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	*Expenses (in ₹)*	*Area in (Sq. Mtr)*	*Number of Employees*
Main Department:			
Purchase Department	*5,00,000*	*12*	*800*
Packing Department	*8,00,000*	*15*	*1700*
Distribution Department	*3,50,000*	*7*	*700*

Service Departments:			
Maintenance Department	*6,40,000*	*4*	*200*
Personnel Department	*3,20,000*	*6*	*250*

The cost of Maintenance Department and Personnel Department is distributed on the basis of 'Area in Square Metres' and 'Number of Employees' respectively.

You are required to:

(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
$\text{BEP (in units)} = \frac{\text{Fixed cost}}{\text{Contribution per unit}}$	$\frac{1,00,000}{(25-15)} = 10,000$	$\frac{3,00,000}{(25-10)} = 20,000$

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

$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{₹\ 60,024 - ₹\ 631}{12,631 \text{ units} - 631 \text{ units}} = ₹\ 4.9494$

(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 $= \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$

For 'X' $= \frac{2 \text{ hours}}{8 \text{ hours}} \times 6 \text{ hours} \times ₹\ 60 = \mathbf{₹\ 90}$

For 'Y' $= \frac{6 \text{ hours}}{8 \text{ hours}} \times 2 \text{ hours} \times ₹\ 60 = \mathbf{₹\ 90}$

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.**