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FOR CA INTERMEDIATE EXAM PREPARATION

CA Intermediate 2023 Suggested Answers · Paper 3 Cost and Management Accounting (Old Scheme)

EXAM
CA Intermediate

YEAR
2023

TYPE
Suggested Answers

SUBJECT
Paper 3 Cost and Management Accounting (Old Scheme)

DATE
May 2023

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-

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(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.*

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(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

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(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**

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(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

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(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

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(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)

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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.

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(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

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								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		

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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.

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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*

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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	

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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

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(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	

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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)

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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.*

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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%

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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)***

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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

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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

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(b) (i) Calculation of Overhead rate per hour

$$\frac{\text{Total Overheads}}{\text{Total hours}}$$

$$\frac{33,75,000}{22,500} = ₹\ \mathbf{150\ per\ hour}$$

(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**

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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.

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(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.

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(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)**

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(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

$$\text{Budgeted time per unit} = \frac{15\,\text{units}}{10\,\text{units}} = 1.5\ \text{minutes}$$

$$\text{So, Budgeted output} = \frac{5,000\,\text{Hours} \times 60\,\text{Minutes}}{1.5\,\text{Minutes}} = 2,00,000\ \text{units}$$

Actual output = 23,900 x 8 units = 1,91,200 units

$$\text{Standard hour for actual output} = 1,91,200 \times \frac{0.25\,\text{Hrs}}{10\,\text{units}} = 4,780\,\text{Hrs}$$

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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

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(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	

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(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**

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(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

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(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.**

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