्रय आदेश
आने वाले ग्राहक	1,500 प्रति आने वाला ग्राहक
निरन्तर वितरण	30 प्रति वितरण किमी. की यात्रा
त्वरित वितरण	4,490 प्रति त्वरित वितरण

सूची विक्रय मूल्य प्रति शर्ट ₹ 1,000 तथा प्रति शर्ट औसत लागत ₹ 600 है । Luxury Designer Pvt. Ltd. का मुख्य कार्यकारी अधिकारी (CEO) अगले वर्ष 2024 में अपनी कम्पनी की लाभदायकता में वृद्धि की संभावनाओं की तलाश हेतु वर्ष 2023 के लिए अपने चारों ग्राहकों में प्रत्येक की लाभदायकता का मूल्यांकन करना चाहता है ।

निम्नलिखित समंक वर्ष 2023 के लिए चारों ग्राहकों के संदर्भ में उपलब्ध हैं :

	थोक संवर्ग ग्राहक (Wholesale Customers – WC)		खुदरा ग्राहक (Retail Customers – RC)	
	WC-1	WC-2	RC-1	RC-2
कुल क्रय आदेशों की संख्या	50	65	224	245
आने वाले ग्राहकों की कुल विजिट संख्या	10	13	25	22
निरन्तर वितरणों की संख्या	46	52	175	198
प्रति वितरण किमी. यात्रा	20	15	10	25
त्वरित वितरणों की संख्या	5	16	50	62
प्रति आदेश औसत शर्ट्स की संख्या	215	110	18	15
प्रति शर्ट औसत विक्रय मूल्य	₹ 700	₹ 800	₹ 900	₹ 950

आपसे अपेक्षित है :

कम्पनी की 2023 में ग्राहक-स्तरीय प्रचालन आय (operating income) और राजस्व के % के रूप में प्रचालन आय तथा संबंधित लाभदायकता के आधार पर इनकी रैंकिंग कीजिए ।

(b) स्टॉर एयरलाईन्स शहर 'ND' तथा 'GA' के मध्य 180 सीट क्षमता के एक विमान का संचालन करती है । औसत सामान्य अधिभोग (Average normal occupancy) प्रति उड़ान 70% अनुमानित है । शहर 'ND' से 'GA' तक एक तरफ का औसत किराया ₹12,500 है । एक विशेषज्ञ विश्लेषक द्वारा एकत्र आधार पर प्रति उड़ान संचालन लागत है : 6

ईंधन लागत (चल) प्रति उड़ान शहर 'ND' से 'GA' तक	₹ 2,28,000 प्रति उड़ान
शहर 'ND' से 'GA' के मध्य उड़ान में वितरित खाद्य सामग्री (यात्री से चार्ज नहीं)	₹ 270 प्रति यात्री
यात्रा एजेन्ट को कमीशन भुगतान (सभी टिकट एजेन्ट के माध्यम से बुक)	7.5% किराये का
स्थिर लागतें :	
'ND' से 'GA' तक प्रति उड़ान पट्टा एवं लैंडिंग व्यय	₹ 9,12,000
'ND' से 'GA' तक प्रति उड़ान, उड़ान क्रू का वेतन	₹ 90,000

नोट : मानिये कि ईंधन लागतें उड़ान में वास्तविक यात्रियों की संख्या से अप्रभावित रहती हैं।

आपसे अपेक्षित है :

(i) स्टॉर एयरलाईन्स द्वारा 'ND' से 'GA' तक प्रति उड़ान शुद्ध परिचालन आय (Net operating income) की गणना कीजिए।

(ii) स्टॉर एयरलाईन्स यह अपेक्षा करती है कि यदि किराया ₹ 11,670 तक कम कर दिया जाये तो यात्री अधिभोग 144 यात्रियों तक बढ़ जायेगा। सलाह दीजिए कि इस प्रस्ताव को लागू किया जाये अथवा नहीं।

3. (a) एक कारखाना वर्तमान में 60% क्षमता पर कार्य करते हुए एक उत्पाद की 12,000 इकाइयाँ उत्पादित करता है। प्रबन्धन इसकी कार्यक्षमता को 70% अथवा 90% स्तर पर बढ़ाने का विचार कर रहा है। यह अनुमानित है कि दोनों ही स्तरों पर कम्पनी सभी उत्पादित इकाइयों को बेचने में सक्षम होगी। अन्य सूचनाएँ निम्न प्रकार हैं : 7

- 70% क्षमता पर कच्चे माल की लागत में 4% वृद्धि तथा विक्रय मूल्य में 3% की कमी होती है ।
- 90% क्षमता पर, कच्चे माल की लागत में 5% वृद्धि तथा विक्रय मूल्य में 4% की कमी होती है ।
- 60% क्षमता पर, उत्पाद की प्रति इकाई लागत ₹ 360 है तथा इसे ₹ 400 प्रति इकाई पर बेचा जाता है ।
- इकाई लागत ₹ 360 में निम्न शामिल हैं :

सामग्री	-	₹ 200
श्रम	-	₹ 60
कारखाना उपरिव्यय	-	₹ 60 (50% स्थिर)
प्रशासनिक एवं विक्रय उपरिव्यय	-	₹ 40 (60% स्थिर)

- 80% क्षमता के ऊपर उत्पाद को बेचने पर अतिरिक्त विज्ञापन लागत ₹ 20,000 होगी ।

आपसे अपेक्षित है :

(i) कम्पनी के लाभ की गणना कीजिए जब कारखाना 60%, 70% और 90% क्षमता पर कार्य करता है ।

(ii) गणना किये गये लाभ के आधार पर क्षमता में वृद्धि के सम्बन्ध में अपने विचार दीजिए ।

(b) S.K. Manufacturing Co. Ltd. ने 31.03.2024 को समाप्ति वर्ष के लिए अपने लागत लेखों के अनुसार ₹ 5,40,400 का शुद्ध लाभ दिखाया । यद्यपि, वित्तीय लेखों ने इसी अवधि के लिए ₹ 2,60,500 के शुद्ध लाभ का खुलासा किया । लेखों के दोनों सेटों के आँकड़ों की जाँच के परिणामस्वरूप निम्नलिखित जानकारी सामने आई : 7

	₹
कारखाना उपरिव्यय न्यून अवशोषण	84,800
प्रशासनिक उपरिव्यय अधि अवशोषण	24,000
बैंक से उधार पर ब्याज का भुगतान	50,000
ब्याज एवं लाभांश की प्राप्ति	65,200
लागत लेखों में स्वयं की सम्पत्ति पर काल्पनिक किराया वसूल	60,000
स्थायी सम्पत्तियों एवं विनियोगों के विक्रय पर हानि	48,000
दान एवं शुल्क	18,800
लागत लेखों में तैयार माल के अन्तिम स्टॉक का अधि-मूल्यांकन	1,25,000
स्टोर समायोजन (वित्तीय खातों में जमा)	7,500
लागत लेखों में ह्रास की अधिक वसूली	40,000
आयकर दिया	1,50,000

अपेक्षित है :

(i) लागत लेखों के अनुसार शुद्ध लाभ को आधार मानकर मिलान विवरण-पत्र (Reconciliation statement) तैयार कीजिए ।

(ii) बताइये कि कब लागत एवं वित्तीय लेखों के मिलान विवरण-पत्र की आवश्यकता नहीं होती है ।

4. (a) Meta Company Ltd. उत्पाद 'Trio' के उत्पादन में संलग्न है जो दो भिन्न प्रक्रियाओं – प्रक्रिया P तथा प्रक्रिया Q से गुजरता है । वर्ष के लिए लेखा पुस्तकों से प्राप्त अन्य सूचनाएँ निम्न हैं : 8

विवरण	प्रक्रिया P	प्रक्रिया Q
प्रयुक्त कच्चा माल (इकाइयाँ)	10,000	--
प्रति इकाई कच्चे माल की लागत	₹ 80	--
प्रत्यक्ष मजदूरी	₹ 52,000	₹ 78,000
प्रत्यक्ष व्यय	₹ 8,600	₹ 11,100
उत्पाद का प्रति इकाई विक्रय मूल्य	₹ 130	₹ 190

₹ 3,00,000 के उत्पादन उपरिव्यय प्रत्यक्ष मजदूरी के प्रतिशत के आधार पर वसूल किये गये ।

दोनों प्रक्रियाओं का वास्तविक उत्पादन था :

P – 9,200 इकाइयाँ तथा Q – 6,400 इकाइयाँ । प्रक्रिया P का तीन-चौथाई उत्पादन प्रक्रिया Q को भेजा गया तथा शेष को बेचा गया । प्रक्रिया Q का समस्त उत्पादन बेच दिया गया । वर्ष के दौरान प्रबन्धन एवं विक्रय व्यय ₹1,70,000 थे । ये व्यय प्रक्रियाओं पर वितरण योग्य नहीं हैं ।

प्रत्येक प्रक्रिया के आगम (input) के आधार पर गणना की गयी दोनों प्रक्रियाओं की सामान्य हानि थी :

प्रक्रिया P - 6% तथा प्रक्रिया Q -10%

प्रक्रिया P की हानि को ₹ 5 प्रति इकाई तथा प्रक्रिया Q की हानि को ₹ 8 प्रति इकाई बेचा गया । मानिये कि प्रक्रिया P तथा प्रक्रिया Q जिम्मेदारी केन्द्र नहीं हैं ।

आपसे निम्न तैयार करने की अपेक्षा है :

(i) प्रक्रिया P खाता

(ii) प्रक्रिया Q खाता

(iii) असाधारण हानि तथा असाधारण लाभ खाते

(iv) लागत लाभ-हानि खाता ।

(b) एक पुन: परीक्षण बैठक में लागत विचरण रिपोर्ट पर विचार किया गया जिसमें कम्पनी के लागत लेखापाल ने उत्पादन उपरिव्ययों के न्यून-अवशोषण (under absorption) की जानकारी दी। 6

वित्तीय वर्ष 2023-24 की समाप्ति पर कम्पनी के लागत लेखों से निम्न सूचना उपलब्ध थी :

- वास्तविक उत्पादन उपरिव्यय ₹ 4,50,000 किये गये जिनमें ₹ 42,000 के 'अपलिखित' (written off) लुप्तप्राय स्टोर्स शामिल हैं।
- वर्ष के दौरान 18,000 इकाइयाँ उत्पादित की गई जिनमें से 10,000 इकाइयाँ बेची गई तथा शेष 8,000 इकाइयाँ तैयार माल स्टॉक में था।
- साथ ही, 5,000 इकाइयाँ कार्यशील इकाइयों के रूप में थी जिन्हें 40% पूर्ण माना जा सकता है।
- इस अवधि में वास्तविक कार्यशील मशीन घंटे 43,000 थे।

ABC Ltd. उत्पादन उपरिव्ययों का अवशोषण पूर्व निर्धारित ₹ 8 मशीन घण्टा दर पर करती है।

अन्वेषण पर ज्ञात हुआ कि न्यून-अवशोषित उत्पादन उपरिव्ययों का 20% दोषपूर्ण योजना बनाने के कारण था तथा शेष के लिए अप्रत्यक्ष सामग्री तथा अप्रत्यक्ष श्रम की लागतों में सामान्य वृद्धि को उत्तरदायी ठहराया गया।

आपसे अपेक्षित है :

(i) वर्ष 2023-24 के दौरान उत्पादन उपरिव्ययों की न्यून-अवशोषण राशि ज्ञात करना, तथा

(ii) लागत लेखों में न्यून-अवशोषित उत्पादन उपरिव्ययों के उपचार को दर्शाना।

5. (a) Super Ltd. एक निर्माणी कम्पनी है जो कारखाने में उच्च श्रम निकासी (High Labour Turnover) की समस्या से चिंतित है। कम्पनी का प्रबन्धन कारणों का विश्लेषण करने तथा उपचारात्मक कदम उठाने से पहले वर्ष 2022-23 में श्रम निकासी के कारण लाभ की हानि ज्ञात करना चाहता है। इस उद्देश्य से, कम्पनी ने आपको निम्न सूचनाएँ दी हैं : 6

(i) गत वर्ष 2022-23 के लिए बिक्री ₹ 2,16,80,000 तथा लाभ-मात्रा अनुपात (P/V ratio) 15% था।

(ii) प्रत्यक्ष श्रम बल द्वारा वास्तविक कार्य घण्टों की कुल संख्या 5,00,000 घंटे थी । वास्तविक प्रत्यक्ष श्रम घंटों में नई भर्तियों के प्रशिक्षण के 60,000 घंटे शामिल हैं, जिनमें से 40% घंटे अनुत्पादक थे ।

(iii) श्रम निकासी के कारण रिक्तियों को भरने में कार्मिक विभाग द्वारा देरी के परिणामस्वरूप 95,000 संभावित उत्पादक घंटे (गैर-उत्पादक प्रशिक्षण घंटों को छोड़कर) खो गये ।

(iv) प्रशिक्षण अवधि के दौरान उत्पादित 1,500 इकाइयाँ दोषपूर्ण थी । दोष के सुधार की लागत ₹ 40 प्रति इकाई थी ।

(v) संस्था को छोड़कर जाने वाले श्रमिकों के निपटान (settlement) की लागत ₹ 2,37,880 थी ।

(vi) भर्ती एवं चयन की लागत ₹ 1,40,000 थी ।

(vii) प्रशिक्षण एवं आगमन की लागत ₹ 1,61,950 थी ।

मानिये कि श्रम निकासी के परिणामस्वरूप खोये गये संभावित उत्पादन को प्रचलित मूल्य पर बेचा जा सकता था । श्रम निकासी के कारण वर्ष 2022-23 में हानि हुए लाभ को ज्ञात कीजिए ।

(b) PQR Ltd द्वारा निम्न सूचना दी गई है : 4

वर्ष	बिक्री (₹)	लाभ/(हानि) (₹)
2022-23	1,80,00,000	(3,80,000)
2023-24	2,40,00,000	11,20,000

आपसे अपेक्षित है :

(i) सम-विच्छेद बिक्री (Break even sales) की गणना कीजिए ।

(ii) वर्ष 2024-25 में, अनुमानित है कि परिवर्तनशील लागत में 5% की वृद्धि होगी तथा स्थिर लागत ₹ 4,80,000 से कम होगी । विक्रय मूल्य समान रहेगा । ₹ 15,00,000 लाभ कमाने के लिए विक्रय मात्रा (Sales Volume) की गणना कीजिए ।

(c) बजटीय नियन्त्रण की प्रतिपुष्टि नियन्त्रण तथा विपरीत प्रतिपुष्टि नियन्त्रण पद्धति पर चर्चा कीजिए । 4

6. (a) लागत नियन्त्रण तथा लागत में कमी में अन्तर स्पष्ट कीजिए । 5

(b) अपशिष्ट (waste) तथा रद्दी (scrap) में अन्तर बतलाइये । लागत लेखों में सामान्य तथा असामान्य अपशिष्ट के व्यवहार (treatment) को बतलाइये । 5

(c) इकाई लागत (Unit Costing) तथा बैच लागत (Batch Costing) को स्पष्ट कीजिए । प्रत्येक विधि के लिए तीन उद्योगों के उदाहरण दीजिए जहाँ पर इन्हें प्रयुक्त किया जाता है । 4

अथवा

(c) निष्क्रिय समय का संक्षेप में वर्णन कीजिए तथा निम्न स्थितियों में लागत लेखों में निष्क्रिय समय के व्यवहार को स्पष्ट कीजिए : 4

(i) प्रत्यक्ष श्रमिक मिस्टर A के मामले में मशीन की स्थापना का समय ।

(ii) अप्रत्यक्ष श्रमिक मिस्टर B के मामले में दोपहर भोजन के लिए सामान्य विश्राम का समय ।

(iii) श्रमिक मिस्टर C के मामले में मशीन के बन्द होने पर खोया गया समय ।

DHG2(H)

रोल नं. .....

कुल प्रश्नों की संख्या – 6

कुल पृष्ठ – 24

अधिकतम अंक – 70

अभ्यर्थियों के लिए सामान्य निर्देश

1. प्रश्न-पत्र के दो भाग हैं, Part-I और Part-II.
2. Part-I में बहुविकल्पीय प्रश्न (MCQs) हैं ।
3. Part-II में वर्णनात्मक प्रकार के उत्तर की अपेक्षा वाले प्रश्न हैं ।
4. सुनिश्चित करें कि दोनों भागों से संबंधित प्रश्न-पत्र आपने प्राप्त किया है । यदि आपने दोनों भाग प्राप्त नहीं किये हैं तो निरीक्षक के ध्यान में लावें।
5. Part-I के प्रश्नों के उत्तर केवल OMR उत्तर-पत्र पर चिह्नित करने हैं जो कि वर्णनात्मक उत्तर-पुस्तिका के मुख्य पृष्ठ पर दिया गया है । Part-II के प्रश्नों के उत्तर वर्णनात्मक उत्तर-पुस्तिका में लिखने हैं । बहुविकल्पीय प्रश्नों के उत्तर वर्णनात्मक उत्तर-पुस्तिका के भीतर या Part-I बहुविकल्पीय प्रश्न-पुस्तिका में लिखने पर उनका मूल्यांकन नहीं होगा ।
6. OMR उत्तर-पत्र, जो कि वर्णनात्मक उत्तर-पुस्तिका के मुख्य पृष्ठ पर दिया गया है । सभी अभ्यर्थियों के लिए, हिंदी माध्यम के अभ्यर्थियों सहित, केवल अंग्रेजी में होगा ।
7. **उपस्थिति पंजीयक में दिया बार कोड स्टीकर वर्णनात्मक प्रकार उत्तर-पुस्तिका पर लगाया जाएगा ।**
8. परीक्षा की समाप्ति के पश्चात् ही आपको परीक्षा कक्ष छोड़ने की अनुमति होगी । यदि आपने समय से पूर्व पेपर पूर्ण कर लिया है तो भी आपको अपनी सीट पर ही बैठना होगा ।
9. परीक्षा की अवधि 3 घंटे है । आपको परीक्षा की समाप्ति के पश्चात् परीक्षा कक्ष छोड़ने के पूर्व निरीक्षक को (a) बहुविकल्पीय प्रश्नों वाले प्रश्न-पत्र का Part-I और (b) वर्णनात्मक उत्तरों वाली उत्तर-पुस्तिका मुख्य पृष्ठ सहित जमा कराना आवश्यक है ।
10. उपर्युक्त दर्शित सामग्री की प्राप्ति पर, निरीक्षक प्रवेश-पत्र के पृष्ठ 2 पर अभिस्वीकृति प्रदान करेगा ।
11. अभ्यर्थी नकल करते या किसी प्रकार की सहायता देते या प्राप्त करते या निरीक्षक के निर्देशों की अवज्ञा करते पाया गया, तो परीक्षा से निष्कासित कर दिया जाएगा और इसके अतिरिक्त दंडात्मक कार्यवाही के लिए भी उत्तरदायी होगा ।

भाग – II

70 अंक

1. भाग–II में 6 प्रश्न हैं । प्रश्न संख्या 1 अनिवार्य है तथा शेष 5 प्रश्नों में से किन्हीं 4 का उत्तर देना है ।
2. कार्यशील टिप्पणियाँ उत्तर का भाग मानी जायेंगी ।
3. उन परीक्षार्थियों को छोड़कर जिन्होंने हिन्दी माध्यम चुना है, प्रश्नों के उत्तर केवल अंग्रेजी में ही देने हैं । वह परीक्षार्थी जिसने हिन्दी माध्यम नहीं चुना है, यदि हिन्दी में उत्तर देता है, तो उसके हिन्दी में दिये गये उत्तरों का मूल्यांकन नहीं होगा ।

saransh

Last Mile Referencer for

COST AND MANAGEMENT ACCOUNTING

The Institute of Chartered Accountants of India

(Setup by an Act of Parliament)

Board of Studies (Academic)

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Noida 201 309

PREFACE

Board of Studies (Academic), the student wing of the Institute, does not leave any stone unturned in providing best-in-class services to its students. It imparts quality academic education through its value-added study materials, wherein concepts are explained in lucid language. Illustrations and Test Your Knowledge Questions contained therein facilitate enhanced understanding and application of concepts learnt. Booklet on MCQs & Case Scenarios contain a rich bank of MCQs and Case Scenarios to hone the analytical skills of students, by applying the concepts learnt in problem solving. Revision Test Papers contain updates and Q & A to help students update themselves with the latest developments before each examination and revise the concepts and provisions by solving questions contained therein. Suggested Answers containing the ideal manner of answering questions set at examination also helps students revise for the forthcoming examination. Mock Test Papers help students assess their level of preparedness before each examination. BoS (Academic) also conducts live virtual classes through eminent faculty for its students across the length and breadth of the country.

To reach out to its students, the BoS (Academic) has also been publishing subject-specific capsules in its monthly Students' Journal "The Chartered Accountant Student" since the year 2017 for facilitating effective revision of concepts dealt with in different topics of each subject at the Foundation, Intermediate and Final levels of the chartered accountancy course. Each issue of the journal includes a capsule relating to specific topic(s) in one subject at each of the three levels. In these capsules, the concepts and provisions are presented in attractive colours in the form of tables, diagrams and flow charts for facilitating easy retention and quick revision of topics.

In today's business world, Chartered Accountants are very much part of the decision-making team of any Organisation. They are rigorously involved in decision making process with the help of Cost and Management Accounting tools. The capsule on 'Cost and Management Accounting' covers diagrams, flow charts tables and formulas. In addition, it encompasses case studies and skill assessment-based questions so that students can critically analyse business problems and strengthen their analytical skills through interpreting and evaluating." This capsule, though, facilitates the students in undergoing quick revision, under no circumstances, such revisions can substitute the detailed study of the materials provided by BoS such as Study Material and Practice Manual.

Happy Reading!

Message of Key ICAI Office Bearers

CA. (Dr.) Debashis Mitra
President, ICAI

The Board of Studies (Academic) of ICAI has always been at the forefront of providing quality education to aspiring CA students and handholding them in preparing for their exams. Saransh — Last Mile Referencer is a step in that direction. This pack of 3 booklets on Accounting, Auditing & Cost Management and Strategic Decision Making covers significant concepts of each chapter in precise form. This will not only help students for their reference for examinations but also Members can use it for their practice reference.

CA. Aniket S. Talati
Vice-President, ICAI

It has always been the endeavour of ICAI to provide updated information to its student to keep them abreast about the latest happenings in the accounting and related fields. The Board of Studies (Academic), the academic wing of ICAI, has come up with a series of booklets 'Saransh – Last Mile Referencer' with key points of different subjects. This will help facilitate effective revision of concepts in each subject.

CA. Dayaniwas Sharma
Chairman, Board of Studies (Academic)

Saransh — Last Mile Referencer is a compilation of capsules on different subjects of Foundation, Intermediate and Final levels of the chartered accountancy course. This series of booklets consolidates all significant topics of Accounting including Accounting Standards & Ind AS, Auditing with Auditing Standards and Cost Management and Strategic Decision Making at one place by capturing the key points. The concepts and provisions presented in attractive colours in the form of tables, diagrams and flow charts will facilitate quick revision of topics and easy retention.

CA. Vishal Doshi
Vice-Chairman, Board of Studies (Academic)

Among the many best-in-class services that the Board of Studies (Academic) provides to its students, Saransh — Last Mile Referencer is another initiative in that direction. These booklets on different subjects have been provided in a concise and precise form. It will facilitate understanding of the concepts better to students and grasp the essence of the subject. These capsules will enhance of level of preparedness before the examinations.

The Institute of Chartered Accountants of India

(Setup by an Act of Parliament)

Board of Studies (Academic)

INDEX

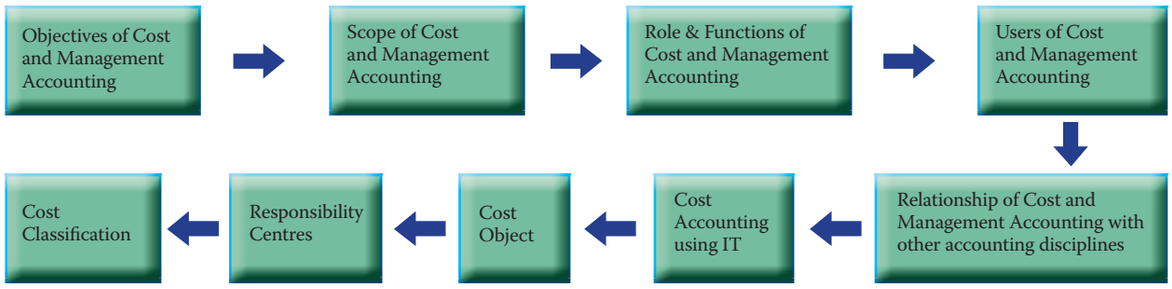
Cost and Management Accounting

In contemporary business environment, existence of an entity depends on the way it tackles the challenges posed by the competitive market conditions. Cost leadership being one of the competitive strategies, gives an added advantage to the entity. Cost being an important aspect for survival and growth in business, requires a mandatory awareness about the cost control and cost reduction. Fourth industrial revolution, also known as Industry 4.0, puts more emphasis on the digitization of information for effective decision-making, which enables an entity in keeping ahead in competition. Cost and Management accounting, a discipline of accounting, capacitates an entity in taking timely decisions by provisions of cost, profitability and other relevant information.

Chartered Accountants, as a global business solution provider, play an important role in business, have an onus by helping an entity to achieve its long-term objectives. In this direction, Cost and Management Accounting helps Chartered Accountants in taking timely and informed business decisions.

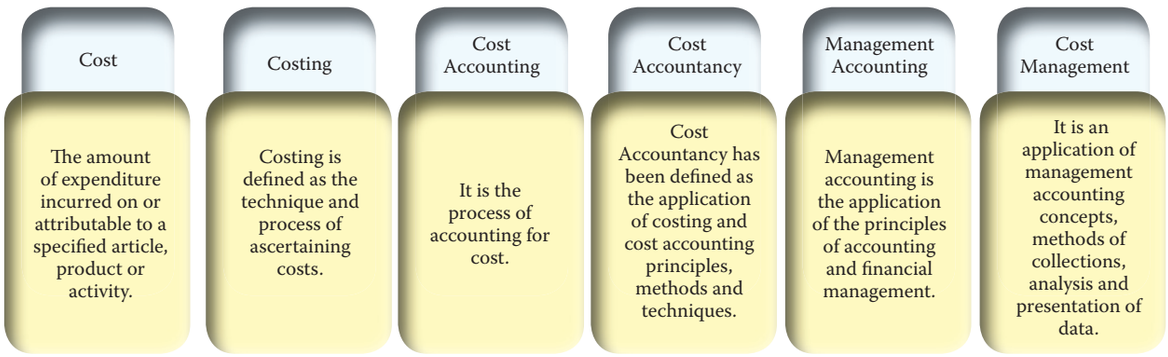
Introduction to Cost and Management Accounting

Chapter Overview



Meaning of Terms used in Cost and Management Accounting

First of all, let us discuss the meaning of various terminologies used in Cost and Management Accounting to have a clear understanding about the subject.



Objectives of Cost Accounting

There are many objectives of cost accounting. The main objectives are explained as below. We also need to keep our focus on understanding the difference between Cost Control and Cost Reduction.

Objectives of Cost Accounting

- **Ascertainment of Cost:** The main objective of cost and management accounting is accumulation and ascertainment of cost. Costs are accumulated, assigned and ascertained for each cost object.
- **Determination of Selling Price and Profitability:** The cost and management accounting system helps in determination of selling price and thus profitability of a cost object.
- **Cost Control:** Maintaining discipline in expenditure is one of the main objectives of a good cost and management accounting system. It ensures that expenditures are in consonance with predetermined set standard and any variation from these set standards is noted and reported on continuous basis.
- **Cost Reduction:** It may be defined "as the achievement of real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended or diminution in the quality of the product."
- **Assisting management in decision making:** Cost and Management accounting by providing relevant information, assist management in planning, implementing, measuring, controlling and evaluation of various activities.

Scope of Cost Accounting

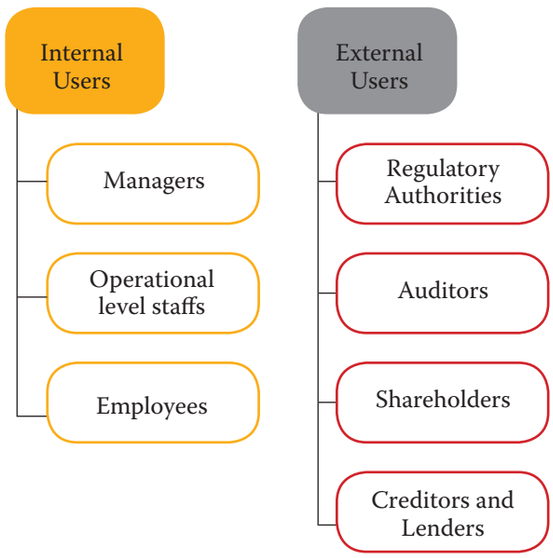
We also need to know various scopes of cost accounting. Cost ascertainment and the process of cost accounting are the major scopes. The other scopes are presented.

Role and Functions of Cost and Management Accounting

Role of a Cost and Management Accounting system	Functions of Cost and Management Accounting System
Provide relevant information to management for decision making	Collection and accumulation of cost for each element of cost
Assist management for planning, measurement, evaluation and controlling of business activities	Assigning costs to cost objects to ascertain cost.
Help in allocation of cost to products and inventories for both external and internal users.	Sets budget and standards for a particular period or activity beforehand and these are compared with the assigned and ascertained cost.
	Provision of relevant information to the management for decision making.
	To gather data like time taken, wastages, process idleness etc., analyse the data, prepare reports and take necessary actions

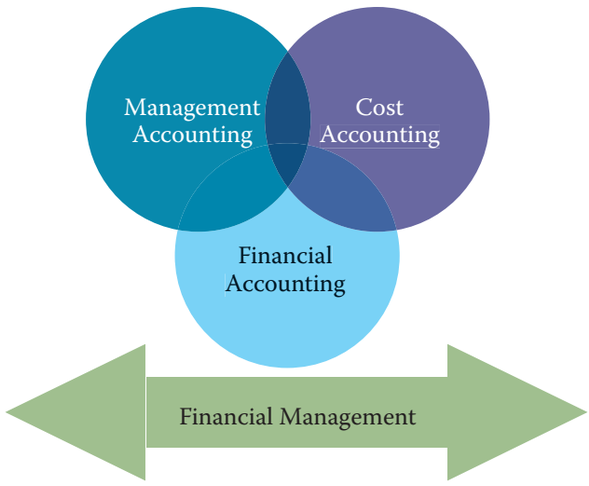
Users of Cost and Management Accounting

Cost and Management Accounting information which are generated or collected are used by various stakeholders. The users of the information can be broadly categorized as below:



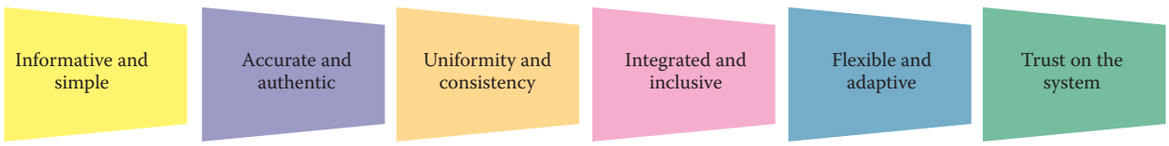
Relationship of Cost Accounting, Management Accounting, Financial Accounting and Financial Management

There is a close relationship between various disciplines like Cost Accounting, Management Accounting, Financial Accounting and Financial Management. Sometimes these disciplines are interrelated and dependent on each other also.



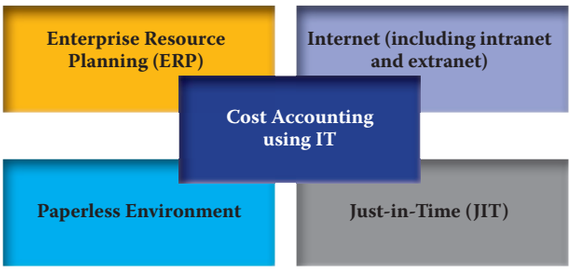
Essentials of a good Cost Accounting System

The essential features which a cost accounting system should possess are depicted as below:



Cost Accounting using Information Technology

With the use of information technology, the cost accounting system gets integrated and automated. The basic features are depicted as below:



Cost Objects

It is very important to understand the meaning of cost object, cost unit and cost driver. Their meaning alongwith examples are illustrated below.

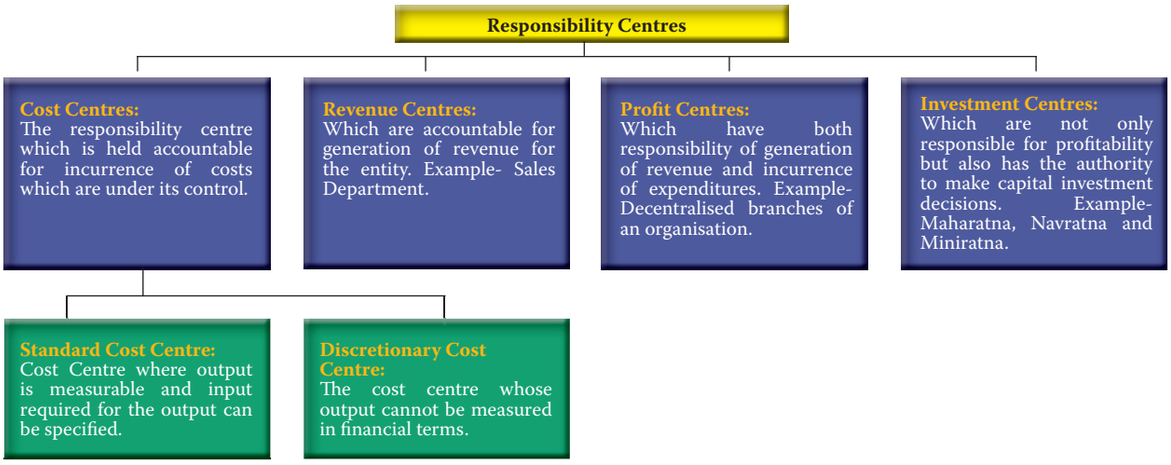
Cost Object: Cost object is anything for which a separate measurement of cost is required. Cost object may be a product (book), a service (airline), a project, a customer, a brand category etc.

Cost Units: It is a unit of product, service or time (or combination of these) in relation to which costs may be ascertained or expressed. Example for power industry is kilo Watt hour (kWh).

Cost Drivers: A Cost driver is a factor or variable which effect level of cost. Example for a purchase department is number of purchase orders.

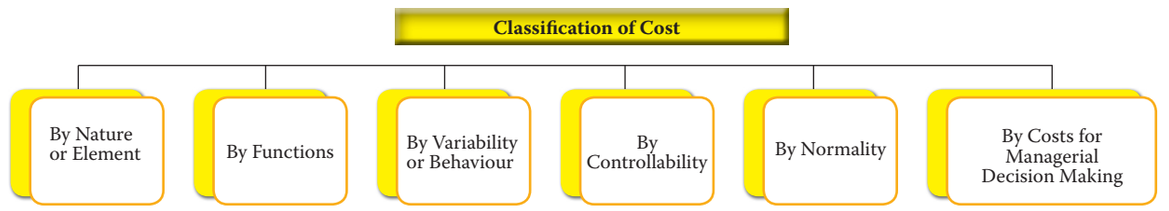
Responsibility Centres

To have a better control over the organisation, management delegates its responsibilities and authorities to various departments or persons, which are known as responsibility centres. There are four types of responsibility centres as discussed below:

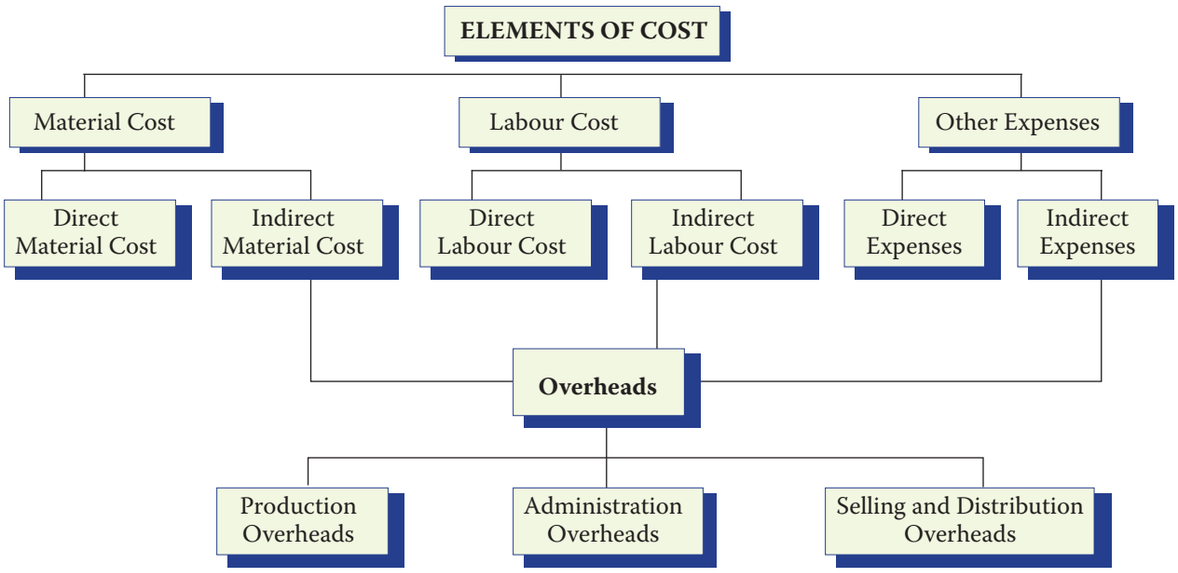


Classification of Cost

Classification of cost basically means grouping of cost according to their common features. The important ways of classification of cost are illustrated as below:



(i) By Nature or Element



(ii) By Functions

- Direct Materials, Direct Employees (Labours), Direct Expenses → **Prime Cost**
- Indirect Material, Indirect Labour, Indirect Expenses → Factory Overheads, Administration Overheads, Selling and Distribution Overheads
  - Factory Overheads → **Factory Cost or Works Cost**
  - Administration Overheads → **Cost of Goods Sold**
  - Selling and Distribution Overheads → **Cost of Sales**

(iii) By Variability or Behaviour

(iv) By Controllability

Controllable Costs: Cost that can be controlled

Uncontrollable Costs: Costs which cannot be influenced or controlled

(v) By Normality

Normal Cost - It is the cost which is normally incurred

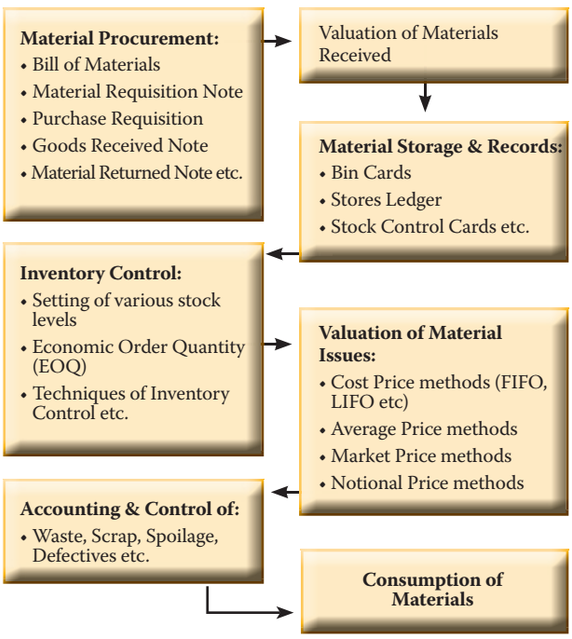
Abnormal Cost - It is the cost which is not normally incurred

(vi) By Cost for Managerial Decision Making

(a) Pre determined Cost	A cost which is computed in advance before production or operations start
(b) Standard Cost	A pre-determined cost, which is calculated from managements 'expected standard of efficient operation' and the relevant necessary expenditure
(c) Marginal Cost	The amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit
(d) Estimated Cost	The expected cost of manufacture, or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase
(e) Differential Cost	It represents the change (increase or decrease) in total cost (variable as well as fixed) due to change in activity level, technology, process or method of production, etc.
(f) Imputed Costs	These costs are notional costs which do not involve any cash outlay
(g) Capitalised Costs	These are costs which are initially recorded as assets and subsequently treated as expenses.
(h) Product Costs	These are the costs which are associated with the purchase and sale of goods (in the case of merchandise inventory).
(i) Opportunity Cost	This cost refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action
(j) Out-of-pocket Cost	It is that portion of total cost, which involves cash outflow
(k) Shut down Costs	Those costs, which continue to be incurred even when a plant is temporarily shut-down e.g. rent, rates, depreciation, etc
(l) Sunk Costs	Historical costs incurred in the past are known as sunk costs. They play no role in decision making in the current period.
(m) Absolute Cost	These costs refer to the cost of any product, process or unit in its totality.
(n) Discretionary Costs	Such costs are not tied to a clear cause and effect relationship between inputs and outputs.
(o) Period Costs	These are the costs, which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred.
(p) Engineered Costs	These are costs that result specifically from a clear cause and effect relationship between inputs and outputs.
(q) Explicit Costs	These costs are also known as out of pocket costs and refer to costs involving immediate payment of cash. Salaries, wages, postage and telegram, printing and stationery, interest on loan etc.
(r) Implicit Costs	These costs do not involve any immediate cash payment.

Material Cost

Chapter Overview



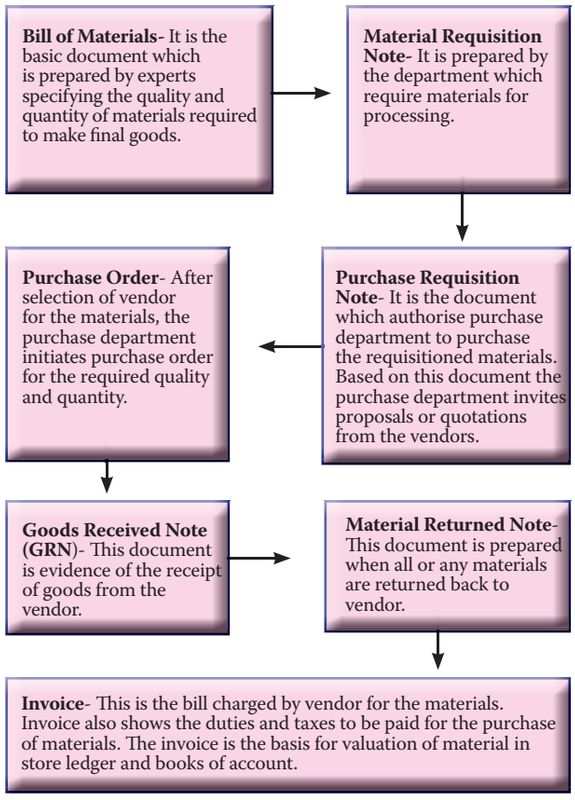
Value at Which Materials are Recorded in Stores Ledger

From the following table we can understand the procedure of calculating total value at which materials are to be recorded in stores ledger.

Particulars	Amount	Amount
Purchase Price		XXX
Additions/ Inclusions:		
Insurance charges	XXX	
Commission or brokerage	XXX	
Freight inward	XXX	
Cost of containers	XXX	
Wastage due to normal reasons	XXX	
Duties and Taxes for which no credit or refund is available	XXX	XXX
Deduction/ Exclusions:		
Discount, Rebate and Subsidy	XXX	
Duties and Taxes for which credit or refund is available	XXX	
Penalties and charges	XXX	
Other expenses not borne	XXX	(XXX)
		XXX

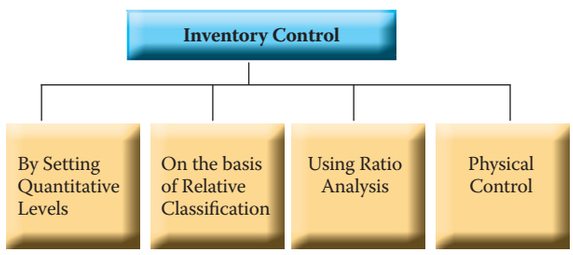
How Material is Procured?

Material requirement procedure can be understood with the help of the following diagram. We should focus on various documents in general required and also should keep in mind the departments who initiate these documents.



How Inventory is Controlled?

Inventory control is the function of ensuring that sufficient inventory is retained to meet all requirements. In inventory control, it is essential to balance between overstock and understock. Various techniques of inventory control are illustrated below:



(a) Inventory Control- By Setting Quantitative Levels

Re-order Stock Level	When to Order
Re-order Quantiy/ EOQ	How Much to Order
Maximum Stock Level	Upto How much to stock
Minimum Stock Level	Atleast How much to keep
Average Stock Level	Stock normally kept
Danger Stock Level	Kept for emergency requirement
Buffer Stock	To meet sudden demand

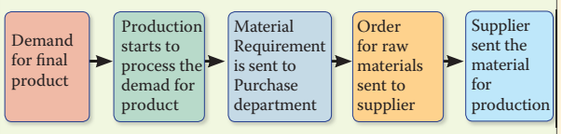
(i) Re-order Stock Level (ROL): Maximum Consumption × Maximum Re-order Period
Or, ROL = Minimum Stock Level + (Average Rate of Consumption × Average Re-order period)

(ii) Re-Order Quantity/ Economic Order Quantity (EOQ):

$$EOQ = \sqrt{\frac{2x \text{ Annual Requirement (A) x Cost per order (O)}}{\text{Carrying Cost per unit per annum (C)}}}$$

Just in Time (JIT) Inventory Management

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



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

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

(v) Average Inventory Level:
Average Stock Level = Minimum Stock Level + 1/2 Re-order Quantity
Or
Average Stock Level =

$$\frac{\text{Maximum Stock Level + Minimum Stock Level}}{2}$$

(b) On the basis of Relative Classification

ABC Analysis	On the basis of value and frequency of inventory
Fast, Slow and Non Moving (FSN)	On the basis of inventory turnover
Vital, Essential and Desirable (VED)	On the basis of importance of inventory
High, Medium and Low (HML)	On the basis of price of an item of inventory

(c) Using Ratio Analysis

(i) Input Output Ratio: Input-output ratio is the ratio of the quantity of input of material to production and the standard material content of the actual output.

(ii) Inventory Turnover Ratio:
Inventory Turnover Ratio =

$$\frac{\text{Cost of materials consumed during the period}}{\text{Cost of average stock held during the period}}$$

(d) Physical Control

(i) Two Bin System: Two Bin System is supplemental to the record of respective quantities on the bin card and the stores ledger card.

(ii) Establishment of system of budgets: Based on this, inventories requirement budget can be prepared. Such a budget will discourage the unnecessary investment in inventories.

(iii) Perpetual inventory records and continuous stock verification :
Perpetual inventory represents a system of records maintained by the stores department in the form of Bin cards and Stores ledger.

(iv) Continuous Stock Verification:
The system of continuous stock-taking consists of physical verification of items of inventory.

Valuation of Material Issue

Cost Price Methods	Average Price Methods	Market Price Methods	Notional Price Methods
• Specific Price Method • First-in First-out (FIFO) method • Last-in-First-out (LIFO) method • Base Stock Method	• Simple Average Price Method • Weighted Average Price Method	• Replacement Price Method • Realisable Price Method	• Standard Price Method • Inflated Price Method • Re-use Price Method

Some of the techniques are discussed as follows:

(i) First-in First-out method (FIFO): The materials received first are to be issued first when material requisition is received. Materials left as closing stock will be at the price of latest purchases.

(ii) Last-in First-out method (LIFO): The materials purchased last are to be issued first when material requisition is received. Closing stock is valued at the oldest stock price.
(Accounting Standard- 2 and Ind AS-2 do not allow LIFO method for inventory valuation, however, for academic knowledge it may be studied).

(iii) Simple Average Method: Material Issue Price=

$$\frac{\text{Total of unit price of each purchase}}{\text{Total Nos of Purchases}}$$

(iv) Weighted Average Price Method: This method gives due weightage to quantities purchased and the purchase price to determine the issue price.

Weighted Average Price =

$$\frac{\text{Total cost of materials in stock}}{\text{Total quantity of materials}}$$

Normal and Abnormal Loss of Materials

Loss of Material

- **Waste:** Portion of basic raw material lost in processing having no recoverable value
- **Scrap:** The incidental material residue coming out of certain manufacturing operations having low recoverable value.
- **Spoilage:** Goods damaged beyond rectification to be sold without further processing.
- **Defectives:** Goods which can be rectified and turned out as good units by the application of additional labour or other services.
- **Obsolescence:** It is the loss in the intrinsic value of an asset due to its supersession.

Treatment of Loss of Material

(i) Treatment of Waste

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

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

(ii) Treatment of Scrap

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

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

(iii) Treatment of Spoilage

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

Abnormal- The cost of abnormal spoilage (i.e., arising out of causes not inherent in manufacturing process) is charged to the Costing Profit and Loss Account.

(iv) Treatment of Defectives:

Normal- The cost less realisable value on sale of defectives are charged to material cost of good production.

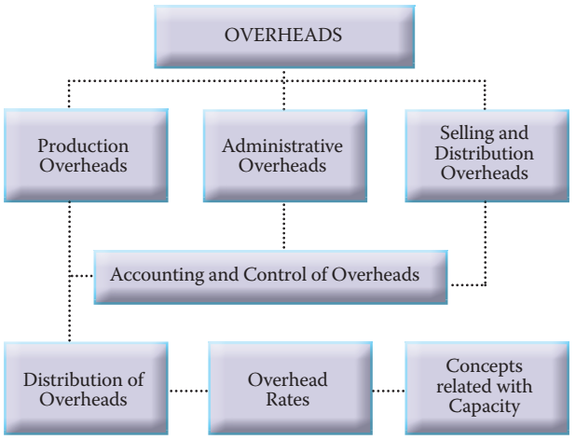
Abnormal- The material cost of abnormal loss is transferred to costing profit and loss account.

(v) Treatment of Obsolescence:

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

Overheads

Chapter Overview



Classification of Overheads

Overheads are the expenditure which can not be identified with a particular cost unit. Overheads can be classified as under.

By Function	By Nature	By Element	By Control
• Factory or Manufacturing or Production Overhead • Office and Administrative Overheads • Selling and Distribution Overheads	• Fixed Overhead • Variable Overhead • Semi-Variable Overheads	• Indirect materials • Indirect employee cost • Indirect expenses	• Controllable costs • Uncontrollable costs

Functional Classification of Overheads

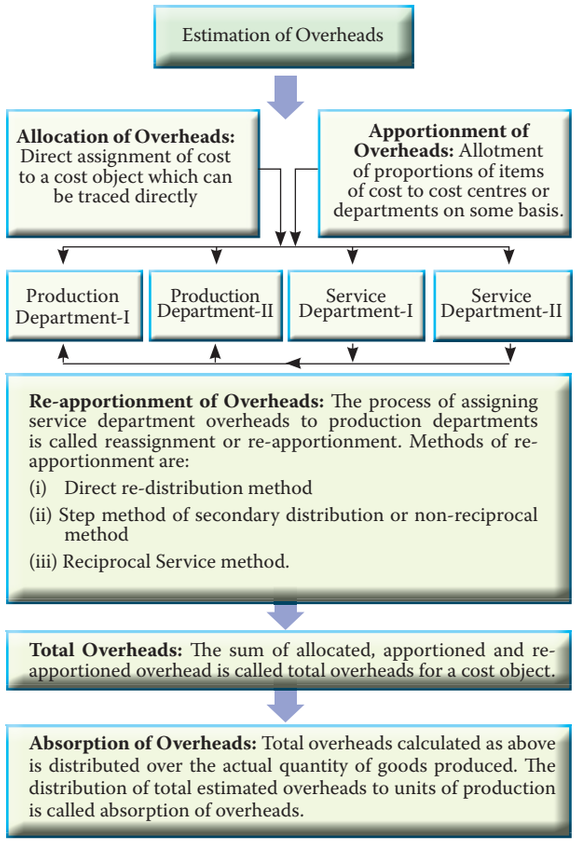
One of the most important ways of classifying overheads is as per their function. As per this classification overheads are classified as under.

Factory or Manufacturing or Production Overhead: Indirect cost incurred for manufacturing or production activity in a factory. Manufacturing overhead includes all expenditures incurred from the procurement of materials to the completion of finished product.

Office and Administrative Overheads: Expenditures incurred on all activities relating to general management and administration of an organisation. It includes formulating the policy, directing the organisation and controlling the operations of an undertaking which is not related directly to production, selling, distribution, research or development activity or function.

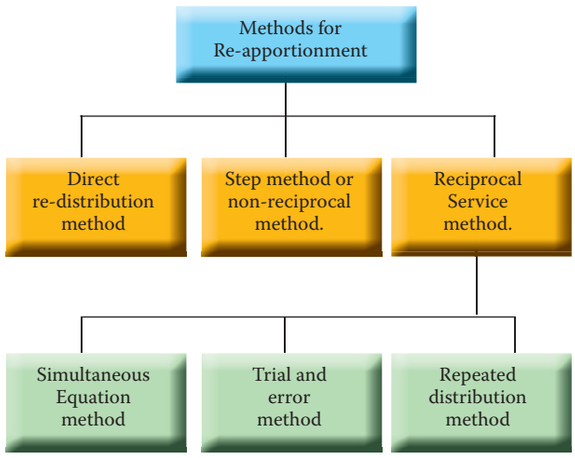
Selling and Distribution Overheads: (i) Selling overhead: expenses related to sale of products and include all indirect expenses in sales management for the organisation.
(ii) Distribution overhead: cost incurred on making product available for sale in the market.

Steps for Distribution of Overheads



Methods for Re-apportionment of Overheads

The re-apportionment of service department expenses over the production departments may be carried out by using any one of the following methods:



Methods of Absorbing Overheads to various Products or Jobs

Several methods are commonly employed either individually or jointly for computing the appropriate overhead rate. The more common of these are:

- Percentage of direct materials
- Percentage of prime cost
- Percentage of direct labour cost
- Labour hour rate
- Machine hour rate
- Rate per unit of Output

Machine hour rate

Machine hour rate implies, cost of running a machine for an hour to produce goods.

The steps involved in determining of Machine hour rate is as follows:

Step1: Calculate total of overheads apportioned to a production department.

↓

Step 2: Apportion further these overheads to machines or group of machines in the department.

↓

Step 3: Allocate machine specific costs (directly identifiable with the machine)

↓

Step 4: Estimate total productive hours for the machine

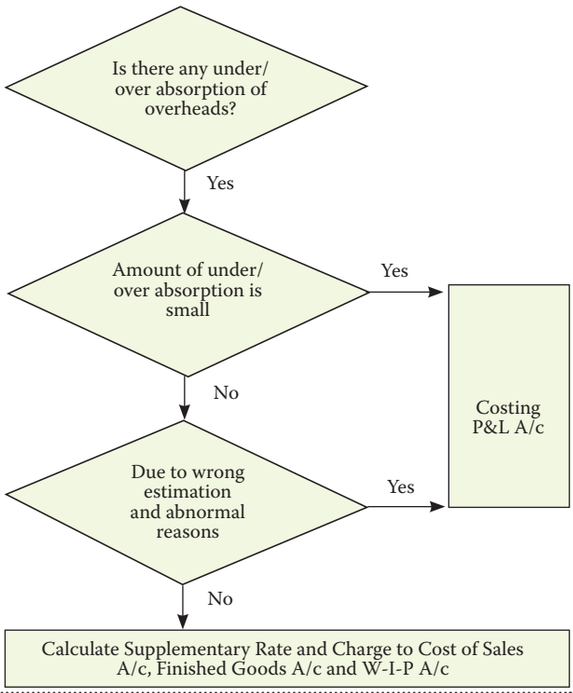
↓

Step 5: Aggregate overheads as apportioned in step-2 and allocated in step-3 and divide it by Estimated total productive hours

↓

The resultant figure is machine hour rate

Treatment of Under-absorption and Over-absorption of overheads in Cost Accounting



Types of Overhead Rates

Normal Rate: This rate is calculated by dividing the actual overheads by actual base. It is also known as actual rate.

Pre-determined Overhead Rate: This rate is determined in advance by estimating the amount of the overhead for the period in which it is to be used.

Blanket Overhead Rate: Blanket overhead rate refers to the computation of one single overhead rate for the whole factory.

Departmental Overhead Rate: It refers to the computation of one single overhead rate for a particular production unit or department.

Concepts related with Capacity

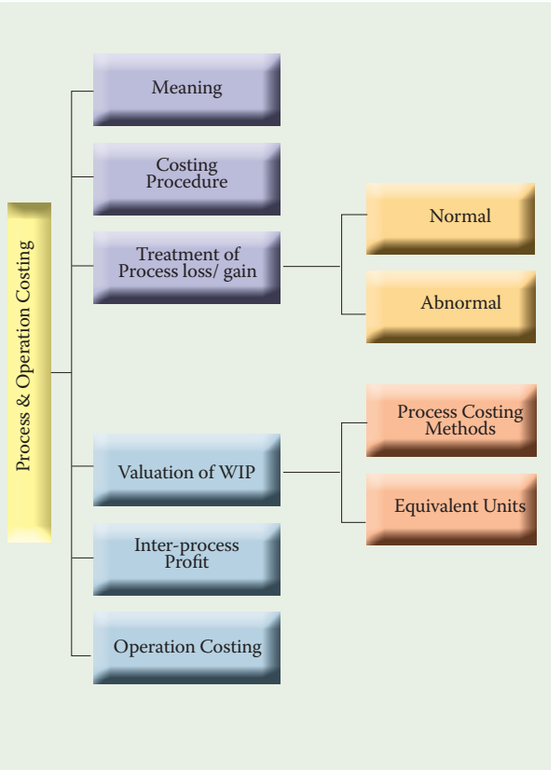
Installed/ Rated capacity	The maximum capacity of producing goods or providing services. It is also known as theoretical capacity.
Practical capacity	It is defined as actually utilised capacity of a plant. It is also known as operating capacity.
Normal capacity	The volume of production or services achieved or achievable on an average over a period under normal circumstances taking into account the reduction in capacity resulting from planned maintenance.
Actual capacity	Capacity actually achieved during a given period.
Idle capacity	It is that part of the capacity of a plant, machine or equipment which cannot be effectively utilised in production.

Treatment of Certain Items in Cost Accounting

Interest and financing charges	It includes any payment in nature of interest for use of non- equity funds and incidental cost that an entity incurs in arranging those funds. Interest and financing charges shall be presented in the cost statement as a separate item of cost of sales.
Packing expenses	Cost of primary packing necessary for protecting the product or for convenient handling, should become a part of cost of production. The cost of packing to facilitate the transportation of the product from the factory to the customer should become a part of the distribution cost.
Fringe benefits	These indirect benefits stand to improve the morale, loyalty and stability of employees towards the organisation. If the amount of fringe benefit is considerably large, it may be recovered as direct charge by means of a supplementary wage or labour rate; otherwise these may be collected as part of production overheads.
Research and Development Expenses	If research is conducted in the methods of production, the research expenses should be charged to the production overhead; while the expenditure becomes a part of the administration overhead if research relates to administration. Similarly, market research expenses are charged to the selling and distribution overhead. Development costs incurred in connection with a particular product should be charged directly to that product. Such expenses are usually treated as "deferred revenue expenses," and recovered as a cost per unit of the product when production is fully established.

Process and Operation Costing

Chapter Overview



Meaning of Process Costing

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 defined as "a method of Cost Accounting whereby costs are charged to processes or operations and averaged over units produced".

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

Costing Procedure in Process Costing

Materials: Each process for which the materials are used, are debited with the cost of materials consumed on the basis of the information received from the Cost Accounting department.

Employee Cost (Labour) - Each process account should be debited with the labour cost or wages paid to labour for carrying out the processing activities. Sometimes the wages paid are apportioned over the different processes after selecting appropriate basis.

Direct expenses - Each process account should be debited with direct expenses like depreciation, repairs, maintenance, insurance etc. associated with it.

Production Overheads- These expenses cannot be allocated to a process. The suitable way out to recover them is to apportion them over different processes by using suitable basis.

Steps in Process Costing

Step-1: Analyse the Physical Flow of Production Units

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Step-2: Calculate Equivalent Units for each Cost Elements

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Step-3: Determine Total Cost for each Cost Element

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Step-4: Compute Cost Per Equivalent Unit for each Cost Element

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Step-5: Assign Total Costs to Units Completed and Ending WIP

Treatment of Normal, Abnormal Loss and Abnormal Gain

Normal Process Loss	Abnormal Process Loss	Abnormal Process Gain/ Yield
• The cost of normal process loss in practice is absorbed by good units produced under the process. The amount realised by the sale of normal process loss units should be credited to the process account.	• 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. • Total cost of abnormal process loss is debited to costing profit and loss account.	• The process account under which abnormal gain arises is debited with the abnormal gain and credited to abnormal gain account which will be closed by transferring to the Costing Profit and Loss account.

Valuation of Work-in-process

The valuation of work-in-process presents a good deal of difficulty because it has units under different stages of completion from those in which work has just begun to those which are only a step short of completion.

(i) 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.

The formula for computing equivalent completed units is:

$$\text{Equivalent completed units} = \left(\begin{array}{c}\text{Actual number of units in}\\ \text{the process of manufacture}\end{array}\right) \times \left(\begin{array}{c}\text{Percentage of}\\ \text{Work completed}\end{array}\right)$$

Input Details	Units	Output Particulars	Units	Equivalent Units					
				Material		Labour		Overhead	
				%	Units	%	Units	%	Units
			a	b	c= a×b	d	e=a×d	f	g=a×f
Opening W-I-P	xxx	Opening W-I-P*	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Unit Introduced	xxx	Finished output**	xxx	xxx	xxx	xxx	xxx	xxx	xxx
		Normal loss***	xxx	-	-	-	-	-	-
		Abnormal loss/ Gain****	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Total		Closing W-I-P	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	xxx	Total	xxx		xxx		xxx		xxx

* Equivalent units for Opening W-I-P is calculated only under FIFO method. Under the Average method, it is not shown separately.

**Under the FIFO method, Finished Output = Units completed and transferred to next process less Opening WIP. Under Average method, Finished Output = Units completed and transferred.

***For normal loss, no equivalent unit is calculated.

****Abnormal Gain/ Yield is treated as 100% complete in respect of all cost elements irrespective of percentage of completion.

(ii) Methods for valuation of work-in-process

First-in-first-out (FIFO) method

Under this method the units completed and transferred include completed units of opening work-in-process and subsequently introduced units. Proportionate cost to complete the opening work-in-process and that to process the completely processed units during the period are derived separately.

Weighted Average (Average) Method

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.

Inter Process Profit

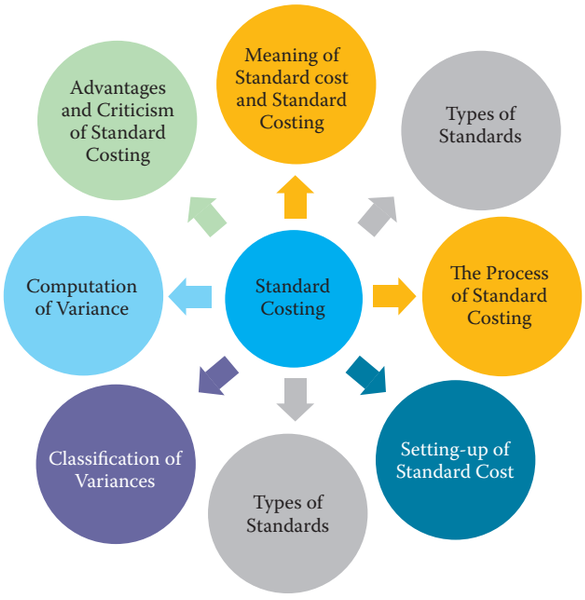
In some process industries the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. The difference between cost and the transfer price is known as inter-process profits.

Operation Costing

This product costing system is used when an entity produces more than one variant of final product using different materials but with similar conversion activities. Which means conversion activities are similar for all the product variants but materials differ significantly. Operation Costing method is also known as Hybrid product costing system as materials costs are accumulated by job order or batch wise but conversion costs i.e. labour and overheads costs are accumulated by department, and process costing methods are used to assign these costs to products.

Standard Costing

Chapter Overview



What is a Standard or Standard Cost?

Standard cost is defined in the CIMA Official Terminology as "'the planned unit cost of the product, component or service produced in a period. The standard cost may be determined on a number of bases. The main use of standard costs is in performance measurement, control, stock valuation and in the establishment of selling prices."

Types of standards

There are various types of standard which are illustrated below:

Ideal Standards: The level of performance attainable when prices for material and labour are most favourable, when the highest output is achieved with the best equipment and layout and when the maximum efficiency in utilisation of resources results in maximum output with minimum cost.

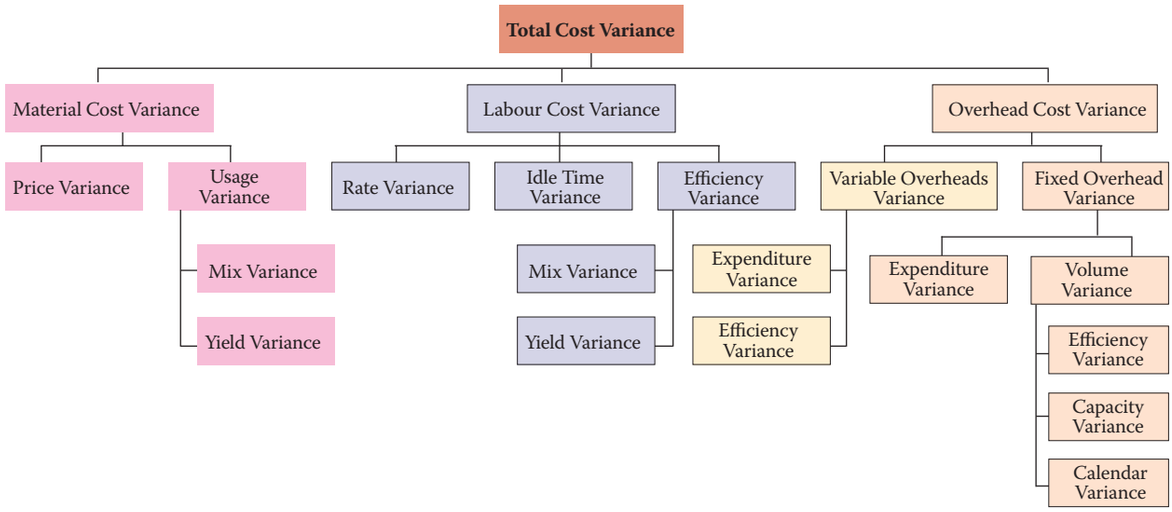
Normal Standards: These are standards that may be achieved under normal operating conditions.

Basic or Bogey Standards: These standards are used only when they are likely to remain constant or unaltered over a long period.

Current Standards: These standards reflect the management's anticipation of what actual costs will be for the current period.

Process followed in Standard Costing

Variances at a Glance



Variance Analysis

(i) Material Cost Variance

Material Cost Variance

[Standard Cost – Actual Cost]

(The difference between the Standard Material Cost *of the actual production volume* and the Actual Cost of Material)

[(SQ × SP) – (AQ × AP)]

Material Price Variance	Material Usage Variance
[Standard Cost of Actual Quantity – Actual Cost] (The difference between the Standard Price and Actual Price for the Actual Quantity Purchased) [(SP – AP) × AQ] *Or* [(SP × AQ) – (AP × AQ)]	[Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity] (The difference between the Standard Quantity *specified for actual production* and the Actual Quantity *used*, at Standard Price) [(SQ – AQ) × SP] *Or* [(SQ × SP) – (AQ × SP)]

Material Mix Variance	Material Yield Variance
[Standard Cost of Actual Quantity in Standard Proportion – Standard Cost of Actual Quantity] (The difference between the Actual Quantity *in standard proportion* and Actual Quantity *in actual proportion*, at Standard Price) [(RSQ – AQ) × SP] *Or* [(RSQ × SP) – (AQ × SP)]	[Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity in Standard Proportion] (The difference between the Standard Quantity *specified for actual production and Actual Quantity in standard proportion*, at Standard Purchase Price) [(SQ – RSQ) × SP] *Or* [(SQ × SP) – (RSQ × SP)]

(ii) Labour Cost Variances

Labour Cost Variance

[Standard Cost – Actual Cost]

(The difference between the Standard Labour Cost and the Actual Labour Cost *incurred for the production achieved)*

[(SH × SR) – (AH* × AR)]

Labour Rate Variance	Labour Idle Time Variance	Labour Efficiency Variance
[Standard Cost of Actual Time – Actual Cost] (The difference between the Standard Rate per hour and Actual Rate per hour for the Actual Hours paid) [(SR – AR) × AH*] *Or* [(SR × AH*) – (AR × AH*)]	[Standard Rate per Hour x Actual Idle Hours] (The difference between the Actual Hours *paid* and Actual Hours *worked* at Standard Rate) [(AH* – AH#) × SR] *Or* [(AH* × SR) – (AH# × SR)]	[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time] (The difference between the Standard Hours *specified for actual production* and Actual Hours *worked* at Standard Rate) [(SH – AH#) × SR] *Or* [(SH × SR) – (AH# × SR)]

Labour Mix Variance Or Gang Variance	Labour Yield Variance Or Sub-Efficiency Variance
[Standard Cost of Actual Time Worked in Standard Proportion – Standard Cost of Actual Time Worked] (The difference between the Actual Hours worked in standard proportion and Actual Hours worked in actual proportion, at Standard Rate) [(RSH – AH#) × SR] *Or* [(RSH × SR) – (AH# × SR)]	[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time *Worked* in Standard Proportion] (The difference between the Standard Hours specified for actual production and Actual Hours worked in standard proportion, at Standard Rate) (SH – RSH) × SR *Or* (SH × SR) – (RSH × SR)

(iii) Variable Overhead Variances

Variable Overhead Cost Variance

(Standard Variable Overheads for Production – Actual Variable Overheads)

Variable Overhead Expenditure (Spending) Variance	Variable Overhead Efficiency Variance
(Standard Variable Overheads for Actual Hours#) *Less* (Actual Variable Overheads) [(SR – AR) × AH#] *Or* [(SR × AH#) – (AR × AH#)]	(Standard Variable Overheads for Production) *Less* (Standard Variable Overheads for Actual Hours#) [(SH – AH#) × SR] *Or* [(SH × SR) – (AH# × SR)]

(iv) Fixed Overhead Variances

Fixed Overhead Cost Variance

(Absorbed Fixed Overheads) *Less* (Actual Fixed Overheads)

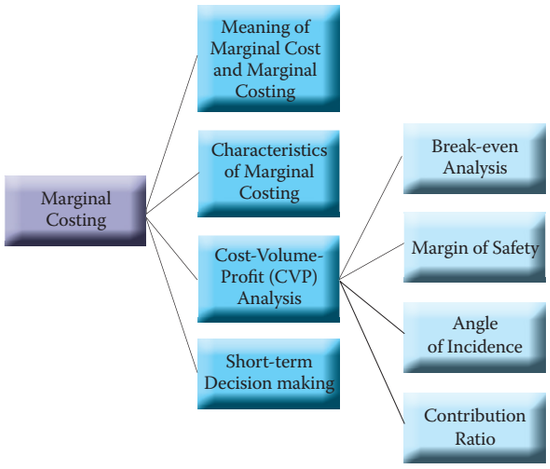
Fixed Overhead Expenditure Variance	Fixed Overhead Volume Variance
(Budgeted Fixed Overheads) *Less* (Actual Fixed Overheads) *Or* (BH × SR) – (AH × AR)	(Absorbed Fixed Overheads) *Less* (Budgeted Fixed Overheads) *Or* (SH × SR) – (BH × SR)

Fixed Overhead Capacity Variance	Fixed Overhead Calendar Variance	Fixed Overhead Efficiency Variance
SR (AH – BH) *Or* (AH × SR) – (BH × SR)	Std. Fixed Overhead rate per day (Actual no. of Working days – Budgeted Working days)	SR (AH – SH) *Or* (AH × SR) – (SH × SR)

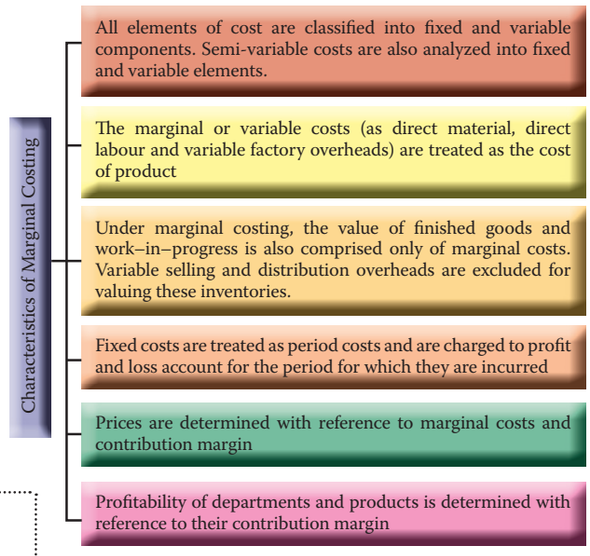
AH* - Actual Hours paid
AH# - Actual Hours worked

Marginal Costing

Chapter Overview



Characteristics of Marginal Costing



Meaning of Terms

In order to understand the concept of marginal costing, let us first define various terminology associated with marginal costing.

Marginal Cost

Marginal cost as understood in economics is the incremental cost of production which arises due to one-unit increase in the production quantity.

Marginal Costing

It is a costing system where products or services and inventories are valued at variable costs only.

Direct Costing

Direct costing and Marginal Costing is used synonymously at various places and it is so also.

Differential Cost

Differential cost is difference between the costs of two different production levels.

Computation of Contribution and Profit under Marginal Costing

For the determination of cost of a product/ service under marginal costing, costs are classified under variable and fixed. All the variable costs are part of product and fixed costs are charged against contribution margin.

Cost and Profit Statement under Marginal Costing

	Amount (Rs)	Amount (Rs)
Revenue		xxx
Product Cost:		
- Direct Materials	xxx	
- Direct employee (labour)	xxx	
- Direct expenses	xxx	
- Variable manufacturing overheads	xxx	
Product (Inventoriable) Costs	**xxx**	**(xxx)**
Product Contribution Margin		xxx
- Variable Administration overheads	xxx	
- Variable Selling & Distribution overheads	xxx	(xxx)
Contribution Margin		**xxx**
Period Cost:		
Fixed Manufacturing expenses	xxx	
Fixed non-manufacturing expenses	xxx	(xxx)
Profit/ (loss)		xxx

Advantages of Marginal Costing

There are many advantages of marginal costing, some of them are discussed below.

Cost-Volume-Profit (CVP) Analysis

It is a managerial tool showing the relationship between various ingredients of profit planning viz., cost, selling price and volume of activity.

Marginal Cost Equation

Marginal Cost Equation = S -V = C = F ± P

Marginal Cost Statement

	(₹)
Sales (S)	xxxx
Less: Variable Cost (V)	xxxx
Contribution (C)	xxxx
Less: Fixed Cost (F)	xxxx
Profit/ Loss (P)	xxxx

Profit Volume Ratio or P/V ratio

This ratio shows the proportion of sales required to cover fixed cost and profit. P/V ratio is calculated as below:

(a) $\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$

(b) When two years' data is given, P/V Ratio

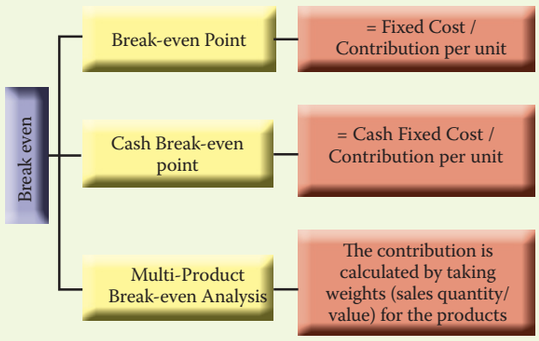
$= \frac{\text{Change in contribution/ Profit}}{\text{Change in sales}} \times 100$

Break-Even Analysis

Break-even analysis is a generally used method to study the CVP analysis. This technique can be explained in two ways.

(i) In narrow sense it is concerned with computing the break-even point.

(ii) In broad sense this technique is used to determine the possible profit/loss at any given level of production or sales.



Angle of Incidence

This angle is formed by the intersection of sales line and total cost line at the break-even point. This angle shows the rate at which profit is earned once the break-even point is reached. The wider the angle the greater is the rate of earning profits. A large angle of incidence with a high margin of safety indicates extremely favourable position

Margin of Safety

This is the difference between the expected level of sales and break even sales (no profit, no loss). The larger is the margin of safety higher is the profit and vice versa.

Variations of Basic Marginal Cost Equation and other formulae

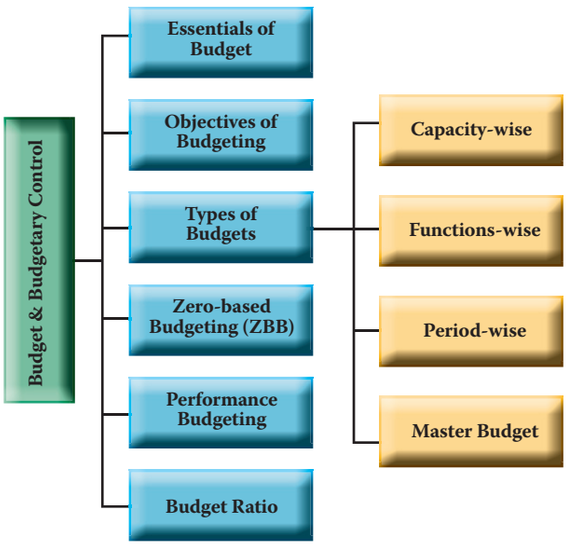
i.	Sales – Variable cost = Fixed cost + Profit / Loss
	By multiplying and dividing L.H.S. by S
ii.	$\frac{S(S-V)}{S} = F + P$
iii.	S x P/V Ratio = F + P or Contribution ($\text{P / V Ratio} = \frac{S-V}{S} \times 100$)
iv.	BES x P/V Ratio = F ($\because$ at BEP Profit is zero)
v.	$\text{BES} = \frac{\text{Fixed cost}}{\text{P/V Ratio}}$
vi.	$\text{P/V Ratio} = \frac{\text{Fixed cost}}{\text{BES}}$
vii	S × P/V Ratio = Contribution (Refer to iii)

viii.	$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sale}} \times 100$
ix.	(BES + MS) × P/V Ratio = Contribution (Total sales = BES + MS)
x.	(BES × P/V Ratio) + (MS × P/V Ratio) = F + P
	By deducting (BES × P/V Ratio) from L.H.S. and F from R.H.S. in (x) above, we get:
xi.	M.S. × P/V Ratio = P
xii.	$\text{P/V Ratio} = \frac{\text{Change in profit}}{\text{Change in sales}} \times 100$
xiii.	$\text{P/V Ratio} = \frac{\text{Change in contribution}}{\text{Change in sales}} \times 100$

xiv.	$\text{Profitability} = \frac{\text{Contribution}}{\text{Key factor}}$
xv.	$\text{Margin of Safety} = \text{Total Sales} - \text{BES}$ or $\frac{\text{Profit}}{\text{P/V Ratio}}$
xvi.	BES = Total Sales – MS
xvii.	$\text{Margin of Safety Ratio} = \frac{\text{Total sales} - \text{BES}}{\text{Total Sales}}$

Budget & Budgetary Control

Chapter Overview



Definition and Terminology

Let us first define various important terminologies used in budget and budgetary control.

Budget	Budgeting	Budgetary control
Quantitative expression of a plan for a defined period of time	Coordinating the combined intelligence of an entire organisation into a plan of action based on past performance	The establishment of budgets relating to the responsibilities of executives of a policy and the continuous comparison of the actual with the budgeted results, either to secure by individual action the objective of the policy or to provide a basis for its revision

Essentials of Budget

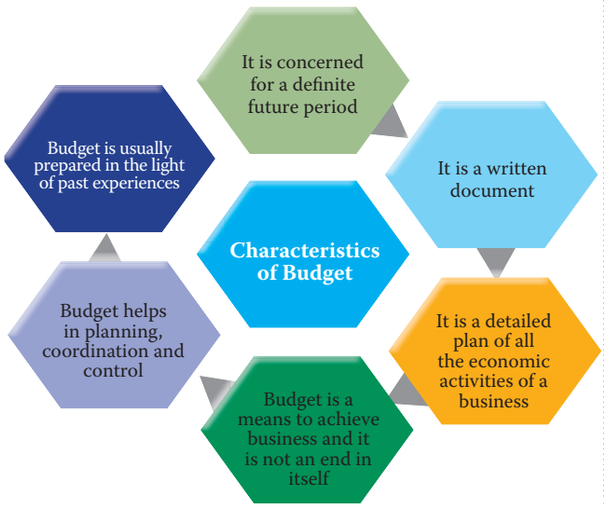
Essential elements of budget are illustrated below:

Essential elements of a budget

Organisational structure must be clearly defined	Setting of clear objectives and reasonable targets	Budgets are prepared for the future periods based on expected course of actions	Budgets are updated for the events that were not kept into the mind while establishing budgets	Budgets should be quantifiable and master budget should be broken down into various functional budgets. Budgets should be monitored periodically	Budgetary performance needs to be linked effectively to the reward system

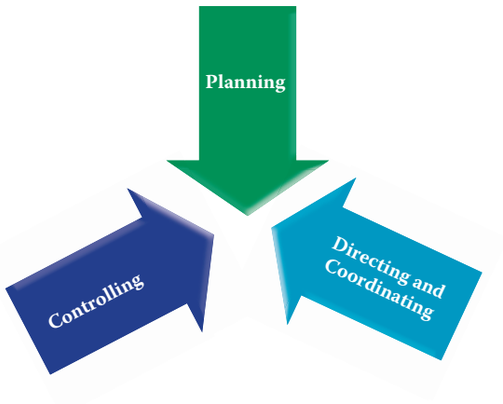
Characteristics of Budget

Main characteristics of budget are as below:



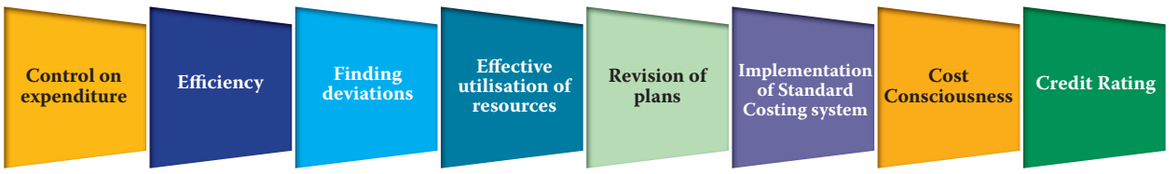
Objectives of Budgeting

The objective of budgeting begins with planning and ends with controlling. Once the planning is done, they can be used for directing and controlling operations so that the stated targets in planning are achieved.

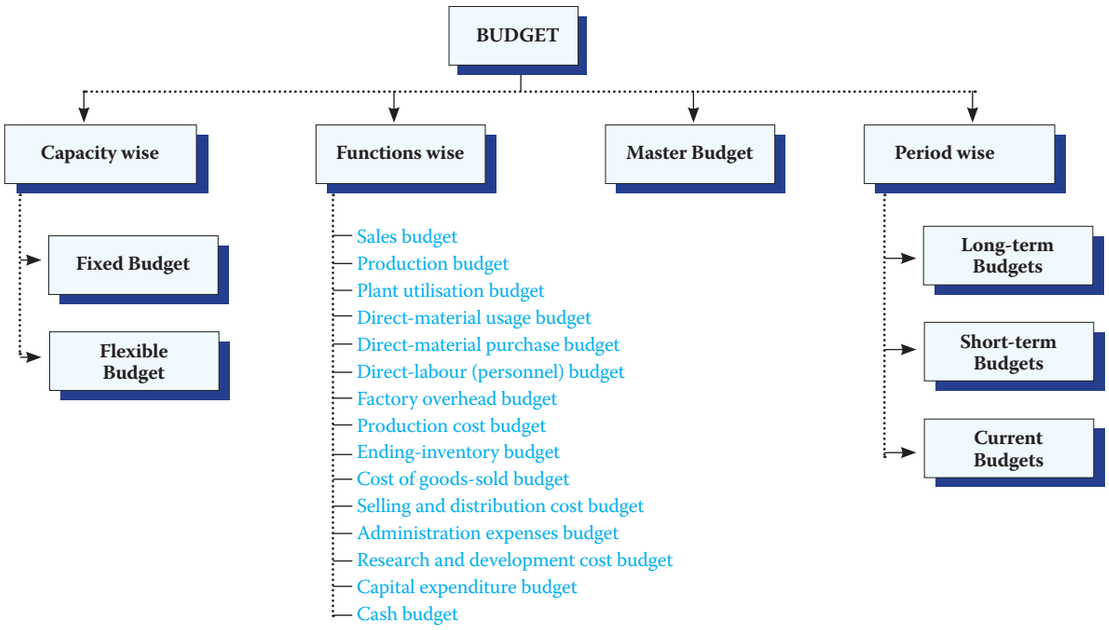


Advantages of Budgetary Control System

There are many advantages of budgetary control system, and some of the them are illustrated below:



Classification of Budget



Definition of different types of Budget

Functional Budgets	Budgets which relate to the individual functions in an organisation are known as Functional Budgets. For example, purchase budget; sales budget; production budget; plant-utilisation budget and cash budget.
Master Budget	It is a consolidated summary of the various functional budgets. It serves as the basis upon which budgeted P & L A/c and forecasted Balance Sheet are built up.
Long-term Budgets	The budgets which are prepared for periods longer than a year are called long-term budgets. Such budgets are helpful in business forecasting and forward planning. Capital expenditure budget and Research and Development budget are examples of long-term budgets.
Short-term Budgets	Budgets which are prepared for periods less than a year are known as short-term budgets. Cash budget is an example of short-term budget. Such types of budgets are prepared in cases where a specific action has to be immediately taken to bring any variation under control, as in cash budgets.
Basic Budgets	A budget which remains unaltered over a long period of time is called basic budget.
Current Budgets	A budget which is established for use over a short period of time and is related to the current conditions is called current budget.
Fixed Budget	According to CIMA official terminology, "a fixed budget, is a budget designed to remain unchanged irrespective of the level of activity actually attained".
Flexible Budget	According to CIMA official terminology, "a flexible budget is defined as a budget which, by recognizing the difference between fixed, semi-variable and variable costs is designed to change in relation to the level of activity attained."

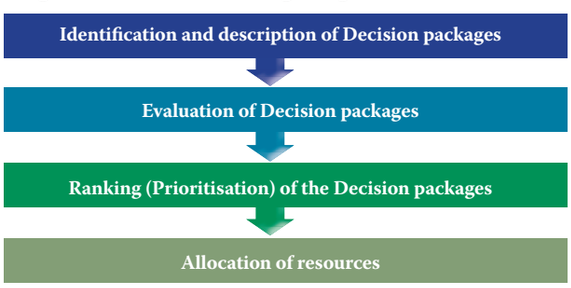
Differences between Fixed Budget and Flexible Budget

Sl. no.	Fixed Budget	Flexible Budget
1.	It does not change with actual volume of activity achieved. Thus it is known as rigid or inflexible budget	It can be re-casted on the basis of activity level to be achieved. Thus it is not rigid.
2.	It operates on one level of activity and under one set of conditions. It assumes that there will be no change in the prevailing conditions, which is unrealistic.	It consists of various budgets for different levels of activity.
3.	Here as all costs like - fixed, variable and semi-variable are related to only one level of activity, so variance analysis does not give useful information.	Here, analysis of variance provides useful information as each cost is analysed according to its behaviour.
4.	If the budgeted and actual activity levels differ significantly, then the aspects like cost ascertainment and price fixation do not give a correct picture.	Flexible budgeting at different levels of activity facilitates the ascertainment of cost, fixation of selling price and tendering of quotations.
5.	Comparison of actual performance with budgeted targets will be meaningless specially when there is a difference between the two activity levels.	It provides a meaningful basis of comparison of the actual performance with the budgeted targets.

Zero- Based Budgeting (ZBB)

It is defined as 'a method of budgeting which requires each cost element to be specifically justified, although the activities to which the budget relates are being undertaken for the first time, without approval, the budget allowance is zero.'

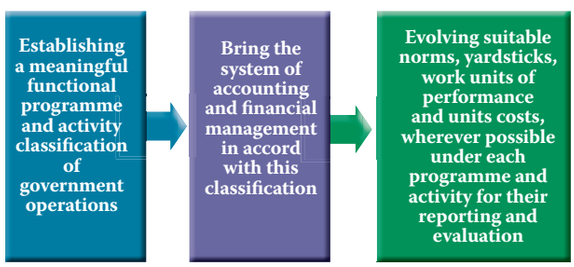
Stages in Zero-based budgeting



Performance Budgeting

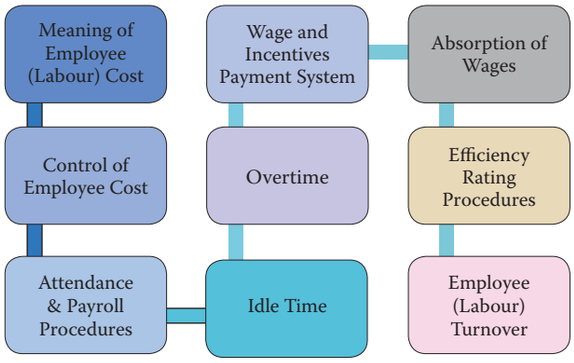
A performance budget is one which presents the purposes and objectives for which funds are required, the costs of the programmes proposed for achieving those objectives, and quantitative data measuring the accomplishments and work performed under each programme.

Steps in Performance Budgeting



EMPLOYEE (LABOUR) COST

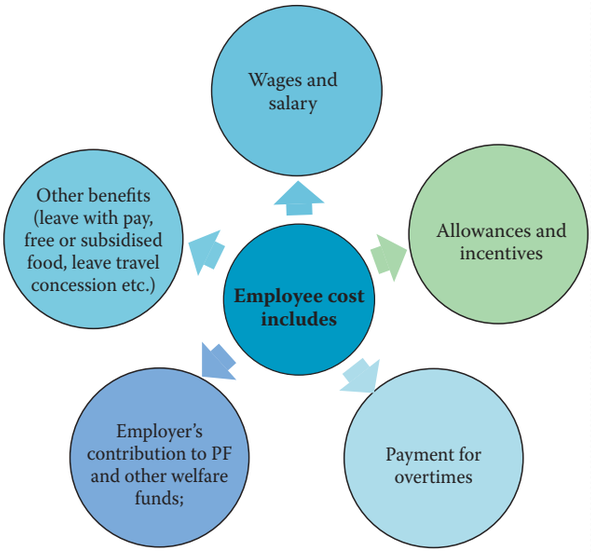
Points of Discussion



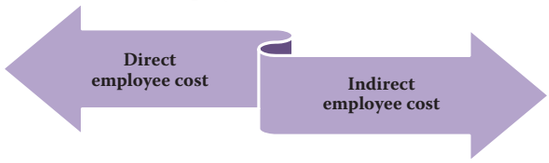
Meaning of Employee (Labour) Cost

EMPLOYEE (LABOUR) COST

- Benefits paid or payable to the employees of an entity, whether permanent, or temporary for the services rendered by them.
- Includes payments made in cash or kind.



Classification of Employee cost:



Direct employee cost	Indirect employee cost
1. **Cost of employees, directly engaged in the production process.**	1. Cost of employees who are **not directly engaged** in the production process.
2. **Easily identifiable and allocable to cost unit.**	2. **Apportioned on** some **appropriate basis**.
3. **Varies with the volume of production and has positive relationship with the volume.**	3. May **not vary with the volume** of production.

Employee Cost Control

EMPLOYEE (LABOUR) COST CONTROL

- **To control over the cost incurred on employees.**
- **To keep the wages per unit of output as low as possible.**
- **To give the employees an appropriate compensation and encourage efficiency.**

Factors for the Control of Employee Cost:

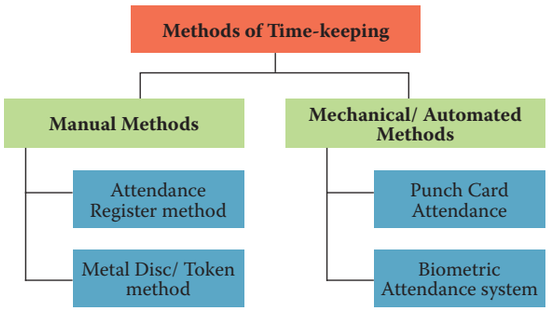
- **Assessment of manpower requirements.**
- **Control over time-keeping and time-booking.**
- **Time and Motion Study.**
- **Control over idle time and overtime.**
- **Control over employee turnover.**
- **Wage and Incentive systems.**
- **Job Evaluation and Merit Rating.**
- **Employee productivity.**

Time-keeping: A record of total time spent by the employees in a factory.

Objectives of Time Keeping:

(i) For the preparation of payrolls.
(ii) For calculating overtime.
(iii) For ascertaining employee cost.
(iv) For controlling employee cost.
(v) For ascertaining idle time.
(vi) For disciplinary purposes.
(vii) For overhead distribution.

Methods of Time-keeping



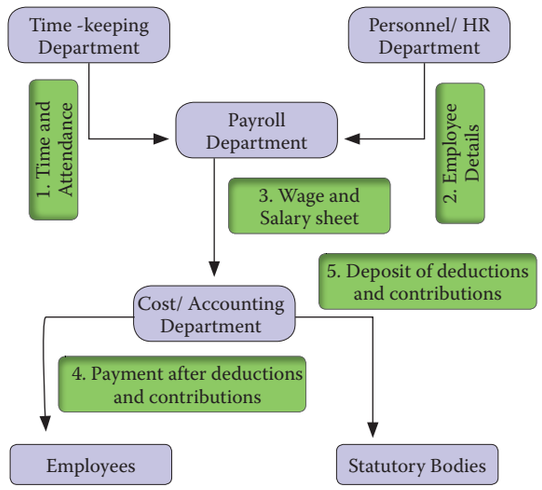
Time-Booking: A method wherein each activity of an employee is recorded.

Objectives of Time Booking:

(i) To compute the cost of the job or activity.
(ii) To measure efficiency.
(iii) To analyse the variance in time with respect to the standard time.

For the collection of all such data, a separate record, generally known as Time (or Job) card, is kept.

Payroll Procedures of Employees



Step-1
- **Attendance and Time details:** *Detailed sheet of number of days or hours worked by each employee as reflected by the time keeping methods are sent to the payroll department.*

Step-2
- **List of employees and other details:** *List of employees on roll and the rate at which they will be paid is sent by the personnel/ HR department.*

Step-3
- **Computation of wages and other incentives:** *Payroll department prepares pay slip and forward the same to the cost/ accounting department.*

Step-4
- **Payment to the employees:** *After all deductions (like PF, ESI, TDS), wages/ salary is paid to the employees.*

Step-5
- **Deposit of all statutory liabilities:** *All statutory deduction are paid to the respective statutory bodies & funds.*

Idle Time

The time during which no production is carried-out because the worker remains idle but are paid.

Normal idle time | **Abnormal idle time**

Normal Idle Time: Time which cannot be avoided or reduced in the normal course of business.

Causes:
- *Time lost between factory gate and the place of work,*
- *Interval between one job and another,*
- *Setting up time for the machine,*
- *Normal rest time, break for lunch etc.*

Treatment of Normal Idle Time
- Treated as a **part of cost of production**.
- In the case of **direct workers** an allowance for normal idle time is considered while **setting of standard hours** or standard rate.
- In case of **indirect workers**, normal idle time is considered for the **computation of overhead rate.**

Abnormal Idle Time: Apart from normal idle time, there may be factors which give rise to abnormal idle time.

- *Lack of coordination,*
- *Power failure, Breakdown of machines,*
- *Non-availability of raw materials,*
- *Strikes, lockouts, poor supervision, fire, flood etc.*

Causes further analysed into

Controllable abnormal idle time	*Uncontrollable abnormal idle time*
Time which could have been put to productive use had the management been more alert and efficient.	**Time lost which management does not have any control e.g., breakdown of machines, flood etc.**

Treatment of Abnormal Idle time

- **Not included in production cost.**
- Shown as a **separate item** in the **Costing Profit and Loss** Account.
- For each category i.e. **controllable and uncontrollable** idle time, the **break-up** of cost due to various factors should be **separately shown**.
- **Management** should aim at **eliminating controllable idle time**.

Overtime

Overtime: Work done beyond normal working hours.

Overtime Payment = Wages paid for overtime at normal rate + Premium (extra) payment for overtime work

Overtime premium: **Extra amount so paid over the normal rate**

CAUSES	↔	TREATMENT
Urgency of work.	↔	Charged to job directly.
To make up shortfall in production due to some unexpected development.	↔	Treated as overhead cost of the particular cost centre which works overtime.
To make up shortfall in production due to some fault of management.	↔	If overtime is worked in a department due to the fault of another department, then premium should be charged to the latter department.
To take advantage of an expanding market or of rising demand.	↔	Overtime worked on account of abnormal conditions such as flood, etc., should be charged to Costing P/L Account.

Systems of Wage Payment and Incentives

System of Wages Payment

Time based	Output based	Combination of time and output based	Premium Bonus method	Group bonus scheme	Incentives for indirect workers

Time based (Time Rate System):

Workers are paid on time basis i.e. hour, day, week, or month.

Wages = Time Worked (Hours/ Days/ Months) × Rate for the time

Output Based (Piece Rate System):

Each operation, job or unit of production is termed a piece.
A rate of payment, is fixed for each piece.
The wages of the worker depend upon his output and rate of each unit of output.

Wages = Number of units produced × Rate per unit

Premium Bonus Method:

The worker is guaranteed his daily wages, if output is below and up to standard.
In case the task is completed in less than the standard time, the saved time is shared between the employees and the employer.

HALSEY PREMIUM PLAN

- **A standard time is fixed for each job or process**
- **Worker gets his time rate even if he exceeds the standard time limit, since his day rate is guaranteed.**
- **If job done in less than the standard time, bonus equal to 50 percent of the wages of time saved is paid.**

Wages = Time taken × Time rate + 50% of time saved × Time rate

ADVANTAGES of HALSEY PREMIUM PLAN

- **Time rate** is **guaranteed**.
- Opportunity for **increasing earnings** by increasing production.
- **System is equitable** in as much as the employer gets a **direct return** for his efforts in improving production methods.

DISADVANTAGES of HALSEY PREMIUM PLAN

- **Incentive** is **not so strong** as with piece rate system.
- **Harder the worker works**, the **lesser** he **gets** per piece.
- Sharing principle may **not be liked by employees**.

ROWAN PREMIUM PLAN

- **Standard time allowance is fixed for performance of a job.**
- **Bonus is paid if time is saved.**
- **Bonus is that proportion of the time wages as time saved bears to the standard time.**

$$\text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

ADVANTAGES of ROWAN PREMIUM PLAN

- A worker can **never double his earnings even if there is bad rate setting**.
- Suitable for **encouraging moderately efficient workers**.
- Sharing principle **appeals to the employer** as being equitable.

DISADVANTAGES of ROWAN PREMIUM PLAN

- System is a **bit complicated**.
- Incentive is **weak at a high production level where the time saved is more than 50% of the time allowed**.
- Sharing principle is **not generally welcomed by employees**.

Absorption of Wages

ELEMENTS OF WAGES

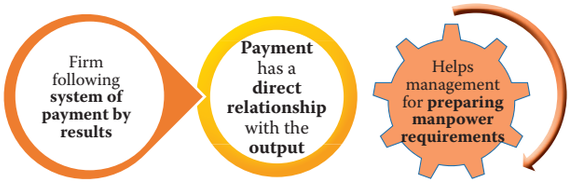
Monetary payment	Non-monetary benefits
• **Basic wages,**	• **Medical facilities;**
• **Dearness allowance,**	• **Educational and training facilities;**
• **Overtime wages,**	• **Recreational and sports facilities;**
• **Production bonus,**	• **Housing and social welfare; and**
• **Employer's contribution to PF, ESI and other funds,**	• **Cost of subsidised canteen and co-operative societies, etc.**
• **Leave pay, etc.**	

Efficiency Rating Procedures

If the time taken by a worker on a job ≤ the standard time, then he is rated efficient.

$$\text{Efficiency in \%} = \frac{\text{Time allowed as per standard}}{\text{Time Taken}} \times 100$$

Need for Efficiency rating:



Factors for increasing Employee productivity:

- **Employing** who possess **right type of skill.**
- Placing the **right** type of **person** to the **right job.**
- **Training** young and old workers by providing right types of opportunities.
- Taking appropriate measures to **avoid** the situation of **excess or shortage of employees.**
- Carrying **out work study for fixation of wages.**

Employee (Labour) Turnover

EMPLOYEE TURNOVER

Rate of change in the composition of employee force during a specified period measured against a suitable index.

Methods to calculate Employee Turnover

Replacement Method
This considers actual replacement of employees irrespective of number of persons leaving the organisation

Separation Method
This considers total number of employees separated

Flux Method
This considers both the number of replacements as well as the number of separations

$$\text{Replacement method} = \frac{\text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

$$\text{Separation method} = \frac{\text{Number of employees Seperated during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

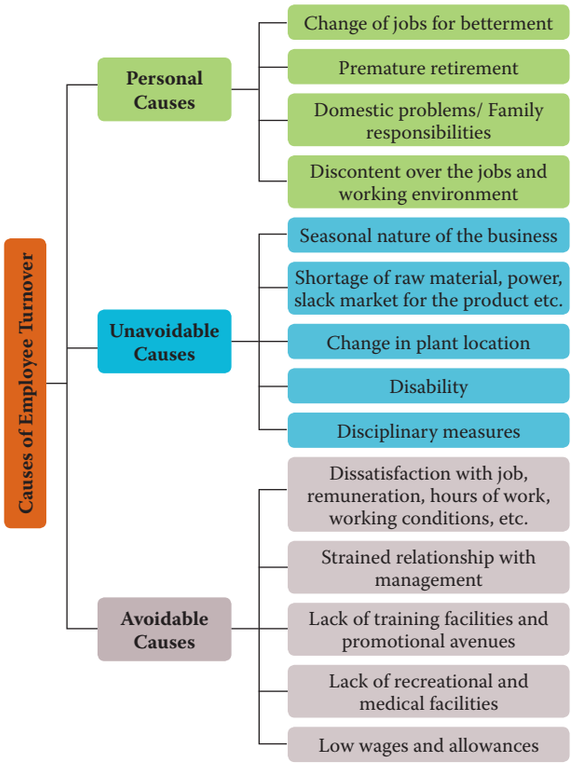
$$\text{Flux method} = \frac{\text{Number of employees Seperated} + \text{Number of employees Replaced during the period}}{\text{Average number Of employees during the period on roll}} \times 100$$

Or

$$\frac{\text{No. of Separations+No.of Accessions (i.e. No.of Replacements+ No.of New Joinings)}}{\text{Average no.of employees during the period on roll}} \times 100$$

Newly recruited employees are also responsible for changes in the composition or work force, some management accountants feel to take new recruitment for calculating employee turnover. The total number of workers joining, including replacements, is called accessions.

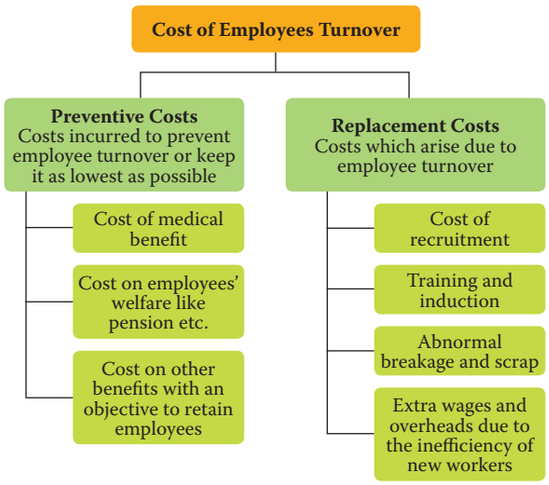
Causes of Employee Turnover:



Effects of Employee Turnover:

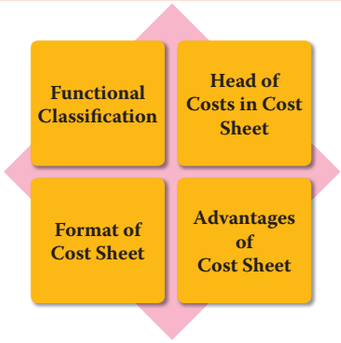
- Even flow of production is disturbed
- Efficiency of new workers is low
- Increased cost of training
- New workers cause increased breakage of tools
- Cost of recruitment

Cost of Employees Turnover:



COST SHEET

Points of Discussion



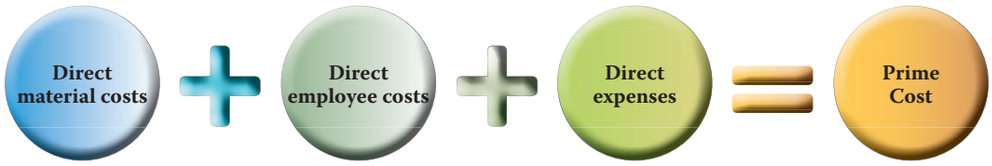
Functional Classification of Elements of Cost

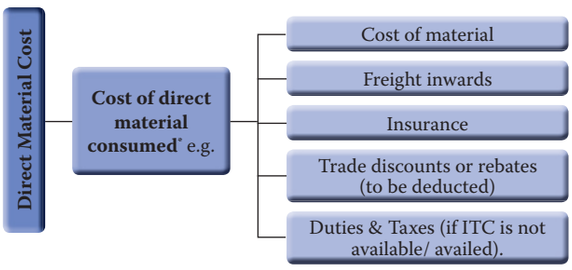
- Direct Material Cost
- Direct Employee (labour) Cost
- Direct Expenses
- Production/ Manufacturing Overheads
- Administration Overheads
- Selling Overheads
- Distribution Overheads
- Research and Development costs etc.

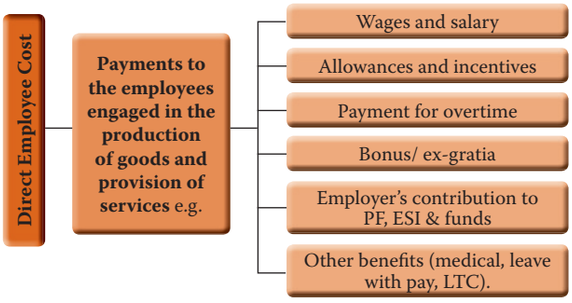
Cost Heads in a Cost Sheet

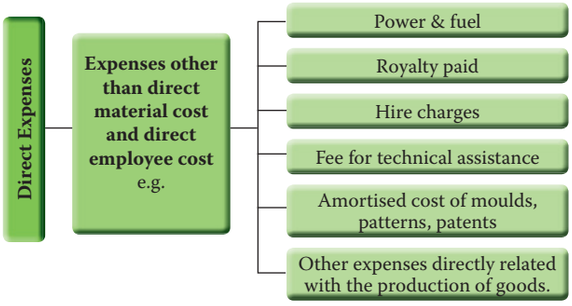
- Prime Cost
- Cost of Production
- Cost of Goods Sold
- Cost of Sales

Prime Cost:









*

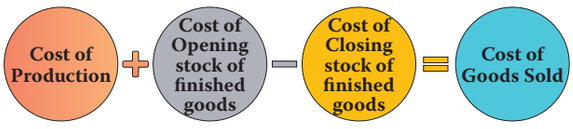
Cost of Production:

Prime Cost	**xxxx**
Add: Factory Overheads#	xxx
Gross Works Costs	**xxxx**
Add: Opening stock of Work-in-process	xxx
Less: Closing stock of Work-in-process	(xxx)
Factory or Works Costs	**xxxx**
Add: Quality Control Cost	xxx
Add: Research & Development cost (Process related)	xxx
Add: Administrative Overheads related with production	xxx
Less: Credit for recoveries (miscellaneous income)	(xxx)
Add: Packing Cost (Primary packing)	xxx
Cost of Production	**xxxx**

 # Factory Overheads (Works / production / manufacturing overheads) includes-

Consumable stores and spares	**Depreciation**	**Lease rent of production assets**
Repair and maintenance of plant and machinery, factory building	**Indirect employees cost related with production activities**	**Drawing and Designing department cost**
Insurance of plant and machinery, factory building, stock of raw material & WIP	**Amortised cost of jigs, fixtures, tooling**	**Service department cost such as Tool Room, Engineering & Maintenance, Pollution Control**

Cost of Goods Sold:



Cost of Sales:

Cost of Goods Sold	**xxxx**
Add: Administrative Overheads (General)	xxx
Add: Selling Overheads	xxx
Add: Packing Cost (secondary)	xxx
Add: Distribution Overheads	xxx
Cost of Sales	**xxxx**

Examples:

Administrative Overheads (General)
- Depreciation and maintenance of, office building, furniture etc.
- Salary of administrative employees, accountants, etc.
- Rent, rates & taxes
- Insurance, lighting, office expenses
- Indirect materials- printing and stationery, office supplies etc.
- Legal charges, audit fees, meeting expenses etc.

Selling Overheads
- Salary and wages related with sales department
- Rent, depreciation, maintenance related with sales department
- Advertisement, maintenance of website for online sales, market research etc.

Packing Cost (secondary)
- Packing material that enables to store, transport, and make the product marketable.

Distribution Overheads
- 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.

Cost Sheet- Specimen Format

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	Opening Stock of Raw Material	xxx	
	Add: Additions/ Purchases	xxx	
	Less: Closing stock of Raw Material	(xxx)	
		xxx	**xxx**
2.	Direct employee (labour) cost	xxx	
3.	Direct expenses	xxx	
4.	**Prime Cost (1+2+3)**	**xxx**	**xxx**
5.	**Add:** Works/ Factory Overheads	xxx	
6.	Gross Works Cost (4+5)	xxx	
7.	**Add:** Opening Work in Process	xxx	
8.	**Less:** Closing Work in Process	(xxx)	
9.	**Works/ Factory Cost (6+7-8)**	**xxx**	**xxx**
10.	**Add:** Quality Control Cost	xxx	
11.	**Add:** Research and Development Cost	xxx	
12.	**Add:** Administrative Overheads (relating to production activity)	xxx	
13.	**Less:** Credit for Recoveries/Scrap/By-Products/ misc. income	(xxx)	
14.	**Add:** Packing cost (primary)	xxx	
15.	**Cost of Production (9+10+11+12-13+14)**	**xxx**	**xxx**
16.	**Add:** Opening stock of finished goods	xxx	
17.	**Less:** Closing stock of finished goods	(xxx)	
18.	**Cost of Goods Sold (15+16-17)**	**xxx**	**xxx**
19.	**Add:** Administrative Overheads (General)	xxx	
20.	**Add:** Marketing Overheads :		
	Selling Overheads	xxx	
	Distribution Overheads	xxx	
21.	**Cost of Sales (18+19+20)**	**xxx**	**xxx**

Treatment of various items of cost in Cost Sheet:

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.
Subsidy/ Grant/ Incentives	• Reduced from the cost objects to which such amount pertains.
Penalty, fine, damages, and demurrage	• Does not form part of cost.
Interest and other finance costs	• Not included in cost of production. • Shall be presented in the cost statement as a separate item of cost of sales.

Advantages of Cost Sheet

- **Provides the total cost figure as well as cost per unit of production.**
- **Helps in cost comparison.**
- **Facilitates preparation of cost estimates required for submitting tenders.**
- **Provides sufficient help in arriving at the figure of selling price.**
- **Facilitates cost control by disclosing operational efficiency.**

UNIT & BATCH COSTING

Points of Discussion

- Methods of Costing
  - Unit Costing
    - Meaning
    - Process of Cost Accumulation and Calculation
  - Batch Costing
    - Meaning
    - Process of Cost Accumulation and Calculation
    - Determination of Economic Batch Quantity (EBQ)
    - Difference between Job and Batch Costing

UNIT COSTING

Meaning of Unit Costing

UNIT COSTING

- **where the output produced is identical and each unit of output requires identical cost.**
- **also known as single or output costing.**
- **applied in industries like PAPER, CEMENT, STEEL WORKS, MINING, BREWERIES ETC.**

Here, costs are collected and analysed element wise and then total cost per unit is ascertained as follows:

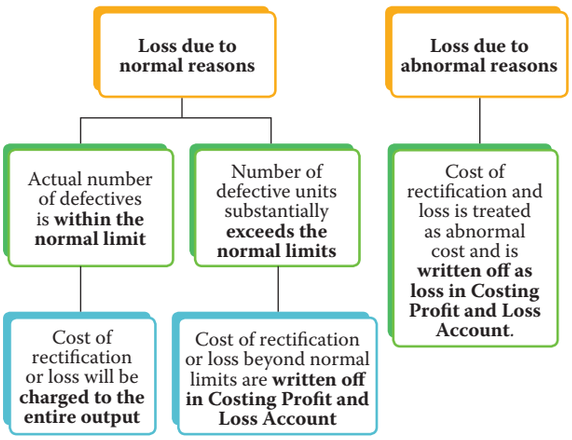
$$\text{Cost per unit} = \frac{\text{Total cost of production}}{\text{No. of units produced}}$$

COST COLLECTION PROCEDURE IN UNIT COSTING

Collection of Materials Cost	Collection of Employees (labour) Cost	Collection of Overheads
It is collected from Material Requisition notes.	**Direct employee cost:** It is collected from job time cards or sheets.	These are collected under suitable standing orders numbers, and selling and distribution overheads against cost accounts numbers.
Accumulated material cost is then posted in cost accounting system.	The time booked/ recorded is valued at appropriate rates and entered in the cost accounting system.	Total expenses so collected are apportioned to service and production departments on some suitable basis.
	Indirect employee costs: These are collected from the payrolls books and posted against standing order or expenses code numbers in the overhead expenses ledger.	The expenses of service departments are finally transferred to production departments.
		The total overhead of production departments is then applied to products on some realistic basis, e.g. machine hour; labour hour etc.

Image source: https://metry.io/en/cost-collection-from-invoices/

TREATMENT OF SPOILED AND DEFECTIVE WORK



BATCH COSTING

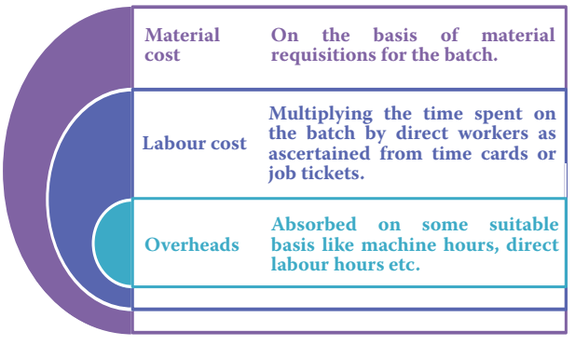
Meaning of Batch Costing

BATCH COSTING

- is a type of specific order costing where articles are manufactured in predetermined lots, known as batch.
- the cost object for cost determination is a batch for production.
- example PEN MANUFACTURING INDUSTRY

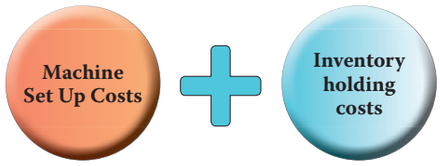
A batch consists of certain number of units which are PROCESSED SIMULTANEOUSLY. Under this method of manufacturing, the inputs are accumulated in the assembly line till it reaches minimum batch size. Soon after a batch size is reached, all inputs in a batch is processed for further operations.

COSTING PROCEDURE IN BATCH COSTING

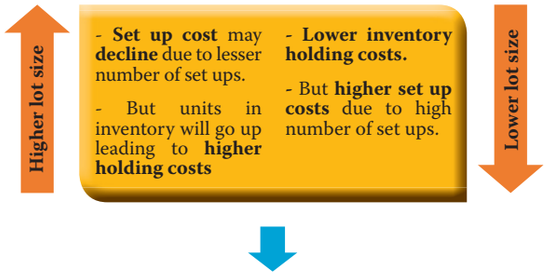


ECONOMIC BATCH QUANTITY (EBQ)

Primarily, the total production cost under batch production comprises of two main costs, namely,

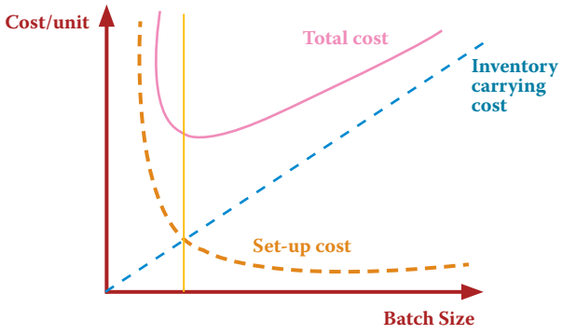


Balancing Machine set up cost and Inventory holding cost



ECONOMIC BATCH QUANTITY (EBQ)

- It is the size of a batch where total cost of set-up and holding costs are at minimum.



Determination of EBQ

By calculating the total cost for a series of possible batch sizes and checking which batch size gives the minimum cost.

Mathematical formula:

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

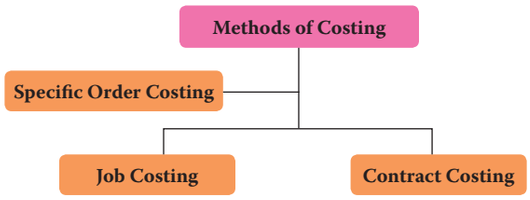
Where, D = Annual demand for the product
S = Setting up cost per batch
C = Carrying cost per unit of production

DIFFERENCE BETWEEN JOB AND BATCH COSTING

Sr. No	Job Costing	Batch Costing
1	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**.

JOB AND CONTRACT COSTING

POINTS OF DISCUSSION



JOB COSTING

MEANING OF JOB COSTING

JOB COSTING

- **It is applicable where the work consists of separate contracts, jobs or batches, each of which is authorised by specific order or contract.**
- **Industry example: PRINTING; FURNITURE; HARDWARE; SHIP-BUILDING; HEAVY MACHINERY; INTERIOR DECORATION.**

PRINCIPLES OF JOB COSTING

- **Analysis and ascertainment of cost of each unit of production**
- **Control and regulate cost**
- **Determine the profitability**

PROCESS OF JOB COSTING

Prepare a **separate cost sheet** for each job

Disclose cost of **materials** issued for the job

Employee costs incurred (on the basis of bill of material and time cards respectively)

When job is completed, **overhead charges** are added for ascertaining total expenditure

SUITABILITY OF JOB COSTING

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

JOB COST CARD/ SHEET

JOB COST CARD/ SHEET

A cost sheet where,
- **quantity of materials issued,**
- **hours spent by different class of employees,**
- **amount of other expenses and share of overheads**

are recorded.

Format of Job Cost Sheet:

JOB COST SHEET

Description: _____ Job No.: _____
Blue Print No.: _____ Quantity: _____
Material No.: _____ Date of delivery: _____
Reference No.: _____ Date commenced: _____
Date finished: _____

Date	Reference	Details	Material	Labour	Overhead
		Total			

Summary of costs	*Estimated (₹)*	*Actual (₹)*
Direct material cost		
Direct wages		
Production overhead		
PRODUCTION COST		
Administration and Selling & Distribution Overheads		
TOTAL COST		
PROFIT/LOSS		
SELLING PRICE		

For the job _____
Units produced _____
Cost/unit _____
Remarks _____
Prepared by: _____
Checked by: _____

COLLECTION OF COSTS FOR A JOB

Materials cost

- Traced to and identified with specific job or work order
- Posted to individual job cost sheets or cards in the work-in-progress ledger
- If the surplus material is utilised on some other job, instead of being returned to the stores first, a material transfer note is prepared.

Labour cost

- Booked against specific jobs in the job time cards or sheets
- Posted to the appropriate job cost card or sheet in work-in-progress ledger

Image source: https://www.dreamstime.com/job-costing-text-paper-sheet-chart-dice-spectacles-pen-laptop-blue-yellow-push-pin-wooden-table-business-banking-image197323655

Overheads

- Manufacturing overheads are collected under suitable standing order numbers
- Selling and distribution overheads are collected against cost accounts numbers
- Total overhead expenses are apportioned to service and production departments on some suitable basis.
- The expenses of service departments are finally transferred to production departments.
- The total production overhead is then applied to products on some realistic basis.

SPOILED AND DEFECTIVE WORK

Meaning

Spoiled work – It is the quantity of production that has been totally rejected and cannot be rectified.

Defective work – It refers to production that is not as perfect as the saleable product but is capable of being rectified

Treatment

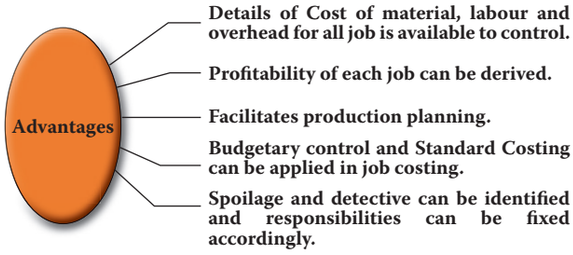
- **Where a percentage of defective work is ALLOWED in a particular batch AS IT CANNOT BE AVOIDED.** → The cost of rectification will be charged to the whole job and spread over the entire output of the batch
- **Where defect is DUE TO BAD WORKMANSHIP.** → The cost of rectification shall be written off as a loss being an abnormal cost
- **Where defect is due to the inspection department WRONGLY ACCEPTING INCOMING MATERIAL OF POOR QUALITY.** → Cost of rectification will be charged to the department and will not be considered as cost of manufacture of the batch

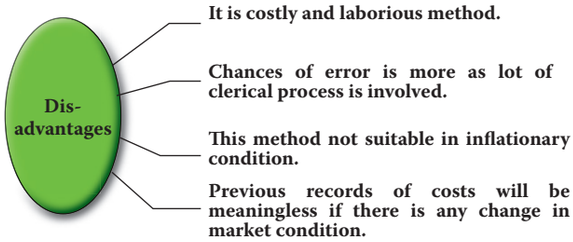
ACCOUNTING OF COSTS FOR A JOB

1.	**For purchase of materials**	
	Stores Ledger Control A/c	**Dr.**
	To Cost Ledger Control A/c	
2.	**For the value of direct materials issued to jobs**	
	Work-in-Process Control A/c	**Dr.**
	To Stores Ledger Control A/c	
3.	**For return of direct materials from jobs**	
	Stores Ledger Control A/c	**Dr.**
	To Work-in-Process Control A/c	
4.	**For return of materials to suppliers**	
	Cost Ledger Control A/c	**Dr.**
	To Stores Ledger Control A/c	
5.	**For indirect materials**	
	Factory Overhead Control A/c	**Dr.**
	To Stores Ledger Control A/c	
6.	**For wages paid**	
	Wages Control A/c	**Dr.**
	To Cost Ledger Control A/c	

7.	**For direct wages incurred on jobs**	
	Work-in-Process Control A/c	**Dr.**
	To Wages Control A/c	
8.	**For indirect wages**	
	Factory Overhead Control A/c	**Dr.**
	To Wages Control A/c	
9.	**For any indirect expense paid**	
	Factory Overhead Control A/c	**Dr.**
	To Cost Ledger Control A/c	
10.	**For charging overhead to jobs**	
	Work-in-Process Control A/c	**Dr.**
	To Factory Overhead Control A/c	
11.	**For the total cost of jobs completed**	
	Cost of Sales A/c	**Dr.**
	To Work-in-Progress Control A/c	
12.	**The balance of Cost of Sales A/c is transferred to Costing Profit and Loss A/c;** For such transfer	
	Costing Profit and Loss A/c	**Dr.**
	To Cost of Sales A/c	
13.	**For the sales value of jobs completed**	
	Cost Ledger Control A/c	**Dr.**
	To Costing Profit and Loss A/c	

ADVANTAGES AND DISADVANTAGES OF JOB COSTING





DIFFERENCE BETWEEN JOB COSTING AND PROCESS COSTING

Job Costing	Process Costing
A Job is carried out by specific orders.	Process of producing the product has a continuous flow and the product produced is homogeneous.
Costs determined for each job.	Costs are compiled on time basis i.e., for each process or department.
Each job is separate and independent.	Products lose their individual identity.
Each job has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
Costs are computed when a job is completed.	Costs are calculated at the end of the cost period.
More managerial attention is required for effective control.	Control here is comparatively easier.

CONTRACT COSTING

MEANING OF CONTRACT COSTING

CONTRACT COSTING

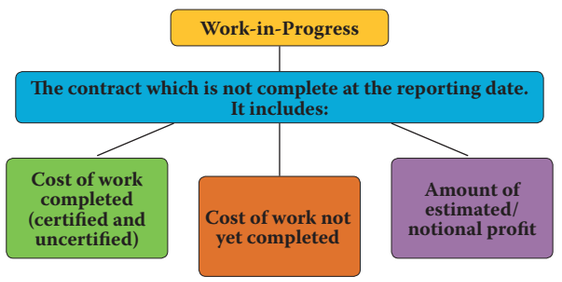
- **It is a form of specific order costing where job undertaken is relatively large and normally takes period longer than a year to complete.**
- **Adopted by the contractors engaged in contracts like CONSTRUCTION OF BUILDING, ROAD, BRIDGE, ERECTION OF TOWER ETC.**

FEATURES OF CONTRACT COSTING

Work in contract is ordinarily carried out at the site of the contract.	**Separate account is usually maintained for each contract.**	**Bulk of the expenses incurred are considered as direct.**
Number of contracts undertaken by a contractor at a time is usually few.	**Indirect expenses mostly consist of office expenses, stores and works.**	**Cost unit in contract costing is the contract itself.**

TERMS USED IN CONTRACT COSTING

(i) Work-in-Progress



(ii) Cost of Work Certified or Value of Work Certified

Expert, based on his assessment, certifies the work completion in terms of percentage of total work.
Cost or value of certified portion is calculated and is known as Cost of work certified or Value of work certified respectively.

(a) Value of Work Certified = Value of Contract × Work certified (%)
(b) Cost of Work Certified = Cost of work to date – (Cost of work uncertified + Material in hand + Plant at site)

(iii) Cost of Work Uncertified

Cost of the work carried out but not certified by the expert.

Always shown at cost price.

The cost of Work Uncertified may be ascertained as follows:

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

(iv) Progress Payment

Progress payment = Value of work certified − Retention money − Payment to date

(v) Retention Money

Retention Money = Value of work certified − Payment actually made

(vi) Cash Received

Cash received = Value of work certified − Retention money

(vii) Notional Profit

Notional profit = Value of work certified − (Cost of work to date − Cost of work not yet certified)

(viii) Estimated Profit

Estimated Profit = Contract price − Estimated total cost

SPECIMEN OF CONTRACT ACCOUNT (with few items)

The cost of Work Uncertified may be ascertained as follows:

	Particulars	(₹)		Particulars	(₹)
To	Materials	xxx	By	Plant at site c/d	xxx
”	Wages	xxx	”	Work-in-progress c/d:	xxx
”	Direct expenses	xxx		- Work certified	xxx
”	Indirect expenses	xxx		- Work uncertified	xxx
”	Plant and Machinery	xxx	”	Costing P&L A/c (b/f) (If Loss)	xxx
”	Cost of Sub-Contract	xxx			
”	Costing P&L A/c (b/f) (If Profit)	xxx			
		XXX			XXX

COST PLUS CONTRACT

Cost- Plus Contract — When the value of the contract is determined by adding an agreed percentage of profit to the total cost.

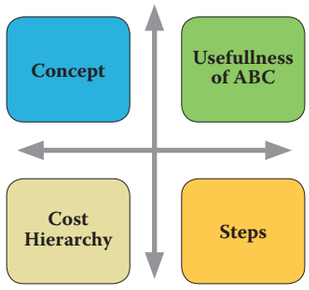
ADVANTAGES AND DISADVANTAGES OF COST PLUS CONTRACT

ADVANTAGES	DISADVANTAGES
• Contractor is assured of a fixed percentage of profit. • Useful when 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.	• Contractor may not have any inducement to avoid wastages and effect economy in production to reduce cost.

ESCALATION CLAUSE

ACTIVITY BASED COSTING

POINTS OF DISCUSSION

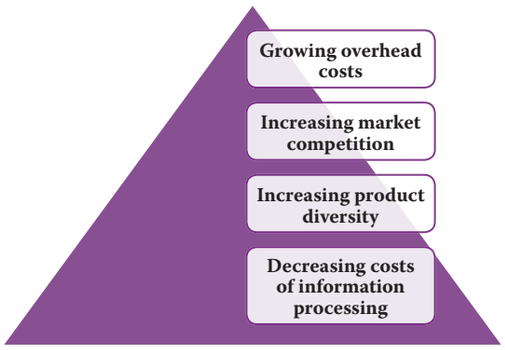


MEANING OF ACTIVITY BASED COSTING

ACTIVITY BASED COSTING (ABC)

- Accounting methodology that assigns costs to activities rather than products or services.
- Costs are assigned based on their use of resources.
- Creates a LINK BETWEEN THE ACTIVITY (resource consumption) and the COST OBJECT.
- Useful to the ORGANIZATION WITH MULTIPLE PRODUCTS.

FACTORS PROMPTING DEVELOPMENT OF ABC



USEFULNESS/SUITABILITY OF ABC

ABC is particularly needed in the following situations:			
High amount of overhead	Wide range of products	Presence of non-volume related activities	Stiff competition

ADVANTAGES AND DISADVANTAGES OF ABC

ADVANTAGES	DISADVANTAGES
• More accurate costing. • Overhead allocation is done on logical basis. • Enables better pricing policies. • Utilizes unit cost rather than just total cost. • Help to identify non-value added activities. • Helpful to the organizations with multiple products. • Highlights problem areas which require attention of the management.	• Expensive. • Not helpful to the small organizations. • May not be applied to organizations with limited products. • Selection of the most suitable cost driver may be difficult or complicated.

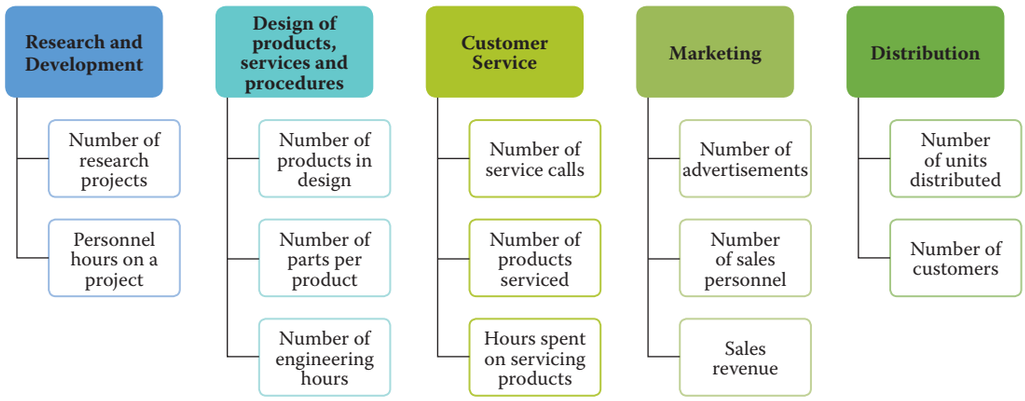
TERMS USED

(i) Activity
- Event that incurs cost.

(ii) Cost Object
- An item for which cost measurement is required

(iii) Cost Driver
- Factor that causes a change in the cost of an activity-
  - **Resource cost driver:** Measure of the quantity of resources.
  - **Activity cost driver:** Measure of the frequency and intensity of demand.

Examples of Cost Driver business function wise:

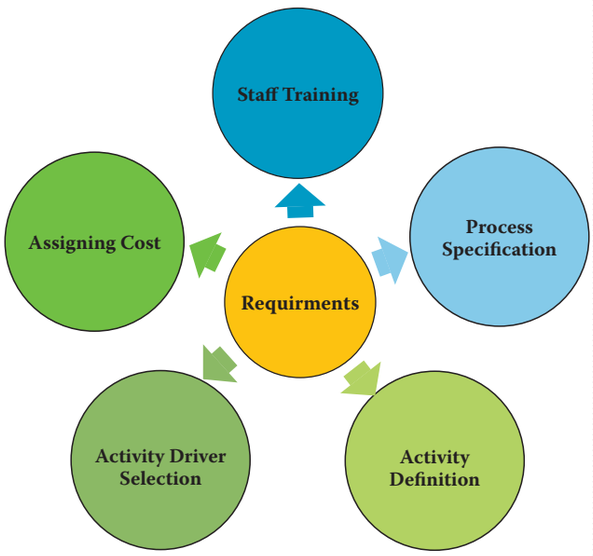


(iv) Cost Pool

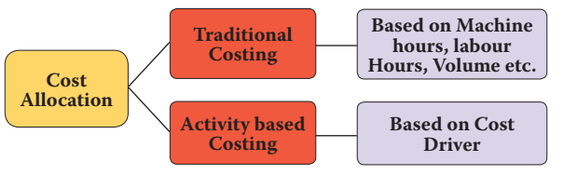
- Group of various individual cost items.
- Example machine set-up.

COST ALLOCATION

REQUIREMENTS IN ABC IMPLEMENTATION



TRADITIONAL ABSORPTION COSTING VS ABC



Activity Based Costing	Traditional Absorption Costing
Related to activities	Related to cost centers
More realistic	Not realistic
Activity–wise cost drivers	Time (hours) - only cost driver
Cost are assigned to cost objects	Costs are assigned to cost units
Aids cost control	Not suitable for cost control.

LEVEL OF ACTIVITIES UNDER ABC METHODOLOGY/COST HIERARCHY

Unit level activities	
Activities which can be identified with the number of units produced.	**- Indirect materials/ consumables - Inspection or testing of every item produced**

Batch level activities	
Activities which are performed each time a batch of goods is produced.	**- Material ordering - Machine set-up costs**

Product level activities	
Activities which are performed to support different products in product line.	**- Designing the product - Producing parts specifications**

Facilities level activities	
Activities which are common and joint to all products manufactured.	**- Maintenance of buildings - Plant security**

STAGES IN ACTIVITY BASED COSTING (ABC)

Identify different activities within the organisation

Break the organisation down into many very small activities.

Relate the overheads to the activities

This creates 'cost pools' or 'cost buckets'.

Support activities are then spread across the primary activities

Where base is the cost driver measuring, how the support activities are used.

Determine the activity cost drivers

To relate the overheads collected in cost pools to the cost objects.

Calculate activity cost driver rates

Calculate activity cost driver rates for each activity

$$\text{Activity cost driver rate} = \frac{\text{Total cost of activity}}{\text{Activity driver}}$$

EXAMPLES OF COST DRIVERS

	ACTIVITY COST POOL	COST DRIVERS
Overhead Costs	Ordering and Receiving Materials cost	Number of purchase orders
	Setting up machines costs	Number of set-ups
	Machining costs	Machine hours
	Assembling costs	Number of parts
	Inspecting and testing costs	Number of tests
	Painting costs	Number of parts
	Supervising Costs	Direct labour hours
	Delivery cost	Number of deliveries
	Shelf-stocking cost	Shelf-stocking hours
	Customer Support	Number of items sold

HOW TO CALCULATE COST PER PRODUCT USING ABC?

If it is given that,

Activity	Cost (₹)
Ordering	64,000
Delivery	1,40,000
Shelf stocking	80,000

Particulars	Product 1	Product 2
No. of Purchase Orders	30	50
No. of Deliveries	110	90
Shelf Stocking Hours	220	180

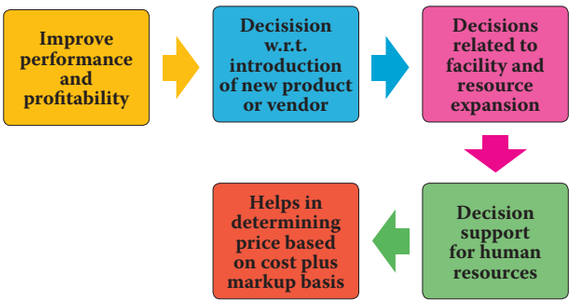
Image source: https://www.dreamstime.com/photos-images/activity-based-costing.html

Then, cost per product as per ABC

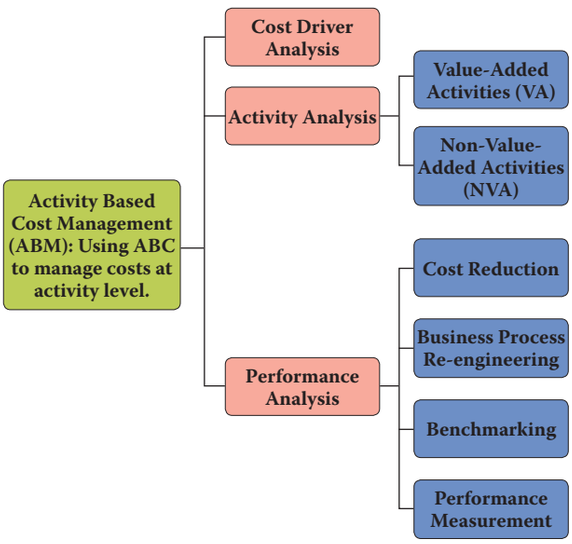
Activity	Total Cost (₹)	Cost Driver	Cost Driver Level	Cost Driver Rate (₹)	Product 1 (₹)	Product 2 (₹)
(a)	(b)	(c)	(d)	(e) = (b)/(d)	(f)	(g)
Ordering	64,000	No. of Purchase Orders	80 (30+50)	800	24,000 (800 x 30)	40,000 (800 x 50)
Delivery	1,40,000	No. of Deliveries	200 (110 + 90)	700	77,000 (700 x 110)	63,000 (700 x 90)
Shelf stocking	80,000	Shelf Stocking Hours	400 (220 +180)	200	44,000 (200 x 220)	36,000 (200 x 180)

PRACTICAL APPLICATIONS OF ACTIVITY BASED COSTING

As a Decision-Making Tool



As Activity Based Management



Facilitate Activity Based Budgeting (ABB)

It analyses the resource input or cost for each activity.
It is the reversing of the ABC process to produce financial plans and budgets.

Key Elements

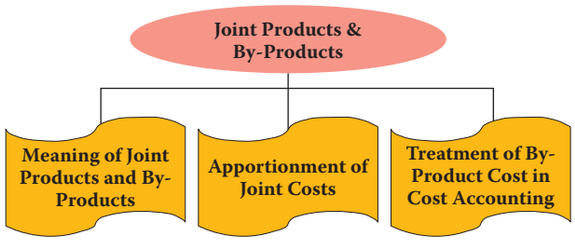
- Type of work to be done
- Quantity of work to be done
- Cost of work to be done

Benefits

- Enhance accuracy of financial forecasts
- Increasing management understanding
- Rapidly and accurately produce financial plans
- Eliminates much of the needless rework

JOINT PRODUCTS AND BY PRODUCTS

POINTS OF DISCUSSION

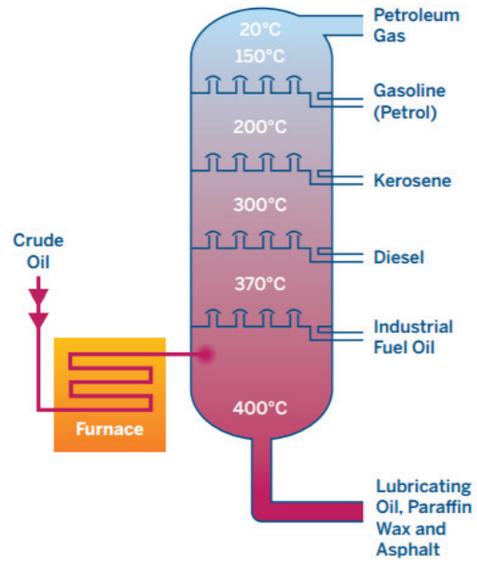


MEANING OF JOINT PRODUCTS AND BY-PRODUCTS

Joint Products* — Two or more products separated in the course of same processing operation.

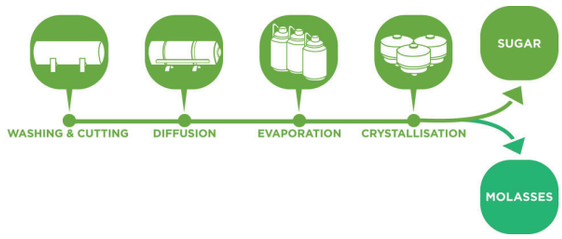
By-Products# — Products recovered from-
- material discarded in main process.
- production of some major products.

*OIL INDUSTRY PRODUCING JOINT PRODUCTS using crude petroleum like gasoline, fuel oil, lubricants, paraffin, asphalt, kerosene etc.



Petroleum Refining Processes[1]

 # MOLASSES IS PRODUCED AS A BY-PRODUCT in the process of sugar manufacturing



Sugar Manufacturing Process[2]

Point at which products are separated from the main product is known as SPLIT-OFF POINT.

DISTINCTION BETWEEN JOINT PRODUCTS AND BY-PRODUCTS

JOINT PRODUCTS	BY-PRODUCTS
• Equal importance. • Produced simultaneously.	• Small economic value. • Incidental to the main product.

[1] *Image source: https://www.cmegroup.com/education/courses/introduction-to-refined-products/a-look-into-the-refining-process.html*

[2] *Image source: http://www.sustainablesugar.eu/molasses*

CO-PRODUCTS

CO-PRODUCTS

Joint products and co-products are used synonymously, but a **distinction is there**.

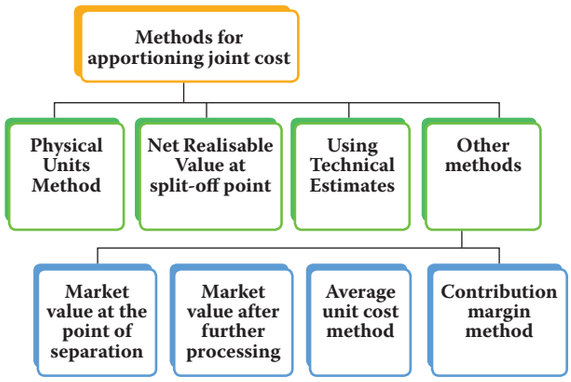
Co-products are the two or more products which are **contemporary but** do **not** emerge necessarily **from the same material in the same process**.

For instance,

wheat and gram produced in two separate farms with separate processing of cultivation are co-products.

Timber boards made from different trees are co-products.

METHODS OF APPORTIONMENT OF JOINT COST TO JOINT PRODUCTS



Physical Units Method:

Joint costs here are apportioned on the basis of some **physical base, such as weight, numbers etc.**

Net Realisable Value at Split-off Point Method:

Joint costs here are apportioned on the basis of **Net Realisable Value at Split-off Point.**

NET REALISABLE VALUE AT SPLIT-OFF POINT

- **sales value of joint products after processing**
- (−) **Estimated profit margins**
- (−) **Selling and distribution expenses**
- (−) **Post split- off costs**

Using Technical Estimates:

This method is used WHEN-

Result obtained by above methods does not match with the resources consumed by joint products, or;

Realisable value of the joint products are not readily available.

Other Methods:

(i) Market value at the point of separation

Useful method where further processing costs are incurred disproportionately.

To determine the apportionment of joint costs over joint products, a multiplying factor is determined as follows:

$$\text{Multiplying factor: } \frac{\text{Joint Cost}}{\text{Total Sales Revenue}} \times 100$$

Alternatively, joint cost may be apportioned in the ratio of sales values of different joint products.

(ii) Market value after further processing

Basis of apportionment of joint cost is the total sales value of finished products.

Use of this METHOD IS UNFAIR WHERE-

Further processing costs after the point of separation are disproportionate, or;

All the joint products are not subjected to further processing.

(iii) Average Unit Cost Method

$$\text{Average unit cost} = \frac{\text{Total process cost (up to the point of separation)}}{\text{Total units of joint product produced}}$$

Physical unit method also follows the same steps of calculation as followed under Average unit cost method, ultimately giving the same outcome.

(iv) Contribution Margin Method

Joint costs segregated into two parts → Variable; Fixed

Variable costs

Apportioned on the basis of units produced (average method or physical quantities)	In case products are further processed after point of separation, then all variable cost incurred be added to the variable costs determined earlier.

↓

Total variable cost is arrived which is deducted from their respective sales values to **ascertain their contribution**.

↓

Fixed costs

Thereafter, fixed costs are **apportioned** over the joint products **on the basis of the contribution ratios**.

METHODS OF APPORTIONMENT OF JOINT COST TO BY-PRODUCTS

Methods for apportioning joint cost

- Net Realisable Value method
- Standard cost in Technical Estimates
- Comparative price
- Re-use basis

Net Realisable Value method:

No further processing required	Further processing required
Realisation on the disposal of the by-product deducted from the total cost of production.	Additional expenses so incurred be deducted from the total value realised from the sale of the by-product.
	↓
	Only the net realisations be deducted from the total cost of production to arrive at the cost of production of the main product.

Standard cost in Technical Estimates:

This method may be adopted where by-product is not saleable.

↓

It may be valued at standard costs.

↓

Standard cost 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 by-product; or by adopting some other consistent basis.

Comparative price:

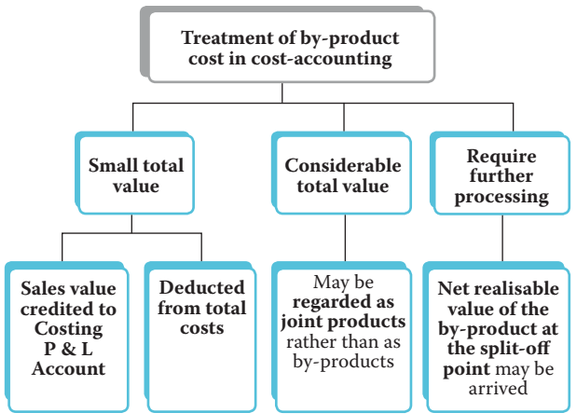
Value of by-product is ascertained with reference to the price of -

Similar material, or;	Alternative material

Re-use basis:

Sometimes, 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, **value put on by-product should be same as that of the materials introduced into the process.**	However, **if 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.**

TREATMENT OF BY-PRODUCT COST IN COST-ACCOUNTING



SERVICE COSTING

POINTS OF DISCUSSION

Service Costing

- **Application of Service Costing**
- **Service Costing vs Product Costing**
- **Methods of Ascertaining Service cost unit**
  - **Composite Unit**
  - **Equivalent Unit**
- **Service Cost Statement**
- **Costing of Services:**
  - (i) Transport
  - (ii) Hotels & Lodges
  - (iii) Hospitals
  - (iv) Information Technology Enabled Services
  - (v) Toll Roads
  - (vi) Educational Institutes
  - (vii) Insurance
  - (viii) Financial Institutes
  - (ix) Others

WHEN is service costing APPLIED?

Internal application	External application
When service provided by service cost centre to other responsibility centre	When services are offered to outside customers as a profit centre
Example- Use of canteen services by hospital staff, operation of fleet of trucks for transport of raw material to factory	Example- Hospitality services provided by a hotel, provision of services by financial institutions

SERVICE COSTING VS. PRODUCT COSTING

Unlike products,

- sevices are intangible.
- sevices cannot be stored.
- there are no inventory for the services.
- employee (labour) cost constitutes a major cost element than material cost.
- Indirect costs like administration overheads have significant proportion in total cost.
- service sector heavily depends on support services.

Composite cost units are used,

- for cost measurement.
- to express the volume of outputs.

WHAT is service cost UNIT?

All the costs incurred during a period are-

- collected
- analyzed
- expressed in terms of a cost per unit of service.

LIST of typical cost unit

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, etc.)
Educational Institutes	Per course, per student, per batch, per lecture, etc.
Information Technology Enabled Services	Cost per project, per module, etc.
Insurance	Per policy, per claim, per TPA, etc.

What are the METHODS for ascertaining Service Cost Unit?

Composite Cost Unit

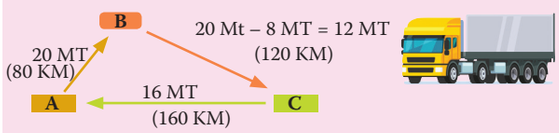
Two measurement units combined together

Example- transportation undertaking measuring operating cost per passenger per kilometre.
Other examples- Ton- km., Quintal- km., Passenger-km., Patient-day etc.

Composite unit may be computed in TWO WAYS

Absolute (Weighted Average) basis	Commercial (Simple Average) basis
Summation of the products of qualitative and quantitative factors	Product of average qualitative and total quantitative factors
ΣWeight Carried (W) × Distance $(D)_1 + (W \times D)_2 + \ldots + (W \times D)_n$	$\Sigma\{\text{Distance } (D)_1 + D_2 + \ldots\ldots\ldots\ldots + D_n\} \times [(\text{Weight}_1 + W_2 + \ldots + W_n)/n]$

Example: A Lorry starts with a load of 20 Metric Ton (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.



Weighted Average or Absolute basis – MT – Kilometer would be calculated as follows:

= (20 MT × 80 Kms) + (12 MT × 120 Kms) + (16 MT × 160 Kms)

= 1,600 + 1,440 + 2,560 = 5,600 MT – Kilometer

Simple Average or Commercial basis – MT – Kilometer would be calculated as follows:

= [{(20+12+16) / 3} MT × (80 +120 +160) Kms]

= 16 MT × 360 Kms = 5,760 MT – Kilometer

Equivalent Cost Unit/ Equivalent Service Unit

Each grade of service is assigned a weight and converted into equivalent units

Example- hotel having three types of suites for its customers, viz., Standard, Deluxe and Luxurious and tariff to be decided for one suite being double the rate of other suite.

Example: A hotel may decide tariff to their different type of suites as follows-

Type of suite	Number of rooms	Room Tariff
Standard	100	Amount X
Deluxe	50	2.5 times of the Standard suites
Luxurious	30	Twice of the Deluxe suites

Since, all three types of suites use same amount of overheads but to attach qualitative weight, these rooms are required to be converted into equivalent units.

(i) If Standard suite is taken as base:

Nature of suite	Occupancy (Room-days)	Equivalent single room suites (Room-days)
Standard	36,000 (100 rooms x 360 days)	36,000 (36,000 x 1)
Deluxe	18,000 (50 rooms x 360 days)	45,000 (18,000 x 2.5)
Luxurious	10,800 (30 rooms x 360 days)	54,000 (10,800 x 5)
		1,35,000

Or

(ii) If Luxurious suite is taken as base:

Nature of suite	Occupancy (Room-days)	Equivalent luxurious suites (Room-days)
Standard	36,000 (100 rooms x 360 days)	7,200 (36,000 x 1/5)
Deluxe	18,000 (50 rooms x 360 days)	9,000 (18,000 x ½)
Luxurious	10,800 (30 rooms x 360 days)	10,800 (10,800 x 1)
		27,000

STATEMENT OF COSTS FOR SERVICE SECTORS

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

COSTING OF TRANSPORT SERVICES

Types of transport services

Goods transport

Passenger transport

Cost unit: Ton– Kilometer

Cost unit: Passenger– Kilometer

Suggestive heads:

Standing charges or fixed costs (costs that remain constant irrespective of distance travelled)

- Insurance
- License fees
- Salary to Driver, Conductor, Cleaners, etc if paid on monthly basis
- Garage costs, including garage rent
- Depreciation (if related to efflux of time)
- Taxes
- Administration expenses, etc.

Variable costs or Running costs (costs associated with distance travelled)

- Petrol and Diesel
- Lubricant oils,
- Wages to Driver, Conductor, Cleaners, etc. if it is related to operations
- Depreciation (if related to activity)
- Any other variable costs identified.

Semi-variable costs or Maintenance costs

- Repairs and maintenance
- Tyres
- Spares, etc.

COSTING OF HOTELS AND LODGES

Cost unit — **Guest-day or Room-day**

COSTING OF HOSPITALS

A hospital may have different departments such as

- Out - Patient
- In Patient
- Medical services like X-Ray, Scanning, etc.
- General services like Catering, Laundry, Power house, etc.
- Miscellaneous services like Transport, Dispensary, etc.

Unit of Cost

- Out Patient – Per Out-patient
- In Patient – Per Room Day
- Scanning – Per Case
- Laundry – Per 100 items laundered

COSTING OF INFORMATION TECHNOLOGY ENABLED SERVICES

EMPLOYEE COST constitutes SIGNIFICANT portion of total operating costs.

DIRECT EMPLOYEE COST is TRACEABLE to SERVICES RENDERED.

Typical MANPOWER DIRECTLY ENGAGED on a project:

- Software Engineers / Functional Consultants / Business Analysts,
- Project Leaders,
- Project Manager,
- Program Manager, etc.

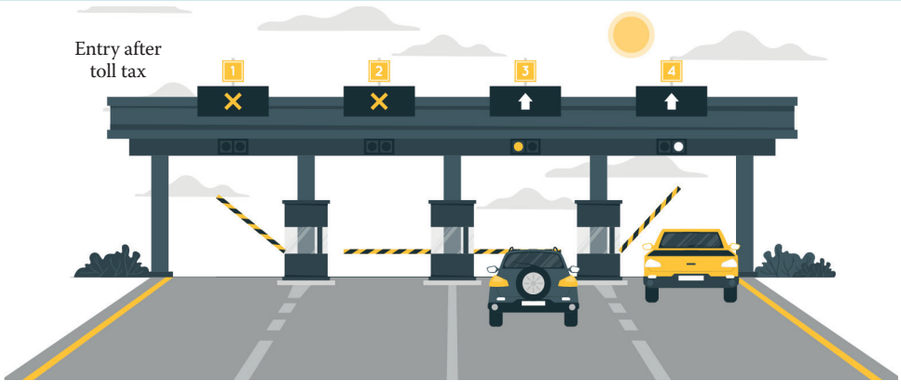
The COSTS are TRACEABLE with a project and hence forming part of DIRECT COSTS of the project.

SUPPORT MANPOWER ENGAGED on a project:

- Quality Assurance Team,
- Testing team,
- Version Control team,
- Staffing Manager, etc.

If time is NOT TRACEABLE with a single project, then it may either be allocated or apportioned to various projects on some SUITABLE BASIS.

COSTING OF TOLL ROADS



Cost Involved

- **Capital Costs (incurred during construction period)**
  - Preliminary and pre-operative expenses,
  - Land Acquisition,
  - Materials, Labour, Overheads incurred in the course of actual construction,
  - Contingency allowance,
  - Interest during construction period.
- **Operating and Maintenance Costs (incurred once the road is operational)**
  - **Annual operating cost**
    - cost of operating tollbooths,
    - administrative expenses,
    - emergency services,
    - communications and security services.
  - **Routine maintenance**
    - Patching of potholes, sealing of cracks, edge repair,
    - Surface renewal,
    - Periodic maintenance.

To compute the toll rate, following formula may be used: $= \frac{\text{Total Cost + Profit}}{\text{Number of Vehicles}}$

COSTING OF EDUCATIONAL INSTITUTIONS

INCOME of the Educational Institutions

One-time fees like Admission fee, Development fee, Annual fee etc

Recurring fees like tuition fee, laboratory, computer and internet fee, library fee, training fee, amenities fee, sports fee, extracurricular activities fee, etc.

Other incomes like transport, hostel, mess and canteen.

EXPENDITURE of the Educational Institutions

Operational Cost like teachers' salary, Building maintenance, Computer maintenance and internet charges.

Research and Development Cost like academic research on various fields of specialisations.

COSTING OF INSURANCE COMPANIES

INCOME of Insurance companies

Premium on policy (periodic or onetime)	Commission on re-insurance	Fund administration fee and return on investment of funds, etc.

EXPENDITURE of Insurance companies

Direct costs like commission paid to agents, claim settlement, cost of valuation, premium for re-insurance, legal and other costs, etc.	**Indirect costs like** actuarial fees, market and product development costs, administration cost, asset management cost, etc.

Method of Costing

Activity Based Costing

Pre-product development activities	Post product development activities	
Market research, product development like specification of coverage, conditions, amount of premium, etc.	Selling of policy	Processing of claims
	Appointment of distribution of sales channel, soliciting for policy, processing of applications, etc.	Claim inception, claim estimation, claim settlement and legal actions.

COSTING OF FINANCIAL INSTITUTIONS

COSTS TO BE IDENTIFIED with appropriate activities that have caused its occurrence.

Then costs must be REASSIGNED FROM ACTIVITIES TO COST OBJECTS based on identified cost drivers.

The concepts on ACTIVITY BASED COSTING under Costing of Insurance Companies is also applicable to financial institutions.

COSTING OF POWER HOUSES

Cost unit — Cost per kilowatt-hour (kWh)

Suggestive heads:

Standing charges or Fixed costs
(costs that remain constant irrespective of power or stream generated)
- Rent, Rates & Taxes
- Insurance
- Depreciation
- Salaries, if paid on time (Monthly basis)
- Administration expenses, etc.

Variable costs or Running costs
(costs associated with power or stream generated)
- Fuel Charges
- Water Charges
- Wages / Labour charges, if paid on the basis of production
- Any other variable costs identified.

Semi-variable costs or Maintenance costs
- Meters
- Furnaces
- Service materials
- Tools, etc.

POINTS OF DISCUSSION

Cost Accounting System

Non-Integral accounting system | Integral accounting system

Reconciliation of Cost and Financial Accounts

Non-integrated Accounting System

SEPARATE LEDGERS are maintained for both cost and financial accounts.

This system is also known as COST LEDGER ACCOUNTING SYSTEM.

This system contain limited ACCOUNTS due to the exclusion of purchases, expenses and also Balance Sheet items like fixed assets, debtors and creditors.

ITEMS OF ACCOUNTS excluded are REPRESENTED BY COST LEDGER CONTROL ACCOUNT.

Integrated Accounting System

COST AND FINANCIAL ACCOUNTS are kept in the SAME SET of books.

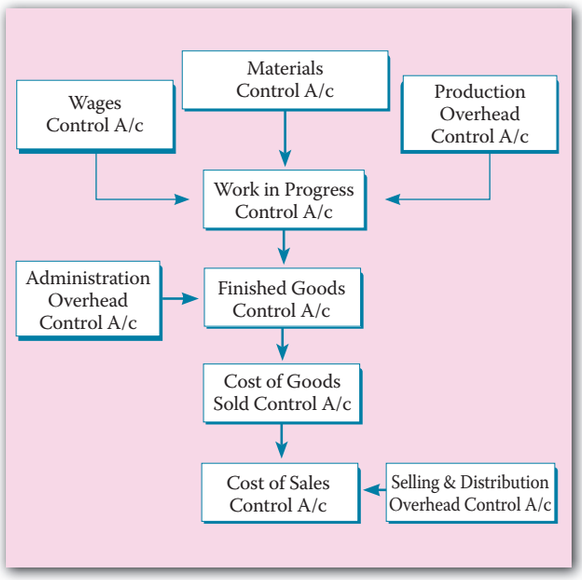
PROVIDES RELEVANT INFORMATION necessary for preparing profit and loss account and the balance sheet.

NON-INTEGRATED ACCOUNTING SYSTEM

MAIN ACCOUNTS usually prepared when a separate Cost Ledger is maintained

- Cost Ledger Control Account
- Stores Ledger Control Account
- Wages Control Account
- Manufacturing/ Production/Works/ Factory Overhead Control Account
- Work-in-Progress 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

FLOWCHART



INTEGRATED ACCOUNTING SYSTEM

ADVANTAGES

- No need for reconciliation
- Less efforts
- Less time consuming
- Economical process

In integrated system, all accounts necessary for showing classification of cost will be used but the cost ledger control account of non-integrated accounting is replaced by use of following accounts:

Bank account | Receivables (Debtors) account | Payables (Creditors) account

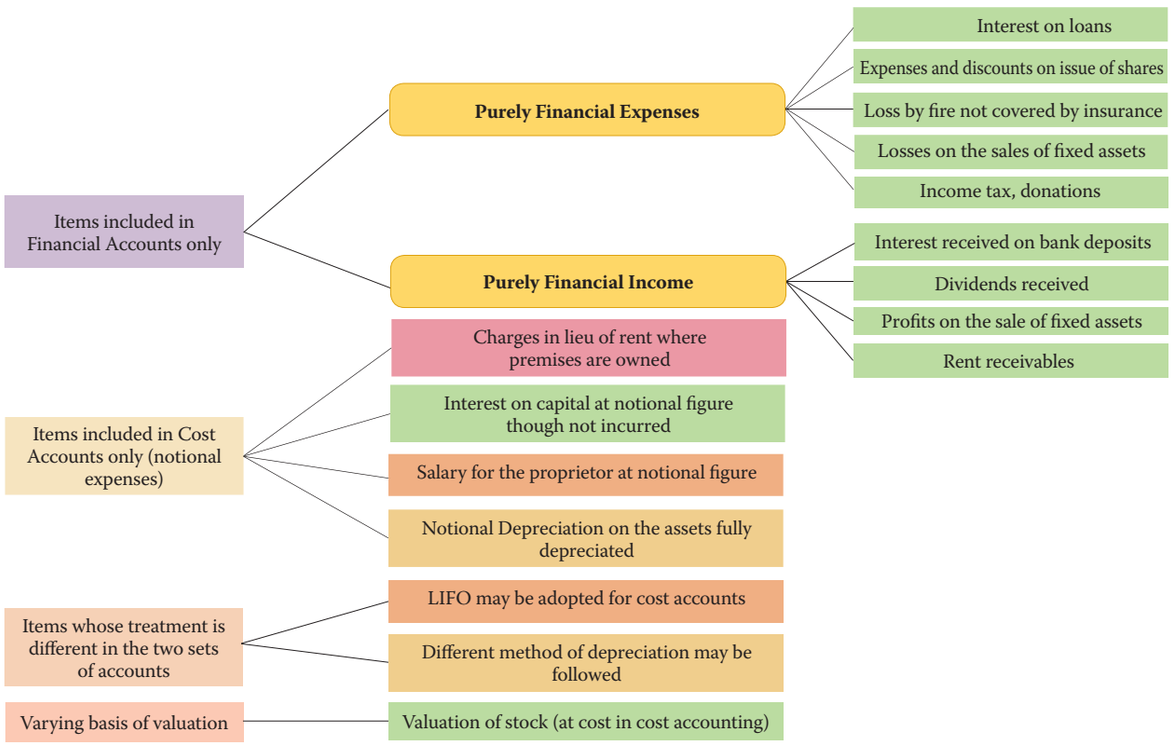
Provision for depreciation account | Fixed assets account | Share capital account

RECONCILIATION OF COST AND FINANCIAL ACCOUNTS

Reconciliation is done when cost and financial accounts are kept separately

Reconciliation of the balances of two sets of accounts is possible by preparing a MEMORANDUM RECONCILIATION ACCOUNT

Causes of differences in Financial and Cost Accounts



Procedure for Reconciliation

1. Ascertainment of profit as per financial accounts
2. Ascertainment of profit as per cost accounts
3. Reconciliation of both the profits

Example:

Profit as per Cost Accounts after following adjustment	**₹3,00,000**
Factory overheads absorbed	₹5,00,000
Selling & Distribution Overhead absorbed	₹2,00,000
Valuation of closing stock of finished goods	₹1,23,000
Administrative Overhead absorbed	₹1,93,000
Profit as per financial accounts after following adjustment	**₹1,10,000**
Factory overheads charged	₹4,50,000
Selling & Distribution Overhead charged	₹1,80,000
Valuation of closing stock of finished goods	₹1,50,000
Administrative Overhead charged	₹2,60,000
Interest on loan	₹2,20,000

Now, reconciliation between Financial and Cost Accounts can be done by preparing RECONCILIATION STATEMENT as follows:

	(Rs.)	(Rs.)
Profit as per Cost Accounts		**3,00,000**
Add: Factory overheads over-absorbed (₹5,00,000 – ₹4,50,000)	50,000	
Selling & Dist. Overhead over-absorbed (₹2,00,000 – ₹1,80,000)	20,000	
Difference in the valuation of closing stock of finished goods (₹1,50,000 – ₹1,23,000)	27,000	97,000
		3,97,000
Less: Admn. overhead under-absorbed (₹2,60,000 – ₹1,93,000)	67,000	
Interest on loan	2,20,000	2,87,000
Profit as per financial accounts		**1,10,000**

saransh

Last Mile Referencer for

COST AND MANAGEMENT ACCOUNTING

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