

CA Intermediate (New Syllabus)
Cost & Management Accounting (Paper 3)
January 2021 - Suggested Answers

Question No. 1 is compulsory.

Answer any **four** questions out of the remaining **five** questions.

Working notes should form part of the answer.

Question 1(a) : [5 Marks]

During a particular period ABC Ltd has furnished the following data :

Sales ₹ 10,00,000

Contribution to sales ratio 37% and

Margin of safety is 25% of sales.

A decrease in selling price and decrease in the fixed cost could change the "contribution to sales ratio" to 30% and "Margin of safety" to 40% of the revised sales.

Calculate :

- (i) Revised Fixed Cost
- (ii) Revised Sales and
- (iii) New Break-Even Point

Solution 1(a) :

Present P/V Ratio = 37% (given)

Hence, present Variable Cost Ratio = 100% - 37% = 63% of sales

Hence, present Variable Cost = 63% of 10,00,000 = ₹ 6,30,000

A decrease in selling price and decrease in the fixed cost will not change the sales quantity and hence, the total variable cost will remain same as ₹ 6,30,000.

Revised P/V Ratio = 30% (given)

Hence, revised Variable Cost Ratio = 100% - 30% = 70% of sales

Hence, **Revised Sales** = ₹ 6,30,000 / 70% = **₹ 9,00,000**

Margin of safety is 40% of the revised sales (given)

Hence, BEP = 100% - 40% = 60% of revised sales

Hence, **Revised BEP** = 60% of 9,00,000 = **₹ 5,40,000**

Fixed Cost = Contribution earned at BEP sales

Hence, **Revised Fixed Cost** = Revised BEP Sales x Revised P/V Ratio
= 5,40,000 x 30% = **₹ 1,62,000**

Question 1(b) : [5 Marks]

A machine shop has 8 identical machines manned by 6 operators. The machine cannot work without an operator wholly engaged on it. The original cost of all the 8 machines works out to ₹32,00,000.

The following particulars are furnished for a six months period :

Normal available hours per month per operator	208
Absenteeism (Without pay) hours per operator	18
Leave (with pay) hours per operator	20
Normal unavoidable idle time-hours per operator	10
Average rate of wages per day of 8 hours per operator	₹ 100
Production bonus estimated	10% on wages
Power consumed	₹ 40,250
Supervision and Indirect Labour	₹ 16,500
Lighting and Electricity	₹ 6,000

The following particulars are given for a year :

Insurance	₹ 3,60,000
Sundry work Expenses	₹ 50,000
Management Expenses allocated	₹ 5,00,000
Depreciation	10% on the original cost
Repairs and Maintenance (including consumables) :	5% of the value of all the machines.

Prepare a statement showing the comprehensive machine hour rate for the machine shop.

Solution 1(b) :**Student Note :**

In my opinion, this question is worth 10 marks, but ICAI asked it for 5 marks.

As machine cannot work without an operator wholly engaged on it, the effective machine hours will be restricted to effective working hours of 6 operators. Two extra machines will be treated as stand-by equipments for emergency use.

You need to be careful about the data given in the question. Some data is monthly, some is six monthly and some data is given on yearly basis. Like, Absenteeism hours, Leave hours and Normal idle time is for 6 months but Normal available hours of operator are monthly.

You can solve this question by either taking all the data on monthly basis or six monthly basis or yearly basis. The final answer i.e. rate per hour will remain the same.

I have solved the question below, by converting all the data on yearly basis.

Working Notes :**Calculation of effective labour hours for a year :**

Particulars	Hours p.a.
(a) Normal available hours per operator p.a. [208 p.m. x 12]	2,496
(b) Absenteeism (Without pay) hours per operator [18 hrs. x 2]	36
(c) Net hours payable per operator [a - b]	2,460
(d) Leave (with pay) hours per operator [20 hrs. x 2]	40
(e) Normal unavoidable idle time-hours per operator [10 hrs. x 2]	20
(f) Effective hours per operator p.a. [c - d - e]	2,400
(g) Net hours payable for 6 operators p.a. [c x 6]	14,760
(h) Effective hours for 6 operator p.a. [f x 6]	14,400

Statement showing calculation of comprehensive machine hour rate :

Particulars	(₹) p.a.
(a) Operator's wages [₹ 100 / 8 hours x 14,760 hours]	1,84,500
(b) Production bonus [10% x 1,84,500]	18,450
(c) Power consumed [₹ 40,250 x 2]	80,500
(d) Supervision and Indirect Labour [₹ 16,500 x 2]	33,000
(e) Lighting and Electricity [₹ 6,000 x 2]	12,000
(f) Insurance	3,60,000
(g) Sundry work Expenses	50,000
(h) Management Expenses allocated	5,00,000
(i) Depreciation [10% x 32,00,000]	3,20,000
(j) Repairs and Maintenance [5% x 32,00,000]	1,60,000
(k) Total operating cost p.a. [a to j]	17,18,450
(l) Comprehensive Machine Hour Rate [17,18,450 / 14,400]	119.3368

Question 1(c) : [5 Marks]

MNO Ltd has provided following details :

- Opening work in progress is 10,000 units at ₹ 50,000 (Material 100%, Labour and overheads 70% complete).
- Input of materials is 55,000 units at ₹ 2,20,000. Amount spent on Labour and Overheads is ₹ 26,500 and ₹ 61,500 respectively.
- 9,500 units were scrapped; degree of completion for material 100% and for labour & overheads 60%.
- Closing work-in-progress is 12,000 units; degree of completion for material 100% and for labour & overheads 90%.

- Finished units transferred to next process are 43,500 units.
- Normal loss is 5% of total input including opening work in progress. Scrapped units would fetch ₹ 8.50 per unit.

You are required to prepare using FIFO method :-

- Statement of Equivalent production
- Abnormal Loss Account

Solution 1(c) :

Student Note :

In my opinion, this question is also worth 10 marks, but ICAI asked it for 5 marks.

We will have to first prepare a statement of equivalent production, then calculate cost per equivalent unit, then value the abnormal loss and lastly prepare abnormal loss account.

(i) Statement of equivalent production by FIFO Method :

Particulars	Total units	Equivalent Production			
		Material Cost		Labour & OH	
		%	Units	%	Units
<u>Input :</u>					
Opening W.I.P.	10,000				
Fresh input	55,000				
Total Input	65,000				
<u>Output :</u>					
A) <u>Completed units :</u>					
Out of opening WIP	10,000	--	--	30%	3,000
Out of introduced	33,500	100%	33,500	100%	33,500
Sub-total (A)	43,500				
B) Normal Loss (5% of 65,000)	3,250	--	--	--	--
C) Abnormal Loss (9500 - 3250)	6,250	100%	6,250	60%	3,750
D) Closing W.I.P.	12,000	100%	12,000	90%	10,800
Total	65,000		51,750		51,050

(ii) Statement of Cost :

Particulars	Material	Labour	Overheads	Total (Rs.)
Cost incurred during the Month	2,20,000	26,500	61,500	3,08,000
Less : Sale value of normal scrap (3,250 units x Rs. 8.50)	(27,625)	--	--	(27,625)
Net Cost	1,92,375	26,500	61,500	2,80,375
(÷) Equivalent units	51,750	51,050	51,050	---
Cost per Equivalent Unit	3.7174	0.5191	1.2047	5.4412

(iii) Valuation of Abnormal Loss :

Particulars	Rs.
Abnormal Loss :	
Material (6,250 units x Rs. 3.7174 p.u.)	23,233.75
Wages (3,750 units x Rs. 0.5191 p.u.)	1,946.625
Overheads (3,750 units x Rs. 1.2047 p.u.)	4,517.625
Total	29,698.00

(iv) Abnormal Loss A/c

Particulars	Qty.	Amount	Particulars	Qty.	Amount
To Process A/c	6,250	29,698	By GLA A/c	6,250	53,125
To Costing Profit & Loss A/c (net gain)		23,427	(sale of scrap @ 8.5)		
Total	6,250	53,125	Total	6,250	53,125

Student Note : Generally there is a debit balance in 'Abnormal Loss A/c' i.e. net loss. However, in the above account, there is excess credit resulting in to net gain. It is because of the fact that realisable value of scrap is higher than the cost of abnormal loss. Don't worry, it is correct.

Question 1(d) : [5 Marks]

GHI Ltd. Manufactures 'Stent' that is used by hospitals in heart surgery. As per the estimates provided by Pharmaceutical Industry Bureau, there will be a demand of 40 Million 'Stents' in the coming year. GHI Ltd is expected to have a market share of 2.5% of the total market demand of the Stents in the coming year. It is estimated that it costs ₹ 1.50 as inventory holding cost per stent per month and that the set-up cost per run of stent manufacture is ₹ 225.

Required :-

- (i) What would be the optimum run size for Stent manufacture ?
- (ii) What is the minimum inventory holding cost ?
- (iii) Assuming that the company has a policy of manufacturing 4,000 stents per run, how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above ?

Solution 1(d) :**Student Note -**

1 million = 10 lakhs. Hence, 40 million = 400 lakhs is the total size of the market.

Hint : Our expected sales i.e. market share = 2.5% x 400 lakhs = 10,00,000 annual demand.

EBQ = Optimum Run Size = Optimum Production in one production run

(i) **EBQ** can be mathematically determined with the help of the following formula;

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

Where,

A = Annual demand for the product = 10,00,000

S = Set up costs per batch = 225

C = Carrying cost per unit of production p.a. = ₹ 1.50 p.m. x 12 months = ₹ 18

$$\text{Economic Batch quantity} = \sqrt{\frac{2 \times 10,00,000 \times 225}{18}} = 5,000 \text{ units}$$

(ii) **Minimum Inventory Holding Cost : (i.e. carrying cost)**

= $\frac{1}{2} \times EBQ \times \text{Carrying cost per unit p.a.}$

= $\frac{1}{2} \times 5,000 \text{ units} \times ₹ 18$

= ₹ 45,000

(iii) **Calculation of Extra Cost :**

Particulars	Run Size 5,000 units	Run Size 4,000 units
(a) Total Set up cost p.a.	$10,00,000 / 5,000 \times 225 = 45,000$	$10,00,000 / 4,000 \times 225 = 56,250$
(b) Total Carrying cost p.a.	$5,000 / 2 \times 18 = 45,000$	$4,000 / 2 \times 18 = 36,000$
(c) Total cost p.a. [a + b]	90,000	92,250
∴ Extra cost p.a.		2,250

Question 2(a) : [10 Marks]

Z Ltd is working by employing 50 skilled workers. It is considering the introduction of an incentive scheme – either Halsey Scheme (with 50% Bonus) or Rowan Scheme of wage payment for increasing the labour productivity to adjust with the increasing demand for its products by 40%.

The company feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient incentive for them to produce more and the company has accordingly given assurance to the workers.

Because of this assurance, an increase in productivity has been observed as revealed by the figures for the month of April, 2020 :

Hourly rate of wages (guaranteed)	₹ 50
Average time for production one unit by one worker at the previous performance (this may be taken as time allowed)	1.975 hours
Number of working days in a month	24
Number of working hours per day of each worker	8
Actual production during the month	6,120 units

Required :

- (i) Calculate the effective increase in earnings of workers in percentage terms under Halsey and Rowan scheme.
- (ii) Calculate the savings to Z Ltd in terms of direct labour cost per unit under both the schemes.
- (iii) Advise Z Ltd about the selection of the scheme that would fulfil its assurance of incentivising workers and also to adjust with the increase in demand.

Solution 2(a) :

Working Notes :

(1) Calculation of actual hours worked :

$$= 8 \text{ hrs. per day} \times 24 \text{ days per month} \times 50 \text{ workers}$$

$$= 9,600 \text{ hours}$$

(2) Calculation of Standard time and Time saved :

$$\text{Standard time allowed for actual output}$$

$$= 6,120 \text{ units} \times 1.975 \text{ hours} = 12,087 \text{ hours}$$

$$\text{Hence, Time saved} = \text{Time allowed} - \text{Time taken}$$

$$= 12,087 - 9,600 = 2,487 \text{ hours}$$

(3) Calculation of wages under Halsey Scheme :

$$\text{Total wages} = (\text{Hours worked} \times \text{Rate} / \text{hr}) + 50\% (\text{Time saved} \times \text{Rate} / \text{hr})$$

$$= (9,600 \text{ hrs.} \times ₹ 50) + 50\% \text{ of } (2,487 \text{ hrs.} \times ₹ 50)$$

$$= 4,80,000 + 62,175 = ₹ 5,42,175$$

$$\text{Hence, Effective earning per hour} = \text{Total wages} / \text{Actual hours}$$

$$= ₹ 5,42,175 / 9,600 \text{ hours} = ₹ 56.4765 \text{ per hour}$$

(4) Calculation of wages under Rowan Scheme :

$$\text{Total wages} = (\text{Hour worked} \times \text{Rate} / \text{hr.}) +$$

$$\left[\frac{\text{Time Saved}}{\text{Time Allowed}} \times (\text{Hour worked} \times \text{Rate/hr}) \right]$$

$$= (9,600 \text{ hrs.} \times ₹ 50) + [2,487 / 12,087 \times (9,600 \times ₹ 50)]$$

$$= 4,80,0000 + 98,764 = ₹ 5,78,764$$

Hence, Effective earning per hour = Total wages / Actual hours

$$= ₹ 5,78,764 / 9,600 \text{ hours} = ₹ 60.2879 \text{ per hour}$$

(i) Calculate the effective increase in % earnings of workers :

(a) For Halsey Plan

$$= \frac{₹ 56.4765 \text{ per hour} - ₹ 50 \text{ per hour}}{₹ 50 \text{ per hour}} \times 100$$

$$= 12.953\%$$

(b) For Rowan Plan

$$= \frac{₹ 60.2879 \text{ per hour} - ₹ 50 \text{ per hour}}{₹ 50 \text{ per hour}} \times 100$$

$$= 20.5758\%$$

(ii) Calculate the savings to Z Ltd in terms of direct labour cost per unit :

Particulars	Halsey Plan	Rowan Plan
(a) Labour cost per unit at present [1.975 hrs. x ₹ 50 per hour]	₹ 98.75	₹ 98.75
(b) Total wages under incentive scheme	₹ 5,42,175	₹ 5,78,764
(c) Actual Production (units)	6,120	6,120
(d) Labour cost per unit under the scheme [b / c]	₹ 88.59	₹ 94.57
∴ Saving in cost per unit [a - d]	₹ 10.16	₹ 4.18

(iii) Advise to Z Ltd about the selection of the scheme that would fulfil its assurance :

Company had given the assurance to workers that their wages will increase by 20% of their present earnings. This assurance is fulfilled under Rowan Scheme, because earnings of workers has increased by 20.5758%. Hence, Rowan scheme should be selected.

Normal production = Actual total hours / hours per unit

$$= 9,600 / 1.975 = 4,860 \text{ units (approx)}$$

Production under incentive schemes = 6,120 units

$$\% \text{ increase in production} = (6,120 - 4,860) / 4,860 \times 100 = 25.92\%$$

Demand for our products has gone up by 40%, which will not get fulfilled.

Question 2(b) : [10 Marks]

The following data are available from the books and records of Q Ltd. for the month of April 2020:

Direct Labour Cost = ₹ 1,20,000 (120% of Factory Overheads)

Cost of Sales = ₹ 4,00,000

Sales = ₹ 5,00,000

Accounts show the following figures :

Particulars	1 st April, 2020 (₹)	30 th April, 2020 (₹)
Inventory :		
Raw Material	20,000	25,000
Work-in-progress	20,000	30,000
Finished Goods	50,000	60,000
Other details :		
Selling Expenses		22,000
General & Admin. Expenses		18,000

You are required to prepare a cost sheet for the month of April 2020 showing :

- (i) Prime Cost
- (ii) Works Cost
- (iii) Cost of Production
- (iv) Cost of Goods sold
- (v) Cost of Sales and Profit earned

Solution 2(b) :

Q Ltd.

Cost Sheet for the month of April, 2020

(to be solved using bottom to top i.e. reverse approach)

Particulars	Amount (Rs.)
Opening stock of raw material	20,000
Add: Purchases (Bal. fig.)	1,65,000
Less: Closing stock of raw material	(25,000)
Raw Material Consumed	1,60,000
Add: Direct Labour (Given)	1,20,000
Prime Cost	2,80,000
Add: Factory Overheads (1,20,000 / 120%)	1,00,000
Gross Factory Cost / Work Cost	3,80,000
Add: Opening Work-in-Progress	20,000
Less: Closing Work-in-Progress	(30,000)

Net Factory cost / Cost of Production	3,70,000
Add: Opening stock of Finished Goods	50,000
Less: Closing stock of Finished Goods	(60,000)
Cost of Goods Sold	3,60,000
Add : Selling expenses	22,000
Add : General & Admin. expenses	18,000
Cost of Sales [starting point] - Given	4,00,000
Sales	5,00,000
Profit (Bal. fig.)	1,00,000

Question 3(a) : [10 Marks]

Two manufacturing companies A and B are planning to merge. The details are as follows :

Particulars	A	B
Capacity utilisation (%)	90	60
Sales (₹)	63,00,000	48,00,000
Variable cost (₹)	39,60,000	22,50,000
Fixed Cost (₹)	13,00,000	15,00,000

Assuming that the proposal is implemented, calculate :

- Break-Even sales of the merged plant and the capacity utilization at that stage.
- Profitability of the merged plant at 80% capacity utilization.
- Sales Turnover of the merged plant to earn a profit of ₹ 60,00,000.
- When the merged plant is working at a capacity to earn a profit of ₹ 60,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

Solution 3(a) :

Student Note - Let's first convert the data at 100% capacity utilisation for both the plants and then merge it together to get the answers.

Working Note -**Sales and Cost Data at 100% Capacity of Merged Plant :**

Particulars	A	B	Merged
(a) Sales (₹)	70,00,000	80,00,000	1,50,00,000
(b) Variable cost (₹)	44,00,000	37,50,000	81,50,000
(c) Contribution [a - b]	26,00,000	42,50,000	68,50,000
(d) Fixed Cost (₹)	13,00,000	15,00,000	28,00,000
(e) Profit Volume Ratio [c / a]			45.6667%

(i) Calculation of Break-Even sales of the merged plant :

$$\begin{aligned} \text{BEP} &= \text{Fixed Cost} / \text{PV Ratio} \\ &= 28,00,000 / 45.6667\% = ₹ 61,31,382 \text{ (approx)} \\ \% \text{ Capacity at BEP} &= ₹ 61,31,382 / 1,50,00,000 = 40.876\% \text{ (approx)} \end{aligned}$$

(ii) Profitability of the merged plant at 80% capacity utilization :

$$\begin{aligned} &= \text{Contribution at 80\% capacity} - \text{Total fixed cost} \\ &= (80\% \times 68,50,000) - 28,00,000 \\ &= 54,80,000 - 28,00,000 = ₹ 26,80,000 \end{aligned}$$

(iii) Sales Turnover of the merged plant to earn a profit of ₹ 60,00,000 :

$$\begin{aligned} &= (\text{Desired Profit} + \text{Fixed Cost}) / \text{P V Ratio} \\ &= (60,00,000 + 28,00,000) / 45.6667\% = ₹ 1,92,70,000 \text{ (approx)} \end{aligned}$$

Student Note : The above calculated turnover is exceeding sales at 100% capacity and hence it is not possible.

(iv) Increase in selling price required to sustain an increase of 5% in fixed overheads :

$$\begin{aligned} \text{Increase in fixed cost} &= 5\% \times 28,00,000 = ₹ 1,40,000 \\ \text{Hence, percentage increase in sales price required at turnover (iii) above -} \\ &= 1,40,000 / 1,92,70,000 \times 100 \\ &= 0.7265\% \text{ (approx)} \end{aligned}$$

Question 3(b) : [10 Marks]

XYZ Ltd is engaged in the manufacturing of toys. It can produce 4,20,000 toys at its 70% capacity on per annum basis. Company is in the process of determining sales price for the financial year 2020-21. It has provided the following information :

Direct Material	₹ 60 per unit
Direct Labour	₹ 30 per unit
Indirect Overheads :	
Fixed	₹ 65,50,000 per annum
Variable	₹ 15 per unit
Semi-variable	₹ 5,00,000 per annum up to 60% capacity and ₹ 50,000 for every 5% increase in capacity or part thereof up to 80% capacity and thereafter ₹ 75,000 for every 10% increase in capacity or part thereof.

Company desires to earn a profit of ₹ 25,00,000 for the year. Company has planned that the factory will operate at 50% of capacity for first six months of the year and at 75% of capacity for further three months and for the balance three months, factory will operate at full capacity.

You are require to -

- (1) Determine the average selling price at which each of the toy should be sold to earn the desired profit.

- (2) Given the above scenario, advise whether company should accept an offer to sell each Toy at :
- (a) ₹ 130 per Toy
- (b) ₹ 129 per Toy

Solution 3(b) :

Student Note - You need to first calculate the total cost for the year, using the data given in the question. Then add desired profit to get desired total sales. Divide total sales with total quantity to get the average selling price per toy.

Semi-variable overheads given in this question is like a step ladder cost.

Working Notes :**(i) Calculation of total output p.a. :**

Particulars	Units
(a) Output at 100% capacity p.a. [4,20,000 / 70%]	6,00,000
(b) Output at 50% capacity for 6 months [6,00,000 x 50%] x 6/12	1,50,000
(c) Output at 75% capacity for next 3 months [6,00,000 x 75%] x 3/12	1,12,500
(d) Output at 100% capacity for last 3 months [6,00,000 x 100%] x 3/12	1,50,000
(e) Total output in a year [b + c + d]	4,12,500

(ii) Calculation of Semi-variable overheads for the year :

Particulars	₹
(a) Overheads at 50% capacity for first 6 months [5,00,000 x 6/12]	2,50,000
(b) Overheads at 75% capacity for next 3 months [5,00,000 + (50,000 x 3)] x 3/12	1,62,500
(c) Overheads at 100% capacity for last 3 months [5,00,000 + (50,000 x 4) + (75,000 x 2)] x 3/12	2,12,500
(d) Total Semi-variable OH for the year [a + b + c]	6,25,000

Student Note : For easy understanding, the capacity slabs are created for semi-variable OH :

Capacity Slabs	0% to 60%	60% to 65%	65% to 70%	70% to 75%
Overheads (₹)	5,00,000	5,50,000	6,00,000	6,50,000
Capacity Slabs		75% to 80%	80% to 90%	90% to 100%
Overheads (₹)		7,00,000	7,75,000	8,50,000

(1) Determination of the average selling price :

Particulars	(₹) p.a.
(a) Direct Material [4,12,500 units x ₹ 60 per unit]	2,47,50,000
(b) Direct Labour [4,12,500 units x ₹ 30 per unit]	1,23,75,000
(c) Fixed Overheads [Given]	65,50,000
(d) Variable OH [4,12,500 units x ₹ 15 per unit]	61,87,500
(e) Semi-Variable OH [As per working (ii) above]	6,25,000
(f) Total cost for the year [a to e]	5,04,87,500
(g) Desired profit for the year [Given]	25,00,000
(h) Total Desired Sales [f + g]	5,29,87,500
(i) Average selling price per unit [(h) / 4,12,500 units]	128.4545

(2) Advise to the company for acceptance of offer :

- (a) Price of ₹ 130 per Toy is above the target selling price, hence accept the offer.
 (b) Price of ₹ 129 per Toy is also above the target selling price, hence accept the offer.

Question 4(a) : [10 Marks]

Mayura Chemicals Ltd buys a particular raw material at ₹ 8 per litre. At the end of the processing in Department 1, this raw material splits-off into products X, Y and Z. Product X is sold at the split-off point, with no further processing. Products Y & Z require further processing before they can be sold. Product Y is processed in Department 2 and Product Z is processed in Department 3. Following is a summary of the costs and other related data for the year 2019-20 :-

Particulars	Departments		
	1	2	3
Cost of Raw Material	₹ 4,80,000	--	--
Direct Labour	₹ 70,000	₹ 4,50,000	₹ 6,50,000
Manufacturing Overhead	₹ 48,000	₹ 2,10,000	₹ 4,50,000
	Products		
	X	Y	Z
Sales (Litres)	10,000	15,000	22,500
Closing inventory (Litres)	5,000	--	7,500
Sale price per litre (₹)	30	64	50

There were no opening and closing inventories of basic raw materials at the beginning as well as at the end of the year. All Finished goods inventory in litres was complete as to processing. The company uses the Net-realizable value method of allocating joint costs.

You are required to prepare :-

- Schedule showing the allocation of joint costs.
- Calculate the Cost of goods sold of each product and the cost of each item in Inventory.
- A comparative statement of Gross Profit.

Solution 4(a) :

Student Note : We have a very similar question in our classroom notes in the Chapter of "Joint Product By-Product Costing. We have to take care of stock adjustments. NRV should be calculated for goods produced to apportion the joint cost of production of Dept. 1. However, to calculate Gross Profit, we need to take actual quantity sold. Department 1 cost is the joint cost and Dept. 2 & 3 cost is the further processing cost for Y & Z.

1. Statement of joint cost (i.e. Dept. 1) :

Particulars	Amount (₹)
Cost of Raw Material	4,80,000
Direct Labour	70,000
Manufacturing Overhead	48,000
Total joint cost	5,98,000

2. Statement showing apportionment of Joint Cost, COGS, Stock and Gross Profit :

Particulars	X	Y	Z	Total
(a) Sales quantity (litres)	10,000	15,000	22,500	--
(b) Closing inventory (Litres)	5,000	--	7,500	--
(c) Production quantity (litres) [a + b]	15,000	15,000	30,000	--
(d) Sales price per litre (₹)	30	64	50	--
(e) Sale value of goods produced [c x d]	4,50,000	9,60,000	15,00,000	29,10,000
(f) Further processing cost (₹) Dept. 2 : [4,50,000 + 2,10,000] Dept. 3 : [6,50,000 + 4,50,000]	--	6,60,000	11,00,000	17,60,000
(g) Net Realisable Value [e - f] (₹)	4,50,000	3,00,000	4,00,000	11,50,000
(h) Joint cost apportioned in the ratio of (g)	2,34,000	1,56,000	2,08,000	5,98,000
(i) Total cost of production [h + f] (₹)	2,34,000	8,16,000	13,08,000	23,58,000
(j) Value of closing stock [i / c x b]	78,000	--	3,27,000	4,05,000
(k) Cost of goods sold [i - j] (₹)	1,56,000	8,16,000	9,81,000	19,53,000
(l) Actual Sales [a x d] (₹)	3,00,000	9,60,000	11,25,000	23,85,000
(m) Gross Profit [l - k] (₹)	1,44,000	1,44,000	1,44,000	4,32,000

Note : I have clubbed all the answers in one statement to avoid duplication of work and save time.

Question 4(b) : [10 Marks]

ABC Ltd. manufactures three products X, Y and Z using the same plant and resources. It has given the following information for the year ended on 31st March, 2020 :

Particulars	X	Y	Z
Production Quantity (units)	1,200	1,440	1,968
Cost per unit :			
Direct Material (₹)	90	84	176
Direct Labour (₹)	18	20	30

Budgeted direct labour rate was ₹ 4 per hour and the production overheads, shown in table below, were absorbed to products using direct labour hour rate. Company followed Absorption Costing Method. However, the company is now considering adopting Activity Based Costing Method.

Activity	Budgeted OH (₹)	Cost Driver	Remarks
Material Procurement	50,000	No. of Orders	Order size was 25 units for each product.
Set-up	40,000	No. of Production Runs	All the three products are produced in production runs of 48 units
Quality control	28,240	No. of Inspections	Done for each production Run.
Maintenance	1,28,000	Maintenance Hours	Total maintenance hours were 6,400 and was allocated in the ratio of 1:1:2 between X, Y & Z

Required :-

1. Calculate the total cost per unit of each product using the Absorption Costing Method.
2. Calculate the total cost per unit of each product using Activity Based Costing Method.

Solution 4(b) :

(1) Calculate of cost per unit using the Absorption Costing Method :

Calculation of Overhead Recovery Rate per Hour :

Particulars	X	Y	Z	Total
(a) Production Quantity (units)	1,200	1,440	1,968	
(b) Direct Labour cost per unit (₹)	18	20	30	
(c) Labour hours per unit [b / 4]	4.5	5	7.5	
(d) Total labour hours [a x c]	5,400	7,200	14,760	27,360
(e) Budgeted overheads (₹) [50,000 + 40,000 + 28,240 + 1,28,000]				2,46,240
(f) OH recovery rate per hr. [e / d]				9.00

Calculation of total cost per unit :

Particulars	X	Y	Z
(a) Direct Material per unit (₹)	90	84	176
(b) Direct Labour cost per unit (₹)	18	20	30
(c) Prime Cost per unit (₹) [a + b]	108	104	206
(d) Labour hours per unit [b / 4]	4.5	5	7.5
(e) OH cost per unit [d x 9]	40.50	45	67.50
(f) Total cost per unit (₹) [c + e]	148.50	149.00	273.50

(2) Calculate of cost per unit using the Activity Based Costing Method :**Calculation of Cost Drivers :**

Particulars	X	Y	Z	Total
(a) Production Quantity (units)	1,200	1,440	1,968	
(b) No. of orders [a / 25] rounded off	48	58	79	185
(c) No. of production runs [a / 48]	25	30	41	96
(d) No. of inspections [same as (c)]	25	30	41	96

Student Note : For calculating no. of orders, we actually need the data related to input raw material quantity purchased. However, in absence of such information, it is calculated based on the production quantity.

Calculation of total cost per unit :

Particulars	Bud. OH (₹)	Cost Driver	X	Y	Z
Material Procurement	50,000	No. of Orders [48 : 58 : 79]	12,973	15,676	21,351
Set-up	40,000	No. of Production Runs [25 : 30 : 41]	10,417	12,500	17,083
Quality control	28,240	No. of Inspections [25 : 30 : 41]	7,354	8,825	12,061
Maintenance	1,28,000	Maintenance Hours [1 : 1 : 2]	32,000	32,000	64,000
Total OH	2,46,240	(a)	62,744	69,001	1,14,495
Production Quantity (units)		(b)	1,200	1,440	1,968
OH cost per unit		(a) / (b)	52.29	47.92	58.18
Prime cost p.u.		WN (1)	108.00	104.00	206.00
Total cost p.u.		OH + Prime cost	160.29	151.92	264.18

Question 5(a) : [10 Marks]

ABC Health care runs an Intensive Medical Care Unit. For this purpose, it has hired a building at a rent of ₹ 50,000 per month with the agreement to bear the repairs and maintenance charges also.

The unit consists of 100 beds and 5 more beds can comfortably be accommodated when the situation demands. Though the unit is open for patients all the 365 days in a year, scrutiny of accounts for the year 2020 reveals that only for 120 days in the year, the unit had the full capacity of 100 patients per day and for another 80 days, it had, on an average only 40 beds occupied per day. But, there were occasions when the beds were full and extra beds were hired at a charge of ₹ 50 per bed per day. This did not come to more than 5 beds above the normal capacity on any one day. The total hire charges for the extra beds incurred for the whole year amounted to ₹ 20,000.

The unit engaged expert doctors from outside to attend on the patients and the fees were paid on the basis of the number of patients attended and time spent by them which on an average worked out to ₹ 30,000 per month in the year 2020.

The permanent staff expenses and other expenses of the unit were as follows :

Particulars	₹
2 Supervisors each at a per month salary of	5,000
4 Nurses each at a per month salary of	3,000
2 Ward boys each at a per month salary of	1,500
Other Expenses for the year were as under :	
Repairs and Maintenance	28,000
Food supplied to patients	4,40,000
Caretaker and other services for patients	1,25,000
Laundry charges for bed linen	1,40,000
Medicines supplied	2,80,000
Cost of Oxygen etc. other than directly borne for treatment of patients	75,000
General Administration Charges allocated to the unit	71,000

Required :

- What is the profit per patient day made by the unit in the year 2020, if the unit recovered an overall amount of ₹ 200 per day on an average from each patient.
- The unit wants to work on a budget for the year 2021, but the number of patients requiring medical care is a very uncertain factor. Assuming that same revenue and expenses prevail in the year 2021 in the first instance, work out the number of patient days required by the unit to break even.

Solution 5(a) :

Working Note :

Calculation of No. of Patient Days p.a. :

Particulars	Patient days
120 days x 100 patients	12,000
80 days x 40 patients	3,200
Extra beds [20,000 / 50]	400
Total patient days p.a.	15,600

(i) Profitability Statement : [For 15,600 Patient Days]

Particulars	Total p.a. (₹)	Per patient day (₹)
(a) Revenue [15,600 x ₹ 200]	31,20,000	200.00
(b) <u>Variable Costs</u> :		
Doctors fees [30,000 p.m. x 12 months]	3,60,000	
Food supplied to patients	4,40,000	
Caretaker and other services for patients	1,25,000	
Laundry charges for bed linen	1,40,000	
Medicines supplied	2,80,000	
Hire charges for extra beds	20,000	
Sub-total (b)	13,65,000	87.50
(c) Contribution [a - b]	17,55,000	112.50
(d) <u>Fixed Costs</u> :		
Rent [50,000 p.m. x 12 months]	6,00,000	
Supervisors salary [5,000 p.m. x 12 x 2]	1,20,000	
Nurses salary [3,000 p.m. x 12 x 4]	1,44,000	
Ward boys salary [1,500 p.m. x 12 x 2]	36,000	
Repairs and Maintenance	28,000	
Cost of Oxygen etc.	75,000	
General Administration Charges	71,000	
Sub-total (d)	10,74,000	68.85
(e) Profit [c - d]	6,81,000	43.65

Student Note : In absence of specific information available in the question, Repairs and Maintenance, Cost of Oxygen other than borne by patients, and General Administration Charges are treated as Fixed Costs by ICAI. You have to write an assumption in the exam.

(ii) Calculation of Break Even Point (BEP) :

$$\begin{aligned}
 \text{BEP} &= \frac{\text{Total Fixed Cost}}{\text{Contribution per patient day}} \\
 &= 10,74,000 / 112.50 \\
 &= \mathbf{9,547 \text{ patient days (approx)}}
 \end{aligned}$$

Question 5(b) : [10 Marks]

Premier Industries has a small factory where 52 workers are employed on an average for 25 days a month and they work 8 hours per day. The normal down time is 15%. The firm has introduced standard costing for cost control. Its monthly budget for November, 2020 shows that the budgeted variable and fixed overhead are ₹ 1,06,080 and ₹ 2,21,000 respectively.

The firm reports the following details of actual performance for November, 2020, after the end of the month :

Actual hours worked	8,100 hrs.
Actual production expressed in standard hours	8,800 hrs.
Actual Variable Overheads	₹ 1,02,000
Actual Fixed Overheads	₹ 2,00,000

You are required to calculate :

- (i) Variable Overhead Variances :
 - (a) Variable overhead expenditure variance
 - (b) Variable overhead efficiency variance
- (ii) Fixed Overhead Variances :
 - (a) Fixed overhead budget variance
 - (b) Fixed overhead capacity variance
 - (c) Fixed overhead efficiency variance
- (iii) Control Ratios :
 - (a) Capacity Ratio
 - (b) Efficiency Ratio
 - (c) Activity Ratio

Solution 5(b) :**Working Notes :**

$$\begin{aligned} \text{Budgeted hours per month} &= (8 \text{ hours / day} \times 25 \text{ days / month} \times 52 \text{ workers}) - \text{down time} \\ &= 10,400 \text{ hrs.} - 15\% = 8,840 \text{ hours} \end{aligned}$$

$$\text{Std. Recovery Rate per hour} = \text{Budgeted Overheads} / \text{Budgeted Overheads}$$

$$\text{For Variable OH (SRR/hr.)} = ₹ 1,06,080 / 8,840 \text{ hours} = ₹ 12 \text{ per hour}$$

$$\text{For Fixed OH (SRR/hr.)} = ₹ 2,21,000 / 8,840 \text{ hours} = ₹ 25 \text{ per hour}$$

(i) Variable Overhead Variances :

$$\begin{aligned} \text{(a) Variable overhead expenditure variance} \\ &= (\text{SRR/hr.} \times \text{Actual hours}) - \text{Actual overheads} \\ &= (₹ 12 \times 8,100 \text{ hrs.}) - ₹ 1,02,000 \\ &= ₹ 4,800 \text{ (A)} \end{aligned}$$

- (b) Variable overhead efficiency variance
 = SRR/hr. x (Standard hours - Actual hours)
 = ₹ 12 x (8,800 hrs. - 8,100 hrs.)
 = ₹ 8,400 (F)

(ii) Fixed Overhead Variances :

- (a) Fixed overhead budget variance (i.e. Expenditure Variance)
 = Budgeted OH - Actual OH
 = ₹ 2,21,000 - ₹ 2,00,000 = ₹ 21,000 (F)
- (b) Fixed overhead capacity variance
 = SRR/hr. x (Budgeted hours - Actual hours)
 = ₹ 25 x (8,840 hrs. - 8,100 hrs.)
 = ₹ 18,500 (A) - underutilisation of capacity
- (c) Fixed overhead efficiency variance
 = SRR/hr. x (Standard hours - Actual hours)
 = ₹ 25 x (8,800 hrs. - 8,100 hrs.)
 = ₹ 15,500 (F)

(iii) Control Ratios :

- (a) Capacity Ratio = Actual hours / Budgeted hours x 100
 = 8,100 / 8,840 x 100 = **91.63%**
- (b) Efficiency Ratio = Standard hours / Actual hours x 100
 = 8,800 / 8,100 x 100 = **108.64%**
- (c) Activity Ratio = Standard hours / Budgeted hours x 100
 = 8,800 / 8,840 x 100 = **99.55%**

Question 6 : [5 Marks each x 4 Ques. = 20 Marks]

Answer any **four** of the following :

- (a) State how the following items are treated in arriving at the value of cost of material purchased :
- (i) Detention Charges/Fines
 - (ii) Demurrage
 - (iii) Cost of Returnable containers
 - (iv) Central Goods and Service Tax (CGST)
 - (v) Shortage due to abnormal reasons.
- (b) State the limitations of Budgetary Control System.
- (c) Explain Blanket Overhead Rate and Departmental Overhead Rate. How they are calculated? State the conditions required for the application of Blanket Overhead Rate.

- (d) State the method of costing that would be most suitable for :
- Oil Refinery
 - Interior Decoration
 - Airlines Company
 - Advertising
 - Car Assembly
- (e) Give any five examples of the impact of use of Information Technology in Cost Accounting.

Solution 6 :

(a) Treatment of certain items in valuing cost of material purchased :

S.N.	Items	Treatment
(i)	Detention charges / Fines	Detention charges / fines imposed for non-compliance of rule or law by any statutory authority. It is an abnormal cost and not included with cost of purchase.
(ii)	Demurrage	Demurrage is a penalty imposed by the transporter for delay in unloading or offloading of materials. It is an abnormal cost and not included with cost of purchase.
(iii)	Cost of returnable containers	Treatment of cost of returnable containers are as follows: <ul style="list-style-type: none"> Returnable Containers: If the containers are returned and their costs are refunded, then cost of containers should not be considered in the cost of purchase. If the amount of refund on returning the container is less than the amount paid, then, only the short fall is added with the cost of purchase.
(iv)	Central Goods and Service Tax (CGST)	Central Goods and Service Tax (CGST) is paid on intra-state supply of goods & services and is collected from the buyer. It is excluded from the cost of purchase if input credit for the same is available. Unless mentioned specifically it should not form part of cost of purchase.
(v)	Shortage due to abnormal reasons	Shortage arises due to abnormal reasons such as material mishandling, theft, breaking of bulk, accident or due to any avoidable reasons are not absorbed by the good units. Losses due to abnormal reasons are debited to costing profit and loss account.

(b) Limitations of Budgetary Control System :

1. Budgets may or may not be true, as they are based on estimates.
2. Budgets are considered as rigid documents.
3. Budgets cannot be executed automatically.
4. Staff co-operation is usually not available during budgetary control exercise.
5. Its implementation is quite expensive.

(c) Blanket Rate v/s Departmental Rate :

- Blanket rate refers to the computation of one single overhead rate for the whole factory.
- Blanket Rate is calculated as :
Total Overheads of the Factory / Basis for charging
- Departmental rate refers to the computation of separate overhead recovery rates for each production department. It can be calculated as :
Departmental Overheads / Basis for charging for that Department
- Conditions required for the application of blanket rate :
 - (a) If only one major product is produced i.e. uniform production
 - (b) Several products are produced, but all the products pass through all the departments or they require almost similar length of services of each department.

(d) Method of Costing to be used :

- Oil Refinery - Process Costing
- Interior Decoration - Job Costing
- Airlines company - Service Costing / Operation Costing
- Advertising - Job Costing
- Car Assembly - Multiple Costing

(e) Impact of Information Technology in Cost Accounting :

1. After the introduction of ERP, different functional activities get integrated and as a consequence, a single entry into the accounting system provides custom made reports for every purpose and saves an organisation from preparing different sets of documents.
2. A move towards paperless environment can be seen where documents like Bill of Material, Material Requisition Note, Goods Received Note, Labour utilisation report etc. are not longer required to be prepared in multiple copies. The related department can get e-copy from the system.
3. Information technology with the help of internet and intranet are helping in resource procurement and mobilization. For example, production department can get materials from the stores without issuing material requisition note physically. Similarly, purchase order can be initiated to the suppliers with the help of internet. This enables an entity to shift towards Just-in-Time (JIT) approach of inventory management.
4. Cost information for a cost centre or cost object is ascertained with accuracy in a timely manner. Each cost centre and cost object is codified and all related costs are assigned to the cost objects or cost centres using assigned codes. This automates the cost accumulation and ascertainment process. The cost information can be customized as per the requirement. For example, a manager is able to receive information job-wise, batch-wise, process-wise, cost centre wise etc.

5. Uniformity in preparation of report, budgets and standards can be achieved with the help of IT. ERP software plays an important role in bringing uniformity irrespective of location, currency, language and regulations.
6. Cost and revenue variance reports are generated on real time basis, which enables the management to take control measures immediately.
7. IT enables an entity to monitor and analyse each process of manufacturing or service activity closely to eliminate non value added activities.

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