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 $\left[\frac{\text{Total Cost}}{85\%}\right]$	**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