CA INTERMEDIATE

VIVITSU

PAPER 4

Cost & Management Accounting Reviewer

Chapter-wise compilation

RTP, MTP and PYP questions

KEY HIGHLIGHTS

- Easy to Hard Difficulty Level
- Importance levels marked as A, B or C
- Reference to all questions
- Quick recap of important concepts
- Exam Insights
- Last Day Revision Questions Marked

APPLICABLE FOR MAY'25, SEPT'25 AND JAN'26

COST & MANAGEMENT ACCOUNTING REVIEWER

CA Intermediate
May 2025,
September 2025 & January 2026

Publisher:

VIVITSU
STRIVING TOWARDS KNOWLEDGE

Wavelength Educom Private Limited

202 Professional Plaza,17 Punit Nagar,
Near Malhar point, Old Padra Road,
Vadodara – 390007, Gujarat

Cost & Management Accounting Reviewer

Published by Vivitsu

8th Edition: January 2025

ISBN: 978-81-983216-9-5

Price: ₹ 700/-

For more information and resources,

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This book belongs to future,

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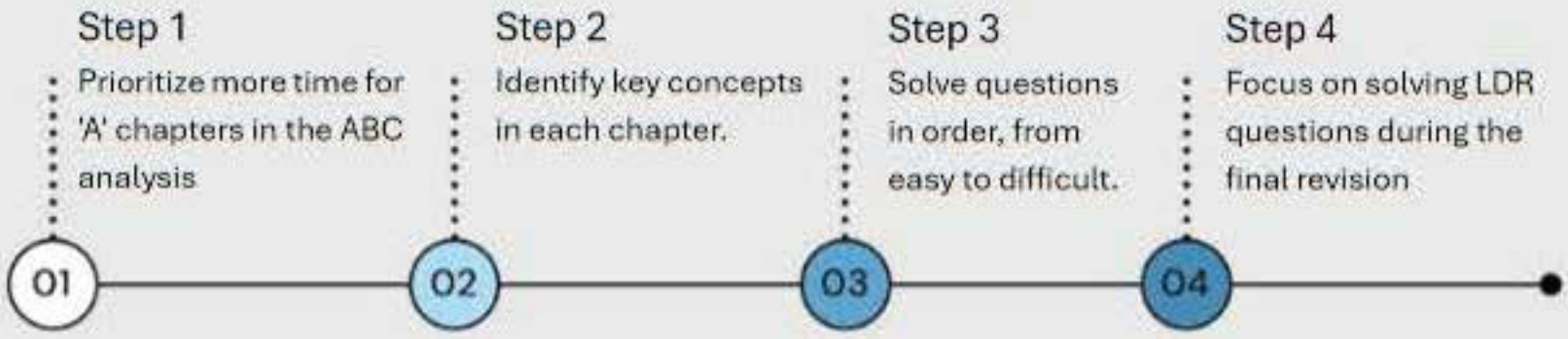


Step 1: Prioritize your chapters

Chapters in the index are categorized as A, B, or C based on their importance. Focus more on 'A' chapters, as they carry the most weight, and give adequate attention to 'B' chapters. While all chapters must be covered, this approach helps manage time efficiently for better results.

Step 2: Identify key concept

Identify the key concepts for each chapter using the list provided at the start of the chapter. Ensure you understand them thoroughly. If you struggle with a question, revisit the concepts, review them, and strengthen your understanding before moving forward.

Step 3: Start easy

Start with Question 1, as they progress from easy to difficult, helping you build confidence throughout the chapter. Pay close attention to the "EXAM INSIGHTS" to avoid common mistakes. Questions are segregated topic wise where possible.

Step 4: Last Day Revision (LDR)

Focus on solving LDR questions during the final revision. In the 1.5 days before the exam, prioritize these questions as they cover the most critical concepts from each chapter. You'll find a quick summary of LDR question numbers listed right before each chapter for easy reference.

Table of Contents

ABC Analysis

- **A** Very Important, Read on priority
- **B** Moderately Important
- **C** Less critical but still essential

Ensure you thoroughly read all chapters without skipping any. The ABC analysis is designed to help you prioritize based on past trends, but it should not replace comprehensive preparation.

CHAPTER 10: PROCESS & OPERATION COSTING

CONCEPTS OF THIS CHAPTER

- Process and Operation Costing: meaning.
- Treatment of process loss and gains in cost accounts.
- Compute equivalent completed production units.
- Methods of valuation of work in process.
- Meaning and treatment of inter-process profits.

LDR Questions

Q 20 Q 25
Q 26 Q 27

QUICK REVIEW OF IMPORTANT CONCEPTS

I. Process Costing

Process costing is a costing method used in industries where materials undergo multiple processes or stages to be transformed into a final product. It is defined as a cost accounting method where costs are assigned to each process or operation and then averaged across the units produced.

II. Valuation of Work-in-process

The valuation of work-in-process presents a good deal of difficulty because it has units under different stages of completion from those in which work has just begun to those which are only a step short of completion.

(i) Equivalent Units

Equivalent units or equivalent production units, means converting the incomplete production units into their equivalent completed units. Under each process, an estimate is made of the percentage completion of word-in-process with regard to different elements of costs, viz., material, labour and overheads.

The formula for computing equivalent completed units is:

$$\text{Equivalent completed units} = \left(\begin{array}{c}\text{Actual Number of units in}\\ \text{the process of manufature}\end{array}\right) \times \left(\begin{array}{c}\text{Percentage of}\\ \text{work completed}\end{array}\right)$$

Input Details	Units	Output Particulars	Units	Equivalent Units					
				Material		Labour		Overhead	
				%	Units	%	Units	%	Units
			a	b	c= a×b	d	e=a×d	f	g=a×f
Opening W-I-P	xxx	Opening W-I-P*	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Unit Introduced	xxx	Finished output**	xxx	xxx	xxx	xxx	xxx	xxx	xxx
		Normal loss***	xxx	-	-	-	-	-	-
		Abnormal loss/ Gain****	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Total		Closing	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	xxx	W-I-P	xxx		xxx		xxx		xxx
		Total							

(i) *Equivalent units for Opening W-I-P is calculated only under FIFO method. Under the Average method, it is not shown separately.

(ii) **Under the FIFO method, Finished Output = Units completed and transferred to next process less Opening WIP. Under Average method, Finished Output = Units completed and transferred.

(iii) ***For normal loss, no equivalent unit is calculated.

(iv) ****Abnormal Gain/ Yield is treated as 100% complete in respect of all cost elements irrespective of percentage of completion.

(ii) Methods for valuation of work-in-process

- **First-in-first-out (FIFO) method**

  Under this method the units completed and transferred include completed units of opening work-in-process and subsequently introduced units. Proportionate cost to complete the opening work-in-process and that to process the completely processed units during the period are derived separately.

- **Weighted Average (Average) Method**

  Under this method, the cost of opening work-in-process and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units.

Questions & Answers

Theory Questions

Question 1

How will you treat normal loss, abnormal loss and abnormal gain in process costing? Explain ***(PYP 5 Marks, May'23)***

Answer 1

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.

EXAM INSIGHTS: This theory question was based on the treatment of normal loss, abnormal loss, and abnormal gain in Process Costing. The performance of the examinees was average in this question.

Question 2

Explain very briefly the following terms: Process Costing ***(PYP 5 Marks, Nov'23)***

Answer 2

Process Costing: Process costing is a method of costing used in industries where the material has to pass through two or more process for being converted into a final product. Here the cost of completing each stage of work is ascertained, like cost of making pulp and cost of making paper from pulp.

Exam insights: Question requiring examinees to explain briefly the given terms related to contract costing, job costing, process costing and co products. The answers given were very vague and displayed a very limited understanding of the terms. Performance of the examinees was average.

Question 3

WHAT is inter-process profit? STATE its advantages and disadvantages. *(MTP 4 Marks, Mar'22, SM)*

Answer 3

Inter-Process Profit: To control cost and to measure performance, different processes within an organization are designated as separate profit centres. In this type of organizational structure, the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. The difference between cost and the transfer price is known as inter - process profits.

The advantages and disadvantages of using inter-process profit, in the case of process type industries are as follows:

Advantages:

1. Comparison between the cost of output and its market price at the stage of completion is facilitated.
2. Each process is made to stand by itself as to the profitability.

Disadvantages:

1. The use of inter-process profits involves complication.
2. The system shows profits which are not realized because of stock not sold out.
3.

Question 4

DISCUSS normal and abnormal Process Loss and ENUMERATE their treatment in Cost Accounts. *(RTP Jan'25)*

Answer 4

There are two types of material losses viz. (i) Normal loss and (ii) Abnormal loss.

(i) **Normal Process Loss:** It is also known as normal wastage. Itis defined as **the loss of material which is inherent in the nature** of work. Such a loss can be reasonably anticipatedfrom the nature of the material, nature of operation, the experience and technical data. It is unavoidable because ofnature of the material or the process. It also includes units withdrawn from the process for test or sampling.

Treatment in Cost Accounts: The cost of **normal processloss 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.

(ii) **Abnormal Process Loss:** It is also known as abnormal wastage. It is defined as the **loss in excess of the pre-determined loss** (Normal process loss). This type of loss may occur due to the carelessness of workers, a bad plant designor operation, sabotage etc. Such a loss cannot obviously be estimated in advance. But it can be kept under control bytaking suitable measures.

Treatment 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, **thetotal cost of abnormal process loss is debited to costing profit and loss account.**

Practical Questions

Question 5

Chill Ltd. uses process costing to manufacture water density sensor for hydro sector. The following information pertains to operations for the month of February:

Particulars	Units
Beginning WIP, February 1	22,400
Started in production during February	1,40,000
Completed production during February	1,28,800
Ending work in progress, February 28	33,600

The beginning work in progress was 50% complete for materials and 30% complete for conversion costs. The ending inventory was 80% complete for material and 30% complete for conversion costs.

Costs pertaining to the month of February are as follows:

Beginning inventory costs are material ₹ 1,38,350, direct labour ₹ 1,50,600 and factory overhead ₹ 63,600

Cost incurred during February are material ₹ 23,95,000, direct labour ₹ 9,14,400, factory overheads ₹ 19,55,800.

CALCULATE:

(i) Using the FIFO method, the equivalent units of production for material.

(ii) Cost per equivalent unit for conversion cost. *(MTP 5 Marks Mar'22, SM)*

Answer 5

(i) Calculation of equivalent units of production:

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Beginning WIP	22,400	From beginning WIP	22,400	50	11,200	70	15,680
Unit Introduced	1,40,000	Completed output	1,06,400	100	1,06,400	100	1,06,400
		Closing W-I-P	33,600	80	26,880	30	10,080
Total	1,62,400	Total	1,62,400		1,44,480		1,32,160

(ii) Calculation of cost per equivalent unit for conversion costs

Particulars	
Direct labour	₹ 9,14,400
Factory overheads	₹ 19,55,800
Total	₹ 28,70,200
Equivalent units	1,32,160 units
Cost per equivalent unit	**₹ 21.72**

Question 6

A product passes through Process-I and Process-II.

Particulars pertaining to the Process-I are:

Materials issued to Process-I amounted to ₹ 80,000, Wages ₹ 60,000 and manufacturing overheads were ₹ 52,500. Normal Loss anticipated was 5% of input, 9,650 units of output were produced and transferred out from Process-I to Process-II. Input raw materials issued to Process-I were 10,000 units.

There were no opening stocks.

Scrap has realizable value of ₹ 5 per unit.

You are required to prepare:

(i) Process-I Account

(ii) Abnormal Gain/Loss Account *(PYP 5 Marks, Dec'21)*

Answer 6

(i) Process - I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Materials	10,000	80,000	By Normal loss (5% of 10,000)	500	2,500
To Wages	-	60,000	By Process-II A/c (₹20* × 9,650 units)	9,650	1,93,000
To Manufacturing OH		52,500			
To Abnormal Gain A/c (₹20*×150units)	150	3,000			
	10,150	1,95,500		10,150	1,95,500

$* \frac{(80,000 + 60,000 + 52,500) - 2,500}{10,000 - 500} = 20$

(ii) Abnormal Gain - Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Normal loss A/c	150	750	By Process-I A/c	150	3,000
To Costing P&L A/c	-	2,250			
	150	3,000		150	3,000

Exam Insights: This Numerical question was based on the basic concept of Process Costing. A reexamines made mistake in the calculation of abnormal gain amounts. Overall performance of the examinees w good.

Question 7

An article passes through three successive operations from raw materials stage to the finished product stage. The following data are available from the production records for the month of March, 2021:

Operation	No. of pieces (Input)	No. of pieces (Rejected)	No. of pieces (Output)
1	1,80,000	60,000	1,20,000
2	1,98,000	18,000	1,80,000
3	1,44,000	24,000	1,20,000

(i) DETERMINE the input required to be introduced in the first operation in no. of pieces in order to obtain finished output of 500 pieces after the last operation.

(ii) CALCULATE the cost of raw material required to produce one piece of finished product, if the weight of the finished piece is 0.5 kg. and the price of raw material is Rs. 80 per kg. ***(MTP 5 Marks, Apr'21)***

Answer 7

Statement of production

Operation	Input	Rejections		Output
		Total	% of output	
1	1,80,000	60,000	50	1,20,000
2	1,98,000	18,000	10	1,80,000
3	1,44,000	24,000	20	1,20,000

(i) Determination of input required to obtain 500 pieces of finished output:

Particulars	No. of pieces
Output required after operation 3	500
Add: Rejection in operation 3 (20%)	100
Output required after operation 2	600
Add: Rejection in operation 2 (10%)	60
Output required after operation 1	660
Add: Rejection in operation 1 (50%)	330
Input required in operation 1	**990**

(ii) Calculation of cost of raw material:

To produce 500 pieces of final output, 990 pieces of inputs are required at operation 1. Thus, to get a finished piece of 0.5 kg. of output, the weight of input required is:

=0.5/500 × 990 = 0.99 kg.

The cost of raw material would be Rs. 80 × 0.99 kg. = Rs.79.20

Question 8

The following information is furnished by Vivit Su Company for Process - II of its manufacturing activity for the month of April 2023:

(i)	Opening Work-in-Progress – Nil
(ii)	Units transferred from Process I – 55,000 units at ₹ 3,27,800
(iii)	Expenditure debited to Process – II: Consumables ₹ 1,57,200 Labour ₹ 1,04,000 Overhead ₹ 52,000
(iv)	Units transferred to Process III – 51,000 units
(v)	Closing WIP – 2,000 units (Degree of completion): Consumables 80% Labour 60% Overhead 60%

(vi)	Units scrapped - 2,000 units, scrapped units were sold at ₹ 5 per unit
(vii)	Normal loss – 4% of units introduced

You are required to:

(i) Prepare a Statement of Equivalent Production.

(ii) Determine the cost per unit

(iii) Determine the value of Work-in-Process and units transferred to Process – III *(RTP Nov'23)*

Answer 8

(i) Statement of Equivalent Production

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material- A*		Consumables		Labour & Overheads	
				%	Units	%	Units	%	Units
Units transferred from Process-I	55,000	Units transferred to Process-III	51,000	100	51,000	100	51,000	100	51,000
		Normal loss (4% of 55,000)	2,200	-	-	-	-	-	-
		Closing W-I-P	2,000	100	2,000	80	1,600	60	1,200
		Abnormal Gain	(200)	100	(200)	100	(200)	100	(200)
	55,000		55,000		52,800		52,400		52,000

*Material A represent transferred-in units from process-I

(ii) Determination of Cost per Unit

Particulars	Amount (₹)	Units	Per Unit (₹)
(i) Direct Material (Consumables) :			
Value of units transferred from Process-I	3,27,800		
Less: Value of normal loss (2,200 units × ₹ 5)	(11,000)		
	3,16,800	52,800	6.00
(ii) Consumables added in Process-II	1,57,200	52,400	3.00
(iii) Labour	1,04,000	52,000	2.00
(iii) Overhead	52,000	52,000	1.00
Total Cost per equivalent unit			12.00

(iii) Determination of value of Work-in-Process and units transferred to Process-III

Particulars	Units	Rate (₹)	Amount (₹)
Value of Closing W-I-P:			
Material from Process-I	2,000	6.00	12,000
Consumables	1,600	3.00	4,800
Labour	1,200	2.00	2,400
Overhead	1,200	1.00	1,200
			20,400
Value of units transferred to Process-III	51,000	12.00	6,12,000

Question 9

The following data are available in respect of Process-I for June 2024:

(1) Opening stock of work in process: 600 units at a total cost of ₹ 4,20,000.

(2) Degree of completion of opening work in process:

Material	100%
Labour	60%
Overheads	60%

(3) Input of materials at a total cost of ₹ 55,20,000 for 9,200 units.

(4) Direct wages incurred ₹ 18,60,000

(5) Production overhead ₹ 8,63,000.

(6) Units scrapped 200 units. The stage of completion of these units was:

Material	100%
Labour	80%
Overheads	80%

(7) Closing work in process; 700 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overheads	70%

(8) 8,900 units were completed and transferred to the next process.

(9) Normal loss is 4% of the total input (opening stock plus units put in)

(10) Scrap value is ₹ 60 per unit.

You are required to:

(i) COMPUTE equivalent production,

(ii) CALCULATE the cost per equivalent unit for each element.

(iii) CALCULATE the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method. *(RTP Sep'24)*

Answer 9

(i) Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production					
				Materials		Labour		Production Overhead	
Details	Units	Details	Units	%	Units	%	Units	%	Units
Opening Stock	600	From opening stock	600	-	-	40	240	40	240
		- From fresh materials	8,300	100	8,300	100	8,300	100	8,300
		Closing W-I-P	700	100	700	70	490	70	490
Fresh inputs	9,200	Normal loss	392	-	-	-	-	-	-
			9,992		9,000		9,030		9,030
		Less: Abnormal Gain	(192)	100	(192)	100	(192)	100	(192)
	9,800		9,800		8,808		8,838		8,838

(ii) Statement of Cost per equivalent units

Elements	(₹)	Cost (₹)	Equivalent units (EU)	Cost per EU (₹)
Material Cost	55,20,000			
Less: Scrap realisation 392 units @ ₹ 60/- p.u.	(23,520)	54,96,480	8,808	624.03
Labour cost		18,60,000	8,838	210.45
Production OH Cost		8,63,000	8,838	97.65
Total Cost		82,19,480		932.13

(iii) Cost of Abnormal Gain – 192 Units

	(₹)	(₹)
Material cost of 192 units @ ₹ 624.03 p.u.	1,19,813.76	
Labour cost of 192 units @ ₹ 210.45 p.u.	40,406.40	
Production OH cost of 192 units @ ₹ 97.65 p.u.	18,748.80	1,78,968.96

Cost of closing WIP – 700 Units

Material cost of 700 equivalent units @ ₹ 624.03 p.u.	4,36,821.00	
Labour cost of 490 equivalent units @ ₹ 210.45 piu.	1,03,120.50	
Production OH cost of 490 equivalent @ ₹ 97.65 p.u.	47,848.50	5,87,790.00

	Cost of 8,900 units transferred to next process	₹
(i)	Cost of opening W-I-P Stock b/f – 600 units	4,20,000.00
(ii)	Cost incurred on opening W-I-P stock	
	Material cost	-
	Labour cost 240 equivalent units @ ₹ 210.45 p.u.	50,508.00
	Production OH cost 240 equivalent units @ ₹ 97.65 p.u.	23,436.00
		4,93,944.00
(iii)	Cost of 8,300 completed units	

	8,300 units @ ₹ 932.13 p.u.	77,36,679.00
	Total cost [(i) + (ii) + (iii))]	86,50,623.00

Question 10

Aditya Agro Ltd. mixes powdered ingredients in two different processes to produce one product. The output of Process- I becomes the input of Process -II and the output of Process-II is transferred to the Packing department.

From the information given below, you are required to PREPARE accounts for Process-I, Process-II and Abnormal loss/ gain A/c to record the transactions for the month of February 20X9.

Process-I

Input:	
Material A	6,000 kilograms at Rs. 50 per kilogram
Material B	4,000 kilograms at Rs. 100 per kilogram
Labour	430 hours at Rs. 50 per hour
Normal loss	5% of inputs. Scrap are disposed off at Rs.16 per kilogram
Output	9,200 kilograms.

There is no work- in- process at the beginning or end of the month.

Process-II

Input:	
Material C	6,600 kilograms at Rs. 125 per kilogram
Material D	4,200 kilograms at Rs. 75 per kilogram
Flavouring Essence	Rs. 3,300
Labour	370 hours at Rs.50 per hour
Normal loss	5% of inputs with no disposal value
Output	18,000 kilograms.

There is no work-in-process at the beginning of the month but 1,000 kilograms in process at the end of the month and estimated to be only 50% complete so far as labor and overhead were concerned. Overhead of Rs. 92,000 incurred to be absorbed on the basis of labor hours. ***(MTP 10 Marks, Mar'19 & Sep '23)***

Answer 10

Process-I A/c

Particulars	Qty. (kgs)	Amount	Particulars	Qty. (kgs)	Amount (Rs.)
To Material A	6,000	3,00,000	By Normal loss	500	8,000
To Material B	4,000	4,00,000	By Process-II A/c	9,200	7,38,857
To Labour	-	21,500	By Abnormal loss A/c	300	24,093
To Overhead $\left(\frac{Rs.92,000\times430hrs}{800hrs}\right)$	--	49,450			
	10,000	7,70,950		10,000	7,70,950

$*\frac{\{(Rs.3,00,000+Rs.4,00,000+Rs.21,500+Rs.49,450)-Rs.8,000)\}}{(10,000-500)units} = \frac{Rs.7,70,950-Rs.8,000}{9,500units} = Rs.\ 80.3105$

Process-II A/c

Particulars	Qty. (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
To Process-I A/c	9,200	7,38,857	By Normal loss	1,000	--
To Material C	6,600	8,25,000	By Packing Dept. A/c (See the working notes)	18,000	18,42,496
To Material D	4,200	3,15,000	By WIP A/c (See the working notes)	1,000	1,00,711
To Flavouring essence	--	3,300			
To Labour	--	18,500			
To Overheads $\frac{Rs.92,000\times370hrs}{800hrs}$	--	42,550			

	20,000	19,43,207		20,000	19,43,207

Abnormal loss A/c

Particulars	Qty. (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
T o Process-I A/c	300	24,093	By Bank	300	4,800
			By Costing Profit & Loss A/c	--	19,293
	300	24,093		300	24,093

Working Notes:

Calculation of Equivalent Production units

Input	Units	Output	Units	Process-I		Mat-C & D		Labour & OH	
				(%)	Units	(%)	Units	(%)	Units
	9,200	Transferred to Packing.	18,000	100	18,000	100	18,000	100	18,000
Mat-C	6,600	Closing WIP	1,000	100	1,000	100	1,000	50	500
Mat-D	4,200	Normal loss	1,000	--	--	--	--	--	--
	20,000		20,000		19,000		19,000		18,500

Calculation of Unit cost			
Cost component	**Amount (Rs.)**	**Equivalent units**	**Cost per unit (Rs.)**
Transferred-in	7,38,857	19,000	38.8872
Material-C	8,25,000	19,000	43.4211
Material-D	3,15,000	19,000	16.5789
Flavouring essence	3,300	19,000	0.1737
Total Material Cost	18,82,157	19,000	99.0609
Labour	18,500	18,500	1.0000
Overheads	42,550	18,500	2.3000
Total Cost	**19,43,207**		**102.3609**

Value of Materials transferred to Packing Department = 18,000 unit × Rs.102.3609 = 18,42,496

Value of WIP : For Materials- 1,000 units × Rs.99.0609	Rs.99,061
For Labour & Overheads 500 units × Rs.3.30=	Rs.1,650
	Rs.1,00,711

Question 11

The product of a manufacturing concern passes through two processes A and B and then to finished stock. The details of expenses incurred on the two processes during the year were as under:

	Process A (₹)	Process B (₹)
Materials	40,000	--
Labour	40,000	56,000
Overheads	16,000	40,000

On completion, the output of Process A is transferred to Process B at a price calculated to give a profit of 20% on the transfer price and the output of Process B is charged to finished stock at a profit of 25% on the transfer price. The finished stock department realized ₹ 4,00,000 for the finished goods received from Process B.

You are asked to SHOW process accounts and total profit, assuming that there was no opening or closing work-in-progress. ***(MTP 5 Marks, Apr'24 & Mar'18)***

Answer 11

Process A Account

	Dr.		Cr.
	₹		₹
To Materials	40,000	By Transfer to Process B A/c	1,20,000
To Labour	40,000		

To Overheads	16,000		
	96,000		
To Profit (20% of transfer price, i.e., 25% of cost)	24,000		
	1,20,000		1,20,000

Process B Account

	Dr.		Cr.
	₹		₹
To Transferred from Process A A/c	1,20,000	By Transfer to Finished Stock A/c	2,88,000
To Labour	56,000		
To Overhead	40,000		
	2,16,000		
To Profit (25% of transfer price i.e., 33.33% of cost)	72,000		
	2,88,000		2,88,000

Statement of Total Profit

	₹
Profit from Process A	24,000
Profit from Process B	72,000
Profit on Sales (₹ 4,00,000 – ₹ 2,88,000)	1,12,000
Total Profit	2,08,000

Question 12

Wave Pvt. Ltd. manufactures their products in three consecutive processes. The details are as below:

	Process X	Process Y	Process Z
Transferred to next Process	60%	50%	
Transferred to warehouse for sale	40%	50%	100%

In each process, there is a weight loss of 2% and scrap of 4% of input of each process. The realizable value of scrap of each process is as below:

Process X @ ₹ 3 per ton

Process Y @ ₹ 5 per ton

Process Z @ ₹ 7 per ton.

The following particulars relate to January 2023:

	Process X	Process Y	Process Z
Materials used (in Tons)	1,500	454	189
Rate per ton	₹ 21.5	₹ 14	₹ 12
Direct Wages	₹ 5,000	₹ 3,260	₹ 2,540
Direct Expenses	₹ 3,820	₹ 2,775	₹ 1,900

PREPARE Process Accounts- X, Y and Z & calculate cost per ton at each process.

(MTP 10 Marks, Mar'23) (Same concept different figures RTP Nov'22)

Answer 12

Process X Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Materials	1,500	32,250	By Weight Loss	30	---
To Wages		5,000	By Scrap	60	180
To Direct Expenses		3,820	By Process Y	846	24,534
			By Warehouse	564	16,356
Total	**1,500**	**41,070**	**Total**	**1,500**	**41,070**

Cost per Ton = (41,070 - 180)/(1,500-30-60) = ₹ 29 per ton

Process Y account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process X	846	24,534	By Weight Loss	26	---

To Materials	454	6,356	By Scrap	52	260
To Wages		3,260	By Process Z	611	18,332.5
To Direct Expenses		2,775	By Warehouse	611	18,332.5
Total	**1300**	**36,925**	**Total**	**1300**	**36,925**

Cost per Ton = (36,925 - 260) / (1,300 – 26 - 52) = ₹30 per ton

Process Z Accounts

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process Y	611	18332.5	By Weight Loss	16	---
To Materials	189	2,268	By Scrap	32	224
To Wages		2,540	By Warehouse	752	24,817
To Direct Expenses		1,900			
Total	**800**	**25,041**	**Total**	**800**	**25041**

Cost per Ton = (25,041-224)/(800-16-32) = ₹ 33 per ton

Question 13

'Dairy Wala Private limited' is engaged in the production of flavoured milk. Its process involve filtration and boiling of milk after that some sugar, flavour, colour is added and then letting it cool to fill the product into clean and sterile bottles. For Producing 10 litre of flavour milk, 100 litre of Raw milk is required, which extracts only 45 litres of standardized milk.

Following information regarding Process – I has been obtained from the manufacturing department of Dairy Wala Private limited for the month of December 2022:

Items	(₹)
Opening work-in process (13,500 litre)	
Milk	1,50,000
Labour	45,000
Overheads	1,35,000
Milk introduced for filtration and boiling (3,00,000 litre)	15,00,000
Direct Labour	6,00,000
Overheads	18,00,000
Abnormal Loss: 3,000 litres	
Degree of completion:	
Milk	100%
Labour and overheads	80%
Closing work-in process: 27,000 litres	
Degree of completion:	
Milk	100%
Labour and overheads	80%
Milk transferred for Packing: 1,18,500 litres	
You are required to PREPARE using average method:	
(i) Statement of equivalent production,	
(ii) (Statement of cost,	
(iii) Statement of distribution cost, and	
(iv) Process-I Account.	

(RTP May'23) (Same concept different figures SM)

Answer 13

(i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Milk		Labour & O.H.	
				%	Units	%	Units
Opening WIP	13,500	Completed and transferred to Process-II	1,18,500	100	1,18,500	100	1,18,500

Units introduced	3,00,000	Normal Loss (55%* of 3,00,000)	1,65,000	--	--	--	--
		Abnormal loss	3,000	100	3,000	80	2400
		Closing WIP	27,000	100	27,000	80	21,600
	3,13,500		3,13,500		1,48,500		1,42,500
* 100 litre of milk extracts only 45 litre of standardized milk. Thus, normal loss = 100 – 45 = 55%							

(ii) Statement showing cost for each element

Particulars	Milk (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in- process	1,50,000	45,000	1,35,000	3,30,000
Cost incurred during the month	15,00,000	6,00,000	18,00,000	39,00,000
Total cost: (A)	16,50,000	6,45,000	19,35,000	42,30,000
Equivalent units: (B)	1,48,500	1,42,500	1,42,500	
Cost per equivalent unit: (C) = (A ÷ B)	11.111	4.526	13.578	29.216

(iii) Statement of Distribution of cost

		(₹)	(₹)
1.	Value of units completed and transferred (1,18,500 units × ₹ 29.216)		34,62,096
2.	Value of Abnormal Loss: -		
a.	Milk (3,000 units × ₹ 11.111)	33,333	
b.	Labour (2400 units × ₹ 4.526)	10,863	
c.	Overheads (2400 units × ₹ 13.579)	32,590	76,786
3.	Value of Closing W-I-P:		
	Milk (27,000 units × ₹ 11.111)	299997	
	Labour (21,600 units × ₹ 4.526)	97,762	
	Overheads (21,600 units × ₹ 13.579)	2,93,306	6,91,065

(iv) Process-I A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Opening W.I.P:			By Normal Loss	1,65,000	--
Milk	13,500	1,50,000	By Abnormal Loss (₹.44 difference due to approximation)	3,000	76,839
Labour	--	45,000	By Process-II A/c	1,18,500	34,62,096
Overheads	--	1,35,000	By Closing WIP	27,000	6,91,065
To Milk introduced	3,00,000	15,00,000			
To Direct Labour		6,00,000			
To Overheads		18,00,000			
	3,13,500	**42,30,000**		**3,13,500**	**42,30,000**

Question 14

Vivi Ltd. produces a product which passes through two processes – Process – I and Process-II. The company has provided following information related to the Financial Year 2021-22:

	Process-I	Process -II
Raw Material @₹ 65 per unit	6,500 units	-
Direct Wages	₹ 1,40,000	₹ 1,30,000
Direct Expenses	30% of Direct Wages	35% of Direct Wages
Manufacturing Overheads	₹ 21,500	₹ 24,500
Realisable value of scrap per unit	₹ 4.00	₹ 16.00
Normal Loss	250 units	500 units
Units transferred to Process-II / finished stock	6,000 units	5,500 units
Sales	-	5,000 units

There was no opening or closing stock of work-in progress.

You are required to prepare:

(i) **Process-I Account**
(ii) **Process -II Account**
(iii) **Finished Stock Account** ***(PYP 10 Marks, Nov'22)***

Answer 14

Process-I A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Raw material used (₹ 65 × 6,500 units)	6,500	4,22,500	By Normal loss (250 units × ₹ 4)	250	1,000
To Direct wages	--	1,40,000	By Process- II A/c (₹ 100 × 6,000 units)	6,000	6,00,000
To Direct expenses (30% of ₹ 1,40,000)	--	42,000	By Abnormal loss (₹ 100 × 250 units)	250	25,000
To Manufacturing overhead		21,500			
	6,500	6,26,000		6,500	6,26,000

Cost per unit of completed units and abnormal loss: $\frac{\text{Total Cost}-\text{Realisable value from normal loss}}{\text{Inputs units}-\text{Normal loss units}}$

$= \frac{\text{Rs.6,26,000}-\text{Rs.1,000}}{\text{6,500 units}-\text{250 units}} = \frac{\text{Rs.6,25,000}}{\text{6,250 units}} = \text{Rs. 100}$

Process- II A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process - I A/c	6,000	6,00,000	By Normal loss (500 units × ₹16)	500	**8,000**
To Direct wages	--	1,30,000	By Finished Stock A/c (₹144 × 5,500 units)	5,500	7,92,000
To Direct expenses (35% of ₹ 1,30,000)	--	45,500			
To Manufacturing overhead	--	24,500			
	6,000	8,00,000		6,000	8,00,000

Cost per unit of completed units and abnormal loss:

$\frac{\text{Total Cost}-\text{Realisable value from normal loss}}{\text{Input units}-\text{Normal loss units}}$

$= \frac{\text{Rs.8,00,000}-\text{Rs.8,000}}{\text{6,000 units}-\text{500 units}} = \frac{\text{Rs.7,92,000}}{\text{5,500 units}} = \text{Rs. 144}$

Finished Goods Stock A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process II A/c	5,500	7,92,000	By Cost of Sales (₹144 × 5,000 units)	5,000	7,20,000
			By Balance c/d	500	72,000
	5,500	7,92,000		5,500	7,92,000

EXAM INSIGHTS: This practical Question is based on the Process costing requiring preparation of Process Accounts and Finished Stock Account. Most of the examinees answered well and secured good marks.

Question 15

A product passes through two processes; Process A and Process B.
The output of Process A is treated as input of Process B.
The following information has been furnished:

	Process A	Process B
Input Material	₹ 3,90,000	-
78,000 Kg.@ ₹ 5		
Indirect Material	-	₹34,320
Wages	₹ 2,85,000	₹ 3,30,000
Overhead	₹ 1,67,400	₹ 1,11,600

Output transferred to Process B	68,640 kgs	
Transfer to Finished Stock	-	69,000 kgs
al loss of input material (weight in kgs.)	7,800 kgs	240 kgs

There is no realisable value for normal loss. No stock of raw materials on work-in-process was left at the end. You are required to prepare the Process account for each Process. *(PYP 5 Marks, Nov'23)*

Answer 15

Process A Account

Particulars	Units	₹	Particulars	Units	₹
To Material	78,000	3,90,000	By Normal Loss	7,800	-
To Wages		2,85,000	By Abnormal Loss	1,560	18,720
To Overheads		1,67,400	By Process B A/c	68,640	8,23,680
Total	**78,000**	**8,42,400**	**Total**	**78,000**	**8,42,400**

Cost per unit of completed units and abnormal loss = $\frac{8,42,400}{78,000 \text{ units} - 7,800 \text{ units}}$ = ₹ 12 unit

Process B Account

Particulars	Units	₹	Particulars	Units	₹
To Process A A/c	68,640	8,23,680	By Normal loss	240	-
To Indirect Material		34,320	By Finished stock	69,000	13,11,000
To Wages		3,30,000			
To Overheads		1,11,600			
To Abnormal gain	600	11,400			
Total	**69,240**	**13,11,000**	**Total**	**69,240**	**13,11,000**

Cost per unit of completed units and abnormal gains:

$\frac{\text{Total cost}}{\text{Inputs} - \text{Normal loss}} = \frac{₹12,99,600}{68,640 \text{ units} - 240 \text{ units}}$ = ₹ 19

EXAM INSIGHTS: Question on process costing requiring preparation of process accounts for two processes. Most of the examinees answered on the correct lines and the performance was good.

Question 16

The following are the details in respect of Process A and Process B of a processing factory:

	Process A (₹)	Process B (₹)
Materials	40,000	--
Labour	40,000	56,000
Overheads	16,000	40,000

The output of Process A is transferred to Process B at a price calculated to give a profit of 20% on the transfer price and the output of Process B is charged to finished stock at a profit of 25% on the transfer price. The finished stock department realized ₹ 4,00,000 for the finished goods received from Process B.
You are asked to SHOW process accounts and total profit, assuming that there was no opening or closing work-in-progress. *(MTP 6 Marks Dec'24)*

Answer 16

Dr. **Process A Account** Cr.

	₹		₹
To Materials	40,000	By Transfer to Process B A/c	1,20,000
To Labour	40,000		
To Overheads	16,000		
	96,000		
To Profit (20% of transfer price, i.e., 25% of cost)	24,000		
	1,20,000		1,20,000

Dr. **Process B Account** Cr.

	₹		₹
To Transferred from Process A A/c	1,20,000	By Transfer to Finished Stock A/c	2,88,000
To Labour	56,000		
To Overhead	40,000		
	2,16,000		
To Profit (25% of transfer price i.e., 33.33% of cost)	72,000		
	2,88,000		2,88,000

Statement of Total Profit

	₹
Profit from Process A	24,000
Profit from Process B	72,000
Profit on Sales (₹ 4,00,000 – ₹ 2,88,000)	1,12,000
Total Profit	2,08,000

Question 17

Meta Company Ltd. is engaged in the production of product 'Trio' which passes through two different processes Process P and Process Q. Other information obtained from books of account for the year is as follows:

Particulars	Process P	Process Q
Raw material used	10,000	---
Raw material cost per unit	₹ 80	---
Direct wages	₹ 52,000	₹ 78,000
Direct Expenses	₹ 8,600	₹ 11,100
Selling price per unit of output	₹ 130	₹ 190

Production overheads of ₹ 3,00,000 are recovered as percentage of direct wages.

Actual output of the two processes was:

P-9,200 units and Q-6,400 units. 3/4thof the output of Process P was passed on to the Process Q and the balance was sold. The entire output of process Q was sold.

Management & Selling expenses during the year were ₹ 1,70,000. These are not allocable to the processes.

The normal loss of the two processes, calculated on the input of every process was:

Process P- 6% and Process Q-10%

The Loss of Process P was sold at ₹ 5 per unit and that of Q at ₹ 8 per unit. Assume that Process P and Process Q are not the responsibility centres.

You are required to prepare:

(i) Process P Account

(ii) Process Q Account

(iii) Abnormal Loss and Abnormal Gain Account

(iv) Costing Profit & Loss Account. ***(PYP 8 Marks May '24)***

Answer 17

Process- P Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Material	10,000	8,00,000	By Normal Loss	600	3,000
To Wages		52,000	By Process Q (9,200 × 3/4)	6,900	7,17,600
To Direct Exp.		8,600	By Costing Profit and Loss (P&L) (9,200 × 1/4)	2,300	2,39,200
To Production Overheads (3,00,000 × 2/5)		1,20,000	By Abnormal Loss	200	20,800
	10,000	9,80,600		10,000	9,80,600

Cost per unit = $\frac{9,80,600-3,000}{10,000-600}$ = ₹ 104 per unit

Process- Q Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount(₹)
To Process P	6,900	7,17,600	By Normal Loss	690	5,520
To Wages		78,000			
To Direct Exp.		11,100	By Costing P&L	6,400	10,11,200
To Production Overheads (3,00,000 × 3/5)		180,000			
To Abnormal Gain	190	30,020			
	7,090	10,16,720		7,090	10,16,720

Cost per unit = $\frac{9,80,700-5,520}{6900-690}$ = ₹ 158 per unit

Abnormal Loss Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process- P	200	20,800	By Bank	200	1,000
			By Costing P&L		19,800
	200	20,800		200	20,800

Abnormal Gain Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Normal Loss	190	1,520	By Process Q	190	30,020
To Costing Profit and Loss		28,500			
	190	30,020		190	30,020

Costing Profit & Loss Account for the year

Dr. **Cr.**

Particulars	Amount(₹)	Particulars	Amount(₹)
To Cost of Sales		By Sales	
P - 2,39,200		P 2300 @ 130	
Q - 10,11,200	12,50,400	Q 6400 @ 190	15,15,000
To Abnormal Loss	19,800	By Abnormal Gain	28,500
To Selling Expense	1,70,000		
To Net Profit	1,03,300		
	15,43,500		15,43,500

Question 18

Following details are related to the work done in Process-I by XYZ Company during the month of March:

	(₹)
Opening work-in process (2,000 units)	
Materials	80,000
Labour	15,000
Overheads	45,000
Materials introduced in Process-I (38,000 units)	14,80,000
Direct Labour	3,59,000
Overheads	10,77,000
Units scrapped: 3,000 units	
Degree of completion:	
Materials	100%
Labour and overheads	80%
Closing work-in process: 2,000 units	
Degree of completion:	
Materials	100%
Labour and overheads	80%
Units finished and transferred to Process-II:	35,000 units

Normal Loss:

5% of total input including opening work-in-process.

Scrapped units fetch ₹ 20 per piece. You are required to PREPARE using average method:

(i) Statement of equivalent production

(ii) Statement of cost

(iii) Statement of distribution cost, and

(iv) Process-I Account, Normal Loss Account and Abnormal Loss Account. ***(SM) (Same concept different figures PYP 5 Marks Jan'21)***

Answer 18

(i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	2,000	Completed and transferred to Process-II	35,000	100	35,000	100	35,000
Units introduced	38,000	Normal Loss (5% of 40,000)	2,000	--	--	--	--
		Abnormal loss (Balancing figure)	1,000	100	1,000	80	800
		Closing WIP	2,000	100	2,000	80	1,600
	40,000		40,000		38,000		37,400

(ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	80,000	15,000	45,000	1,40,000
Cost incurred during the month	14,80,000	3,59,000	10,77,000	29,16,000
Less: Realisable Value of normal scrap (₹ 20 × 2,000 units)	(40,000)	--	--	(40,000)
Total cost: (A)	15,20,000	3,74,000	11,22,000	30,16,000
Equivalent units: (B)	38,000	37,400	37,400	
Cost per equivalent unit: (C) = (A ÷ B)	40.00	10.00	30.00	80.00

(iii) Statement of Distribution of cost

		Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (35,000 units × ₹ 80)		28,00,000
2.	Value of Abnormal Loss:		
	- Materials (1,000 units × ₹ 40)	40,000	
	- Labour (800 units × ₹ 10)	8,000	
	- Overheads (800 units × ₹ 30)	24,000	72,000
3.	Value of Closing W-I-P:		
	- Materials (2,000 units × ₹ 40)	80,000	
	- Labour (1,600 units × ₹ 10)	16,000	
	- Overheads (1,600 units × ₹ 30)	48,000	1,44,000

(iv) Process-I A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W.I.P:			By Normal Loss (₹ 20 × 2,000 units)	2,000	40,000
- Materials	2,000	80,000	By Abnormal loss	1,000	72,000
- Labour	--	15,000	By Process-I A/c	35,000	28,00,000
- Overheads	--	45,000	By Closing WIP	2,000	1,44,000
To Materials introduced	38,000	14,80,000			
To Direct Labour		3,59,000			
To Overheads		10,77,000			
	40,000	30,56,000		40,000	30,56,000

Normal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	2,000	40,000	By Cost Ledger Control A/c	2,000	40,000
	2,000	40,000		2,000	40,000

Abnormal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	1,000	72,000	By Cost Ledger Control A/c	1,000	20,000
			By Costing Profit & Loss A/c		52,000
	1,000	72,000		1,000	72,000

Question 19

The following information relate to Process A:

(i)	Opening Work-in-Process	8,000 units at Rs.15,00,000
	Degree of Completion: Material	100%
	Labour and Overhead	60%
(ii)	Input 1,82,000 units at	Rs.1,47,50,000
(iii)	Wages paid	Rs.68,12,000
(iv)	Overheads paid	Rs.34,06,000
(v)	Units scrapped	14,000
	Degree of Completion: Material	100%
	Wages and Overheads	80%
(vi)	Closing Work - in- Process	18,000 units
	Degree of Completion: Material	100%
	Wages and Overheads	70%
(vii)	Units completed and transferred to next process 1,58,000 units	
(viii)	Normal loss 10% of total input including opening WIP	
(ix)	Scrap value is Rs.15 per unit to be adjusted out of direct material cost	

You are required to COMPUTE on the basis of FIFO

(i) Equivalent Production

(ii) Cost per unit

(iii) Value of units transferred to next process.

(MTP 10Marks, Oct'18, RTP Nov 19) (Same concepts different figures MTP 10 Marks Apr'21)

Answer 19

(i) Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production			
Particulars	Units	Particulars	Units	Material		Labour & Overheads	
				(%)	Units	(%)	Units
Opening WIP	8,000	Transfer to next Process:					
Introduced	1,82,000	Opening WIP completed	8,000	--	--	40	3,200
		Introduced & completed	1,50,000	100	1,50,000	100	1,50,000
		Normal loss 10% (8,000 + 182,000)	19,000	--	--	--	--
		Abnormal gain	(5,000)	100	(5,000)	100	(5,000)
		Closing WIP	18,000	100	18,000	70	12,600
	1,90,000		1,90,000		1,63,000		1,60,800

(ii) Computation of Cost per unit

Particulars	Materials (Rs.)	Labour (Rs.)	Overhead (Rs.)
Input of Materials	1,47,50,000	--	--
Expenses	--	68,12,000	34,06,000
Total	1,47,50,000	68,12,000	34,06,000
Less: Sale of Scrap (19,000 units × Rs.15)	(2,85,000)	--	--

Net cost	1,44,65,000	68,12,000	34,06,000
Equivalent Units	1,63,000	1,60,800	1,60,800
Cost Per Unit	88.7423	42.3632	21.1816

Total cost per unit = ₹ (88.7423 + 42.3632 + 21.1816) = ₹ 152.2871

(iii) Value of units transferred to next process:

	Amount (Rs.)	Amount (Rs.)
Opening W-I-P	15,00,000.00	
Add: Labour (3,200 units × Rs. 42.3632)	1,35,562.24	
Overhead (3,200 units × Rs. 21.1816)	67,781.12	17,03,343.36
New introduced (1,50,000 units × Rs. 152.2871)		2,28,43,065.00
		2,45,46,408.36

Question 20

LDR

XYZ Ltd. is manufacturer of medicines. It carries on production operation in two processes. The material first passes through Process I, where Medicine ' X' is produced. Following data are given for the month October, 2022:

Opening work-in-progress quantity (Material 100% and conversion 50% complete)	(in Liter)	12,000
Material input quantity	(in Liter)	60,000
Work completed quantity	(in Liter)	40,000
Closing work-in-progress quantity (Material 100% and conversion 80% complete)	(in Liter)	15,000
Opening work-in-progress cost		
Material cost	(in ₹)	1,75,000
Processing cost	(in ₹)	1,40,000
Material input cost	(in ₹)	7,70,000
Processing cost	(in ₹)	8,35,000

Normal process loss is 15% of material input. It has no realizable value.

Any quantity of Medicine 'X' can be sold for ₹ 42.50 per Liter. Alternatively, it can be transferred to Process II for further processing and then sold as Medicine ' XYZ' for ₹ 50 per Liter. Further materials are added in Process II, which yield 1.25 Liter of Medicine ' XYZ' for every Liter of Medicine 'X' of Process I. Out of the 40,000 Liter of work completed in Process I, 10,000 Liter are sold as Medicine 'X' and 30,000 Liter are passed through Process II for sale as Medicine 'XYZ'.

The monthly costs incurred in Process II (other than the cost of Medicine ' X') are:

Input	30,000 Liter of Medicine 'X'
Materials Cost	₹ 2,75,000
Processing Costs	₹ 2,50,000

You are required to:

(i) **PREPARE Statement of Equivalent production and determine the cost per Liter of Medicine 'X' in Process I, using the weighted average cost method.**

(ii) **Company is mulling over the option to sell the 30,000 Liter of Medicine ' X' at Process-I without processing it further in Process-II. WILL IT BE beneficial for the company over the current pattern of processing 30,000 Liter in process-II? *(MTP 10 Marks, Sep'22)***

Answer 20

(i) Process I Statement of Equivalent Production (Under Weighted Average Method)

Particulars	Input units (in Liter)	Particulars	Output units (in Liter)	Equivalent Production			
				Material		Conversion	
				(%)	Equivalent units (in Liter)	(%)	Equivalent units (in Liter)
Opening WIP	12,000	Units introduced and completed	40,000	100	40,000	100	40,000

New Material Introduced	60,000	Normal Loss (15% of 60,000 liters)	9,000	-	-	-	-
		Closing WIP	15,000	100	15,000	80	12,000
		Abnormal Loss (Bal. fig.)	8,000	100	8,000	100	8,000
	72,000		72,000		63,000		60,000

Statement of Cost for Each Element

Elements of Costs	Material (₹)	Conversion Cost (₹)
Costs of Opening WIP	1,75,000	1,40,000
Cost of the Process (for the period)	7,70,000	8,35,000
Total Cost	**9,45,000**	**9,75,000**
Equivalent Units (in liter)	63,000	60,000
Cost Per equivalent Units (in liter)	**₹ 15**	**₹ 16.25**

Therefore, Cost of Medicine 'X' is ₹ 31.25 per liter (₹ 15 + ₹ 16.25)

(ii) Statement showing comparative data to decide whether 30,000 Liters of Medicine 'X' should be further processed into 'XYZ'

	Alternative 1	Alternative 2
	Sell medicine 'X' afterProcess I (₹)	**Process further into 'XYZ' (₹)**
Sales	**12,75,000 (30,000 liters x ₹ 42.50)**	**18,75,000 (37,500 liters x ₹ 50)**
Less: Costs:		
Process I - Costs (30,000 liters x ₹ 31.25)	9,37,500	9,37,500
Material in Process II	-	2,75,000
Conversion cost in Process II	-	2,50,000
Total Cost	**9,37,500**	**14,62,500**
Profit	**3,37,500**	**4,12,500**

Hence, company should process further as it will increase profit further by ₹ 75,000 (₹ 4,12,500 – ₹ 3,37,500)

Question 21

PQR Company Ltd. provides the following information relating to Process-P:

(i) Opening Work-in-progress	- NIL
(ii) Units Introduced	- 45,000 units @ ₹ 10 per unit
(iii) Expenses debited to the process: Direct material ₹ 65,500 Labour ₹ 90,800 Overhead ₹1,80,700	
(iv) Normal loss in the process	2% of Input
(v) Work-in progress	1800 units
Degree of completion	
Materials	- 100 %
Labour	- 50%
Overhead	- 40%
(vi) Finished output	- 42,000 units

(vii) Degree of completion of abnormal loss:

Materials	100%
Labour	80%
Overhead	60%

(viii) Units scrapped as normal loss were sold at ₹ 5 per unit.

(ix) All the units of abnormal loss were sold at ₹ 2 per unit. You are required to PREPARE:

- Statement of equivalent production.
- Statement showing the cost of finished goods, abnormal loss and closing balance of work-in-progress.
- Process-P account and abnormal loss account. *(MTP 10 Marks July'24)*

Answer 21

Statement of Equivalent Production

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material		Labour		Overhead	
				%	Units	%	Units	%	Units
Unit Introduced	45,000	Finished output	42,000	100	42,000	100	42,000	100	42,000
		Normal loss (2% of 45,000)	900	-	-	-	-	-	-
		Abnormal loss	300	100	300	80	240	60	180
		Closing W-I-P	1,800	100	1,800	50	900	40	720
	45,000		45,000		44,100		43,140		42,900

Statement of Cost

Particulars	Units	Rate (₹)	Amount (₹)	Amount (₹)
(i) Finished goods	42,000	17.9042		7,51,976.40
(ii) Abnormal Loss				
Material	300	11.5873	3,476.19	
Labour	240	2.1048	505.15	
Overhead	180	4.2121	758.18	4,739.52
(iii) Closing W-I-P:				
Material	1,800	11.5873	20,857.14	
Labour	900	2.1048	1,894.32	
Overhead	720	4.2121	3,032.71	25,784.17

Cost per Unit

Particulars	Amount (₹)	Units	Per Unit (₹)
(i) Direct Material :			
Unit Introduced	4,50,000		
Add: Material	65,500		
	5,15,500		
Less: Value of normal loss (900 units × ₹ 5)	(4,500)		
	5,11,000	44,100	11.5873
(ii) Labour	90,800	43,140	2.1048
(iii) Overhead	1,80,700	42,900	4.2121
			17.9042

Process – P A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Input	45,000	4,50,000	By Normal loss	900	4,500
To Direct Material	-	65,500	By Abnormal loss	300	4,740
To Labour	-	90,800	By Finished goods	42,000	7,51,976
To Overhead		1,80,700	By Closing W-I-P	1,800	25,784
	45,000	7,87,000		45,000	7,87,000

Abnormal Loss A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process-B A/c	300	4,740	By Cost ledger control A/c or Bank A/c	300	600
			By Costing Profit & loss A/c	-	4,140
	300	4,740		300	4,740

Question 22

As demand for LED light increases, more entrepreneurs are coming into its manufacturing process. eLED Pvt. Ltd. is also one of the recently formed company whose main business is related to LED lights.

The company has extended its hand into various LED products like COB (Chip On Board) LEDs, SMD (Surface Mounted Device) LEDs, RGB LEDs, Flashing LEDs, Miniature LEDs, OLEDs, Filament Bulbs, etc.
However, at the beginning stage, the company has decided to only assemble the products and enter into manufacturing stage at later years.
The details relating to the first process of mounting for the month of August are given below:

Opening Work-in-Process:	31,000 units
Material	₹12,40,000
Labour	₹2,32,500
Overheads	₹6,97,500
Introduction during the process:	5,89,000 units
Material	₹2,29,40,000
Labour	₹55,64,500
Overheads	₹1,66,93,500

The process involve some wastage as well. The management estimated a normal loss of 5% of total input including opening work-in-process which can be sold out for ₹ 20 per unit. However, the workers reported 46,500 units as scrapped in which 100% material was used along with 80% of Labour and overheads.
5,42,500 units were transferred for next process of soldering.
Some units were still in process and thus, shifted for the next month process of mounting. With 100% material used along with 80% labour and overheads, 31,000 units were shifted.
Following the average method of inventory, you are required to PREPARE:

- Statement of cost showing cost per equivalent unit
- Statement of distribution cost
- Process Account (Mounting)
- Normal Loss Account and Abnormal Loss Account. *(MTP 10 Marks Aug'24)*

Answer 22

(i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour &O.H.	
				%	Units	%	Units
Opening WIP	31,000	Completed andtransferred to Process (Soldering)	5,42,500	100	5,42,500	100	5,42,500
Units introduced	5,89,000	Normal Loss (5% of6,20,000)	31,000	--	--	--	--
		Abnormal loss (Balancing figure)	15,500	100	15,500	80	12,400
		Closing WIP	31,000	100	31,000	80	24,800
	6,20,000		6,20,000		5,89,000		5,79,700

Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	12,40,000	2,32,500	6,97,500	21,70,000
Cost incurred during the month	2,29,40,000	55,64,500	1,66,93,500	4,51,98,000
Less: Realisable Value of normal scrap (₹20 × 31,000 units)	(6,20,000)	--	--	(6,20,000)
Total cost: (A)	2,35,60,000	57,97,000	1,73,91,000	4,67,48,000
Equivalent units: (B)	5,89,000	5,79,700	5,79,700	
Cost per equivalentunit: (C) = (A ÷ B)	**40.00**	**10.00**	**30.00**	**80.00**

(ii) Statement of Distribution of cost

		Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (5,42,500 units × ₹80)		4,34,00,000
2.	Value of Abnormal Loss:		
	- Materials (15,500 units × ₹40)	6,20,000	
	- Labour (12,400 units × ₹10)	1,24,000	
	- Overheads (12,400 units × ₹30)	3,72,000	11,16,000
3.	Value of Closing W-I-P:		
	- Materials (31,000 units × ₹ 40)	12,40,000	
	- Labour (24,800 units × ₹ 10)	2,48,000	
	- Overheads (24,800 units × ₹ 30)	7,44,000	22,32,000
	Total		**4,67,48,000**

(iii) Process Account (Mounting)

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W.I.P:			By Normal Loss (₹20 × 31,000 units)	31,000	6,20,000
- Materials	31,000	12,40,000	By Abnormal loss	15,500	11,16,000
- Labour	--	2,32,500	By Process A/c (Soldering)	5,42,500	4,34,00,000
- Overheads	--	6,97,500	By Closing WIP	31,000	22,32,000
To Materials introduced	5,89,000	2,29,40,000			
To Direct Labour		55,64,500			
To Overheads		1,66,93,500			
	6,20,000	4,73,68,000		6,20,000	4,73,68,000

(iv) Normal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To ProcessAccount (Mounting)	31,000	6,20,000	By Cost LedgerControl A/c	31,000	6,20,000
	31,000	6,20,000		31,000	6,20,000

Abnormal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process Account(Mounting)	15,500	11,16,000	By Cost Ledger Control A/c	15,500	3,10,000
			By Costing Profit & Loss A/c		8,06,000
	15,500	11,16,000		15,500	11,16,000

Question 23

Wiwitsu Ltd. produces a product "XYZ" which passes through two processes, viz. Process-A and Process-B. The details for the year ending 31st March, 2020 are as follows:

	Process A	Process - B
40,000 units introduced at a cost of	Rs. 3,60,000	-
Material consumed	Rs. 2,42,000	2,25,000
Direct wages	Rs. 2,58,000	1,90,000
Manufacturing expenses	Rs. 1,96,000	1,23,720
Output in units	37,000	27,000
Normal wastage of inputs	5%	10%
Scrap value (per unit)	Rs. 15	20
Selling price (per unit)	Rs. 37	61

Additional Information:

(a) 80% of the output of Process-A, was passed on to the next process and the balance was sold. The entire

output of Process- B was sold.

(b) Indirect expenses for the year was Rs. 4,48,080.

(c) It is assumed that Process-A and Process-B are not responsibility centre.

Required:

(i) PREPARE Process-A and Process-B Account.

(ii) PREPARE Costing Profit & Loss Account showing the net profit/ net loss for the year.

(MTP 10 Marks, May'20 & Oct '23)

Answer 23

(i) Process- A Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Inputs	40,000	3,60,000	By Normal wastage	2,000	30,000
			(2,000 units × Rs.15)		
To Material	---	2,42,000	By Abnormal loss A/c	1,000	27,000
			(1,000 units × Rs.27)		
To Direct wages	---	2,58,000	By Process- B	29,600	7,99,200
			(29,600 units × Rs.27)		
To Manufacturing Exp.	---	1,96,000	By Profit & Loss A/c	7,400	1,99,800
			(7,400 units × Rs.27)		
	40,000	10,56,000		40,000	10,56,000

Cost per unit = Rs. 10,56,000- Rs. 30,000 / 40,000units -2,000 units = Rs. 27 per unit

Normal wastage = 40,000 units × 5% = 2,000 units

Abnormal loss= 40,000 units – (37,000 units + 2,000 units) = 1,000 units

Transfer to Process- B = 37,000 units × 80% = 29,600 units

Sale = 37,000 units × 20% = 7,400 units

Process- B Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	29,600	7,99,200	By Normal wastage (2,960 units × Rs. 20)	2,960	59,200
To Material	---	2,25,000	By Profit & Loss A/c (27,000 units × Rs. 48)	27,000	12,96,000
To Direct Wages	---	1,90,000			
To Manufacturing Exp.	---	1,23,720			
To Abnormal Gain A/c (360 units × Rs. 48)	360	17,280			
	29,960	13,55,200		29,960	13,55,200

Cost per unit = Rs. 13,37,920-Rs.59,200 / 29,600 units – 2,960 units = Rs. 48 per unit

Normal wastage = 29,600 units × 10% = 2,960 units

Abnormal gain = (27,000 units + 2,960 units) – 29,600 units = 360 units

(ii) Costing Profit & Loss Account

Particulars	Amount (Rs.)	Particulars	Amoun (Rs.)
To Process- A A/c	1,99,800	By Sales:	
To Process- B A/c	12,96,000	· Process-A (7,400 units × Rs. 37)	2,73,800
To Abnormal loss A/c	12,000	· Process- B (27,000 units × Rs. 61)	16,47,000
To Indirect Expenses	4,48,080	By Abnormal gain	10,000
		By Net loss	25,000
	19,55,880		19,55,880

Working Notes:

Normal wastage (Loss) Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	2,000	30,000	By Abnormal Gain A/c (360 units × Rs. 20)	360	7,200

To Process- B A/c	2,960	59,200	By Bank (Sales)	4,600	82,000
	4,960	89,200		4,960	89,200

Abnormal Loss Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Process- A A/c	1,000	27,000	By Bank A/c (1,000 units × Rs. 15)	1,000	15,000
			By Profit & Loss A/c	---	12,000
	1,000	27,000		1,000	27,000

Abnormal Gain Account

Particulars	Units	Amount (Rs.)	Particulars	Units	Amount (Rs.)
To Normal loss A/c (360 units × Rs. 20)	360	7,200	By Process- B A/c	360	17,280
To Profit & Loss A/c		10,080			
	360	17,280		360	17,280

Question 24

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

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

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

The scraps are sold at Rs. 10 per unit

Product-Z can be sold at Rs. 135 per unit with a selling cost of Rs. 15 per unit

No. of units produced:

Process-I- 6,600; Process-II- 5,200, Process-III- 4,800 and Product-Z- 600

There is no stock at the beginning and end of the month.

You are required to PREPARE accounts for:

(i) Process-I, II and III

(ii) By-Product-Z *(MTP 10 Marks, Mar'21, RTP Nov'20)*

Answer 24

Total direct wages

= Rs. 42,000 + Rs. 54,000 + Rs. 48,000 = Rs. 1,44,000

Percentage absorption of production overhead on the basis of direct wages

$= \frac{2,88,000}{1,44,000} \times 100 = 200\%$

(i) Process-I A/c

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

*Cost per Unit = $\frac{\text{Rs.}(3,42,000-3,500)}{(7,000-350)\text{Units}}$ = Rs.50.9022

Process-II A/c

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

*Cost per Unit = $\frac{\text{Rs.}(6,49,955-6,600)}{(6,600-660)\text{Units}}$ = Rs. 108.3089

Process-III A/c

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

***Cost per Unit = $\frac{\text{Rs.}(8,05,406-2,600-21,000)}{(5,200-260-660)\text{Units}}$ = Rs. 180.1396

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

(ii) By-Product Process A/c

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

Question 25

LDR

A Manufacturing unit manufactures a product which passes through three distinct Processes - A, B and C. The following data is given:

	Process A	Process B	Process C
Material consumed (in ₹)	36,400	31,500	28,000
Direct wages (in ₹)	56,000	49,000	42,000

- **The total Production Overhead of ₹ 2,20,500 was recovered @ 150% of Direct wages.**
- **15,000 units at ₹ 28 each were introduced to Process 'A'.**
- **The output of each process passes to the next process and finally, 12,000 units were transferred to Finished Stock Account from Process ' C'.**
- **No stock of materials or work in progress was left at the end.**

The following additional information is given:

Process	% of wastage to normal input	Value of Scrap per unit (₹)
A	6%	15.40
B	?	28.00
C	5%	14.00

You are required to:

(i) **FIND OUT the percentage of wastage in process 'B', given that the output of Process 'B' is transferred to Process 'C' at ₹ 56 per unit.**

(ii) **PREPARE Process accounts for all the three processes A, B and C.**

(MTP 10 Marks, Apr'22) (Same concept different figures PYP 10 Marks Jul'21)

Answer 25

Process-A Account

Particulars	Units	Dr. (₹)	Particulars	Units	Cr. (₹)
To Material introduced	15,000	4,20,000	By Normal Loss A/c [(6% of 15,000 units) x ₹ 15.40]	900	13,860
To Additional material	--	36,400	By Process-B A/c (₹ 41.31* × 14,100 units)	14,100	5,82,540
To Direct wages	--	56,000			
To Production OH	--	84,000			
	15,000	5,96,400		15,000	5,96,400

* Cost per unit of completed units

$$= \frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{\text{Rs.5,96,400} - \text{Rs.13,860}}{\text{15,000 units} - \text{900 units}} = \text{Rs. 41.31}$$

Dr. Process-B Account Cr.

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-A A/c	14,100	5,82,540	By Normal Loss A/c [(#13.44% of 14,100 units) x ₹ 28]	1,895	53,060
To Additional material	--	31,500	By Process-C A/c (₹ 56 × 12,205 units)	12,205	6,83,480
To Direct wages	--	49,000			
To Production OH	--	73,500			
	14,100	7,36,540		14,100	7,36,540

#Calculation for % of wastage in process 'B':

Let's consider number of units lost under process 'B' = b

Now, $\frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = 56$

$\frac{\text{Rs.7,36,540} - \text{Rs.28b}}{\text{14,100 units} - \text{b}} = \text{Rs. 56}$

₹ 7,36,540 - ₹ 28b = ₹ 7,89,600 - ₹ 56b

28b = ₹ 53,060 => b = 1,895 units

% of wastage = 1,895 units /14,100 units = **13.44%**

Process-C Account

Particulars	Units	Dr. (₹)	Particulars	Units	Cr. (₹)
To Process-B A/c	12,205	6,83,480	By Normal Loss A/c [(5% of 12,205 units) x ₹ 14]	610	8,540
To Additional material	--	28,000	By Finished Stock A/c (₹ 69.68$ × 12,000 units)	12,000	8,36,160
To Direct wages	--	42,000			
To Production OH	--	63,000			
To Abnormal gain (₹ 69.68$ × 405 units)	405	28,220			
	12,610	8,44,700		12,610	8,44,700

Cost per unit of completed units = $\frac{\text{Total Cost} - \text{Realisable value from normal loss}}{\text{Input units} - \text{Normal loss units}}$

$= \frac{\text{Rs.8,16,480} - \text{Rs.8,540}}{\text{12,205 units} - \text{610 units}}$

= ₹69.68

Question 26

LDR

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 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?**

(Note: You are not required to prepare Process Accounts) (PYP 10 Marks, May'22)

Answer 26

(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	$\frac{29,500+3,34,000}{1,04,000}$	3.5
Processing cost	$\frac{14,750+2,53,100}{1,04,000}$	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, itis advisable to process further chemical 'G'.

Exam Insights: This numerical question was based on the topic Process costing for calculating equivalent units, cost for transferred units to Process-II, cost of abnormal loss, cost of closing work-in-progress and decision for processing in Process-II or sell after first process. Some of examinees faced hardship in the calculation of equivalent units; hence, the performance of the examinees was average.

Question 27 — LDR

Navyug Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes and the company uses a FIFO process costing system to value work-in-process and finished goods. At the end of the last month, a fire occurred in the factory and destroyed some of the paper files containing records of the process operations for the month.

Navyug Ltd. needs your help to prepare the process accounts for the month during which the fire occurred. You have been able to gather some information about the month's operating activities but some of the information could not be retrieved due to the damage. The following information was salvaged:

- **Opening work-in-process at the beginning of the month was 900 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 29,970.**
- **Closing work-in-process at the end of the month was 160 litres, 30% complete for labour and 20% complete for overheads.**
- **Normal loss is 10% of input and total losses during the month were 1,800 litres partly due to the fire damage.**
- **Output sent to finished goods warehouse was 4,200 litres.**
- **Losses have a scrap value of ₹ 20 per litre.**
- **All raw materials are added at the commencement of the process.**
- **The cost per equivalent unit (litre) is ₹39 for the month made up as follows:**

	(₹)
Raw Material	23
Labour	7
Overheads	9
	39

REQUIRED:

(i) Calculate the quantity (in litres) of raw material inputs during the month.

(ii) Calculate the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.

(iii) Calculate the values of raw material, labour and overheads added to the process during the month.

(iv) Prepare the process account for the month.

(MTP 10 Marks, Oct'21, RTP May'18) (Same concept different figures RTP May'20)

Answer 27

(i) Calculation of Raw Material inputs during the month:

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	900	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,260	Process Losses	1,800
		Closing WIP	160
	6,160		6,160

(ii) Calculation of Normal Loss and Abnormal Loss/Gain

Particulars	Litres
Total process losses for month	1,800
Normal Loss (10% input)	526
Abnormal Loss (balancing figure)	1,274

(iii) Calculation of values of Raw Material, Labour and Overheads added to the process:

	Material	Labour	Overheads
Cost per equivalent unit	₹ 23.00	₹ 7.00	₹ 9.00
Equivalent units (litre) (refer the working note)	4,734	4,892	4,966
Cost of equivalent units	₹ 1,08,882	₹ 34,244	₹ 44,694
Add: Scrap value of normal loss (526 units × ₹ 20)	₹ 10,520	--	--
Total value added	₹ 1,19,402	₹ 34,244	₹ 44,694

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	900	Units completed:							
Units introduced	5,260	- Opening WIP	900	--	--	270	30	360	40
		- Fresh inputs	3,300	3,300	100	3,300	100	3,300	100
		Normal loss	526	--	--	--	--	--	--
		Abnormal loss	1,274	1,274	100	1,274	100	1,274	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,734		4,892		4,966	

(iv) Process Account for Month

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	900	29,970	By Finished goods	4,200	1,63,800
To Raw Materials	5,260	1,19,402	By Normal loss	526	10,520
To Wages	--	34,244	By Abnormal loss	1,274	49,686
To Overheads	--	44,694	By Closing WIP	160	4,304
	6,160	2,28,310		6,160	2,28,310

Question 28

Following information is available regarding Process-I for the month of February:

Production Record:

Units in process as on 1st February (All materials used, 25% complete for labour and overhead)	4,000
New units introduced	16,000
Units completed	14,000
Units in process as on 28th February (All materials used, 33-1/3% complete for labour and overhead)	6,000
Cost Records:	
Work-in-process as on 1st February	(₹)
Materials	6,000
Labour	1,000
Overhead	1,000
	8,000
Cost during the month:	
Materials	25,600
Labour	15,000
Overhead	15,000
	55,600
Presuming that average method of inventory is used, PREPARE:	

(i)	Statement of equivalent production.	
(ii)	Statement showing cost for each element.	
(iii)	Statement of apportionment of cost.	
(iv)	Process cost account for Process-I.	

(MTP 10 Marks, Nov'21, RTP May '19, SM) (Same concept different figures RTP Nov'21)

Answer 28

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

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	4,000	Completed and transferred	14,000	100	14,000	100	14,000
Units introduced	16,000	Closing WIP	6,000	100	6,000	33-1/3	2,000
	20,000		20,000		20,000		16,000

(ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in- process	6,000	1,000	1,000	8,000
Cost incurred during the month	25,600	15,000	15,000	55,600
Total cost: (A)	31,600	16,000	16,000	63,600
Equivalent units: (B)	20,000	16,000	16,000	
Cost per equivalent unit: (C) = (A ÷ B)	1.58	1	1	3.58

(iii) Statement of apportionment of cost

		Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (14,000 units × ₹ 3.58)		50,120
2.	Value of Closing W-I-P:		
	- Materials (6,000 units × ₹ 1.58)	9,480	
	- Labour (2,000 units × ₹ 1)	2,000	
	- Overheads (2,000 units × ₹ 1)	2,000	13,480

(iv) Process-I Cost Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W-I-P	4,000	8,000	By Completed units	14,000	50,120
To Materials	16,000	25,600	By Closing W-I-P	6,000	13,480
To Labour	--	15,000			
To Overhead	--	15,000			
	20,000	63,600		20,000	63,600

Question 29

The following data are available in respect of Process-I for January 2024:

(1) Opening stock of work in process: 600 units at a total cost of ₹ 4,200.

(2) Degree of completion of opening work in process:

Material	100%
Labour	60%
Overheads	60%

(3) Input of materials at a total cost of ₹ 55,200 for 9,200 units.

(4) Direct wages incurred ₹ 18,600

(5) Overheads ₹ 8,630.

(6) Units scrapped 200 units. The stage of completion of these units was:

Material	100%
Labour	80%
Overheads	80%

(7) Closing work in process; 700 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overheads	70%

(8) 8,900 units were completed and transferred to the next process.

(9) Normal loss is 4% of the total input (opening stock plus units put in)

(10) Scrap value is ₹ 6 per unit. You are required to:

(i) PREPARE using FIFO method, Statement of equivalent production,

(ii) PREPARE Statement of cost,

(iii) CALCULATE cost of closing WIP,

CALCULATE the cost of the units to be transferred to the next process.

(RTP May'24, MTP 10 Marks April '19) (Same concept different figures MTP 10 Marks Oct'22)

Answer 29

(i) Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production					
				Materials		Labour		Overheads	
Details	Units	Details	Units	%	Units	%	Units	%	Units
Opening Stock	600	Finished goods transferred to next process:							
		-From opening stock	600	-	-	40	240	40	240
		-From fresh materials	8,300	100	8,300	100	8,300	100	8,300
		Closing W-I-P	700	100	700	70	490	70	490
Fresh inputs	9,200	Normal loss	392	-	-	-	-	-	-
			9,992		9,000		9,030		9,030
		Less: Abnormal Gain	(192)	100	(192)	100	(192)	100	(192)
	9,800		9,800		8,808		8,838		8,838

(ii) Statement of Cost per equivalent units

Elements	(₹)	Cost (₹)	Equivalent units	Cost perequivalent Unit (₹)
Material Cost	55,200			
Less: Scrap realization 392 units @ ₹ 6/- p.u.	2,352	52,848	8,808	6.00
Labour cost		18,600	8,838	2.10
Overheads		8,630	8,838	0.98
Total Cost		80,078		9.08

Cost of Abnormal Gain – 192 Units

	(₹)	(₹)
Material cost of 192 units @ ₹ 6.00/- p.u.	1,152.00	
Labour cost of 192 units @ ₹ 2.10/- p.u.	403.20	
Overheads of 192 units @ ₹ 0.98/- p.u.	188.16	1,743.36

(iii) Cost of closing WIP – 700 Units

Material cost of 700 equivalent units @ ₹ 6.00/- p.u.	4,200.00	
Labour cost of 490 equivalent units @ ₹2.10/- p.u.	1,029.00	
Overheads of 490 equivalent @ ₹ 0.98/- p.u.	480.20	5709.20

(iv) Calculation of cost of 8,900 units transferred to next process

			(₹)
(i)	Cost of opening W-I-P Stock b/f –	600 units	4,200.00
(ii)	Cost incurred on opening W-I-P stock		
	Material cost	—	
	Labour cost 240 equivalent units @ ₹ 2.10 p.u.	504.00	
	Overheads 240 equivalent units @ ₹ 0.98/- p.u.	235.20	
			739.20
(iii)	Cost of 8,300 completed units		
	8,300 units @ ₹9.08 p.u.		75,364.00
	Total cost [(i) + (ii) + (iii))]		80,303.20

Question 30

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

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

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

Costs incurred in Process-II are as follows:

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

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

Required:

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

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

(RTP May'21) (Same concept but different figures RTP May'22 & SM)

Answer 30

Process I

Statement of Equivalent Production and Cost

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

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

Process-I Account

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

* (Material 10,000 units × ₹ 7.5) + (Labour 5,000 units × ₹ 10) + (Overheads 5,000 units × ₹7)
= ₹ 75,000 + ₹ 50,000 + ₹ 35,000 = ₹ 1,60,000

Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--

	Closing WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

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

Process-II Account

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

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

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

Question 31

Hawtt Veel is a renowned brand of HV Ltd. which manufactures toy car. The manufacturing process of the toy cars at first involve designing the parts, creating the mold and then simultaneously melting the plastic. As the mold created last year is being used as it is for the current year, the first process involves only melting the plastic (Process I). The next process is about injecting the plastic into the mold and assembling the parts formed (Process II).

During the month of April, the materials for 1,20,000 toy cars were put through Process I of which melting process were completed for 90,000 toy cars only before transferring to Process II.

The costs incurred in Process I are as follows:

Direct material	₹ 22,50,000
Direct wages	₹ 27,00,000
Factory overheads	₹ 18,00,000

Degree of completion for those not transferred to Process II is as follows:

Materials	100%
Labour and overheads	50%

Out of those transferred to Process II for injecting and assembling, 84,000 units of toy car were completed and transferred to finished goods store for protective packing. The process of protective packing is done at the end of the Process II and the costs incurred are as follows:

Packing materials	₹ 6,00,000
Direct wages	₹ 5,25,000
Factory overheads	₹ 6,75,000

There was a normal loss of 600 units in Process II with no salvage value.

Some units were still in progress under Process II and thus, shifted for the next month process.

The degree of completion for those not transferred to finished goods store is as follows:

Materials	100%
Labour and overheads	25%

You are required to PREPARE-

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

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

(MTP 10 Marks Nov'24)

Answer 31

(i) Process I – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Equivalent Production units
		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	90,000	30,000	100%	30,000	1,20,000
Wages	90,000	30,000	50%	15,000	1,05,000
Overhead	90,000	30,000	50%	15,000	1,05,000

Process I

Particulars	Process Cost (₹)	Equivalent Production (units)	Process Cost p.u. (₹) (2)/(3)	WIP stock Equivalen tunits	Cost of WIP Stock(₹) (4) x (5)	Transfer toProcess II (₹) (2)-(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	22,50,000	1,20,000	18.750	30,000	5,62,500	16,87,500
Wages	27,00,000	1,05,000	25.714	15,000	3,85,714	23,14,286
Overhead	18,00,000	1,05,000	17.143	15,000	2,57,143	15,42,857
	67,50,000				12,05,357	55,44,643

Process I A/c

Particulars	Unit	(₹)	Particulars	Units	(₹)
To Direct material	1,20,000	22,50,000	By Process II A/c	90,000	55,44,643
To Direct wages	--	27,00,000	By Closing W-I-P	30,000	12,05,357
To Factory overhead	--	18,00,000			
	1,20,000	67,50,000		1,20,000	67,50,000

(ii) Process II – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Equivalent Productionunits
		Units	% of Completion	EquivalentUnits	
	(1)			(2)	(1) + (2)
Material	84,000	5,400*	100%	5,400	89,400
Wages	84,000	5,400	25%	1,350	85,350
Overhead	84,000	5,400	25%	1,350	85,350

*(90,000 - 84,000 - 600) units = 5,400 units

Process II

Particulars	Process Cost (₹)	Equivalent Production (units)	Process Cost p.u.(₹) (2)/(3)	WIP stock Equivalent units	Cost ofWIP Stock(₹) (4) x (5)	Transferto FinishedStock (₹) (2)-(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	55,44,643	89,400	62.021	5,400	3,34,911	52,09,732
Wages	5,25,000	85,350	6.151	1,350	8,304	5,16,696
Overhead	6,75,000	85,350	7.909	1,350	10,677	6,64,323
	67,44,643				3,53,892	63,90,751
Add: Packing Material Cost						6,00,000
Cost of Finished Stock						69,90,751

Process II A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process I	90,000	55,44,643	By Finished Stock	84,000	69,90,751
To Direct wages	--	5,25,000	By Normal loss	600	--
To Factory overhead	--	6,75,000	By WIP stock	5,400	3,53,892
To Packing charges	--	6,00,000			
	90,000	73,44,643		90,000	73,44,643

Multiple Choice Questions (MCQ)

1. **The type of process loss that should not be allowed to affect the cost of good units is:** ***(SM)***
   (a) Abnormal loss
   (b) Normal loss
   (c) Seasonal loss
   (d) Standard loss

Ans: (a)

2. **200 units were introduced in a process in which 20 units is the normal loss. If the actual output is 150 units, then there is:** ***(SM)***
   (a) No abnormal loss
   (b) No abnormal gain
   (c) Abnormal loss of 30 units
   (d) Abnormal gain of 30 units

Ans: (c)

3. **100 units are processed at a total cost of ₹ 160, normal loss is 10%, & scrap units are sold @ ₹ 0.25 each. If the output is 80 units, then the value of abnormal loss is:** ***(SM)***
   (a) ₹ 2.50
   (b) ₹16
   (c) ₹17.50
   (d) ₹17.75

Ans: (c)

4. **When average method is used in process costing, the opening inventory costs are:** ***(SM)***
   (a) Subtracted from the new costs
   (b) Added to the new costs
   (c) Kept separate from the costs of the new period
   (d) Averaged with other costs to arrive at total cost

Ans: (b)

5. **Spoilage that occurs under inefficient operating conditions and is ordinarily controllable is called:** ***(SM)***
   (a) Normal spoilage
   (b) Abnormal spoilage
   (c) Normal defects
   (d) None of the above

Ans: (b)

6. **The cost of normal process loss is -*(SM)***
   (a) Absorbed by good units produced and amount realized by the sale of loss units should be debited to the process account.
   (b) Debited to costing profit and loss account.
   (c) Absorbed by good units produced.
   (d) Debited to costing profit and loss account and amount realized by the sale of loss units should be credited to the process account.

Ans: (c)

7. **The value of abnormal loss is equal to:** ***(SM)***
   (a) Total cost of materials
   (b) Total process cost less realizable value of normal loss
   (c) Total process cost less cost of scrap
   (d) Total process cost less realizable value of normal loss less value of transferred out goods.

Ans: (d)

8. **Inter-process profit is calculated, because:** *(SM)*
   (a) a process is a cost centres
   (b) each process has to report profit
   (c) the efficiency of the process is measured
   (d) the wages of employees are linked to the process profitability.

Ans: (c)

9. **Under Weighted Average (Average) Method:** *(SM)*
   (a) The cost to complete the opening WIP is ignored.
   (b) The cost to complete the opening WIP and other completed units are calculated separately.
   (c) The cost of opening work-in-process and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units.
   (d) Closing stock of work in process is valued at current cost.

Ans: (c)

10. **A process account is debited by abnormal gain, the value is determined as:** *(SM)*
   (a) Equal to the value of normal loss
   (b) Cost of good units less realizable value of normal loss
   (c) Cost of good units less realizable value of actual loss
   (d) Equal to the value of good units less closing stock

Ans: (b)

11. **Lean Labs develops 55mm film using a four-step process that moves progressively through four departments. The company specializes in overnight service and has the largest drug store chain as its primary customer. Currently, direct labor, direct materials, and overhead are accumulated by departments. The cost accumulation system that best describes the system Lean Labs is using is:** *(SM)*
   (a) Operation costing.
   (b) Activity-based costing.
   (c) Job-order costing.
   (d) Process costing.

Ans: (d)

12. **When compared with normal spoilage, abnormal spoilage:** *(SM)*
   (a) Arises more frequently from factors that are inherent in the manufacturing process.
   (b) Is given the same accounting treatment as normal spoilage.
   (c) Is generally thought to be more controllable by purchase department than production department.
   (d) Is not typically influenced by the "tightness" of production standards.

Ans: (d)

13. **Assume 550 units were worked on during a period in which a total of 500 good units were completed. Normal spoilage consisted of 30 units; abnormal spoilage, 20 units. Total production costs were ₹ 2,200. The company accounts for abnormal spoilage separately on the income statement as loss due to abnormal spoilage. Normal spoilage is not accounted for separately. What is the cost of the good units produced?** *(SM)*
   (a) ₹ 2,080
   (b) ₹ 2,115
   (c) ₹ 2,200
   (d) ₹ 2,332

Ans: (b)

14. **IC Limited uses process costing systems and inspects its goods post manufacturing. An engineer noticed on May 31st the following:**

Good units completed	15,000
Normal spoilage (units)	300
Abnormal spoilage (units)	100

Unit costs were: Material ₹ 2.50 and conversion costs (Labour & overheads) ₹ 6.00. The number of units that company would transfer to its finished goods stock and the related cost of these units are:

(a) 15,000 units transferred at a cost of ₹ 127,500
(b) 15,000 units transferred at a cost of ₹ 130,050
(c) 15,000 units transferred at a cost of ₹ 135,000
(d) 15,300 units transferred at a cost of ₹ 130,050

Ans: (b)

15. A product passes through Process-I. Input raw material issued were 8,000 units. Normal loss anticipated was 10% of input with realisable value of ₹ 5 per unit. 7,600 units of output were produced and transferred to the next process. If the total cost incurred under Process-I was ₹ 40,000, then amount of abnormal gain/(loss) is: *(MTP 2 Marks, Apr'24)*

(a) ₹ 2,000
(b) (₹ 5,000)
(c) (₹ 2,500)
(d) ₹ 3,000

Ans: (a)

16. The following information is available in respect of Process I: Raw material purchased and introduced 10,000 units @ 5 per unit Raw Material received from store 4000 units @ 6 per unit Direct Labour 40,000 Overheads 28,000 Output of Process is 13,500 units, Normal wastage 5% of inputs Scrap value of wastage 4 per unit The value of Abnormal Gain is: *(RTP Sep'24)*

(a) ₹ 2062.68
(b) ₹ 2135.34
(c) ₹ 2103.70
(d) ₹ 2093.2

Ans: (d)

Process a/c

Particulars	Units	Amount	Particulars	units	Amount
Raw material	10,000	50,000	Normal loss	700	2,800
Stores	4,000	24,000	Units transferred	13,500	1,41,293.2
Direct Wages		40,000			
Production overheads		28,000			
Abnormal gain	200	2,093.2			
		1,44,093.2			1,44,093.2

Cost per unit = $\frac{1,42,000-2,800}{14,000-700}$ = 10.466 per unit

17. A Chemical is passed through three processes and the output of Process 1 Account is transferred to Process 2 Account. The input units in Process 1 are 58,500 units and the output units are 55,200 units, normal loss is 2% and rest is abnormal loss.
You are required to calculate the per unit cost of output units in Process 1 Account, if the total expenses incurred in Process 1 are, 6,87,960. *(PYP 2 Marks Sep'24)*

(a) ₹ 11.76
(b) ₹ 12.00
(c) ₹ 12.20
(d) ₹ 12.46

Ans: (b)

CHAPTER 11: JOINT PRODUCTS AND BY PRODUCTS

CONCEPTS OF THIS CHAPTER

- Joint products and by-products: meaning.
- Difference between joint products and by-products.
- Methods of apportionment of joint costs.
- Treatment of by-product costs in cost accounting.

LDR Questions

Q 19 Q 20
Q 24

QUICK REVIEW OF IMPORTANT CONCEPTS

I. Meaning of Joint Products and By-Products

i. Joint Products

- Joint products are two or more products that are separated during the same processing operation.
- Example: In the oil industry, crude petroleum is processed to produce joint products such as gasoline, fuel oil, lubricants, paraffin, asphalt, and kerosene.

ii. By-Products

- By-products are products recovered from:
  - Material discarded in the main process.
  - Production of some major products.

II. Methods for Apportioning Joint Cost

1. Physical Units Method : Joint costs are apportioned based on a physical base, such as weight or number of units.
2. Net Realisable Value at Split-Off Point : Apportionment is based on the sales value of joint products after processing, minus:
   - Estimated profit margins
   - Selling and distribution expenses
   - Post split-off costs
3. Using Technical Estimates : This method is used when the results from the previous methods do not align with the resources consumed by the joint products, or when the realizable value of the joint products is not readily available.
4. Other Methods

i. Market Value at the Point of Separation

- This method is useful when further processing costs are incurred disproportionately.
- To determine the apportionment of joint costs, a multiplying factor is calculated as:
  - Multiplying Factor = (Joint Cost / Total Sales Revenue) × 100

Alternatively, joint costs can be apportioned in the ratio of the sales values of different joint products.

ii. Market Value After Further Processing

- Joint costs are apportioned based on the total sales value of finished products.
- This method is considered unfair when further processing costs after the point of separation are not incurred equally for all joint products.

iii. Average Unit Cost Method

- Average Unit Cost = (Total Process Cost up to Point of Separation) / (Total Units of Joint Product Produced)
- The physical unit method follows the same steps and yields the same outcome as the average unit cost method.

iv. Contribution Margin Method: Joint costs are segregated into two parts:
   - Variable costs
   - Fixed costs

III. Methods of Apportionment of Joint Cost to By-Products

- Methods for apportioning joint cost
- Net Realisable Value method
- Standard cost in Technical Estimates
- Comparative price
- Re-use basis

IV. Treatment of By-Product Cost in Cost-Accounting

Treatment of by-product cost in cost-accounting

- Small total value
  - Sales value credited to Costing P & L Account
  - Deducted from total costs
- Considerable total value
  - May be regarded as joint products rather than as by-products
- Require further processing
  - Net realisable value of the by-product at the split-off point may be arrived

Questions & Answers

Theory Questions

Question 1

Explain very briefly the following terms: Co-Products *(PYP 1 Mark Nov'23)*

Answer 1

Co-Products: Co-products may be defined as Two or more products which are contemporary but do not emerge necessarily from the same material in the same process.

Question 2

DISCUSS the treatment of by-product cost in Cost Accounting when they are of small total value.
(RTP Nov'21, RTP Jan'25)

Answer 2

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

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

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

Question 3

How apportionment of joint costs up-to the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? DISCUSS.
(RTP May'24 & May '21, MTP 5 Marks Nov '21 MTP 4 Marks Mar'24)

Answer 3

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

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

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

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

Question 4

Anju Ltd. is engaged in the production of butter. While producing butter buttermilk is also produced. Buttermilk is identified as by-product of butter. What is the TREATMENT of buttermilk in the cost accounts of Anju Ltd. ***(MTP 5 Marks Aug'24) (PYP 4 Marks Sep'24)***

Answer 4

Buttermilk is a by-product of butter and treatment of by-product in cost accounting is as follows.

(i) When they are of small total value, the amount realized from their sale may be dealt as follows:
- Sales value of the by-product may be credited to Profit and LossAccount and no credit be given in Cost Accounting. The credit to Profit and Loss Account here is treated either as a miscellaneous income or as additional sales revenue.
- The sale proceeds of the by-product may be treated as deduction from the total costs. The sales proceeds should be deducted either from production cost or cost of sales.

(ii) When the by-products are of considerable total value: Where by- products are of considerable total value, they may be regarded as joint products rather than as by- products. To determine exact cost of by-products the costs incurred upto the point of separation, should be apportioned over by-products and joint products by using a logical basis.

(iii) When they require further processing: In this case, the net realisable value of the by-product at the split-off point may be arrived at by subtracting the further processing cost from realisable value of by-product. If the value is small, it may be treated as discussed in (i) above.

Question 5

Narrate the terms 'Joint Products' and 'By-Products' with an example of each term.
(PYP 4 Marks, Dec'21)

Answer 5

(i) **Joint Products -** Joint products represent "two or more products separated in the course of the same processing operation usually requiring further processing, each product being in such proportion that no single product can be designated as a major product".
In other words, two or more products of equal importance, produced, simultaneously from the same process, with each having a significant relative sale value are known as joint products. **For example**, in the oil industry, gasoline, fuel oil, lubricants, paraffin, coal tar, asphalt and kerosene are all produced from crude petroleum. These are known as joint products.

(ii) **By-Products -** These are defined as "products recovered from material discarded in a main process, or from the production of some major products, where the material value is to be considered at the time of severance from the main product." Thus, by- products emerge as a result of processing operation of another product or they are produced from the scrap or waste of materials of a process. In short, a by-product is a secondary or subsidiary product which emanates as a result of manufacture of the main product.

The point at which they are separated from the main product or products is known as split-off point. The expenses of processing are joint till the split –off point.

Examples of by-products are molasses in the manufacture of sugar, tar, ammonia and benzole obtained on carbonisation of coal and glycerine obtained in the manufacture of soap.

Exam Insights: This theory question tested the basic knowledge of Joint product and By product with example. Most of the examinees answered it partially correct. Performance of the examinees was below average.

Question 6

DISCUSS the Net Realizable Value (NRV) method of apportioning joint costs to by-products. ***(RTP Sep'24 MTP 5 Marks, Aug'18, MTP 5 Marks March '21)***

Answer 6

Net Realisable Value method: The realisation on the disposal of the by-product may be deducted from the total cost of production so as to arrive at the cost of the main product. For example, the amount realised by the sale of molasses in a sugar factory goes to reduce the cost of sugar produced in the factory.

When the by-product requires some additional processing and expenses are incurred in making it saleable to the best advantage of the concern, the expenses so incurred should be deducted from the total value realised from the sale of the by-product and only the net realisations should be deducted from the total cost of production to arrive at the cost of production of the main product. Separate accounts should be maintained for collecting additional expenses incurred on:

(i) further processing of the by-product, and

(ii) selling, distribution and administration expenses attributable to the by-product.

Practical Questions

Question 7

The following information is available for A Ltd.:

Sales-

P: 200 kg @ ₹ 120 per kg.

Q: 240 kg @ ₹ 60 per kg.

Joint costs-

Marginal cost ₹ 17,600

Fixed cost ₹ 15,600

You are required to FIND OUT the cost of joint products P and Q using contribution margin method. ***(MTP 5 Marks, Apr'22)***

Answer 7

The marginal cost (variable cost) of ₹ 17,600 is apportioned over the joint products P and Q in the ratio of their physical quantity i.e. 200 : 240

Marginal cost for Product P : ₹ 17,600 × 200/440 = ₹ 8,000

Marginal cost for Product Q : ₹ 17,600 × 240/440 = ₹ 9,600

The fixed cost of ₹ 15,600 is apportioned over the joint products P and Q in the ratio of their contribution margin i.e. 160 : 48 (Refer to working note)

Product P : ₹ 15,600 × 160/208 = ₹ 12,000

Product Q : ₹ 15,600 × 48/208 = ₹ 3,600

Working Note:

Computation of contribution margin ratio

Products	Sales revenue	Marginal cost	Contribution
	(₹)	(₹)	(₹)
P	24,000	8,000	16,000

Q	14,400	9,600 (Refer to above)	4,800

Contribution ratio is 160: 48

Question 8

Mili Ltd., a manufacturing company, produces two main products and a by-product out of a joint process. The ratio of output quantities to input quantities of direct material used in the joint process remains consistent on yearly basis.

Company has employed the physical volume method to allocate joint production costs to the main products. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main products.

During a month, company incurred joint production costs of ₹ 15,00,000. The main products are not marketable at the split off point and thus have to be processed further. Details of company's operation are given in the table below.

Particulars	Product-Q	Product-R	By product
Monthly output in kg.	90,000	1,80,000	75,000
Selling price per kg.	₹ 50	₹ 30	₹ 5
Process costs	₹ 3,00,000	₹ 4,50,000	

FIND OUT the amount of joint product cost that Mili Ltd. would allocate to product-R by using the physical volume method to allocate joint production costs? *(MTP 5 Marks, Mar'22, SM)*

Answer 8

Calculation of Net joint costs to be allocated:

Particulars	Amount (₹)
Joint Costs	15,00,000
Less: Net Realizable value of by-product (75,000 × 5)	3,75,000
Net joint costs to be allocated	11,25,000

Therefore, amount of joint product cost that Mili Ltd. would allocate to the product-R by using the physical volume method to allocate joint production costs:

$$= \frac{\text{Physical quantity of Product–R}}{\text{Total Quantity}} \times \text{Net joint costs to be allocated}$$

$$= \frac{1,80,000\ units}{2,70,000\ units} \times 11,25,000 = \text{Rs. } 7,50,000$$

Question 9

ASR Ltd mainly produces Product 'L' and gets a by-Product 'M' out of a joint process. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main product. During the month of October 2022, company incurred joint production costs of ₹ 4,00,000. The main Product 'L' is not marketable at the split off point. Thus, it has to be processed further. Details of company's operation are as under:

Particulars	Product L	By- Product M
Production (units)	10,000	200
Selling price per kg	₹ 45	₹ 5
Further processing cost	₹ 1,01,000	-

You are required to find out:

(i) Profit earned from Product 'L'.

(ii) Selling price per kg of product 'L', if the company wishes to earn a profit of ₹ 1,00,000 from the above production. *(PYP 5 Marks, Nov'22)*

Answer 9

(i) Calculation of profit on product 'L'

Particular	₹
Sales	4,50,000
Less: Further processing cost	(1,01,000)
	3,49,000
Less: Joint Production Cost*	(3,99,000)
loss	(50,000)

*Joint Production Cost = [4,00,000 – (200 × 5)] = 3,99,000

(ii) Calculation of desired selling price of product 'L'

$$\text{Desired Selling Price} = \frac{\text{Desired Profit+Total Cost}}{\text{Units Measured}}$$

$$= \frac{1,00,000+1,01,000+3,99,000}{10,000} = \text{Rs. 60 per kg.}$$

Exam Insights: The question tested the knowledge of examinees on the topic Joint product costing. In the first part, examinees had to calculate profit earned from main product L and in the second part, to calculate the selling price per kg of product L to earn a certain level of profit. Most of the examinees attempted the first part correctly while faltering in the second part. Overall performance of the examinees was above average.

Question 10

A manufacturing process yields the following products out of the raw materials introduced in the process:

Main Product X	60% of Raw Materials
By-Product Y	15% of Raw Materials
By Product Z	20% of Raw Materials
Wastage	5% of Raw Materials

Other information is as follows:

a. **Total Cost: Raw Materials 1,000 units of ₹ 9,200; Labour ₹ 8,200; Overheads ₹ 12,000**
b. **One unit of product z requires ½ the raw materials required for one unit of product Y, one unit of product X requires1½ times the raw materials required for product Y.**
c. **Product X required double the time needed for production of one unit of Y and one unit of Z.**
d. **Product Z requires ½ the time required for the production of one unit of product Y.**
e. **Overheads are to be apportioned in the ratio of 6:1:1.**

You are required to CALCULATE the total and per unit of cost of each of the products. ***(MTP 5 Marks, Sep'22)***

Answer 10

Statement of Distribution of Costs

Cost Elements	Basis	Total Cost	Main Product X (600 Units)		By-Product Y (150 Units)		By-Product Z (200 Units)	
			Total	Per Unit	Total	Per Unit	Total	Per Unit
Raw Materials	18:3:2	9,200	7,200	12	1,200	8	800	4
Labour	36:3:2	8,200	7,200	12	600	4	400	2
Overheads	6:1:1	12,000	9,000	15	1,500	10	1,500	7.50
Total		29,400	23,400	39	3,300	22	2,700	13.50

Working Notes:

1. Calculation of Units produced:

Main Product X	60% of Raw Materials	600 Units
By-Product Y	15% of Raw Materials	150 Units
By Product Z	20% of Raw Materials	200 Units
Wastage 5% of Raw Materials		50 Units
		1000 Units

2. Cost Allocation Raw Materials

Let Product Z requires 1 unit of raw materials then, Product Y will require 2 units of raw materials and Product

X will require 3 units of raw materials.

Product	X		Y		Z
Individual Unit ratio (a)	3	:	2	:	1
Units (b)	600		150		200
Ratio for Cost Allocation (a*b)	1800	:	300	:	200
Ratio	18	:	3	:	2

Labour:

Let Product Z requires 1 hour of Labour then, Product Y will require 2 hours of Labour and Product X will require 6 hours of Labour.

Product	X		Y		Z
Individual Unit ratio (a)	6	:	2	:	1
Units (b)	600		150		200
Ratio for Cost Allocation (a*b)	3600	:	300	:	200
Ratio	36	:	3	:	2

Question 11

JP Ltd. uses joint production process that produces three products at the split -off point. Joint production costs during the month of July, 2022 were ₹ 33,60,000.

Product information for the month of July is as follows:

Particulars	Product A	Product B	Product C
Units produced	3,000	6,000	9,000
Sales prices:			
At the split-off	₹ 200		
After further processing	₹ 300	₹ 350	₹ 100
Costs to process after split-off	₹ 6,00,000	₹ 6,00,000	₹ 6,00,000

Other information is as follows:

Product C is a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Further, Product B & C must be processed further before they can be sold. FIND OUT the joint cost allocated to Product A in the month of July if joint cost allocation is based on Net Realizable Value.

(RTP Nov'22)

Answer 11

Product A	
As the Question says that "Products B and C must be processed further before they can be sold", it means Product A can be sold at the split-off point.	
Cost to process Product A after the split-off point	= ₹ 6,00,000
Additional revenue to be earned by processing further	= ₹ 3,00,000 (₹ 100 increase in selling price per unit x 3,000 units)
Therefore, Product A will not be processed further, and the sales value at split -off for A will be used for allocating the joint costs.	
Sales value at the split-off for A	= ₹ 6,00,000 (₹ 200 × 3,000 units)
Product B	
Since Product B must be processed further, we use its net realizable value for the joint cost allocation.	
Net realizable value of Product B	= ₹ 15,00,000 [(₹ 350 × 6,000 units) − ₹ 6,00,000 further processing costs]
Product C	
Product C, the by-product, must also be processed further to be sold.	

Net realizable value of Product C	= ₹ 3,00,000 [(₹ 100 × 9,000 units) – ₹ 6,00,000 in further processing costs]
Joint Cost Allocation	
Joint production cost	= ₹ 33,60,000
Since, by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated	
	= ₹ 30,60,000 (₹ 33,60,000 - ₹ 3,00,000 NRV of Product C)
Allocation of joint costs between Product A and B will be on the basis of ₹ 6,00,000: ₹ 15,00,000	
Joint Cost allocated to Product	= ₹ 30,60,000 × $\frac{₹\ 6,00,000}{₹21,000}$ ₹ 8,74,286

Question 12

A company manufactures one main product (MN) and two by-products AB and PQ. For the month of January 2024, following details are available:

Total Cost upto separation Point ₹ 2,12,400

	MN	AB	PQ
Cost after separation	-	₹35,000	₹24,000
No. of units produced	4,000	1,800	3,000
Selling price per unit	₹100	₹40	₹30
Estimated net profit as percentage tosales value	-	20%	30%
Estimated selling expenses as percentage to sales value	30%	15%	15%

There are no beginning or closing inventories.

PREPARE statement showing:

(i) Allocation of joint cost; and

(ii) Product-wise and overall profitability of the company for January 2024. ***(MTP 6 Marks July'24)***

Answer 12

(i) Statement showing allocation of Joint Cost

Particulars	AB	PQ
No. of units Produced	1,800	3,000
Selling Price Per unit (₹)	40	30
Sales Value (₹)	72,000	90,000
Less: Estimated Profit (AB -20% & PQ -30%)	(14,400)	(27,000)
Cost of Sales	57,600	63,000
Less: Estimated Selling Expenses(AB -15% & PQ -15%)	(10,800)	(13,500)
Cost of Production	46,800	49,500
Less: Cost after separation	(35,000)	(24,000)
Joint Cost allocated	11,800	25,500

(ii) Statement of Profitability

Particulars	MA (₹)	AB (₹)	PQ (₹)
Sales Value (A)	4,00,000 (4,000x ₹ 100)	72,000	90,000
Less:- Joint Cost	1,75,100 (2,12,400 -11,800 - 25,500)	11,800	25,500
Cost after separation	-	35,000	24,000
Selling Expenses (MA- 30%, AB-15% &PQ-15%)	1,20,000	10,800	13,500
(B)	2,95,100	57,600	63,000
Profit (A –B)	1,04,900	14,400	27,000
Overall Profit = 1,04,900 + 14,400 + 27,000 = ₹ 1,46,300			

Question 13

A factory producing article A also produces a by-product B which is further processed into finished product. The joint cost of manufacture is given below:

Material	₹ 5,000
Labour	₹ 3,000
Overhead	₹ 2,000
	₹ 10,000

Subsequent cost in ₹ are given below:

	A	B
Material	3,000	1,500
Labor	1,400	1,000
Overhead	600	500
	5,000	3,000

Selling prices are A ₹ 16,000
B ₹ 8,000

Estimated profit on selling prices is 25% for A and 20% for B.

Assume that selling and distribution expenses are in proportion of sales prices. Show how you would apportion joint costs of manufacture and prepare a statement showing cost of production of A and B.

(MTP 5 Marks, Oct'23, RTP Nov'23)

Answer 13

Apportionment of Joint Costs

Particulars	A (₹)	B (₹)
Selling Price	16,000	8,000
Less: Estimated profit	4,000 (25% of ₹16,000)	1,600 (20% of ₹ 8,000)
Cost of sales	12,000	6,400
Less: Selling & Distribution exp. (Refer working note)	267 (₹ 400 × 2/3)	133 (₹ 400 × 1/3)
Less: Subsequent cost	5,000	3,000
Share of Joint cost	6,733	3,267

So, Joint cost of manufacture is to be distributed to A & B in the ratio of 6733 : 3267

Statement showing Cost of Production of A and B

Elements of cost	Joint Cost		Subsequent Cost		Total Cost	
	A	B	A	B	A	B
Material	3,367	1,633	3,000	1,500	6,367	3,133
Labour	2,020	980	1,400	1,000	3,420	1,980
Overheads	1,346	654	600	500	1,946	1,154
				Cost of production	11,733	6,267

Working Note:

Calculation of Selling and Distribution Expenses

Particulars	(₹)
Total Sales Revenue (₹ 16,000 + ₹ 8,000)	24,000
Less: Estimated Profit (₹ 4,000 + ₹ 1,600)	(5,600)
Cost of Sales	18,400
Less: Cost of production:	
- Joint Costs	(10,000)
- Subsequent costs (₹ 5,000 + ₹ 3,000)	(8,000)
Selling and Distribution expenses (Balancing figure)	400

Question 14

Three products X, Y and Z alongwith a byproduct B are obtained again in a crude state which require further processing at a cost of ₹ 5 for X; ₹ 4 for Y; and ₹ 2.50 for Z per unit before sale. The byproduct is however saleable as such to a nearby factory. The selling prices for the three main products and byproduct, assuming they should yield a net margin of 25 percent of cost, are fixed at ₹ 13.75 ₹ 8.75 and ₹ 7.50 and ₹ 1.00 respectively – all per unit quantity sold.

During a period, the joint input cost including the material cost was ₹ 90,800 and the respective outputs were:

X	8,000 units
Y	6,000 units
Z	4,000 units
B	1,000 units

By product should be credited to the joint cost and only the net joint costs are to be allocated to the main products.

CALCULATE the joint cost per unit of each product and the margin available as a percentage on cost.

(RTP Sep'24)

Answer 14

Working Notes:

(i) Computation of Allocation Ratio for Joint Costs

	Products		
	X ₹	Y ₹	Z. ₹
Selling Price	13.75	8.75	7.50
Less: anticipated margin@ 25% on cost of 20% on sales	2.75	1.75	1.50
Cost of sales	11.00	7.00	6.00
Less: post split off cost	5.00	4.00	2.50
Joint cost per unit	6.00	3.00	3.50
Output (units)	8,000	6,000	4,000
Total output cost	48,000	18,000	14,000
Allocation ratio for joint costs	24	9	7

(ii) Computation of net allocable joint costs

	₹	₹
Joint input cost including material cost		90,800
Less: Credit for realization from by-product B:		
Sales revenue (1,000 × Re. 1)	1,000	
Less: profit @ 25% on cost or 20% on sales	200	800
Net joint costs to be allocated		90,000

Determination of joint cost per unit of each product

Product	Net joint costs allocation ₹	Output (units) ₹	Joint cost per unit₹
X	54,000 (Note: 1)	8,000	6.75
Y	20,250	6,000	3.38
Z	15,750	4,000	3.94
	90,000		

Profit margin available on each product as a percentage on cost

Product	Joint Cost₹	Post spilt-off cost₹	Total Cost₹	Sellin Pric₹	Margin ₹	Margin % on cost
X	6.75	5.00	11.75	13.75	2.00	17.02
Y	3.38	4.00	7.38	8.75	1.37	18.56
Z	3.94	2.50	6.44	7.50	1.06	16.46

Note: 1

$X = \frac{24}{40} \times 90{,}000 =$ **54,000**

$Y = \frac{9}{40} \times 90{,}000 =$ **20,250**

$Z = \frac{7}{40} \times 90{,}000 =$ **15,750**

90,000

Question 15

Wavelength 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. ***(PYP 5 Marks, May'22, SM)***

Answer 15

(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.

Exam Insights: This numerical question tested the knowledge of examinees on the topic joint costing. In the first part, examinees had to calculate profit/loss after further processing and in the second part, to advise the management regarding the products which are to be further processed. Performance of the examinees was average.

Question 16

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

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

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

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

The details of sales during the said period are:

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

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

Required:

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

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

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

(iv) On the basis of profits before and after further processing of product A and B, give your COMMENT that products should be further processed or not. *(RTP Nov'21)*

Answer 16

Calculation of quantity produced

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

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

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

(ii) Statement of cost per kg

	Product A	Product B
Output (kg)	1,60,000	3,20,000
Share in joint cost (₹)	12,50,000	5,00,000
Joint Cost per kg (₹) (A)	7.8125	1.5625
Further processing cost (₹)	2,60,000	3,00,000
Further processing cost per kg (₹) (B)	1.625	0.9375
Total cost per kg (₹) {(A)+(B)}	9.4375	2.5000

(iii) Statement of profit

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

(iv) Profitability statement before and after processing

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

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

Question 17

A factory produces two products, 'Ghee' and 'Cream' from a single process. The joint processing costs during a particular month are:

Direct Material	₹ 60,000
Direct Labour	₹ 19,200
Variable Overheads	₹ 24,000
Fixed Overheads	₹ 64,000

Sales: Ghee - 200 litre @ ₹ 600 per litre; Cream – 240 litre @ ₹ 200 per litre. REQUIRED:

I. **Apportion joints costs on the basis of:**
   (i) **Physical Quantity of each product.**
   (ii) **Contribution Margin method, and**

II. **Determine Profit or Loss under both the methods.** ***(MTP 5 Marks, Oct'21, PYP 5 Marks Nov '19)***

Answer 17

Total Joint Cost

Particulars	Amount (₹)
Direct Material	60,000
Direct Labour	19,200
Variable Overheads	24,000
Total Variable Cost	1,03,200
Fixed Overheads	64,000
Total joint cost	1,67,200

Apportionment of Joint Costs:

			Product-Ghee	Product-Cream
I.	(i)	Apportionment of Joint Cost on the basis of 'Physical Quantity'	**₹ 76,000** $\left(\frac{₹1,67,200}{200+240\ litre}\ X\ 200\right)$	**₹ 91,200** $\left(\frac{₹1,67,200}{200+240\ litre}\ X\ 240\right)$
	(ii)	Apportionment of Joint Cost on the basis of 'Contribution Margin Method':		
		- Variable Costs (on basis of physical units)	**₹ 46,909** $\left(\frac{₹1,03,200}{200+240\ litre}\ X\ 200\right)$	**₹ 56,291** $\left(\frac{₹1,03,200}{200+240\ litre}\ X\ 240\right)$
		Contribution Margin	**73,091** (₹600×200 – 46,909)	**- 8,291** (₹200×240 – 56,291)
		Fixed Costs*	₹ 64,000	
		Total apportioned cost	₹ 1,10,909	₹ 56,291
II.	**(iii)**	**Profit or Loss:**		
	When Joint cost apportioned on basis of physical units			
	A.	Sales Value	₹ 1,20,000	₹ 48,000
	B.	Apportioned joint cost on basis of 'Physical Quantity':	₹ 76,000	₹ 91,200
	A-B	**Profit or (Loss)**	**44,000**	**(43,200)**
	When Joint cost apportioned on basis of 'Contribution Margin Method'			
	C	Apportioned joint cost on basis of 'Contribution Margin Method'	₹ 1,10,909	₹ 56,291
	A-C	**Profit or (Loss)**	₹ 9,091	₹ (8,291)

* The fixed cost of ₹ 64,000 is to be apportioned over the joint products- Ghee and Cream in the ratio of their contribution margin but contribution margin of Product- Cream is Negative so fixed cost will be charged to Product- Ghee only.

Exam Insights: This was a numerical problem from the topic 'Joint products and by-products'. The question required apportionment of joint cost on the basis of physical quantity method and contribution margin method. Performance of the examinees was average.

Question 18

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

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

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

You are required to prepare:

(i) Schedule showing the allocation of joint costs.

(ii) Calculate the Cost of goods sold of each product and the cost of each item in Inventory.

(iii) A comparative statement of Gross profit. *(PYP 10 Marks, Jan'21)*

Answer 18

(i) Statement of Joint Cost allocation of inventories of X, Y and Z

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Final sales value of total production (Working Note 1)	4,50,000 (15,000 x ₹ 30)	9,60,000 (15,000 x ₹ 64)	15,00,000 (30,000 x ₹ 50)	29,10,000
Less: Additional cost	--	6,60,000	11,00,000	17,60,000
Net realizable value (at split-off point)	4,50,000	3,00,000	4,00,000	11,50,000
Joint cost allocated (Working Note 2)	2,34,000	1,56,000	2,08,000	5,98,000

(ii) Calculation of Cost of goods sold and Closing inventory

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Allocated joint cost	2,34,000	1,56,000	2,08,000	5,98,000
Add: Additional costs	--	6,60,000	11,00,000	17,60,000
Cost of goods sold (COGS)	2,34,000	8,16,000	13,08,000	23,58,000
Less: Cost of closing inventory (Working Note 1)	78,000 (COGS × 100/3%)	--	3,27,000 (COGS × 25%)	4,05,000
Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000

(iii) Comparative Statement of Gross Profit

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Sales revenue	3,00,000 (10,000 x ₹ 30)	9,60,000 (15,000 x ₹ 64)	11,25,000 (22,500 x ₹ 50)	23,85,000
Less: Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000
Gross Profit	**1,44,000**	**1,44,000**	**1,44,000**	4,32,000

Working Notes:

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

Products	Quantity sold in litres	Quantity of closing inventory in litres	Total production	Closing inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)]	(5) = (3)/ (4)
X	10,000	5,000	15,000	100/3

Y	15,000	--	15,000	--
Z	22,500	7,500	30,000	25

2. Joint cost apportioned to each product:

$$= \frac{\text{Total Joint Cost}}{\text{Total Net Realisable Value}} \times \text{Net Realisable Value of each product}$$

Joint cost of product X $= \frac{\text{Rs.5,98,000}}{\text{Rs.11,50,000}} \times \text{Rs. 4,50,000} = \text{Rs. 2,34,000}$

Joint cost of product Y $= \frac{\text{Rs.5,98,000}}{\text{Rs.11,50,000}} \times \text{Rs. 3,00,000} = \text{Rs. 1,56,000}$

Joint cost of product Y $= \frac{\text{Rs.5,98,000}}{\text{Rs.11,50,000}} \times \text{Rs. 4,00,000} = \text{Rs. 2,08,000}$

Question 19

LDR

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 splitoff 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'.

(PYP 10 Marks, May'23)

Answer 19

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	

$= \frac{14,580}{80\ \%} = 18,225$

∴ Input of Process R $= \frac{18225}{72.9\%} = 25,000$ kgs

Alternative presentation for Calculation of Input in Process R, S and T

Working notes:

Process T (Kg.)			
To Input (Transfer from process S)	20,250	By Normal loss	2,025

		By Output Product X	14,580
		By output of by-product Z	3,645
	20,250		20,250
Process S (kg.)			
To Input (Transfer from process S)	22,500	By Normal loss (10%)	2,250
		By Transfer to process T	20,250
	22,500		22,500

Process R (kg.)			
To Input	25,000	By Normal loss (10%)	2,500
		By Transfer to process S	22,500
	25,000		25,000

2. Calculation of Joint Cost

Process	Inputs	Variable cost per kg	Variable cost	Fixed Cost	Total Cost
		₹	₹	₹	₹
R	25,000	5	1,25,000	42,000	1,67,000
S	25,000	4.5	1,01,250	5,000	1,06,250
T	25,000	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

Exam Insights: This numerical question was based on Joint and By- Product Costing. Examinees were asked to apportion the joint costs. The performance of most of the examinees was poor as they were not able to calculate the correct input of processes after adjustment for normal loss.

Question 20 LDR

Wivitsu Limited manufactures three joint products A, B and C from a joint process. Product B is sold at split off point whereas product A and C are sold after further processing. 10% of the quantity of product A is lost

in further processing. Data regarding these products for the year ending 31st March,2023 are as follows:

	A	B	C
Number of units produced and sold	3,60,000	2,10,000	4,50,000
Selling price per unit at split off point	-	₹ 6	-
Selling price per unit after further processing	₹ 9.50	-	₹ 12
Further processing costs	₹ 8,60,000	-	₹10,40,000

The joint production cost up-to the split off point at which A, B and C become separable products is ₹ 57,26,000.

Required:

(i) Prepare a statement showing apportionment of joint cost to the products using Net realizable value method.

(ii) Assume Wivitsu Limited has received an offer from D Limited to purchase product 'A' at the split off point at ₹ 7 per unit and another company PQR Limited has offered to purchase product 'C' at split off point at 9 per unit.

Advise whether these offers should be accepted or not? *(PYP 5 Marks, Nov'23)*

Answer 20

(i) Statement showing apportionment of joint cost to the products using NRV method

Particulars	Product A (₹)	Product B (₹)	Product C (₹)
Sales value	34,20,000 (3,60,000 x ₹ 9.5)	12,60,000 (2,10,000 x ₹ 6)	54,00,000 (4,50,000 x ₹ 12)
Less: Further processing cost	8,60,000	-	10,40,000
Net Realisable Value	25,60,000	12,60,000	43,60,000
Apportionment of Joint cost of ₹ 57,26,000 in the ratio of 256:126:436	17,92,000	8,82,000	30,52,000

(ii) Decision whether to Process further or not

Particulars	Product A (₹)	Product C (₹)
Incremental Revenue	9,00,000 (₹ 9.5-₹ 7) x 3,60,000	13,50,000 (₹ 12- ₹ 9) x 4,50,000
Less: Further processing cost	8,60,000	10,40,000
Less: wastage if further processed	2,80,000 ₹ 7 x (3,60,000*10%/90%)	-
Incremental profit/(loss)	**(2,40,000)**	**3,10,000**

On comparing incremental sales revenue with further processing cost, there is net loss of ₹ 2,40,000 in case of product A and profit of ₹ 3,10,000 in case of product C. Hence **offer of D Ltd should be accepted and Product A should be sold at split off point** Whereas product C should be **sold after further processing.**

The solution can also be presented in following way:

Profit from further processing

Particulars	Product A (₹)	Product C (₹)
Sales Revenue	34,20,000 (3,60,000 x 9.5)	54,00,000 (4,50,000 x 12)
Less: Joint cost	17,92,000	30,52,000
Less: Further processing cost	8,60,000	10,40,000
(i) Profit/(loss)	**7,68,000**	**13,08,000**

Profit from Accepting offer (Sale at separation point)

Particulars	Product A (₹)	Product C (₹)
Sales Revenue	28,00,000 (3,60,000/0.90) x 7	40,50,000 (4,50,000 x 9)
Less: Joint cost	17,92,000	30,52,000
(ii) Profit/(loss)	**10,08,000**	9,98,000
Incremental profit (loss) (i)-(ii)	**(2,40,000)**	**3,10,000**

On comparing profit at separation point with further processing profit, there is net loss of ₹ 2,40,000 in case of product A and profit of ₹ 3,10,000 in case of product C. Hence **offer of D Ltd should be accepted and Product A should be sold at split off point** Whereas product C should be **sold after further processing.**

Exam Insights: Question on joint products and by products requiring apportionment of joint cost to the products using Net realizable value method and evaluating and advising on whether to sell the products at split off point or after further processing based on the da ta given in the question. Most of the examinees did not take the correct sales quantity figure for calculation of net realizable value of one of the products 'As', which resulted in wrong calculation of NRV. This in turn resulted in wrong apportioning of joint cost. Overall performance was below average.

Question 21

A company produces two products, A and B, through a joint production process. The total joint production cost incurred is as under:

Material	**₹ 20,000**
Labour	**₹ 10,000**
Variable overheads	**₹ 6,000**
Fixed Overheads	**₹ 24,000**

Product A and B can be sold for ₹ 20 per unit and ₹ 15 per unit respectively at split off point. The produced quantities are Product A-2,000 units and Product B – 4,000 units.

(i) You are required to calculate the joint production cost allocation for each product using the:
(a) Physical unit method.
(b) Contribution margin method.

(ii) Product B can be further processed by incurring expenditure of ₹ 12,000. Loss in further processing is 2%. It can be sold @ ₹ 18 per unit. Explain the impact on profitability if Product B is further processed.
(PYP 5 Marks May '24)

Answer 21

Working

Calculation of joint cost

Description	Amount (₹)
Material	20,000
Labour	10,000
Variable overheads	6,000
Total variable cost	**36,000**
Fixed overheads	24,000
Total joint cost	**60,000**

(i) (a) Allocation of joint cost using physical unit method:

Product A = ₹60,000 × 2,000/6,000 = ₹ 20,000

Product B = ₹60,000 × 4,000/6,000 = ₹ 40,000

(b) Allocation of joint cost using contribution margin method:

	Description	Product-A	Product-B
	Units produced	2,000	4,000
	Selling price per unit (₹)	20	15
A.	Sales value (₹)	40,000	60,000
B.	**Allocation of joint variable cost on the basis of physical unit**		
	₹36,000 × 2,000/6,000	(12,000)	
	₹36,000 × 4,000/6,000		(24,000)
C = A-B	**Contribution**	**28,000**	**36,000**
D	Allocation of fixed joint cost on the basis of contribution margin		
	₹24,000 × 28,000/64,000	(10,500)	
	₹24,000 × 36,000/64,000		(13,500)
C-D	Profit at split off point	**17,500**	**22,500**

Allocation of Joint Cost based on Contribution Margin Method:

Particulars	Product A	Product B
Allocation of Variable Cost	₹ 12,000	₹ 24,000
Allocation of Fixed Cost	₹ 10,500	₹ 13,500
Total Joint Cost	**₹ 22,500**	**₹ 37,500**

(ii) Profitability after further processing of Product B

Description	Amount (₹)
Units produced and sold 98% of 4,000 units	3,920
Selling price per unit (₹)	18
Sales value (₹)	70,560
Joint cost upto split off point	(37,500)
Further processing cost	(12,000)
Profit after further processing	**21,060**

Calculation of the profitability after further processing of product B can also be done in the following manner:

Profitability after further processing of Product B

Description	Amount (₹)
Incremental revenue on further processing (3,920 x ₹18)- (4,000 x ₹15)	10,560
Further processing cost	(12,000)
Incremental loss after further processing	**1,440**

Impact on profitability on Product B

If Product B is sold at split off point it earns profit of ₹ 22,500, but after further processing the profit is reduced to ₹ 21,060/- i.e. an opportunity loss of ₹ 1,440/-.

Question 22

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

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

The selling prices quoted here are expected to remain the same in the coming year. During 2022-23, the selling prices of the items and the total amounts sold were:

X –186 tons sold for ₹3,000 per ton

Y –527 tons sold for ₹2,250 per ton

Z –736 tons sold for ₹1,500 per ton

The total joint manufacturing costs for the year were ₹12,50,000.

An additional ₹6,20,000 was spent to finish product Z.

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

X 180 tons

Y 60 Tons

Z 25 tons

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

Required:

COMPUTE the cost of inventories of X, Y and Z and cost of goods sold for year ended March 31, 2023, using Net realizable value (NRV) method of joint cost allocation.

(MTP 10 Marks, Apr'23) (Same concepts different figures MTP 10 Marks Mar'23, RTP Nov'20)

Answer 22

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

	Products			Total
	X	Y	Z	
	(₹)	(₹)	(₹)	(₹)
Final sales value of total production (Working Note 1)	10,98,000 (366 × ₹3,000)	13,20,750 (587 × ₹2,250)	11,41,500 (761 × ₹1,500)	35,60,250
Less: Additional cost	--	--	(6,20,000)	(6,20,000)
Net realisable value (at split-off point)	10,98,000	13,20,750	5,21,500	29,40,250
Joint cost allocated (Working Note 2)	4,66,797	5,61,496	2,21,707	12,50,000

Cost of goods sold as on March 31, 2023
(By using Net Realisable Value Method)

	Products			Total
	X	Y	Z	
	(₹)	(₹)	(₹)	(₹)
Allocated joint cost	4,66,797	5,61,496	2,21,707	12,50,000
Additional costs	--	--	6,20,000	6,20,000
Cost of goods available for sale (CGAS)	4,66,797	5,61,496	8,41,707	18,70,000
Less: Cost of ending inventory (Working Note 1)	2,29,571 (CGAS×49.18%)	57,385 (CGAS × 10.22%)	27,692 (CGAS × 3.29%)	3,14,648
Cost of goods sold	2,37,226	5,04,111	8,14,015	15,55,352

Working Notes

1. Total production of three products for the year 2022-2023

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

2. Joint cost apportioned to each product:

$$\frac{\text{Total Joint Cost}}{\text{Total net Realisable value}} \text{ X Net Realizable Value of each Product}$$

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

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

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

Question 23

OPR Ltd. purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the spilt-off point - S, P, N and A. Product 'A' is fully processed at the split-off point. Product S, P and N can be individually further refined into SK, PM, and NL respectively. The joint cost of purchasing the crude vegetable oi l and processing it were ₹ 40,000. Other details are as follows:

Product	Further processing costs (₹)	Sales at split-off point (₹)	Sales after further processing (₹)
S	80,000	20,000	1,20,000
P	32,000	12,000	40,000

N	36,000	28,000	48,000
A	-	20,000	-

You are required to identify the products which can be further processed for maximizing profits and make suitable suggestions. ***(PYP 5 Marks, Jul'21, SM)***

Answer 23

Statement of Comparison of Profits before and after further processing

	S (₹)	P (₹)	N (₹)	A (₹)	Total (₹)
A. Sales at split off point	20,000	12,000	28,000	20,000	80,000
B. Apportioned Joint Costs (Refer Working Note)	**10,000**	**6,000**	**14,000**	**10,000**	40,000
C. **Profit at split-off point**	10,000	6,000	14,000	10,000	40,000
D. Sales after further processing	1,20,000	40,000	48,000	-	2,08,000
E. Further processing cost	80,000	32,000	36,000	-	1,48,000
F. Apportioned Joint Costs (Refer Working Note)	10,000	6,000	14,000	-	-
G. **Profit if further processing (D – E + F)**	**30000**	**2,000**	**(-) 2,000**	-	-
H. Increase/ decrease in profit after further processing (G- C)	20,000	- 4000	- 16,000	-	-

Suggested Product to be further processed for maximizing profits:

On comparing the figures of "Profit if no further processing" and "Profits if further processing", one observes that OPR Ltd. is earning more after further processing of Product S only i.e. ₹ 20,000. Hence, for maximizing profits, only Product S should be further processed and Product P, N and A should be sold at split-off point.

Working Note:

Apportionment of joint costs on the basis of Sales Value at split -off point

$$\text{Apportioned joint cost} = \frac{\text{Total joint cost}}{\text{Total Sales value at split-off point}} \times \text{Sales value of each product}$$

Where,

Total Joint cost = ₹ 40,000

Total sales at split off point (S, P, N and A) = 20,000 + 12,000 + 28,000 + 20,000 = ₹ 80,000

$$\text{Share of S in joint cost} = \frac{\text{Rs.40,000}}{\text{Rs.80,000}} \times \text{Rs. 20,000} = \text{Rs. 10,000}$$

$$\text{Share of P in joint cost} = \frac{\text{Rs.40,000}}{\text{Rs.80,000}} \times \text{Rs. 12,000} = \text{Rs. 6,000}$$

$$\text{Share of N in joint cost} = \frac{\text{Rs.40,000}}{\text{Rs.80,000}} \times \text{Rs. 28,000} = \text{Rs. 14,000}$$

$$\text{Share of A in joint cost} = \frac{\text{Rs.40,000}}{\text{Rs.80,000}} \times \text{Rs. 20,000} = \text{Rs. 10,000}$$

Alternative Solution

Decision for further processing of Product S, P and N

Products	S (₹)	P (₹)	N (₹)
Sales revenue after further processing	1,20,000	40,000	48,000
Less: sales value at split-off point	20,000	12,000	28,000
Incremental Sales Revenue	**1,00,000**	**28,000**	**20,000**
Less: Further Processing cost	80,000	32,000	36,000
Profit/ loss arising due to further processing	**20,000**	**(-)4,000**	**(-)16,000**

Suggested Product to be further processed for maximizing profits:

On comparing the figures of "Profit if no further processing" and "Profits if further processing", one observes that OPR Ltd. is earning more after further processing of Product S only i.e. ₹ 20,000. Hence, for maximizing profits, only Product S should be further processed and Product P, N and A should be sold at split-off point.

Exam Insights: It was a practical problem on treatment of joint cost and identification of products which has to be further processed for maximizing profits. Many examinees could not present the answer in a convincing manner in spite of arriving at the correct decision. Performance of the examinees was average.

Question 24

LDR

A company processes a raw material in its Department 1 to produce three products, viz. A, B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in Department 1 at a total cost of ₹ 12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively. A and B were further processed in Department 2 at a cost of ₹ 1,80,000 and ₹ 1,50,000 respectively.

X was further processed in Department 3 at a cost of ₹ 1,08,000. There is no waste in further processing. The details of sales affected during the period were as under:

	A	B	X
Quantity Sold (kgs.)	17,000	5,000	44,000
Sales Value (Rs.)	12,24,000	2,50,000	7,92,000

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been ₹ 50, ₹ 40 and ₹ 10 per kg respectively.

Required:

(i) Prepare a statement showing the apportionment of joint costs to A, B and X.

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

(iii) Prepare a statement showing the product wise and total profit for the period.

(iv)* State with supporting calculations as to whether any or all the products should be further processed or not. *(RTP May'18, RTP May'19 MTP 10 Marks Sep '23)

Answer 24

(i) Statement showing the apportionment of joint costs to A, B and X

Products	A	B	X	Total
Output (kg)	18,000	10,000	54,000	
Sales value at the point of split off (Rs.)	9,00,000 (Rs. 50 x 18,000)	4,00,000 (Rs. 40 x 10,000)	5,40,000 (Rs. 10 x 54,000)	18,40,000
Joint cost apportionment on the basis of sales value at the point of split off (Rs.)	6,30,000 $\left(\frac{Rs.12,88,000}{Rs.18,40,000} \times Rs.9,00,000\right)$	2,80,000 $\left(\frac{Rs.12,88,000}{Rs.18,40,000} \times Rs.4,00,000\right)$	3,78,000 $\left(\frac{Rs.12,88,000}{Rs.18,40,000} \times Rs.5,40,000\right)$	12,88,000

(ii) Statement showing the cost per kg. of each product (indicating joint cost; further processing cost and total cost separately)

Products	A	B	X
Joint costs apportioned (Rs.) : (I)	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000
Joint cost per kg (Rs.): (I ÷ II)	35	28	7
Further processing Cost per kg. (Rs.)	10 $\left(\frac{Rs.1,80,000}{18,000kg}\right)$	15 $\left(\frac{Rs.1,50,000}{10,000kg}\right)$	2 $\left(\frac{Rs.1,08,000}{54,000kg}\right)$
Total cost per kg (Rs.)	45	43	9

(iii) Statement showing the product wise and total profit for the period

Products	A	B	X	Total
Sales value (Rs.)	12,24,000	2,50,000	7,92,000	
Add: Closing stock value (Rs.) (Refer to Working note 2)	45,000	2,15,000	90,000	

Value of production (Rs.)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (Rs.)	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (Rs.)	1,80,000	1,50,000	1,08,000	
Total cost (Rs.)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (Rs.)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

Products	A	B	X
Sales value (Rs.)	12,24,000	2,50,000	7,92,000
Quantity sold (Kgs.)	17,000	5,000	44,000
Selling price Rs./kg	72 $\left(\frac{\text{Rs.12,24,000}}{\text{17,000kg}}\right)$	50 $\left(\frac{\text{Rs.2,50,000}}{\text{5,000kg}}\right)$	18 $\left(\frac{\text{Rs.7,92,000}}{\text{44,000kg}}\right)$

2. Valuation of closing stock:

Since the selling price per kg of products A, B and X is more than their total costs, therefore closing stock will be valued at cost.

Products	A	B	X	Total
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (Rs.)	45	43	9	
Closing stock value (Rs.)	45,000 (Rs. 45 x 1,000 kg)	2,15,000 (Rs. 43 x 5,000 kg)	90,000 (Rs.9x10,000 kg)	3,50,000

(iv) Calculations for processing decision

Products	A	B	X
Selling price per kg at the point of split off (Rs.)	50	40	10
Selling price per kg after further processing (Rs.) (Refer to working Note 1)	72	50	18
Incremental selling price per kg (Rs.)	22	10	8
Less: Further processing cost per kg (Rs.)	(10)	(15)	(2)
Incremental profit (loss) per kg (Rs.)	12	(5)	6

Product A and X has an incremental profit per unit after further processing, hence, these two products may be further processed. However, further processing of product B is not profitable hence, product B shall be sold at split off point.

Question 25

JPBP Ltd. manufactures two joint products A and B simultaneously from the same process. The process produces another product C which is recovered incidentally from the material used in the manufacture of A and B.

The expenditures incurred up to the point of separation i.e. split-off point are ₹ 14,82,000. As the joint products are capable of being measured in the same units, joint costs are allocated on the basis of physical unit.

Though the joint products A and B are saleable at split-off point, these can also be further processed and sold at a higher market price, with some sales promotion efforts. However, product C can be sold only after further processing.

The management is of the view that, as the net realisable value of the product C at split off point is too small, the value may be deducted from the joint production cost.

The relevant details of the products are as follows:

Particulars	Product A	Product B	Product C
Output (kg.)	16,250	8,125	1,625
Selling price at the split-off point (per kg.) (₹)	72	80	-
Further processing cost (per kg.) (₹)	16	20	8
Further marketing cost (per kg.) (₹)	8	8	4
Selling price after further processing (per kg.) (₹)	112	104	24

You are required the following:

(i) DETERMINE the profit/ (loss) of each joint product if these are sold without further processing.

(ii) WHETHER joint products be processed further? Decide on the basis of incremental profit/ (loss).

(RTP Jan'25)

Answer 25

Working:

1. **Product C is produced incidentally from the material used inthe manufacture of A and B, thus, Product C is a By-product.**

	Per unit (₹)
Selling price after further processing (per kg.) (₹)	24
Less: Further Processing Cost (per kg)	8
Further Marketing Cost (per kg)	4
	12

Calculation of Joint Cost to be borne by By-product C

Joint Costs to be borne by By-product C = Output (kg.) x ₹12

= 1,625 kg. × ₹12

= ₹19,500

2. **Allocation of joint cost among joint products (on the basis ofphysical units) (given)**

Product A: (₹14,82,000 - ₹19,500) × $(\frac{16,250}{24,375})$ = **₹ 9,75,000**

Product B: (₹14,82,000 - ₹19,500) × $(\frac{8,125}{24,375})$ = **₹ 4,87,500**

(i) Statement of Profit/ (Loss) if joint products are soldwithout processing

Particulars	Product A	Product B	Total
(a) Output (kg.)	16,250	8,125	
(b) Selling price at the split-off point (per kg.) (₹)	72	80	
(c) Sales Value (a) x (b)	11,70,000	6,50,000	18,20,000
(d) Allocation of joint costs	9,75,000	4,87,500	14,62,500
(e) Profit at the point ofseparation (c)-(d)	**1,95,000**	**1,62,500**	3,57,500

(ii) Further processing decision

Particulars	Product A (₹)	Product B (₹)
(a) Selling price at split off	72	80
(b) Selling price after further processing	112	104
(c) Incremental revenue (b)-(a)	40	24
(d) Further processing cost	16	20
(e) Further Marketing Cost	8	8
(f) Incremental cost (d)+(e)	24	28
(g) Incremental profit/ (loss) perkg (c)-(f)	**16**	**(4)**
(h) Total Incremental profit/(loss)	**₹ 16 x 16,250 kg ₹ 2,60,000**	**(₹ 4) x 8,125 kg (₹ 32,500)**

Therefore, Product A should be processed further as they giveincremental profit. On the other hand, Product B should be sold at

split-off point as they suffer incremental losses after furtherprocessing.

Question 26

Wave Ltd. is a petroleum refining company which uses cracking process for producing gasoline, diesel and Heavy fuel oil (HFO). All three final products are extracted simultaneously at one common split-off point. Gasoline and diesel are immediately available for sale upon separation, requiring no further processing. In contrast, heavy fuel oil (HFO) undergoes additional processing before it can be sold, as there is no market for it at the split-off point.

Throughout the year, the selling prices and total quantities sold for each item were as follows:

Product	Quantity sold (Gallons)	Selling Price per gallon (₹)
Gasoline	1,674	400
Diesel	4,743	300
Heavy fuel oil (HFO)	6,624	200

The selling prices listed above are projected to remain unchanged in the upcoming year.

The total joint manufacturing costs for the year amounted to ₹ 15,00,000, with an additional cost of ₹ 7,44,000 incurred for finishing Heavy fuel oil (HFO).

There were no opening inventories of gasoline, diesel and Heavy fuel oil (HFO). Though, at the end of the period, the following inventories of complete units were available: 1,620 gallons of gasoline, 540 gallons of diesel, and 225 gallons of Heavy fuel oil (HFO).

You are required to COMPUTE the following for gasoline, diesel and Heavy fuel oil (HFO)-

(i) joint cost allocated, and

(ii) cost of goods sold

using Net Realisable Value Method of joint cost allocation. *(MTP 5 Marks Nov'24)*

Answer 26

(i) Statement of Joint Cost allocation of inventories of gasoline,diesel and Heavy fuel oil (HFO)

(By using Net Realisable Value Method)

	Products			Total
	Gasoline	Diesel	Heavy fuel oil (HFO)	
	(₹)	(₹)	(₹)	(₹)
Final sales value of total production (Working Note 1)	13,17,600 (3,294 × ₹ 400)	15,84,900 (5,283 × ₹ 300)	13,69,800 (6,849 × ₹ 200)	42,72,300
Less: Additional cost	-	-	(7,44,000)	(7,44,000)
Net realisable value (at split-off point)	13,17,600	15,84,900	6,25,800	35,28,300
Joint cost allocated(Working Note 2)	**5,60,156**	**6,73,795**	**2,66,049**	**15,00,000**

(ii) Cost of goods sold

(By using Net Realisable Value Method)

	Products			Total
	Gasoline	Diesel	Heavy fuel oil (HFO)	
	(₹)	(₹)	(₹)	(₹)
Allocated joint cost (from (i))	5,60,156	6,73,795	2,66,049	15,00,000
Additional costs	--	--	7,44,000	7,44,000
Cost of goods available for sale (CGAS)	5,60,156	6,73,795	10,10,049	22,44,000
Less: Cost of ending inventory (Working Note 1)	2,75,485 (CGAS × 49.18%)	68,862 (CGAS × 10.22%)	33,231 (CGAS × 3.29%)	3,77,578
Cost of goods sold	**2,84,671**	**6,04,933**	**9,76,818**	**18,66,422**

Working Notes

1. Total production of three products for the year

Products	Quantitysold (in gallon)	Quantity ofending inventory (ingallon)	Total production	Ending inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)}	(5) = (3)/ (4)
Gasoline	1,674	1,620	3,294	49.18
Diesel	4,743	540	5,283	10.22
Heavy fuel oil (HFO)	6,624	225	6,849	3.29

2. Joint cost apportioned to each product

$$\frac{Total\ Joint\ cost}{Total\ Net\ Realisable\ value} \times \text{Net Realisable Value of each product}$$

Total cost of Gasoline	$\frac{₹\,15,00,000}{₹\,35,28,300}$ x ₹13,17,600	₹5,60,156
Total cost of Diesel	$\frac{₹\,15,00,000}{₹\,35,28,300}$ × ₹15,84,900	₹6,73,795
Total cost of Heavy fuel oil (HFO)	$\frac{₹\,15,00,000}{₹\,35,28,300}$ × ₹6,25,800	₹2,66,049

MULTIPLE CHOICE QUESTIONS

1. **In sugar manufacturing industries molasses is also produced along with sugar. Molasses may be of smaller value as compared with the value of sugar and is known as:** ***(SM)***
   (a) Common product
   (b) By- product
   (c) Joint product
   (d) None of them

Ans: (b)

2. **Method of apportioning joint costs on the basis of output of each joint product at the point of split off is:** ***(SM)***
   (a) Sales value method
   (b) Physical unit method
   (c) Average cost method
   (d) Marginal cost and contribution method

Ans: (b)

3. **In the Net realizable value method, for apportioning joint costs over the joint products, the basis of apportionment would be:** ***(SM)***
   (a) Selling price per unit of each of the joint products
   (b) Selling price multiplied by units sold of each of the joint products
   (c) Sales value of each joint product less further processing costs of individual products
   (d) Both (b) and (c)

Ans: (d)

4. **The main purpose of accounting of joint products and by- products is to:** ***(SM)***
   (a) Determine the opportunity cost
   (b) Determine the replacement cost
   (c) Determine profit or loss on each product line
   (d) None of the above

Ans: (c)

5. **Under net realizable value method of apportioning joint costs to joint products, the selling & distribution cost is:** ***(SM)***
   (a) Added to joint cost
   (b) Deducted from further processing cost
   (c) Deducted from sales value
   (d) Ignored

Ans: (c)

6. **Which of the following is a co-product?** ***(SM)***
   (a) Diesel and Petrol in an oil refinery
   (b) Edible oils and oil cakes
   (c) Curd and butter in a dairy
   (d) Mustard oil and Sunflower oil in an oil processing company.

Ans: (d)

7. **Which of the following is an example of by-product? *(SM)***
   (a) Diesel and Petrol in an oil refinery
   (b) Edible oils and oil cakes
   (c) Curd and butter in a dairy
   (d) Mustard seeds and mustard oil.

Ans: (b)

8. **Which of following method can be used when the joint products are of unequal quantity and used for captive consumption? *(SM)***
   (a) Technical estimates, using market value of similar goods
   (b) Net Realizable value method
   (c) Physical Units method
   (d) Market value at split-off method.

Ans: (a)

9. **Which of the following statement is not correct in relation to Co-products? *(SM)***
   (a) Co-products may also have joint products
   (b) Costing for co-products are done according to process costing method
   (c) Co-products do not have any by-products
   (d) Co-products are treated as a separate cost object for costing purpose.

Ans: (c)

10. **When a by-product does not have any realizable value, the cost of by- product is: *(SM)***
   (a) Transferred to Costing Profit & Loss A/c
   (b) By-product cost is borne by the good units
   (c) By-product cost is ignored
   (d) By-product cost is determined taking value of similar goods

Ans: (b)

11. **SG Ltd manufactures two products from a joint milling process. The two products developed are Mine support (MS) and Commercial building (CB). A standard production run incurs joint costs of ₹ 1,00,000 and results in 60,000 units of MS and 90,000 units of CB. Each MS sells for ₹ 200 per unit, and each CB sells for ₹ 450 per unit. Assuming no further processing work is done after the split-off point, the amount of joint cost allocated to Commercial building (CB) on a physical quantity allocation basis would be: *(SM)***
   (a) ₹ 60,000.
   (b) ₹ 180,000.
   (c) ₹ 225,000.
   (d) ₹ 1,20,000.

Ans: (a)

12. **Kay Company manufactures two hair care lotions, Livi and Sili, out of a joint process. The joint (common) costs incurred are ₹ 6,30,000 for a standard production run that generates 1,80,000 gallons of Livi and 1,20,000 gallons of Sili. Livi sells for ₹ 240 per gallon, and Sili sells for ₹ 390 per gallon. If additional processing costs beyond the split-off point are ₹ 140 per gallon for Livi and ₹ 90 per gallon for Sili, the joint cost of each production run allocated to Livi on a physical-quantity basis is: *(SM)***
   (a) ₹ 340,000.
   (b) ₹ 378,000.
   (c) ₹ 232,000.
   (d) ₹ 580,000.

Ans: (b)

13. **For the purpose of allocating joint costs to joint products, the sales price at point of sale, reduced by cost to complete after split-off, is assumed to be equal to the: *(SM)***
   (a) Joint costs
   (b) Sales price less a normal profit margin at point of sale
   (c) Net sales value at split off
   (d) Total costs.

Ans: (c)

14.ICT Ltd. belongs to pharmaceutical industries. The chemical process that ICT Ltd. operates convert one compound into three category of medicines viz. BetaTab, Folick and TegriCap. Though BetaTab and Folick are already converted to final product at split-off point, Tegricap needs further processing along with addition of new compound with it.

The market for BetaTab and Folick is highly active, thus the production is sold at split-off point, however, Tegricap can be sold only after further processing.

Following information is provided for the current year:

Products	Quantity sold (tons)	Selling price per ton (₹)
BetaTab	372	7,500
Folick	1,054	5,625
TegriCap	1,472	3,750

The selling price is expected to remain the same for coming years.

The total joint manufacturing costs till split-off point is ₹ 62,50,000 and the amount spent for further processing w.r.t. Tegricap is ₹ 31,00,000

The details regarding closing inventories are as follows:

Products	Completed units (tons)
BetaTab	360
Folick	120
TegriCap	50

You are required to COMPUTE the joint cost allocated to BetaTab, Folick and TegriCap using Net realizable value (NRV) method. *(RTP Jan'25)*

(a) BetaTab- ₹ 15,65,481, Folick - ₹ 33,26,647 and TegriCap - ₹ 13,57,872

(b) BetaTab - ₹ 23,33,985, Folick - ₹ 28,07,478 and TegriCap - ₹ 11,08,537

(c) BetaTab - ₹ 19,27,533, Folick - ₹ 23,18,570 and TegriCap - ₹ 20,03,897

(d) BetaTab - ₹ 11,08,537, Folick - ₹ 28,07,478 and TegriCap - ₹ 23,33,985

Ans: (b)

15.RN Ltd. manufactures two primary products, P1 and P2, through a joint process and a by-product, R12, is produced spontaneously. The relationship between output quantities to the direct material input stays stable.

To allocate joint production costs to the primary products, the company utilizes the physical volume method.

During the month of March, company incurred joint production costs of ₹ 1,30,00,000. As the primary products are not freely marketable at the split-off point, they are processed further.

The net realizable value of the by-product is treated as deductions from the joint production costs before the joint costs are allocated to the primary products.

The information regarding company's production and its cost during the month of March is provided below:

Particulars	P1	P2	R12
Output (kg.)	1,95,000	3,90,000	81,250
Selling price per kg.	₹ 200	₹ 120	₹ 40
Further processing costs	₹ 26,00,000	₹ 39,00,000	-

FIND OUT the amount of joint product cost to be allocated to P2 by using the physical volume method. *(MTP 2 Marks Nov'24)*

(a) ₹ 65,00,000

(b) ₹ 97,50,000

(c) ₹ 39,00,000

(d) ₹ 32,50,000

Ans: (a)

CHAPTER 12: SERVICE COSTING

CONCEPTS OF THIS CHAPTER

- Cost accounting method for service sectors.
- Units used in different service sectors.
- KPIs used in service sectors.
- Calculate costs for different service industries.

LDR Questions

Q19 Q21
Q24 Q33

QUICK REVIEW OF IMPORTANT CONCEPTS

METHODS FOR DETERMINING THE SERVICE COST UNITS

i. Composite Cost Unit- May be computed in two ways

Absolute (Weighted Average) basis	Commercial (Simple Average) basis

ii. Equivalent Cost Unit/ Equivalent Service Unit is when each grade of service is assigned a weight and converted into equivalent units

STATEMENT OF COSTS FOR SERVICE SECTORS

Cost sheet on the basis of variability is prepared classifying all the costs into three different heads.

- Fixed costs or Standing charges
- Variable costs or Operating expenses
- Semi-variable costs or Maintenance expenses

Costing of Transport Services

Types of transport services		
	• Goods transport	– Cost unit: Ton– Kilometre
	• Passenger transport	– Cost unit: Passenger– Kilometre

Standing charges or fixed costs (costs that remain constant irrespective of distance travelled)

- Insurance
- License fees
- Taxes
- Administration Expenses.
- Garage costs, including garage Rent
- Depreciation (If related to efflux of time)
- Salary drive, Conductor, Cleaners, etc if paid on monthly basis

Variable costs or Running costs (costs associated with distance travelled)

- Petrol and Diesel
- Lubricant oils
- Any other variable costs identified.
- Depreciation (If related to activity)
- Wages to Driver, Conductor, Cleaners, etc

Semi-variable costs or Maintenance costs

- Repair and Maintenance
- Tyres
- Spares, etc.

Costing of Hotels and Lodges

Cost unit ⟶ Guest-day or Room-day

Costing Of Hospitals

A hospital may have different departments such as

- Out - Patient
- In patient
- Medical Services Like X-Ray, Scanning, etc.
- General Services like Catering, Laundry, Power house, etc.
- Miscellaneous services like Transport, Dispensary, etc.

Unit of Cost

- Out Patient – Per Out-patient
- Scanning – Per Case
- In Patient – Per Room Day
- Laundry – Per 100 items laundered

Costing of Information Technology Enabled Services

- EMPLOYEE COST constitutes SIGNIFICANT portion of total operating costs.
- DIRECT EMPLOYEE COST is TRACEABLE to SERVICES RENDERED.

Typical MANPOWER DIRECTLY ENGAGED on a project:	**SUPPORT MANPOWER ENGAGED on a project:**
• Software Engineers / Functional Consultants / Business Analysts, • Project Leaders, • Project Manager, • Program Manager, etc. The COSTS are TRACEABLE with a project and hence forming part of DIRECT COSTS of the project	• Quality Assurance Team, • Testing team, • Version Control team, • Staffing Manager, etc. If time is NOT TRACEABLE with a single project, then it may either be allocated or apportioned to various projects on some SUITABLE BASIS.

Costing of Toll Roads

Capital Costs (incurred during construction period)

Preliminary and pre-operative expenses, Land Acquisition, Materials, Labour, Overheads incurred during actual construction, Contingency allowance, Interest during construction period.

Operating and Maintenance Costs (incurred once the road is operational)

Annual operating cost- cost of operating tollbooths, emergency services, administrative expenses & communications and security services

Routine maintenance cost- Patching of potholes, sealing of cracks, edge repair, Surface renewal, Periodic maintenance.

To compute the toll rate, following formula may be used: $\frac{\text{Total Cost+Profit}}{\text{Number of Vehicles}}$

Costing of Educational Institutions

INCOME of the Educational Institutions

- **One-time fees** like Admission fee, Development fee, Annual fee etc
- Recurring fees like tuition fee, laboratory, computer and internet fee, library fee, training fee etc.
- **Other incomes** like transport, hostel, mess and canteen.

EXPENDITURE of the Educational Institutions

- **Operational Cost** like teacher's salary, Building maintenance, PC maintenance and internet charges.
- **Research and Development Cost** like academic research on various fields of specialisations.

Costing of Insurance Companies

INCOME of Insurance companies		• Premium on policy (periodic or onetime) • Commission on re-insurance • Fund administration fee and return on investment of funds, etc.
EXPENDITURE of Insurance companies	Direct cost	commission paid to agents, claim settlement, cost of valuation, premium for re-insurance, legal and other costs, etc.
	Indirect cost	actuarial fees, market and product development costs, administration cost, asset management cost, etc.

Costing of Financial Institutions

- COSTS TO BE IDENTIFIED with appropriate activities that have caused its occurrence.
- Then costs must be REASSIGNED FROM ACTIVITIES TO COST OBJECTS based on identified cost drivers.
- The concepts on ACTIVITY BASED COSTING under Costing of Insurance Companies is also applicable to financial institutions.

Costing of Power Houses

Cost unit ⟷ Cost per kilowatt-hour (kWh)

Standing charges or Fixed costs (costs that remain constant irrespective of power or stream generated)

- Rent, Rates & Taxes
- Insurance
- Depreciation
- Salaries, if paid on time (Monthly basis)
- Administration expenses, etc.

Variable costs or Running costs (costs associated with power or stream generated)

- Fuel Charges
- Water Charges
- Wages / Labour charges, if paid on the basis of production
- Any other variable costs identified.

Semi-variable costs or Maintenance costs

- Meters
- Furnaces
- Service Materials
- Tools, etc.

Questions & Answers

Theory Questions

Question 1

DIFFERENCIATE between Service costing and Product costing *(MTP 5 Marks, Mar'21, SM RTP Sep'24)*

Answer 1

Service costing differs from product costing (such as job or process costing) in the following ways due to some basic and peculiar nature.

(i) Unlike products, services are intangible and cannot be stored, hence, there is no inventory for the services.

(ii) Use of Composite cost units for cost measurement and to express the volume of outputs.

(iii) Unlike a product manufacturing, employee (labour) cost constitutes a major cost element than material cost.

(iv) Indirect costs like administration overheads are generally have a significant proportion in total cost of a service as unlike manufacturing sector, service sector heavily depends on support services and traceability of costs to a service may not economically feasible.

Question 2

STATE the unit of cost for the following service industries:

(i) Electricity Supply service

(ii) Hospital

(iii) Cinema

(iv)* Hotels *(MTP 4 Marks, Apr'22 & Sep '22)

Answer 2

Sr. No.	Service industry	Unit of cost
(i)	Electricity Supply service	Kilowatt- hour (kWh)
(ii)	Hospital	Patient per day, room per day or per bed, per operation etc.
(iii)	Cinema	Per ticket.
(iv)	Hotels	Guest Days or Room Days

Question 3

Explain Build-Operate-Transfer (BOT) approach and classify the following expenses in Capital Cost or Operating and Maintenance Cost for Toll Roads:

(i) Land acquisition

(ii) Interest expenses incurred for servicing term loans

(iii) Material and Labour

(iv) Toll Collection Expenses

(v) Contingency Allowance

(vi) Periodic painting cost of railings etc. *(PYP 5 Marks Sep'24)*

Answer 3

Build-Operate-Transfer (BOT) Approach: BOT is an option for the Government to outsource public projects to the private sector.

With BOT, the private sector designs, finances, constructs and operates the facility and eventually, after specified concession period, the ownership is transferred to the Government. Therefore, BOT can be seen as a developing technique for infrastructure projects by making them amenable to private sector participation.

Expenses	Classification
Land acquisition	Capital Cost
Interest expenses incurred for servicing term loans	Operating and Maintenance Cost
Material and Labour	Capital Cost
Toll Collection Expenses	Operating and Maintenance Cost
Contingency Allowance	Capital Cost
Periodic painting cost of railingsetc.	Operating and Maintenance Cost

Question 4

What do you understand by Build-Operate-Transfer (BOT) approach in Service Costing? How is the Toll rate computed? *(PYP 5 Marks, Jul'21)*

Answer 4

Build-Operate-Transfer (BOT) Approach: In recent years a growing trend emerged among Governments in many countries to solicit investments for public projects from the private sector under BOT scheme. **BOT is an option for the Government to outsource public projects to the private sector.**

With BOT, the private sector designs, finances, constructs and operate the facility and eventually, after specified concession period, the ownership is transferred to the Government. Therefore, BOT can be seen as a developing technique for infrastructure projects by making them amenable to private sector participation.

Toll Rate: In general, the toll rate should have a direct relation with the benefits that the road users would gain from its improvements. The benefits to road users are likely to be in terms of fuel savings, improvement in travel time and good riding quality.

To compute the toll rate, following formula may be used

= Total Cost + Profit / Number of vehicles

Or, to compute the toll rate following formula with rounding off to nearest multiple of five has been adopted:

User fee = Total distance x Toll rate per km.

Exam Insights: It was a service costing question on Build-Operate-Transfer (BOT). Performance of the examinees was below average.

Question 5

EXPLAIN the Methods for ascertaining Service Cost Unit. *(MTP 5 Marks Nov'24)*

Answer 5

Methods for ascertaining Service Cost UnitComposite Cost Unit

Sometime two measurement units are combined together to know the cost of service or operation. These are called composite cost units. For example, a public transportation undertaking would measure the operating cost per passenger per kilometer.

Examples of Composite units are Tonne- km., Quintal- km, Passenger- km., Patient-day etc. **Composite unit may be computed in two ways.**

(i) Absolute (Weighted Average) basis.

(ii) Commercial (Simple Average) basis.

In both bases of computation of service cost unit, weightage is alsogiven to qualitative factors rather quantitative (which are directlyrelated with variable cost elements) factors alone.

(i) Weighted Average or Absolute basis – It is a summation of the products of qualitative and quantitative factors. For example, to calculate absolute Tonne-Km for a goods transport is calculatedas follows.:

$$\sum(\text{Weight Carried} \times \text{Distance})_1 + (\text{Weight Carried} \times \text{Distance})_2 + \ldots + (\text{Weight Carried} \times \text{Distance})_n$$

Similarly, in case of Cinema theatres, price for various classes of seats is fixed differently. For example– First class seat may be provided with higher quality service and hence charged at a higher rate, whereas Second Class seat may be priced less. In this case, appropriate weight to be given effectfor First Class seat and Second Class seat – to ensure propercost per composite unit.

(ii) Simple Average or Commercial Basis – It is the product of average qualitative and total quantitative factors. For example,in case of goods transport, Commercial Tonne-Km is arrived atby multiplying total distance km., by average load quantity.

$$\sum(\text{Distance}_1 + \text{Distance}_2 + \ldots\ldots + \text{Distance}_n) \times \left(\frac{W_1+W_2+\cdots+W_n}{n}\right)$$

In both the example, variable cost is dependent of distance andis a quantitative factor. Since, the weight carried does not affectthe variable cost hence and is a qualitative factor.

Equivalent Cost Unit/ Equivalent Service Unit:

To calculate cost or pricing of two more different grade of services which uses common resources, **each grade of service is assigned a weight and converted into equivalent units.** Converting services into equivalent units make different grade of services equivalent and comparable.

Practical Questions

Costing of Transport Services

Question 6

Answer the following:

A company has the following three alternative proposals for conveyance facilities for its sales personnel who has to do substantial traveling, approximately 20,000 kilometers yearly:

(i) Purchasing and maintaining its own fleet of cars. The average cost of a car is ₹ 7,20,000

(ii) Allow the Executive to use their own car and reimburse the expenses @ ₹ 12 per kilometer and also bear insurance costs.

(iii) Hire cars from an agency at ₹ 2,16,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol	**₹ 7.20 per km.**
Tyre	**₹ 0.144 per km.**
Taxes	**₹ 960 per car per annum**
Repairs and maintenance	**₹ 0.24 per km.**
Insurance	**₹ 1,440 per car per annum**
Life of the car	**5 years with annual mileage of 20,000 km.**
Resale value	**₹ 96,000 at the end of the fifth year.**

WORK OUT the relative costs of three proposals and rank them. ***(MTP 5 Marks, Sep'22, SM)***

Answer 6

Calculation of relative costs of three proposals and their ranking

	I- Use of company's car per km. (₹)	II- Use of own car per km. (₹)	III- Use of hired car per km. (₹)
Reimbursement	--	12.00	--
Hire Charges	--	--	10.80*
Fixed cost:			
Insurance	0.072	0.072	--
Taxes	0.048	--	0.048
Depreciation	6.24#	--	--
Running and Maintenance Cost:			

Petrol	7.20	--	7.20
Repairs and Maintenance	0.24	--	--
Tyre	0.144	--	0.144
Total cost per km.	13.944	12.072	18.192
Cost for 20,000 km.	2,78,880	2,41,440	3,63,840
Ranking of proposals	II	I	III

*(₹ 2,16,000 ÷ 20,000 km.) = ₹ 10.80

#[(₹ 7,20,000 - ₹ 96,000) ÷ 5 years] ÷ 20,000 km. = ₹ 6.24

The Second alternative i.e., use of own car by the executive and reimbursement of expenses by the company is the best alternative from company's point of view.

Question 7

Wavelength Transport Company is running local city buses. It has a fleet of 20 Buses. Each bus can carry average 40 passengers per day and cover distance of 112.50 kms per day. Due to Covid-19 pandemic, the company is running 90% buses on average.

Below are the operational expenses worked out for the month of November, 2021:

Original cost per bus	₹ 48,00,000
Insurance for 20 buses	₹ 63,36,000 per annum
Diesel & Oil	₹ 10 per km.
Salary of drivers per bus	₹ 25,000
Salary of cleaners per bus	₹ 15,000
Tyres and tubes	₹ 12,58,040
Lubricants	₹ 10,70,000
Repairs	₹ 24,70,000
Road tax per bus	₹ 1,50,000
Administrative overhead	₹ 50,88,000 per annum

Depreciation on buses is computed @ 20% using Straight Line Method.

Passenger tax is 15% on total taking.

Based on abovementioned information, you are required to COMPUTE the fare to be charged from each passenger per kilometer assuming 25% margin on total taking (Total receipts from passengers.)

(MTP 10 Marks, Mar'22)

Answer 7

Operating Cost Statement

Particulars	**Total Cost Per Month (in ₹)**
Fixed Charges:	
Salary of Drivers (₹ 25,000 × 20 buses)	5,00,000
Salary of Cleaners (₹ 15,000 × 20 buses)	3,00,000
Road Tax (₹ 1,50,000 × 20 buses)	30,00,000
Insurance (₹ 63,36,000/12 months)	5,28,000
Depreciation $\left(\frac{48,00,000\times20\%\times20\text{buses}}{12\text{ months}}\right)$	16,00,000
Administrative Overheads (₹ 50,88,000/12 months)	4,24,000
Total (A)	**63,52,000**
Variable Charges:	
Diesel (60,750 km. × ₹10)	6,07,500
Tyres and Tubes	12,58,040
Lubricants	10,70,000
Repairs	24,70,000
Total (B)	**54,05,540**
Total Operating Cost (A+B)	1,17,57,540
Add: Passenger tax (Refer to WN-1)	29,39,385

Add: Profit (Refer to WN-1)	48,98,975
Total takings (C)	**1,95,95,900**
No. of passengers kms. in a month (D)	24,30,000
Cost per passenger km. (C/D)	**8.06**

Working Notes:

1. Let total takings be X then Passenger tax and profit will be as follows:

X	= ₹ 1,17,57,540 + 0.15X + 0.25X
X – 0.40X	= ₹ 1,17,57,540
X	$= \frac{1,17,57,540}{0.60}$ = ₹ 1,95,95,900
Passenger tax	= ₹ 1,95,95,900 × 0.15 = ₹ 29,39,385
Profit	= ₹ 1,95,95,900 × 0.25 = ₹ 48,98,975

2. Total Kilometres to run during the month of November, 2021
   = (112.50 km. × 30 days × 20 Buses) x 90% = 60,750 Kilometres
3. Total passenger Kilometres during the month of November, 2021
   = 60,750 km. × 40 passengers = 24,30,000 Passenger- km.

Question 8

Star Airlines operates a single aircraft of 180 seats capacity between city 'ND' and 'GA'. The average normal occupancy is estimated at 70% per flight. The average one-way fare is ₹ 12,500 from city 'ND" to 'GA'. The costs of operation of the flight as collected by an expert analyst are:

Fuel cost (Variable) per flight from 'ND' to 'GA'	₹ 2,28,000 per flight
Food served on flight from 'ND' to 'GA' (no charge to passenger)	₹ 270 per passenger
Commission paid to Travel Agents (All ticket booking through agents)	7.5% of fare
Fixed costs:	
Lease & landing charges per flight 'ND' to 'GA'	₹ 9,12,000
Salaries of flight crew per flight 'ND' to 'GA'	₹ 90,000

Note: Assume that fuel costs are unaffected by the actual number of passengers on a flight.

You are required to:

(i) Calculate the net operating income that Star Airlines makes per flight from 'ND' to 'GA'.

(ii) Star Airlines expects that its occupancy will increase to 144 passengers per flight if the fare is reduced to ₹ 11,670. Advise whether this proposal should be implemented or not.

(PYP 6 Marks May '24)

Answer 8

(i) No. of passengers 180 seats × 70% = 126

	(₹)	(₹)
Fare collection (126 passengers × ₹12,500)		15,75,000
Variable costs:		
Fuel	2,28,000	
Food (126 passengers × ₹270)	34,020	
Commission (7.5 % of ₹15,75,000)	1,18,125	3,80,145
Contribution per flight		11,94,855
Fixed costs:		
Lease and Landing Charges	9,12,000	
Salaries of flight Crew	90,000	10,02,000
Net income per flight		1,92,855

(ii)

Fare collection (144 passengers × ₹11,670)		16,80,480
Variable costs:		
Fuel	2,28,000	
Food (144 passengers × ₹270)	38,880	
Commission (7.5% of ₹16,80,480)	1,26,036	3,92,916

Contribution		12,87,564
Fixed costs:		
Lease and Landing Charges	9,12,000	
Salaries of flight Crew	90,000	10,02,000
Net income per flight		2,85,564

There is an increase in contribution by ₹ 92,709. Hence the proposal is acceptable.

Question 9

Royal transport company has been given a 50-kilometre-long route to run 6 buses. The cost of each bus is ₹ 75,00,000. The buses will make 3 round trips per day carrying on an average 75 percent passengers of their seating capacity. The seating capacity of each bus is 48 passengers. The buses will run on an average 25 days in a month. The other information for the year 2021-22 is given below:

Garage Rent	**₹ 60,000 per month**
Annual Repairs & Maintenance	**₹ 2,40,000 each bus**
Salaries of 6 drivers	**₹ 20,000 each per month**
Wages of 6 conductors	**₹ 16,000 each per month**
Wages of 6 cleaners	**₹ 10,000 each per month**
Manager's salary	**₹ 50,000 per month**
Road Tax, Permit fee, etc.	**₹ 60,000 for a quarter**
Office expenses	**₹ 25,000 per month**
Cost of diesel per litre	**₹92**
Kilometer run per litre for each bus	**6 kilometers**
Annual Depreciation	**20% of cost**
Annual Insurance	**4% of cost**
Engine oils & lubricants (for 1,000 kilometres)	**₹ 20,000**

You are required to calculate the bus fare to be charged from each passenger per kilometer (upto four decimal points), if the company wants to earn profit of $33\frac{1}{3}$ percent on taking (total receipts from passengers).
(MTP 10 Marks, Oct'22)

Answer 9

Working Notes:

1. **Total Kilometres to be run during the year 2021-22**
   = 50 km.× 2 sides × 3 trips × 25 days × 12 months × 6 buses = 5,40,000 Kilometres
2. **Total passenger Kilometres**
   = 5,40,000 km. × 48 passengers × 75% = 1,94,40,000 Passenger- km.

Operating Cost Sheet for the year 2021- 22

	Particulars	Total Cost (Rs.)
A.	**Fixed Charges:**	
	Garage rent (Rs. 60,000 × 12 months)	7,20,000
	Salary of drivers (Rs. 20,000 × 6 drivers ×12 months)	14,40,000
	Wages of Conductors (Rs. 16,000 × 6 conductors × 12 months)	11,52,000
	Wages of Cleaners (Rs. 10,000 × 6 cleaners × 12 months)	7,20,000
	Manager's salary (Rs.50,000 × 12 months)	6,00,000
	Road Tax, Permit fee, etc. (Rs. 60,000 × 4 quarters)	2,40,000
	Office expenses (Rs. 25,000 × 12 months)	3,00,000
	Depreciation (Rs. 75,00,000 × 6 buses × 20%)	90,00,000
	Insurance (Rs. 75,00,000 × 6 buses × 4%)	18,00,000
	Total (A)	1,59,72,000
B.	**Variable Charges:**	
	Repairs and Maintenance (Rs. 2,40,000 × 6 buses)	14,40,000

	Diesel {(5,40,000 km. ÷ 6 km.) × Rs.92}	82,80,000
	Engine oils & lubricants {(Rs. 20,000. ÷ 1000 km.) × 5,40,000 km}	1,08,00,000
	Total (B)	2,05,20,000
	Total Cost (A+B)	3,64,92,000
	Add: 33 1/3 % Profit on takings or 50% on cost	1,82,46,000
C.	Total Takings (Total bus fare collection)	5,47,38,000
D.	Total Passenger-km. (Working Note 2)	1,94,40,000
E.	Bus fare to be charged from each passenger per km. (C ÷ D)	2.82

Question 10

SpeedEx Logistics, established in 2010 and headquartered in Mumbai, India, operates within the transportation and logistics industry as a third- party logistics (3PL) provider. The company's fleet consists of 10 trucks, 15 vans, and 5 trailer, each serving distinct purposes. The records of Truck R-40 reveal the following information for July 2024.

Days Maintained	**30**
Days Operated	**25**
Total Hours Operated	**300**
Total Kilometres Covered	**2,500**
Total Tonnage Carried	
(4 tonne-load per trip, return journey empty 2 round trips perday)	

The following further information is made available:

A. Operating Costs for the month: Petrol ₹ 400, oil ₹170, Grease ₹ 90, Wages to driver ₹ 550, Wages to Worker ₹ 350.

B. Maintenance Costs for the month: Repair ₹ 170, Overhaul ₹ 60, Tyres ₹ 150, Garage charges ₹ 100.

C. Fixed Costs for the month based on the estimates for the year: Insurance ₹ 50, Licence, tax etc. ₹ 80, Interest ₹ 40, Other Overheads ₹ 190

D. Capital costs: Cost of acquisition ₹ 54,000; Residual Value at the end of 5 years life ₹ 36,000.

You are required to CALCULATE:

(i) cost per days maintained

(ii) cost per days operated

(iii) cost per hours operated

(iv) cost per kilometres covered

(v) cost per commercial tonne km ***(MTP 5 Marks Aug'24)***

Answer 10

	Particulars	Amount in ₹
A.	**Operating costs:**	
	Petrol	400
	Oil	170
	Grease	90
	Wages to Driver	550
	Wages to Worker	350
	(A)	1,560
B.	**Maintenance Costs:**	
	Repairs	170
	Overhead	60
	Tyres	150
	Garage Charges	100
	(B)	480
C.	**Fixed Cost:**	
	Insurance	50
	License, Tax etc	80
	Interest	40
	Other Overheads	190

	Depreciation $\frac{(54,000 - 36,000)}{5 \times 12}$	300
	(C)	660
	Total Cost (A + B + C)	2,700

(i) Cost per days maintained = ₹ 2700/30 days = ₹ 90

(ii) Cost per days operated = ₹ 2700/25 days = ₹ 108

(iii) Cost per hours operated = ₹ 2700/300 hours = ₹ 9

(iv) Cost per kilometres covered = ₹ 2700/2500 kms = ₹ 1.08

(v) Cost per commercial tonne kms = ₹ 2700/5000 tonne kms = ₹ 0.54

*Commercial tonne kms = Total distance travelled x Average load

$= \frac{(4 \text{ tonnes} + 0 \text{ tonnes})}{2} \times 2500 \text{ kms}$

= 5000 tonne kms

Question 11

Royal Transport Services runs fleet of buses within the limits of Jaipur city. The following are the details which were incurred by the company during October, 2021:

	(₹)
Cost of each Bus	24,00,000
Garage Rent	1,00,000
Insurance	25,000
Road tax	20,000
Manager's Salary	60,000
Assistant's Salary (Two)	32,000 each
Supervisor's Salary (Three)	24,000 each
Driver's Salary (Twenty-Five)	20,000 each
Cleaner's Salary (Twenty)	5,000 each
Office Staff's Salary	1,00,000
Consumables	1,20,000
Repairs & Maintenance	90,000
Other Fixed Expenses	72,000
Diesel (10 Kms per Litre)	80 per litre
Oils & Lubricants	1,45,000
Tyres and tubes	35,000
Depreciation	10% p.a. on Cost
Other details are as below:	
	Capacity
Buses	60 Passengers
13 Buses	50 Passengers

Each bus makes 4 round trips a day covering a distance of 10 Kilometers in each trip (One Way) on an average. During the trips 80% of the seats are occupied. The annual records show that 5 buses are generally required to be kept away from roods each day for repairs.

You are required to CALCULATE cost per passenger-km.

Cost sheet to be prepared on the basis of 25 buses. *(RTP Nov'22)*

Answer 11

Operating Cost Sheet

Particulars	Amount (₹)	Amount (₹)
Standing Charges:		
Depreciation (₹ 24,00,000 X 10% X 1/12 X 25)	5,00,000	
Garage Rent	1,00,000	
Insurance Road Tax	25,000	
Manager's Salary	20,000	

Assistant's Salary (₹ 32,000 X 2)	60,000	
Supervisor's Salary (₹ 24,000 X 3)	64,000	
Driver's Salary (₹ 20,000 X 25)	72,000	
Cleaner's Salary (₹ 5,000 X 20)	5,00,000	
Office Staff's Salary	1,00,000	
Consumables	1,00,000	
Repairs & Maintenance	1,20,000	
Other Fixed Expenses	90,000	
	72,000	18,23,000
Running Charges		
Diesel (49,600 Kms / 10 Kms X ₹ 80 per unit)	3,96,800	
Oils & Lubricants	1,45,000	
Tyres and tubes	35,000	5,76,800
Total Operating Cost		**23,99,800**

$$\text{Cost per passenger-km} = \frac{\text{Total Operating Cost}}{\text{Passenger-kms}}$$

$$= \frac{23,99,800}{27,18,080} = 0.883$$

Working Note:

Calculation of Total Kilometers and Passenger Kilometers

Specification	Total Km.	Passenger–Km.
12 Buses (60 Passengers)	29,760 Kms (10 Kms × 4 X 2 trips × 31 days x 12 Buses)	14,28,480 (29760 Kms x 60 Pass. x 80%)
13 Buses (50 Passengers)	32,240 Kms (10 Kms × 4 X 2 trips × 31 days x 13 Buses)	12,89,600 (32240 Kms x 50 Pass. x 80%)
Total	**62,000**	**27,18,080**

Since 5 buses out of 25 buses are kept for repairs every day

Actual total Km. 62,000 × 20/25 = 49,600

Question 12

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'. ***(PYP 5 Marks, May'22)***

Answer 12

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.)

Exam Insights: This numerical question was based on the basic concept of service costing. Most of the examinees made mistakes in the calculation of total operated time taken per trip. Overall performance of the examinees dates was poor.

Question 13

Chiku Transport Service is a Delhi based national goods transport service provider, owning four trucks for this purpose. The cost of running and maintaining these trucks are as follows:

Particulars	Amount
Diesel cost	₹ 19.20 per km.
Engine oil	₹ 4,200 for every 13,000 km.
Repair and maintenance	₹ 36,000 for every 10,000 km.
Driver's salary	₹ 24,000 per truck per month
Cleaner's salary	₹ 15,000 per truck per month
Supervision and other general expenses	₹ 14,000 per month
Cost of loading of goods	₹ 180 per Metric Ton (MT)

All four trucks were purchased for ₹ 30 lakhs with an estimated life of 7,20,000 km each.

During the next month, it is expecting 6 bookings, the details are as follows:

Sr. No.	Journey	Distance in km	Weight- Up (in MT)	Weight- Down (in MT)
1.	Delhi to Kochi	2,700	14	6
2.	Delhi to Guwahati	1,890	12	0
3.	Delhi to Vijayawada	1,840	15	0
4.	Delhi to Varanasi	815	10	0
5.	Delhi to Asansol	1,280	12	4
6.	Delhi to Chennai	2,185	10	8
	Total	10,710	73	18

Required

(i) Calculate the total absolute Ton-km for the vehicles.

(ii) Calculate the cost per ton-km. ***(MTP 6 Marks Mar'24 & MTP 10 Marks, Apr'21)***

Answer 13

(i) Calculation of Absolute Ton-km for the next month:

Journey	Distance in km	Weight- Up (in MT)	Ton-km	Weight- Down (in MT)	Ton-km	Total
	(a)	(b)	(c)=(a)×(b)	(d)	(e)= (a)×(d)	(c)+(e)
Delhi to Kochi	2,700	14	37,800	6	16,200	54,000
Delhi to Guwahati	1,890	12	22,680	0	0	22,680
Delhi to Vijayawada	1,840	15	27,600	0	0	27,600
Delhi to Varanasi	815	10	8,150	0	0	8,150
Delhi to Asansol	1,280	12	15,360	4	5,120	20,480
Delhi to Chennai	2,185	10	21,850	8	17,480	39,330
Total	10,710	73	1,33,440	18	38,800	1,72,240

Total Ton-Km = 1,72,240 ton-km

(ii) Calculation of cost per ton-km:

Particulars	Amount (₹)	Amount (₹)
A. Running cost:		
Diesel Cost {₹19.20 × (10,710 × 2)}	4,11,264.00	
Engine oil cost $\left(\frac{4,200}{13,000\text{km}} \times 21,420\text{km}\right)$	6,920.31	
Cost of loading of goods {₹180 × (73+18)}	16,380.00	
Depreciation {(30,00,000/720,000×21,420 km) ×4}	3,57,000.00	7,91,564.31
B. Repairs & Maintenance Cost (36,000/10,000×21,420)		77,112.00
C. Standing Charges		
Drivers' salary (₹24,000 × 4 trucks)	96,000.00	
Cleaners' salary (₹15,000 × 4 trucks)	60,000.00	
Supervision and other general exp.	14,000.00	1,70,000.00
Total Cost (A + B + C)		10,38,676.31
Total ton-km		1,72,240
Cost per ton-km		6.03

Question 14

A transport company has a fleet of four trucks of 10 tonne capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	One way Distance Km	No. of trips per day	Load carried per trip / day tonnes
1	48	4	6
2	120	1	9
3	90	2	8
4	60	4	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under

Year	Total distance travelled	Maintenance Cost ₹
1	1,60,200	1,38,150
2	1,56,700	1,35,525

The following are the details of expenses for the year under review:

Diesel	₹ 60 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	₹ 22,000 per truck per month
Licence and taxes	₹ 15,000 per annum per truck
Insurance	₹ 80,000 per annum for all the four trucks

Purchase Price per truck	₹30,00,000, Life 10 years. Scrap value at the end of life is ₹1,00,000.
Oil and sundries	₹ 525 per 100 km run.
General Overhead	₹ 1,10,840 per annum

The trucks operate 24 days per month on an average.

Required

(i) PREPARE an Annual Cost Statement covering the fleet of four trucks

(ii) CALCULATE the cost per km. run.

(iii) DETERMINE the freight rate per tonne km. to yield a profit of 30% on freight.

(RTP Nov'19) (Same concept different figures MTP 10 Marks March '19 & Sep '23)

Answer 14

(i) Annual Cost Statement of fourvehicles

	(₹)
Diesel {(4,21,632 km. ÷ 4 km) × ₹ 60) (Refer to Working Note 1)	63,24,480
Oil & sundries {(4,21,632 km. ÷ 100 km.) × ₹ 525}	22,13,568
Maintenance {(4,21,632 km. × ₹ 0.75) + ' 18,000}(Refer to Working Note 2)	3,34,224
Drivers' salary {(₹ 22,000 × 12 months) × 4 trucks}	10,56,000
Licence and taxes (₹ 15,000 × 4 trucks)	60,000
Insurance	80,000
Depreciation {(₹ 29,00,000 ÷ 10 years) × 4 trucks}	11,60,000
General overhead	1,10,840
Total annual cost	**1,13,39,112**

(ii) Cost per km. run

$$\text{Cost per Kilometer run} = \frac{\text{Totalannual cost of vehicles}}{\text{Totalkilometre travelled annually}} \text{ (Refer to working Note 1)}$$

$$= \frac{\text{Rs.1,13,39,112}}{\text{4,21,632 Kms}} = \text{Rs. 26.89}$$

(iii) Freight rate per tonne km (to yield a profit of 30% on freight)

$$\text{Cost per Kilometer run} = \frac{\text{Totalannual cost of three vehicles}}{\text{Total effective tonnes kms.per annum}} \text{ (Refer to working Note 1)}$$

$$= \frac{\text{Rs.1,13,39,112}}{\text{16,10,496kms}} = \text{Rs. 7.04}$$

$$\text{Freight rate per tonne km.} \left(\frac{\text{Rs.7.04}}{0.7}\right) \times 1 = \text{Rs. 10.06}$$

Working Notes:

1. Total kilometer travelled and tonnes kilometer (load carried) by four trucks in one year

Truck number	One way distance in kms	No. of trips	Total distance covered in km per day	Load carried per trip / day in tonnes	Total effective tonnes km
1	48	4	384	6	1,152
2	120	1	240	9	1,080
3	90	2	360	8	1,440
4	60	4	480	8	1,920
Total			**1,464**		**5,592**

Total kilometer travelled by four trucks in one year

(1,464 km. × 24 days × 12 months) = 4,21,632

Total effective tonnes kilometer of load carried by four trucks during one year

(5,592 tonnes km. × 24 days × 12 months) = 16,10,496

2. Fixed and variable component of maintenance cost:

Variable maintenance cost per km	$= \frac{\text{Difference in maintence cost}}{\text{Difference in distance travelled}}$
	$= \frac{\text{Rs.1,38,150} - \text{Rs.1,35,525}}{\text{1,60,200Kms} - \text{1,56,700 kms}}$
	= Rs. 0.75

Fixed maintenance cost	= Total maintenance cost–Variable maintenance cost
	= ₹ 1,38,150 – 1,60,200 kms × ₹ 0.75 = ₹ 18,000

Question 15

GMCS Ltd. collects raw milk from the farmers of Ramgarh, Pratapgarh and Devgarh panchayats and processes this milk to make various dairy products. GMCS Ltd. has its own vehicles (tankers) to collect and bring the milk to the processing plant. Vehicles are parked in the GMCS Ltd.'s garage situated within the plant compound. Following are the information related with the vehicles:

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles assigned	4	3	5
No. of trips a day	3	2	4
One way distance from the processing plant	24 k.m.	34 k.m.	16 k.m.
Fess & taxes per month (Rs.)	5,600	6,400	---

All the 5 vehicles assigned to Devgarh panchayat, were purchased five years back at a cost of Rs. 9,25,000 each. The 4 vehicles assigned to Ramgarh panchayat, were purchased two years back at a cost of Rs. 11,02,000 each and the remaining vehicles assigned to Pratapgarh were purchased last year at a cost of Rs. 13,12,000 each. With the purchase of each vehicle a two years free servicing warranty is provided. A vehicle gives 10 kmpl mileage in the first two year of purchase, 8 kmpl in next two years and 6 kmpl afterwards. The vehicles are subject to depreciation of 10% p.a. on straight line basis irrespective of usage. A vehicle has the capacity to carry 10,000 litres of milk but on an average only 70% of the total capacity is utilized.

The following expenditures are related with the vehicles:

Salary of Driver (a driver for each vehicle)	Rs. 24,000 p.m.
Salary to Cleaner (a cleaner for each vehicle)	Rs. 12,000 p.m.
Allocated garage parking fee	Rs. 4,200 per vehicle per month
Servicing cost	Rs. 15,000 for every complete 5,000 k.m. run.
Price of diesel per litre	Rs. 78.00

From the above information you are required to CALCULATE

(i) Total operating cost per month for each vehicle. (Take 30 days for the month)

(ii) Vehicle operating cost per litre of milk. ***(MTP 10 Marks, Mar'21)***

Answer 15

(i) Calculation of Operating Cost per month for each vehicle

	Ramgarh (Rs.)	Pratapgarh (Rs.)	Devgarh (Rs.)	Total (Rs.)
A. Running Costs:				
- Cost of diesel (Working Note- 2)	1,68,480	95,472	2,49,600	5,13,552
- Servicing cost (Working Note- 3)	45,000	-	45,000	90,000
	2,13,480	**95,472**	**2,94,600**	**6,03,552**
B. Fixed Costs:				
- Salary to drivers	96,000 (4 drivers × Rs. 24,000)	72,000 (3 drivers × Rs. 24,000)	1,20,000 (5 drivers × Rs. 24,000)	2,88,000
- Salary to cleaners	48,000 (4 cleaners × Rs. 12,000)	36,000 (3 cleaners × Rs. 12,000)	60,000 (5 cleaners × Rs. 12,000)	1,44,000
- Allocated garage parking fee	16,800 (4 vehicles × Rs.4,200)	12,600 (3 vehicles × Rs.4,200)	21,000 (5 vehicles × Rs.4,200)	50,400
- Depreciation (Working Note- 4)	36,733	32,800	38,542	1,08,075
- Fess & taxes	5,600	6,400	---	12,000
	2,03,133	**1,59,800**	**2,39,542**	**6,02,475**
Total [A + B]	**4,16,613**	**2,55,272**	**5,34,142**	**12,06,027**

Operating Cost per vehicle	1,04,153 (Rs.4,16,613 ÷ 4 vehicles)	85,091 (Rs.2,55,272 ÷ 3 vehicles)	1,06,828 (Rs.5,34,142 ÷ 5 vehicles)	1,00,502 (Rs.12,06,027÷ 12 vehicles)

(ii) Vehicle operating cost per litre of milk

$$\frac{\text{Total Operating Cost per Month}}{\text{Total Milk Carried a Month}} = \frac{\text{Rs.12,06,027}}{\text{79,80,000 Litres(Working Note-5)}} = \text{Rs. 0.15}$$

Working Notes:

1. Distance covered by the vehicles in a month

Route		Total Distance (inK.M.)
Ramgarh	(4 vehicles × 3 trips × 2 × 24 km. × 30 days)	17,280
Pratapgarh	(3 vehicles × 2 trips × 2 × 34 km. × 30 days)	12,240
Devgarh	(5 vehicles × 4 trips × 2 × 16 km. × 30 days)	19,200

2. Cost of diesel consumption

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	19,200
Mileage per litre of diesel	8 kmpl	10 kmpl	6 kmpl
Diesel consumption (Litre)	2,160 (17,280 ÷ 8)	1,224 (12,240 ÷ 10)	3,200 (19,200 ÷ 6)
Cost of diesel consumption @ Rs. 78 per litre (Rs.)	1,68,480	95,472	2,49,600

3. Servicing Cost

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	19,200
Covered under free service warranty	No	Yes	No
No. of services required	3 (17,280 k.m. ÷ 5,000 k.m.)	2 (12,240 k.m. ÷ 5,000 k.m.)	3 (19,200 k.m. ÷ 5,000 k.m.)
Total Service Cost (Rs.)	45,000 (Rs. 15,000 × 3)	---	45,000 (Rs. 15,000 × 3)

4. Calculation of Depreciation

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles	4	3	5
Cost of a vehicle (Rs.)	11,02,000	13,12,000	9,25,000
Total Cost of vehicles (Rs.)	44,08,000	39,36,000	46,25,000
Depreciation per month (Rs.)	36,733 $\left(\frac{\text{Rs.44,08,000}\times 10\%}{\text{12 months}}\right)$	32,800 $\left(\frac{\text{Rs.39,36,000}\times 10\%}{\text{12 months}}\right)$	38,542 $\left(\frac{\text{Rs.46,25,000}\times 10\%}{\text{12 months}}\right)$

5. Total volume of Milk Carried

Route		Milk Qty. (Litre)
Ramgarh	(10,000 ltr. × 0.7 × 4 vehicles × 3 trips × 30 days)	25,20,000
Pratapgarh	(10,000 ltr. × 0.7 × 3 vehicles × 2 trips × 30 days)	12,60,000
Devgarh	(10,000 ltr. × 0.7 × 5 vehicles × 4 trips × 30 days)	42,00,000
		79,80,000

Question 16

A mini-bus, having a capacity of 32 passengers, operates between two places - 'A' and 'B'. The distance between the place 'A' and place 'B' is 30 km. The bus makes 10 round trips in a day for 25 days in a month. On an average, the occupancy ratio is 70% and is expected throughout the year.

The details of other expenses are as under:

	Amount (₹)
Insurance	15,600 Per annum
Garage Rent	2,400 Per quarter
Road Tax	5,000 Per annum

Repairs	4,800 Per quarter
Salary of operating staff	7,200 Per month
Tyres and Tubes	3,600 Per quarter
Diesel: (one litre is consumed for every 5 km)	13 Per litre
Oil and Sundries	22 Per 100 km run
Depreciation	68,000 Per annum

Passenger tax @ 22% on total taking is to be levied and bus operator requires a profit of 25% on total taking. PREPARE operating cost statement on the annual basis and find out the cost per passenger kilometer and one way fare per passenger. *(MTP 8 Marks July'24)*

Answer 16

Operating Cost Statement

	Particulars	Total Cost Per annum (₹)
A.	Fixed Charges:	
	Insurance	15,600
	Garage rent (₹ 2,400 × 4 quarters)	9,600
	Road Tax	5,000
	Salary of operating staff (₹ 7,200 × 12 months)	86,400
	Depreciation	68,000
	Total (A)	1,84,600
B.	Variable Charges:	
	Repairs (₹ 4,800 × 4 quarters)	19,200
	Tyres and Tubes (₹ 3,600 × 4 quarters)	14,400
	Diesel {(1,80,000 km. ÷ 5 km.) × ₹ 13}	4,68,000
	Oil and Sundries {(1,80,000 km. ÷ 100 km.) × ₹ 22}	39,600
	Total (B)	5,41,200
	Total Operating Cost (A+B)	7,25,800
	Add: Passenger tax (Refer to WN-1)	3,01,275
	Add: Profit (Refer to WN-1)	3,42,359
	Total takings	13,69,434

Calculation of Cost per passenger kilometre and one way fare perpassenger:

$$\text{Cost per Passenger-Km.} = \frac{\text{Total Operating Cost}}{\text{Total passenger–Km}}$$

$$= \frac{7,25,800}{40,32,000 \text{Passenger–Km}} = ₹\ 0.18$$

$$\text{One way fare per passenger} = \frac{\text{Total Takings}}{\text{Total passenger–Km}} \times 30 \text{ Km}$$

$$= \frac{₹\ 13,69,434}{40,32,000 \text{Passenger–Km}} \times 30 \text{ Km} = ₹\ 10.20$$

Working Notes:

1. Let total taking be X then Passenger tax and profit will be as follows:
   X = ₹ 7,25,800 + 0.22 X + 0.25X
   X – 0.47 X = ₹ 7,25,800
   $X = \frac{₹7,25,800}{0.53}$ ₹ 13,69,434
   Passenger tax = ₹ 13,69,434 × 0.22 = ₹ 3,01,275
   Profit = ₹ 13,69,434 × 0.25 = ₹ 3,42,359
2. Total Kilometres to be run during the year
   = 30 km.× 2 sides × 10 trips × 25 days × 12 months = 1,80,000Kilometres
3. Total passenger Kilometres
   = 1,80,000 km. × 32 passengers × 70% = 40,32,000 Passenger-km.

Question 17

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

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

Passenger tax is 20% of the total takings.

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

The fares are to be indicated per passenger for the journeys: (i) Delhi to Hisar (ii) Delhi to Aligarh and (iii) Delhi to Alwar. ***(RTP Nov'21, SM)***

Answer 17

Working Notes:

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

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Hisar	160	2	9	2,880
Delhi to Aligarh	160	2	12	3,840
Delhi to Alwar	170	2	6	2,040
Total				8,760

2. Passenger- km. per month

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

Monthly Operating Cost Statement

Particulars	(₹)	(₹)
(i) Running Costs		
Diesel {(8,760 km / 5 km) × ₹ 90}	1,57,680.00	
Lubricant oil {(8,760 km / 100) × ₹ 30}	2,628.00	1,60,308.00
(ii) Maintenance Costs		
Repairs & Maintenance		5,000.00
(iii) Standing charges		
Salary to driver	30,000.00	
Salary to conductor	26,000.00	
Salary of part-time accountant	7,000.00	
Insurance (₹ 6,000 ÷12)	500.00	
Road tax (₹ 21,912 ÷12)	1,826.00	
Permit fee	500.00	
Depreciation {(₹ 15,00,000 × 30%) / 12}	37,500.00	1,03,326.00
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,68,634.00
Passenger Tax*		1,07,453.60
Total Cost		3,76,087.60
Add: Profit*		1,61,180.40
Total takings per month		5,37,268.00

*Let total takings be X then,

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

X = ₹ 2,68,634 + 0.2 X + 0.3 X

0.5 X = ₹ 2,68,634 or, X = ₹ 5,37,268

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

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

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

Rate per Passenger-Km. = Total takings per month / Total Passenger – Km.per month

= Rs. 5,37,268 / 4,14,000 Passenger –Km. = Rs. 1.30 (approx.)

Bus fare to be charged per passenger:

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

Question 18

Wiwitsu Travels provides mini buses to an IT company for carrying its employees from home to office and dropping back after office hours. It runs a fleet of 8 mini buses for this purpose. The buses are parked in a garage adjoining the company's premises. Company is operating in two shifts (one shift in the morning and one shift in the afternoon). The distance travelled by each mini bus one way is 30 kms. The company works for 20 days in a month.

The seating capacity of each mini bus is 30 persons. The seating capacity is normally 80% occupied during the year. The details of expenses incurred for a year are as under:

Particulars	
Driver's salary	₹ 20,000 per driver per month
Lady attendant's salary (mandatorily required for each mini bus)	₹ 10,000 per attendant per month
Cleaner's salary (One cleaner for 2 mini buses)	₹ 15,000 per cleaner per month
Diesel (Avg. 8 kms per litre)	₹ 80 per litre
Insurance charges (per annum)	2% of Purchase Price
License fees and taxes	₹ 5,080 per mini bus per month

Garage rent paid	₹ 24,000 per month
Repair & maintenance including engine oil and lubricants (for every 5,760 kms)	₹ 2,856 per mini bus
Purchase Price of mini bus	₹ 15,00,000 each
Residual life of mini bus	8 Years
Scrap value per mini bus at the end of residual life	₹ 3,00,000

Wiwitsu Travels charges two types of fare from the employees. Employees coming from a distance of beyond 15 kms away from the office are charged double the fare which is charged from employees coming from a distance of up-to 15 kms. away from the office. 50% of employees travelling in each trip are coming from a distance beyond 15 kms. from the office. The charges are to be based on average cost.

You are required to:

(i) Prepare a statement showing expenses of operating a single mini bus for a year,

(ii) Calculate the average cost per employee per month in respect of:

(a) Employees coming from a distance upto 15 kms. from the office.

(b) Employees coming from a distance beyond 15 kms. from the office. *(PYP 10 Marks, Dec '21) (RTP Jan'25)*

Answer 18

(i) Statement of Expenses of operating a mini bus in a year

	Particulars	Rate (₹)	Per Bus per annum (₹)
(a)	**Standing Charges:**		
	Driver's salary	20,000 p.m	2,40,000
	Lady attendant's salary	10,000 p.m	1,20,000
	Average Cleaner's salary (50%)	15,000 p.m	90,000
	Insurance charge	30,000 p.a.	30,000
	License fee, taxes etc.	5,080 p.m.	60,960
	Average Garage Rent	24,000 p.m	36,000
	Depreciation {(15,00,000 – 3,00,000) ÷ 8}	1,50,000 p.a.	1,50,000
(b)	**Maintenance Charges:**		
	Repairs & maintenance including engine oil and lubricants (Working Note 1)	28,560 p.a.	
(c)	**Operating Charges:**		
	Diesel (Working Note 2)		5,76,000
	Total Cost (A + B + C)		13,31,520
	Cost per month		1,10,960

(ii) Average cost per employee per month:

A. Employee coming from distance of upto 15 km

$$= \frac{\text{Total cost per month}}{\text{Total no.of equivalent employee}} = \frac{1,10,960}{72*} = \text{Rs. } 1,541.11$$

B. Employee coming from a distance beyond 15 km

= 1541.11 × 2 = ₹ 3,082.22

*** Considering half fare employees as a base**

Full fare employees (12 × 2)	24 employees
Add: Half fare employees (Working Note 3)	12 employees
Total Equivalent number of employees per month	36 employees
Total Equivalent number of employees per month (morning + afternoon shift of company)	72 employees

Working Notes:

1. Calculation of Repairs and maintenance cost of a bus:

Distance travelled in a year:

(4 trip × 2 shifts × 30 km. × 20 days × 12 months)

Distance travelled p.a.: 57,600 km.

Repairs and maintenance cost per Bus per annum:

$= \frac{57,600 \text{ km.}}{5,760 \text{ km}}$ X Rs. 2,856 per bus

= ₹ 28,560 per annum

2. Calculation of diesel cost per bus per annum:

Distance travelled in a year = 57,600 km

Diesel cost per Bus per annum:

$= \frac{57,600 \text{ km.}}{8 \text{ km}}$ X Rs. 80

= 5,76,000

3. Calculation of equivalent number of employees per bus:

Seating capacity of a bus	30 employees
Occupancy (80% of capacity)	24 employees
Half fare employees (50% of 24 employees)	12 employees
Full fare employees (50% of 24 employees)	12 employee

[**Note**: Total Equivalent number of employees per month (morning + afternoon shift of company can also be calculated considering full fare employees as a base. In that case the number will be 36. Then fare for employees coming from distance beyond 15km will be 1,10,960/36 =₹ 3,082.22 and employees coming from distance upto 15 km will be 3,082.22 / 2 = ₹ 1,541.11]

Exam Insights: This Numerical Question was based on the concept of Operating Costing. Many examinees faced hardship in the calculation of the cost of diesel, repairs & maintenance and equivalent employee's numbers. Performance of the examinees was below average.

Question 19

LDR

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

Particulars	CNG Car	EV Car
Car purchase price (₹)	9,20,000	15,20,000
Govt. subsidy on purchase of car (₹)	--	1,50,000
Life of the car	15 years	10 years
Residual value (₹)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (₹)	60	--
Power cost per Kwh (₹)	--	7.60
Annual Maintenance cost (₹)	8,000	5,200
Annual insurance cost (₹)	7,600	14,600
Tyre replacement cost in every 5 -year (₹)	16,000	16,000
Battery replacement cost in every 8- year (₹)	12,000	5,40,000

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

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

You have been approached by the management of A LMV Pvt. Ltd. for consultation on the two options of operating the cab service.

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

(MTP 10 Marks, Apr'23, RTP May'24 & May '22)

Answer 19

Workings:

1. Calculation of Depreciation per month:

	Particulars	CNG Car	EV Car
(A)	Car purchase price (₹)	9,20,000	15,20,000
(B)	Less: Govt. subsidy (₹)	--	(1,50,000)
(C)	Less: Residual value (₹)	(95,000)	(1,70,000)
(D)	Depreciable value of car (₹) [A-B-C]	8,25,000	12,00,000
(E)	Life of the car	15 years	10 years
(F)	Annual depreciation (₹) [D÷E]	55,000	1,20,000
(G)	**Depreciation per month (₹) [F÷12]**	**4,583.33**	**10,000**

2. Fuel/ Electricity consumption cost per month:

	Particulars	CNG Car	EV Car
(A)	Average distance covered in a month (KM)	1,500	1,500
(B)	Mileage (KM)	20	240
(C)	Qty. of CNG/ Full charge required [A÷B]	75 kg.	6.25
(D)	Electricity Consumption [C×30kwh]	-	187.5
(E)	Cost of CNG per kg (₹)	60	-
(F)	Power cost per Kwh (₹)	-	7.60
(G)	**CNG Cost per month (₹) [C×E]**	**4,500**	**-**
(H)	**Power cost per month (₹) [D×F]**	**-**	**1,425**

3. Amortized cost of Tyre replacement:

	Particulars	CNG Car	EV Car
(A)	Life of vehicle	15 years	10 years
(B)	Replacement interval	5 years	5 years
(C)	No. of time replacement required	2 times	1 time
(D)	Cost of tyres for each replacement (₹)	16,000	16,000
(E)	Total replacement cost (₹) [C×D]	32,000	16,000
(F)	Amortized cost per year (₹) [E÷A]	2,133.33	1,600
(G)	**Cost per month (₹) [F÷12]**	**177.78**	**133.33**

4. Amortized cost of Battery replacement:

	Particulars	CNG Car	EV Car
(A)	Life of vehicle	15 years	10 years
(B)	Replacement interval	8 years	8 years
(C)	No. of time replacement required	1 time	1 time
(D)	Cost of battery for each replacement (₹)	12,000	5,40,000
(E)	Total replacement cost (₹) [C×D]	12,000	5,40,000
(F)	Amortized cost per year (₹) [E÷A]	800	54,000
(G)	**Cost per month (₹) [F÷12]**	**66.67**	**4,500**

Calculation of Operating cost per month

	Particulars	CNG Car (₹)	EV Car (₹)
(A)	**Running cost:**		
	Fuel cost/ Power consumption cost [Refer WN-2]	4,500	1,425
(B)	**Maintenance cost:**		
	Annual Maintenance cost [Annual cost ÷12]	666.67	433.33
	Annual Insurance cost [Annual cost ÷12]	633.33	1,216.67
	Amortized cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortized cost of Battery replacement[Refer WN-4]	66.67	4,500
		1,544.45	6,283.33
(C)	**Fixed cost:**		
	Depreciation [Refer WN-1]	4,583.33	10,000

	Driver's salary	20,000	20,000
	Garage rent	4,500	4,500
	Share of Office & Administration cost	1,500	1,500
		30,583.33	36,000
(D)	**Operating cost per month [A+B+C]**	**36,627.78**	**43,708.33**

Costing of Toll Roads

Question 20

RST Toll Plaza Limited built an 80-kilometre-long highway between two cities and operates a toll plaza to collect tolls from passing vehicles using the highway. The company has estimated that 50,000 light weight, 12,000 medium weight and 10,000 heavy weight vehicles will be using the highway in one month in outward journey and the same number for return journey.

As per government notification, vehicles used for medical emergencies, Members of Parliament, and essential services are exempt from toll charges. It is estimated that 10% of light weight vehicles will pass the highway for such use.

It is the policy of the company that if vehicles return within 24 hours of their outward journey, the toll fare will be reduced by 25 percent automatically. It is estimated that 30% of chargeable light weight vehicles return within the specified time frame.

The toll charges for medium weight vehicles is to be fixed as 2.5 times of the light weight vehicles and that of heavy weight vehicles as 2 times of the medium weight vehicles.

The toll and maintenance cost for a month is ₹ 59,09,090, The company requires a profit of 10% over the total cost to cover interest and other costs.

Required:

(i) Calculate the toll rate for each type of vehicle if concession facilities are not available on the return journey.

(ii) Calculate the toll rate that will be charged from light weight vehicles if a return journey concession facility is available, assuming that the revenue earned from light weight vehicles calculated in option (remains the same. *(PYP 5 Marks, May '23)*

Answer 20

Working Notes:

(1) Calculation of equivalent numbers of Light weight vehicles (when no concession is provided on return journey)

Type of vehicle	Monthly traffic (A)	Return traffic (B)	Ratio (C)	Equivalent light weight [(A + B) × C]
Light weight	45,000*	45,000	1	90,000
Medium weight	12,000	12,000	2.5	60,000
Heavy weight	10,000	10,000	5	1,00,000
				2,50,000

*50,000 light vehicles less 10% exempted vehicles

(2) Calculation of equivalent numbers of Light weight vehicles (when concession is provided on return journey)

Type of vehicle	Monthly Traffic (A)	Return traffic (B)	Ratio (C)	Equivalent light weight [(A + B) × C]
Light weight	45,000*	41,625 [45,000- (45,000 × 30% × 25%)]	1	86,625
Medium weight	12,000	12,000	2.5	60,000
Heavy weight	10,000	10,000	5	1,00,000
				2,46,625

(i) Calculation of toll rate for each type of vehicle:

Total cost to cover ÷ Equivalent type of vehicles

(₹ 59,09,090 + 10% of ₹ 59,09,090) ÷ 2,50,000 equivalent vehicles (Refer working note 1)

= 65,00,000 ÷ 2,50,000 = ₹ 26

Toll rate for:

Light weight vehicle = ₹ 26

Medium weight vehicle = ₹ 26 × 2.5 = ₹ 65

Heavy weight vehicle = ₹ 26 × 5 = ₹ 130

(ii) Calculation of toll rate for each type of vehicle:

Revenue earned from Light weight vehicle in (i) above

= 90,000 vehicles × ₹ 26 = ₹ 23,40,000

New toll rate to maintain the same revenue from Light weight vehicle

= ₹ 23,40,000 ÷ 86,625 (Refer working note-2) = ₹ 27.01

Light weight vehicle = ₹ 27.01

Rate to be charged from 13,500 light weight vehicles = 27.01 × 0.75 = 20.26

(iii) Alternative presentation

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

Exam Insights: This numerical question was based on Service Costing. Most of the examinees were not able to calculate equivalent number of vehicles and toll rate in the situation of concessional fare. Hence, a below average performance was observed.

Question 21

LDR

MKL Infrastructure built and operates 110 k.m. highway on the basis of Built-Operate- Transfer (BOT) for a period of 21 years. A traffic assessment has been carried out to estimate the traffic flow per day which shows the following figures:

Sr. No.	Type of vehicle	Daily traffic volume
1.	Two wheelers	44,500
2.	Car and SUVs	3,450
3.	Bus and LCV	1,800
4.	Heavy commercial vehicles	816

The following is the estimated cost of the project:

Sr. no.	Activities	Amount (₹ in lakh)
1	Site clearance	341.00
2	Land development and filling work	9,160.00
3	Sub base and base courses	10,520.00
4	Bituminous work	32,140.00
5	Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	28,110.00
6	Drainage and protection work	9,080.00
7	Traffic sign, marking and road appurtenance	8,810.00
8	Maintenance, repairing and rehabilitation	12,850.00
9	Environmental management	1,964.00
	Total Project cost	1,12,975.00

An average cost of ₹1,200 lakh has to be incurred on administration and toll plaza operation.

On the basis of the vehicle specifications (i.e. weight, size, time saving etc.), the following weights has been assigned to the passing vehicles:

Sr. No.	Type of vehicle	
1.	Two wheelers	5%
2.	Car and SUVs	20%
3.	Bus and LCV	30%
4.	Heavy commercial vehicles	45%

Required:

(i) CALCULATE the total project cost per day of concession period.

(ii) COMPUTE toll fee to be charged for per vehicle of each type, if the company wants earn a profit of 15% on total cost.

[Note: Concession period is a period for which an infrastructure is allowed to operate and recover its investment] ***(MTP 10 Marks, Nov'21) (Same concept different figures MTP 10 Marks Oct'19, SM RTP Sep'24)***

Answer 21

(i) Calculation of total project cost per day of concession period:

Activities	Amount (₹ in lakh)
Site clearance	341.00
Land development and filling work	9,160.00
Sub base and base courses	10,520.00
Bituminous work	32,140.00
Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc	28,110.00
Drainage and protection work	9,080.00
Traffic sign, marking and road appurtenance	8,810.00
Maintenance, repairing and rehabilitation	12,850.00
Environmental management	1,964.00
Total Project cost	**1,12,975.00**
Administration and toll plaza operation cost	1,200.00
Total Cost	1,14,175.00
Concession period in days (21 years × 365 days)	7,665
Cost per day of concession period (₹ in lakh)	**14.90**

(ii) Computation of toll fee:

Cost to be recovered per day = Cost per day of concession period + 15% profit on cost

= ₹ 14,90,000 + ₹ 2,23,500 = ₹ 17,13,500

Cost Per equivalent vehicle = ₹ 17,13,500 / 76,444 units (Refer working note)

= ₹ 22.42 per equivalent vehicle

(iii) Vehicle type-wise toll fee:

Sr. No.	Type of vehicle	Equivalent cost [A]	Weight [B]	Toll fee per vehicle [A×B]
1.	Two wheelers	₹22.42	1	**22.42**
2.	Car and SUVs	₹22.42	4	**89.68**
3.	Bus and LCV	₹22.42	6	**134.52**
4.	Heavy commercial vehicles	₹22.42	9	**201.78**

Working Note:

The cost per day has to be recovered from the daily traffic. The each type of vehicle is to be converted into equivalent unit. Let's convert all vehicle types equivalent to Two-wheelers..

Sr. No.	Type of vehicle	Daily traffic volume [A]	Weight	Ratio [B]	Equivalent Two- wheeler [A×B]
1.	Two wheelers	44,500	0.05	1	44,500
2.	Car and SUVs	3,450	0.20	4	13,800
3.	Bus and LCV	1,800	0.30	6	10,800
4.	Heavy commercial vehicles	816	0.45	9	7,344
	Total				**76,444**

Question 22

A hotel having 20 single rooms is having 80% occupancy in normal season (8 months) and 50% in off- season (4 months) in a year (take 30 days month).

Annual fixed expenses	Amount in ₹
Salary of the staff (excluding room attendant)	15,00,000
Repair & maintenance	12,60,000
Depreciation on building & furniture	12,40,000
Other fixed expenses like dusting, sweeping etc.	13,25,000
	53,25,000
Variable expenses (per guest per day)	
Linen, laundry & security support	80.00
Electricity & other facilities	120.00
Misc. expenses like attendant etc.	300.00
	500.00

Management wishes to make a margin of 25% of total cost.

Required

(a) CALCULATE the Tariff per room per day.

(b) CALCULATE the break-even occupancy in normal season (in percentage also) assuming there is 50% occupancy in off-season. ***(MTP 6 Marks, Apr'24)***

Answer 22

Workings:

Total occupancy = Occupancy in normal season + Occupancy in off- season

= (20 rooms × 80% × 8 months × 30 days) + (20 rooms × 50% × 4 months × 30 days)

= 3,840 + 1,200 = 5,040 room-days

Total Cost = Variable cost + Fixed cost

= (₹ 500 × 5,040 room-days) + ₹ 53,25,000

= ₹ 25,20,000 + ₹ 53,25,000

= 78,45,000

(a) Calculation of tariff rate per room

Tariff per room per day = (Total cost + 25% Margin on total cost) ÷ Total occupancy

= (₹ 78,45,000 + 19,61,250) ÷ 5,040 = ₹ 1,945.68

(b) Calculation of break-even occupancy

Contribution per day = Tariff – Variable cost

= ₹ 1,945.68 – 500 = ₹ 1445.68

Break-even occupancy = ₹ 53,25,000 ÷ 1445.68 = 3683

Occupancy in normal season = Break-even occupancy – Occupancy in off-season

= 3683 – (20 rooms × 50% × 4 months × 30 days)

= 3683 – 1200 = 2483 room-days

In Percentage = 2483 ÷ 4800 = 51.73%

Question 23

Royal Hotel offers three types of rooms to its guests - Deluxe Room, Executive Room and Suite Room. Other information is as follows: -

	Deluxe Room	Executive Room	Suite Room
Room Tariff per day	₹ 1,500	₹ 2,400	₹ 3,800
No. of rooms	20	10	4

Average occupancy during the year	80%	60%	75%
Housekeeping expenses per day	₹280	₹320	₹425

The hotel provides complimentary breakfast facility to its executive room and suite room guests while swimming pool facility is provided free of cost only to suite room guests.

The restaurant and swimming pool is run by a contractor. The contractor recovers charges of ₹ 150 per person for breakfast and ₹ 200 per person for using swimming pool facility from Royal Hotel.

Besides the above-mentioned charges, annual fixed expenses are as follows:

Salaries to staff ₹ 57,60,000

Electricity Expenses ₹ 24,00,000

Salaries to staff are apportioned to Deluxe Room. Executive Room and Suite Room in the ratio of 25:35:40 and electricity expenses are to be apportioned in proportion to occupancy.

You are required to calculate the total profit of each room type on annual basis.

Note: Assume 360 days in a year and double occupancy in each category of room. *(PYP 10 Marks, Nov'23)*

Answer 23

Calculation of room days:

Nature of Room	Occupancy (Room-days)
Deluxe room	5760 (20 x 80% x 360)
Executive room	2160 (10 x 60% x 360)
Suite room	1080 (4 x 75% x 360)

Statement showing Total Profit for each room type

Elements	Deluxe room (₹)	Executive Room (₹)	Suite room (₹)	Total (₹)
Room Days	**5760**	**2160**	**1080**	
Revenue	86,40,000	51,84,000	41,04,000	1,79,28,000
Cost				
Housekeeping @ ₹ 280 per room day	16,12,800	6,91,200	4,59,000	27,63,000
Breakfast @ ₹ 150 per person	-	6,48,000	3,24,000	9,72,000
Swimming pool @ ₹ 200 per person	-	-	4,32,000	4,32,000
Salaries to staff (25:35:40)	14,40,000	20,16,000	23,04,000	57,60,000
Electricity expenses (occupancy)	15,36,000	5,76,000	2,88,000	24,00,000
Total cost	45,88,800	39,31,200	38,07,000	1,23,27,000
Profit	**40,51,200**	**12,52,800**	**2,97,000**	**56,01,000**

The solution can also be presented in following way:

Calculation of room days

	Particulars	Occupancy during the year		
		Deluxe Room	Executive Room	Suite Room
(i)	No. of Rooms	20	10	4
(ii)	Occupancy in %	80%	60%	75%
	No. of rooms occupied per day	16	6	3
	No. of rooms occupied per year	5,760	2,160	1,080

Statement showing Total Profit for each room type

Annual Room Rent	Deluxe Room	Executive Room	Suite Room
Room Rent per day per room	₹ 1,500	₹ 2,400	₹ 3,800
Annual Room Rent (A)	₹ 86,40,000	₹ 51,84,000	₹ 41,04,000
Annual Fixed Expenses			
Staff Salary (25:35:40)	₹ 14,40,000	₹ 20,16,000	₹ 23,04,000
Electricity Expenses (Occupancy)	₹ 15,36,000	₹ 5,76,000	₹ 2,88,000
Total (B)	₹ 29,76,000	₹ 25,92,000	₹ 25,92,000
Housekeeping Expenses	₹ 16,12,800	₹ 6,91,200	₹ 4,59,000
Breakfast Charges		₹ 6,48,000 (2,160 x 2 x 150)	₹ 3,24,000 (1,080 x 2 x 150)
Swimming Pool Charges			₹ 4,32,000

			(1,080 x 2 x 200)
Total (C)	₹ 16,12,800	₹ 13,39,200	₹12,15,000
Total Cost (B+C)	₹ 45,88,800	₹ 39,31,200	₹ 38,07,000
Profit	**₹ 40,51,200**	**₹ 12,52,800**	**₹ 2,97,000**

Exam Insights: Question on Service Costing requiring calculation of total profit of each room type on annual basis of Royal Hotel which offers three types of rooms to its guests. Overall performance of the examinees was above average.

Question 24

LDR

A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off- season (Winter)months in a year when numbers of visitor are limited. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March. [Assume a month to be of 30 days].

(i) Occupancy during the season is 80% while in the off- season it is 40% only.

(ii) Total investment in the home is ₹ 200 lakhs of which 80% relate to buildings and balance for furniture and equipment.

(iii) Expenses:

- **Staff salary [Excluding room attendants] : ₹ 5,50,000**
- **Repairs to building : ₹ 2,61,000**
- **Laundry charges : ₹ 80,000**
- **Interior : ₹ 1,75,000**
- **Miscellaneous expenses : ₹ 1,90,800**

(iv) Annual depreciation is to be provided for buildings @ 5% and on furniture and equipment @ 15% on straight-line basis.

(v) Room attendants are paid ₹ 10 per room day on the basis of occupancy of the rooms in a month.

(vi) Monthly lighting charges are ₹ 120 per room, except in four months in winter when it is ₹ 30 per room.

You are required to WORK OUT the room rent chargeable per day both during the season and the off-season months on the basis of the foregoing information.

(SM Same concept different figures MTP 10 Marks, Oct '21, PYP 10 Marks Nov'19)

Answer 24

Working Notes:

(i) Total

Season	Occupancy (Room-days)	Equivalent Full Room charge days
Season – 80% Occupancy	100 Rooms × 80% × 6 months × 30 days in a month = 14,400 Room Days	14,400 Room Days × 100% = 14,400
Off-season – 40% Occupancy	100 Rooms × 40% × 6 months × 30 days in a month = 7,200 Room Days	7,200 Room Days × 50% = 3,600
Total Room Days	14,400 + 7,200 = 21,600 Room Days	18,000 Full Room days

(ii) Lighting Charges:

It is given in the question that lighting charges for 8 months is ₹120 per month and during winter season of 4 months it is ₹30 per month. Further it is also given that peak season is 6 months and off season is 6 months.

It should be noted that – being Hill station, winter season is to be considered as part of Off season. Hence, the non-winter season of 8 months include – Peak season of 6 months and Off season of 2 months.

Accordingly, the lighting charges are calculated as follows:

Season	Occupancy (Room-days)
Season & Non-winter – 80% Occupancy	100 Rooms × 80% × 6 months × ₹120 per month = ₹ 57,600
Off- season & Non-winter – 40% Occupancy (8 – 6 months)	100 Rooms × 40% × 2 months × ₹120 per month = ₹ 9,600

Off- season & -winter – 40% Occupancy months)	100 Rooms × 40% × 4 months × ₹ 30 per month = ₹ 4,800
Total Lighting charges	₹ 57,600+ 9,600 + 4,800 = ₹ 72,000

Statement of total cost:

	(₹)
Staff salary	5,50,000
Repairs to building	2,61,000
Laundry & Linen	80,000
Interior	1,75,000
Sundries Expenses	1,90,800
Depreciation on Building (₹ 200 Lakhs × 80% × 5%)	8,00,000
Depreciation on Furniture & Equipment (₹ 200 Lakhs × 20% × 15%)	6,00,000
Room attendant's wages (₹ 10 per Room Day for 21,600 Room Days)	2,16,000
Lighting charges	72,000
Total cost	29,44,800
Add: Profit Margin (20% on Room rent or 25% on Cost)	7,36,200
Total Rent to be charged	36,81,000

Calculation of Room Rent per day:

Total Cost / Equivalent Full Room days = ₹ 36,81,000/ 18,000 = ₹204.50

Room Rent during Season – ₹204.50

Room Rent during Off season = ₹204.50 × 50% = ₹ 102.25

Exam Insights: This was a numerical question relating to the topic 'Costing of Service Sector'. Examinees were required to calculate hotel room rent chargeable per day. Most of the examinees could not compute the total cost correctly and hence could not work out room rent chargeable per day during season and off-season. Performance of the examinees was below average.

Question 25

Vivi Resorts (P) Ltd. offers three types of rooms to its guests, viz deluxe room, super deluxe room and luxury suite. You are required to DETERMINE the tariff to be charged to the customers for different types of rooms on the basis of following information:

Types of Room	Number of Rooms	Occupancy
Deluxe Room	100	90%
Super Deluxe Room	60	75%
Luxury Suite	40	60%

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and that of 'luxury suite' is 3 times of 'deluxe room'. Annual expenses are as follows:

Particulars	Amount (Rs. lakhs)
Staff salaries	780.00
Lighting, Heating and Power	350.00
Repairs, Maintenance and Renovation	220.00
Linen	60.00
Laundry charges	34.00
Interior decoration	85.00
Sundries	36.28

An attendant for each room was provided when the room was occupied and he was paid Rs. 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on Rs. 900 lakhs, furniture and fixtures @ 10% on Rs. 90 lakhs and air conditioners @ 10% on Rs. 75 lakhs. Profit is to be provided @ 25% on total taking and assume 360 days in a year.

(MTP 10 Marks, May'20 Same concepts but different figures MTP 10 Marks, Mar'18 RTP Nov '23)

Answer 25

Total cost statement of Vivi Resort (P) Limited

Particulars	Cost per annum (Rs. in lakhs)
Staff Salaries	780.00
Room Attendant's Wages (Refer working note 3)	286.20
Lighting, Heating & Power	350.00
Repairs, Maintenance & Renovation	220.00
Linen	60.00
Laundry charges	34.00
Interior Decoration	85.00
Sundries	36.28
Depreciation: (Refer working note 4)	
- Building	45.00
- Furniture & Fixture	9.00
- Air Conditioners	7.50
Total cost for the year	1912.98

Computation of profit:

Let Rs. x be the rent for deluxe from.

Equivalent deluxe room days are 90,720 (Refer working note 2)

Total takings = Rs. 90,720x

Profit is 25% of total takings.

Profit = 25% of Rs. 90,720x = Rs. 22,680x

Total takings = Total Cost + Profit

Rs. 90,720x = Rs. 19,12,98,000 + Rs. 22,680x

Rs. 90,720x -Rs. 22,680x = Rs. 19,12,98,000

Rs. 68,040x = Rs. 19,12,98,000

$$X = \frac{Rs.19,12,98,000}{Rs.68,040} = Rs.\ 2,811.55$$

Rent to be charged for deluxe room	Rs. 2,811.55
Rent to be charged for super deluxe room = Rent of deluxe room x 2 = Rs. 2,811.55 x 2	Rs. 5,623.10
Rent to be charged for luxury suite = Rent of Super Deluxe room x 1.5 = Rs. 5,623.10 x 1.5	Rs. 8,434.65

Working Notes:

(1) Computation of Room Occupancy

Type of Room	No. of rooms x no. of days x occupancy %	Room days
Deluxe Room	100 rooms x 360 days x 90% occupancy	32,400
Super Deluxe Room	60 rooms x 360 days x 75% occupancy	16,200
Luxury Suite	40 rooms x 360 days x 60% occupancy	8,640
	Total	57,240

(2) Computation of equivalent deluxe room days

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and luxury suite' is 3 times of 'deluxe room'. Therefore, equivalent room days would be:

Type of Room	Room days	Equivalent deluxe room days
Deluxe Room	32,400 x 1	32,400
Super Deluxe Room	16,200 x 2	32,400
Luxury Suite	8,640 x 3	25,920
	Total	90,720

(3) Computation of room attendant's wages

Room occupancy days @ Rs. 500 per day = 286.2 lakhs (i.e. 57,240 days ×Rs. 500)

(4) Computation of Depreciation per annum

Particulars	Cost (Rs.)	Rate of Depreciation	Depreciation (Rs.)
Building	9,00,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

Costing of Hospitals

Question 26

Health Wealth Hospital is interested in estimating the cost for each patient stay. The hospital offers general healthcare facility i.e. only basic services.

You are required to:

(i) CLASSIFY each of the following costs as either direct or indirect with respect to each patient.

(ii) CLASSIFY each of the following costs as either fixed or variable with respect to hospital costs per day.

	Direct	Indirect	Fixed	Variable
Electronic monitoring	_____	_____	_____	_____
Meals for patients	_____	_____	_____	_____
Nurses' salaries	_____	_____	_____	_____
Parking maintenance	_____	_____	_____	_____
Security	_____	_____	_____	_____

(RTP Nov'22)

Answer 26

Item	Direct	Indirect	Fixed	Variable
Electronic monitoring	YES			YES
Meals for patients	YES			YES
Nurses' salaries		YES	YES	
Parking maintenance		YES	YES	
Security		YES	YES	

Question 27

ABC Hospital runs a Critical Care Unit (CCU) in a hired building. CCU consists of 35 beds and 5 more beds can be added, if required.

Rent per month - ₹ 75,000

Supervisors – 2 persons – ₹ 25,000 Per month – each

Nurses – 4 persons – ₹ 20,000 per month – each

Ward Boys – 4 persons – ₹ 5,000 per month – each

Doctors paid ₹ 2,50,000 per month – paid on the basis of number of patients attended and the time spent by them

Other expenses for the year are as follows:

Repairs (Fixed) – ₹ 81,000

Food to Patients (Variable) – ₹ 8,80,000

Other services to patients (Variable) – ₹ 3,00,000

Laundry charges (Variable) – ₹ 6,00,000

Medicines (Variable) – ₹ 7,50,000

Other fixed expenses – ₹ 10,80,000

Administration expenses allocated – ₹ 10,00,000

It was estimated that for 150 days in a year 35 beds are occupied and for 80 days only 25 beds are occupied. The hospital hired 750 beds at a charge of ₹ 100 per bed per day, to accommodate the flow of patients. However, this does not exceed more than 5 extra beds over and above the normal capacity of 35 beds on any day.

You are required to –

(1) CALCULATE contribution per Patient day, if the hospital recovers on an average ₹ 2,000 per day from each patient.

(2) FIND OUT Breakeven point for the hospital. *(SM, MTP 10 Marks Oct '23)*

Answer 27

Working Notes:

(1) Calculation of number of Patient days

35 Beds × 150 days	=	5,250
25 Beds × 80 days	=	2,000
Extra beds	=	750
Total	=	8,000

Statement of Profitability

Particulars	**Amount**	**Amount**
Income for the year (₹ 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (₹ 2,50,000 per month × 12)	30,00,000	
Food to Patients (Variable)	8,80,000	
Other services to patients (Variable)	3,00,000	
Laundry charges (Variable) – (₹)	6,00,000	
Medicines (Variable) – (₹)	7,50,000	
Bed Hire Charges (₹100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (₹ 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × ₹25,000 ×12)	6,00,000	
Nurses (4 persons × ₹ 20,000 × 12)	9,60,000	
Ward Boys (4 persons × ₹ 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses – (₹)	10,80,000	
Administration expenses allocated – (₹)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

(1) Calculation of Contribution per Patient day

Total Contribution – ₹ 1,03,95,000

Total Patient days – 8,000

Contribution per Patient day – ₹ 1,03,95,000 / 8,000 = ₹ 1,299.375

(2) Breakeven Point = Fixed Cost / Contribution per Patient day

= ₹ 48,61,000 / ₹1,299.375

= 3,741 patient days

Question 28

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

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

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

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

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

Required:

(i) What is the profit per patient day made by the unit in the year 2020, if the unit recovered an overall amount of ₹ 200 per day on an average from each patient.

(ii) The unit wants to work on a budget for the year 2021, but the number of patients requiring medical care is a very uncertain factor. Assuming that same revenue and expenses prevail in the year 2021 in the first instance, work out the number of patient days required by the unit to break even.

(PYP 10 Marks, Jan'21)

Answer 28

Workings:

Calculation of number of Patient days

100 Beds × 120 days	=	12000
40 Beds × 80 days	=	3,200
Extra beds	=	400
Total	=	15,600

(i) Statement of Profitability

Particulars	Amount (₹)	Amount (₹)
Income for the year (₹ 200 per patient per day × 15,600 patient days)		31,20,000
Variable Costs:		
Doctor Fees (₹ 30,000 per month × 12)	3,60,000	
Food to Patients (Variable)	4,40,000	
Caretaker Other services to patients (Variable)	1,25,000	
Laundry charges (Variable)	1,40,000	
Medicines (Variable)	2,80,000	
Bed Hire Charges (₹ 50 × 400 Beds)	20,000	
Total Variable costs		(13,65,000)
Contribution		17,55,000
Fixed Costs:		
Rent (₹ 50,000 per month × 12)	6,00,000	
Supervisor (2 persons × ₹ 5,000 × 12)	1,20,000	
Nurses (4 persons × ₹ 3,000 × 12)	1,44,000	
Ward Boys (2 persons x ₹ 1500 x12)	36,000	
Repairs (Fixed)	28,000	
Cost of Oxygen	75,000	
Administration expenses allocated	71,000	
Total Fixed Costs		(10,74,000)

Profit		**6,81,000**

Calculation of Contribution and profit per Patient day

Total Contribution	= ₹17,55,000
Total Patient days	= 15,600 days
Contribution per Patient day	= ₹17,55,000 / 15,600 days = ₹112.50
Total Profit	= ₹ 6,81,000
Total Patient days	= 15,600 days
Profit per Patient day	= ₹6,81,000 / 15,600 days = ₹ 43.65

(ii)Breakeven Point = Fixed Cost / Contribution per Patient day

= ₹ 10,74,000 / ₹ 112.50

= 9,547 patient days

Costing of Power Houses

Question 29

PREPARE cost statement of Panipat Thermal Power Station showing the cost of electricity generated per kwh, from the following data.

Total units generated	**16,50,000 kWh**
	(₹)
Operating labour	**21,75,000**
Repairs & maintenance	**7,25,000**
Lubricants, spares and stores	**5,80,000**
Plant supervision	**4,35,000**
Administration overheads	**29,00,000**
Insurance Charges	**15,00,000**
Fuel Charges	**8,00,000**

7 kWh. of electricity generated per kg. of coal consumed @ ₹4.75 per kg. Depreciation charges @ 5% on capital cost of ₹3,10,00,000. ***(RTP May'23 Same concept different figures SM)***

Answer 29

Total units generated 16,50,000 kWh.

Cost Statement of Panipat Thermal Power Station

	Per annum (₹)	Per kWh. (₹)
Fixed costs:		
Plant supervision	4,35,000	
Administration overheads	29,00,000	
Insurance Charges	15,00,000	
Depreciation (5% of ₹ 3,10,00,000 p.a.)	15,50,000	
Total fixed cost: (A)	63,85,000	3.87
Variable costs:		
Operating labour	21,75,000	
Fuel Charges	8,00,000	
Lubricants, spares and stores	5,80,000	
Repairs & maintenance	7,25,000	
Coal cost (Refer to working note)	11,19,643	
Total variable cost: (B)	53,99,643	3.27
Total cost [(A) + (B)]	1,17,84,643	7.14

Working Note:

Coal cost (16,50,000 kWh. ÷ 7 kWh) × ₹4.75 per kg. = ₹11,19,643

Question 30

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

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

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

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

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

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

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

Ignore the interest cost.

Required:

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

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

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

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

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

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

(RTP May'21, SM)

Answer 30

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

Particulars	Per bus per annum (₹)	Fleet of 25 buses per annum (₹)
Running costs : (A)		
Diesel (Refer to working note 1)	2,21,056	55,26,400
Repairs & maintenance costs: (B)	20,500	5,12,500
Fixed charges:		
Driver's salary (₹ 12,000 × 12 months)	1,44,000	36,00,000

Cleaners salary (₹ 8,000 × 12 months)	96,000	24,00,000
Licence fee, taxes etc.	8,400	2,10,000
Insurance	15,600	3,90,000
Depreciation $\left(\frac{\text{Rs.20,00,000}-\text{Rs.1,60,000}}{\text{16 years}}\right)$	1,15,000	28,75,000
Total fixed charges: (C)	3,79,000	94,75,000
Total expenses: (A+B+C)	6,20,556	1,55,13,900

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

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

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

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

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

Minimum bus fare to be recovered:

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

Working Notes:

1. Calculation of diesel cost per bus:

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

2. Calculation of equivalent number of students per bus:

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

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

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

Costing of Financial Institutions

Question 31

STI is majorly providing education loan in its loan department. For the month of August, salary paid to the education loan processors is ₹ 21,60,000. W.r.t. overhead cost, 30% is applicable to the processing of education loan out of the total overhead cost of loan department.

The total overhead cost for the month of August is ₹ 16,40,000 which includes payment of ₹ 11,000 w.r.t. legal advice relating to one of the education loan processing.

The education loan applications processed during this month are 500. You are required to COMPUTE the cost of processing per education loan application. ***(MTP 2 Marks Dec'24)***

Answer 31

Statement showing computation of the cost of processing an education loan application

Particulars	(₹)
Salary paid to the education loan processors	21,60,000
Legal advice cost relating to education loan	11,000
Overhead cost (30% of (₹ 16,40,000 - ₹ 11,000)]	4,88,700
Total processing cost per month	26,59,700
No. of applications processed per month	500
Total processing cost per education loan application	**5,319.40**

Question 32

WEPL Bank is having a branch which is engaged in processing of 'Vehicle Loan' and 'Education Loan' applications in addition to other services to customers. 30% of the overhead costs for the branch are estimated to be applicable to the processing of 'Vehicle Loan' applications and 'Education Loan' applications each.

Branch is having four employees at a monthly salary of ₹ 50,000 each, exclusively for processing of Vehicle Loan applications and two employees at a monthly salary of ₹ 70,000 each, exclusively for processing of Education Loan applications.

In addition to above, following expense are incurred by the Branch:

- **Branch Manager who supervises all the activities of branch, is paid at ₹ 90,000 per month.**
- **Legal charges, Printing & stationery and Advertising Expenses are incurred at ₹ 30,000, ₹ 12,000 and ₹ 18,000 respectively for a month.**
- **Other expenses are ₹ 10,000 per month.**

You are required to:

(i) **Compute the cost of processing a Vehicle Loan application on the assumption that 496 Vehicle Loan applications are processed each month.**

(ii) **Find out the number of Education Loan Applications processed, if the total processing cost per Education Loan Application is same as in the Vehicle Loan Application as computed in (i) above.** ***(PYP 5 Marks, Nov'22)***

Answer 32

Particulars	Vehicle loan Applications (₹)	Education loan Application (₹)	Total (₹)
Employee Cost	2,00,000(₹ 50,000 ×4)	1,40,000(₹ 70,000 × 2)	3,40,000
Apportionment of Branch manager's salary	27,000	27,000	54,000
Legal charges, Printing & stationery, and	18,000	18,000	36,000

Advertising expenses			
Other expenses	3,000	3,000	6,000
Total cost	2,48,000	1,88,000	4,36,000

(i) Computation of cost of processing a vehicle loan application:

Total Cost ÷ No. of applications

₹ 2,48,000 ÷ 496 = ₹ 500

(ii) Computation of no. of Education loan Processed

Total Cost = No. of applications × Processing cost per application

₹ 1,88,000 = No. of applications × ₹ 500

No. of education loan applications = ₹1,88,000 ÷ ₹500 = 376 applications

Exam Insights: This is a Numerical question on service costing consisting of two parts. First part requires the calculation of cost of processing a vehicle loan application while second part required calculation of number of educational loan applications that can be processed. Most of theexaminees correctly calculated first part but unable to calculate the second part. Overall performance of the examinees was average.

Costing in Insurance Companies

Question 33

LDR

Secure lifeline Ltd. operates in life insurance business. It launched a new insurance policy 'Total secure'. The company has incurred the following expenditures during the last year for the policy:

	₹
Cost of marketing of the policy	74,58,000
Sales support expenses	18,89,250
Policy issuance cost	16,59,735
Claims management cost	2,07,240
Policy development cost	18,56,250
Postage and logistics	16,91,250
Facilities cost	25,14,600
Policy servicing cost	58,09,155
Employees cost	9,24,000
IT cost	1,22,62,800
Office administration cost	26,73,660

Number of policies sold- 844.

Total insured value of policies - ₹ 1,640 crore.

Required:

(i) CALCULATE total cost for Professionals Protection Plus' policy segregating the costs into four main activities namely (a) Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.

(ii) CALCULATE cost per policy.

(iii) CALCULATE cost per rupee of insured value. ***(MTP 5 Marks, Mar'23, SM, RTP Nov'18, PYP 5 Marks Jul'21)***

Answer 33

(i) Calculation of total cost for 'Professionals Protection Plus' policy

	Particulars	Amount (₹)	Amount (₹)
1.	**Marketing and Sales support:**		
	- Policy development cost	18,56,250	
	- Cost of marketing	74,58,000	
	- Sales support expenses	18,89,250	1,12,03,500
2.	**Operations:**		
	- Policy issuance cost	16,59,735	
	- Policy servicing cost	58,09,155	
	- Claims management cost	2,07,240	76,76,130
3.	**IT Cost**		1,22,62,800

4.	**Support functions**		
	- Postage and logistics	16,91,250	
	- Facilities cost	25,14,600	
	- Employees cost	9,24,000	
	- Office administration cost	26,73,660	78,03,510
	Total Cost		**3,89,45,940**

Exam Insights: This practical problem was based on service costing which required examinees to segregate costs of Insurance policy under four main activities and to calculate cost per policy. Most of the examinees could not segregate the costs correctly. Performance of the examinees was below average.

(ii) Calculation of Cost per policy $\frac{\text{Total Cost}}{\text{Number of policies}} = \frac{3,89,45,940}{844}$ = Rs. 46,144.48

(iii) Cost per rupee of insured value $\frac{\text{Total Cost}}{\text{Total insured value}} = \frac{3,89,45,940}{1.640 \text{ crore}}$ = Rs. 0.0024

Multiple Choice Questions (MCQ)

Costing of Transport Services

1. **The cost of diesel and lubricant is an example of:** ***(SM)***
   (a) Operating cost
   (b) Fixed charges
   (c) Semi-variable cost
   (d) None of the above

Ans: (a)

2. **Absolute Tonne-km. is an example of:** ***(SM)***
   (a) Composite units in power sector
   (b) Composite unit of transport sector
   (c) Composite unit for bus operation
   (d) Composite unit for oil and natural gas

Ans: (b)

3. **A truck carrying 10 tons of goods over 200 kilometres per day for 26 days in a month. The ton kms applicable is –** ***(MTP 2 Marks July'24)***
   (a) 52,000
   (b) 20,000
   (c) 5200
   (d) 260

Ans: (a)

4. **Find out the most appropriate unit cost from the following information of ZMD Transport Services Ltd. dealing in goods carriage:** ***(MTP 2 Marks, Apr'24)***

Total cost	=	₹ 5,25,000
Kms. Travelled	=	8,75,000
Tonnes carries	=	4,000
No. of Drivers	=	25
No. of trucks	=	20
Tonnes Km carried	=	6,55,000

   (a) ₹ 0.6
   (b) ₹ 0.8
   (c) ₹ 21,000
   (d) 131.25

Ans (b)

Costing of Toll Roads

5. In Toll Road cost, the repetitive costs includes: *(SM)*

(a) Maintenance cost
(b) Annual operating costs
(c) None of the above
(d) Both (a) and (b)

Ans: (a)

6. Depreciation is treated as fixed cost if it is related to: *(SM)*

(a) Activity level
(b) Related with machine hours
(c) Efflux of time
(d) None of the above

Ans: (c)

7. BOT approach means: *(SM)*

(a) Build, Operate and Transfer
(b) Buy, Operate and Transfer
(c) Build, Operate and Trash
(d) Build, Own and Trash

Ans: (a)

Costing of Hotel & Lodges

8. A hotel has 200 rooms (120 Deluxe rooms and 80 Premium rooms). The normal occupancy in summer is 80% and winter 60%. The period of summer and winter is taken as 8 months and 4 months respectively. Assume 30 days in each month. Room rent of Premium room will be double of Deluxe room. Hotel is expecting a profit of 20% on total revenue, total cost for the year is 2,66,11,200. Calculate the room rent to be charged for Premium room. *(RTP Sep'24)*

(a) ₹ 450 per room day
(b) ₹ 900 per room day
(c) ₹ 380 per room day
(d) ₹ 760 per room day

Ans: (b)

Costing of Hospitals

9. Composite cost unit for a hospital is: *(SM)*

(a) Per patient
(b) Per patient-day
(c) Per day
(d) Per bed

Ans: (b)

Costing of Education Institutions

10. Which of the following costing method is not appropriate for costing of educational institutes: *(SM)*

(a) Batch Costing
(b) Activity Based Costing
(c) Absorption Costing
(d) Process Costing

Ans: (d)

Costing in Insurance Companies

11. ALC Ltd. is a insurance company. It launched a new term insurance policy Names as Protection Plus. The total cost for the policy during the year is ₹ 1,60,00,000. Total number of policies sold is 410 and total insured value of policies is ₹ 920 crore.

What is the cost per rupee of insured value? *(RTP Sep'24)*

(a) ₹ 0.0017
(b) ₹ 0.18
(c) ₹ 575
(d) ₹ 2.24

Ans: (a)

12.Pre-product development activities in insurance companies, include: *(SM)*

(a) Processing of Claim
(b) Selling of policy
(c) Provision of conditions
(d) Policy application processing

Ans: (c)

13.Parth Ltd. operates in insurance business. Previous Year, the company launched a new term insurance policy called 'Max Jivan' and incurred the following expenditure throughout the year:

Particulars	Amount (₹)
Claim management cost	52,82,000
Facilities cost	6,49,82,500
Employees cost	2,25,18,000
Cost of marketing of the policy	19,30,71,000
Policy development cost	4,86,50,000
Policy issuance cost	4,10,05,000
Policy servicing cost	13,40,65,500
Sales support expenses	4,44,80,000
Office administration cost	6,67,20,000
I.T. Cost	30,71,90,000
Postage and logistics	4,50,36,000

You are required to ASCERTAIN the cost of the policy 'Max Jivan' segregated into four main activities namely (a) Marketing and Sales support (b) Operations (c) I.T. Cost and (d) Support functions.
(MTP 2 Marks Nov'24)

(a) Marketing and Sales support- ₹ 23,75,51,000, Operations - ₹ 22,90,02,500, I.T. Cost- ₹ 30,71,90,000 and Support functions- ₹ 19,92,56,500
(b) Marketing and Sales support- ₹ 28,62,01,000, Operations- ₹ 22,53,88,500, I.T. Cost- ₹ 30,71,90,000 and Support functions- ₹ 15,42,20,500
(c) Marketing and Sales support- ₹ 28,62,01,000, Operations- ₹ 18,03,52,500, I.T. Cost- ₹ 30,71,90,000 and Support functions- ₹ 19,92,56,500
(d) Marketing and Sales support- ₹ 24,17,21,000 Operations- ₹ 22,48,32,500, I.T. Cost- ₹ 30,71,90,000 and Support functions- ₹ 19,92,56,500

Ans: (c)

Costing of Power Houses

14.Cost units used in power sector is: *(SM)*

(a) Kilo meter (K.M)
(b) Kilowatt-hour (kWh)
(c) Number of electric points
(d) Number of hours

Ans: (b)

Costing of IT & ITES

15.Jobs undertaken by IT & ITES organizations are considered as:

(a) Project
(b) Batch work
(c) Contract
(d) All the above

Ans: (a)

CHAPTER 13: STANDARD COSTING

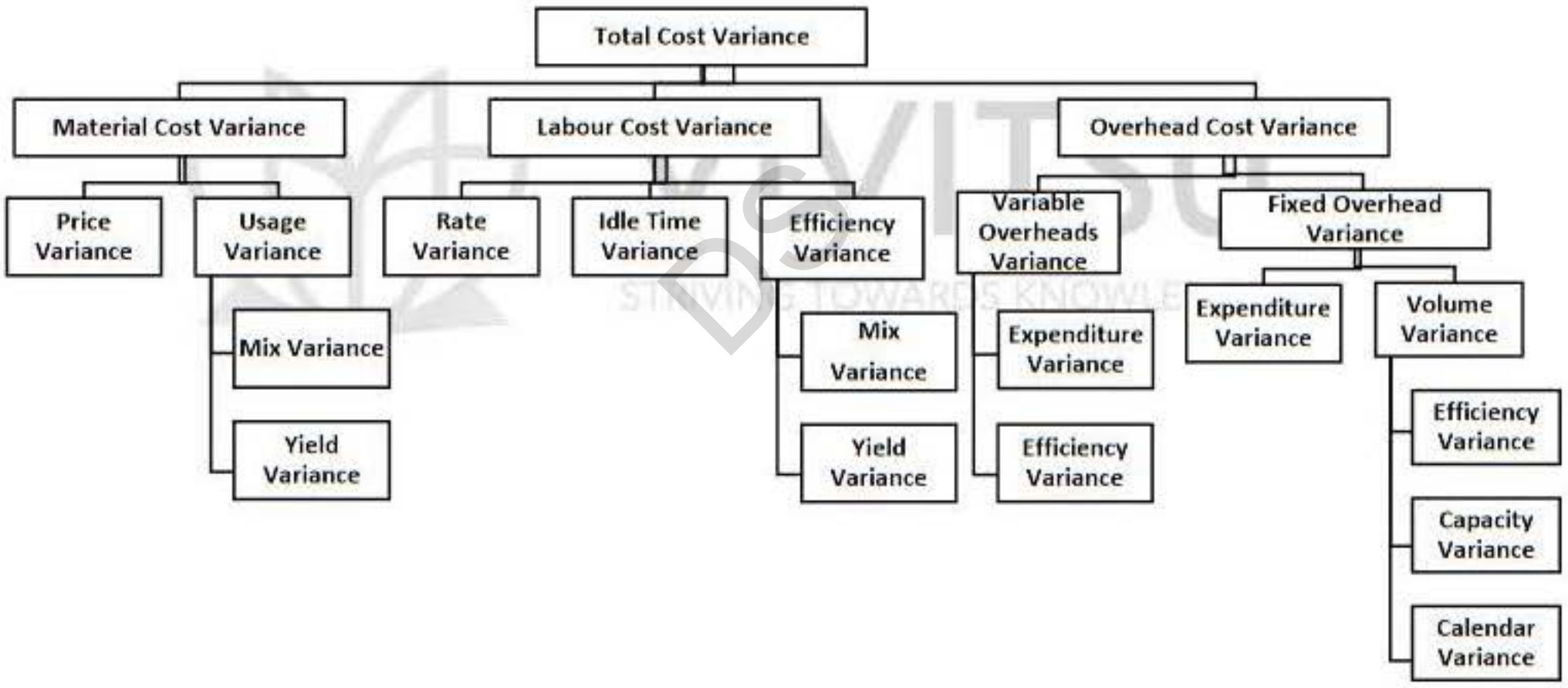
CONCEPTS OF THIS CHAPTER

- Meaning of standard cost and variances.
- Difference between controllable and uncontrollable variances.
- Analyse and compute variances for material, labour, and overheads.

LDR Questions

Q7 Q10
Q 14 Q20
Q 25

QUICK REVIEW OF IMPORTANT CONCEPTS



Variance Analysis

Material Cost Variance

[Standard Cost – Actual Cost]

(The difference between the Standard Material Cost of the actual production volume and the Actual Cost of Material)

[(SQ × SP) – (AQ × AP)]

Material Price Variance	Material Usage Variance
[Standard Cost of Actual Quantity – Actual Cost] (The difference between the Standard Price and Actual Price for the Actual Quantity Purchased) [(SP – AP) × AQ] Or [(SP × AQ) – (AP × AQ)]	[Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity] (The difference between the Standard Quantity specified for actual production and the Actual Quantity used, at Standard Price) [(SQ – AQ) × SP] Or [(SQ × SP) – (AQ × SP)]

Material Mix Variance	Material Yield Variance
[Standard Cost of Actual Quantity in Standard Proportion – Standard Cost of Actual Quantity] (The difference between the Actual Quantity in standard proportion and Actual Quantity in actual proportion, at Standard Price) [(RSQ – AQ) × SP] Or [(RSQ × SP) – (AQ × SP)]	[Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity in Standard Proportion] (The difference between the Standard Quantity specified for actual production and Actual Quantity in standard proportion, at Standard Purchase Price) [(SQ – RSQ) × SP] Or [(SQ × SP) – (RSQ × SP)]

Labour Cost Variance

[Standard Cost – Actual Cost]

(The difference between the Standard Labour Cost and the Actual Labour Cost incurred for the production achieved)

[(SH × SR) – (AH* × AR)]

Labour Rate Variance	Labour Idle Time Variance	Labour Efficiency Variance
[Standard Cost of Actual Quantity – Actual Cost] (The difference between the Standard Rate per Hour and Actual Rate per Hour for Actual Hours Paid) [(SR – AR) × AH*] Or [(SR × AH) – (AR × AH*)]	[Standard Rate per Hour x Actual Idle Hours] (The difference between the Actual Hours paid and Actual Hours worked at Standard Rate) [(AH* – AH#) × SR] Or [(AH* × SR) – (AH# × SR)]	[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time] (The difference between the Standard Hours specified for actual production and Actual Hours worked at Standard Rate) [(SH – AH#) × SR] Or [(SH × SR) – (AH# × SR)]

Labour Mix Variance Or Gang Variance	Labour Yield Variance Or Sub-Efficiency Variance
[Standard Cost of Actual Time Worked in Standard Proportion – Standard Cost of Actual Time Worked] (e difference between the Actual Hours worked in standard proportion and Actual Hours worked in actual proportion, at Standard Rate) [(RSH – AH#) × SR] Or [(RSH × SR) – (AH# × SR)]	[Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time Worked in Standard Proportion] (The difference between the Standard Hours specified for actual production and Actual Hours worked in standard proportion, at Standard Rate) (SH – RSH) × SR Or (SH × SR) – (RSH × SR)

Variable Overhead Cost Variance

(Standard Variable Overheads for Production – Actual Variable Overheads)

Variable Overhead Expenditure (Spending) Variance	Variable Overhead Efficiency Variance
(Standard Variable Overheads for Actual Hours#) Less (Actual Variable Overheads) [(SR – AR) × AH#] Or [(SR × AH#) – (AR × AH#)]	(Standard Variable Overheads for Production) Less (Standard Variable Overheads for Actual Hours#) [(SH – AH#) × SR] Or [(SH × SR) – (AH# × SR)]

Fixed Overhead Cost Variance

(Absorbed Fixed Overheads) Less (Actual Fixed Overheads)

Fixed Overhead Expenditure Variance	Fixed Overhead Volume Variance
(Budgeted Fixed Overheads) Less (Actual Fixed Overheads) Or (BH × SR) – (AH × AR)	(Absorbed Fixed Overheads) Less (Budgeted Fixed Overheads) Or (SH × SR) – (BH × SR)

Fixed Overhead Capacity Variance	Fixed Overhead Calendar Variance	Fixed Overhead Efficiency Variance
SR (AH – BH) Or (AH × SR) – (BH × SR)	Std. Fixed Overhead rate per day (Actual no. of Working days – Budgeted Working days)	SR (AH – SH) Or (AH × SR) – (SH × SR)

AH* - Actual Hours paid

AH# - Actual Hours worked

Questions & Answers

Theory Questions

Question 1

Define the following terms:

(i) Controllable Variance

(ii) Uncontrollable Variance *(PYP 2 Marks Sep'24, MTP 5 Marks, Mar '21)*

Answer 1

(i) Controllable variances: Controllable variances are those which can be controlled under the normal operating conditions if a responsibility centre takes preventive measures and acts prudently. Responsibility centres are answerable for all adverse variances which could have been controlled.

(ii) Uncontrollable variances: Uncontrollable variances are those whichoccurs due to conditions which are beyond the control of a responsibility centre and cannot be controlled even though all preventive measures are in place.

Question 2

"Calculation of variances in standard costing is not an end in itself, but a means to an end." DISCUSS.
(MTP 4 Marks Dec'24)

Answer 2

The crux of standard costing lies in variance analysis. Standard costing is the technique whereby standard costs are predetermined and subsequently compared with the recorded actual costs. It is a technique of cost ascertainment and cost control. It establishes predetermined estimates of the cost of products and services based on management's standards of efficient operation. It thus lays emphasis on "what the cost should be". These should be costs are when compared with the actual costs. The difference between standard cost and actual cost of actual output is defined as the variance.

The variance in other words in the difference between the actual performance and the standard performance. The calculations of variances are simple. A variance may be favourable or unfavourable. If the actual cost is less than the standard cost, the variance is favourable but if the actual cost is more than the standard cost, the variance will be unfavourable. They are easily expressible and do not provide detailed analysis to enable management of exercise control over them. It is not enough to know the figures of these variances from month to month. We in fact are required to trace their origin and causes of occurrence for taking necessary remedial steps to reduce / eliminate them.

A detailed probe into the variance particularly the controllable variances helps the management to ascertain:

(i) the amount of variance

(ii) the factors or causes of their occurrence

(iii) the responsibility to be laid on executives and departments and

(iv) corrective actions which should be taken to obviate or reduce the variances.

Mere calculation and analysis of variances is of no use. The success of variance analysis depends upon how quickly and effectively the corrective actions can be taken on the analysed variances. In fact variance gives information. The manager needs to act on the information provided for taking corrective action. Information is the means and action taken on it is the end. In other words, the calculation of variances in standard costing is not an end in itself, but a means to an end.

Question 3

Discuss briefly some of the criticism which may be levelled against the Standard Costing System.
(PYP 5 Marks, May'22)

Answer 3

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.

Exam Insights: This theory question was based on criticism against standard costing system. Majority other examinees had not answered it on the correct line. Performance of the examinees was poor.

Practical Questions

Material Variances

Question 4

Y Lid manufactures "Product M" which requires three types of raw materials - "A", "B" & "C". Following information related to 1st quarter of the F.Y. 2022-23 has been collected from its books of accounts. The standard material input required for 1,000 kg of finished product 'M' are as under:

Material	Quantity (Kg.)	Std. Rate per Kg. (₹)
A	500	25
B	350	45
C	250	55
	1100	
Standard Loss	100	
Standard Output	1000	

During the period, the company produced 20,000 kg of product "M" for which the actual quantity of materials consumed and purchase prices are as under:

Material	Quantity (Kg.)	Purchase price per Kg. (₹)
A	11,000	23

B	7,500	48
C	4,500	60

You are required to calculate:

(i) Material Cost Variance

(ii) Material Price Variance for each raw material and Product 'M'

(iii) Material Usage Variance for each raw material and Product 'M'

(iv) Material Yield Variance

Note: Indicate the nature of variance i.e. Favorable or Adverse. *(PYP 10 Marks, Nov'22)*

Answer 4

Basic Calculations:

	Standard for 20,000 kg.			Actual for 20,000 kg.		
	Qty.	Rate	Amount	Qty.	Rate	Amount
	Kg.	(₹)	(₹)	Kg.	(₹)	(₹)
A	10,000	25	2,50,000	11,000	23	2,53,000
B	7,000	45	3,15,000	7,500	48	3,60,000
C	5,000	55	2,75,000	4,500	60	2,70,000
Total	22,000		8,40,000	23,000		8,83,000

Calculation of Variances:

(i)	Material Cost Variance = Std. Cost for actual output– Actual cost	
	MCV=8,40,000 – 8,83,000	= ₹ 43,000(A)
(ii)	Material Price Variance	= (SP–AP) × AQ
	A = (25 - 23) x 11,000	= 22,000 (F)
	B = (45 – 48) x 7,500	= 22,500 (A)
	C = (55 – 60) x 4,500	= 22,500 (A)
		= 23,000 (A)
(iii)	Material Usages Variance	= (SQ–AQ) × SP
	A = (10,000 – 11,000) x 25	= 25,000 (A)
	B = (7,000 – 7,500) x 45	= 22,500 (A)
	C = (5,000 – 4,500) x 55	= 27,500 (F)
		= 20,000 (A)
(iv)	Material Yield Variance	= (SQ–RSQ*) × SP
	A = (10,000 – 10,454.54) x 25	= 11,363.5(A)
	B = (7,000 – 7,318.18) x 45	= 14,318.1(A)
	C = (5,000 – 5,227.27) x 55	= 12,500(A)
		= 38,181.6(A)
	*Revised Standard Quantity (RSQ)	
	$A = \frac{10,000}{22,000} X\ 23,000$	= 10,454.54
	$B = \frac{7,000}{22,000} X\ 23,000$	= 7,318.18
	$C = \frac{5,000}{22,000} X\ 23,000$	= 5,227.17

Material Yield Variance can also be Calculated as below

Material yield variance = Standard cost per unit (Actual yield – Standard yield)

Standard Cost per unit = $\frac{Rs.8,40,000}{20,000}$ = Rs. 42

New Standard Yield = $\frac{20,000}{22,000} X\ 23,000 = 20,909$

Material yield variance = ₹ 42 (20,000 – 20,909)= = ₹ 38,178 (A)

Exam Insights: This Numerical question tested the basic knowledge of examinees on the topic of standard costing. The examinees were required to calculate various material cost variances for raw materials A, B & C and also for Finished Product M. Most of the examinees calculated material cost and price variances correctly. Several examinees were unable to calculate material yield variance. Overall performance of the examinees was above average.

Question 5

Following data is extracted from the books of XYZ Ltd. for the month of January, 2020:

(i) Estimation-

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
Material-A	800	?	--
Material-B	600	30.00	18,000
			--

Normal loss was expected to be 10% of total input materials.

(ii) Actuals- 1480 kg of output produced.

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
Material-A	900	?	--
Material-B	?	32.50	--
			59,825

(iii) Other Information-

Material Cost Variance	= ₹ 3,625 (F)
Material Price Variance	= ₹ 175 (F)

You are required to CALCULATE:

(i) Standard Price of Material-A;

(ii) Actual Quantity of Material-B;

(iii) Actual Price of Material-A;

(iv) Revised standard quantity of Material-A and Material-B; and

(v) Material Mix Variance; *(MTP 10 Marks, Oct'20 & Mar'23, SM)*

Answer 5

(i)	Material Cost Variance (A + B)	= {(SQ × SP) – (AQ × AP)}
	₹ 3,625	= (SQ × SP) – ₹ 59,825
	(SQ × SP)	= ₹ 63,450
	$(SQ_A \times SP_A) + (SQ_B \times SP_B)$	= ₹ 63,450
	(940 kg × SP_A) + (705 kg × ₹ 30)	= ₹ 63,450
	(940 kg × SP_A) + ₹ 21,150	= ₹ 63,450
	(940 kg × SP_A)	= ₹ 42,300
	SP_A	= ₹ 42,300 / 940kg
	Standard Price of Material-A	**= ₹ 45**
Working Note:		
SQ i.e. quantity of inputs to be used to produce actual output		
		$= \frac{1,480 \text{ kg}}{90\%} = 1,645\text{kg}$
	SQ_A	$= \frac{800\text{kg}}{(800+600)} \times 1,645 \text{ kg.} = 940\text{kg}$
	SQ_B	$= \frac{600\text{kg}}{(800+600)} \times 1,645 \text{ kg.} = 705\text{kg}$
(ii)	Material Price Variance (A + B)	= {(AQ × SP) – (AQ × AP)}
	₹ 175	= (AQ × SP) – ₹ 59,825
	(AQ × SP)	= ₹ 60,000
	$(AQ_A \times SP_A) + (AQ_B \times SP_B)$	= ₹ 60,000
	[900 kg × ₹ 45 (from (i) above)] + (AQ_B × ₹30)	= ₹ 60,000

	₹ 40,500 + (AQ_B × ₹ 30)	= ₹ 60,000
	(AQ_B × ₹ 30)	= ₹ 19,500
	AQ_B	= 19,500 / 30 = 650 kg
	Actual Quantity of Material B	= 650 kg
(iii)	(AQ × AP)	= ₹ 59,825
	(AQ_A × AP_A) + (AQ_B × AP_B)	= ₹ 59,825
	(900 kg × APA) + (650 kg (from (ii) above) × ₹ 32.5)	= ₹ 59,825
	(900 kg × APA) + ₹ 21,125	= ₹ 59,825
	(900 kg × AP_A)	= ₹ 38,700
	AP_A	= 38,700 / 900 = 43
	Actual Price of Material-A	= ₹ 43
(iv)	Total Actual Quantity of Material-A and Material-B	
	= AQ_A + AQ_B	= 900 kg + 650 kg (from (ii) above)
		= 1,550 kg
	Now,	
	Revised SQ_A	= 800kg /800+600 X 1,550kg. = 886kg.
	Revised SQ_B	= 600kg/(800+600)X 1,550kg. = 664kg.
(v)	Material Mix Variance (A + B)	= {(RSQ × SP) – (AQ × SP)}
	= {(RSQA × SPA) + (RSQB × SPB) – 60,000}	
	= (886 kg (from (iv) above) × ₹ 45 (from (i) above))+ (664 kg (from (iv) above) × ₹ 30) - ₹ 60,000	
	= (39,870 + 19,920) – 60,000 = ₹ 210 (A)	

Question 6

WEPL operates in coal mining through open cast mining method. Explosives and detonators are used for excavation of coal from the mines. The following are the details of standard quantity of explosives materials used for mining:

Particulars	Rate (₹)	Standard Qty.for Iron ore	Standard Qty. forOverburden (OB)
SME	40.00 per kg.	2.4 kg per tonne	1.9 kg per cubic-meter
Detonators	20.00 per piece	2 pcs per tonne	2 pcs per cubic- meter

The standard stripping ratio is 3:1 (means 3 cubic- meter of overburden soil to be removed to get one tonne of coal).

During the month of December 2023, the company produces 20,000 tonnes of coal and 58,000 cubic- meter of OB. The quantity of explosive materials used and paid for the month is as below:

Material	Quantity	Amount (₹)
SME	1,67,200 kg.	63,53,600
Detonators	1,18,400 pcs	24,27,200

Explosive suppliers are paid for the explosive materials on the basis of performance of the explosives which is termed as powder factor. One of the suppliers has presented their bill for explosive supplied for the month of December 2023. You being a bill passing officer of WEPL is required to COMPUTE the material price variance, material quantity variance and material cost variance.

(RTP May'24, MTP 10 Marks April '22 & Sep '23)

Answer 6

Workings:

1. Calculation of Standard Qty. of Explosives and Detonators foractual output:

	Particulars	Coal	Overburden (OB)	Total
SME:				
A	Actual Output	20,000 tonne	58,000 M^3	
B	Standard Qty per unit	2.4 kg. / tonne	1.9 kg. /M^3	
C	**Standard Qty. for actual production [A×B]**	**48,000 kg.**	**1,10,200 kg.**	**1,58,200 kg.**
Detonators:				
D	Standard Qtyper unit	2 pcs/ tonne	2 pcs/ M^3	

E	**Standard Qty.for actual production [A × D]**	**40,000 pcs.**	**1,16,000 pcs**	**1,56,000 pcs**

2. Calculation of Actual Price per unit of materials:

Material	Quantity [A]	Amount (₹) [B]	Rate (₹) [C = B÷A]
SME	1,67,200 kg.	63,53,600	38.00
Detonators	1,18,400 pcs	24,27,200	20.50

Computation of material price variance:

Material Price Variance	= Actual Qty. × (Std. Price - Actual Price)
SME	= 1,67,200 kg. × (₹40 – ₹38) = ₹3,34,400 (F)
Detonators	= 1,18,400 pcs × (₹20 – ₹20.5) = ₹59,200 (A)
Total	**= ₹2,75,200 (F)**

Computation of material quantity variance:

Material Qty. Variance	= Std. Price × (Std. Qty for actual output – Actual Qty.)
SME	= ₹40 × (1,58,200 kg. - 1,67,200 kg.) = ₹3,60,000 (A)
Detonators	= ₹20 × (1,56,000 pcs -1,18,400 pcs) = ₹7,52,000 (F)
Total	= ₹3,92,000 (F)

Computation of material cost variance:

Material cost variance	= Std. cost – Actual Cost
Or,	(Std. Price × Std. Qty) – (Actual Price × Actual Qty.)
SME	= (₹ 40 × 1,58,200 kg) – (₹ 38 × 1,67,200 kg.)
	= ₹ 63,28,000 – ₹ 63,53,600 = ₹ 25,600 (A)
Detonators	= (₹ 20 × 1,56,000 pcs) – (₹ 20.50 × 1,18,400 pcs)
	= ₹31,20,000 – ₹24,27,200 = 6,92,800 (F)
Total	**= ₹6,67,200 (F)**

Question 7

LDR

Banku manufacturing Ltd. is engaged in producing a item named 'ABC'. It produces 'ABC' in a batch of 100 kgs. Standard material inputs required for 100 kgs. of 'ABC' are as below:

Material	Quantity (in kgs.)	Rate per kg. (in ₹)
A	50	110
B	30	320
C	30	460

During the month of April, 2024, actual production was 50,000 kgs. of 'ABC' for which the actual quantities of material used for a batch and the prices paid thereof are as under:

Material	Quantity (in kgs.)	Rate per kg. (in ₹)
A	60	115
B	25	330
C	20	405

You are required to CALCULATE the following variances based on the above given information for the month of April, 2024 for Banku manufacturing Ltd.:

(i) Material Cost Variance;
(ii) Material Price Variance;
(iii) Material Usage Variance;
(iv) Material Mix Variance;
(v) Material Yield Variance. ***(RTP Jan'25)***

Answer 7

Material	SQ* × SP (₹)	AQ** × SP (₹)	AQ** × AP (₹)	RSQ*** × SP (₹)
A	27,50,000	33,00,000	34,50,000	26,24,600
	(25,000 kg. × ₹110)	(30,000 kg. × ₹110)	(30,000 kg. × ₹115)	(23,860 kg. × ₹110)
B	48,00,000	40,00,000	41,25,000	45,82,400
	(15,000 kg. × ₹320)	(12,500 kg. × ₹320)	(12,500 kg. × ₹320)	(14,320 kg. × ₹320)
C	69,00,000	46,00,000	40,50,000	65,87,200
	(15,000 kg. × ₹460)	(10,000 kg. × ₹460)	(10,000 kg. × ₹405)	(14,320 kg. × ₹460)

Total	1,44,50,000	1,19,00,000	1,16,25,000	1,37,94,200

* Standard Quantity of materials for actual output:

A	$= \frac{50 \text{ Kgs.}}{100 \text{ Kgs}} \times 50{,}000 \text{ kgs.} = 25{,}000 \text{ Kgs.}$
B	$= \frac{30 \text{ Kgs.}}{100 \text{ Kgs}} \times 50{,}000 \text{ kgs.} = 15{,}000 \text{ Kgs.}$
C	$= \frac{30 \text{ Kgs.}}{100 \text{ Kgs}} \times 50{,}000 \text{ kgs.} = 15{,}000 \text{ Kgs.}$

** Actual Quantity of Material used for actual output:

A	$= \frac{60 \text{ Kgs.}}{100 \text{ Kgs}} \times 50{,}000 \text{ kgs.} = 30{,}000 \text{ Kgs.}$
B	$= \frac{25 \text{ Kgs.}}{100 \text{ Kgs}} \times 50{,}000 \text{ kgs.} = 12{,}500 \text{ Kgs.}$
C	$= \frac{20 \text{ Kgs.}}{100 \text{ Kgs}} \times 50{,}000 \text{ kgs.} = 10{,}000 \text{ Kgs.}$

***Revised Standard Quantity (RSQ):

A	$= \frac{50 \text{ Kgs.}}{110 \text{ Kgs}} \times 52{,}500 \text{ kgs.} = 23{,}860 \text{ Kgs.}$
B	$= \frac{30 \text{ Kgs.}}{110 \text{ Kgs}} \times 52{,}500 \text{ kgs.} = 14{,}320 \text{ Kgs.}$
C	$= \frac{30 \text{ Kgs.}}{110 \text{ Kgs}} \times 52{,}500 \text{ kgs.} = 14{,}320 \text{ Kgs.}$

(i) Material cost variance = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)

Or = (SQ × SP) – (AQ × AP)

A	= ₹27,50,000 - ₹34,50,000	= ₹7,00,000 (A)
B	= ₹48,00,000 - ₹41,25,000	= ₹6,75,000 (F)
C	= ₹69,00,000 - ₹40,50,000	= ₹28,50,000 (F)
		= ₹28,25,000 (F)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

= (AQ × SP) – (AQ × AP)

A	= ₹33,00,000 - ₹34,50,000	= ₹1,50,000 (A)
B	= ₹40,00,000 - ₹41,25,000	= ₹1,25,000 (A)
C	= ₹46,00,000 - ₹40,50,000	= ₹5,50,000 (F)
		= ₹2,75,000 (F)

(iii) Material Usage Variance = Std. Price (Std. Qty. – Actual Qty.)

Or = (SQ × SP) – (AQ × SP)

A	= ₹27,50,000 - ₹33,00,000	= ₹5,50,000 (A)
B	= ₹48,00,000 - ₹40,00,000	= ₹8,00,000 (F)
C	= ₹69,00,000 - ₹46,00,000	= ₹23,00,000 (F)
		= ₹25,50,000 (F)

(iv) Material Mix Variance = Std. Price (Revised Std. Qty. – Actual Qty.)

Or = (RSQ × SP) – (AQ × SP)

A	= ₹26,24,600 - ₹33,00,000	= ₹6,75,400 (A)
B	= ₹45,82,400 - ₹40,00,000	= ₹5,82,400 (F)
C	= ₹65,87,200 - ₹46,00,000	= ₹19,87,200 (F)
		= ₹18,94,200 (F)

(v) Material Yield Variance = Std. Price (Std. Qty. – Revised Std. Qty.)

Or = (SQ × SP) – (RSQ × SP)

A	= ₹27,50,000 - ₹26,24,600	= ₹1,25,400 (F)
B	= ₹48,00,000 - ₹45,82,400	= ₹2,17,600 (F)
C	= ₹69,00,000 - ₹65,87,200	= ₹3,12,800 (F)

Labour Variances

Question 8

The following information has been provided by a company:

Number of units produced and sold	9,000
Standard labour rate per hour	₹ 12
Standard hours required for 9,000 units	-
Actual hours required	25,641 hours
Labour efficiency	105.3%
Labour rate variance	₹ 1,53,846 (A)

You are required to CALCULATE:

(i) Actual labour rate per hour
(ii) Standard hours required for 9,000 units
(iii) Labour Efficiency variance
(iv) Standard labour cost per unit
(v) Actual labour cost per unit. *(MTP 10 Marks, Oct'21 RTP Nov'23)*

Answer 8

SR – Standard labour Rate per Hour
AR – Actual labour rate per hour
SH – Standard Hours
AH – Actual hours

(i)	Labour rate Variance	= AH (SR – AR)
	- 1,53,846	= 25,641 (12 – AR)
	- 6	= 12 – AR
	AR	= ₹ 18
(ii)	Labour Efficiency	$= \frac{SH}{AH} \times 100 = 105.3$
	SH	$\frac{AH \times 105.3}{100} = \frac{25,641 \times 105.3}{100}$
	SH	= 26,999.973
	SH	= 27,000 hours
(iii)	Labour Efficiency Variance	= SR (SH – AH)
		= 12 (27,000 – 25,641)
		= ₹ 16,308 (F)
(iv)	Standard Labour Cost per Unit	$= \frac{27,000 \times 12}{9,000} =$ ₹ 36
(v)	Actual Labour Cost Per Unit	$= \frac{25,641 \times 18}{9,000} =$ ₹ 51.282

Question 9

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 *(PYP 5 Marks, May'22)*

Answer 9

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= $\frac{120 \text{ hours}}{20 \text{ units}}$ = 6 hours

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) × AHPaid
= (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.

EXAM INSIGHTS: This numerical question tested the basic knowledge of examinees on the topic of standard costing. The examinees had to calculate various labour variances. The crux of question was to calculate actual number of hours worked and actual number of hours paid. Some of the examinees failed to calculate Labour efficiency variance and Labour Idle time variance. Performance of the examinees was above average.

Question 10

LDR

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

You are required to COMPUTE:

(i) Total Labour Cost Variance.
(ii) Total Labour Rate Variance.
(iii) Total Labour Gang Variance.
(iv) Total Labour Yield Variance, and
(v) Total Labour Idle Time Variance. ***(RTP May'22, PYP 10 Marks Jul'21)***

Answer 10

Working Notes:

1. Calculation of Standard Man hours

When 100 workers work for 1 hour, the standard output is 50 units.

Standard man hours per unit = $\frac{100 \text{ hours}}{50 \text{ Units}}$ = **2 hours per unit**

2. Calculation of standard man hours for actual output:

= 1,920units x 2 hours **= 3,840 hours.**

3. Calculation of actual cost

Type of Workers	No of Workers	Actual Hours Paid	Rate (₹)	Amount (₹)	Idle Hours (5% of hours paid)	Actual hours Worked
Group 'A'	10	400	12.40	4,960	20	380

Group 'B'	30	1,200	12	14,400	60	1,140
Group 'C'	60	2,400	11.40	27,360	120	2,280
	100	**4,000**		**46,720**	**200**	**3,800**

4. Calculation of Standard wage Rate:

Labour Efficiency Variance	= 480F
(Standard hours for Actual production – Actual Hours) x SR	= 480F
(3,840 – 3,800) x SR	= 480
Standard Rate (SR)	**= ₹ 12 per hour**

(i) Total Labour Cost Variance

= (Standard hours x Standard Rate) – (Actual Hours x Actual rate)

= (3,840 x 12) – 46,720 **= 640A**

(ii) Total Labour Rate Variance

= (Standard Rate – Actual Rate) x Actual Hours

Group 'A' = (12 - 12.40) 400	=	160A
Group 'B' = (12 - 12) 1,200	=	0
Group 'C' = (12 – 11.40) 2,400	=	1,440F
		1,280F

(iii) Total Labour Gang Variance

= Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang - Average Standard Rate per hour of Actual Gang*

*on the basis of hours worked

= 3,800 × (12- 3,840 X 12 / 3,800)

= **0**

[Note: As the number of workers in standard and actual is the same, there is no difference in mix ratio, so labour gang variance will be NIL]

(iv) Total Labour Yield Variance

= Average Standard Rate per hour of Standard Gang × {Total Standard Time (hours) - Total Actual Time worked (hours)}

= 12 x (3,840 – 3,800)

= 480F

(v) Total Labour idle time variance

= Total Idle hours x standard rate per hour

= 200 hours x 12

= 2,400A

EXAM INSIGHTS: This practical problem tested the basic knowledge of examinees on the topic of standard costing requiring computation of various labor variances. Most of the examinees had just written the formula of different variances. They did not understand how to calculate standard hours for actual output. Performance of the examinees was poor.

Overhead Variances

Question 11

The following are the details given:

Budgeted Days	**25**
Budgeted Fixed Overheads	**1,00,000**
Budgeted Production	**800 units per day**
Actual Production	**21,000 units**
Fixed Overheads are absorbed @ ₹ 10 per hour.	
Fixed overheads efficiency variance	**10,000A**
Fixed overheads calendar variance	**8,000F**
Fixed overheads cost variance	**15,000A**

You are required to CALCULATE:

(a) Actual Fixed Overheads

(b) **Actual Days**
(c) **Actual Hours**
(d) **Fixed overheads Expenditure variance**
(e) **Fixed overheads volume variance**
(f) **Fixed overheads capacity variance** ***(MTP 10 Marks, Mar'22)***

Answer 11

(i)	Fixed Overhead Cost Variance	= (Std Fixed Overheads – Actual Fixed Overheads)
		$= \left(\frac{1,00,000}{20,000} \times 21,000 \text{ units} - \text{Actual Fixed Overheads}\right) = 15,000\ (A)$
		= (1,05,000 - Actual Fixed Overheads) = 15,000A
	=> Actual Fixed Overheads = 1,20,000	
(ii)	Fixed Overhead Calendar Variance	=(Actual Days – Budgeted Days) x Budgeted rate per day
		$= (\text{Actual Days} - 25) \times \frac{1,00,000}{25} = 8,000\ F$
		= (Actual Days -25) = 2
	=> Actual Days	= 27
(iii)	Fixed Overhead Efficiency Variance	=(Standard Hours for Actual Production – Actual Hours) x Budgeted rate per hour
		$= \left(\frac{10,000}{20,000} \times 21,000 - \text{Actual Hours}\right) X\ 10 = 10,000A$
		= (10,500 – Actual Hours) = -1,000
	=> Actual Hours	= 11,500
(iv)	Fixed overheads Expenditure variance	= (Budgeted Fixed Overheads – Actual Fixed Overheads)
		= (1,00,000 – 1,20,000) = 20,000A
(v)	Fixed overheads volume variance	= (Budgeted units – Actual Units) x Budgeted Rate per unit
		$= (20,000 - 21,000) \times \frac{1,00,000}{20,000} = 5,000F$
(vi)	Fixed overheads capacity variance	= (Budgeted Hours for Actual Days – Actual Hours) x Budgeted Rate per Hour
		$= \left(\frac{10,000}{25} X\ 27 - 11,500\right) X\ 10 = 7,000F$

Question 12

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.** ***(PYP 10 Marks, Jan'21)***

Answer 12

Workings:

Calculation of budgeted hours

Budgeted hours = (52 x 25 x 8) x 85% = 8,840 hours

(i) Variable overheads variance

(a) Variable overhead expenditure variance

= Std. overhead for Actual hours – Actual variable Overhead

$= \left(\frac{\text{Rs.1,06,080}}{8,840} \times 8,100\right)$ - Rs. 1,02,000

= **4800 A**

(b) Variable overhead efficiency variance

Std. rate per hour × (Std. hours for actual production – Actual hours)

$= \frac{\text{Rs.1,06,080}}{8,840}$ (8,800 hours – 8,100 hours)

= 8400 F

(ii) Fixed overhead variances

(a) Fixed overhead budget variance

= Budgeted overhead – Actual overhead

= ₹ 2,21,000 – ₹ 2,00,000

= 21,000 F

(b) Fixed overhead capacity variance

= Std rate × (Actual hours – budgeted hours)

$= \frac{\text{Rs.2,21,000}}{8,840} \times (8,100 - 8,840)$

= 18,500 A

(c) Fixed overhead efficiency variance

= Std rate x (Std hours for actual production – Actual hours)

$= \frac{Rs.2,21,000}{8,840} \times (8,800 - 8,100)$

= 17,500 F

(iii) Control Ratios

(a) Capacity Ratio

$= \frac{\text{Actual hours}}{\text{Budgeted hours}} \times 100$

$= \frac{8,100}{8,840} \times 100 = 91.63\%$

(b) Efficiency Ratio

$= \frac{\text{Standard hours}}{\text{Actual hours}} \times 100$

$= \frac{8,800}{8,100} \times 100 = 108.64\%$

(c) Activity Ratio

$= \frac{\text{Standard hours}}{\text{Budgted hours}} \times 100$

$= \frac{8,800}{8,840} \times 100 = 99.55\%$

Question 13

In a manufacturing company the standard units of production of the year were fixed at 1,20,000 units and overhead expenditures were estimated to be:

Fixed	₹ 12,00,000;	Variable	₹ 6,00,000;
Semi-Variable	₹ 1,80,000		

Actual production during the April, 2019 of the year was 8,000 units. Each month has 20 working days. During the month there was one public holiday. The actual overheads amounted to:

Fixed	₹ 1,10,000;	Variable	₹ 48,000;
Semi-Variable	₹ 19,200		

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable character.

CALCULATE the followings:

(i) **Overhead Cost Variance**
(ii) **Fixed Overhead Cost Variance**
(iii) **Variable Overhead Cost Variance**
(iv) **Fixed Overhead Volume Variance**
(v) **Fixed Overhead Expenditure Variance**
(vi) **Calendar Variance.** ***(MTP 10 Marks, Oct'19 & PYP Dec'21)***

Answer 13

COMPUTATION OF VARIANCES

(i)	**Overhead Cost Variance**	= Absorbed Overheads – Actual Overheads
		= (₹87,200 + ₹44,800) – (₹1,21,520 + ₹55,680)
		= ₹ 45,200 (A)
(ii)	**Fixed Overhead Cost Variance**	= Absorbed Fixed Overheads – Actual Fixed Overheads
		= ₹ 87,200 – ₹1,21,520
		= ₹ 34,320 (A)
(iii)	**Variable Overhead Cost Variance**	= Standard Variable Overheads for Production – Actual Variable Overheads
		= ₹ 44,800 – ₹ 55,680
		= ₹ 10,880 (A)
(iv)	**Fixed Overhead Volume Variance**	= Absorbed Fixed Overheads – Budgeted Fixed Overheads
		= ₹ 87,200 – ₹1,09,000
		= ₹ 21,800 (A)
(v)	**Fixed Overhead Expenditure Variance**	= Budgeted Fixed Overheads – Actual Fixed Overheads
		= ₹10.90 × 10,000 units – ₹1,21,520
		= ₹ 12,520 (A)
(vi)	**Calendar Variance**	= Possible Fixed Overheads – Budgeted Fixed Overheads
		= ₹1,03,550 – ₹1,09,000
		= ₹ 5,450 (A)

WORKING NOTE

Fixed Overheads per Unit = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{\text{Rs.12,00,000}}{\text{1,20,000 units}}$	₹ 10
Fixed Overheads element in *Semi-Variable* Overheads i.e. 60% of ₹ 1,80,000	₹ 1,08,000
Fixed Overheads per Unit = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{\text{Rs.1,08,000}}{\text{1,20,000 units}}$	₹ 0.90
Standard Rate of Absorption of Fixed Overheads *per unit* (₹10 + ₹0.90)	₹10.90
Fixed Overheads Absorbed on 8,000 units @ Rs10.90	₹ 87,200
Budgeted Variable Overheads	₹ 6,00,000
Add : Variable element in Semi-Variable Overheads 40% of ₹ 1,80,000	₹ 72,000
Total Budgeted Variable Over heads	₹ 6,72,000
Standard Variable Cost *per unit* = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = \frac{\text{Rs.6,72,000}}{\text{1,20,000units}}$	₹5.60
Standard Variable Overheads for 8,000 units @ ₹5.60	₹ 44,800
Budgeted Annual Fixed Overheads (₹ 12,00,000 + 60% of ₹ 1,80,000)	₹13,08,000

EXAM INSIGHTS: This Numerical question tested the basic knowledge of examinees on the topic of Standard Costing. The examinees had to calculate various fixed and variable overhead cost variance. The main theme of question was based on segregating the semi- variable overheads into fixed and variable cot and to calculate standard cost for actual output. Some of the examinees had calculated fixed overhead variances correctly but failed to calculate variable overhead variances and calendar variance. Performance of the examinees was below average.

Possible Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} \times \text{Actual Days}$ $\left[\frac{\text{Rs.1,09,000}}{\text{20 Days}} \times \text{19 Days}\right]$	₹ 1,03,550
Actual Fixed Overheads (₹1,10,000 + 60% of ₹ 19,200)	₹1,21,520
Actual Variable Overheads (₹48,000 + 40% of ₹19,200)	₹ 55,680

Question 14

LDR

PQR Alloys Ltd. uses a standard costing system. Budgeted information for the year:

Budgeted output	**84,000 units**
Variable Factory Overhead per unit	**₹ 16**
Standard time for one unit of output	**0.80 machine hour**
Fixed factory overheads	**₹ 6,72,000**
Actual results for the year:	
Actual output	**87,600 units**
Variable Overhead efficiency variance	**₹ 67,200 (A)**
Actual Fixed factory overheads	**₹ 7,05,000**
Actual variable factory overheads	**₹ 14,37,000**

Required:

Calculate the following variances clearly indicating Adverse(A) or Favorable (F):

(i) **Variable factory overhead expenditure variance.**

(ii) **Fixed factory overhead expenditure variance.**

(iii) **Fixed factory overhead efficiency variance.**

(iv) **Fixed factory overhead capacity variance.** ***(PYP 10 Marks, Nov'23)***

Answer 14

Calculation of actual hours

Standard rate per hour = $\frac{\text{Variable factory overhead per unit}}{\text{Standard time for one unit of output}} = \frac{₹16}{0.8} = ₹\ 20$

Variable Overhead Efficiency Variance:

(Standard hours for actual production – Actual hours) × Standard rate per hour

Let actual hours be x

$[(87,600 \times 0.8) - x] \times 20 = -67,200$

$(70,080 - x) \times 20 = -67,200$

$x = 73,440$

(i) **Variable Factory Overhead Expenditure Variance:**

(Variable overhead at actual hours – Actual variable overheads)

$\left[\left(\frac{13,44,000}{67,200} \times 73,440\right) - 14,37,000\right]$

= 31,800 F

(ii) **Fixed Factory Overhead Expenditure Variance:**

Budgeted fixed overhead – Actual fixed overhead.

(6,72,000 – 7,05,000)

= 33,000 A

(iii) **Fixed Factory Overhead Efficiency Variance:**

(Standard hours for actual production – Actual hours) × Standard rate per hour

(70,080 – 73,440) × 10 = 33,600 A

(iv) **Fixed Overhead Capacity Variance:**

(Actual hours - Budgeted hours) × Standard rate per hour

(73,440 - 67,200) ×10 = 62,400 F

The solution can also be presented in following way based on Quantity (units)

Calculation of standard quantity for actual hours:

Variable standard rate per unit (SR) = ₹ 16

Variable Overhead Efficiency Variance:

(SR x AQ) – (SR x standard quantity for Actual hours worked)

-67,200 = (16 x 87,600) – 16 x

-67200 = 14,01,600- 16 x

x = 14,68,800 / 16 = **91,800** (SQ for actual hours worked)

(i) **Variable Factory Overhead Expenditure Variance:**
(SR x SQ for actual hour worked – Actual variable overheads)
16 x 91,800 – 14,37,000 or 14,68,800 – 14,37,000
= 31,800 F

(ii) **Fixed Factory Overhead Expenditure Variance:**
Budgeted fixed overhead – Actual fixed overhead.
(6,72,000 – 7,05,000)
= 33,000 A

(iii) **Fixed Factory Overhead Efficiency Variance:**
Standard rate per unit (SR) = 6,72,000 / 84,000 = ₹ 8 per unit
(SR x AQ) – (SR x standard quantity for Actual hours)
(8 x 87,600) – (8 x 91,800)
(7,00,800 – 7,34,400) = 33,600 A

(iv) **Fixed Overhead Capacity Variance:**
(SR x standard quantity for Actual hours - Budgeted fixed overheads)
(8 x 91800) – (6,72,000)
(7,34,400 – 6,72,000) = 62,400 F

EXAM INSIGHTS: Numerical question which tested the basic knowledge of examinees on the topic of standard costing. The examinees were required to calculate variable factory overhead expenditure variance and fixed overhead variances. Most of the examinees could calculate Fixed overhead expenditure variance correctly, however they could not calculate the actual hours worked during the year based on the data given in the question and hence could not proceed correctly with the other required variances. Overall performance of the examinees was below average.

All Variances

Question 15

The following are the standard cost for a product-X:

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

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

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

You are required to CALCULATE:

(i) Material Usage Variance
(ii) Material Price Variance
(iii) Material Cost Variance
(iv) Labour Efficiency Variance
(v) Labour Rate Variance
(vi) Labour Cost Variance
(vii) Variable Overhead Cost Variance
(viii) Fixed Overhead Cost Variance. ***(MTP 10 Marks, Apr'23)***

Answer 15

(i) Material Usage Variance

= Std. Price (Std. Quantity – Actual Quantity)
= ₹ 90 (18,000 kg. – 17,800 kg.)
= ₹ 18,000 (Favourable)

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

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

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

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

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

(vii) Variable Cost Variance
= Std. Variable Cost – Actual Variable Cost
= (14,400 hrs. × ₹ 15) – ₹2,17,500
= ₹ 1,500 (Adverse)

(viii) Fixed Overhead Cost Variance
= Absorbed Fixed Overhead – Actual Fixed Overhead
= (1,800 units × ₹400) - ₹ 7,68,000
= ₹ 7,20,000 – ₹ 7,68,000 = ₹ 48,000 (Adverse)

Question 16

The details regarding a product manufactured by the company for the last one week are as follows: Standard cost (per unit)

Direct materials 10 units @ ₹ 22.50	₹ 225
Direct wages 5 hours @ ₹ 120	₹ 600
Total:	₹ 825
Actual (for whole activity):	
Direct materials	₹ 96,525
Direct wages	₹ 2,44,860
Analysis of variances:	
Direct materials:	
Price	₹ 8,775 (Adverse)
Usage	₹ 5,625 (Favourable)
Direct wages (labour):	
Efficiency	₹ 5,400 (Adverse)
You are required to CALCULATE:	

(i) **Material Cost variance**
(ii) **Actual output units**
(iii) **Actual price of material per unit**
(iv) **Actual Wages rate per labour hour**
(v) **Labour rate variance**
(vi) **Labour Cost variance** ***(MTP 10 Marks, Sep'22)***

Answer 16

(i)	**Material Cost Variance**	**= Material Price Variance+ Material Usage Variance**
		= ₹ 8,775 A + ₹ 5,625 F= **₹ 3,150 Adverse**
(ii)	**Actual output units**	
	Let x be the actual quantity of output	
	Then Standard Quantity of input for actual output 'x'	
	SQ = 10x	
	Material cost variance	= (SQ x SP) - (AQ x AP)
	-3,150	= (10x x 22.50) - ₹ 96,525
	-3,150	= 225x - ₹ 96,525
	225x	= 96,525 – 3,150 = ₹ 93,375
	X	= 93,375/225 = **415 Units**
(iii)	**Actual Price of Material per unit**	
	Material Usage variance	= (SQ - AQ) x SP
	5,625	= (10x - AQ) x ₹ 22.50
	5,625	= (10 x 415 units - AQ) x ₹ 22.50
	5,625/22.50	= 4,150 - AQ
	AQ	= 4,150 – 250 = **3,900 units**
	Now, AQ x AP	= ₹ 96,525 (given)
	AP	= ₹ 96,525/AQ
		= ₹ 96,525/3,900 units = **₹ 24.75**
(iv)	**Actual wages rate per labour hour**	
	Labour efficiency variance = 5,400 Adverse (given)	
	Standard rate per hour (Standard time – Actual time) = -5,400	
	₹ 120 [(Actual output units x Number of hours per output) – Actual time] = -5,400	
	₹ 120 [(415 units x 5 hrs) – Actual time]	= -5,400
	2,075 hrs – Actual time	= -5,400/120
	Actual time	= 2,075 + 45
		= **2,120 hrs**
	Now Direct wages	= ₹ 2,44,860 (given)
	Actual time x Actual rate per hour	= ₹ 2,44,860
	Actual rate per hour	= ₹ 2,44,860 / 2,120 hrs
		= **₹ 115.50**
(v)	**Labour rate variance**	
	= Actual time (Standard Rate – Actual Rate)	
	= 2,120 hrs (₹ 120 - ₹ 115.50)	
	= 2,120 hrs x ₹ 4.50 = **9,540 Favourable**	
(vi)	**Labour Cost variance**	
	= Labour rate variance+ Labour efficiency variance	
	= 9,540 F + 5,400 A = **4,140 Favourable**	

Question 17

The following information is available from the cost records of a company for the month of July, 2022:

1.	Material purchased	22,000 pieces	₹ 9,00,000
2.	Material consumed	21,000 pieces	
3.	Actual wages paid for	5,150 hours	₹ 2,57,500
4.	Fixed Factory overhead incurred		₹ 4,60,000

5.	Fixed Factory overhead budgeted		₹ 4,20,000
6.	Units produced	1,900	
7.	Standard rates and prices are:		
	Direct material	₹ 45 per piece	
	Standard input	10 pieces per unit	
	Direct labour rate	₹ 60 per hour	
	Standard requirement	2.5 hours per unit	
	Overheads	₹ 80 per labour hour	

You are required to CALCULATE the following variances:

(i) Material price variance
(ii) Material usage variance
(iii) Labour rate variance
(iv) Labour efficiency variance
(v) Fixed overhead expenditure variance
(vi) Fixed overhead efficiency variance
(vii) Fixed overhead capacity variance *(MTP 10 Marks, Oct'22) (Same concept different figures SM)*

Answer 17

(i) **Material price variance (on the basis of Single plan):**

= Actual Quantity $_{\text{Purchased}}$ (Std. Price – Actual Price)

= 22,000 pcs ($Rs.$ 45 – $\frac{\text{Rs.9,00,000}}{\text{Rs.22,000pcs}}$)= Rs.90,000* (Favourable)

Or,

Material price variance (on the basis of Partial plan):

= Actual Quantity $_{\text{consumed}}$ (Std. Price – Actual Price)

= 21,000 pcs (Rs. 45 – $\frac{\text{Rs.9,00,000}}{\text{Rs.22,000pcs}}$)= Rs.85,909* (Favourable)

(*Figure may slightly differ due to rounding off the actual price per unit)

(ii) **Material usage variance:**

= Std. price per piece (Std. Quantity – Actual Quantity $_{\text{consumed}}$

= Rs.45 (1,900 units × 10 – 21,000) = Rs. 90,000 (Adverse)

(iii) **Labour rate variance:**

= Actual hours paid (Std. rate – Actual rate)

= 5,150 hours (Rs. 60 – $\frac{\text{Rs.2,57,500}}{\text{5,150 hours}}$ = Rs. 51,500 (Favourable)

(iv) **Labour efficiency variance:**

= Std. rate per hour (Std. hours – Actual Quantity $_{\text{worked}}$)

= Rs.60 (1,900 units × 2.5 hours – 5,150 hours) = Rs. 24,000 (Adverse)

(v) **Fixed overhead expenditure variance:**

= Budgeted Overhead – Actual Overhead

= Rs. 4,20,000 – Rs. 4,60,000 = Rs. 40,000 (Adverse)

(vi) **Fixed overhead efficiency variance:**

= Std. rate (Std. hours – Actual hours worked)

= Rs.80 (1,900 units × 2.5 hours – 5,150 hours) = Rs. 32,000 (Adverse)

Or,

Fixed overhead efficiency variance on basis of units

= Std. rate per unit (Actual output – Standard output for actual hours)

= Rs.200 (1,900 units – 5,150 / 2.5 hours) = Rs. 32,000 (Adverse)

(vii) **Fixed overhead capacity variance:**

= Std. rate (Actual hours worked – Budgeted hours)

= Rs. 80 (5,150hours – $\frac{\text{Rs..4,20,000}}{\text{Rs.80}}$ = Rs. 8,000 (Adverse)

Or,

Fixed overhead capacity variances on basis of units

= Std. rate per unit (Standard output for actual hours – Budgeted output)

= Rs.200 (2,060 units – 4,20,000 / 200) = Rs. 8,000 (Adverse)

Question 18

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

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

Budgeted output for a quarter of a year was 10,000 Kg. Actual output is 9,000 Kg.
Actual costs for this quarter are as follows:

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

You are required to CALCULATE:
(i) Material Usage Variance
(ii) Material Price Variance
(iii) Material Cost Variance
(iv) Labour Efficiency Variance
(v) Labour Rate Variance
(vi) Labour Cost Variance
(vii) Variable Overhead Cost Variance
(viii) Fixed Overhead Cost Variance. (RTP May'21) (Same concept but different figures RTP Nov'20)

Answer 18

(i)	Material Usage Variance	= Std. Price (Std. Quantity – Actual Quantity)
		= ₹ 90 (9,000 kg. – 8,900 kg.)
		= ₹ 9,000 (Favorable)
(ii)	Material Price Variance	= Actual Quantity (Std. Price – Actual Price)
		= 8,900 kg. (₹ 90 – ₹ 92) = ₹ 17,800 (Adverse)
(iii)	Material Cost Variance	= Std. Material Cost – Actual Material Cost
		= (SQ × SP) – (AQ × AP)
		= (9,000 kg. × ₹ 90) – (8,900 kg. × ₹ 92)
		= ₹ 8,10,000 – ₹ 8,18,800
		= ₹ 8,800 (Adverse)
(iv)	Labour Efficiency Variance	= Std. Rate (Std. Hours – Actual Hours)
		= ₹ 80 (9,000/10 × 8 hours) – 7,000 hrs.
		= ₹ 80 (7,200 hrs. – 7,000 hrs.)
		= ₹ 16,000 (Favorable)
(v)	Labour Rate Variance	= Actual Hours (Std. Rate – Actual Rate)
		= 7,000 hrs. (₹ 80 – ₹ 84)
		= ₹ 28,000 (Adverse)
(vi)	Labour Cost Variance	= Std. Labour Cost – Actual Labour Cost
		= (SH X SR)- (AH X AR)
		= (7,200 hrs. × ₹ 80) – (7,000 hrs. × ₹ 84)
		= ₹ 5,76,000 – ₹ 5,88,000
		= ₹ 12,000 (Adverse)
(vii)	Variable Cost Variance	= Std. Variable Cost – Actual Variable Cost
		= (7,200 hrs. × ₹ 20) – ₹ 1,40,000
		= ₹ 4,000 (Adverse)
(vii)	Fixed Overhead Cost Variance	= Absorbed Fixed Overhead – Actual Fixed Overhead

		$= \frac{Rs.250}{10\ kgs} \times 9,000$ kgs.- Rs. 2,60,000
		= ₹ 2,25,000 – ₹ 2,60,000 = ₹ 35,000 (Adverse)

Question 19

Su Ltd. has furnished the following standard cost data per' unit of production:
Material 15 kg @ ₹ 15 per kg.
Labour 6 hours @ ₹ 5 per hour
Variable overhead 6 hours @ ₹ 12 per hour.
Fixed overhead ₹ 4,50,000 per month (Based on a normal volume of 30,000 labour hours.)
The actual cost data for the month of August 2023 are as follows:
Material used 65,000 kg at a cost of ₹ 9,85,000.
Labour paid ₹ 1,40,000 for 31,500 hours worked.
Variable overheads ₹ 3,60,200
Fixed overheads ₹ 4,70,000
Actual production 4,800 units.
CALCULATE:
(i) Material Cost Variance.
(ii) Labour Cost Variance.
(iii) Fixed Overhead Cost Variance.
(iv) Variable Overhead Cost Variance.
(MTP 6 Marks, Mar'24 MTP 5 Marks, Mar '21) (Same concept different figures MTP 5 Marks Nov'21)

Answer 19

(a) Budgeted Production 30,000 hours ÷ 6 hours per unit = 5,000 units

Budgeted Fixed Overhead Rate		= ₹ 4,50,000 ÷ 5,000 units = ₹ 90 per unit Or
		= ₹ 4,50,000 ÷ 30,000 hours = ₹ 15 per hour.
(i)	Material Cost Variance	= (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)
		= (4,800 units × 15 kg. × ₹15) - ₹ 9,85,000
		= ₹ 10,80,000 – ₹ 9,85,000
		= ₹ 95,000 (F)
(ii)	Labour Cost Variance	= (Std. Hours × Std. Rate) – (Actual Hours × Actual rate)
		= (4,800 units × 6 hours × ₹ 5) – ₹1,40,000
		= ₹ 1,44,000 – ₹ 1,40,000
		= ₹ 4,000 (F)
(iii)	Fixed Overhead Cost Variance	= (Budgeted Rate × Actual Qty) – Actual Overhead
		= (₹ 90 x 4,800 units) – ₹ 4,70,000
		= ₹ 38,000 (A)
	OR	= (Budgeted Rate × Std. Hours) – Actual Overhead
		= (₹ 15 x 4,800 units × 6 hours) – ₹ 4,70,000
		= ₹ 38,000 (A)
(iv)	Variable Overhead Cost Variance	= (Std. Rate × Std. Hours) – Actual Overhead
		= (4,800 units × 6 hours × ₹ 12) - ₹ 3,60,200
		= ₹ 3,45,600 - ₹ 3,60,200
		= ₹ 14,600 (A)

Question 20

LDR

Ahaan Limited operates a system of standard costing in respect of one of its products 'AH1' which is manufactured within a single cost centre. Details of standard per unit are as follows:

- **The standard material input is 20 kilograms at a standard price of ₹ 24 per kilogram.**
- **The standard wage rate is ₹ 72 per hour and 5 hours are allowed to produce one unit.**
- **Fixed production overhead is absorbed at the rate of 100% of wages cost.**

During the month of April 2022, the following was incurred:

- **Actual price paid for material purchased @ ₹ 22 per kilogram.**

- Total direct wages cost was ₹ 43,92,000
- Fixed production overhead cost incurred was ₹ 45,00,000

Analysis of variances was as follows:

Variances	Favourable	Adverse
Direct material price	₹ 4,80,000	-
Direct material usage	₹ 48,000	
Direct labour rate	-	₹ 69,120
Direct labour efficiency	₹ 33,120	-
Fixed production overhead expenditure		₹ 1,80,000

You are required to CALCULATE the following for the month of April, 2022

(i) Material cost variance
(ii) Budgeted output (in units)
(iii) Quantity of raw materials purchased (in kilograms)
(iv) Actual output (in units)
(v) Actual hours worked
(vi) Actual wage rate per labour hour
(vii) Labour cost variance
(viii) Production overhead cost variance *(RTP Nov'22)*

Answer 20

i. Direct Material Cost Variance

= Direct Material Price Variance + Direct Material Usage Variance

= ₹ 4,80,000 F + ₹ 48,000 F = ₹ 5,28,000 F

ii. Budgeted Output (units)

Fixed Production Overhead Expenditure Variance

= Budgeted Fixed Overhead - Actual Fixed Overheads

= Budgeted Output x Standard Overhead Rate - Actual Fixed Overheads

₹ 1,80,000 A = Budgeted Output x ₹ 360 (5 hrs @₹ 72) - ₹ 45,00,000

Budgeted Output = $\frac{₹45,00,000 - ₹1,80,000}{₹360}$ = **12,000 units**

iii. Quantity of Materials purchased (in kilograms)

Material Price Variance = Actual Usage (Standard Price per kg - Actual price per kg)

₹ 4,80,000 F = Actual Usage (₹ 24 - ₹ 22)

Actual usage in kgs = $\frac{₹4,80,000 - ₹1,80,000}{2}$ = 2,40,000 kgs

iv. Actual Output (units)

Actual Direct Wages	₹ 43,92,000
Direct labour rate variance	₹ 69,120 A
Direct labour efficiency variance	₹ 33,120 F
Standard labour cost for actual output	₹ 43,56,000

Actual Output = $\frac{\text{Standard labour cost for actual output}}{\text{Standard wage rate per unit}}$

= $\frac{₹4,3,56,000 - ₹1,80,000}{₹ 360\ (72 \times 5)}$ = 12,100 units

Alternatively, let X be the actual quantity of output

Then, Standard Quantity of input for actual output 'X'

20X	= SQ
Material cost variance	= (SQ x SP) - (AQ x AP)
₹ 5,28,000	= (20 X x ₹ 24) - (2,40,000 kgs x ₹ 22)
480X	= ₹ 52,80,000 + ₹ 5,28,000
480X	= ₹ 58,08,000
X	= $\frac{₹ 58,08,000}{480}$ = **12,100 units**

v. Actual hours worked

Labour Efficiency Variance	= Standard Labour Rate (Standard time for actual output - Actual time)

₹ 33,120 F	= ₹ 72 (5 hours x 12100 units - Actual time)
460 hours	= 60,500 hours - Actual time
Actual time	= 60,500 - 460 = 60,040 hours

vi. Actual wage rate per hour

Actual Wages paid	= ₹ 43,92,000
Actual hours worked	= 60,040 hours
Actual Wage rate per hour	$= \frac{₹\ 43,92,000}{60,040\ \text{hours}}$ = **₹ 73.15 per hour**

vii. Labour cost variance

= Labour rate variance + Labour efficiency variance
= ₹ 69,120 A + ₹ 33,120 F
= **₹ 36,000 A**

viii. Production Overhead Cost Variance

= Actual Output x Standard overhead rate - Actual Overheads Incurred
= 12,100 units x₹ 360 - ₹ 45,00,000
= ₹ 43,56,000 - ₹ 45,00,000
= ₹ 1,44,000 A

Question 21

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

	₹
Direct materials 10 kg @ ₹45 per kg	450
Direct labour 8 hours @ ₹50 per hour	400
Variable Overhead 8 hours @ ₹10 per hour	80
Fixed Overhead	200
	1,130

Budgeted output for the third quarter of a year was 10,000 Kg. Actual output is 9,000 Kg.
Actual cost for this quarter are as follows :

	₹
Direct Materials 8,900 Kg @ ₹46 per Kg.	4,09,400
Direct Labour 7,000 hours @ ₹52 per hour	3,64,000
Variable Overhead incurred	72,500
Fixed Overhead incurred	1,92,000
You are required to CALCULATE:	

(i) Material Usage Variance
(ii) Material Price Variance
(iii) Material Cost Variance
(iv) Labour Efficiency Variance
(v) Labour Rate Variance
(vi) Labour Cost Variance
(vii) Variable Overhead Cost Variance
(viii) Fixed Overhead Cost Variance
(MTP 8 Marks July'24)

Answer 21

(i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
= ₹ 45 (9,000 kgs. – 8,900 kgs.)
= ₹ 4,500 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 8,900 kgs. (₹ 45 – ₹ 46)
= ₹ 8,900 (Adverse)

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

= (9,000 kgs. × ₹ 45) – (8,900 kgs. × ₹ 46)
= ₹ 4,05,000 – ₹ 4,09,400
= ₹ 4,400 (Adverse)

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

$= ₹ 50 \left(\frac{9,000}{10} \times 8\ hours - 7,000\ hrs.\right)$

= ₹ 50 (7,200 hrs. – 7,000 hrs.)
= ₹ 10,000 (Favourable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 7,000 hrs. (₹ 50 – ₹ 52)
= ₹ 14,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost
= (SH × SR) – (AH × AR)
= (7,200 hrs. × ₹ 50) – (7,000 hrs. × ₹ 52)
= ₹ 3,60,000 – ₹ 3,64,000
= ₹ 4,000 (Adverse)

(vii) Variable Overhead Cost Variance = Std. Overhead for Actual Production – Actual Variable Overhead Cost
= (7,200 hrs. × ₹ 10) – ₹ 72,500
= ₹ 500 (Adverse)

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

$= \frac{₹ 200}{10\ kgs} \times 9,000$ kgs. - ₹ 1,92,000

= ₹ 1,80,000 – ₹ 1,92,000
= ₹ 12,000 (Adverse)

Question 22

Following standards have been set for manufacturing a product 'XYZ':

Direct Material:	(₹)
4 units of X @ ₹ 8 per unit	32.00
6 units of Y @ ₹ 6 per unit	36.00
30 units of Z @ ₹ 2 per unit	60.00
	128.00
Direct Labour:	
6 hrs @ ₹ 16 per hour	96.00
Total standard prime cost	224.00

The company actually manufactured and sold 12,000 units of the product 'XYZ' during the year.
Direct material costs were as follows:
50,000 units of X at ₹ 8.80 per unit
72,000 units of Y at ₹ 5.60 per unit
354,000 units of Z at ₹ 2.40 per unit
The company worked 70,000 direct labour hours during the year. For 10,000 of these hours, the company paid at ₹ 24 per hour while for the remaining, the wages were paid at standard rate.
You are required to CALCULATE the following:

(i) Material Price Variance
(ii) Material Usage Variance
(iii) Labour Rate Variance
(iv) Labour Efficiency Variance *(MTP 5 Marks Dec'24)*

Answer 22

For Material Cost Variances:

	SQ × SP	AQ × AP	AQ × SP
X	12,000 x 4 x ₹ 8 = ₹ 3,84,000	50,000 x ₹ 8.80 = ₹ 4,40,000	50,000 x ₹ 8 = ₹ 4,00,000
Y	12,000 x 6 x ₹ 6 = ₹ 4,32,000	72,000 x ₹ 5.60 = ₹ 4,03,200	72,000 x ₹ 6 = ₹ 4,32,000
Z	12,000 x 30 x ₹ 2 = ₹ 7,20,000	3,54,000 x ₹ 2.40 = ₹ 8,49,600	3,54,000 x ₹ 2 = ₹ 7,08,000

Total	₹ 15,36,000	₹ 16,92,800	₹ 15,40,000

Material Price Variance = Actual quantity (Std. price – Actual price)
= (AQ x SP) – (AQ x AP)
= ₹ 15,40,000 – ₹ 16,92,800
= ₹ 1,52,800 (A)

Material Usage Variance = Standard Price (Std. Quantity – Actual Quantity)
= (SP x SQ) – (SP x AQ)
= ₹ 15,36,000 – ₹ 15,40,000
= ₹ 4,000 (A)

For Labour Cost Variance:

	SH × SR	AH × AR	AH × SR
Labour	(12,000 x 6) x ₹16 = ₹ 11,52,000	10,000 x ₹ 24 = ₹ 2,40,000 60,000 x ₹ 16 = ₹ 9,60,000	70,000 x ₹ 16 = ₹ 11,20,000
Total	₹ 11,52,000	₹ 12,00,000	₹ 11,20,000

Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= (AH x SR) – (AH x AR)
= ₹ 11,20,000 – ₹ 12,00,000
= ₹ 80,000 (A)

Labour Efficiency Variance = Standard Rate (Std. Hours – Actual Hours)
= (SR x SH) – (SR x AH)
= ₹ 11,52,000 – ₹ 11,20,000
= ₹ 32,000 (F)

Question 23

(Includes concepts of Process Costing)

X Associates undertake to prepare income tax returns for individuals for a fee. They use the weighted average method and actual costs for the financial reporting purposes. However, for internal reporting, they use a standard costs system. The standards, based on equivalent performance, have been established as follows:

Labour per return	5 hrs. @ ₹ 40 per hour
Overhead per return	5 hrs. @ ₹ 20 per hour

For July 2023 performance, budgeted overhead is ₹98,000 for standard labour hours allowed. The following additional information pertains to the month of July 2023:

July 1	Return-in-process (25% complete)	200 No.
	Return started in July	825 Nos
July 31	Return-in-process (80% complete)	125 Nos
Cost Data:		
July 1	Return-in-process labour	₹ 12,000
	- Overheads	₹ 5,000
July 1 to 31	Labour : 4,000 hours	₹ 1,78,000
	Overheads	₹ 90,000

You are required to compute:

(i) For each element, equivalent units of performance and the actual cost per equivalent unit.

(ii) Actual cost of return-in-process on July 31.

(iii) The standard cost per return.

(iv) The labour rate and labour efficiency variance as well as overhead volume and overhead expenditure variance. *(MTP 10 Marks, Oct '23)*

Answer 23

(i) Statement Showing Cost Elements Equivalent Units of Performance and the Actual Cost Per Equivalent Unit

Detail of Returns	Detail of Input Units	Details	Equivalent Units				
			Output Units	Labour		Overheads	
				Units	%	Units	%

Returns in Process at Start	200	Returns Completed in July	900	900	100	900	100
Returns Started in July	825	Returns in Process at the end of July	125	100	80	100	80
	1,025		1,025	1,000		1,000	

Costs:	Labour (₹)	Overhead (₹)
From previous month	12,000	5,000
During the month	1,78,000	90,000
Total Cost	1,90,000	95,000
Cost per Equivalent Unit	190.00	95.00

(ii) Actual cost of returns in process on July 31:

	Numbers	Stage of Completion	Rate per Return (₹)	Total (₹)
Labour	125 returns	0.80	190.00	19,000
Overhead	125 returns	0.80	95.00	9,500
				28,500

(iii) Standard Cost per Return:

Labour	5 Hrs × ₹ 40 per hour	= ₹200
	5 Hrs × ₹ 20 per hour	= ₹100
		₹ 300

Budgeted volume for July	= ₹ 98,000 / 1000 = 980 Returns
Actual labour rate	= ₹ 178000 / 4000 = ₹44.50

(iv) Computation of Variances:

Statement Showing Output (July only) Element Wise	Labour	Overhead
Actual performance in July in terms of equivalent units as Calculated above	1,000	1,000
Less: Returns in process at the beginning of July in terms of equivalent units i.e. 25% of returns (200)	50	50
	950	950

Variance Analysis:

Labour Rate Variance

= Actual Time × (Standard Rate – Actual Rate)

= Standard Rate × Actual Time – Actual Rate × Actual Time

= ₹ 40 × 4,000 hrs. – ₹ 1,78,000 = ₹ 18,000(A)

Labour Efficiency Variance

= Standard Rate × (Standard Time – Actual Time)

= Standard Rate × Standard Time – Standard Rate × Actual Time

= ₹ 40 × (950 units × 5 hrs.) – ₹ 40 × 4,000 hrs.

= ₹ 30,000(F)

Overhead Expenditure or Budgeted Variance

= Budgeted Overhead – Actual Overhead

= ₹ 98,000 – ₹ 90,000

= ₹ 8,000(F)

Overhead Volume Variance

= Recovered/Absorbed Overhead – Budgeted Overhead

= 950 Units × 5 hrs. × ₹20 – ₹ 98,000 = ₹ 3,000(A)

Question 24

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 semiskilled workers. The weekly working hours are 40 hours per worker. Standard wage rate is the same for skilled and semi- skilled workers.
- The monthly fixed overheads are budgeted at ₹ 76,480 Overheads are evenly distributed throughout the month and assume 4 weeks in a month. In the last week of the month, the actual fixed overhead expenses were ₹ 19,500.

Required:

(i) Calculate the standard price per kg and the standard quantity of raw material.

(ii) Calculate the material usage variance, labour cost variance, and labour efficiency variance.

(iii) Calculate the fixed overhead cost variance, the fixed overhead expenditure variance and the fixed overhead volume variance.

Note: Indicate the nature of variance i.e Favourable or Adverse. *(PYP 10 Marks, May'23)*

Answer 24

(i) Calculation of Standard price per kg and the standard quantity of raw material:

(a) Standard Price

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

12,500 (F)	= (SP × AQ) – ₹ 3,12,500
12,500 (F)	= (SP × 25,000) – ₹ 3,12,500
SP	**= ₹ 13**

Standard Quantity

(b) Material Cost Variance = Standard Cost – Actual Cost

1,800 (A)	= SQ × ₹13 – ₹ 3,12,500
SQ	**= 23,900 kg.**

(ii) Calculation of Material Usage Variance, Labour Cost Variance and Labour Efficiency Variance

(a)	**Material Usage Variance**	=	Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity
		=	SQ × SP – AQ × SP
			Or
		=	SP × (SQ – AQ)
		=	₹ 13 × (23,900 kg. – 25,000 kg.)
		=	**₹ 14,300 (A)**
(b)	**Labour Cost Variance**	=	Standard Cost – Actual Cost
		=	(SH × SR) – (AH × AR)
		=	₹ 2,39,000 – ₹ 2,30,000
		=	**₹ 9,000 (F)**
(c)	**Labour Efficiency Variance**	=	Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time
		=	(SH × SR) – (AH × SR)
			Or
		=	(SH – AH) × SR
		=	₹ 50 × [4,780 hrs. – 5,000 hrs.]
		=	**₹ 11,000 (A)**

(iii) Calculation of Fixed Overhead Cost Variance, Fixed Overhead Expenditure Variance and Fixed Overhead Volume Variance:

(a)	**Fixed overhead cost variance**	=	Standard Fixed Overheads – Actual Fixed Overheads
		=	18,279 – 19,500
		=	**₹ 1,221(A)**
(b)	**Fixed Overhead Expenditure**	=	Budgeted Fixed Overheads – Actual Fixed Overheads
	Variance	=	₹ 19,120 – ₹ 19,500
		=	**₹ 380 (A)**
(c)	**Fixed overhead volume variance**	=	(Budgeted output – Actual Output) X Budgeted rate per unit

	=	(2,00,000 – 1,91,200) 0.0956
	=	₹ 8,800 x 0.0956
	=	**₹ 841 (A)**

Alternative presentation to part (iii) (a) and (b)

(i) Fixed Overhead Cost Variance:

= Overhead absorbed for actual production – Actual overhead incurred

= $\frac{19,120}{2,00,000}$ x 1,91,200 – 19,500 = **₹ 1,221(A)**

(ii) Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted overhead

= $\frac{19,120}{2,00,000}$ x 1,91,200 – 19,120 = **₹ 841(A)**

Working Notes:

1. Standard time to produce 10 units of product X is 15 minutes. Therefore, we can manufacture 40 units in an hour.

Hours available in a week

125 Workers x 40 Hours = 5,000 hours

Therefore, budgeted output = 5,000 x 40 units per hour = 2,00,000 units

Alternatively

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

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

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

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

2.

Labour									
Budget			Revised standard				Actual		
Hours	Rate	₹	Hours	Rate	₹		Hours	Rate	₹
5,000	50	2,50,000	4,780	50	2,39,000	Skilled	3000	50	1,50,000
						Semi-Skilled	2000	40	80,000
							5000		2,30,000

3.

	Budget	Actual
Units	2,00,000	1,91,200
Fixed Overheads	19,120	19,500

4. Standard Fixed overheads:

$\frac{19,120}{2,00,000}$ ×1,91,200 = ₹18,279

Budgeted rate per unit:

$\frac{19,120}{2,00,000}$ = ₹0.0956

EXAM INSIGHTS: This numerical question was based on Standard Costing to test the conceptual clarity of the examinees. Most of the examinees had just calculated the standard price per kg and standard quantity of raw material with material usage variance correctly but failed to calculate labour & fixed overhead variances. The overall performance of the examinees was below average.

Question 25

LDR

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

Direct Material 1 Meter @ ₹ 60 per meter	₹ 60
Direct Labour 2 hour @ ₹ 20 per hour	₹ 40

Variable overhead 2 hour @ ₹ 10 per hour	₹ 20
Total	₹ 120

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

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

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

You are required to CALCULATE the following Variances:

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

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

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

(RTP Nov'21) (Same concept different figures MTP 10 Marks Aug'18, SM)

Answer 25

(i) Material Variances

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

Material Cost Variance	**= (SQ × SP – AQ × AP)**
= 6,00,000 – 6,61,200	= ₹ 61,200 (A)
Material Price Variance	**= (SP – AP) AQ**
= (60 - 58) 11,400	= ₹ 22,800 (F)
Material Usage Variance	**= (SQ – AQ) SP**
= (10,000 – 11,400) 60	= ₹ 84,000 (A)

(ii) Variable Overheads Variances

Variable overhead cost Variance

= Standard variable overhead – Actual Variable Overhead

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

Variable overhead Efficiency Variance

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

Let Actual Hours be 'X', then:

(20,000 – X) × 10	= 4,000 (A)
2,00,000 – 10X	= - 4,000
X	= 2,04,000 ÷ 10
Therefore, Actual Hours (X)	= 20,400

Variable overhead Expenditure Variance

= Variable Overhead at Actual Hours - Actual Variable Overheads

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

(ii) Labour variances

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

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

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

= 4,00,000 – 4,48,800 = ₹ 48,800 (A)

Labour Rate Variance = (SR – AR) × AH

= (20 – 22) × 20,400 = ₹ 40,800 (A)

Labour Efficiency Variance = (SH – AH) × SR

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

Question 26

BG company produces a standard product and sold in a packet of 10 kg. The standard cost card per pack is as follows:

Direct Material:

A - 4 kg @ ₹ 50 per kg

B - 8 kg @ ₹ 40 per kg

Direct Labour:

6 hours @ ₹ 20 per hour

The company manufactured and sold 1,600 packets during the month. Actual data for material and labour recorded as under.

Direct Material:

A - 7,000 kg @ ₹ 40 B - 12,500 kg @ ₹ 45

Labour hours paid for two different categories of workers:

Skilled 6,000 hours @ ₹ 25

Semi-skilled 4,000 hours @ ₹ 20

5% of the time paid was lost due to an abnormal reason.

Calculate the following variances indicating their nature (Favourable or Adverse):

(i) Material cost variances
(ii) Material price variances
(iii) Material usage variances
(iv) Material mix variances
(v) Material yield variances
(vi) Labour cost variances
(vii) Labour rate variances
(viii) Labour efficiency variances
(ix) Labour Idle time variances *(PYP 9 Marks Sep'24)*

Answer 26

	Budget			Actual		
	Qty. (Kg.) [SQ]	Price (₹) [SP]	Amount (₹)[SQ x SP]	Qty. (Kg.) [AQ]	Price (₹) [AP]	Amount (₹)[AQ x AP]
A	6,400	50	3,20,000	7,000	40	2,80,000
B	12,800	40	5,12,000	12,500	45	5,62,500
	19,200		**8,32,000**	**19,500**		**8,42,500**

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

= ₹8,32,000 – ₹8,42,500 = ₹ **10,500 (A)**

Material Price Variance = (SP – AP) x AQ

A (₹50 – ₹40) × 7,000 Kg = ₹ **70,000 (F)**

B (₹40 – ₹45) × 12,500 Kg = ₹ **62,500 (A)**

₹ 7,500 (F)

Material Usage Variance = SP x (SQ – AQ)

A ₹50 × (6,400 Kg – 7000 Kg) = ₹ **30,000 (A)**

B ₹40 × (12,800 Kg – 12,500 Kg) = ₹ **12,000 (F)**

₹ 18,000 (A)

Material Mix Variance = (RSQ - AQ) X SP

A = (6,500 Kg – 7,000 Kg) x ₹50 = ₹ **25,000 (A)**

B = (13,000 Kg – 12,500 Kg) x ₹40 = ₹ **20,000 (F)**

₹ 5,000 (A)

Material Yield Variance = (SQ – RSQ) X SP

A = (6,400 Kg – 6,500 Kg) x ₹50 = ₹ **5,000 (A)**

B = (12,800 Kg – 13,000 Kg) x ₹40 = ₹ **8,000 (A)**

₹ 13,000 (A)

Labour

Standard Hours for actual Production = 6 Hours X 1,600 Units = 9,600 Hours

Labour Cost Variance = (SH X SR – AH X AR)
= 9,600 hrs x ₹20 – {(6,000 hrs x ₹25) + (4,000 hrs x ₹20)}
= ₹1,92,000 – ₹2,30,000 = ₹ **38,000 (A)**

Labour Rate Variance = (SR – AR) X AH
= (₹20 -₹25) x 6,000 hrs = ₹ **30,000 (A)**

Efficiency Variance = (SH – AH worked) x SR
= (9,600 hrs – 9,500 hrs) x ₹20 = ₹ **2,000 (F)**

Idle time Variance = Idle Hours X SR
= (AH – AH#) × SR
= (10,000 hours – 9,500 hours) x ₹20 = ₹ **10,000 (A)**

AH# refers to Actual Hours Worked

Multiple Choice Questions (MCQ)

1. **Which of the following variance arises when more than one material is used in the manufacture of a product:** ***(SM)***
   (a) Material price variance
   (b) Material usage variance
   (c) Material yield variance
   (d) Material mix variance

Ans: (d)

2. **Idle time variance is obtained by multiplying:** ***(SM)***
   (a) The difference between standard and actual hours by the actual rate of labour per hour
   (b) The difference between actual labour hours paid and actual labour hours worked by the standard rate
   (c) The difference between standard and actual hours by the standard rate of labour per hour
   (d) None of the above.

Ans: (b)

3. **Overhead cost variances is:** ***(SM)***
   (a) The difference between overheads recovered on actual output - actual overhead incurred.
   (b) The difference between budgeted overhead cost and actual overhead cost.
   (c) Obtained by multiplying standard overhead absorption rate with the difference between standard hours for actual output and actual hours worked.
   (d) None of the above

Ans: (a)

4. **Under standard cost system the cost of the product determined at the beginning of production is its** ***(SM)***
   (a) Direct cost
   (b) Pre-determined cost
   (c) Historical cost
   (d) Actual cost

Ans: (b)

5. **The deviations between actual and standard cost is known as:** ***(SM)***
   (a) Multiple analysis
   (b) Variable cost analysis
   (c) Variance analysis
   (d) Linear trend analysis

Ans: (c)

6. **The standard which is attainable under favourable conditions is:** ***(SM)***
   (a) Theoretical standard
   (b) Expected standard
   (c) Normal standard
   (d) Basic standard

Ans: (a)

7. **The Standard most suitable from cost control point of view is:** ***(SM)***
   (a) Normal standard
   (b) Theoretical standard
   (c) Expected standard
   (d) Basic standard

Ans: (c)

8. **Controllable variances are best disposed-off by transferring to:** ***(SM)***
   (a) Cost of goods sold
   (b) Cost of goods sold and inventories
   (c) Inventories of work–in–progress and finished goods
   (d) Costing profit and loss account

Ans: (d)

9. **Basic standards are:** ***(SM)***
   (a) Those standards, which require high degree of efficiency and performance.
   (b) Average standards and are useful in long term planning.
   (c) Standards, which can be attained or achieved
   (d) Assuming to remain unchanged for a long time.

Ans: (d)

10. **A furniture company uses premium wood for sofa. Standard quantity of premium wood per sofa is 5 sq. ft. Standard price per sq. ft. of premium wood is ₹ 10. Actual production of sofa is 1,000. Premium wood actually used is 5,300 sq. ft. Actual purchase price of premium wood per sq. ft. is ₹ 10. What is material cost variance?** ***(MTP 2 Marks July'24)***
   (a) ₹ 3,000 (A)
   (b) ₹ 4,300 (A)
   (c) ₹ 7,300 (A)
   (d) ₹ 5,300 (F)

Ans: (a)

11. **If standard hours for 100 units of output are 400 @ ₹ 2 per hour and actual hours taken are 380 @ ₹ 2.25 per hour, then the labour rate variance is:** ***(SM)***
   (a) ₹ 95 (adverse)
   (b) ₹ 100 (adverse)
   (c) ₹ 25 (favourable)
   (d) ₹ 120 (adverse)

Ans: (a)

12. **The wages budget for the last period was based on a standard repair time of 30 minutes per unit and a standard wage rate of ₹ 50 per hour. The actual data for the last period are as follows:**
   Number of units = 30,000
   Labour rate variance = 7,500 (A)
   Labour efficiency variance = Nil
   From the information find out the actual rate of wages per unit ***(MTP 2 Marks, Mar'24)***
   (a) ₹ 50
   (b) ₹ 25.50
   (c) ₹ 50.50
   (d) ₹ 25.25

Ans: (d)

CHAPTER 14: MARGINAL COSTING

CONCEPTS OF THIS CHAPTER

- Meaning and characteristics of Marginal Costing.
- Meaning of CVP Analysis and its use in short-term decisions.
- Application of Break-even point, Margin of safety, and Angle of incidence.
- Calculation of various formulae in CVP analysis.
- Apply marginal costing and CVP in short-term decisions.
- Difference between Marginal Costing and Absorption Costing.

LDR Questions
Q 28
Q 33
Q 35

QUICK REVIEW OF IMPORTANT CONCEPTS

I. Computation of Contribution and Profit under Marginal Costing

For the determination of cost of a product/ service under marginal costing, costs are classified under variable and fixed. All the variable costs are part of product and fixed costs are charged against contribution margin.

Cost and Profit Statement under Marginal Costing

	Amount(Rs)	Amount(Rs)
Revenue		xxx
Product Cost:		
- Direct Materials	xxx	
- Direct employee (Labour)	xxx	
- Direct expenses	xxx	
- Variable manufacturing overheads	xxx	
Product (Inventoriable) Costs	**xxx**	**(xxx)**
Product Contribution Margin		xxx
- Variable Administration overheads	xxx	
- Variable Selling & Distribution overheads	xxx	(xxx)
Contribution Margin		**xxx**
Period Cost:		
Fixed Manufacturing expenses	xxx	
Fixed non-manufacturing expenses	xxx	(xxx)
Profit/ (loss)		xxx

II. Profit Volume Ratio or P/V ratio

This ratio shows the proportion of sales required to cover fixed cost and profit. P/V ratio is calculated as below:

(a) $\text{P/V Ratio} = \frac{\text{Contribution}}{\text{sale}} \times 100$

(b) When two years' data is given, $\text{P/V Ratio} = \frac{\text{Change in Contribution/Profit}}{\text{Change in sales}} \times 100$

III. Break-Even Analysis

Break-even analysis is a generally used method to study the CVP analysis. is technique can be explained in two ways.

(i) In narrow sense it is concerned with computing the break-even point.

(ii) In broad sense this technique is used to determine Short term profit planning Policy Proper recovery of Overheads the possible profit/loss at any given level of production or sales.

Break even		
• Break-even Point	• Cash Break-even point	• Multi-Product Break-even Analysis
= Fixed Cost /Contribution per unit	= Cash Fixed Cost / Contribution per unit	The contribution is calculated by taking weights (sales quantity/ value) for the products

IV. Variations of Basic Marginal Cost Equation and the Formula

i.	Sales – Variable cost = Fixed cost + Profit / Loss
	By multiplying and dividing L.H.S. by S
ii.	$\frac{s(s-v)}{s} = F+P$
iii.	S x P/V Ratio = F + P or Contribution (P / V Ratio = $\frac{s-v}{s}$ x 100)
iv.	BES x P/V Ratio = F (∵ at BEP Profit is zero)
v.	BES = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}}$
vi.	P/V Ratio = $\frac{\text{Fixed Cost}}{\text{BES}}$
vii	S × P/V Ratio = Contribution (Refer to iii)
viii.	P/V Ratio = $\frac{\text{Contribution}}{\text{Sale}}$ x 100
ix.	(BES + MS) × P/V Ratio = Contribution (Total sales = BES + MS)
x.	(BES × P/V Ratio) + (MS × P/V Ratio) = F + P
	By deducting (BES × P/V Ratio) from L.H.S. and F from R.H.S. in (x) above, we get:
xi.	M.S. × P/V Ratio = P
xii.	P/V Ratio = $\frac{\text{Change in profit}}{\text{Change in sales}}$ x 100
xiii.	P/V Ratio = $\frac{\text{Change in contribution}}{\text{Change in sales}}$ x 100
xiv.	Profitability = $\frac{\text{contribution}}{\text{Key factor}}$
xv.	Margin of Safety = Total Sales – BES or $\frac{\text{Profit}}{\text{P/V Ratio}}$
xvi.	BES = Total Sales – MS
xvii.	Margin of Safety Ratio = $\frac{\text{Total sales - BES}}{\text{Total Sales}}$

Questions & Answers

Question 1

What is Margin of Safety? What does a large Margin of Safety indicates? How can you calculate Margin of Safety? *(PYP 5 Marks, Jul'21)*

Answer 1

Margin of Safety: The margin of safety can be defined as the difference between the expected level of sale and the breakeven sales.

The larger the margin of safety, the higher is the chances of making profits.

The Margin of Safety can be **calculated by** identifying the difference between the projected sales and breakeven sales in units multiplied by the contribution per unit. This is possible because, at the breakeven point all the fixed costs are recovered and any further contribution goes into the making of profits.

Margin of Safety = (Projected sales – Breakeven sales) in units x contribution per unit

It also can be calculated as:

$$\text{Margin of Safety} = \frac{\text{Profit}}{\frac{\text{P}}{\text{V}}\text{Ratio}}$$

Exam Insights: Examinees were required to explain margin of safety. Performance of the examinees was above average.

Question 2

DISCUSS basic assumptions of Cost Volume Profit analysis.*(MTP 5 Marks, Apr'21, SM, MTP 4 Marks Apr'24)*

Answer 2

Assumptions of Cost Volume Profit analysis:

1. **Changes in the levels of revenues and costs arise only because of changes in the number of product (or service) units produced and sold –** for example, the number of television sets produced and sold by Sony Corporation or the number of packages delivered by Overnight Express. The number of output units is the only revenue driver and the only cost driver. Just as a cost driver is any factor that affects costs, a revenue driver is a variable, such as volume, that causally affects revenues.
2. **Total costs can be separated into two components**; a fixed component that does not vary with output level and a variable component that changes with respect to output level. Furthermore, variable costs include both direct variable costs and indirect variable cos ts of a product. Similarly, fixed costs include both direct fixed costs and indirect fixed costs of a product
3. When represented graphically, **the behaviours of total revenues and total costs are linear (**meaning they can be represented as a straight line) in relation to output level within a relevant range (and time period).
4. Selling price, variable cost per unit, and total fixed costs (within a relevant range and time period) are known and constant.
5. The analysis either covers a single product or assumes that **the proportion of different products when multiple products are sold will remain constant** as the level of total units sold changes.
6. All revenues and costs can be added, subtracted, and compared **without taking into account the time value of money.**

Question 3

A factory can produce 1,80,000 units per annum at its 60% capacity. The estimated costs of production are as under:

Direct material	**₹ 50 per unit**
Direct employee cost	**₹ 16 per unit**
Indirect expenses:	
- Fixed	**₹ 32,50,000 per annum**
- Variable	**₹ 10 per unit**
- Semi-variable	**₹ 40,000 per month up to 50% capacity and ₹ 15,000 for every 20% increase in the capacity or part thereof.**

If production program of the factory is as indicated below and the management desires to ensure a profit of ₹10,00,000 for the year, DETERMINE the average selling price at which each unit should be quoted:
First three months of the year- 50% of capacity;
Remaining nine months of the year- 75% of capacity. ***(MTP 5 Marks, Nov'21)***

Answer 3

Statement of Cost

	First three months (₹)	Remaining nine months (₹)	Total (₹)
	37,500 units	**1,68,750 units**	**2,06,250 units**
Direct material	18,75,000	84,37,500	1,03,12,500
Direct employee cost	6,00,000	27,00,000	33,00,000
Indirect- variable expenses	3,75,000	16,87,500	20,62,500
Indirect – fixed expenses	8,12,500	24,37,500	32,50,000
Indirect- semi-variable expenses			
- For first three months @ ₹ 40,000 p.m.	1,20,000		1,20,000
- For remaining nine months @ ₹ 70,000* p.m.		6,30,000	6,30,000
Total cost	37,82,500	1,58,92,500	1,96,75,000
Desired profit	-	-	10,00,000
Sales value	-	-	2,06,75,000
Average selling price per unit			100.24

* ₹ 40,000 for 50% capacity + ₹ 15,000 for 20% increase in capacity + ₹ 15,000 for 5% increase in capacity (because cost is increased for every 20% increase in capacity or part thereof)

Question 4

Answer the following:
A company makes 1,500 units of a product for which the profitability statement is given below:

	(₹)
Sales	**1,20,000**
Direct Materials	**30,000**
Direct Labour	**35,000**
Variable Overheads	**15,000**
Fixed Cost	**16,800**
Profit	**22,200**

After the first 500 units of production, the company has to pay a premium of ₹ 5 per unit towards overtime labour. The premium so paid has been included in the direct labour cost of ₹ 35,000 given above.
You are required to COMPUTE the Break-even point. ***(MTP 5 Marks, Oct'22)***

Answer 4

Data / Unit	**1 – 500 (Rs.)**	**501 – 1,500 (Rs.)**
Sales (Rs.1,20,000 / 1,500 units)	80	80
Direct Material (Rs.30,000 / 1,500 units)	20	20
Direct Labour*	20	25
Variable Overheads (Rs.15,000 / 1,500 units)	10	10
Contribution	30	25

Contribution at 500 units	=	Rs. 15,000
Fixed Cost	=	Rs. 16,800
Shortfall	=	Rs. 1,800
No. of units to recover shortfall	=	72 units (Rs. 1,800 / Rs.25)

Break Even Point = 572 units (500 units + 72 units)

(*)

Let X be the Direct Labour per unit up to 500 units. Total Direct Labour-

$$500X + 1,000 \times (X + 5) = 35,000$$
$$1,500X + 5,000 = 35,000$$
$$X = 20$$

Therefore, up to 500 units the Direct Labour is Rs. 20. After 500 units it is Rs. 25.

Question 5

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. ***(PYP 5 Marks, Jan'21)***

Answer 5

Contribution to sales ratio (P/V ratio)	= 37%
Variable cost ratio	= 100% - 37% = 63%
Variable cost	= ₹ 10,00,000 x 63% = ₹ 6,30,000
After decrease in selling price and fixed cost, sales quantity has not changed. Thus, variable cost is ₹ 6,30,000.	
Revised Contribution to sales	= 30%
Thus, Variable cost ratio	= 100% - 30% = 70%
Thus, Revised sales	=Rs. 6,30,000 / 70% = Rs. 9,00,000
Revised, Break-even sales ratio	= 100% - 40% (revised Margin of safety) = 60%
(i) Revised fixed cost	= revised breakeven sales x revised contribution to sales ratio
	= ₹ 5,40,000 (₹ 9,00,000 x 60%) x 30%
	= ₹ 1,62,000
(ii) Revised sales	= ₹ 9,00,000 (as calculated above)
(iii) Revised Break-even point	= Revised sales x Revised break-even sales ratio
	= ₹ 9,00,000 x 60%
	= ₹ 5,40,000

Question 6

PQ Ltd. sells bottles and currently is trying to find out the profitability of opening another store which will have the following expenses and revenues:

	Amount per piece (₹)
Selling Price	600
Variable costs:	
Material cost	410
Salesmen's commission	60
Total variable cost	470
Annual fixed expenses are:	(₹)
- Rent	6,00,000
- Office and administrative expenses	20,00,000
- Advertising	8,00,000
- Other fixed expenses	2,00,000

Calculate the annual break-even point in units and in value. Also determine the profit or loss if 35,000 units of bottles are sold. ***(MTP 4 Marks, Mar'24)***

Answer 6

Total Fixed Cost = ₹ 6,00,000 + ₹20,00,000 + ₹8,00,000 + ₹ 2,00,000 = ₹ 36,00,000

Contribution per unit = ₹600 - ₹470 = ₹130

$$\text{P/V Ratio} = \frac{\text{Contribution per unit}}{\text{Selling Price}} \times 100 = \frac{130}{600} \times 100 = 21.67\ \%$$

$$\text{Break-even Point} = \frac{\text{Total Fixed Cost}}{\text{Contribution per unit}}$$

$$= \frac{36,00,000}{130} = 27,692.31 \text{ or } 27,693 \text{ units}$$

$$\text{Break-even Sales} = \frac{\text{Total Fixed Cost}}{\text{P/V Ratio}} = \frac{36,00,000}{21.67\ \%} = ₹1,66,12,829$$

Calculation of Profit/ (loss):

Total Contribution (₹130 × 35,000 units)	= ₹45,50,000
Less: Fixed Cost	= ₹36,00,000
Profit	= ₹ 9,50,000

Question 7

T Ltd., produces and sells 95,000 units of 'X' in a year at its 80% production capacity. The selling price of product is ₹ 8 per unit. The variable cost is 75% of sales price per unit. The fixed cost is ₹ 3,50,000. The company is continuously incurring losses and management plans to shut -down the plant. The fixed cost is expected to be reduced to ₹ 1,30,000. Additional costs of plant shut- down are expected at ₹ 15,000. Should the plant be shut-down? Find the shut-down point in units and also in percentage of capacity level of production. ***(MTP 5 Marks, Oct'23) (Same Concept but Different Figures of PYP 5 Marks Nov'23)***

Answer 7

Statement Showing "Operating Loss"

	If Plant is Continued	If Plant is Shutdown
Sales	7,60,000	---
Less: Variable Cost	5,70,000	---
Contribution	1,90,000	---
Less: Fixed Cost	3,50,000	1,30,000
Less: Additional Cost	---	15,000
Operating Loss	1,60,000	1,45,000

Decision on Shut Down

A comparison of loss figures (indicated as above) points out that loss is reduced by **₹ 15,000** (₹ 1,60,000 - ₹ 1,45,000) if plant is shut down.

→ Accordingly, plant should be Shut Down.

$$\textbf{Shut Down Point} = \frac{\text{Rs.3,50,000} - \text{Rs.1,45,000}}{\text{Rs.8} - \text{Rs.6}} = 1,02,500 \text{ units}$$

Capacity Level at Shut Down Point (%)

At 100% Level – Production Capacity

$$= 1,18,750 \left(\frac{95,000 \text{ Units}}{0.80}\right)$$

Capacity Level at Shut Down Point

$$= 86.32\% \left(\frac{1,02,500 \text{ Units}}{1,18,750 \text{ Units}}\right)$$

Exam insights: Question on Marginal costing requiring commenting on whether the Noida plant should be shut down under the given scenario and to calculate shut down point in units. Most of the examinees failed to consider all the relevant costs for the decision and could not arrive at the decision correctly. The shut down point also could not be calculated correctly. Overa performance was poor.

Question 8

LR Ltd. is considering two alternative methods to manufacture a new product it intends to market. The two methods have a maximum output of 50,000 units each and produce identical items with a selling price of ₹ 25 each. The costs are:

	Method-1 Semi-Automatic (₹)	Method-2 Fully-Automatic (₹)
Variable cost per unit	15	10
Fixed costs	1,00,000	3,00,000

You are required to calculate:

(1) Cost Indifference Point in units. Interpret your results.

(2) The Break-even Point of each method in terms of units. ***(PYP 5 Marks, Jul'21)***

Answer 8

(i) Cost Indifference Point

	Method-1 and Method-2 (₹)
Differential Fixed Cost (I)	₹ 2,00,000 (₹ 3,00,000 – ₹ 1,00,000)
Differential Variable Costs (II)	₹ 5 (₹ 15 – ₹ 10)
Cost Indifference Point (I/II) (Differential Fixed Cost / Differential Variable Costs per unit)	**40,000**

Interpretation of Results

At activity level below the indifference points, the alternative **with lower fixed costs and higher variable costs should be used.** At activity level above the indifference point, alternative with **higher fixed costs and lower variable costs should be used.**

No. of Product	Alternative to be Chosen
Product ≤ 40,000 units	Method-1, Semi-Automatic
Product ≥ 40,000 units	Method-2, Automatic

(ii) Break Even point (in units)

	Method-1	Method-2
BEP (in units) = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$	1,00,000 / (25-15)= 10,000	3,00,000 / (25-15) = 20,000

Exam insights: This practical problem was based on Marginal Costing which required calculation of cost indifference point between two methods and interpretation of the result. Question also required calculation of BEP under both methods. Most of the examinees failed to interpret the cost indifference point. Performance of the examinees was average.

Question 9

Following data is available from the costing department of Aarya Ltd. which manufactures and markets a single product:

Material	Rs. 32 per unit	Fixed Cost (Rs.)	Rs. 10,00,000
Conversion Cost (Variable)	Rs. 24 per unit	Present Sales (units)	90,000
Dealer's Margin (10% of Sales)	Rs. 8 per unit	Capacity Utilization	60 %
Selling Price	Rs. 80 per unit		

There is acute competition in the market, thus extra efforts are necessary to enhance the sales. For this, following suggestions have been proposed:

(i) Reducing the sales price by 5 per cent.

(ii) Increasing the dealer's margin by 20 per cent over the existing rate.

Which of these two suggestions would you RECOMMEND, if the company desires to maintain the present profit? GIVE REASONS. ***(MTP 10 Marks, Apr'21)***

Answer 9

Workings:

Statement Showing Profit on Sale of 90,000 units

	(Rs.)	(Rs.)
Selling Price per unit		80
Less: Variable Cost per unit		
Material	32	
Conversion Cost	24	
Dealers' Margin	8	64
Contribution per unit		16
Total Contribution (90,000 units × Rs. 16)		14,40,000
Less: Fixed Cost		10,00,000
Profit		4,40,000

In both the proposed suggestions, the fixed costs remain unchanged. Therefore, the present profit of Rs. 4,40,000 can be maintained by maintaining the total contribution at the present level i.e. Rs. 14,40,000.

(i)	**Reducing Selling Price by 5%**	
	New Selling Price (Rs. 80 – 5% of Rs. 80)	= Rs. 76
	New Dealer's Margin (10% of Rs. 76)	= Rs. 7.60
	New Variable Cost (Rs. 32 + Rs. 24 + Rs. 7.60)	= Rs. 63.60
	New Contribution per unit (Rs. 76 – Rs. 63.60)	= Rs. 12.40
	Level of sales required for present level of Profits	$= \frac{\text{Total Contribution Required}}{\text{New Contribution per unit}}$
		$= \frac{\text{Rs.14,40,000}}{\text{Rs.12.40}}$
		= 1,16,129 units
(ii)	**Increasing Dealer's Margin by 20%**	
	New Dealer's Margin after increasing it by 20%	= Rs. 8 + (20% of Rs. 8)
		= Rs. 9.60
	New Variable Cost (Rs. 32 + Rs. 24 + Rs. 9.60)	= Rs. 65.60
	Contribution (Rs. 80 – Rs. 65.60)	= Rs. 14.40
	Level of sales required for present level of Profits	$= \frac{\text{Total Contribution Required}}{\text{New Contribution per unit}}$
		$= \frac{\text{Rs.14,40,000}}{\text{Rs.14.40}}$
		= 1,00,000 units

Conclusion:

The second proposal, i.e., increasing the Dealer's Margin is recommended because:

1. The contribution per unit is higher which is Rs. 14.40 in comparison to Rs. 12.40 in the first proposal; and
2. The sales (in units) required to earn the same level of profit are lower. They are at 1,00,000 units as against 1,16,129 units in the first proposal. This means a lower sales effort and less finance would be required for implementing proposal (ii) as against proposal (i). Of course, under proposal (ii) the company can earn higher profits than at present level if it can increase its sales beyond 1,00,000 units.

Question 10

At budget activity of 80% of total capacity, a company earns a P/V ratio of 30% and a profit of 15% of total sales. Due to covid pandemic resulting in poor demand, the company has to reduce its selling price by 10%. The company was able to achieve a production and sales volume for the year equivalent to 50% of total capacity. The sales value at this level was ₹ 27,00,000 at a reduced price of ₹ 18 per unit. Due to reduction in production, the actual variable cost went up by 5% of the budget.

You are required to:

(i) PREPARE statement of profitability at budget and actual activity.

(ii) FIND P/V ratio and BES (in ₹ and unit of the actual sales activity). ***(MTP 10 Marks, Mar'22)***

Answer 10

Actual Sales	₹ 27,00,000
Actual Selling Price per unit	18
Actual units (50%) $(\frac{27,00,000}{18})$	1,50,000
Therefore, budgeted units (80%) (1,50,000 X $\frac{80}{50}$)	2,40,000
Budgeted Selling Price (18 / 90%)	20

Budgeted Variable Cost per unit = $\frac{(2,40,000X20)(1-.30)}{2,40,000 \text{ units}} = \frac{33,60,000}{2,40,000 \text{ units}}$ = Rs. 14

(i) Statement of profitability at budget and actual activity

Particulars		Budget (80%)	Actual (50%)
Units		2,40,000	1,50,000
Sales (₹)	(a)	48,00,000	27,00,000
Variable cost (₹)	(b)	33,60,000	22,05,000
Contribution (₹) (c = a - b)		14,40,000	4,95,000
Fixed cost (₹)	(d)	7,20,000	7,20,000
Profit (₹)	(e = c – d)	7,20,000	(2,25,000)

(ii) Calculation of P/V ratio and BES

P/V ratio	$= \frac{\text{Contribution}}{\text{Sales}} \times 100$	
	$= \frac{4,95,000}{27,00,000} \times 100$	= 18.33%
Break Even Sales (in Rs.)	$= \frac{Fixed\ Cost}{\frac{P}{V}\ Ratio}$	
	$= \frac{7,20,000}{18.33\%}$	= Rs. 39,27,987
Break Even Sales (In Units)	$= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$	
	$= \frac{7,20,000}{3.3*}$	= 2,18,182 Units
*Contribution per unit	$= \frac{4,95,000}{1,50,,000 \text{ units}}$	= 3.3 per unit

Question 11

Company manufacture and sell 3 types of mobile handset. It also manufactures wireless charger for mobile. The company has worked out following estimates for next year.

	Annual Demand (in units)	Selling Price (₹ per unit)	Material cost (₹ per unit)	Labour cost (₹ per unit)
X5	5,000	8,000	2,000	1,000
X6	4,000	9,000	2,500	1,500
X7	3,000	12,000	3,000	2,000
Wireless Charger	15,000	1,500	300	200

To encourage the sale of wireless charger a discount of 10% in its price is being offered if it were to be purchased along with mobile. It is expected that customer buying mobile will also buy the wireless charger. The company factory has an effective capacity of 35,000 labour hours. The labour is paid @ ₹ 500 per hour. Overtime of labour has to be paid at double the normal rate. Other variable cost work out to be 50% of direct labour cost and fixed cost is ₹ 1,00,00,000. There will be no inventory at the end of the year.

PREPARE statement of profitability. ***(MTP 10 Marks, Apr'22)***

Answer 11

Calculation of Labour overtime hours		
Total hours required for production		
X5	(5,000 x 2 hrs)	10,000
X6	(4,000 x 3 hrs)	12,000
X7	(3,000 x 4 hrs)	12,000
Wireless Charger	(15,000 x 0.40 hrs)	6,000
		40,000
Hours available		(35,000)
Overtime		5,000

Statement of Profitability

Particulars	**Amount (₹)**	**Amount (₹)**
Sales		
X5 (5,000 x 8,000)	4,00,00,000	
X6 (4,000 x 9,000)	3,60,00,000	
X7 (3,000 x 12,000)	3,60,00,000	
Wireless Charger [(12,000 x 1,350) + (3,000 x 1,500)	2,07,00,000	**13,27,00,000**
Less: Variable cost		
Material:		
X5 (5,000 x 2,000)		
X6 (4,000 x 2,500)		
X7 (3,000 x 3,000)		
Wireless Charger (15,000 x 300)	3,35,00,000	
Labour:		
X5 (5,000 x 1,000)		
X6 (4,000 x 1,500)		
X7 (3,000 x 2,000)		
Wireless Charger (15,000 x 200)		
Overtime (5,000 x 1,000)	2,50,00,000	
Other variable overheads	1,25,00,000	7,10,00,000
Contribution		**6,17,00,000**
Less: Fixed Cost		1,00,00,000
Profit		**5,17,00,000**

Question 12

LNP Ltd. and MNT Ltd. are engaged in manufacturing of identical products. Existing revenue and cost data is as follows:

	LNP Ltd. (₹)	MNT Ltd. (₹)
Sales	13,60,000	17,00,000
Variable Cost	10,88,000	10,20,000
Fixed Cost	1,72,000	5,80,000

You are required to calculate:

(i) Break-even point (in Value) for each company

Sales at which each company will earn a profit of ₹ 5,00,000

Sales at which both companies will have same profits. ***(MTP 10 Marks, Mar '23)***

Answer 12

Income Statement

	LNP Ltd. (₹)	MNT Ltd. (₹)
Sales (Rs.)	13,60,000	17,00,000
Less: Variable Cost	10,88,000	10,20,000
Contribution	2,72,000	6,80,000
P.V. Ratio $(\frac{\text{Contribution}}{\text{Sales}} X\ 100)$	20%	40%
Fixed Cost (₹)	1,72,000	5,80,000
Profit (₹)	1,00,000	1,00,000

(i)	Break even point	$= \frac{\text{Fixed Cost}}{\text{P.V.Ratio}}$
	LNP Ltd.	$= \frac{Rs.1,72,000}{20\%}$ = Rs. 8,60,000
	MNT Ltd.	$= \frac{Rs.5,80,000}{40\%}$ = Rs. 14,50,000
(ii)	Sales value to earn a profit of ₹ 5,00,000	
	Sales	$= \frac{\text{Fixed Cost+Desired Profit}}{\text{P.V.Ratio}}$
	LNP Ltd.	$= \frac{1,72,000+5,00,000}{40\%}$ = Rs. 33,60,000
	MNT Ltd.	$= \frac{5,80,000+5,00,000}{40\%}$ = Rs. 27,00,000

(iii)	Sales value at which both companies will earn same profit
	Let S = Sales value and P = Profit
	Sales – Variable cost = Fixed cost + Profit
	or, Contribution = Fixed cost + Profit
	LNP Ltd.:
	20% S = ₹1,72,000 + P
	or, 0.20S = ₹1,72,000 + P ..... (i)
	MNT Ltd.
	40% S = ₹5,80,000 + P
	or, 0.40S = ₹5,80,000 + P ..... (ii)
	By solving these equations, we will get the value of 'S' and 'P'
	0.20S = 1,72,000 + P
	0.40S = 5,80,000 + P
	- - -
	- 0.20S = -4,08,000
	or, S = ₹ 20,40,000
	Putting the value of 'S' in equation no. (i) we will get the value of 'P'
	0.20 × 20,40,000 = 1,72,000 + P
	or, P = ₹2,36,000

Therefore, at Sale value of ₹20,40,000 both the companies will earn same profit of ₹ 2,36,000

Question 13

The following figures are related to KG Limited for the year ending 31st March, 2023:
Sales - 48,000 units @ ₹ 400 per unit;
P/V Ratio 25% and Break-even Point 50% of sales.
You are required to CALCULATE:
(i) Fixed cost for the year
(ii) Profit earned for the year

(iii) Units to be sold to earn a target net profit of ₹ 22,00,000 for a year.

(iv) Number of units to be sold to earn a net income of 25% on cost. ***(MTP 5 Marks, Apr'23)***

Answer 13

Break- even point (in units) is 50% of sales i.e. 24,000 units.

Hence, Break- even point (in sales value) is 24,000 units × ₹ 400 = ₹ 96,00,000

(i)	Break even Sales	$= \frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{ ratio}}$
	Or, Rs. 96,00,000	$= \frac{\text{Fixed Cost}}{25\%}$
	Or, Fixed Cost	= ₹ 96,00,000 × 25%
		= ₹ 24,00,000
	So Fixed Cost for the year is ₹ 24,00,000	
(ii)	Contribution for the year	= (48,000 units × ₹ 400) × 25%
		= ₹ 48,00,000
	Profit for the year	= Contribution – Fixed Cost
		= ₹48,00,000 - ₹ 24,00,000
		= ₹ 24,00,000
(iii)	Target net profit is ₹22,00,000	
	Hence, Target contribution	= Target Profit + Fixed Cost
		= ₹ 22,00,000 + ₹ 24,00,000
		= ₹ 46,00,000
	Contribution per unit	= 25% of ₹ 400 = ₹ 100 per unit
	No. of units	$= \frac{\text{Rs.46,00,000}}{\text{Rs.100 per unit}}$ = 46,000 units
	So, 46,000 units to be sold to earn a target net profit of ₹ 22,00,000 for a year.	
(iv)	Let desired total Sales (Number of units × Selling price) be x then desired profit is 25% on Cost or 20% on Sales i.e. 0.2 x	
	Desired Sales	$= \frac{\text{Fixed Cost+Desired Profit}}{\frac{\text{P}}{\text{v}}\text{ Ratio}}$
	x	$= \frac{\text{Rs.24,00,000+0.2x}}{25\%}$
	or, 0.25 x	= ₹ 24,00,000 + 0.2 *x*
	or, 0.05 x	= ₹ 24,00,000
	or, x	= ₹ 4,80,00,000
	No. of units to be sold	$= \frac{₹\ 4,80,00,000}{\text{Rs.400}}$ = 1,20,000 units

Question 14

The following data are available from the budget records of Finesign Women's Handbag Company for the forthcoming budget period.

	₹
Selling Price per unit	1000
Variable cost per unit:	
Cost of Material used	750.00
Sales commission	50.00
Total Variable Cost	800.00
Annual fixed expenses:	
Rent	7,00,000
Salaries	11,00,000
Other fixed expenses	5,00,000
Total Fixed Cost	23,00,000

Although the firm manufactures Bags with different styles, they have identical purchase costs and selling price.

Requirement:

(a) What is the annual break-even point both in terms of units and value?

(b) If the store manager is paid 1 per cent commission on sales, what would be the annual break-even point both in terms of units and value?

(c) If the firm decides to pay a fixed salary of ₹ 9,00,000 in lieu of sales commission, what would the annual break-even point in terms of units and value be?

Considering break-even point in requirement (a), If the stores manager is paid 2 per cent commission on each bag sold in excess of the break-even point, what would be the profit if 20000 bags were sold. ***(RTP May'23)***

Answer 14

(a) P/V ratio: $\frac{\text{Sales per unit} - \text{Variable Cost per unit}}{\text{Selling Price per unit}} \times 100$

$= \frac{1000-800}{1000} \times 100$

$= \frac{200}{1000} \times 100 = 20\%$

Annual BEP in Units: $\frac{\text{Annual fixed Cost}}{\text{Contribution per unit}}$

$= \frac{\text{Rs.23,00,000}}{\text{Rs.200}} = 11{,}500 \text{ units}$

Annual BEP in Value : $\frac{\text{Annual fixed Cost}}{\frac{\text{P}}{\text{V}} \text{ ratio}}$

$= \frac{\text{Rs.23,00,000}}{\text{Rs.20\%}} =$ ₹ 1,15,00,000

(b) Revised P/V ratio and BEP:

commission on sales per unit= 1% of 1,000= ₹10

So, P/V ratio : $\frac{1000-(750+50+10)}{1000}$

$= \frac{190}{1000} \text{ X } 100 = 19\%$

BEP in terms of units = $\frac{\text{Annual fixed Cost}}{\text{Contribution per unit}}$

$= \frac{\text{Rs.23,00,000}}{190} = 12{,}106 \text{ units}$

BEP in terms of value : $\frac{\text{Annual fixed Cost}}{\text{P/V}}$

$= \frac{\text{Rs.23,00,000}}{19\%} = \text{Rs. } 1{,}21{,}05{,}263$

(c) Break-even point under fixed salary plan:

P/V ratio : $\frac{\text{Contribution per unit}}{\text{Selling price per unit}} = \frac{1000-750}{1000} \times 100 = \frac{250}{1000} \times 100 = 25\%$

Revised fixed cost:

Original fixed cost	₹ 23,00,000
Proposed fixed salary	₹ 9,00,000
Total	₹ 32,00,000

BEP in terms of units = $\frac{\text{Annual fixed Cost}}{\text{Contribution per unit}} = \frac{32{,}00{,}000}{250} = 12{,}800 \text{ units}$

BEP in terms of value : $\frac{\text{Annual fixed Cost}}{\frac{\text{P}}{\text{V}} \text{ ratio}} = \frac{\text{Rs.32,00,000}}{25\%} = 1{,}28{,}00{,}000$

(d) Annual break-even point under requirement (a) is 11,500 units.

Margin of safety at sales volume of 20,000 unit of bags (20,000 – 11,500) = 8500 units

Contribution on sales beyond break-even sales:

Revised contribution per unit: 200 – (2% of 1000) = 180

Profit = Margin of safety (in units) × Contribution per unit

= 8500 × 180 = ₹ 15,30,000

Question 15

(a) A dairy product company manufacturing baby food with a shelf life of one year furnishes the following information:

(i) On 1st April, 2023, the company has an opening stock of 20,000 packets whose variable cost is ₹ 180 per packet.

(ii) In 2022-23, production was 1,20,000 packets and the expected production in 2023-24 is 1,50,000 packets. Expected sales for 2023-24 is 1,60,000 packets.

(iii) In 2022-23, fixed cost per unit was ₹ 60 and it is expected to increase by 10% in 2023-24. The variable cost is expected to increase by 25%. Selling price for 2023-24 has been fixed at ₹ 300 per packet.

You are required to calculate the Break-even volume in units for 2023-24.

(b) The M-Tech Manufacturing Company is presently evaluating two possible processes for the manufacture of a toy. The following information is available:

Particulars	Process A (₹)	Process B (₹)
Variable cost per unit	12	14
Sales price per unit	20	20
Total fixed costs per year	30,00,000	21,00,000
Capacity (in units)	4,30,000	5,00,000
Anticipated sales (Next year, in units)	4,00,000	4,00,000

Suggest:

1. Identify the process which gives more profit.
2. Would you change your answer as given above, if you were informed that the capacities of the two processes are as follows:

A - 6,00,000 units; B - 5,00,000 units? *(RTP Nov'23)*

Answer 15

(a) Working Notes:

Particulars	2022-23 (₹)	2023-24 (₹)
Fixed Cost	72,00,000 (₹ 60 × 1,20,000 units)	79,20,000 (110% of ₹ 72,00,000)
Variable Cost	180	225 (125% of ₹ 180)

Calculation of Break-even Point (in units):

Since, shelf life of the product is one year only, hence, opening stock is to be sold first.

	(₹)
Total Contribution required to recover total fixed cost in 2023- 24 and to reach break-even volume.	79,20,000
Less: Contribution from opening stock {20,000 units × (₹ 300 – ₹ 180)}	24,00,000
Balance Contribution to be recovered	55,20,000

Units to be produced to get balance contribution

$= \frac{\text{Rs.55,20,000}}{\text{Rs.300–Rs.225}}$ = 73,600 packets.

Break-even volume in units for 2023-24

	Packets
From 2023-24 production	73,600
Add: Opening stock from 2022-23	20,000
	93,600

(b) 1. Comparative Profitability Statements

Particulars	Process- A (₹)	Process- B (₹)
Selling Price per unit	20.00	20.00
Less: Variable Cost per unit	12.00	14.00
Contribution per unit	8.00	6.00
Total Contribution	32,00,000 (₹ 8 × 4,00,000)	24,00,000 (₹ 6 × 4,00,000)
Less: Total fixed costs	30,00,000	21,00,000

Profit	2,00,000	3,00,000
Capacity (units)	4,30,000	5,00,000
Total Contribution at full capacity	34,40,000 (₹ 8 × 4,30,000)	30,00,000 (₹ 6 × 5,00,000)
Fixed Cost	30,00,000	21,00,000
Profit	4,40,000	9,00,000

Process - B gives more profit.

2.

Particulars	**Process- A (₹)**	**Process- B (₹)**
*Capacity (units)	6,00,000	5,00,000
Total contribution	48,00,000 (₹ 8 × 6,00,000)	30,00,000 (₹ 6 × 5,00,000)
Fixed Cost	30,00,000	21,00,000
Profit	18,00,000	9,00,000

Process-A be chosen.

***Note: It is assumed that capacity produced equals sales.**

Question 16

RS Ltd. manufactures and sells a single product X whose selling price is ₹ 100 per unit and the variable cost is ₹ 60 per unit.

(i) If the Fixed Costs for this year are ₹ 24,00,000 and the annual sales are at 60% margin of safety, CALCULATE the rate of net return on sales, assuming an income tax level of 40%

(ii) For the next year, it is proposed to add another product line Y whose selling price would be ₹ 150 per unit and the variable cost ₹ 100 per unit. The total fixed costs are estimated at ₹ 28,00,000. The sales mix of X : Y would be 5 : 3. COMPUTE the break-even sales in units for both the products. *(RTP Sep'24)*

Answer 16

(i)

Contribution per unit = Selling price – Variable cost

= ₹ 100 – ₹ 60

= ₹ 40

Break-even Point = $\frac{₹\ 24,00,000}{₹\ 40}$

= 60,000 units

Percentage Margin of Safety = $\frac{Actual\ Sales - Break-even\ Sales}{Actual\ Sales}$

Or, 60% = $\frac{Actual\ Sales - 60,000 units}{Actual\ Sales}$

∴ Actual Sales = 1,50,000 units

	(₹)
Sales Value (1,50,000 units × ₹ 100)	1,50,00,000
Less: Variable Cost (1,50,000 units × ₹ 60)	(90,00,000)
Contribution	60,00,000
Less: Fixed Cost	(24,00,000)
Profit	36,00,000
Less: Income Tax @ 40%	(14,40,000)
Net Return	21,60,000

Rate of net Return on Sales = 14.40% $\left(\frac{₹\ 21,60,000}{₹\ 1,50,00,000} \times 100\right)$

(ii) Products

	X (₹)	Y (₹)
Selling Price per unit	100	150
Variable Cost per unit	60	100
Contribution per unit	40	50

Composite contribution will be as follows:

Contribution per unit	=	$\left(\frac{40}{8} \times 5\right) + \left(\frac{50}{8} \times 3\right)$
	=	25 + 18.75 = ₹ 43.75
Break-even Sale	=	64,000 units $\left(\frac{₹\ 28,00,000}{₹\ 43.75}\right)$

Break-even Sales Mix:

X (64,000 units × 5/8) = 40,000 units

Y (64,000 units × 3/8) = 24,000 units

Question 17

The following information is given by PQR Ltd:

Year	Sales (₹)	Profit (Loss (₹)
2022-23	1,80,00,000	(3,80,000)
2023-24	2,40,00,000	11,20,000

You are required to:

(i) Calculate the Break-even sales.

(ii) In 2024-25, it is estimated that the variable cost will go up by 5% and fixed cost will reduce by ₹ 4,80,000. Selling prices will remain the same. Calculate the sales volume to earn a profit of ₹ 15,00,000.

(PYP 6 Marks May'24)

Answer 17

(i) Break-even sales $= \frac{Fixed\ Cost}{P/V\ Ratio}$

P/V Ratio $= \frac{Change\ in\ Profit}{Change\ in\ Sale} \times 100$ Or, $\frac{15,00,000}{2,40,00,000-1,80,00,000} \times 100$

Or $\frac{15,00,00}{60,00,000} \times 100$ or, 25%

Fixed Cost = Contribution – Profit

= ₹ 2,40,00,000 × 25% - ₹ 11,20,000

= ₹ 60,00,000 – ₹ 11,20,000 = ₹ 48,80,000

Break-even sales = $\frac{48,80,000}{25\%}$ = ₹ 1,95,20,000

(ii) Desired Contribution in 2024-25 = Revised Fixed Cost + Target Profit

= (₹ 48,80,000- ₹ 4,80,000) + ₹ 15,00,000

= ₹ 59,00,000

Earlier P/V ratio = 25%. So Variable Cost ratio =75%. Selling price remain the same.

Variable cost increased by 5% i.e. Variable Cost ratio will be 78.75% (75+5%of 75).

Now revised P/V ratio=21.25%

Sales Volume in 2024-25 = $\frac{59,00,000}{21.25\%}$ = ₹ 2,77,64,706(approx.)

If it is assumed that variable costs will go up by 5% in total. So, it will be increased from 75% to 80% and a solution can be done in the following way:

(iii) Desired Contribution in 2024-25 = Revised Fixed Cost + Target Profit

= (₹ 48,80,000-₹ 4,80,000) + ₹ 15,00,000

= ₹ 59,00,000

Earlier P/V ratio = 25%. So Variable Cost ratio =75%. Selling prices remain the same.

Variable cost increased by 5% i.e. Variable Cost ratio will be 80% (75%+5%).

Now revised P/V ratio = 20%

Sales Volume in 2024 - 25 = $\frac{59,00,000}{20\%}$ = ₹ 2,95,00,000

Question 18

A company manufactures and sells a product, the price of which is controlled by the Government. Raw material required for this product is also made available at a fixed controlled price. The following figures have been called for the previous two accounting years of the company:

	Year- I	Year- II
Quantity Sold (tones)	1,26,000	1,44,000
Price per tone	₹185	₹185
		(₹In thousands)
Sales Value	23,310	26,640
Raw Materials	11,340	12,960
Direct Labour	1,512	1,872
Factory, Administration and Selling Expenses	9,702	11,232
Profit	756	576

During the year II direct labour rates increased by 8 1/3%. Increases in factory, administration and selling expenses during the year were ₹ 8,10,000 on account of factors other than the increased quantities produced and sold. The managing director desires to know, what quantity if they had produced and sold would have given the company the same net profit per tonne in Year II as it earned during the Year I Advise him.

(MTP 7 Marks Aug'24)

Answer 18

Contribution per tonne	**(₹)**
Sales Price	185.00
Variable Cost:	
Material (W.N.-1)	90.00
Labour (W.N.-2)	13.00
Variable Overhead (W.N.-3)	40.00
Contribution	42.00
Profit Required (₹7,56,000 /1,26,000 tonnes)	6.00
Balance Contribution per tonne for meeting FixedCosts	36.00
Fixed Costs (W.N.-4)	54,72,000
Quantity Required (₹ 54,72,000 ÷ ₹ 36)	1,52,000 tonnes

Working Notes

1.	Materials Cost per tonne in Year III $\left(\frac{₹\ 1,29,60,000}{1,44,000\ \text{tonnes}}\right)$	₹ 90
2.	Labour Cost per tonne in Year II $\left(\frac{₹\ 18,72,000}{1,44,000\ tonnes}\right)$	₹ 13
3.	Variable portion of Factory, Administration and Sell. Expenditure, etc	₹
	Total in Year II	1,12,32,000
	Less: Increase otherwise than on account ofincreased turnover	8,10,000
		1,04,22,000
	Less: Amount Spent in Year I	97,02,000
	Increase	7,20,000
	Increase in Quantity Sold	18,000 tonnes
	Variable Expenses per tonne $\left(\frac{₹\ 7,20,000}{18,000\ \text{Tonnes}}\right)$	₹ 40
	Fixed portion of Factory, Administration and Selling Expenses (Yr. 2)	₹1,12,32,000
	Variable Expenses @ ₹40 per tonne	₹57,60,000
	Fixed Portion	₹54,72,000

Question 19

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

(₹ in '000)

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

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

(i) Fixed Cost

(ii) Break-even Sales *(RTP Nov'21, SM)*

Answer 19

Computation of Profit Volume Ratio

(₹ in '000)

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

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

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

(ii) **Computation of Break-Even Sales**

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

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

$= \frac{\text{Rs.13,50,000}}{54\%}$

= Rs. 25,00,000

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

Question 20

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

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

Assuming that the proposal is implemented, calculate:

(i) Break-Even sales of the merged plant and the capacity utilization at that stage.

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

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

(iv) When the merged plant is working at a capacity to earn a profit of ₹ 60,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

(PYP 10 Marks, Jan'21)

Answer 20

Workings:

1. Statement showing computation of Breakeven of merged plant and other required information

S. No.	Particulars	Plan A		Plant B		Merged Plant (100%) (₹)
		Before (90%) (₹)	After (100%) (₹)	Before (60%) (₹)	After (100%) (₹)	
(i)	Sales	63,00,000	70,00,000	48,00,000	80,00,000	1,50,00,000
(ii)	Variable cost	39,60,000	44,00,000	22,50,000	37,50,000	81,50,000
(iii)	Contribution (i - ii)	23,40,000	26,00,000	25,50,000	42,50,000	68,50,000
(iv)	Fixed Cost	13,00,000	13,00,000	15,00,000	15,00,000	28,00,000
(v)	Profit (iii - iv)	10,40,000	13,00,000	10,50,000	27,50,000	40,50,000

2. PV ratio of merged plant $= \frac{\text{Contribution}}{\text{Sales}} \times 100$

$= \frac{₹\ 68,50,000}{1,50,00,000} \times 100 = 45.67\%$

(i) Break even Sales of merged plant $= \frac{\text{Fixed Cost}}{\frac{P}{V}\text{ Ratio}} = \frac{\text{Rs.28,00,000}}{45.67\%}$

= Rs. 61,30,939.34 (approx.)

Capacity utilization $= \frac{\text{Rs.61,30,939.34}}{1,50,00,000} \times 100 = 40.88\%$

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

= (₹ 1,50,00,000 x 80%) x P/v ratio – fixed cost

= ₹ 1,20,00,000 x 45.67% – ₹ 28,00,000

= ₹ 26,80,400

(iii) Sales to earn a profit of ₹ 60,00,000

Desired sales $= \frac{\text{Fixed Cost+Desired profit}}{\frac{P}{V}\text{ratio}}$

$= \frac{\text{Rs.28,00,000+Rs.60,00,000}}{45.67\%}$

= ₹ 1,92,68,666 (approx.)

(iv) Increase in fixed cost

= ₹ 28,00,000 x 5% = ₹ 1,40,000

Therefore, percentage increase in sales price

$= \frac{\text{Rs.1,40,000}}{\text{Rs.1,92,68,666}} \times 100 = 0.726\%$ (approx.)

Question 21

XYZ Ltd. is engaged in the manufacturing of toys. It can produce 4,20,000 toys at its 70% capacity on per

annum basis. Company is in the process of determining sales price for the financial year 2020-21. It has provided the following information:

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

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

You are required to:

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

(2) Given the above scenario, advise whether company should accept an offer to sell each Toy at:

(a) ₹ 130 per Toy

(b) ₹ 129 per Toy *(PYP 10 Marks, Jan'21)*

Answer 21

(1) Statement of Cost

	For first 6 months	For further 3 months	For remaining 3 months	Total
	6,00,000 x 6/12 x 50% = 1,50,000units	6,00,000 x 3/12 x 75% = 1,12,500units	6,00,000 x 3/12 = 1,50,000units	4,12,500units
Direct Material	90,00,000	67,50,000	90,00,000	2,47,50,000
Direct labour	45,00,000	33,75,000	45,00,000	1,23,75,000
Indirect – Variable Expenses	22,50,000	16,87,500	22,50,000	61,87,500
Indirect – Fixed Expenses	32,75,000	16,37,500	16,37,500	65,50,000
Indirect Semi-variable expenses				
- For first six months @ 5,00,000 per annum	2,50,000			
- For further three months @ 6,50,000* per annum		1,62,500		
- For further three months @ 8,50,000** per annum			2,12,500	6,25,000
Total Cost	1,92,75,000	1,36,12,500	1,76,00,000	5,04,87,500
Desired Profit				25,00,000
Sales value				5,29,87,500
Average Sales price per Toy				**128.45**

* ₹ 5,00,000+ [3 times (from 60% to 75%) x 50,000] = ₹ 6,50,000

** ₹ 6,50,000+ [1 time (from 75% to 80%) x 50,000] + [2 times (from 80% to 100%) × 75,000] = ₹ 8,50,000

(2) (a) Company Should accept the offer as it is above its targeted sales price of ₹ 128.45 per toy.

(b) Company Should accept the offer as it is above its targeted sales price of ₹ 128.45 per toy.

Question 22

A Z company has prepared its budget for the production of 2,00,000 units. The variable cost per unit is ₹ 16 and fixed cost is ₹ 4 per unit. The company fixes its selling price to fetch a profit of 20% on total cost.

You are required to calculate:

(i) Present break-even sales (in ₹ and in quantity).

(ii) Present profit-volume ratio.

(iii) **Revised break-even sales in ₹ and the revised profit-volume ratio, if it reduces its selling price by 10%.**

(iv) **What would be revised sales- in quantity and the amount, if a company desires a profit increase of 20% more than the budgeted profit and selling price is reduced by 10% as above in point(iii) .**
(PYP 10 Marks, Dec'21)

Answer 22

Variable Cost per Unit = ₹16

Fixed Cost per Unit = ₹ 4, Total Fixed Cost= 2,00,000 units x ₹ 4 = ₹8,00,000

Total Cost per Unit = ₹20

Selling Price per unit = Total Cost + Profit = Rs. 20+Rs. 4 = Rs. 24

Contribution per unit = Rs. 24- Rs. 16 = Rs. 8

(i) Present Break- even Sales (Quantity) = $\frac{\text{Fixed Cost}}{\text{Contribution margin per unit}} = \frac{\text{Rs.8,00,000}}{\text{Rs.8}}$ = 1,00,000 units

Present Break –even Sales(Rs.) = 1,00,000 units × Rs. 24 = Rs. 24,00,000

(ii) Present P/V Ratio = 8/24 X 100 = 33.33%

(iii) Revised Selling Price per unit = Rs. 24 – 10% of Rs. 24 = Rs. 21.60

Revised Contribution per unit = Rs. 21.60 – Rs. 16 = Rs. 5.60

Revised P/V Ratio = $\frac{5.60}{21.60} \times 100 = 25.926\%$

Revised Break-even point (Rs.) = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{ Ratio}} = \frac{8,00,000}{25.926\%}$ = Rs. 30,85,705

Or

Revised Break-even point (units) = $\frac{\text{Fixed Cost}}{\text{Contribution margin per unit}} = \frac{\text{Rs.8,00,000}}{5.60}$ = 1,42,857 units

Revised Break-even point (₹) = 1,42,857 units x ₹ 21.60 = ₹ 30,85,711

(iv) Present profit =₹ 8,00,000

Desired Profit = 120% of ₹ 8,00,000 =₹ 9,60,000

Sales to earn a profit of ₹ 9,60,000

Total contribution required = 8.00.000 + 9,60,000 = ₹ 17,60,000

$\frac{\text{Fixed Cost+Desired Profit}}{\text{Contribution per unit}} = \frac{8,00,000+9,60,000}{5.60}$ = 3,14,286 units

Revised sales (in Rs.) = 3,14,286 units X Rs. 21.60 = Rs. 67,88,578

EXAM INSIGHTS: This Numerical problem based on the concept of Marginal costing. First three parts of the question were answered in the correct line. In the fourth part, many examinees failed to calculate amount of desired contribution. Performance of the examinees was good.

Question 23

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? ***(PYP 5 Marks, May'22)***

Answer 23

		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.

EXAM INSIGHTS: This numerical problem was based on the concept of Marginal costing. Most of the examinees answered on the correct line. Performance of the examinees was good.

Question 24

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). ***(PYP 5 Marks, May'22)***

Answer 24

	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]

P/V Ratio= $\frac{\text{Change in profit}}{\text{Change in sales}} \times 100$

$\therefore \frac{16,20,000}{81,00,000} \times 100 = 20\%$

(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 31stDecember, 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) = $\frac{\text{Fixed Cost}}{\frac{\text{P}}{\text{V}}\text{ ratio}} \times 100$

$\frac{15,00,000}{20\%}$ = **₹ 75,00,000**

(iii) Profits 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**

EXAM INSIGHTS: This numerical question was based on Marginal costing to calculate the Total fixed cost, Break-Even sales and Profit in given sales volume. Most of the examinees did well. Performance of the examinees was good.

Question 25

ABC Ltd sells its Product 'Y' at a price of ₹ 300 per unit and its variable cost is ₹ 180 per unit. The fixed costs are ₹ 16,80,000 per year uniformly incurred throughout the year. The Profit for the year is ₹ 7,20,000.
You are required to calculate:

(i) BEP in value (₹) and units.
(ii) Margin of Safety
(iii) Profits made when sales are 24,000 units.
(iv) Sales in value (₹) to be made to earn a net profit of ₹ 10,00,000 for the year. ***(PYP 5 Marks, Nov'22)***

Answer 25

(i) Calculation of BEP in value

P/V ratio $= \frac{\text{Sales Price} - \text{Variable Cost}}{\text{Sales}} = \frac{300-180}{300} = 40\%$

Break Even Point in Value (₹) $= \frac{\text{Fixed cost}}{\frac{\text{P}}{\text{V}}\text{ ratio}} = \frac{16,80,000}{40\%}$ = Rs. 42,00,000

Break Even Point in Units $= \frac{\text{Fixed cost}}{\text{Contribution}} = \frac{16,80,000}{120}$ = 14,000 Units

(Alternatively, $\frac{\text{Rs.}42,00,000}{300}$ = 14000 Units)

(ii) Margin of Safety (in Amount) = $\frac{\text{Profit}}{\frac{\text{P}}{\text{V}}\text{ratio}} = \frac{7,20,000}{40\%}$ = Rs. 18,00,000

Margin of safety may also be calculated by deducting BEP sales from present sale. Present sale is ₹ 60,00,000 i.e. (16,80,000 + 7,20,000)/40%.

Margin of Safety (in Units) = $\frac{\text{Profit}}{\text{Contribution per unit}} = \frac{7,20,000}{120}$ = 6,000 units

(iii) Profits when sales are 24,000 units

Particular	(₹)
Contribution (24,000 X 120)	28,80,000
Less: Fixed cost	16,80,000
Profit	12,00,000

(iv) Sales in value to earn a net profit of ₹10,00,000

$$\frac{\text{Fixed cost+Desired profit}}{\frac{P}{V}\text{ ratio}} = \frac{16,80,000+10,00,000}{40\%} = \text{Rs. } 67,00,000$$

Exam Insights: This is a Numerical question on Marginal Costing for calculation of Break-Even Point (BEP) in value and units, Margin of Safety (MOS), profit on given sales volume and sales value to earn a certain level of net profit. Most of the examinees answered correctly and secured good marks.

Question 26

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. ***(PYP 5 Marks, May'23)***

Answer 26

Particulars	Product A	Product B
	₹	₹
Selling Price	180	175
Variable cost:		
Direct Material	55	60
Direct labour	35	45
Variable factory overheads	40	20
	130	125
Contribution	50	50
Machine hour (p.u.)	10	5
Contribution per hour	**5**	**10**
Rank	**II**	**I**

Calculation of Product Mix

Hours available	55,000
Product B (6000 x 5)	**30,000**

Balance Hours	25,000
Product A (2500 x 10)	**25,000**
Balance Hours	0

Calculation of Profit

		₹
Contribution		
A	2500 units x 50	
B	6000 x 50	4,25,000
Less:	Fixed cost	(1,40,000)
	Profit	2,85,000

EXAM INSIGHTS: In this numerical question, examinees were asked to calculate the Best Product Mix and the maximum profit when machine hours are a limiting factor. Most of the examinees failed to calculate contribution per machine hour, hence committed mistake in calculation of the best product mix. The overall performance was below average.

Question 27

NG Ltd. has an annual fixed cost of ₹ 98,50,000. In the year 2022-23, sales amounted to ₹7,80,60,000 as compared to ₹5,93,10,000 in the preceding year 2021-22. Profit in the year 2022-23 is ₹37,50,000 more than that in 2021-22.

Required:

(i) CALCULATE Break-even sales of the company.

(ii) DETERMINE profit/ loss on a forecasted sales volume of ₹8,20,00,000.

(iii) If there is a reduction in selling price by 10% in the financial year 2022-23 and company desires to earn the same amount of profit as in 2021-22, COMPUTE the required sales amount?

(MTP 5 Marks Apr'23, Mar'19 & Sep '23)

Answer 27

(i) $\text{Break-even Sales} = \frac{\text{Fixed Cost}}{\frac{P}{V}\text{ Ratio}}$

$$\text{P/v Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 \text{ or, } \frac{\text{Rs.37,50,000}}{\text{Rs.7,80,60,000} - \text{Rs.5,93,10,000}} \text{ X } 100$$

$$\text{Or } \frac{\text{Rs.37,50,000}}{\text{Rs.1,87,50,000}} \times 100 \text{ or, } 20\%$$

$$\text{Break-even Sales} = \frac{\text{Rs.98,50,000}}{20\%} = \text{Rs. } 4,92,50,000$$

(ii) Profit/ loss = Contribution – Fixed Cost
= ₹ 8,20,00,000 × 20% - ₹98,50,000
= ₹1,64,00,000 – ₹98,50,000 = ₹65,50,000

(iii) To earn the same amount of profit in 2022-23 as it was in 2021-22, the company must earn the same amount of contribution as it had earned in 2021-22.

Sales – Variable cost = Contribution equal to 2021-22 contribution

Contribution in 2021-22	= Sales in 2021-22 × P/V Ratio in 2021-22
	= ₹5,93,10,000 × 20% = ₹1,18,62,000

Let the number of units to be sold in 2022-23 = X

Sales in 2022-23 – Variable cost in 2022-23 = Desired Contribution

90 X – 80 X = ₹1,18,62,000

Or 10 X = 1,18,62,000
Or X = 11,86,200 units
Therefore, Sales amount required to earn a profit equal to 2021-22 profit
= ₹ 90 × 11,86,200 units = ₹ 10,67,58,000

Question 28

LDR

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

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

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

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

Required

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

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

(MTP 10 Marks, Nov'21, RTP May '21 & May '22) (Same concept different figures SM)

Answer 28

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

	Products			Total
	S	T	U	
Selling Price (₹)	600	800	400	
Less: Variable Cost (₹)	300	400	240	
Contribution per unit (₹)	300	400	160	
P/V Ratio (Contribution/Selling price)	50%	50%	40%	
Sales Mix	25%	35%	40%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	12.5%	17.5%	16%	46%
Present Total Contribution (₹ 1,20,00,000 × 46%)				₹55,20,000
Less: Fixed Costs				₹36,00,000
Present Profit				₹19,20,000
Present Break Even Sales (₹ 36,00,000/0.46)				₹ 78,26,087

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

	Products			
	S	T	M	Total
Selling Price (₹)	600	800	600	
Less: Variable Cost (₹)	300	400	300	
Contribution per unit (₹)	300	400	300	
P/V Ratio (Contribution/Selling price)	50%	50%	50%	
Sales Mix	40%	35%	25%	

Contribution per rupee of sales (P/V Ratio x Sales Mix)	20%	17.5%	12.5%	50%
Proposed Total Contribution (₹1,28,00,000 x 50%)				₹64,00,000
Less: Fixed Costs				₹36,00,000
Proposed Profit				₹28,00,000
Proposed Break Even Sales (₹36,00,000/0.50)				₹72,00,000

Question 29

The following information has been obtained from the records of a manufacturing unit:

	Rs.	Rs.
Sales 80,000 units @ Rs. 50		**40,00,000**
Material consumed	**16,00,000**	
Variable Overheads	**4,00,000**	
Labour Charges	**8,00,000**	
Fixed Overheads	**7,20,000**	**35,20,000**
Net Profit		**4,80,000**

CALCULATE:

(i) The number of units by selling which the company will neither lose nor gain anything.

(ii) The sales needed to earn a profit of 20% on sales.

(iii) The extra units which should be sold to obtain the present profit if it is proposed to reduce the selling price by 20% and 25%.

(iv) The selling price to be fixed to bring down its Break-even Point to 10,000 units under present conditions. ***(MTP 10 Marks, Mar'21)***

Answer 29

Workings:

(1) Contribution per unit = Selling price per unit – Variable cost per unit

= Rs. 50 – {Rs. (16,00,000 + 4,00,000 + 8,00,000) ÷ 80,000 units}

= Rs. 50 – Rs. 35 = Rs. 15

(2) Profit-Volume (P/V) Ratio = $\frac{\text{Contribution per unit}}{\text{Selling Price per unit}} \times 100 = \frac{\text{Rs.15}}{\text{Rs.50}} \times 100 = 30\%$

Calculations:

(i) The number of units to be sold for neither loss nor gain i.e. Break-even units:

$= \frac{\text{Fixed Overheads}}{\text{Contribution per unit}} = \frac{\text{Rs.7,20,000}}{\text{Rs.15}} = 48{,}000$ Units

(ii) The sales needed to earn a profit of 20% on sales:

As we know S = V + F + P

(S = Sales; V = Variable Cost; F = Fixed Cost; P = Profit)

Suppose Sales units are *x* then

Rs. 50*x*	= Rs. 35 *x* + Rs. 7,20,000 + Rs. 10*x*
Rs. 50*x* – Rs. 45*x*	= Rs. 7,20,000
Or, $X = \frac{\text{Rs.7,20,000}}{\text{Rs.5}}$	= 1,44,000 units

Therefore, Sales needed = 1,44,000 units × Rs. 50 = Rs. 72,00,000 to earn a profit of 20% on sales.

(iii) Calculation of extra units to be sold to earn present profit of Rs.4,80,000 under the following proposed selling price:

		When selling price is reduced by	
		20% (Rs.)	**25% (Rs.)**
	Selling price per unit	40.00	37.50
		(Rs. 50 × 80%)	(Rs. 50 × 75%)
	Less: Variable Cost per unit	35.00	35.00
	Contribution per unit	5.00	2.50
	Desired Contribution:		
	Fixed Overheads	7,20,000	7,20,000

	Desired Profit	4,80,000	4,80,000
		12,00,000	12,00,000
(a)	Sales unit for desired contribution $\left[\frac{\text{Desired Contribution}}{\text{Contribution per unit}}\right]$	2,40,000 units $\frac{\text{Rs.12,00,000}}{\text{Rs.5}}$	4,80,000 units $\frac{\text{Rs.12,00,000}}{\text{Rs.2.5}}$
(b)	Units presently sold	80,000 units	80,000 units
(c)	Extra units to be sold {(a) – (b)}	1,60,000 units	4,00,000 units

(iv) Sales price to bring down BEP to 10,000 units:

B.E.P (Units)	$= \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$
Or, Contributionper unit	= Rs. 7,20,000/10,000 units = Rs. 72
So, Sales Price (per unit)	= Variable Cost + Contribution
	= Rs. 35 + Rs. 72 = Rs. 107

Question 30

PS Limited is a manufacturing company and is operating at 75% capacity utilization. The PV ratio at this level of activity is 40%.

The flexible budget drafted by the company for two levels of activity is given below:

	Capacity utilization (75 %)	Capacity utilization (100 %)
	Amount in ₹ (Lakhs)	Amount in ₹ (Lakhs)
Direct materials	180	240
Direct wages	120	160
Power and fuel	12	16
Repairs and maintenance	18	21
Consumables	21	28
Supervision	20	20
Indirect labour	36	42
Administrative expenses	21	21
Selling expenses	18	18
Depreciation	54	54

You are required to:

i. **CALCULATE the profit earned by PS Limited at 75% level of activity.**

ii. **CALCULATE the break-even level of activity.** ***(MTP 10 Marks, Sep'22)***

Answer 30

Calculation of Semi Variable component

	Repairs and Maintenance (₹)	Indirect labour (₹)
At 75% capacity	18,00,000	36,00,000
At 100% capacity	21,00,000	42,00,000
Variable component for 25%	3,00,000	6,00,000
Hence variable cost at 75%	3,00,000 x 75/25=**9,00,000**	6,00,000 x 75/25 =**18,00,000**
Fixed cost at 75% capacity	18,00,000 – 9,00,000 = **9,00,000**	36,00,000 – 18,00,000=**18,00,000**

Segregation of Fixed and Variable cost

	75%	100%	VC at 75%	FC at 75%
Direct Material	180	240	180	
Direct Labour	120	160	120	
Power and fuel	12	16	12	
Repairs and maintenance	18	21	**9**	**9**
Consumables	21	28	21	
Supervision	20	20		20
Indirect labour	36	42	**18**	**18**
Administrative expenses	21	21		21

Selling expenses	18	18		18
Depreciation	54	54		54
Total	500	620	**360**	**140**

(i) Calculation of profit earned at 75% capacity

Given PV ratio = 40%, Hence variable cost would be 60%	
If variable cost is ₹ 360 lakhs then sales would be 360/ 0.60	= ₹ 600 lakhs
Less: Variable cost	= ₹ 360 lakhs
Less: Fixed cost	= ₹ 140 lakhs
Profit	**= ₹ 100 lakhs**

(ii) Break-even level of activity

BEP Sales = FC/ P/V ratio = 140 /0.40 = **₹ 350 lakhs**

Question 31

A company manufactures four products. The annual demand for products, selling prices and variable production costs are as follows:

Product	P	Q	R	S
Demand (Units)	1,20,000	1,86,000	1,71,000	99,000
	₹	₹	₹	₹
Selling price/unit	23.88	28.68	55.08	47.88
Direct Material/Unit	10.08	13.20	30.48	24.96
Direct Labour/unit	4.08	4.08	6.72	6.36
Variable overheads/unit	1.44	1.44	2.40	2.16

Other data:

(i) The variable overheads are absorbed on a machine hour basis at a rate of ₹ 1.20 per machine hour.

(ii) Fixed overheads total ₹ 46,84,000 per annum.

(iii) Production capacity available 8,15,000 machine hours per annum.

(iv) Products P, Q and R can be bought-in at ₹ 21.36 per unit, ₹ 24 per unit and ₹ 48 per unit respectively.

You are required to calculate Best product mix and Profitability statement for the year.

(MTP 10 Marks, Oct'23)

Answer 31

(i) Statement Showing "Calculation of Contribution/ unit"

	P (₹)	Q (₹)	R (₹)	S (₹)
Selling Price ...(A)	23.88	28.68	55.08	47.88
Variable Cost				
Direct Material	10.08	13.20	30.48	24.96
Direct Labour	4.08	4.08	6.72	6.36
Variable Overheads	1.44	1.44	2.40	2.16
Total Variable Cost ...(B)	15.60	18.72	39.60	33.48
Contribution per unit ...(A) - (B)	8.28	9.96	15.48	14.40

(ii) Calculation of Machine Hours/ unit

Machine Hours per unit	1.20	1.20	2.00	1.80

(iii) Machine Hours Required

Machine Hours per unit	1,44,000*	2,23,200%	3,42,000@	1,78,200#
			Total	8,87,400

* - (1,20,000 × 1.2); % - (1,86,000 × 1.2); @ - (1,71,000 × 2); # - (99,000 × 1.8)

(iv) Total Machine Hours Available 8,15,000. Hence, it is a key factor. Product 'S' is to be manufactured, since it is not available with sub-contractor/ market.

(v) Statement Showing "Make or Buy for Products P, Q, R"

	P (₹)	Q (₹)	R (₹)
Sub-Contractor/ Buy Price	21.36	24.00	48.00
Less: Variable Manufacturing Cost	15.60	18.72	39.60
Saving in Cost	5.76	5.28	8.40
Saving in Cost per machine hour	4.8	4.4	4.20
Ranking	I	II	III

(vi) Statement Showing "Best Product Mix"

Product	Units	Machine Hour/ Unit	Total Machine Hours
S	99,000	1.8	1,78,200
P	1,20,000	1.2	1,44,000
Q	1,86,000	1.2	2,23,200
R (Balance)	1,34,800	2.0	2,69,600
		Total	8,15,000

Balance quantity of R to be purchased 36,200 units (1,71,000 – 1,34,800).

(vii) Profitability Statement

Product	No of Units	Contribution/unit (₹)	Total Cont. (₹)
P (Mfg)	1,20,000	8.28	9,93,600
Q (Mfg)	1,86,000	9.96	18,52,560
R (Mfg)	1,34,800	15.48	20,86,704
R (Buy)	36,200	7.08 (₹55.08 - ₹48.00)	2,56,296
S (Mfg)	99,000	14.40	14,25,600
Total Contribution			66,14,760
Less: Fixed Overheads			46,84,000
Net Profit			19,30,760

Question 32

a) RPP Manufacturers is approached by an international customer for one-time special order similar to one offered to its domestic customers. Per unit data for sales to regular customers is provided below:

Direct material	**₹ 693**
Direct labour	**₹ 315**
Variable manufacturing support	**₹ 504**
Fixed manufacturing support	**₹ 1092**
Total manufacturing costs	**₹ 2604**
Markup (50%)	**₹ 1302**
Targeted selling price	**₹ 3906**

It is provided that RPP Manufacturers has excess capacity. Required:

(i) WHAT is the full cost of the product per unit?

(ii) WHAT is the contribution margin per unit?

(iii) WHICH costs are relevant for making the decision regarding this one-time special order? WHY?

(iv) For RPP Manufacturers, WHAT is the minimum acceptable price of this one- time-special order only

(v) For this one-time-only special order, SHOULD RPP Manufacturers consider a price of ₹ 2100 per unit? WHY or why not?

b) The lab corner of New life Hospital Trust operates two types of specialist MRI scanning machine- MR10 and MR59. Following details are estimated for the next period:

Machine	MR10	MR59
Running hours	1,100	2,000
	(₹)	(₹)
Variable running costs excluding special technology	68,750	1,60,000
Fixed Costs	50,000	2,43,750

A brain scan is normally carried out on machine type MR10. This task uses special technology costing ₹ 100 each and takes four hours of machine time. Because of the nature of the process, around 10% of the scans

produce blurred and therefore useless results.

Required:

(i) CALCULATE the total cost of a satisfactory brain scan on machine type MR10.

(ii) Brain scans can also be done on machine type MR59 and would take only 1.8 hours per scan with a reduced reject rate of 6%. However, the cost of the special technology would be ₹ 137.50 per scan. ADVISE which type should be used, assuming sufficient capacity is available on both types of machines. Consider fixed costs will remain unchanged. *(RTP Nov'22)*

Answer 32

(i)	Full cost of the product per unit	
	Direct material	₹ 693
	Direct labour	₹ 315
	Variable manufacturing support	₹ 504
	Fixed manufacturing support	₹ 1092
	Total manufacturing costs	₹ 2604
(ii)	Contribution margin per unit	
	Selling price	₹ 3906
	Less: Variable costs	
	Direct material	₹ 693
	Direct labour	₹ 315
	Variable manufacturing support	₹ 504
	Contribution margin per unit	₹ 2394
(iii)	Costs for decision making are those costs that differ between alternatives, which in this situation are the incremental costs.	
	Direct material	₹ 693
	Direct labour	₹ 315
	Variable manufacturing support	₹ 504
	Total incremental costs	₹ 1512
(iv)	Minimum acceptable price would be the incremental costs in the short term i.e. ₹ 1512	
(v)	Yes, RPP Manufacturers may consider a price of ₹ 2100 per unit because this price is greater than the minimum acceptable price.	

(i)

Particulars	**(₹)**
Variable cost per running hour of Machine MR10 (₹ 68,750/1100 hours)	62.50
Fixed cost (₹ 50,000/1100 hours)	45.46
Cost of brain scan on Machine MR10:	(₹)
Variable machine cost (4 hours × ₹ 62.50)	250.00
Special technology	100.00
Total variable cost	350.00
Fixed machine cost (4 hours × ₹ 45.46)	181.84
Total cost of a scan	531.84
Total cost of a satisfactory scan (₹ 531.84/0.9)	590.93

(ii) It is given that fixed costs will remain unchanged and thus they are not relevant for the decision. The relevant costs would be the incremental costs of an additional scan:

Machine MR10:	(₹)
Variable cost per scan	350.00
Variable cost per satisfactory scan (₹ 350/0.9)	388.89
Machine MR59:	(₹)
Variable machine cost per scan (₹ 1,60,000 / 2000 hours ×1.8 hours)	144.00
Special technology	137.50
Variable cost per scan	281.50
Variable cost per satisfactory scan (₹ 281.50/0.94)	299.47

The relevant costs per satisfactory scan are cheaper on Machine MR59 and therefore brain scans should be undertaken on said machine.

Question 33 LDR

An agriculture based company having 210 hectares of land is engaged in growing three different cereals namely, wheat, rice and maize annually. The yield of the different crops and their selling prices are given below:

	Wheat	Rice	Maize
Yield (in kgs per hectare)	2,000	500	100
Selling Price (₹ per kg)	20	40	250

The variable cost data of different crops are given below:

(All figures in ₹ per kg)

Crop	Labour charges	Packing Materials	Other variable expenses
Wheat	8	2	4
Rice	10	2	1
Maize	120	10	20

The company has a policy to produce and sell all the three kinds of crops. The maximum and minimum area to be cultivated for each crop is as follows:

Crop	Maximum Area (in hectares)	Minimum Area (in hectares)
Wheat	160	100
Rice	50	40
Maize	60	10

You are required to:

(i) **Rank the crops on the basis of contribution per hectare.**

(ii) **Determine the optimum product mix considering that all the three cereals are to be produced.**

(iii) **Calculate the maximum profit which can be achieved if the total fixed cost per annum is ₹ ₹21,45,000.** ***(PYP 10 Marks, Nov'22)*** **(Assume that there are no other constraints applicable to this company)**

Answer 33

(i) Statement showing Ranking of crops on the basis of Contribution per hectare

Sr. No.	Particulars	Wheat	Rice	Maize
(i)	Sales price per kg (₹)	20	40	250
(ii)	Variable cost* per kg (₹)	14	13	150
(iii)	Contribution per kg (₹)	6	27	100
(iv)	Yield (in kgs per hectare)	2,000	500	100
(v)	Contribution per hectare (₹)	12,000	13,500	10,000
(vi)	Ranking	II	I	III

*Variable cost = Labour Charges +Packing Material+ Other Variable Expenses

Therefore, to maximize profits, the order of priority of production would be Rice, Wheat and Maize.

(ii) & (iii) Statement showing optimum product mix considering that all the three cereals are to be produced and maximum profit thereof

Sr. No.	Particulars	Wheat	Rice	Maize	Total
(i)	Minimum Area (in hectare)	100	40	10	150
(ii)	Remaining area (in hectare)				60
(iii)	Distribution of remaining area based on ranking considering Maximum area	50	10	-	60
(iv)	Optimum mix (in hectare)	150	50	10	210
(v)	Contribution per hectare (₹)	12,000	13,500	10,000	
(vi)	Total contribution (₹)	18,00,000	6,75,000	1,00,000	25,75,000

(vii)	Fixed cost (₹)				21,45,000
(viii)	Maximum Profit (₹)				4,30,000

Optimum Product Mix and calculation of maximum profit earned by company can also be presented as below

(ii) Optimum Product Mix:

Particular	Area (in hectares)	Yield (kg per hectare)	Total Production (in kgs)
(a) Maximum of Rice	50	500	25000
(b) Minimum of Maize	10	100	1000
(c) Balance of Wheat	150	2000	300000
	210		326000

(iii) Calculation of maximum profit earned by the company:

	Production (in kgs)	Contribution (₹ per kg)	Total contribution(₹)
(a) Rice	25,000	24	6,75,000
(b) Maize	1,000	100	1,00,000
(c) Wheat	3,00,000	6	18,00,000
Total contribution			25,75,000
Less: Total Fixed Cost per annum			(21,45,000)
Maximum profits earned by the company			4,30,000

Exam Insights: This Numerical question was based on marginal costing requiring ranking of crops based on contribution per hectare and thereafter determining optimum product mix and maximum profit that can be achieved. Many examinees calculated the contribution per hectare correctly but faltered in awarding ranks. A few examinees also made mistakes in calculating optimum product mix despite correctly calculating contribution and awarding ranks. Overall performance of the examinees was below average.

Question 34

AB Ltd produces a single product V2 and sells it at a fixed price of ₹ 2,050 per unit. The production and sales data for first quarter of the year 2023-24 are as follows:

	April	May	June
Sales in units	4,200	4,500	5,200
Production in units	4,600	4,400	5,500

The actual/budget information for each month was as follows:

Direct materials	4 kilograms at ₹ 120 per kilogram
Direct labor	6 hours at ₹ 60 per hour
Variable production overheads	150% of direct labour
Fixed production overheads	₹ 5,00,000
Fixed selling overheads	₹ 95,000

There was no opening inventory at the start of the quarter. Fixed production overheads are budgeted at ₹ 60,00,000 per annum and are absorbed into products based on a budgeted normal output of 60,000 units per annum.

Required:

(i) Prepare a profit statement for each of the three months using absorption costing principles.

(ii) Prepare a profit statement for each of the three months using marginal costing principles.

(iii) Present a reconciliation of the profit or loss figures given in your answer to (i) and (ii).

(MTP 10 Marks, Mar'24)

Answer 34

(i) Statement of Profit under Absorption Costing

Particulars		April (₹)	May (₹)	June (₹)
Sales (units)		4,200	4,500	5,200
Selling price per unit		2,050	2,050	2,050
Sales value	(A)	86,10,000	92,25,000	1,06,60,000
Cost of Goods Sold:				
Opening Stock @ ₹1,480		0	5,92,000	4,44,000
Production cost @ ₹1,480		68,08,000	65,12,000	81,40,000
Closing Stock @ ₹1,480		(5,92,000)	(4,44,000)	(8,88,000)
Under/ (Over) absorption		40,000	60,000	(50,000)
Add: Fixed Selling Overheads		95,000	95,000	95,000
Cost of Sales	(B)	63,51,000	68,15,000	77,41,000
Profit	(A – B)	22,59,000	24,10,000	29,19,000

Workings:

1. Calculation of full production cost

	(₹)
Direct Materials (4 kg. × ₹ 120)	480
Direct labour (6 hours × ₹ 60)	360
Variable production Overhead (150% of ₹ 360)	540
Total Variable cost	1,380
Fixed production overhead $\left(\frac{60,00,000}{60,000 \text{ units}}\right)$	100
	1,480

2. Calculation of Opening and Closing stock

	April	May	June
Opening Stock	0	400	300
Add: Production	4,600	4,400	5,500
Less: Sales	4,200	4,500	5,200
Closing Stock	400	300	600

3. Calculation of Under/Over absorption of fixed production overhead

	April (₹)	May (₹)	June (₹)
Actual Overhead	5,00,000	5,00,000	5,00,000
Overhead absorbed	4,60,000 (4,600 units × ₹100)	4,40,000 (4,400 units × ₹100)	5,50,000 (5,500 units × ₹100)
Under/(Over) absorption	40,000	60,000	(50,000)

(ii) Statement of Profit under Marginal Costing

Particulars	April (₹)	May (₹)	June (₹)
Sales (units)	4,200	4,500	5,200
Selling price per unit	2,050	2,050	2,050
Sales value	86,10,000	92,25,000	1,06,60,000
Less: Variable production cost @ ₹1,380	57,96,000	62,10,000	71,76,000
Contribution	28,14,000	30,15,000	34,84,000
Less: Fixed Production Overheads	5,00,000	5,00,000	5,00,000
Less: Fixed Selling Overheads	95,000	95,000	95,000
Profit	22,19,000	24,20,000	28,89,000

(iii) Reconciliation of profit under Absorption costing to Marginal Costing

Particulars	April (₹)	May (₹)	June (₹)
Profit under	22,59,000	24,10,000	29,19,000
Absorption Costing			
Add: Opening Stock	0	40,000	30,000
		(400 × ₹100)	(300 × ₹100)
Less: Closing Stock	40,000	30,000	60,000

	(400 × ₹100)	(300 × ₹100)	(600 × ₹100)
Profit under Marginal Costing	22,19,000	24,20,000	28,89,000

Question 35

LDR

The analysis of cost sheet of A Ltd. for the last financial year has revealed the following information for it's product R:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of cost of goods sold	--
Direct Labour	15% of cost of goods sold	--
Factory Overhead	10% of cost of goods sold	₹ 2,30,000
General & Administration Overhead	2% of cost of goods sold	₹ 71,000
Selling & Distribution Overhead	4% of cost of sales	₹ 68,000

Last year 5,000 units were sold at ₹185 per unit.

You being an associate to cost controller of the A Ltd., CALCULATE:

(i) Break-even Sales (in rupees),

(ii) Profit earned during last year,

(iii) Margin of safety (in %) and

(iv) The profit if the sales were 10% less than the actual sales. ***(MTP 10 Marks, Oct'21, RTP May'24 & May'20)***

Answer 35

Workings:

Calculation of Cost of Goods Sold (COGS):

COGS	= {(DM- 0.3 COGS) + (DL- 0.15 COGS) + (FOH- 0.10 COGS + ₹ 2,30,000) + (G&AOH- 0.02 COGS +71,000)}
Or COGS	= 0.57 COGS + ₹ 3,01,000
Or COGS	$= \frac{₹\ 3,01,000}{0.43}$ = ₹ 7,00,000

Calculation of Cost of Sales (COS):

COS	= COGS + (S&DOH- 0.04 COS + ₹ 68,000)
Or COS	= ₹ 7,00,000 + (0.04 COS + ₹ 68,000)
	$= \frac{₹\ 7,68,000}{0.96}$ = ₹ 8,00,000

Calculation of total Fixed Costs:

Factory Overhead	₹ 2,30,000
General & Administration OH	₹ 71,000
Selling & Distribution OH	₹ 68,000
	₹ 3,69,000

Calculation of Variable Costs:

Direct Material	(0.3 × ₹ 7,00,000)	₹ 2,10,000
Direct Labour	(0.15 × ₹ 7,00,000)	₹ 1,05,000
Factory Overhead	(0.10 × ₹ 7,00,000)	₹ 70,000
General & Administration OH	(0.02 × ₹ 7,00,000)	₹ 14,000
Selling & Distribution OH	(0.04 × ₹ 8,00,000)	₹ 32,000
		₹ 4,31,000

Calculation of P/V Ratio:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{variable costs}}{\text{Sales}} \times 100$$

$$= \frac{(₹\ 185\ X\ 5,000\ \text{units}) - ₹\ 4,31,000}{₹\ 185 \times 5,000\ \text{units}} \times 100 = 53.41\ \%$$

(i) Break-Even Sales $= \frac{Fixed\ Costs}{P/v\ Ratio} = \frac{₹\ 3,69,000}{53.41\%}$ = ₹ 6,90,882

(ii) Profits earned during the last year

= (Sales – Total Variable Costs) – Total Fixed Costs
= (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000
= ₹ 1,25,000

(iii) Margin of Safety (%) = $\frac{\text{Sales} - \text{Break even sales}}{\text{Sales}}$ X 100

$= \frac{₹\ 9,25,000 - ₹\ 6,90,882}{₹\ 9,25,000}$ X 100 = 25.31%

(iv) Profits if the sales were 10% less than the actual sales:
Profit = 90% (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000
= ₹ 4,44,600 - ₹ 3,69,000 = ₹ 75,600

Question 36

JC Ltd. has a production capacity of 80,000 units per year. Presently a company produces 60,000 units. Its cost structure is as under:

Material Cost	**₹ 6 per unit**
Labour Cost	**₹ 4 per unit**
Variable overheads	**₹ 2 per unit**

Total fixed cost ₹ 3,00,000 per annum. Present selling price ₹ 20 per unit in the month of January, 2024 company received an offer from a Japanese client to supply 20,000 units at a price of ₹ 14 per unit with the additional shipping cost of ₹ 8,000.

Required:

(i) On the basis of changes in the profit, advice to the company, whether the offer should be accepted or not?

(ii) Will your advice be different, if the customer is local one?

(iii) If Japanese client offer for supply of 30,000 units to a price of ` 14 (part supply of order not accepted) and shipping cost treated as variable cost, analyze the impact on the profit of JC Ltd., if order accepted. ***(PYP 4 Marks Sep'24)***

Answer 36

(i) Statement Showing "Cost and Profit under Both Situation"

Particulars	**Existing Production (60,000 units)**	**After Offer (80,000 units)**
	(₹)	**(₹)**
Sales		
Existing (60,000 x ₹20)	12,00,000	12,00,000
Offer (20,000 x ₹14)	-	2,80,000
Total Sales	12,00,000	14,80,000
Less: Direct Materials @ ₹6	3,60,000	4,80,000
Direct Labour @ ₹4	2,40,000	3,20,000
Variable Overheads @ ₹2	1,20,000	1,60,000
Contribution	4,80,000	5,20,000
Less: Additional Shipping cost	-	8,000
Less: Fixed Cost	3,00,000	3,00,000
Profit	**1,80,000**	**2,12,000**

Since the Profit has increased by ₹ 32,000, the proposal of the Japanese client should be accepted

(ii) Yes, the advice will be different, if the customer is local one since the company is currently selling at ₹ 20 in local market and therefore, selling at discounted price of ₹14 may impact its local market.

(iii) Statement Showing "Cost and Profit"

Particulars	**After Offer (80,000 units)**
	(₹)
Sales	

Existing (50,000 x ₹20)	10,00,000
Offer (30,000 x ₹14)	4,20,000
Total Sales	14,20,000
Less: Direct Materials @ ₹6	4,80,000
Direct Labour @ ₹4	3,20,000
Variable Overheads @ ₹2	1,60,000
Additional Shipping cost (₹8,000/20,000 units) x 30,000 units	12,000
Contribution	4,48,000
Less: Fixed Cost	3,00,000
Profit	1,48,000

If offer of Japanese client to supply 30,000 units at a price of ₹14 isaccepted, **the Profit will decrease by ₹32,000 from the current level.**

Question 37

ABC Ltd. is a well-known company for producing baby care products.
The company produces and sells two variants of organic shampoo for children: "Baby Rose" and "Baby Lily".
The sales and cost data for both products are provided below:

Particulars	Baby Rose	Baby Lily
Current demand and Sales (Number of bottles)	4,000	3,000
Production Capacity (Number of bottles)	7,500	6,000
Selling Price per bottle (₹)	600	750
Variable Costs per bottle:		
- Direct Materials (₹ 20 Per litre)	160	200
- Other Variable Costs	270	350

The fixed costs amount to ₹ 5,00,000 and ₹ 4,50,000 for Baby Rose and Baby Lily respectively. The Production Manager has informed that 1,00,000 litres of material is available for production. A dealer has approached the company and proposed to purchase both products at the existing selling prices, which are to be produced by utilizing the remaining unused material. However, he has insisted that all the bottles must be packed with eco-friendly packaging, which will result in an additional cost of ₹ 10 per bottle for the company. Presently, the company is not using eco-friendly material for packing of bottles.
Required:
Prepare a detailed statement showing the overall contribution and profit of the company after acceptance of the dealer's proposal. ***(PYP 7 Marks Sep'24)***

Answer 37
Statement showing the Overall contribution and profit of the company

Particulars	**Baby Rose**	**Baby Lily**	**Total**
	(₹)	**(₹)**	**(₹)**
Selling price per bottle	600	750	-
Less: Direct Materials	160	200	-
Other variablecosts	270	350	-
Additionalpackaging	10	10	
Contribution per bottle	**160**	**190**	-
Material required perbottle	8 litres	10	
Contribution per litreof material	**20**	**19**	
Ranking on the basis ofContribution per litreof material	I	II	
	Baby Rose (4,000 + 3,500 bottles)	Baby Lily (3,000 +1,000 bottles)	
Selling price per bottle	600	750	-
Sales Value	45,00,000	30,00,000	

Variable Cost			
Direct Materials	7,500 units x ₹160 = 12,00,000	4,000 units x ₹200 = 8,00,000	
Other Variable Costs	7,500 units x ₹270 = 20,25,000	4,000 units x ₹350 = 14,00,000	
Eco-friendly pack cost	3,500 units x ₹10 = 35,000	1,000 units x ₹10 = 10,000	
Total Variable Costs	32,60,000	22,10,000	
Contribution	4,000 units x 170 3,500 units x 160 = 12,40,000	3,000 units x 200 1,000 units x 190 = 7,90,000	20,30,000
Less: Fixed Cost	5,00,000	4,50,000	9,50,000
Profit	**7,40,000**	**3,40,000**	**10,80,000**

WN1

		Baby Rose	**Baby Lily**
Raw Material used per unit of bottle	**(a)**	8 litres (₹160/₹20)	10 litres (₹200/₹20)
Current Demand and Sales	**(b)**	4,000 bottles	3,000 bottles
Total Raw Material used	**(c = a x b)**	32,000 litres	30,000 litres

WN2

Raw Material available after current sales = 1,00,000 litres – 62,000 litres
= 38,000 litres

Since the contribution per unit of Baby Rose is higher than Baby Lily, thecompany will produce and sale Baby Rose shampoo to the dealer.

Number of units that can be produced in 38,000 litres = 38,000 litres/8 litres
= 4,750 bottles

However, the Production capacity of Baby Rose is 7,500 bottles, only 3,500bottles can be produced.

Raw materials used in 3,500 bottles = 8 litres x 3,500 bottles = 28,000 litresRemaining material = 10,000 litres

Number of Baby Lily that can be produced in 10,000 litres = 10,000 litres/10litres
= 1,000 bottles **Alternatively, Solution can also be presented in following way: Statement showing the Overall contribution and profit of the company**

Particulars	**Baby Rose**	**Baby Lily**	**Total**
	(₹)	**(₹)**	**(₹)**
Selling price per bottle	600	750	-
Less: Direct Materials	160	200	-
Other variable costs	270	350	-
Contribution per bottle Beforeadditional packaging	170	200	-
Contribution per bottle per unit of raw material Before additional packaging	21.25	20	
Ranking on the basis ofContribution per bottle per unitof raw material	I	II	

Particulars	**Current Sales (WN2)**	**Additional Salesof Baby Rose (3,500 bottles)**	**Additional Salesof Baby Lily (1,000 bottles)**	**Total**
	(₹)	**(₹)**	**(₹)**	**(₹)**
Selling price per bottle	-	600	750	-
Less: Direct Materials	-	160	200	-
Other variablecosts	-	270	350	-
Additionalpackaging	-	10	10	
Contribution per unit	-	160	190	-
Total Contribution	12,80,000	5,60,000	1,90,000	20,30,000
Less: Fixed Cost	9,50,000	-	-	9,50,000
Profit	3,30,000	5,60,000	1,90,000	10,80,000

WN1

		Baby Rose	Baby Lily
Raw Material used per unit of bottle	**(a)**	8 litres (₹160/₹20)	10 litres (₹200/₹20)
Current Demand and Sales	**(b)**	4,000 bottles	3,000 bottles
Total Raw Material used	**(c = a x b)**	32,000 litres	30,000 litres

WN2

Statement showing the current contribution and profit of the company

Particulars	**Baby Rose**	**Baby Lily**	**Total**
	(₹)	**(₹)**	**(₹)**
Selling price per bottle	600	750	-
Less: Direct Materials	160	200	-
Other variable costs	270	350	-
Contribution per bottle Beforeadditional packaging	170	200	-
Contribution per bottle per unit of raw material Before additional packaging	21.25	20	
Total Contribution Before additional packaging	6,80,000	6,00,000	12,80,000
Less: Fixed Cost	5,00,000	4,50,000	9,50,000
Profit	1,80,000	1,50,000	3,30,000

WN3

Raw Material available after current sales = 1,00,000 litres – 62,000 litres
= 38,000 litres

Since the contribution per unit of Baby Rose is higher than Baby Lily, thecompany will produce and sale Baby Rose shampoo to the dealer.

Number of units that can be produced in 38,000 litres = 38,000 litres/8 litres
= 4,750 bottles

However, the Production capacity of Baby Rose is 7,500 bottles, only 3,500bottles can be produced.

Raw materials used in 3,500 bottles = 8 litres x 3,500 bottles = 28,000 litresRemaining material = 10,000 litres

Number of Baby Lily that can be produced in 10,000 litres = 10,000 litres/10litres
= 1,000 bottles

Question 38

XYZ Ltd. is a company involved in production and construction specialised equipment and machines on the demand of customers. The company received an order for construction of a specialised machine, it had nearly completed this job relating to construction of a specialised machine, when it discovered that the customer had gone out of business. At this stage, the position of the job was as under:

	(₹)
Original cost estimate	**27,50,000**
Costs incurred so far	**24,80,000**
Costs to be incurred	**3,70,000**
Progress payment received from original customer	**15,50,000**

After searches, a new customer for the machine has been found. He is interested to take the machine, if certain modifications are carried out. The new customer wanted the machine in its original condition, but without its AI device and with certain other modifications. The costs of these additions and modifications are estimated as under:

Direct Materials (at cost)	**₹ 1,05,000**
Direct Wages Dept.: X	**35 men days**
Dept.: Y	**55 men days**
Variable Overheads	**30% of Direct Wages in each Dept.**
Delivery Costs	**₹ 15,500**

Fixed overheads will be absorbed at 50% of direct wages in each department.

The following additional information is available:

(1) The direct materials required for the modification are in stock and if not used for modification of this order, they will be used in another job in place of materials that will now cost ₹ 1,50,000.

(2) Department X is working normally and hence any engagement of labour will have to be paid at the

direct wage rate of ₹ 1,000 per man day.

(3) Department Y is extremely busy. Its direct wages rate is ₹ 1,200 per man day and it is currently yielding a contribution of ₹ 3 per rupee of direct wages.

(4) Additional supervisory required for the modification cost ₹ 80,000.

(5) The cost of the AI device that the new customer does not require is ₹ 1,35,000. If it is taken out, it can be used in another job in place of a different mechanism. The latter mechanism has otherwise to be bought for ₹ 1,05,000. The dismantling and removal of the control mechanism will take 5 man day in department X.

(6) If the conversion is not carried out, some of the materials in the original machine can be used in another contract in place of materials that would have cost ₹ 2,00,000. It would have taken 5 men days of work in department X to make them suitable for this purpose. The remaining materials will realize ₹ 1,50,000 as scrap. The drawings, which are included as part for the job can he sold for ₹ 45,000.

You are required to CALCULATE the minimum price, which the company can afford to quote for the new customer as staled above. *(RTP Jan'25)*

Answer 38

Statement of Minimum Price Which the Company Can Afford toQuote for the New Customer

	(₹)	(₹)
Cost to be incurred to bring the machine in itsoriginal condition		3,70,000
Direct Material (Replacement Value)		1,50,000
Direct Wages		
Dept. X: (35 men days × ₹1,000)	35,000	
Dept. Y: (55 men days × ₹1,200)	66,000	
Opportunity Cost of Contribution Lost byDept. Y (₹66,000 × ₹3)	1,98,000	2,99,000
Variable Overheads [30%×(₹35,000+₹66,000)]		30,300
Delivery Costs		15,500
Additional Supervisory required formodification		80,000
Saving Due to Alternative Use of AI Device		
Bought Out Price	1,05,000	
Less: Dismantling & Removal Cost (5 men day × ₹1,000)	5,000	
Less: Variable Cost (30% × ₹ 5,000)	1,500	(98,500)
Net Loss on Material Cost Savings (W.N.)		1,93,500
Opportunity Cost of Remaining Materials which can be sold as scrap		1,50,000
Opportunity Cost of Sale of Drawings		45,000
Total Minimum Price which may be quoted		12,34,800

Working Note

	(₹)
Loss on Material Cost Saving of Machine	2,00,000
Less: Conversion Cost (5 men days × ₹1,000)	5,000
Less: Variable Cost (30% × ₹5,000)	1,500
Net Loss on Material Cost Saving of Machine	1,93,500

Question 39

DISCUSS advantages of Marginal Costing. ***(RTP Jan'25)***

Answer 39

Advantages of Marginal Costing:

1. **Simplified Pricing Policy:** The marginal cost remains constant per unit of output whereas the fixed cost remains constant in total. Since marginal cost per unit is constant from period to period within a short span of time, firm decisions on pricing policy can be taken.
2. **Proper recovery of Overheads:** Overheads are recovered in costing on the basis of pre-determined rates. If fixed overheads are included on the basis of pre-determined rates, there will be under- recovery of

overheads if production isless or if overheads are more. There will be over- recovery of overheads if production is more than the budget or actual expenses are less than the estimate. This creates the problemof treatment of such under or over-recovery of overheads. Marginal costing avoids such under or over recovery of overheads.

3. **Shows Realistic Profit:** Advocates of marginal costing argues that under the marginal costing technique, the stockof finished goods and work-in-progress are carried on marginal cost basis and the fixed expenses are written off to profit and loss account as period cost. This shows the true profit of the period.
4. **How much to produce:** Marginal costing helps in the preparation of break-even analysis which shows the effect of increasing or decreasing production activity on the profitability of the company.
5. **More control over expenditure:** Segregation of expenses as fixed and variable helps the management to exercise control over expenditure. The management can compare the actual variable expenses with the budgeted variable expenses andtake corrective action through analysis of variances.
6. **Helps in Decision Making:** Marginal costing helps themanagement in taking a number of business decisions likemake or buy, discontinuance of a particular product, replacement of machines, etc.
7. **Short term profit planning:** It helps in short term profit planning by B.E.P charts.

Question 40

A Korean beverage company plans to set up a subsidiary in India to manufacture fruit juice. Based on projected annual sales of 40,000 bottles, cost analysis has provided the following estimates for the Indian subsidiary:

	Total Annual Costs (₹)	Percentage of Total Annual Cost which is Variable
Material	3,15,000	100%
Labour	1,40,000	75%
Factory Overheads	1,35,000	50%
Administrative Overheads	50,000	35%

The fruit juice produced in India will be sold through manufacturer's representatives, who will earn a commission of 10% of the sales price.

Expenses from the Korean office will not be allocated to the Indian subsidiary.

Required

(i) COMPUTE the sale price per bottle to enable the management to realise an estimated 10% profit on sale proceeds in India.

(ii) CALCULATE the break-even point in Rupee sales and also in number of bottles for the Indian subsidiary on the assumption that the sale price is ₹ 19 per bottle. ***(MTP 8 Marks Dec'24)***

Answer 40

(i) Computation of Sale Price Per Bottle

Output: 40,000 Bottles

	(₹)
Variable Cost:	
Material	3,15,000
Labour (₹ 1,40,000 × 75%)	1,05,000
Factory Overheads (₹ 1,35,000 × 50%)	67,500
Administrative Overheads (₹ 50,000 × 35%)	17,500
Commission (10% on ₹ 8,00,000) (W.N.-1)	80,000
Fixed Cost:	
Labour (₹ 1,40,000 × 25%)	35,000
Factory Overheads (₹ 1,35,000 × 50%)	67,500
Administrative Overheads (₹ 50,000 × 65%)	32,500
Total Cost	7,20,000
Profit (W.N.-1)	80,000
Sales Proceeds (W.N.-1)	8,00,000
Sales Price per bottle $\frac{8,00,000}{40,000\ bottles}$	20

(ii) Calculation of Break-even Point

Sales Price per Bottle = ₹19

Variable Cost per Bottle = $\frac{₹5,85,000 (W.N.-2)}{40,000\ bottles}$

= ₹ 14.625

Contribution per Bottle = ₹ 19 – ₹14.625

= ₹ 4.375

Break -even Point

(in number of Bottles) = $\frac{Fixed\ costs}{contribution\ per\ bottle}$

= $\frac{₹1,35,000}{₹4.375}$ = 30,857 Bottles

Break- even Point

(in Sales Value) = 30,857 Bottles × ₹ 19

= ₹ 5,86,285/-

Working Note W.N.-1

Let the Sales Price be 'x'

Comisssion = $\frac{10x}{100}$

Profit = $\frac{10\ X}{100}$

X = $6,40,000 + \frac{10\ X}{100} + \frac{10\ X}{100}$

100x - 10x - 10x = 6,40,00,000

80x = 6,40,00,000

X = 6,40,00,000 / 80

= ₹ 8,00,000

W.N.-2

Total Variable Cost

	(₹)
Material	3,15,000
Labour	1,05,000
Factory Overheads	67,500
Administrative Overheads	17,500
Commission [(40,000 Bottles x ₹20) x 10%]	80,000
Total	5,85,000

MULTIPLE CHOICE QUESTIONS

1. **Under marginal costing the cost of product includes:**
   (a) Prime costs only.
   (b) Prime costs and variable overheads.
   (c) Prime costs and fixed overheads.
   (d) Prime costs and factory overheads.

Ans: (b)

2. **Reporting under marginal costing is accomplished by:**
   (a) Treating all costs as period costs.
   (b) Eliminating the work-in-progress inventory account.
   (c) Matching variable costs against revenue and treating fixed costs as period costs.
   (d) Including only variable costs in income statement.

Ans: (c)

3. **Period costs are:**
   (a) Variable costs.
   (b) Fixed costs.
   (c) Prime costs.
   (d) Overheads costs.

Ans: (b)

4. **When sales and production (in units) are same then profit under:**
   (a) Marginal costing is higher than that of absorption costing.
   (b) Marginal cost is lower than that of absorption costing.
   (c) Marginal costing is equal to that of absorption costing.
   (d) None of the above.

Ans: (c)

5. **When sales exceed production (in units) then profit under:**
   (a) Marginal costing is higher than that of absorption costing.
   (b) Marginal costing is lower than that of absorption costing.
   (c) Marginal costing is equal than that of absorption costing.
   (d) None of above.

Ans: (a)

6. **The main difference between marginal costing and absorption costing is regarding the treatment of:**
   (a) Prime cost.
   (b) Fixed overheads.
   (c) Direct materials.
   (d) Variable overheads.

Ans: (b)

7. **Under profit volume ratio, the term profit:**
   (a) Means the sales proceeds in excess of total costs.
   (b) Here means the same thing as is generally understood.
   (c) Is a misnomer, it in fact refers to contribution i.e. (sales revenue-variable costs).
   (d) None of the above.

Ans: (c)

8. **Factors which can change the break-even point:**
   (a) Change in fixed costs.
   (b) Change in variable costs.
   (c) Change in the selling price.
   (d) All the above.

Ans: (d)

9. **If P/V ratio is 40% of sales then what about the remaining 60% of sales:**
   (a) Profit.
   (b) Fixed cost.
   (c) Variable cost.
   (d) Margin of safety.

Ans: (c)

10. **The P/V ratio of a product is 0.6 and profit is ₹ 9,000. The margin of safety is:**
   (a) ₹ 5,400
   (b) ₹ 15,000
   (c) ₹ 22,500
   (d) ₹ 3,600

Ans: (b)

11. **A company's fixed costs are ₹ 5,00,000, the selling price per unit is ₹ 200, and the variable cost per unit is ₹100. How many units must the company sell to earn the targeted profit of ₹ 2,00,000?** ***(MTP 2 Marks Aug'24)***
   (a) 2,000 units
   (b) 5,000 units
   (c) 10,000 units
   (d) 7,000 units

Ans: (d)

12. **PS Limited is facing downfall in its demand. Marketing team has suggested to reduce the selling price by 5% to compete in the market. Variable cost is 76% of the current selling price.**
You are required to find out the PN Ratio after reducing the price by 5% *(PYP 2 Marks Sep'24)*

(a) 20%
(b) 24%
(c) 25.26%
(d) 19%

Ans: (a)

13. **Ms. Gauri has the business of selling pens. She has setup this pen retailing for over 10 years with good profit volume ratio. Her average cost from the retailing is ₹ 11.25 per unit if she sells 16,000 units and is ₹ 11 per unit if she sells 20,000 units.**
For the current month, she also charged ₹ 5,000 towards depreciation and the rental payment due. The excess of sales revenue over the variable costs is ₹ 3.333 per unit.
You are required to CALCULATE Break-even Point (in units), Cash Break- even Point (in units) and Profit Volume Ratio. (RTP Jan'25)

(a) Break-even Point- 6,000 units, Cash Break-even Point- 6,000 units and Profit Volume Ratio- 33.33%
(b) Break-even Point- 6,000 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 25%
(c) Break-even Point- 4,500 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 33.33%
(d) Break-even Point- 4,500 units, Cash Break-even Point- 4,500 units and Profit Volume Ratio- 25%

Ans: (b)

14. **Mefttal Ltd. is currently operating at 60% of its total capacity which is 1.5 times than the previous year. The total capacity of the company is 2,00,000 units.**
Other information relating to the production is provided below:
(i) The total cost of production for the current year is ₹ 59,28,000, and for the previous year, it was ₹ 44,72,000.
(ii) No changes are anticipated in the cost structure for the upcoming years.
Selling price is ₹ 52 per unit and is expected to remain the same in the coming years.
You are required to CALCULATE Break-Even Point (in units). *(MTP 2 Marks Nov'24)*

(a) 1,20,000 units
(b) 40,000 units
(c) 80,000 units
(d) 1,00,000 units

Ans: (d)

15. **Due to sudden rise in demand of the product, the sales of Arrow Ltd. for current year enhanced to 3 times the average of last 4 years. The Break even point and the variable cost of the company for the current year is ₹ 1,17,00,000 and 93,60,000 respectively.**
The sales data relating to past years is given below:

Year	Sales (₹)
Year 1 (latest)	62,00,000
Year 2	50,00,000
Year 3	52,00,000
Year 4	44,00,000
Year 5	66,00,000

CALCULATE the fixed cost to the company for the current year. *(MTP 2 Marks Dec'24)*

(a) ₹ 64,35,000
(b) ₹ 48,12,453
(c) ₹ 65,34,340
(d) ₹ 46,80,000

Ans: (d)

CHAPTER 15: BUDGET & BUDGETARY CONTROL

CONCEPTS OF THIS CHAPTER

- Meaning of budget and budgetary control
- Essentials of a budget
- Objectives and importance of budget and control
- Process of preparing budgets
- Motivation in the budgeting process
- Types of budgets
- Difference between fixed and flexible budgets
- Prepare fixed and flexible budgets

LDR Questions

Q10 Q13
Q16 Q26
Q37

QUICK REVIEW OF IMPORTANT CONCEPTS

Classification of Budget

(1) Capacity wise

Fixed Budget | Flexible Budget

(2) Functions wise

Sales budget	Ending-inventory budget	Production cost budget
Production budget	Cost of goods-sold budget	Factory overhead budget
Plant utilisation budget	Selling and distribution cost budget	Cash budget
Direct-material usage budget	Administration expenses budget	Direct-labour(personnel) budget
Direct-material purchase budget	Research and development cost budget	Capital expenditure budget

(3) Master Budget

(4) Period wise

Long-term Budgets | Short-term Budgets | Current Budgets

Zero- Based Budgeting (ZBB)

It is defined as 'a method of budgeting which requires each cost element to be specifically justified, although the activities to which the budget relates are being undertaken for the first time, without approval, the budget allowance is zero'.

Stages in Zero-based budgeting

Identification and description of Decision packages	Evaluation of Decision packages
Ranking (Prioritisation) of the Decision packages	Allocation of resources

Performance Budgeting

A performance budget is one which presents the purposes and objectives for which funds are required, the costs of the programmes proposed for achieving those objectives, and quantitative data measuring the accomplishments and work performed under each programme.

Steps in Performance Budgeting

(i) Establishing a meaningful functional programme and activity classification of government operations
(ii) Bring the system of accounting and financial management in accord with this classification
(iii) Evolving suitable norms, yardsticks, work units of performance and units costs, wherever possible under each programme and activity for their reporting and evaluation

Questions & Answers

Theory Questions

Question 1

DESCRIBE the steps necessary for establishing a good budgetary control system.
(MTP 5 Marks, Apr'21, Dec'24, SM)

Answer 1

The following steps are necessary for establishing a good budgetary control system:

1. Determining the objectives to be achieved, over the budget period, and the policy or policies that might be adopted for the achievement of these objectives.
2. Determining the activities that should be undertaken for the achievement of the objectives.
3. Drawing up a plan or a scheme of operation in respect of each class of activity, in quantitative as well as monetary terms for the budget period.
4. Laying out a system of comparison of actual performance by each person, or department with the relevant budget and determination of causes for the variation, if any.
5. Ensuring that corrective action will be taken where the plan has not been achieved and, if that is not possible, for the revision of the plan.

Question 2

Fixed budgets are very simple to understand and less time-consuming, however, only flexible budgets are more realistic and practicable because it gives due consideration to behaviour of revenue and cost at different levels of activity. But still there are certain demerits of both the budgets. NARRATE the same.
(MTP 4 Marks Aug'24)

Answer 2

	Demerits of Fixed Budget
1.	It does not suite a dynamic organization and may give misleading results. A poor or good performance may remain un-noticed.
2.	It is not suitable for long period.
3.	It is also found unsuitable particularly when the business conditions are changing constantly. Accurate estimates are not possible.

	Demerits of Fixed Budget
1.	The formulation of flexible budget is possible only when there is proper accounting system maintained, perfect knowledge about the factors of production and various business circumstances is available.
2.	Flexible Budget also requires the system of standard costing in business.
3.	It is very expensive and labour oriented.

Question 3

Define the following terms:

(i) Performance Budgeting

(ii) Budget Period (PYP 2 Marks Sep'24)

Answer 3

(i) Performance budgeting: Performance budgeting (PB) involves evaluation of the performance of an organisation in the context of both specific as well as overall objectives of the organisation.
Performance Budgeting provide a meaningful relationship between estimated inputs and expected outputs as an integral part of the budgeting system. A performance budget is one which presents the

purposes and objectives for which funds are required, the costs of the programmes proposed for achieving those objectives, and quantitative data measuring the accomplishments and work performed under each programme. Thus, PB is a technique of presenting budgets for costs and revenues in terms of functions. Programmes and activities correlate the physical and financial aspect of the individual items comprising the budget.

(ii) **Budget period:** The period covered by a budget is known as budget period. There is no general rule governing the selection of the budget period. In practice the Budget Committee determines the length of the budget period suitable for the business. Normally, a calendar year or a period co-terminus with the financial year is adopted. The budget period for the calendar or financial year is then divided into shorter periods; it may be monthly or quarterly or for such periods as coincide with period of trading activity of the business.

Question 4

Explain the difference between fixed budget and flexible budget. ***(MTP 5 Marks, Aug '18 & Apr'22, SM)***

Answer 4

Difference between Fixed and Flexible Budgets:

S. No.	Fixed Budget	Flexible Budget
1.	It does not change with actual volume of activity achieved. Thus it is known as rigid or inflexible budget.	It can be re-casted on the basis of activity level to be achieved. Thus it is not rigid.
2.	It operates on one level of activity and under one set of conditions. It assumes that there will be no change in the prevailing conditions, which is unrealistic.	It consists of various budgets for different levels of activity.
3.	Here as all costs like - fixed, variable and semi-variable are related to only one level of activity so variance analysis does not give useful information.	Here analysis of variance provides useful information as each cost is analysed according to its behaviour.
4.	If the budgeted and actual activity levels differ significantly, then the aspects like cost ascertainment and price fixation do not give a correct picture.	Flexible budgeting at different levels of activity facilitates the ascertainment of cost, fixation of selling price and tendering of quotations.
5.	Comparison of actual performance with budgeted targets will be meaningless specially when there is a difference between the two activity levels.	It provides a meaningful basis of comparison of the actual performance with the budgeted targets.

Question 5

DEFINE Zero Based Budgeting and mention its various stages. ***(MTP 5 Marks, Oct'21, PYP Nov'19 5 Marks)***

Answer 5

Zero-based Budgeting: (ZBB) is an emergent form of budgeting which arises to overcome the limitations of incremental (traditional) budgeting system. Zero- based Budgeting (ZBB) is **defined** as 'a method of budgeting which requires each cost element to be specifically justified, although the activities to which the budget relates are being undertaken for the first time, without approval, the budget allowance iszero'.

ZBB is an activity based budgeting system where budgets are prepared for each activities rather than functional department. Justification in the form of cost benefits for the activity is required to be given. The activities are then evaluated and prioritized by the management on the basis of factors like synchronization with organizational objectives, availability of funds, regulatory requirement etc.

ZBB is suitable for both corporate and non-corporate entities. In case of non-corporate entities like Government department, local bodies, not for profit organizations, where these entities need to justify the benefits of expenditures on social programmers like mid-day meal, installation of street lights, provision of drinking water etc.

ZBB involves the following stages:

(i) Identification and description of Decision packages
(ii) Evaluation of Decision packages
(iii) Ranking (Prioritisation) of the Decision packages
(iv) Allocation of resources

Question 6

STATE the advantages of Zero-based budgeting. ***(MTP 5 Marks March '23 RTP Nov '20 & May '18)***

Answer 6

The advantages of zero-based budgeting are as follows:

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

Question 7

State the limitations of Budgetary Control System. ***(PYP 5 Marks, Jan '21) (MTP 4 Marks Nov'24)***

Answer 7

Limitations of Budgetary Control System

Points	Description
1. Based on Estimates	Budgets are based on a series of estimates, which are based on the conditions prevalent or expected at the time budget is established. It requires revision in plan if conditions change.
2. Time factor	Budgets cannot be executed automatically. Some preliminary steps are required to be accomplished before budgets are implemented. It requires proper attention and time of management. Management must not expect too much during the initial development period.
3. Co-operation Required	Staff co-operation is usually not available during the initial budgetary control exercise. In a decentralised organisation, each unit has its own objective and these units enjoy some degree of discretion. In this type of organisation structure, coordination among different units is required. The success of the budgetary control depends upon willing co-operation and teamwork,
4. Expensive	The implementation of budget is somewhat expensive. For successful implementation of the budgetary control, proper organisation structure with responsibility is prerequisite. Budgeting process start from the collection of information to for preparing the budget and performance analysis. It consumes valuable resources (in terms of qualified manpower, equipment, etc.) for this purpose; hence, it is an expensive process.
5. Not a substitute for management	Budget is only a managerial tool and must be intelligently applied for management to get benefited. Budgets are not a substitute for good management.

6. Rigid document	Budgets are sometime considered as rigid documents. But in reality, an organisation is exposed to various uncertain internal and external factors. Budget should be flexible enough to incorporate ongoing developments in the internal and external factors affecting the very purpose of the budget.

Question 8

What is 'Budgetary Control System' and discuss the components of the same. *(PYP 5 Marks, Dec'21, SM)*

Answer 8

Budgetary Control System: It is the system of management control and accounting in which all the operations are forecasted and planned in advance to the extent possible and the actual results compared with the forecasted and planned results.

Components of Budgetary Control System: The policy of a business for a defined period is represented by the master budget, the detailed components of which are given in a number of individual budgets called functional budgets. These functional budgets are broadly grouped under the following heads:

1. **Physical budgets:** Those budgets which contain information in quantitative terms such as the physical units of sales, production etc. This may include quantity of sales, quantity of production, inventories, and manpower budgets are physical budgets.
2. **Cost budgets:** Budgets which provides cost information in respect of manufacturing, administration, selling and distribution, etc. for example, manufacturing costs, selling costs, administration cost, and research and development cost budgets are cost budgets.
3. **Profit budgets:** A budget which enables the ascertainment of profit. For example, sales budget, profit and loss budget, etc.
4. **Financial budgets:** A budget which facilitates in ascertaining the financial position of a concern, for example, cash budgets, capital expenditure budget, budgeted balance sheet etc.

EXAM INSIGHTS: This theory question on Budgetary Control and its components. Majority of the examinees had not answered in the correct line. Performance of the examinees was below average.

Question 9

Discuss Feedback Control and Feedforward Control system of budgetary control. *(PYP 4 Marks May'24)*

Answer 9

There are two types of budgetary control system based on timing of action:

Feedback Control: The feedback system of budgetary control, the actual results for the budgeted period are collected and compared with the budgeted figures. The exercise of variance identification is done after the completion of the budget period. The variances are reported and based on the report corrective actions are taken, responsibility is fixed and based on experience, modification in future targets is implemented. As the name suggests, it is an Ex-post Corrective control system of budget.

This system of budgetary control is common in organistions where Management Information System (MIS) is not so robust and where data is obtained only after the finalisation of books of account. Though this type of control system is less expensive to maintain but has limitations.

Feedforward Control: This the opposite of feedback control system of budgetary control. It is Ex-Ante Preventive control mechanism of budgetary control. The budgets are set at the inception of the budgeted period and the actual results are continuously monitored and compared. The targets are kept realistic as far as possible and the targets are reviewed and reset if necessary.

This budgetary control system requires a robust MIS supported by integrated ERP system enabling an entity to get data as and when desired basis. This system is very expensive and beneficial for the organisations where the business environment is dynamic and information has important role in getting edge in competition and todays data warfare.

Question 10 LDR

Define Budget Manual. What are the salient features of Budget Manual?
(PYP 5 Marks, Nov 22 RTP May '21 & Nov '19, MTP 5 Marks Nov'21, SM) (PYP 5 Marks Sep'24)

Answer 10

Budget Manual: The budget manual is a booklet specifying the objectives of an organisation in relation to its strategy. The budget is made to decide how much an organisation would earn and spend and in what manner. In the budget, the organisation sets its priorities too.

Effective budgetary planning relies on the provision of adequate information to the individuals involved in the planning process. Many of these information needs are contained in the budget manual. A budget manual is a collection of documents that contains key information for those involved in the planning process CIMA London defines budget manual as, 'A document which sets out the responsibilities of the persons engaged in, the routines of, and the forms and records required for, budgetary control'.

Contents of a budget manual: Typical budget manual may include the following:

(i) A statement regarding the objectives of the organisation and how they can be achieved through budgetary control;

(ii) A statement about the functions and responsibilities of each executive, both regarding preparation and execution of budgets;

(iii) Procedures to be followed for obtaining the necessary approval of budgets. The authority of granting approval should be stated in explicit terms. Whether, one two or more signatures are required on each document should be clearly stated;

(iv) A form of organisation chart to show who are responsible for the preparation of each functional budget and the way in which the budgets are interrelated.

(v) A timetable for the preparation of each budget.

(vi) The manner of scrutiny and the personnel to carry it out;

(vii) Reports, statements, forms and other record to be maintained.

(viii) The accounts classification to be employed. It is necessary that the framework within which the costs, revenue and other financial accounts are classified must be identical both in the accounts and budget department.

(ix) The reporting of the remedial action.

(x) The manner in which budgets, after acceptance and issuance, are to be revised or amended, these are included in budgets and on which action can be taken only with the approval of top management

(xi) This will prevent the formation of a 'bottleneck' with the late preparation of one budget holding up the preparation of all others.

(xii) Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion.

(xiii) A list of the organization's account codes, with full explanations of how to use them.

(xiv) Information concerning key assumptions to be made by managers in their budgets, for example the rate of inflation, key exchange rates, etc. (Any four points)

EXAM INSIGHTS: This theory question is on defining budget manual and its salient features. Most of the examinees were unable to answer it correctly. Performance of the examinees was poor.

Practical Questions

Budget Ratios

Question 11

CALCULATE (i) Efficiency ratio (ii) Activity Ratio (iii) Capacity Ratio. The relevant data is as below: Budgeted Production 1,44,000 units
Standard Hours per unit 12
Actual Production 1,20,000 units
Actual Working Hours 12,00,000 ***(MTP 5 Marks, Mar'23, Aug '18) (Same concept different figures MTP Oct***

'19 5 Marks)

Answer 11

(i)	**Efficiency Ratio**	$= \frac{\text{Standard hour (for actual Production)}}{\text{Actual hour works}} \times 100$
		$= \frac{1,20,000 \text{ units X } 12 \text{ hrs.}}{12,00,000 \text{ hrs.}} \times 100 = 120\%$
(ii)	**Activity Ratio**	$= \frac{\text{Standard hour (for actual Production)}}{\text{Budgeted Hours}} \times 100$
		$= \frac{14,40,0000}{1,44,000 \text{ Units X } 12 \text{ hours}} \times 100 = 83.34\%$
(iii)	**Capacity Ratio**	$= \frac{\text{Actual Hours (worked)}}{\text{Budgeted Hours}} \times 100$
		$= \frac{12,00,0000 \text{ hrs}}{1,44,000 \text{ Units X } 12 \text{ hours}} \times 100 = 69.45\%$

Question 12

The following data is available for Vivit Su Ltd. for the month of February 2024:

Standard working hours	8 hours per day of 6 days per week
No. of weeks in the month	4
Maximum capacity	150 employees
Actual working	125 employees
Actual usage of Budgeted Capacity Ratio	86%
Efficiency Ratio	110%

You are required to calculate the following:

(i) Actual Hours worked.

(ii) Standard Hours for actual output.

(iii) Activity Ratio.

(iv) Standard Capacity Usage Ratio. *(PYP 4 Marks May '24)*

Answer 12

(i) Actual Hours worked

Actual Usage of Budgeted Capacity Ratio = $\frac{\text{Actual working Hours}}{\text{budgeted Hours}} \times 100$

86% = (Actual working hours÷ Budgeted hours) × 100

Budgeted hours=125 workers × 8 hours× 6 days × 4 weeks = 24,000 hours

Actual hours= 24,000 × 86% = 20,640 hours

(ii) Standard hours for actual output

Efficiency ratio = $\frac{Standard\ Hrs}{Actual\ Hrs} \times 100$

110% = Standard hours÷ Actual hours

Standard hours= 20,640 × 110% = 22,704 hours

(iii) Activity ratio = $\frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100$

= (22,704 ÷ 24,000) × 100 = 94.6%

(iv) Standard capacity usage ratio

$= \frac{\text{Budgeted Hours}}{\text{Max.possible hours in the budgeted period}} \times 100$

= {24,000 hours÷ (150 workers × 8 hours× 6 days × 4 weeks)} × 100

= (24,000 ÷ 28,800) × 100 = 83.33%

Question 13

LDR

Following information is available for DK and Co.:

Standard working hours	9 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	7,200 hours
Std. hours expected to be earned per four weeks	9,000 hours
Actual hours worked in the four- week period	6,750 hours
Standard hours earned in the four- week period	7,875 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

You are required to CALCULATE the following ratios:

(i) Efficiency Ratio
(ii) Activity Ratio
(iii) Calendar Ratio
(iv) Standard Capacity Usage Ratio
(v) Actual Capacity Usage Ratio
(vi) Actual Usage of Budgeted Capacity Ratio *(RTP Nov'22, SM)*

Answer 13

Maximum Capacity in a budget period
= 50 Employees × 9 Hrs. × 5 Days × 4 Weeks = 9,000 Hrs.
Budgeted Hours
= 40 Employees × 9 Hrs. × 5 Days × 4 Weeks = 7,200 Hrs.
Actual Hrs.
= 6,750 Hrs
Standard Hrs. for Actual Output
= 7,875 Hrs.
Budget No. of Days
= 20 Days (4 Weeks x 5 Days)
Actual No. of Days
= 20 – 1 = 19 Days

(i) $\text{Efficiency Ratio} = \frac{\text{Standard Hrs}}{\text{Standard Hrs}} \times 100 = \frac{7{,}875 \text{ hours}}{6{,}750 \text{ hours}} \times 100 = 116.67\%$

(ii) $\text{Activity Ratio} = \frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100 = \frac{7{,}875 \text{ hours}}{7{,}200 \text{ hours}} \times 100 = 109.375\%$

(iii) $\text{Calendar Ratio} = \frac{\text{Available working days}}{\text{Budgeted working days}} \times 100 = \frac{19 \text{ days}}{20 \text{ days}} \times 100 = 95\%$

(iv) $\text{Standard Capacity Usage Ratio} = \frac{\text{Budgeted Hours}}{\text{Max.possible hours in the budgeted period}} \times 100$

$= \frac{7{,}200 \text{ hours}}{9{,}000 \text{ hours}} \times 100 = 80\%$

(v) $\text{Actual Capacity Usage Ratio} = \frac{\text{Actual Hours worked}}{\text{max.possible working hours in a period}} \times 100$

$= \frac{6{,}750 \text{ hours}}{9{,}000 \text{ hours}} \times 100 = 75\%$

(vi) $\text{Actual Usage of Budgeted Capacity Ratio} = \frac{\text{Actual working Hours}}{\text{Budgeted Hours}} \times 100$

$= \frac{6{,}750 \text{ hours}}{7{,}200 \text{ hours}} \times 100 = 93.75\%$

Question 14

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

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

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

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

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

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

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

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

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

COMMENT on the comparative results. ***(RTP Nov'21, SM)***

Answer 14

Budget Showing Current Position and Position for 2020-21

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

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

Question 15

The information of Z Ltd. for the year ended 31st March 2021 is as below:

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

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

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

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as:
Product X – Rs. 40 per unit and Product Y- Rs. 70 per unit.
For the FY 2021-22, it is expected that demand for product X and Y will fall by 20% & 10% respectively. It is also expected that direct wages cost will raise by 20% and other fixed costs by 10%. Products will be required to be sold at a discount of 20%.
You are required to:
(i) PREPARE profitability statement for the FY 2020-21
(ii)* PREPARE a budget for the FY 2021-22. *(MTP 10 Marks, Mar'21) (RTP Nov'20)

Answer 15
(i) Product-wise Profitability Statement for the FY 2020-21:

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
Output (units)	8,000	4,000	
Selling price per unit	600	550	
Sales value	48,00,000	22,00,000	70,00,000
Direct material	11,20,000 (₹140 × 8,000 units)	6,30,000 (₹157.50 × 4,000 units)	17,50,000
Direct wages	7,20,000 (₹90 × 8,000 units)	5,30,000 (₹132.5 × 4,000 units)	12,50,000
Variable factory overheads*	5,47,200 (76% of Rs. 7,20,000)	4,02,800 (76% of Rs. 5,30,000)	9,50,000
Other variable costs	3,20,000 (₹40 × 8,000 units)	2,80,000 (₹70 × 4,000 units)	6,00,000
Contribution	20,92,800	3,57,200	24,50,000
Fixed factory overheads	-	-	12,00,000
Other fixed costs	-	-	4,00,000
Profit			**8,50,000**

* Percentage absorption of variable factory overhead on the basis of direct wages

$= \frac{9,50,000}{12,50,000} \times 100 = 76\%$

(ii) Preparation of Budget for the FY 2021-22:

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

Question 16

LDR

PQR Limited manufactures three products - Product X, Product Y and Product Z. The output for the current year is 2,50,000 units of Product X, 2,80,000 units of Product Y and 3,20,000 units of Product Z respectively. Selling price of Product X is 1.25 times of Product Z whereas Product Y can be sold at double the price at which product Z can be sold. Product Z can be sold at a profit of 20% on its marginal cost.

Other information are as follows:

	Product X	Product Y	Product Z
Direct Material Cost (Per unit)	₹ 20	₹ 20	₹ 20
Direct Wages Cost (per unit)	₹ 16	₹ 24	₹ 16

Raw material used for manufacturing all the three products is the same. Direct Wages are paid @ ₹ 4 per labour hour,

Total overhead cost of the company is ₹ 52,80,000 for the year, out of which ₹ 1 per labour hour is variable and the rest is fixed.

In the next year it is expected that sales of product X and product Z will increase by 12% and 15% respectively and sale of product Y will decline by 5%. The total overhead cost of the company for the next year is estimated at ₹ 55,08,000. The variable cost of ₹ 1 per labour hour remains unchanged.

It is anticipated that all other costs will remain same for the next year and there is opening and closing stock. Selling Price per unit of each product will remain unchanged in the next year.

Required:

Prepare a budget showing the current position and the position for the next year clearly indicating the total product-wise contribution and profit for the company as a whole. ***(PYP 10 Marks, May'23)***

Answer 16

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	4	6	4	

	(Refer WN-1)				
D	Total variable cost/ Marginal cost per unit [A+B+C]	40	50	40	
E	Add: Profit [20% of D]	-	-	8	
F	Selling price unit [D+E]	-	-	48	
G	Price weight	1.25	2	1	
H	Selling price per unit [Selling price of Product Z × G]	60	96	48	
I	Contribution per unit [H-D]	20	46	8	
J	Quantity to be sold	2,50,000	2,80,000	3,20,000	
K	Total Contribution [J×I]	50,00,000	1,28,80,000	25,60,000	2,04,40,000
L	Fixed Overheads [Refer WN-1]				13,20,000
M	Profit				1,91,20,000

Working Notes:

1. Segregation of Overheads into variable and fixed in current year

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Total overhead cost	-	-	-	52,80,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,50,000	2,80,000	3,20,000	
D	Total variable overhead cost [B×C]	10,00,000	16,80,000	12,80,000	39,60,000
E	Fixed overhead cost [A-D]				13,20,000

ii) Budget showing next year's position of total product wise contribution and profitability

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Selling price per unit	60	96	48	
B	Contribution per unit	20	46	8	
C	Quantity to be sold	2,80,000 [112% of 2,50,000]	2,66,000 [95% of 2,80,000]	3,68,000 [115% of 3,20,000]	
D	Total Contribution [B×C]	56,00,000	1,22,36,000	29,44,000	2,07,80,000
	Fixed Overheads [Refer WN-2]				13,20,000
	Profit				1,94,60,000

Working Notes:

2. Segregation of Overheads into variable and fixed in next year

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Total overhead cost	-	-	-	55,08,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,80,000	2,66,000	3,68,000	
D	Total variable	11,20,000	15,96,000	14,72,000	41,88,000

	overhead cost [B×C]				
E	Fixed overhead cost [A-D]				13,20,000

EXAM INSIGHTS: It is a numerical question based on Budgetary Control. Most of the examinees we're not able to segregate total overheads into fixed and variable overhead; hence, the remaining part of the question was not calculated correctly. The overall performance of the examinees were below average.

Flexible Budget

Question 17

(Includes concepts of Standard Costing)

Tricon Co. furnishes the following information for the month of September, 2020.

Particulars	Budget Details	Static Budget	Actual
Units produced & Sold		4,000	3,200
		(₹)	(₹)
Direct Material	3 kg p.u. @ Rs. 30 per kg.	3,60,000	3,10,000
Direct Labour	1 hr. p.u. @ Rs. 72 per hr.	2,88,000	2,25,600
Variable Overhead	1 hr. p.u. @ Rs. 44 per hr.	1,76,000	1,47,200
Fixed Overhead		1,80,000	1,68,000
Total Cost		10,04,000	8,50,800
Sales		12,00,000	8,96,000
Profit		1,96,000	45,200

During the month 10,000 kg. of materials and 3,100 direct labour hours were utilized.

Required:

(i) PREPARE a flexible budget for the month.

(ii) DETERMINE the material usage variance and the direct labour rate variance for the actual vs the flexible budget. ***(MTP 10 Marks, Apr '21)***

Answer 17

(i) Statement Showing "Flexible Budget for 3,200 units Activity Level"

Particulars	Amount (₹)	Amount (₹)
Sales $\left(\frac{₹\ 12,00,000}{4,000\ \text{units}} \times 3,200\ \text{units}\right)$		9,60,000
Less: Variable Cost		
Direct Material (3,200 units × 3 kg. p.u. × Rs. 30 per kg.)	2,88,000	
Direct Labour (3,200 units × 1 hr. p.u. × Rs. 72 per hr.)	2,30,400	
Variable Overhead (3,200 units × 1 hr. p.u. × Rs. 44 per hr.)	1,40,800	(6,59,200)
Contribution		3,00,800
Less: Fixed Overhead		1,80,000
Profit		1,20,800

(ii) Computation of Variances

Material Usage Variance	= Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity
	= (SQ × SP) – (AQ × SP)
	Or
	= (SQ – AQ) × SP
	= [(3,200 units × 3 kg.) – 10,000 kg.] × ₹ 30.00
	= ₹ 12,000 (A)
Labour Rate Variance	= Standard Cost of Actual Time – Actual Cost
	= (SR × AH) – (AR × AH)
	Or
	= (SR – AR) × AH

	= [(Rs. 72- Rs. 2,25,600/3,100 hrs.) x 3,100 hrs.]
	= ₹ 2,400 (A)

Question 18

A firm has a total capacity of producing 1,00,000 units of an item. The budgeted expenses at this level of activity are as under:

	Per unit (₹)
Direct Materials	**650**
Direct Wages	**325**
Direct Expenses	**125**
Variable overheads	**50**
Fixed Production Overheads	**25**
Selling and Distribution Overheads (20% fixed)	**25**
Administrative Expenses (100% fixed)	**60**
Total	**1,260**

The selling price is ₹ 1,750 per unit and is anticipated to remain constant.

You are required to PREPARE a flexible budget, on the basis of marginal costing, for 60,000 and 75,000 units of output level showing the profit and P/V Ratio. ***(MTP 10 Marks, Sep'22)***

Answer 18

Workings -

1. **Fixed Production overheads (given) = ₹ 25 per unit**

   So, at 1,00,000 units capacity, it will be ₹ 25,00,000 (1,00,000 units x ₹ 25)

2. **Selling and distribution overheads:**

Given (1,00,000 units x ₹ 25)	= ₹ 25,00,000
So, Fixed component	= ₹ 25,00,000 × 20% = ₹ 5,00,000
Hence, variable component	= ₹ 25,00,000 - ₹ 5,00,000 = ₹ 20,00,000
Variable per unit	= ₹ 20,00,000/1,00,000 units
	= ₹ 20 per unit

Flexible Budget

Particulars	Per unit (₹)	Output Level	
		60,000 units (₹)	75,000 units (₹)
Sales (A)	1,750	10,50,00,000	13,12,50,000
Variable costs:			
Direct Material	650	**3,90,00,000**	**4,87,50,000**
Direct Wages	325	**1,95,00,000**	**2,43,75,000**
Direct expenses	125	**75,00,000**	**93,75,000**
Variable overheads	50	**30,00,000**	**37,50,000**
Selling and distribution overheads	20	12,00,000	15,00,000
Total Variable cost **(B)**	1,170	7,02,00,000	8,77,50,000
Contribution (C = A - B)		**3,48,00,000**	**4,35,00,000**
Fixed costs:			
Production overheads		25,00,000	25,00,000
Administrative overheads		60,00,000	60,00,000
Selling and distribution overheads		**5,00,000**	**5,00,000**
Total Fixed cost **(D)**		90,00,000	90,00,000
Profit (C-D)		**2,58,00,000**	**3,45,00,000**

P/V Ratio = (₹ 3,48,00,000/₹ 10,50,00,000) x 100 = 33.143%

OR

P/V Ratio = (₹ 4,35,00,000/₹ 13,12,50,000) x 100 = 33.143%

Question 19

Savi Limited is currently working at 80% of its capacity level and furnished the following information for current period:

Production / Sales	96,000 units
Direct Variable Cost	₹ 20 per unit
Factory Overheads	₹ 8,40,000
Administrative Overheads (Fixed)	₹ 20,60,000
Sales Commission	2% of Sales Value
Transportation Expenses	₹ 4,000 per truck (Loading Capacity 4,000 units)

The selling price of the product is ₹ 120 per unit and Factory Overheads are 80% variable in nature.
The management of Savi Limited has come.to know that there will be high fluctuations in the demand of the product in upcoming year and it would not be an easy task to predict the demand. Selling price per unit will not be affected by demand fluctuations.
Savi Limited has decided to prepare a flexible budget for. the product at 60%, 80% and 100% capacity level.
You are required to prepare the Flexible Budget showing total cost of the product at each level.
(PYP 6 Marks Sep'24)

Answer 19
Flexible Budget of Savi Ltd

	60% (72,000 units) (₹)	80% (96,000 units) (₹)	100% (1,20,000 units) (₹)
Sales **(A)**	120.00	120.00	120.00
Variable Costs:			
- Direct Variable Cost	20.00	20.00	20.00
- Variable Factory Overheads (WN1)	7.00	7.00	7.00
- Sales Commission (2%)	2.40	2.40	2.40
- Transportation Expenses	1.00	1.00	1.00
Total Variable Cost **(B)**	30.40	30.40	30.40
Contribution Per Unit **(C) =(A – B)**	89.60	89.60	89.60
Total Contribution **(D)**	64,51,200.00	86,01,600.00	1,07,52,000.00
Fixed Costs:			
- Administrative Overheads (100%)	20,60,000.00	20,60,000.00	20,60,000.00
- Factory Overheads(20%)	1,68,000.00	1,68,000.00	1,68,000.00
Total Fixed Costs **(E)**	22,28,000.00	22,28,000.00	22,28,000.00
Profit **(D-E)**	42,23,200.00	63,73,600.00	85,24,000.00
Total Cost	**44,16,800.00**	**51,46,400.00**	**58,76,000.00**

WN1:

Variable factory Overheads = ₹8,40,000 x 80% = ₹ 6,72,000
Variable factory Overheads per unit = ₹6,72,000/96,000 units = ₹7

Question 20

The Accountant of KPMR Ltd. has prepared the following budget for the coming year 2022 for its two products 'AYE' and 'ZYE':

Particulars	Product 'AYE'	Product 'ZYE'
Production and Sales (in Units)	4,000	3,000
	Amount (in ₹)	Amount (in ₹)
Selling Price per unit	200	180
Direct Material per unit	80	70

Direct Labour per unit	40	35
Variable Overhead per unit	20	25
Fixed Overhead per unit	10	10

After reviewing the above budget, the management has called the marketing team for suggesting some measures for increasing the sales. The marketing team has suggested that by promoting the products on social media, the sales quantity of both the products can be increased by 5%. Also, the selling price per unit will go up by 10%. But this will result in increase in expenditure on variable overhead and fixed overhead by 20% and 5% respectively for both the products.

You are required to prepare flexible budget for both the products:

(i) Before promotion on social media,

(ii) After promotion on social media. ***(PYP 5 Marks, Dec'21)***

Answer 20

(i) Flexible Budget (before promotion)

	Particulars	Product 'AYE'	Product 'ZYE'	Total
	Production & Sales (units)	4,000	3,000	
		Amount (₹)	Amount (₹)	Amount (₹)
A.	Sales Value	8,00,000 (₹ 200×4,000)	5,40,000 (₹ 180×3,000)	13,40,000
B.	Direct Materials	3,20,000 (₹ 80 × 4,000)	2,10,000 (₹70 × 3,000)	5,30,000
C.	Direct labour	1,60,000 (₹ 40 × 4,000)	1,05,000 (₹ 35 × 3,000)	2,65,000
D.	Variable Overheads	80,000 (₹ 20 × 4,000)	75,000 (₹ 25 × 3,000)	1,55,000
E.	Total Variable Cost (B+C+D)	5,60,000	3,90,000	9,50,000
F.	Contribution (A-E)	2,40,000	1,50,000	3,90,000
G.	Fixed Overhead	40,000 (₹10 × 4,000)	30,000 (₹10 × 3,000)	70,000
H.	Profit (F-G)	2,00,000	1,20,000	3,20,000
	Profit per unit	50	40	

(ii) Flexible Budget (after promotion)

	Particulars	Product 'AYE'	Product 'ZYE'	Total
	Production & Sales (units)	4,200 (4,000×105%)	3,150 (3,000×105%)	
		Amount (₹)	Amount (₹)	Amount (₹)
A.	Sales Value	9,24,000 (₹ 220 × 4,200)	6,23,700 (₹ 198 × 3,150)	15,47,700
B.	Direct Materials	3,36,000 (₹ 80 × 4,200)	2,20,500 (₹ 70 × 3,150)	5,56,500
C.	Direct labour	1,68,000 (₹ 40 × 4,200)	1,10,250 (₹ 35 × 3,150)	2,78,250
D.	Variable Overheads	1,00,800 (₹ 24 × 4,200)	94,500 (₹ 30 × 3,150)	1,95,300
E.	Total Variable Cost (B+C+D)	6,04,800	4,25,250	10,30,050
F.	Contribution (A-E)	3,19,200	1,98,450	5,17,650
G.	Fixed Overhead	42,000 (₹ 40,000 × 105%)	31,500 (₹ 30,000 × 105%)	73,500
H.	Profit (F-G)	2,77,200	1,66,950	4,44,150
	Profit per unit	66	53	

Question 21

Aman International School has a total of 180 students consisting of 6 sections with 30 students per section. The school plans for a picnic around the city during the week-end to places such as Prayag zoo, the Capi Park, Azad planetarium etc. A private transport operator has come forward to lease out the buses for taking the students. Each bus will have a maximum capacity of 50 (excluding 2 seats reserved for the teachers accompanying the students). The school will employ two teachers for each bus, paying them an allowance of ₹ 500 per teacher. It will also lease out the required number of buses. The following are the other cost estimates:

	Cost per student (₹)
Breakfast	50
Lunch	100
Tea	10
Entrance fee at zoo	20

Rent ₹ 6500 per bus.
Special permit fee ₹ 500 per bus.
Block entrance fee at the planetarium ₹ 2500.
Prizes to students for games ₹ 500.
No cost are incurred in respect of the accompanying teachers (except the allowance of ₹ 500 per teacher).
You are required to PREPARE:

(a) A flexible budget estimating the total cost for the levels of 60, 90,120,150 and 180 students. Each item of cost is to be indicated separately.
(b) COMPARE the average cost per student at these levels.
(c) WHAT will be your conclusions regarding the break-been level of student if the school proposes to collect ₹ 400 per student? ***(MTP 10 Marks, Apr'24)***

Answer 21

(a) Flexible Budget for different levels

	₹	₹	₹	₹	₹
No. of Students VARIABLE COST	60	90	120	150	180
Breakfast	3000	4500	6000	7500	9000
Lunch	6000	9000	12000	15000	18000
Tea	600	900	1200	1500	1800
Entrance fee	1200	1800	2400	3000	3600
Sub-total (A)	10800	16200	21600	27000	32400
Variable cost/unit	180	180	180	180	180
SEMI-VARIABLE COST					
Bus rent	13000	13000	19500	19500	26000
Special permit fee	1000	1000	1500	1500	2000
Allowance for teachers	2000	2000	3000	3000	4000
Sub-total (B)	16000	16000	24000	24000	32000
FIXED COST					
Block entrance fee	2500	2500	2500	2500	2500
Prize to students	500	500	500	500	500
Sub total (C)	3000	3000	3000	3000	3000
Total cost (A + B + C)	29,800	35,200	48,600	54,000	67,400

(b)

Cost per student	496.67	391.11	405.00	360.00	374.44

(c)

Break-even level	₹
Collection per students	400
Less Variable Cost	180
Contribution	220

Since semi-fixed costs relate to a block of 50 students, the fixed and semi-variable cost for three level will

be:

Level of Student	51–100	101–150	151-200
Fixed + Semi–variable cost (₹)	19,000	27,000	35,000
Contribution per unit (₹)	220	220	220
Break Even level of students	86	123	159

Question 22

BT Ltd. achieves sale of ₹ 73,12,500 with COGS of 40% while operating at 75% of its normal capacity during the current financial year.

The information relating to Administration, Selling and Distribution costs is given below:

Administration costs:

Office salaries	**₹ 11,70,000**
General expenses	**5 per cent of COGS**
Depreciation	**₹ 97,500**
Rates and taxes	**₹ 1,13,750**

Selling costs:

Salaries	**8 per cent of sales**
Travelling expenses	**5 per cent of COGS**
Sales office expenses	**2.5 per cent of COGS**
General expenses	**2.5 per cent of COGS**

Distribution costs:

Wages	**₹ 1,95,000**
Rent	**1 per cent of sales**
Other expenses	**10 per cent of COGS**

Considering some of the expenses like office salaries, depreciation, rates and taxes, and wages, to remain the same irrespective of the level of activity, as these expenses are fixed in nature, PREPARE flexible administration, selling and distribution costs budget, operating at 85%, 100% and 115% of normal capacity. ***(RTP Jan'25)***

Answer 22

Flexible Budget of BT Ltd.

Particulars	**75% (₹)**	**85% (₹)**	**100% (₹)**	**115% (₹)**
Sales	73,12,500	82,87,500	97,50,000	1,12,12,500
COGS (40% of Sales)	29,25,000	33,15,000	39,00,000	44,85,000
AdministrationCosts:				
Office Salaries (fixed)	11,70,000	11,70,000	11,70,000	11,70,000
General expenses (5% of COGS)	1,46,250	1,65,750	1,95,000	2,24,250
Depreciation (fixed)	97,500	97,500	97,500	97,500
Rent and rates (fixed)	1,13,750	1,13,750	1,13,750	1,13,750
(A) Total Adm. Costs	15,27,500	15,47,000	15,76,250	16,05,500
Selling Costs:				
Salaries (8% of sales)	5,85,000	6,63,000	7,80,000	8,97,000
Travelling expenses (5% of COGS)	1,46,250	1,65,750	1,95,000	2,24,250
Sales office (2.5% of COGS)	73,125	82,875	97,500	1,12,125
General expenses (2.5% of COGS)	73,125	82,875	97,500	1,12,125
(B) Total Selling Costs	8,77,500	9,94,500	11,70,000	13,45,500
Distribution Costs:				
Wages (fixed)	195,000	195,000	195,000	195,000
Rent (1% of sales)	73,125	82,875	97,500	1,12,125
Other expenses (10% of COGS)	2,92,500	3,31,500	3,90,000	4,48,500

(C) Total Distribution Costs	5,60,625	6,09,375	6,82,500	7,55,625
Total Costs (A + B + C)	**29,65,625**	**31,50,875**	**34,28,750**	**37,06,625**

Question 23

A factory is currently working at 60% capacity and produces 12,000 units of a product. Management is thinking to increase the working capacity either to 70% or 90% level. It is estimated that at both the levels, it will be able to sell all the produced units. The other details are as under:

- **At 70% capacity, the cost of raw materials increases by 4% and the selling price falls by 3%.**
- **At 90% capacity, the cost of raw materials increases by 5% and selling price falls by 4%.**
- **At 60% capacity, the product cost is ₹ 360 per unit and it is sold at ₹ 400 per unit.**
- **The unit cost of 360 consists of the following:**

Material	**₹ 200**
Labour	**₹ 60**
Factory overhead	**₹ 60 (50 % fixed)**
Administrative & Selling overhead	**₹ 40 (60 % fixed)**

Additional advertising cost of ₹ 20,000 is to be incurred for selling the product above 80% capacity.

You are required to:

(i) Calculate the profits of the company when the factory works at 60%, 70% and 90% capacity level.

(ii) Offer your comments regarding increase in the capacity based on profit calculated.

(PYP 7 Marks May '24)

Answer 23

(i) Expense Budget at 60%, 70% & 90% level

	60% (12,000 units)		70% (14,000 units)		90% (18,000 units)	
	Per unit (₹)	Amount (₹)	Per unit (₹)	Amount (₹)	Per unit (₹)	Amount (₹)
Sales **(A)**	400	48,00,000	388	54,32,000	384	69,12,000
Variable Costs:						
Direct Material	200	24,00,000	208	29,12,000	210	37,80,000
Direct Wages	60	7,20,000	60	8,40,000	60	10,80,000
Variable Factory Overheads	30	3,60,000	30	4,20,000	30	5,40,000
Variable Administrative & Selling Overheads	16	1,92,000	16	2,24,000	16	2,88,000
Total Variable Cost **(B)**	306	36,72,000	314	43,96,000	316	56,88,000
Contribution **(C)=(A−B)**	94	11,28,000	74	10,36,000	68	12,24,000
Fixed Costs:						
Fixed Factory Overheads (50%)	--	3,60,000	--	3,60,000	--	3,60,000
Fixed Administrative & Selling Overheads (60%)	--	2,88,000	--	2,88,000	--	2,88,000
Adverting Cost	--	--	--	--	--	20,000
Total Fixed Costs **(D)**	--	6,48,000	--	6,48,000	--	6,68,000
Profit **(C – D)**	--	4,80,000	--	3,88,000	--	5,56,000

(ii) Comment: Increase of production capacity to 90% is likely to increase the profit to maximum of ₹ 5,56,000 due to increase in contribution while fixed cost is slightly increased due to in advertising cost. At 70% capacity, profit is reduced to minimum of ₹ 3,88,00 due to decrease in selling price by 3% along with increase in raw material cost by 4% resulting in decrease of contribution. Therefore, it is recommended that factory should operate at 90% capacity.

Question 24

SP Ltd. has prepared budget for the coming year for its two products A and B.

	Product A (₹)	Product B (₹)
Production & Sales unit	6,000 units	9,000 units
Raw material cost per unit	60.00	42.00
Direct labour cost per unit	30.00	18.00
Variable overhead per unit	12.00	6.00
Fixed overhead per unit	8.00	4.00
Selling price per unit	120.00	78.00

After some marketing efforts, the sales quantity of the Product A & B can be increased by 1,500 units and 500 units respectively but for this purpose the variable overhead and fixed overhead will be increased by 10% and 5% respectively for the both products.

You are required to PREPARE flexible budget for both the products:

(i) Before marketing efforts

(ii) After marketing efforts *(MTP 5 Marks, Apr'23 & Mar'19, RTP May'19)*

Answer 24

(i) Flexible Budget before marketing efforts:

	Product A (₹)		Product B (₹)	
	6,000 units		9,000 units	
	Per unit	Total	Per unit	Total
Sales	120.00	7,20,000	78.00	7,02,000
Raw material cost	60.00	3,60,000	42.00	3,78,000
Direct labour cost per unit	30.00	1,80,000	18.00	1,62,000
Variable overhead per unit	12.00	72,000	6.00	54,000
Fixed overhead per unit	8.00	48,000	4.00	36,000
Total cost	110.00	6,60,000	70.00	6,30,000
Profit	10.00	60,000	8.00	72,000

(ii) Flexible Budget after marketing efforts:

	Product A (₹)		Product B (₹)	
	7,500 units		9,500 units	
	Per unit	Total	Per unit	Total
Sales	120.00	9,00,000	78.00	7,41,000
Raw material cost	60.00	4,50,000	42.00	3,99,000
Direct labour cost per unit	30.00	2,25,000	18.00	1,71,000
Variable overhead per unit	13.20	99,000	6.60	62,700
Fixed overhead per unit	6.72	50,400	3.98	37,800
Total cost	109.92	8,24,400	70.58	6,70,500
Profit	10.08	75,600	7.42	70,500

Question 25

Soya B Limited is presently operating at 50% capacity and producing 50,000 units. The entire output is sold at a price of Rs. 180 per unit. The cost structure at the 50% level of activity is as under:

	(₹)
Direct Material	60 per unit
Direct Wages	20 per unit
Variable Overheads	20 per unit
Direct Expenses	12 per unit
Factory Expenses (30% fixed)	16 per unit
Selling and Distribution Exp. (85% variable)	10 per unit
Office and Administrative Exp. (100% fixed)	6 per unit

The company anticipates that the variable costs will go up by 20% and fixed costs will go up by 10%. You are required to prepare an Expense budget, based on marginal cost for the company at 50%,75% and 100% level of activity and find out the profits at respective levels. ***(MTP 10 Marks, Mar'23, March '18)***
(Same concepts different figures MTP 10 Marks May'20, SM)

Answer 25

Expense Budget of Soya B Ltd. for the period

	Per unit (₹)	50,000 units	75,000 units	1,00,000 units
		Amount (₹)	Amount (₹)	Amount (₹)
Sales **(A)**	180	90,00,000	1,35,00,000	1,80,00,000
Less: Variable Costs:				
- Direct Material	72	36,00,000	54,00,000	72,00,000
- Direct Wages	24	12,00,000	18,00,000	24,00,000
- Variable Overheads	24	12,00,000	18,00,000	24,00,000
- Direct Expenses	14.4	7,20,000	10,80,000	14,40,000
- Variable factory expenses (70% of Rs 16 p.u.)x 120%	13.44	6,72,000	10,08,000	13,44,000
- Variable Selling & Dist. exp. (85% of Rs 10 p.u.)x120%	10.2	5,10,000	7,65,000	10,20,000
Total Variable Cost **(B)**	158.04	79,02,000	1,18,53,000	1,58,04,000
Contribution **(C) = (A – B)**	21.96	10,98,000	16,47,000	21,96,000
Less: Fixed Costs:				
- Office and Admin. exp. (100%)	--	3,30,000	3,30,000	3,30,000
- Fixed factory exp. (30%)	--	2,64,000	2,64,000	2,64,000
- Fixed Selling & Dist. exp. (15%)	--	82,500	82,500	82,500
Total Fixed Costs **(D)**	--	6,76,500	6,76,500	6,76,500
Profit **(C – D)**	--	4,21,500	9,70,500	15,19,500

Question 26

LDR

M Ltd. is a public sector undertaking (PSU), produces a product A. The company is in process of preparing its revenue budget for the year 2024. The company has the following information which can be useful in preparing the budget:

(i) **It has anticipated 12% growth in sales volume from the year 2023 of 4,20,000 tonnes.**

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

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

(iv) **The projected increase in WPI for 2024 is 4%**

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

(vi) **85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is ₹ 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2024 and it is expected that a 15% increase in pay will be given.**

(vii) **The casual employees are getting a daily wage of ₹ 850. The wages in linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2024.**

(viii) **Power cost for the year 2023 is ₹ 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.**

(ix) **During the year 2023, the company has paid ₹ 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.**

(x) **During the year 2023, the company has paid ₹ 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2024.**

(xi) **During the year 2023, the company has paid ₹ 6,00,000 for car hire charges (excluding fuel cost). In year**

2024, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.

(xii) Depreciation on fixed assets for the year 2023 is ₹ 80,40,00,000 and it will be 15% lower in 2024.

You being an associate to the budget controller of the company, PREPARE Revenue (Flexible) budget for the year 2024 and also show the budgeted profit/ loss for the year.*(RTP May'24 & May '22)*

Answer 26

Revenue Budget (Flexible Budget) of M Ltd. for the Year 2024

	Particulars	PY 2023	CY 2024
A	Sales Volume (Tonnes)	4,20,000	4,70,400 [112%×4,20,000]
B	Selling Price per tonne (₹)	23,000	23,000
		(₹ in lakh)	**(₹ in lakh)**
C	**Sales value [A×B]**	**96,600**	**1,08,192**
D	**Raw material Cost:**		
(i)	Qty. of Material [2.3 tonnes × A] (tonnes)	9,66,000	10,81,920
(ii)	Price per tonne (₹)	4,500	4,500
(iii)	**Total raw materialcost [(i)×(ii)]**	**43,470**	**48,686.40**
E	**Wages & Salary Cost:**		
(i)	Wages to casualemployees (15%×6,000 = 900 employees)	2,386.80 [900×26×12×₹850]	2,508.47 [900×26×12×₹893.33]
(ii)	Salary to permanentemployees (85%×6,000 = 5,100 employees)	47,736 [5100×26×12×₹3,000]	51,316.20 [(5100×26×6×₹3,000) + (5100×26×6×₹3,450)]
(iii)	**Total wages & salary[(i)+(ii)+(iii)]**	**50,122.80**	**53,824.67**
F	**Power cost:**		
(i)	For production (units)	4,20,000 [60%×7,00,000]	4,70,400 [112%×4,20,000]
(ii)	For employees & offices (units) [40%×7,00.000]	2,80,000	2,80,000
(iii)	Total Power consumption (units) [(i)+(ii)]	7,00,000	7,50,400
(iv)	Power rate per unit (₹) [₹42,00,000÷7,00,000]	6.00	6.00
(v)	Total power cost [(iii)×(iv)]	**42**	**45.024**
G	**Safety and maintenance Cost**	**60**	**67.20 [112%×4,20,000]**
H	**Diesel cost**	**1.2**	**-**
I	**Car Hire charge:**		
(i)	Car hire charge	6	6
(ii)	Fuel reimbursement cost	-	1.38 [115%×1.2]
(iii)	GST@5% on RCM basis [5%× (I +ii)]	-	0.369
(iv)	**Total Car hire charge cost [(i)+(ii)+(iii)]**	**6**	**7.749**
J	**Depreciation**	**8,040**	**6,834 [85%×8040]**
K	Total Cost [Sum of D to J]	1,01,742	1,09,465.043
L	**Profit/ (Loss) [C-L]**	**(5,142)**	**(1273.043)**

Question 27

PPP Ltd. is currently operating at 80% of its capacity producing 80,000 units. For the past two years, the production is increasing by 10% of its capacity consistently. The cost details are as follows:

	Year 3	Year 2	Year 1 (Current year)
	(₹)	(₹)	(₹)
Direct Materials	12,00,000	14,00,000	16,00,000
Direct Labour	6,00,000	7,00,000	8,00,000
Factory Overheads	3,20,000	3,40,000	3,60,000
Selling Overheads	3,40,000	3,80,000	4,20,000
Administrative Overheads	1,60,000	1,60,000	1,60,000
	26,20,000	29,80,000	33,40,000

The company is planning for 90% capacity level for next year.

Additional information:

Due to increase in demand of the raw material, the distributor is expected to increase the price by 10% from the next year.

At the beginning of the current year, the dispute occurred between workers and employees regarding wages which lead them to go on strike. Later on, they settled for 20% increase in wages from next year.

Following increases in overhead cost are expected for next year:

Variable Factory Overheads	5%
Fixed Factory Overheads	10%
Variable Selling Overheads	10%
Fixed Selling Overheads	15%
Administrative Overheads	15%

Profit is estimated @ 25% on total cost.

You are required to PREPARE flexible budget for the next year at 90% level of capacity.

Also ascertain profit and contribution. *(MTP 7 Marks Aug'24)*

Answer 27

PPP Ltd.

Budget for 90% capacity level for the next year

Budgeted production (units)		**90,000**
	Per Unit (₹)	**Amount (₹)**
Direct Material (note 2)	22	19,80,000
Direct Labour (note 3)	12	10,80,000
Variable factory overhead (note 4)	2.10	1,89,000
Variable selling overhead (note 5)	4.40	3,96,000
Variable cost	**40.50**	**36,45,000**
Fixed factory overhead (note 4)		2,20,000
Fixed selling overhead (note 5)		1,15,000
Administrative overhead (note 6)		1,84,000
Fixed cost		**5,19,000**
Total cost		**41,64,000**
Add: Profit 25% on total cost		10,41,000
Sales		**52,05,000**
Contribution (Sales – Variable cost)		**15,60,000**

Working Notes:

1. **At 80% level of capacity (current year), the production is 80,000 units.**
   Thus, total level of capacity is 1,00,000 units.
   Therefore, Year 2 is at 70% capacity and Year 3 is at 60% capacity as the production is increasing by 10% of its capacityconsistently.
2. **Direct Material**

	(₹)		(₹)
80% Capacity	16,00,000	70% Capacity	14,00,000
70% Capacity	14,00,000	60% Capacity	12,00,000
10% changein capacity	**2,00,000**	10% change incapacity	**2,00,000**

For 10% increase in capacity, the total direct material costregularly changes by ₹2,00,000

Thus, Direct material cost (variable) = ₹ 2,00,000 ÷ 10,000 = ₹20
After 10% increase in price, direct material cost per unit = ₹20 × 1.10 = ₹22
Direct material cost at 90,000 budgeted units = 90,000 × ₹ 22 = ₹19,80,000

3. Direct labor:

	(₹)		(₹)
80% Capacity	8,00,000	70% Capacity	7,00,000
70% Capacity	7,00,000	60% Capacity	6,00,000
10% change incapacity	**1,00,000**	10% change incapacity	**1,00,000**

For 10% increase in capacity, direct labour cost regularlychanges by ₹1,00,000.
Direct labour cost per unit = ₹1,00,000 ÷ 10,000 = ₹10
After 20% increase in price, direct labour cost per unit = ₹10 × 1.20 = ₹12
Direct labour for 90,000 units = 90,000 units × ₹12 = ₹10,80,000.

4. Factory overheads are semi-variable overheads:

	(₹)		(₹)
80% Capacity	3,60,000	70% Capacity	3,40,000
70% Capacity	3,40,000	60% Capacity	3,20,000
10% change incapacity	**20,000**	10% change incapacity	**20,000**

Variable factory overhead = ₹ 20,000 ÷ 10,000 units = ₹ 2
Variable factory overhead for 80,000 units = 80,000 × ₹ 2 = ₹ 1,60,000
Fixed factory overhead = ₹ 3,60,000 – ₹ 1,60,000 = ₹ 2,00,000.
Variable factory overhead after 5% increase = ₹ 2 × 1.05 = ₹ 2.10
Fixed factory overhead after 10% increase = ₹ 2,00,000 × 1.10 = ₹ 2,20,000.

5. Selling overhead is semi-variable overhead:

	(₹)		(₹)
80% Capacity	4,20,000	70% Capacity	3,80,000
70% Capacity	3,80,000	60% Capacity	3,40,000
10% change in capacity	40,000	10% change in capacity	40,000

Variable selling overhead = ₹ 40,000 ÷ 10,000 units = ₹ 4
Variable selling overhead for 80,000 units = 80,000 × ₹ 4 = ₹ 3,20,000.
Fixed selling overhead = ₹ 4,20,000 – ₹ 3,20,000 = ₹ 1,00,000
Variable selling overhead after 10% increase = ₹ 4 × 1.10 = ₹ 4.40
Fixed selling overhead after 15% increase = ₹ 1,00,000 × 1.15 = ₹ 1,15,000

6. Administrative overhead is fixed:

After 15% increase = ₹ 1,60,000 × 1.15 = ₹ 1,84,000

Production, Purchases & Sales Budget

Question 28

XY Co. Ltd manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2022-23:

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	400 units at ₹ 9	600 units at ₹ 9	500 units at ₹ 9	700 units at ₹ 9
Y	300 units at ₹ 21	500 units at ₹ 21	200 units at ₹ 21	400 units at ₹ 21

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by ₹ 1, it will, find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹ 1 it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:
Percentage increase in sales over budgeted sales

Product	East Division	West Division
X	+ 10%	+ 5%
Y	+ 20%	+ 10%

With the help of intensive advertisement campaign, following additional sales (over and above the above-mentioned estimated sales by Divisional Mangers) are possible:

Product	East Division	West Division
X	60 units	70 units
Y	40 units	50 units

You are required to prepare Sales Budget for 2023-24 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2022-23. *(RTP Nov'23, SM)*

Answer 28

Statement Showing Sales Budget for 2023-24

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	500[1]	10	5,000	400[3]	20	8,000	13,000
West	700[2]	10	7,000	600[4]	20	12,000	19,000
Total	1,200		12,000	1,000		20,000	32,000

Workings

1. 400 × 110% + 60 = 500 units
2. 600 × 105% + 70 = 700 units
3. 300 × 120% + 40 = 400 units
4. 500 × 110% + 50 = 600 units

Statement Showing Sales Budget for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	400	9	3,600	300	21	6,300	9,900
West	600	9	5,400	500	21	10,500	15,900
Total	1,000		9,000	800		16,800	25,800

Statement Showing Actual Sales for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	500	9	4,500	200	21	4,200	8,700
West	700	9	6,300	400	21	8,400	14,700
Total	1,200		10,800	600		12,600	23,400

Question 29

Vivit Su Ltd. manufactures and sells a single product and estimated the following related information for the period November, 2020 to March, 2021.

Particulars	November, 2020	December, 2020	January, 2021	February, 2021	March, 2021
Opening Stock of Finished Goods (in Units)	7,500	3,000	9,000	8,000	6,000
Sales (in Units)	30,000	35,000	38,000	25,000	40,000
Selling Price per unit (in ₹)	10	12	15	15	20

Additional Information:

- Closing stock of finished goods at the end of March, 2021 is 10,000 units.
- Each unit of finished output requires 2 kg of Raw Material 'A' and 3 kg of Raw Material 'B'.

You are required to prepare the following budgets for the period November, 2020 to March, 2021 on monthly basis:

(i) Sales Budget (in ₹)

(ii) Production budget (in units) and

(iii) Raw material Budget for Raw material 'A' and 'B' separately (in units) *(PYP 10 Marks, Jul'21)*

Answer 29

i. Sales Budget

						(in ₹)
Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Sales (in Units)	30,000	35,000	38,000	25,000	40,000	1,68,000
Selling Price per unit (₹)	10	12	15	15	20	-
Total Sales (₹)	3,00,000	4,20,000	5,70,000	3,75,000	8,00,000	24,65,000

ii. Production Budget (in units)

Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Sales	30,000	35,000	38,000	25,000	40,000	1,68,000
Add: Closing stock of finished goods	3,000	9,000	8,000	6,000	10,000	36,000
Total quantity required	33,000	44,000	46,000	31,000	50,000	2,04,000
Less: Opening stock of finished goods	7,500	3,000	9,000	8,000	6,000	33,500
Units to be produced	**25,500**	**41,000**	**37,000**	**23,000**	**44,000**	1,70,500

iii. Raw material budget (in units)

For Raw material 'A'

Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500
Raw material consumption p.u. (kg.): (b)	2	2	2	2	2	-
Total raw material consumption (Kg.): (a × b)	**51,000**	**82,000**	**74,000**	**46,000**	**88,000**	3,41,000

For Raw material 'B'

Particulars	**Nov, 20**	**Dec, 20**	**Jan, 21**	**Feb, 21**	**Mar, 21**	**Total**
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500
Raw material Consumption p.u. (kg.): (b)	3	3	3	3	3	-
Total raw material consumption (Kg.): (a × b)	**76,500**	**1,23,000**	**1,11,000**	**69,000**	**1,32,000**	5,11,500

EXAM INSIGHTS: This Numerical question on Flexible Budget by segregating cost into fixed and variable. Many examinees faced hardship to understand the concept of fixed cost when the level of production changed; hence fixed overheads cost was not calculated correctly in the second part of the question. Performance of the examinees was average.

Question 30

Nakata Ltd a Vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

Month	No. of vehicles
October	40,000
November	35,000
December	45,000
January	60,000
February	65,000

To manufacture a vehicle a standard cost of Rs.5,71,400 is incurred and sold through dealers at a uniform selling price of Rs.8,57,100 to customers. Dealers are paid 15% commission on selling price on sale of a vehicle. Apart from other materials four units of Part - X are required to manufacture a vehicle. It is a policy of the

company to hold stocks of Part-X at the end of each month to cover 40% of next month's production. 48,000 units of Part-X are in stock as on 1st October.

There are 9,500 nos. of completed vehicles are in stock as on 1st October and it is policy to have stocks at the end of each month to cover 20% of the next month's sales.

You are required to

(i) PREPARE Production budget (in nos.) for the month of October, November, December and January.

(ii) PREPARE a Purchase budget for Part-X (in units) for the months of October, November and December.

(iii) CALCULATE the budgeted gross profit for the quarter October to December.

(MTP 10 Marks, Apr'19, Oct'22 & Oct'23, RTP May'20)

Answer 30

(i) Preparation of Production Budget (in units)

	October	November	December	January
Demand for the month (Nos.)	40,000	35,000	45,000	60,000
Add: 20% of next month's demand	7,000	9,000	12,000	13,000
Less: Opening Stock	(9,500)	(7,000)	(9,000)	(12,000)
Vehicles to be produced	37,500	37,000	48,000	61,000

(ii) Preparation of Purchase budget for Part-X

	October	November	December
Production for the month (Nos.)	37,500	37,000	48,000
Add: 40% of next month's production	14,800 (40% of 37,000)	19,200 (40% of 48,000)	24,400 (40% of 61,000)
	52,300	56,200	72,400
No. of units required for production	2,09,200 (52300 × 4 units)	2,24,800 (56200 × 4 units)	2,89,600 (72,400 × 4 units)
Less: Opening Stock	(48,000)	(59,200) (14800 × 4 units)	(76,800) (19200 × 4 units)
No. of units to be purchased	1,61,200	1,65,600	2,12,800

(iii) Budgeted Gross Profit for the Quarter October to December

	October	November	December	Total
Sales in nos.	40,000	35,000	45,000	1,20,000
Net Selling Price per unit*	7,28,535	7,28,535	7,28,535	
Sales Revenue (Rs. in lakh)	2,91,414	2,54,987.25	3,27,840.75	8,74,242
Less: Cost of Sales (Rs. in lakh) (Sales unit × Cost per unit)	2,28,560	1,99,990.00	2,57,130.00	6,85,680
Gross Profit (Rs. in lakh)	62,854	54,997.25	70,710.75	1,88,562

* Net Selling price unit = ₹ 8,57,100 – 15% commission on ₹8,57,100
= ₹7,28,535.

Question 31

P Ltd. manufactures two products called 'X' and 'Y'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 72 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following forecast information has been extracted from departmental estimates for the year ended 31st March 2025 (the budget period):

	Product X	Product Y
Sales (units)	28,000	13,000
Finished goods stock increase by year-end	320	160
Post-production rejection rate (%)	4	6
Material Z usage (per completed unit, net of wastage)	5 kg	6 kg
Material Z wastage (%)	10	5

Additional information:

- Usage of raw material Z is expected to be at a constant rate over the period.
- Annual cost of holding one unit of raw material in stock is 11% of the material cost.
- The cost of placing an order is ₹ 15,600 per order.
- The management of P Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

Required:

(a) (i) Prepare Production budget for Products X and Y (in units) for the year ended 31st March 2025.
(ii) Calculate the Economic Order Quantity for Material Z (in kgs). (3+2=5 Marks)

(b) Prepare Purchases budget for Material Z (in kgs and value) for the year ended 31st March 2025.(5 Marks)

(c) If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration, calculate the maximum number of units of Product X and Y that could be produced.
(MTP 14 Marks, Mar'24 RTP May'18 MTP 10 Marks, Sep '23)

Answer 31

(i) Production Budget (in units) for the year ended 31st March 2025

	Product X	Product Y
Budgeted sales (units)	28,000	13,000
Add: Increase in closing stock	320	160
No. good units to be produced	28,320	13,160
Post production rejection rate	4%	6%
No. of units to be produced	29,500 $\left(\frac{28,320}{0.96}\right)$	14,000 $\left(\frac{13,160}{0.94}\right)$

(ii) Calculation of Economic Order Quantity for Material Z

$$EOQ = \sqrt{\frac{2\times2,52,310\times15,600}{72\times11\%}} = \sqrt{\frac{5,04,620\times15,600}{72\times11\%}} = 31,526.95 \text{ kg.}$$

(b) Purchase budget (in kgs and value) for Material Z

	Product X	Product Y
No. of units to be produced	29,500	14,000
Usage of Material Z per unit of production	5 kg.	6 kg.
Material needed for production	1,47,500 kg.	84,000 kg.
Materials to be purchased	1,63,889 kg. $\left(\frac{1,47,500}{0.90}\right)$	88,421 kg. $\left(\frac{84,000}{0.95}\right)$
Total quantity to be purchased	2,52,310 kg.	
Rate per kg. of Material Z	₹72	
Total purchase price	₹1,81,66,320	

(c) Since the maximum number of orders per year cannot be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of Material Z that can be available for production:

= 4,000 kg. × 40 orders =1,60,000 kg.

	Product X	Product Y
Material needed for production to maintain the same production mix	1,03,929 kg. $\left(1,60,000 \times \frac{1,63,889}{2,52,310}\right)$	56,071 kg. $\left(1,60,000 \times \frac{88,421}{2,52,310}\right)$
Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for production	93,536 kg.	53,267 kg.
Units to be produced	18,707 units $\left(\frac{93,536\text{kg.}}{5\text{kg.}}\right)$	8,878 units $\left(\frac{53,267\text{kg.}}{6\text{kg.}}\right)$

Question 32

EDF Ltd. produces two products using Skilled labour and two types of materials. Shown below the information for the next month's budget:

	Product- A	Product-B
Budgeted sales (in units)	4,080	6,120
Budgeted material consumption per unit (in kg):		
Material-X	8.5	5.1
Material-Y	6.8	10.2
Standard labour hours allowed per unit of product	5.1	8.5

Material-X and Material-Y cost ₹8 and ₹10 per kg and labours are paid ₹30 per hour. Overtime premium is 75% and is payable, if a worker works for more than 45 hours a week. There are 400 direct workers.

The target efficiency ratio for the productive hours worked by the direct workers in actually manufacturing the products is 85%. In addition the non-productive down-time is budgeted at 15% of the productive hours worked.

There are four 6-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A	550 units
Product-B	350 units
Material-X	1,200 kgs.
Material-Y	600 kgs.

The anticipated closing stocks for budget period are as below:

Product-A	5 days sales
Product-B	5 days sales
Material-X	10 days consumption
Material-Y	3 days consumption

Required:

CALCULATE the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month.*(RTP May'23, SM) (Same concepts different figures MTP 10 Marks Oct'18, SM, MTP 7 Marks Jul'24)*

Answer 32

Number of days in budget period = 4 weeks × 6 days = 24 days

Number of units to be produced

	Product-A (units)	Product-B (units)
Budgeted Sales	4,080	6,120
Add: Closing stock	850 $\left(\frac{4,080 \text{ units}}{24 \text{ days}} \text{X } 5 \text{ Days}\right)$	1275 $\left(\frac{6,120 \text{ units}}{24 \text{ days}} \text{X } 5 \text{ Days}\right)$
Less.: Opening Stock	550	350
	4,380	7,045
(i) Material Purchase Budget		
	Material-X (Kg.)	**Material-Y (Kg.)**
Material required:		
Product-A	37,230 (4,380 units × 8.5 kg.)	29,784 (4,380 units × 6.8 kg.)
Product-B	35,930 (7,045 units × 5.1 kg.)	71,859 (7,045 units × 10.2 kg.)
	73,160	1,01,643
Add: Closing stock	30,483 $\left(\frac{73,160 \text{ kgs.}}{24 \text{ days}} \text{X } 10 \text{ days}\right)$	21,176 $\left(\frac{1,01,643 \text{ kgs.}}{24 \text{ days}} \text{X } 5 \text{ days}\right)$

Less: Opening stock	1,200	600
Quantity to be purchased	1,02,443	1,22,219
Rate per kg. of Material	8	10
Total Cost	8,19,541	12,22,186
(ii) Wages Budget		
	Product-A (Hours)	**Product-B (Hours)**
Units to be produced	4,380	7,045
Standard hours allowed per unit	5.1	8.5
Total Standard Hours allowed	22,338	59,883
Productive hours required for production	$\frac{22,338 \text{ hours}}{85\%} \times 26,280$	$\frac{59,883 \text{ hours}}{85\%} \times 70,450$
Add: Non-Productive down time hours	3942 (15% of 26,280 hours)	10568 (15% of 70,450 hours)
Hours to be paid	30,222	81,018
Total Hours to be paid =	1,11,240	
Hours to be paid at normal rate (4 weeks × 45 hours × 400 workers) =	72000	
Hours to be paid at premium rate	39,240	
Total wages to be paid = (72,000 hours × ₹30 + 39,240 hours × ₹ 52.5)	= ₹ 21,60,000 + ₹ 20,60,100 = ₹ 42,20,100	

Question 33

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.** ***(PYP 10 Marks, May'22)***

Answer 33

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
	Labour hour per unit	1 hour	0.5 hour
	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. 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

III. 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	6,620
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		

EXAM INSIGHTS: This numerical problem based on budgetary control was divided into two parts. In the first part, examinees were required to calculate production of shirts and shorts when limited labour hours are available. Most of the examinees failed to understand the concept. The second part of the question required to prepare sales and production budget. Most of the examinees did well. Performance of the examinees was above average.

Question 34

HL Limited produces and sells four varieties of beverage. The past data shows different demand patterns for various quarters during the year. The sales quantity and selling price for the month of September 2023 is as follows:

	Sales Quantity	Selling Price per unit
Hot Coffee	1,40,000 Units	₹ 20/-

Cold Coffee	3,40,000 Units	₹ 40/-
Fruit Juice	4,20,000 Units	₹ 20/-
Carbonated Soft Drink	2,70,000 units	₹ 20/-

For the quarter October to December 2023, it is estimated that due to climate changes the demand for Hot Coffee would increase every month by 50% of the previous month and the demand for Cold Coffee would decrease every month by 30% of the previous month. The demand for Fruit Juice would decrease by 20% in the month of October 2023 and thereafter it will remain constant. HL Limited would be able to sell only 60,000 units, 50,000 units and 30,000 units of Carbonated Soft Drink respectively during the months of October, November and December 2023. There would be no change in the selling price of all the products during the next quarter.

Standard Quantity of closing stock for the period September 2023 to December 2023 is as follows:

(in units)

	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
September 2023	12,000	13,000	11,000	7,500
October 2023	15,000	14,000	12,000	5,500
November 2023	13,000	15,000	10,000	6,000
December 2023	11,000	16,000	13,000	7,000

You are required to prepare a Production Budget (in units) and Sales Budget (in units and sales value) for the months of October, November and December 2023. *(PYP 10 Marks, Nov'23)*

Answer 34

Production Budget (in units)

Particulars	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
October 2023				
Sales*	2,10,000	2,38,000	3,36,000	60,000
Add: Closing stock	15,000	14,000	12,000	5,500
Total Quantity Required	2,25,000	2,52,000	3,48,000	65,500
Less: Opening stock	12,000	13,000	11,000	7,500
Production	**2,13,000**	**2,39,000**	**3,37,000**	**58,000**
November 2023				
Sales*	3,15,000	1,66,600	3,36,000	50,000
Add: Closing stock	13,000	15,000	10,000	6,000
Total Quantity Required	3,28,000	1,81,600	3,46,000	56,000
Less: Opening stock	15,000	14,000	12,000	5,500
Production	**3,13,000**	**1,67,600**	**3,34,000**	**50,500**
December 2023				
Sales*	4,72,500	1,16,620	3,36,000	30,000
Add: Closing stock	11,000	16,000	13,000	7,000
Total Quantity Required	4,83,500	1,32,620	3,49,000	37,000
Less: Opening stock	13,000	15,000	10,000	6,000
Production	**4,70,500**	**1,17,620**	**3,39,000**	**31,000**

*sales units are taken from sales budget

Sales Budget (in Units and sales value)

Particulars	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
October 2023 (in units)	2,10,000 [1,40,000 + (1,40,000 x 50%)]	2,38,000 [3,40,000 - (3,40,000 x 30%)]	3,36,000 [420000 - (4,20,000x20%)]	60,000
October 2023 (Sales Value in ₹)	42,00,000 (2,10,000 x ₹ 20)	95,20,000 (2,38,000 x ₹ 40)	67,20,000 (3,36,000 x ₹20)	12,00,000 (60,000 x ₹ 20)

November 2023 (in units)	3,15,000 [2,10,000 +(2,10,000 x 50%)]	1,66,600 [2,38,000 - (2,38,000 x 30%)]	3,36,000	50,000
November 2023 (Sales Value in ₹)	63,00,000 (3,15,000 x ₹ 20)	66,64,000 (1,66,600 x ₹ 40)	67,20,000 (3,36,000 x ₹ 20)	10,00,000 (50,000 x ₹ 20)
December 2023 (in units)	4,72,500 [3,15,000 +(3,15,000 x 50%)]	1,16,620 [1,66,600 - (1,66,600 x 30%)]	3,36,000	30,000
December 2023 (Sales Value in ₹)	94,50,000 (4,72,500 x ₹ 20)	46,64,800 (1,16,620 x ₹ 40)	67,20,000 (3,36,000 x ₹ 20)	6,00,000 (30,000 x ₹ 20)

Sales Budget can also be presented in following way:

	Oct 2023		Nov 2023		Dec 2023	
	Quantity (units)	Amount (₹)	Quantity (units)	Amount (₹)	Quantity (units)	Amount (₹)
Hot Coffee @ ₹ 20 per unit	2, 10,000	42,00,000	3,15,000	63,00,000	4,72,500	94,50,000
Cold Coffee @ ₹ 40 per unit	2,38,000	95,20,000	1,66,600	66,64,000	1,16,620	46,64,800
Fruit Juice @ ₹ 20 per unit	3,36,000	67,20,000	3,36,000	67,20,000	3,36,000	67,20,000
Carbonated Soft Drink @ ₹ 20 per unit	60,000	12,00,000	50,000	10,00,000	30,000	6,00,000
		2,16,40,000		**2,06,84,000**		**2,14,34,800**

EXAM INSIGHTS: Question on preparation of production budget and sales budget based on the data given in the question. Overall performance of the examinees was above average.

Question 35

C Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

	Product-A	Product-B
Budgeted sales (in units)	2,400	3,600
Budgeted material consumption per unit (in kg):		
Material-X	5	3
Material-Y	4	6
Standard labour hours allowed per unit of product	3	5

Material-X and Material-Y cost ₹ 4 and ₹ 6 per kg and labours are paid ₹ 25 per hour. Overtime premium is 50% and is paid, if a worker works for more than 40 hours a week. There are 180 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%. In addition, the non-productive down-time is budgeted at 20% of the hours worked.

There are four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A	400 units
Product-B	200 units
Material-X	1,000 kg.
Material-Y	500 kg.

The anticipated closing stocks for budget period are as below:

Product-A	4 days sales
Product-B	5 days sales
Material-X	10 days consumption

Material-Y **6 days consumption**

Required:

CALCULATE the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month. ***(MTP 6 Marks Dec'24)***

Answer 35

Number of days in budget period = 4 weeks × 5 days = 20 days

Number of units to be produced

	Product -A (units)	**Product-B (units)**
Budget Sales	2,400	3,600
Add : Closing stock	480 $\left\langle \frac{2{,}400\ units}{20\ days}\ X\ 4\ days \right\rangle$	900 $\left\langle \frac{3{,}600\ units}{20\ days}\ X\ 5\ days \right\rangle$
Less : opening stock	(400)	(200)
	2,480	4,300

(i) Material Purchase Budget

	Material-X (Kg.)	**Material-Y (Kg.)**
Material required:		
- Product-A	12,400 (2,480 units × 5 kg.)	9,920 (2,480 units × 4 kg.)
- Product-B	12,900 (4,300 units × 3 kg.)	25,800 (4,300 units × 6 kg.)
Add: Closing stock	25,300 12,650 $\left\langle \frac{25{,}300\ kgs}{20\ days}\ X\ 10\ days \right\rangle$	35,720 10,716 $\left\langle \frac{35{,}720\ kgs}{20\ days}\ X\ 6\ days \right\rangle$
Less: Opening stock	(1,000)	(500)
Quantity to be purchased	36,950	45,936
Rate per kg. of Material	₹ 4	₹ 6
Total Cost	₹ 1,47,800	₹ 2,75,616

(ii) Wages Budget

	Product-A (Hours)	**Product-B (Hours)**
Units to be produced	2,480 units	4,300 units
Standard hours allowed per unit	3	5
Total Standard Hours allowed	7,440	21,500
Productive hours required for production	$\frac{7{,}440\ Hours}{80\%}$ = 9,300	$\frac{21{,}500\ Hours}{80\%}$ = 26,875
Add: Non-Productive down time	1,860 hours. (20% of 9,300 hours)	5,375 hours. (20% of 26,875 hours)
Hours to be paid	11,160	32,250

Total Hours to be paid = 43,410 hours (11,160 + 32,250)

Hours to be paid at normal Rate = 4 weeks X 40 hours X 180 workers = 28,800 Hours

Hours to be paid at premium Rate = 43,410 hours – 28,800 hours = 14,610 hours

Total wages to be paid = 28,800 hours X ₹25 + 14,610 hours X ₹37.5

= ₹7,20,000 + ₹ 5,47,875

= ₹12,67,875

Question 36

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

The other relevant details are as under:

Purchase Price:	**Material A**	**₹ 160 per kg**
	Materials B	**₹ 100 per kg**

Labour Rate:	**Machine Shop**	**₹ 140 per hour**
	Assembly Shop	**₹ 70 per hour**

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

Required

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

(ii) PREPARE Production Budget in units and

(iii) PREPARE Material Purchase Budget in units. ***(RTP Sep'24 MTP 10 Marks, Nov'21 RTP May '21)***

Answer 36

Workings

Statement Showing "Total Variable Cost for the year"

Particulars	**Amount (₹)**
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

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

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

Number of Units Sold	=	Total Variable Cost/Variable Cost per unit
	=	₹ 1,72,80,000 / ₹ 2,160
	=	8,000 units
Selling Price per unit	=	Total Sales Value / Number of Units Sold
	=	₹ 3,02,40,000 / 8,000 units
	=	₹ 3,780

(ii) Production Budget (units)

Particulars	**Units**

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

(iii) Materials Purchase Budget (Kg.)

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

Question 37 — LDR

V Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2019.

The following information are made available for this purpose:

(i) It expects to sell 50,000 bags of 'X' during the second quarter of 2019 at the selling price of ₹ 900 per bag.

(ii) Each bag of 'X' requires 2.5 kgs. of a raw – material called 'Y' and 7.5 kgs. of raw – material called 'Z'.

(iii) Stock levels are planned as follows:

Particulars	Beginning of Quarter	End of Quarter
Finished Bags of 'X' (Nos.)	15,000	11,000
Raw – Material 'Y' (Kgs.)	32,000	26,000
Raw – Material 'Z' (Kgs.)	57,000	47,000
Empty Bag (Nos.)	37,000	28,000

(iv) 'Y' cost Rs.120 per Kg., 'Z' costs Rs.20 per Kg. and 'Empty Bag' costs Rs.80 each.

(v) It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is Rs.50 per hour.

(vi) Variable manufacturing costs are Rs.45 per bag. Fixed manufacturing costs Rs.30,00,000 per quarter.

(vii) Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are Rs.20,50,000 per quarter.

Required

(i) PREPARE a production budget for the said quarter.

(ii) PREPARE a raw–material purchase budget for 'Y', 'Z' and 'Empty Bags' for the said quarter in quantity as well as in rupees.

(iii) COMPUTE the budgeted variable cost to produce one bag of 'X'.

(iv) PREPARE a statement of budgeted net income for the said quarter and show both per unit and total cost data. ***(MTP 10 Marks, Oct'19 & April '23) (Same concept different figures SM)***

Answer 37

(i) Production Budget of 'X' for the Second Quarter

Particulars	**Bags (Nos.)**
Budgeted Sales	50,000
Add: Desired Closing stock	11,000
Total Requirements	61,000
Less: Opening stock	15,000
Required Production	46,000

(ii) Raw–Materials Purchase Budget in Quantity as well as in Rs. for 46,000 Bags of 'X'

Particulars	**'Y' Kgs.**	**'Z' Kgs.**	**Empty Bags Nos.**
Production Requirements	2.5	7.5	1.0

Per bag of 'X'			
Requirement for Production	1,15,000 (46,000 × 2.5)	3,45,000 (46,000 × 7.5)	46,000 (46,000 × 1)
Add: Desired Closing Stock	26,000	47,000	28,000
Total Requirements	1,41,000	3,92,000	74,000
Less: Opening Stock	32,000	57,000	37,000
Quantity to be purchased	1,09,000	3,35,000	37,000
Cost per Kg./Bag	₹120	₹20	₹80
Cost of Purchase (₹)	1,30,80,000	67,00,000	29,60,000

(iii) Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'

Particulars	**(₹)**
Raw – Material	
Y 2.5 Kg @120	300.00
Z 7.5 Kg. @20	150.00
Empty Bag	80.00
Direct Labour (Rs.50× 9 minutes / 60 minutes)	7.50
Variable Manufacturing Overheads	45.00
Variable Cost of Production per bag	582.50

(iv) Budgeted Net Income for the Second Quarter

Particulars	**Per Bag (₹)**	**Total (₹)**
Sales Value (50,000 Bags)	900.00	4,50,00,000
Less: Variable Cost:		
Production Cost	582.50	2,91,25,000
Admn. & Selling Expenses (5% of Sales Price)	45.00	22,50,000
Budgeted Contribution	272.50	1,36,25,000
Less: Fixed Expenses:		
Manufacturing		30,00,000
Admn. & Selling		20,50,000
Budgeted Net Income		85,75,000

Cash Budget

Question 38

The following information relates to Anu Limited, a AI enabled toy manufacturing company:
The selling price of a toy is ₹ 3,000, and sales are made on credit and invoiced on the last day of the month.
Variable costs of production per toy are materials (₹ 1,000), labour (₹ 800), and overhead (₹ 400)
The sales manager has forecasted the following volumes:

Month	No. of Toys
November	1,000
December	1,000
January	1,000
February	1,250
March	1,500
April	2,000
May	1,900
June	2,200
July	2,200
August	2,300

Customers are expected to pay 50% One month after the sale and 50% Two months after the sale.

The company produces the toys two months before they are sold and the creditors for materials are paid two months after production.
Variable overheads are paid in the month following production and are expected to increase by 25 % in April; 75% of wages are paid in the month of production and 25% in the following month. A wage increase of 25% will take place on 1st March.
The company needs funds for the running the business and purchase of new machine so it will sell one of its freehold properties in June for ₹ 20,00,000, and buy a new machine in June for ₹ 5,00,000. Depreciation is currently ₹ 10,000 per month, and will rise to ₹ 15,000 after the purchase of the new machine.
The company's corporation tax of ₹ 1,00,000 is due for payment in March.
The company presently has a cash balance at bank on 31 December 2023, of ₹ 50,000.
You are required to PREPARE a cash budget for the six months from January to June, 2024.
(MTP 8 Marks Nov'24)

Answer 38

Workings:

1. Sale receipts

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Forecast sales (S)	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200
	₹	₹	₹	₹	₹	₹	₹	₹
S×3000	30,00,000	30,00,000	30,00,000	37,50,000	45,00,000	60,00,000	57,00,000	66,00,000
Debtors pay:								
1 month 50%		15,00,000	15,00,000	15,00,000	18,75,000	22,50,000	30,00,000	28,50,000
2nd month 50%		-	15,00,000	15,00,000	15,00,000	18,75,000	22,50,000	30,00,000
	-	15,00,000	30,00,000	30,00,000	33,75,000	41,25,000	52,50,000	58,50,000

2. Variable overheads

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Qty produced (Q)	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	₹	₹	₹	₹	₹	₹	₹	₹
Var. overhead (Q×400)	4,00,000	5,00,000	6,00,000	8,00,000	7,60,000			
Var. overhead (Q×500)						11,00,000	11,00,000	11,50,000
Paid one month later		4,00,000	5,00,000	6,00,000	8,00,000	7,60,000	11,00,000	11,00,000

3. Wages payments

Month	Dec	Jan	Feb	Mar	Apr	May	Jun
Qty produced (Q)	1,250	1,500	2,000	1,900	2,200	2,200	2,300
	₹	₹	₹	₹	₹	₹	₹
Wages (Q ×800)	10,00,000	12,00,000	16,00,000				
Wages (Q ×1,000)				19,00,000	22,00,000	22,00,000	23,00,000
75% this month	7,50,000	9,00,000	12,00,000	14,25,000	16,50,000	16,50,000	17,25,000
25% next		2,50,000	3,00,000	4,00,000	4,75,000	5,50,000	5,50,000

month							
	7,50,000	11,50,000	15,00,000	18,25,000	21,25,000	22,00,000	22,75,000

CASH BUDGET – SIX MONTHS ENDED JUNE

	Jan	Feb	Mar	Apr	May	Jun
	₹	₹	₹	₹	₹	₹
Receipts:						
Sales receipts	30,00,000	30,00,000	33,75,000	41,25,000	52,50,000	58,50,000
Freehold property	-	-	-	-	-	20,00,000
	30,00,000	**30,00,000**	**33,75,000**	**41,25,000**	**52,50,000**	**78,50,000**
Payments:						
Materials	10,00,000	12,50,000	15,00,000	20,00,000	19,00,000	22,00,000
Var. overheads	5,00,000	6,00,000	8,00,000	7,60,000	11,00,000	11,00,000
Wages	11,50,000	15,00,000	18,25,000	21,25,000	22,00,000	22,75,000
Machine	-	-	-	-	-	5,00,000
Tax	-	-	1,00,000	-	-	-
	26,50,000	**33,50,000**	**42,25,000**	**48,85,000**	**52,00,000**	**60,75,000**
Net cash flow	3,50,000	(3,50,000)	(8,50,000)	(7,60,000)	50,000	17,75,000
Balance b/f	50,000	4,00,000	50,000	(8,00,000)	(15,60,000)	(15,10,000)
Cumulative cash flow	4,00,000	50,000	(8,00,000)	(15,60,000)	(15,10,000)	2,65,000

Multiple Choice Questions (MCQ)

1. **If a company wishes to establish a factory overhead budget system in which estimated costs can be derived directly from estimates of activity levels, it should prepare a:** *(SM)*
   (a) Master budget
   (b) Cash budget
   (c) Flexible budget
   (d) Fixed budget

Ans: (c)

2. **The classification of fixed and variable cost is useful for the preparation of:** *(SM)*
   (a) Master budget
   (b) Flexible budget
   (c) Cash budget
   (d) Capital budget

Ans: (b)

3. **Budget manual is a document:** *(SM)*
   (a) Which contains different type of budgets to be formulated only.
   (b) Which contains the details about standard cost of the products to be made.
   (c) Setting out the budget organization and procedures for preparing a budget including fixation of responsibilities, formats and records required for the purpose of preparing a budget and for exercising budgetary control system.
   (d) None of the above

Ans: (c)

4. **The budget control organization is usually headed by a top executive who is known as:** *(SM)*
   (a) General manager
   (b) Budget director/budget controller
   (c) Accountant of the organization
   (d) None of the above

Ans: (b)

5. **"A favorable budget variance is always an indication of efficient performance". Do you agree, give reason?** ***(SM)***

(a) A favorable variance indicates, saving on the part of the organization hence it indicates efficient performance of the organization.

(b) Under all situations, a favorable variance of an organization speaks about its efficient performance.

(c) A favorable variance does not necessarily indicate efficient performance, because such a variance might have been arrived at by not carrying out the expenses mentioned in the budget.

(d) None of the above.

Ans: (c)

6. **A budget report is prepared on the principle of exception and thus-*(SM)***

(a) Only unfavorable variances should be shown

(b) Only favorable variance should be shown

(c) Both favorable and unfavorable variances should be shown

(d) None of the above

Ans: (c)

7. **Purchases budget and materials budget are same: *(SM)***

(a) Purchases budget is a budget which includes only the details of all materials purchased

(b) Purchases budget is a wider concept and thus includes not only purchases of materials but also other item's as well

(c) Purchases budget is different from materials budget; it includes purchases of other items only

(d) None of the above

Ans: (b)

8. **Efficiency ratio is: *(SM)***

(a) The extent of actual working days avoided during the budget period

(b) Activity ratio/ capacity ratio

(c) Whether the actual activity is more or less than budgeted activity

(d) None of the above

Ans: (b)

9. **Activity Ratio depicts: *(SM)***

(a) Whether actual capacity utilized exceeds or falls short of the budgeted capacity

(b) Whether the actual hours used for actual production were more or less than the standard hours

(c) Whether actual activity was more or less than the budgeted capacity

(d) None of the above

Ans: (c)

10. **Which of the following is usually a short-term budget: *(SM)***

(a) Capital expenditure budget

(b) Research and development budget

(c) Cash budget

(d) Sales budget

Ans: (c)

11. **The following extract is taken from the overhead budget of X:**

Budgeted activity	50%	75%
Budgeted overhead (₹)	30,00,000	40,00,000

What would be the budgeted overhead for 60% level of activity: *(MTP 2 Marks, Mar'24)*

(a) ₹ 32,00,0000

(b) ₹ 34,00,000

(c) ₹ 30,00,000

(d) ₹ 36,00,000

Ans: (b)

12. **A business manufactures a single product and is preparing its production budget for the year ahead. It is estimated that 2,00,000 units of the product can be sold in the year and the opening inventory is currently 25,000 units. The inventory level is to be reduced by 40% by the end of the year. What is production budget in units?** ***(RTP Sep'24)***

(a) 1,95,000 units
(b) 1,90,000 units
(c) 1,84,000 units
(d) 1,75,000 units

Ans: (b)

13. **Standard hours required for doing a work is 100 hours and budgeted hours is 120 hrs while the same work is actually completed by workers in 110 hrs. You are required to calculate the activity ratio:** ***(MTP 2 Marks July '24)***

(a) 109.09%
(b) 83.33%
(c) 90.90%
(d) 110%

Ans: (b)

CHAPTER 16: CASE SCENARIOS

LDR Questions
CS 3
CS 11
CS 18

CS 1 (RTP May'24) (Chapter 2- Material Cost)

The purchase committee of A Ltd. has been entrusted to review the material procurement policy of the company. The chief marketing manager has appraised the committee that the company at present produces a single product X by using two raw materials A and B in the ratio of 3:2. Material A is perishable in nature and has to be used within 10 days from Goods received note (GRN) date otherwise material becomes obsolete. Material B is durable in nature and can be used even after one year. Material A is purchased from the local market within 1 to 2 days of placing order. Material B, on the other hand, is purchased from neighbouring state and it takes 2 to 4 days to receive the material in the store.

The purchase price of per kilogram of raw material A and B is ₹30 and ₹44 respectively exclusive of taxes. To place an order, the company has to incur an administrative cost of ₹1,200. Carrying cost for Material A and B is 15% and 5% respectively. At present material A is purchased ina lot of 15,000 kg. to avail 10% discount on market price. GST applicable for both the materials is 18% and the input tax credit is availed.

The sales department has provided an estimate that the company could sell 30,000 kg. in January 2024 and also projected the same trend for the entire year.

The ratio of input and output is 5:3. Company works for 25 days in amonth and production is carried out evenly.

The following queries/ calculations to be kept ready for purchase committees' reference:

1. **For the month of January 2024, what would be the quantity of thematerials to be requisitioned for both material A and B:**
   (a) 9,000 kg & 6,000 kg respectively
   (b) 18,000 kg & 12,000 kg respectively
   (c) 27,000 kg & 18,000 kg respectively
   (d) 30,000 kg & 20,000 kg respectively.

Ans: (d)

2. **The economic order quantity (EOQ) for both the material A & B:**
   (a) 13,856 kg & 16,181 kg respectively
   (b) 16,197 kg & 17,327 kg respectively
   (c) 16,181 kg & 17,165 kg respectively
   (d) 13,197 kg & 17,165 kg respectively

Ans: (a)

3. **What would the maximum stock level for material A:**
   (a) 18,200 kg.
   (b) 12,000 kg.
   (c) 16,000 kg.
   (d) 16,200 kg.

Ans: (b)

4. **Calculate saving/ loss in purchase of Material A if the purchase order quantity is equal to EOQ.**
   (a) Profit of Rs. 3,21,201.
   (b) Loss of Rs. 3,21,201.
   (c) Profit of Rs. 2,52,500.
   (d) Loss of Rs. 2,52,500.

Ans: (b)

5. **What would the minimum stock level for material A:**
   (a) 1,800 kg.
   (b) 1,200 kg.
   (c) 600 kg.
   (d) 2,400 kg.

Ans: (c)

CS 2 (RTP May'24) (Chapter 3-Employee Cost)

The board of the J Ltd. has been appraised by the General Manager (HR) that the employee attrition rate in the company has increased. The following facts has been presented by the GM(HR):

(1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.
(2) 20% of the output during training period was defective. Cost of rectification of a defective unit was ₹ 25.
(3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.
(4) Selling price per unit is ₹ 180 and P/V ratio is 20%.
(5) Settlement cost of the workers leaving the organization was ₹ 1,83,480.
(6) Recruitment cost was ₹ 1,56,340
(7) Training cost was ₹ 1,13,180

You, being an associate finance to GM(HR), has been asked the following questions:

1. **How much quantity of output is lost due to labour turnover?**
   (a) 10,000 units
   (b) 8,000 units
   (c) 12,000 units
   (d) 12,600 units

Ans: (c)

2. **How much loss in the form of contribution, the company incurred due to labour turnover?**
   (a) ₹ 4,32,000
   (b) ₹ 4,20,000
   (c) ₹ 4,36,000
   (d) ₹ 4,28,000

Ans: (a)

3. **What is the cost repairing of defective units?**
   (a) ₹ 75,000
   (b) ₹ 15,000
   (c) ₹ 50,000
   (d) ₹ 25,000

Ans: (b)

4. **Calculate the profit lost by the company due to increased labour turnover.**
   (a) ₹ 7,50,000
   (b) ₹ 15,00,000
   (c) ₹ 5,00,000
   (d) ₹ 9,00,000

Ans: (d)

5. How much quantity of output is lost due to inexperience of the new worker?
   (a) 1,000 units
   (b) 2,600 units
   (c) 2,000 units
   (d) 12,600 units

Ans: (c)

CS 3 **(RTP May'24) (Chapter 4- Overheads: Absorption Costing Method)** **LDR**

During half year ending inter departmental review meeting of P Ltd., cost variance report was discussed and the performance of the departments were assessed. The following figures were presented.
For a period of first six months of the financial year, following information were extracted from the books:

Actual production overheads	₹ 34,08,000
The above amount is inclusive of the following paymentsmade:	
Paid as per court's order	₹ 4,50,000
Expenses of previous year booked in current year	₹ 1,00,000
Paid to workers for strike period under an award	₹ 4,20,000
Obsolete stores written off	₹ 36,000

Production and sales data for the six months are as under:

Production:	
Finished goods	1,10,000 units
Works-in-progress	
(50% complete in every respect)	80,000 units
Sale:	
Finished goods	90,000 units

Machine worked during the period was 3,000 hours.
At the of preparation of revenue budget, it was estimated that a total of ₹ 50,40,000 would be required for budgeted machine hours of 6,000 as production overheads for the entire year.
During the meeting, a data analytic report revealed that 40% of the over/under-absorption was due to defective production policies and the balance was attributable to increase in costs.
You were also present at the meeting; the chairperson of the meeting has asked you to be ready with the followings for the performance appraisal of the departmental heads:

1. How much was the budgeted machine hour rate used to recover overhead?
   (a) ₹ 760
   (b) ₹ 820
   (c) ₹ 780
   (d) ₹ 840

Ans: (d)

2. How much amount of production overhead has been recovered (absorbed) upto the end of half year end?
   (a) ₹ 25,20,000
   (b) ₹ 34,08,000
   (c) ₹ 24,00,000
   (d) ₹ 24,60,000

Ans: (a)

3. What is the amount of overhead under/ over absorbed?
   (a) 1,18,000 over-absorbed
   (b) 1,18,000 under- absorbed
   (c) 18,000 over-absorbed
   (d) 18,000 under-absorbed

Ans: (a)

4. **What is the supplementary rate for apportionment of over/under absorbed overheads over WIP, Finished goods and Cost of sales?**
   (a) ₹ 0.315 per unit
   (b) ₹ 0.472 per unit
   (c) ₹ 0.787 per unit
   (d) ₹ 1 per unit

Ans: (b)

5. **What is the amount of over/under absorbed overhead apportioned to Work in Progress?**
   (a) ₹ 9,440
   (b) ₹ 42,480
   (c) ₹ 18,880
   (d) ₹ 70,800

Ans: (c)

CS 4 (MTP 10 Marks March'24) (Chapter 10- Process & Operation Costing)

Arnav Ltd. manufactures chemical solutions used in paint and adhesive products. Chemical solutions are produced in different processes. Some of the processes are hazardous in nature which may results in fire accidents.

At the end of the last month, one fire accident occurred in the factory. The fire destroyed some of the paper files containing records of the process operations for the month.

You being an associate to the Chief Manager (Finance), are assigned to prepare the process accounts for the month during which the fire occurred. From the documents and files of other sources, following information could be retrieved:

Opening work-in-process at the beginning of the month was 500 litres, 80% complete for labour and 60% complete for overheads. Opening work-in- process was valued at ₹ 2,78,000.

Closing work-in-process at the end of the month was 100 litres, 20% complete for labour and 10% complete for overheads.

Normal loss is 10% of input (fresh) and total losses during the month were 800 litres partly due to the fire damage.

Output transferred to finished goods was 3,400 litres.

Losses have a scrap value of ₹ 20 per litre.

All raw materials are added at the commencement of the process.

The cost per equivalent unit is ₹ 660 for the month made up as follows:

Raw Material ₹ 300 Labour ₹ 200 Overheads ₹ 160

The company uses FIFO method to value work-in-process and finished goods.

The following information are required for managerial decisions: (Chapter 10: Process & Operation Costing)

1. **How much quantity of raw material introduced during the month?**
   (a) 4,300 Litres
   (b) 3,500 Litres
   (c) 4,200 Litres
   (d) 3,800 Litres

Ans: (d)

2. **The Quantity of normal loss and abnormal loss are:**
   (a) Normal loss- 380 litres & Abnormal loss- 420 litres
   (b) Normal loss- 350 litres & Abnormal loss – 450 litres
   (c) Normal loss- 430 litres & Abnormal loss – 370 litres
   (d) Normal loss- 420 litres & Abnormal loss – 380 litres.

Ans: (a)

3. **Value of raw material added to the process during the month is:**
   (a) ₹ 10,10,000
   (b) ₹ 10,33,600
   (c) ₹ 10,18,400
   (d) ₹ 10,20,000

Ans: (b)

4. **Value of labour and overhead in closing Work-in-process are: (Chapter 10: Process & Operation Costing)**
   (a) ₹ 4,000 & ₹ 1,600 respectively
   (b) ₹ 20,000 & ₹ 16,000 respectively
   (c) ₹ 16,000 & ₹ 9,000 respectively
   (d) ₹ 13,200 & ₹ 6,600 respectively

Ans: (a)

5. **Value of output transferred to finished goods is: (Chapter 10: Process & Operation Costing)**
   (a) ₹ 22,57,200
   (b) ₹ 20,06,400
   (c) ₹ 22,44,000
   (d) ₹ 19,27,200

Ans: (c)

CS 5 (MTP 10 Marks Mar'24) (Chapter 6- Cost Sheet)

M Ltd. is producing a single product and may expand into product diversification in next one to two years. M Ltd. is amongst a labour-intensive company where majority of processes are done manually. Employee cost is a major cost element in the total cost of the company. The company conventionally uses performance parameters Earnings per manshift (EMS) to measure cost paid to an employee for a shift of 8 hours, and Output per manshift (OMS) to measure an employee's output in a shift of 8 hours.

The Chief Manager (Finance) of the company has emailed you few information related to the last month. The email contains the following data related to the last month:

During the last month, the company has produced 2,34,000 tonnes of output. Expenditures for the last months are:

(i) Raw materials consumed ₹ 50,00,000
(ii) Power consumed 13,000 Kwh @ ₹ 8 per Kwh to run the machines for production.
(iii) Diesels consumed 2,000 litres @ ₹ 93 per litre to run power generator used as alternative or backup for power cuts.
(iv) Wages & salary paid – ₹ 6,40,00,000
(v) Gratuity & leave encashment paid – ₹ 64,20,000
(vi) Hiring charges paid for HEMM- ₹ 30,00,000. HEMM are directly used in production.
(vii) Hiring charges paid for cars used for official purpose – ₹ 66,000
(viii) Reimbursement of diesel cost for the cars – ₹ 22,000
(ix) The hiring of cars attracts GST under RCM @5% without credit.
(x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of dispatch) – ₹ 12,000
(xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of dispatch) and factory premises is ₹ 8,000 and ₹ 18,000 per month respectively.
(xii) TA/ DA and hotel bill paid for sales manager- ₹ 36,000
(xiii) The company has 1,800 employees works for 26 days in a month.

You are asked to calculate the followings:

1. **What is the amount of prime cost incurred during the last month:**
   (a) ₹ 7,54,20,000
   (b) ₹ 7,57,10,000

(c) ₹ 7,56,06,000
(d) ₹ 7,87,10,000

Ans: (d)

2. **What is the total and per shift cost of production for last month:**
   (a) ₹ 7,87,10,000 and ₹ 336.37 respectively
   (b) ₹ 7,87,10,000 and ₹ 1,681.84 respectively
   (c) ₹ 7,87,28,000 and ₹ 1,682.22 respectively
   (d) ₹ 7,87,28,000 and ₹ 336.44 respectively

Ans: (c)

3. **What is the value of administrative cost incurred during the last month:**
   (a) ₹ 92,400
   (b) ₹ 88,000
   (c) ₹ 1,48,400
   (d) ₹ 1,44,000

Ans: (a)

4. **What is the value of selling and distribution cost and total cost of sales:**
   (a) ₹ 36,000 & ₹ 7,88,76,400 respectively
   (b) ₹ 56,000 & ₹ 7,88,76,400 respectively
   (c) ₹ 36,000 & ₹ 7,88,72,000 respectively
   (d) ₹ 56,000 & ₹ 7,88,72,000 respectively

Ans: (b)

5. **What is the value EMS and OMS for the last month:**
   (a) ₹ 1,504.70 & 5 tonnes respectively
   (b) ₹ 1,367.52 & 5 tonnes respectively
   (c) ₹ 1,504.70 & 4.37 tonnes respectively
   (d) ₹ 1,367.52 & 4.37 tonnes respectively

Ans: (a)

CS 6 (MTP 10 Marks Apr'24) (Chapter 14- Marginal Costing)

A meeting of the heads of departments of the Arnav Ltd. has been called to review the operating performance of the company in the last financial year. The head of the production department appraised that during the last year the company could operate at 70% capacity level but in the coming financial year 95% capacity level can be achieved if an additional amount of ₹100 Crore on capex and working capital is incurred.

The head of the finance department has presented that during the last financial year the company had a P/V ratio of 40%, margin of safety and the break-even were ₹50 crore and ₹200 crore respectively.

To the reply to the proposal of increasing the production capacity level to 95%, the head of the finance department has informed that this could be achieved if the selling price and variable cost are reduced by 8% and 5% of sales respectively. Fixed cost will also increase by ₹20 crore due to increased depreciation on additional assets. The additional capital will be arranged at a cost of 15% p.a. from a bank.

In the coming financial year, it has been aimed to achieve an additional profit of ₹10 crore over and above the last year's profit after adjusting the interest cost on the additional capital.

The following points is required to be calculated on urgent basis to put the same in the meeting. You being an assistant to the head of finance, has been asked the followings:

1. **What will be the revised sales for the coming financial year?**
   (a) ₹ 322.22 Crore
   (b) ₹ 311.11 Crore
   (c) ₹ 300.00 Crore
   (d) ₹ 324.24 Crore

Ans: (a)

2. **What will be the revised break-even point for the coming financial year?**
   (a) ₹ 222.22 Crore
   (b) ₹ 252.22 Crore
   (c) ₹ 244.44 Crore
   (d) ₹ 255.56 Crore

Ans: (d)

3. **What will be the revised margin of safety for the coming financial year?**
   (a) ₹ 100 Crore
   (b) ₹ 58.89 Crore
   (c) ₹ 55.56 Crore
   (d) ₹ 66.66 Crore

Ans: (d)

4. **The profit of the last year and for the coming year are:**
   (a) ₹ 50 Crore & ₹95 Crore respectively
   (b) ₹ 20 Crore & ₹ 65 Crore respectively
   (c) ₹ 20 Crore & ₹ 30 Crore respectively
   (d) ₹ 45 Crore & ₹ 66.66 Crore respectively

Ans: (C)

5. **The total cost of the last year and for the coming year are:**
   (a) ₹ 230 Crore & ₹292.22
   (b) ₹ 230 Crore & ₹275 Crore
   (c) ₹ 220 Crore & ₹282.22 Crore
   (d) ₹ 220 Crore & ₹292.22 Crore

Ans: (a)

CS 7 (MTP 10 Marks Apr'24) (Chapter 13- Standard Costing)

K Ltd. is a manufacturer of a single product A. 8,000 units of the product A has been produced in the month of March 2024. At the beginning of the year a total 1,20,000 units of the product-A has been planned for production. The cost department
t has provided the following estimates of overheads:

Fixed	₹ 12,00,000	Variable	₹ 6,00,000
Semi-Variable	₹ 1,80,000		

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable character.
The records of the production department shows that the company could have operated for 20 days but there was a festival holiday during the month.
The actual cost data for the month of March 2024 are as follows:

Fixed	₹ 1,19,000	Variable	₹ 48,000
Semi-Variable	₹ 19,200		

The cost department of the company is now preparing a cost variance report for managerial information and action. You being an accounts officer of the company are asked to calculate the following information for preparation of the variance report:

1. **What is the amount of variable overhead cost variance for the month of March 2024:**
   (a) ₹ 10,200 (A)
   (b) ₹ 10,400 (A)
   (c) ₹ 10,800 (A)
   (d) ₹ 10,880 (A)

Ans: (d)

2. **What is the amount of fixed overhead volume variance for the month of March 2024:**
   (a) ₹ 9,000 (F)
   (b) ₹ 9,000 (A)
   (c) ₹ 21,800 (A)
   (d) ₹ 11,000 (A)

Ans: (c)

3. **What is the amount of fixed overhead expenditure variance for the month of March 2024:**
   (a) ₹ 21,520 (A)
   (b) ₹ 21,500 (A)
   (c) ₹ 21,400 (A)
   (d) ₹ 21,480 (A)

Ans: (a)

4. **What is the amount of fixed overhead calendar variance for the month of March 2024:**
   (a) ₹ 5,400 (A)
   (b) ₹ 5,450 (A)
   (c) ₹ 5,480 (A)
   (d) ₹ 5.420 (A)

Ans: (b)

5. **What is the amount of fixed overhead cost variance for the month of March 2024:**
   (a) ₹ 43,320 (A)
   (b) ₹ 43,300 (A)
   (c) ₹ 43,200 (A)
   (d) ₹ 43,380 (A)

Ans: (a)

CS 8 (RTP Sep'24) (Chapter 2- Material Cost)

'Axe Trade', an unregistered supplier under GST, purchased material from Vye Ltd. which is registered supplier under GST. During the month of June 2024, the Axe Traders has purchased a lot of 5,000 units on credit from Vye Ltd. The information related to the purchase are as follows:

Listed price of one lot of 5,000 units	-	₹ 2,50,000
Trade discount	-	@ 10% on listed price
CGST and SGST (Credit available)	-	18% (9% CGST + 9% SGST)
Cash discount	-	@ 10%

(Will be given only if payment is made within 30 days.)

Toll Tax paid	₹ 5,000
Freight and Insurance	₹ 17,220
Demurrage paid to transporter	₹ 5,000
Commission and brokerage on purchases	₹ 10,000
Amount deposited for returnable containers	₹ 30,000
Amount of refund on returning the container	₹ 20,000
Other Expenses	@ 2% of total cost

A 20% shortage in material on receipt is expected considering the nature of the raw material.

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

1. **If Axe Traders pays the supplier within 30 days of purchase, then, what is the total amount of cash discount received from the supplier and how it is treated to calculate material cost?**
   (a) ₹ 25,000 & it will not be deducted from the material cost
   (b) ₹ 26,550 & it will be deducted from the material cost
   (c) ₹ 26,550 & it will not be deducted from the material cost

(d) ₹ 22,500 & it will not be deducted from the material cost

Ans: (d)

2. What will be the amount of other expenses and how it is treated in material cost?

(a) ₹ 6,154.40 & it will be added with the material cost
(b) ₹ 6,280.00 & it will be added with the material cost
(c) ₹ 5,344.40 & it will be added with the material cost
(d) ₹ 5,453.47 & it will not be added with the material cost

Ans: (b)

3. What is the amount of GST and how will it be treated in cost sheet of Axe Traders?

(a) ₹ 40,500 & it will not be added with material cost
(b) ₹ 40,500 & it will be added with material cost
(c) ₹ 45,000 & it will not be added with material cost
(d) ₹ 45,000 & it will be added with material cost

Ans: (b)

4. What is the total material cost chargeable in the cost sheet of Axe Traders?

(a) ₹ 3,14,000
(b) ₹ 2,73,500
(c) ₹ 2,72,673
(d) ₹ 3,13,874

Ans: (a)

5. The number of good units and cost per unit of the materials received are:

(a) 5,000 units & ₹ 62.80
(b) 5,000 units & ₹ 54.70
(c) 4,000 units & ₹ 78.50
(d) 4,000 units & ₹ 68.38

Ans: (c)

CS 9 (RTP Sep'24) (Chapter 13- Standard Costing)

ABC Pvt Ltd is engaged in the manufacture of a Product Q. The product has the following standard production requirements determined by the technical team of the company post satisfactory completion of test run.
Raw Material Z – 2 units @ ₹ 2 per unit
Skilled labour of – 2.5 hours@ ₹ 5 per hour
Fixed Overheads – ₹ 7.5 per unit
The input of Raw material Z has a yield of 80% everytime when infused into production. The actual quantity of Raw material Z consumed for production during the year was 24,000 units. The Usage variance of Material Z was 2,000 Favourable. Further the actual amount of material cost for the material consumed amounted to ₹ 45,000.
During the said year, the actual working hours were 30,000 for which the labour cost paid by the company amounted to ₹1,20,000. The idle time variance amounted to 10,000 Adverse.
The actual fixed overheads incurred for the year amounted to ₹ 1,50,000 and the expenditure variance was ₹25,000 Favourable.
In the context of the above, the following needs to be determined:

1. The Actual output of Product Q produced during the year is:

(a) 10,000 units
(b) 12,500 units
(c) 25,000 units
(d) 15,000 units

Ans: (a)

2. **The Material price and material cost variance are:**
   (a) Price variance – 3,000 Adverse, Cost Variance – 5,000 Adverse
   (b) Price variance – 3,000 Favourable, Cost Variance – 5,000 Favourable
   (c) Price variance – 3,000 Favourable, Cost Variance – 8,000 Adverse
   (d) Price variance – 5,000 Adverse, Cost Variance – 3,000 Favourable

Ans: (b)

3. **The Standard Hours, Net Actual hours and the idle time are:**
   (a) Standard Hours – 27,500 Net Actual Hours – 28,000 hours Idle Time – 2,000 hours
   (b) Standard Hours – 22,500 Net Actual Hours – 28,500 hours Idle Time – 1,500 hours
   (c) Standard Hours – 24,000 Net Actual Hours – 29,000 hours Idle Time – 1,000 hours
   (d) Standard Hours – 25,000 hours Net Actual Hours –28,000 hours Idle Time – 2,000 hours

Ans: (d)

4. **Labour Efficiency variance and Labour rate variance are:**
   (a) Labour Efficiency Variance – 30,000 Favourable Labour rate Variance – 25,000 Adverse
   (b) Labour Efficiency Variance – 25,000 Favourable, Labour rate Variance – 30,000 Adverse
   (c) Labour Efficiency Variance – 25,000 Adverse, Labour rate Variance – 30,000 Favourable
   (d) Labour Efficiency Variance – 30,000 Adverse Labour rate Variance – 25,000 Favourable

Ans: (c)

5. **Fixed Overhead volume variance is:**
   (a) Fixed Overhead volume variance – 1,00,000 Favourable
   (b) Fixed Overhead volume variance – 50,000 Adverse
   (c) Fixed Overhead volume variance – 1,00,000 Adverse
   (d) Fixed Overhead volume variance – 50,000 Favourable

Ans: (c)

CS 10 (MTP 10 Marks July'24) (Chapter 2- Material Cost)

Tropic Pvt Ltd was engaged in the business of manufacturing Product P. The product P required 2 units of Material R. The company intends to sell 24,000 units of Product P and does not wish to retain any closing stock. However the opening stock of Product P is 4,000 units. Raw Material R has to be procured after considering the opening stock of R amounting to 10,000 units. The technical team further confirms that the yield in the course of manufacture of Product P is 80% of the input.

The company presently procures its annual requirement of materials on a quarterly basis from its regular supplier enjoying a discount of 2.5% on the invoice price of the material of ₹ 20 per unit. Every time the company places orders for Material R, it incurs ₹ 125 for each of the order placed. The company also has taken a rented warehouse for storing material R and the annual cost of storage is ₹ 10 per unit. The company appointed Mr. T a Chartered Accountant to review the cost of inventory and provide measures of improvement of cost. After reviewing the material purchase and consumption pattern, Mr. T suggested that the implementation of Wilson's EOQ would be beneficial to the company. He emphasized that the change in the quantity ordered would result in reduction of inventory carrying costs.

Mr. T further reviewed the labour costing and identified that the employees were paid overtime wages to ensure timely completion of projects. Overtime wages comprised of daily wage and 100% of daily wages as overtime premium. Based on the cost record it was understood that every month had 180 hours of regular working hours which was remunerated at ₹ 200 per hour and Overtime of 20 hours which was remunerated at ₹ 400 per hour. Mr. T suggested that the above time taken may be considered as standard and a scheme of Incentive be introduced to reduce overtime cost. He further indicated that Rowan scheme of incentive be used to measure performance and the improved productivity per hour would be 125 units per hour.In this regard, address the following queries in line with the suggestions provided by Mr. T to Tropic Pvt Ltd.

1. **The annual requirement of Material R to meet the target sales of 24,000 units of Product P is:**
   (a) 48,000 units
   (b) 60,000 units
   (c) 40,000 units
   (d) 50,000 units

Ans: (c)

2. **The ordering quantity as per the current inventory policy and the proposed Wilson's Economic order quantity of Material R are:**
   (a) Order Quantity as per the current inventory policy – 10,000 units & Economic Order Quantity – 1,000 units
   (b) Order Quantity as per the current inventory policy – 15,000 units & Economic Order Quantity – 1,225 units
   (c) Order Quantity as per the current inventory policy – 12,000 units & Economic Order Quantity – 1,095 units
   (d) Order Quantity as per the current inventory policy – 12,500 units & Economic Order Quantity – 1,118 units

Ans: (a)

3. **The net savings to inventory cost on migration from the current inventory policy to the Wilson's Economic Order Quantity policy would be: (Chapter 2: Material Cost)**
   (a) Savings from EOQ as compared to current discount policy – ₹ 26,820
   (b) Savings from EOQ as compared to current discount policy – ₹ 20,500
   (c) Savings from EOQ as compared to current discount policy – ₹ 33,253
   (d) Savings from EOQ as compared to current discount policy – ₹ 25,546

Ans: (b)

4. **Incentive payable under the Rowan Incentive scheme amounts to:**
   (a) ₹ 7,500
   (b) ₹ 6,400
   (c) ₹ 6,000
   (d) ₹ 8,000

Ans:(b)

5. **The savings in labour cost achieved by implementation of incentive scheme over the overtime payments amounts to:**
   (a) ₹ 9,600
   (b) ₹ 5,600
   (c) ₹ 8,000
   (d) ₹ 3,200

Ans:(b)

CS 11 (MTP 10 Marks July'24) (Chapter 14-Marginal Costing) LDR

XYZ Manufacturing Pvt. Ltd. is a prominent company in the electric appliances industry, known for producing a diverse range of high-quality products. The company has built a reputation for reliability and innovation in the manufacturing of household appliances, including fans, mixers, and heaters. XYZ Manufacturing Pvt. Ltd. is dedicated to delivering products that meet the needs of its customers while adhering to the highest standards of quality and performance.

The company operates a state-of-the-art factory that is fully equipped with advanced machinery and technology to ensure efficient and consistent production. The factory operates 25 days a month, running multiple shifts to meet the growing demand for its products. The company have spare capacity to

additional orders. Each product type—fans, mixers, and heaters—undergoes a meticulous manufacturing process that includes assembly, quality testing, and packaging.

Cost Category	Amount (₹)
Fixed Costs (per month)	
Factory Rent	₹ 3,00,000
Depreciation	₹ 2,00,000
Administrative Expenses	₹ 1,00,000
Salaries	₹ 4,00,000
Total Fixed Costs	₹ 10,00,000
Number of units produced per month (Note: Last month there was an additional special order of 2000 units which resulted in higher production)	10,000 units
Selling price per unit	₹ 1,500

Additional Info: Raw Materials include Copper, Plastic, and Other Materials. The per unit cost of Copper is ₹ 80 more than the cost of Plastic, while the cost of Other Materials is twice that of Plastic. And the total Raw Material Cost per unit is ₹ 210 more than the combined cost of Copper & Plastic.
The Labour Hour Rate is ₹ 100 per hour. The total labour hours used in the last month were 36,000 Hours. The Utilities Cost per unit is ₹ 100, and the Packaging Cost per unit is ₹ 50. Being a finance manager of the company, you are required to answer the following:

1. Calculate the contribution margin per unit.
   (a) ₹ 550
   (b) ₹ 600
   (c) ₹ 650
   (d) ₹ 700

Ans:(a)

2. Determine the break-even point in sales revenue.
   (a) ₹ 31,28,593
   (b) ₹ 25,85,153
   (c) ₹ 27,27,025
   (d) ₹ 27,05,983

Ans: (c)

3. If the company wants to achieve a target profit of ₹ 5,00,000, what should be the sales volume (in units)?
   (a) 2,000 units
   (b) 2,727 units
   (c) 2,750 units
   (d) 3,000 units

Ans: (b)

4. What would be the impact on the break-even point if the variable cost per unit increases by 10%?
   (a) 2,178 units
   (b) 2,198 units
   (c) 2,248 units
   (d) 2,258 units

Ans: (b)

5. Calculate the margin of safety in percentage if the company sells 4,000 units if the variable cost per unit increases by 10%
   (a) 44.85%
   (b) 42.55%
   (c) 45.05%
   (d) 45.75%

Ans: (c)

CS 12 (MTP 10 Marks Aug'24) (Chapter 6 -Cost Sheet)

Mr. Vikas, a toy importer has understood the importance of manufacturing in India. Heis backed up by the new govt. policies that motivate him to manufacture in India. As per the custom department any import made for the manufacturing under "Made in India", custom duty will be refunded upto 80%. Vikas decided not to import toy from China anymore, instead import raw material from Srilanka, for the manufacturing of toys in India. Under an agreement of Govt. Of India with Srilankan Govt., any impo8rtfrom Sri Lanka will receive tax benefits.

Vikas ordered material Xendga & material Zenga from Srilanka. Details are given below :-

	Srilankan Rupees (SLR)
Material Xendga (12,000 units * 125 SLR)	15,00,000
Material Zenga (8,000 units * 225 SLR)	18,00,000
Factory cost	33,00,000
Add: Containers cost	2,00,000
Add: Freight upto loading shipment on ship (paid by exporter)	50,000
F.O.B.	35,50,000

- Ocean Freight is $ 2,000
- Insurance is $ 1,500

When shipment reached India, it was unloaded at Chennai port. Vikas requested to put the goods in custom port's warehouse. Vikas due to cash crunch was not in a position to pay custom duty and therefore did not file the bill of exchange (B.O.E.). Custom authorities charged a penalty of INR 15,000.

Finally, after a month Vikas filled B.O.E. and paid custom duty of 20% on CIF value ofthe shipment. IGST was also applicable @ 18% on the combined value of CIF & custom duty paid.

He spent further a sum of INR 12,500 to bring the imported goods to his factory. An inspection was done on the goods and it was found that 5% of the goods were broken.This came to management as a surprise because generally such rate of defects on imports is 8%.

Additional Information:

- Exchange rates:
  1) 1 INR = 0.25 SLR
  2) 1 USD = 75 INR
- IGST credits are available.
- Containers were refunded at INR 38,000.
- Indian and Srilankan brokers were paid commission by Vikas on factory cost.Indian broker charged 6% whereas Srilankan broker charged 12%.
- CIF (cost, insurance and Freight) includes F.O.B (Free on Board)., Insurance &Ocean freight.

You are required to answer the following 5 questions:

1. What is the total cost of shipment to be recorded by Vikas?
   (a) INR 13,17,000
   (b) INR 13,04,500
   (c) INR 13,54,500
   (d) INR 13,32,500

Ans: (b)

(Chapter 4: Overheads – Absorption Costing Method)

2. What is the absorption rate of total cost per unit of Zenga?
   (a) INR 90.28
   (b) INR 84.44
   (c) INR 93.62
   (d) INR 85.77

Ans: (a)

3. **What is the absorption rate of total cost per unit of Xendga?**
   (a) INR 52.01
   (b) INR 54.24
   (c) INR 58.13
   (d) INR 68.65

Ans: (b)

4. **Amount of refundable taxes?**
   (a) INR 4,13,600
   (b) INR 4,57,600
   (c) INR 2,20,000
   (d) INR 2,37,600

Ans: (a)

5. **If loss of goods was 9% instead of 5%, what will be the amount that will be charged to statement of profit & loss?**
   (a) INR 13,045
   (b) INR 19,898.4
   (c) INR 14,178.4
   (d) INR 24,045

Ans: (c)

CS 13 (MTP 10 Marks Aug'24) (Chapter 13- Standard Costing)

Hilfy textiles Ltd. has been a major player in the textile industry, producing high- quality polyester mix cotton fabric. The production process is complex and involves multiple stages, including spinning, weaving, quality control, and packaging. The company has been facing challenges in controlling costs and maintaining profitability, mainly due to fluctuating material costs and labor inefficiencies.

To address these challenges, the company's management has decided to implement a standard costing system to better manage costs, set benchmarks,and identify variances. The goal is to gain better control over production costs, improve budgeting accuracy, and enhance decision-making.

Hilfy textiles Ltd. had prepared the following estimation for the month of April:

	Quantity/Time	Rate (₹)	Amount (₹)
Cotton	8,000 m	50.00	4,00,000
Polyester	6,000 m	40.00	2,40,000
Skilled labour	1,000 hours	37.50	37,500
Unskilled labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour timeof 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the costaccounting department:

The company has produced 14,800 m finished product by using the followings:

	Quantity/Time	Rate (₹)	Amount (₹)
Cotton	9,000 m	48.00	4,32,000
Polyester	6,500 m	37.00	2,40,500
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

On the basis of analysis of standard costing system, company's management wants to take actions like supplier negotiation, process optimisation, employee training, etc.

Being the cost manager of the company, you are required to answer the followingfive requirements of the management:

1. **Compute Material mix variance and Material Yield Variance**
   (a) ₹ 1430 (A) & 43,200 (F)
   (b) ₹1430 (F) & 43,200 (F)
   (c) ₹24,000 (A) & 37,500 (F)
   (d) ₹19,300 (A) & 37,500 (F)

Ans: (a)

2. **Compute Material Price Variance for supplier negotiation**
   (a) ₹18,000 (A)
   (b) ₹43,200 (F)
   (c) ₹37,500 (A)
   (d) ₹37,500 (F)

Ans: (d)

3. **Compute Material Cost Variance**
   (a) ₹32,500 (F)
   (b) ₹24,500 (A)
   (c) ₹79,270 (F)
   (d) ₹79,270 (A)

Ans: (c)

4. **Compute Labour Efficiency Variance and Labour Yield Variance.**
   (a) ₹940 (A) & 1,140 (A)
   (b) ₹2,424 (A) & 1,556 (A)
   (c) ₹2,424 (A) & 1,556 (A)
   (d) ₹940 (A) & 1,140 (F)

Ans: (b)

5. **Compute Labour Cost Variance.**
   (a) ₹ 884 (A)
   (b) ₹1,556 (F)
   (c) ₹884 (F)
   (d) ₹1,556 (A)

Ans: (a)

CS 14 (PYP 10 Marks Sep'24) (Chapter 10- Process & Operation Costing)

Sagar Limited, an oil refinery uses Process Costing for determining the cost of each process. Management of Sagar Limited is confused about method of valuation of WIP. They have FIFO and Weighted Average Cost methods under consideration.

Finance manager Mr. Sahil has put forward that Weighted Average Cost method is suitable when there are significant fluctuations in. price and quantity. In this method, calculation has to be done at every purchase and it is a complex and time-consuming method.

He also stated that price and quantity of input and output material of Sagar Limited is almost same for whole year; hence FIFO method would be more suitable for the company. He also revealed that in oil refinery industry; FIFO method is preferred over Weighted Average Cost method and switching to FIFO method will save time and money.

He further stated that by using FIFO method closing WIP is valued at current cost and provided the following information:

Opening WIP : 12,000 Units, Total cost ₹ 1,66,200.

Degree of Completion : Material - 100%
Labour and Overhead - 80%

Material introduced: (74,500 Units) ₹ 4,76,465
Direct Labour ₹ 3,70,395
Direct Overhead ₹ 2,96,316
Units Scrapped: 1,900 units Degree of Completion:
Material 100%
Labour and Overhead 70%
Closing WIP : 2,600 units Degree of Completion:
Material 100%
Labour and Overhead 60%
Rest of the units were transferred to next process.
Normal Loss is 2% of total input unit including opening work-in-process. Realizable value of normal loss is ₹ 2 per unit deducted from cost of material introduced.
You are required to calculate the following using FIFO method (MCQs 1 to 5):

1. Equivalent units of Material and Material cost per unit
   (a) 86,500 units and ₹ 5.50 per unit
   (b) 74,500 units and ₹ 6.39 per unit
   (c) 72,770 units and ₹ 6.50 per unit
   (d) 72,600 units and ₹ 6.56 per unit

Ans: (c)

2. Equivalent units of labour and overheads and total cost per unit
   (a) 82,490 units and ₹ 8.08 per unit
   (b) 74,079 units and ₹ 9.00 per unit
   (c) 75,290 units and ₹ 8.85 per unit
   (d) 79,790 units and ₹ 8.35 per unit

Ans: (b)

3. Value of abnormal loss to be shown in process account .
   (a) ₹ 2,176.00
   (b) ₹ 2,182.00
   (c) ₹ 2,168.35
   (d) ₹ 1,896.52

Ans: (a)

4. Value of units transferred to next process
   (a) ₹ 11,10,660
   (b) ₹ 12,75,600
   (c) ₹ 12,51,200
   (d) ₹ 12,72,800

Ans: (d)

5. Value of closing WIP
   (a) ₹ 31,096
   (a) ₹ 31,044
   (b) ₹ 30,940
   (c) ₹ 28,340

Ans: (c)

CS 15 (PYP 10 Marks Sep'24) (Chapter 2-Material Cost)

FW Limited manufactures various types of footwear and covers a considerable market share. The footwear made by company are stylish and durable. The management calls for an urgent meeting because it has come to their notice that two of their old permanent customers have moved on to its competitors.
Marketing Manager has stated that there are circumstances when company cannot fulfill the demand of their customers due to shortage of supply and this is the main reason for move on.

Production Manager has stated that production team is working efficiently but workers have to wait long enough for raw material which leads to idle time and low production.

The cost accounts department of FW Limited has furnished the following data for the component B :

Purchase Price	₹ 4,800 per unit
Trade Discount	2% of purchase price
Total duties (No Credit availed)	8% of purchase price
Insurance Charges	₹ 62,000 per year
Units purchased during the year	60,000 units
Opening Stock	5,000 units @ ₹ 5,150 per unit
Closing Stock	4,500 units

Usages per week		Delivery period	
Minimum	1,050 units	Minimum	5 weeks
Maximum	1,200 units	Maximum	9 weeks
Average	1,125 units	Average	7 weeks

Lead time for emergency purchases is 2 weeks. Additional Information :

- Normal wastage during the storage is 80 units (no realizable value) and abnormal wastage is 40 units.
- Factory works for 365 days in a year.

You are required to calculate the followings (MCQs):

1. Calculate per unit cost of material by using Average Price Method.
   (a) ₹ 5,100
   (b) ₹ 5,119
   (c) ₹ 5,094
   (d) ₹ 5,133

Ans: (a)

2. Calculate minimum stock level.
   (a) 10,800 units
   (b) 7,825 units
   (c) 5,250 units
   (d) 2,925 units

Ans: (d)

3. What will be danger level of stock ?
   (a) 2,400 units
   (b) 7,875 units
   (c) 2,250 units
   (d) 2,240 units

Ans: (c)

4. Calculate average number of days (round off) for which average inventory level to be held.
   (a) 27 days
   (b) 29 days
   (c) 26 days
   (d) 30 days

Ans: (b)

5. Calculate amount of Abnormal Loss during storage to be transferred to Costing Profit & Loss Account (based on average price)
   (a) ₹ 2,04,000
   (b) ₹ 2,04,760
   (c) ₹ 2,03,760
   (d) ₹ 2,05,320

Ans: (a)

CS 16 (RTP Jan'25) (Chapter 14- Marginal Costing)

Popular company produces various articles for student purposes. It has been in industry since last 25 years. Company had a very humble start but gained popularity over the years due to excellent quality products which were sold at very competitive prices. Company has huge reserves and feel that it is also obligated to give back to the society from which it has grown.

Last year management decided to produce and supply special quality school bags, water bottles, & geometry boxes to NGOs, at no price, as a social responsibility. These articles were simple looking but were more durable, that would not have wore-off easily and could have been used for long-term.

This year management wants to add another dimension to this social work. It approached charitable schools and government run schools and offered them the supply of the same articles, at cost. This will help students in these schools to get these things at a very low price compared to market.

The variable costs are ₹ 100, ₹ 80, and ₹ 40 for school bags, water bottles, and geometry boxes, respectively. These articles are made using a single machine. 0.20 hours of machine operation is required for manufacturing 1 unit of school bag. Similarly, machine hours required for each units of water bottle and geometry box is 0.15 hours and 0.10 hours, respectively. Fixed overhead related to machine is ₹ 7,40,000 per year. Machine can operate for 8,000 hours in a year.

Company has decided to sell its 80% capacity production in markets. Rest is divided amongst the 2 undergoing social works, equally.

All Schools requests these items in the ratio of 2:3:5, as per their demand by the school students.

Company wants to set a price for these articles to be offered to the schools. Management has few questions they need the answers to. They assigned the task to their team. Team made rough calculations but as there were too many people on the team, each came up with different answers. As a Chartered accountant, you have been approached. Understand the case closely, find the correct answers and help management to set a price.

Answer the following:

1. What is allocated fixed cost per unit of School bags, water bottles, and geometry boxes?
   (a) 18.5, 13.875, 9.75
   (b) 18.5, 13.875, 9.25
   (c) 18.5, 13.785, 9.25
   (d) 18.5, 13.785, 9.50

Ans: (b)

2. If the prices were ₹ 200, ₹ 160, and ₹ 100, what would be the overall break-even point in units in relation to fixed cost allocated to these supplies?
   (a) 308.33 units
   (b) 500 units
   (c) 508.33 units
   (d) 1,000 units

Ans: (d)

3. Find out the maximum number of units of each article that can be given at the prices given in Part (ii).
   (a) 61, 92, 154
   (b) 200, 300, 500
   (c) 101, 152, 254
   (d) 100, 150, 250

Ans: (b)

4. What will be the maximum units that can be supplied to the schools of each article?
   (a) 1103, 1645, 2726
   (b) 1093, 1655, 2748
   (c) 1185, 1777, 2962
   (d) 1133, 1675, 2958

Ans: (c)

5. What should be the correct price for each item as per the management's decision?
   (a) 118.50, 93.875, 49.75
   (b) 118.50, 93.785, 49.25
   (c) 118.50, 93.785, 49.50
   (d) 118.50, 93.875, 49.25

Ans: (b)

CS 17 (RTP Jan'25) (Chapter 10- Process & Operation Costing)

Knowing the hectic schedule of a student preparing for the examination, a homemaker managing work from home or a new parent busy in neonatal care, a freshly qualified professional (Mr. Rishi) entered into a start-up business of manufacturing frozen foods.

The process majorly involve washing and cutting the vegetables (Process I), blanching, cooling and mixing of ingredients with spices (Process II), forming, frying and freezing the final product (Process III).

In Accounts, Mr. Rishi normally transfers the output of one process to another process at cost but, being a young entrepreneur, he is interested in knowing the profit made at each and every process. Thus, it was decided to transfer the output of Process I and II to the next process at cost plus 25%. Further, the output of Process III is also transferred to finished stock at cost plus 33 1/3%.

Following information is extracted from the books of Mr. Rishi for the current year:

	Process I (₹)	Process II (₹)	Process III (₹)	Finished Stock (₹)
Opening stock	8,02,500	14,44,500	21,40,000	24,07,500
Direct materials	42,80,000	34,77,500	26,75,000	--
Direct wages	66,87,500	57,78,000	49,22,000	--
Factory overheads	51,36,000	38,52,000	35,57,750	--
Closing stock	10,70,000	17,12,000	20,86,500	26,75,000
Inter-process profit included in opening stock	NIL	2,14,000	5,35,000	10,70,000

Stock in processes is valued at prime cost. The finished stock is valued at the price at which it is received from Process III.

Mr. Rishi wants you to FIGURE OUT the following to analyse the profit generated at each process:

1. What is the transfer price value at which the output of Process I is transferred to Process II?
   (a) ₹ 1,97,95,000
   (b) ₹ 39,59,000
   (c) ₹ 1,58,36,000
   (d) ₹ 1,69,06,000

Ans: (b)

2. What is the transfer price value at which the output of Process II is transferred to Process III?
   (a) ₹ 1,20,97,476
   (b) ₹ 4,07,93,750
   (c) ₹ 2,86,96,274
   (d) ₹ 3,43,47,000

Ans: (d)

3. What is the transfer price value at which the output of Process III is transferred to Finished Stock?
   (a) ₹ 5,40,88,500
   (b) ₹ 3,98,91,140
   (c) ₹ 2,94,44,860
   (d) ₹ 6,93,36,000

Ans: (d)

4. What is the cost value at which the output of Process III is trans- ferred to Finished Stock?
   (a) ₹ 5,40,88,500
   (b) ₹ 3,98,91,140
   (c) ₹ 2,94,44,860
   (d) ₹ 6,93,36,000

Ans: (b)

5. What is the cost value of closing stock of Process III A/c?
   (a) ₹ 20,86,500
   (b) ₹ 15,64,884
   (c) ₹ 3,98,91,140
   (d) ₹ 5,21,616

Ans: (b)

CS 18 (MTP 10 Marks Nov'24) (Chapter 13- Standard Costing) LDR

XYZ Manufacturing Ltd. is a mid-sized enterprise that has established a strong reputation in the field of precision engineering. The company specializes in producing high-quality engineering components that meet the stringent requirements of various industries including automotive, aerospace, medical devices, and industrial machinery. With a commitment to precision and excellence, XYZ Manufacturing Ltd. has positioned itself as a reliable supplier of critical components that demand the highest levels of accuracy and durability. To maintain stringent control over its production costs and enhance cost efficiency, XYZ Manufacturing Ltd. operates under a standard costing system. This system plays a pivotal role in the company's financial and operational management. Standard costing involves setting predetermined costs for each production element, including materials, labor, and overheads. These predetermined costs, known as standard costs, serve as benchmarks against which actual production costs are measured.

Particulars	Budgeted Data	Actual Data
Units Produced	10,000 units	9,500 units
Fixed Overheads	₹ 20,00,000	₹ 19,50,000 + ₹ 1,00,000 (additional quality control cost for
		1,000 units chosen on sample basis)
Hours Worked	15,000 hours	14,250 hours
Variable Overhead Rate	₹ 50 per hour	₹ 50 per hour (first 10,000 hours) ₹ 60 per hour (additional hours)

Based on the given information, you are being required to answer the following questions (MCQs 1 to 5):

1. What is the Fixed Overhead Cost Variance for XYZ Manufacturing Ltd. in May 2024?
   (a) ₹50,000 (A)
   (b) ₹ 1,00,000 (A)
   (c) ₹ 1,50,000 (A)
   (d) ₹ 2,00,000 (A)

Ans: (c)

2. What is the Fixed Overhead Volume Variance for XYZ Manufacturing Ltd. in May 2024?
   (a) ₹50,000 (F)
   (b) ₹50,000 (A)
   (c) ₹ 1,00,000 (F)
   (d) ₹ 1,00,000 (A)

Ans: (d)

3. What is the Variable Overhead Efficiency Variance for XYZ Manufacturing Ltd. in May 2024?
   (a) ₹37,500 (A)
   (b) ₹42,500 (A)
   (c) ₹0
   (d) ₹25,000 (A)

Ans: (c)

4. **What is the Variable Overhead Expenditure Variance for XYZ Manufacturing Ltd. in May 2024?**
   (a) ₹40,000 (A)
   (b) ₹42,500 (A)
   (c) ₹45,000 (A)
   (d) ₹45,030 (A)

Ans: (b)

5. **What is the Fixed Overhead Expenditure Variance for XYZ Manufacturing Ltd. in May 2024?**
   (a) ₹50,000 (F)
   (b) ₹50,000 (A)
   (c) ₹1,00,000 (F)
   (d) ₹1,00,000 (A)

Ans: (b)

CS 19 (MTP 10 Marks Nov'24) (Chapter 14- Marginal Costing)

A garment manufacturer has been producing and selling T-shirts exclusively for Indian market. His T-shirts are made of a specific material which is eco-friendly. It means that T-shirts are bio-degradable in soil after it becomes unsuitable for use.

This invention has been applauded throughout the country. Owner, Vikas, registered for the patent rights for his invention so that no one else could use it.

Vikas feels that this invention will also be liked in foreign markets, and thus plans to expand his business outside India. He feels that US market is the first foreign market he should tap into.

Current cost structure (each T-shirt):

Direct material	90	
Direct labour	60	
Special service (Used in T-shirt making, 50% fixed)	80	
Fixed overhead	50	
Administration overhead (fixed)	20	
Total cost per T-shirt	300	
(+) Profit margin	200	
Selling price in India		500

There is no limitation of any resources in India. Vikas is able to sell 80,000 T-shirts each year. He is currently working at 80% of his total capacity.

After searching for potential customers in US, Vikas received an inquiry for 30,000 units from a wholesale distributor in California. As per the inquiry, order will be placed if price per T-shirt is reasonable and the order has to be satisfied in full.

Vikas decided to send a quote and the order was placed by the foreign client, on the same day. Vikas, without a second thought accepted the order, but did not feel the need to extend the manufacturing capacity; therefore he decided forgo a few Indian clients.

This foreign order also required special packaging. It is spent at 20% of the total prime cost per T-shirt. The production was done quickly and foreign consignment was transported to custom port via services from a carriage agency. It charged ₹ 80,000 for 1 truck, whose capacity was 500 kg, to transport whole of the consignment. Truck was 20% vacant after loading the consignment.

Bill of lading was filed and a professional fee of ₹ 25,000 for filing this was paid to a Chartered accountant. Custom port also charged ₹ 80 per kg per day to handle the material, storing it in warehouse, and for loading the goods on ship.

The shipping company, which was booked by Vikas for taking the consignment to US, got delayed due to bad weather. Stock was held at port for 5 days and on 6th day it was loaded on ship. Shipping company charged ₹ 2,800/ 10kg of goods. Insurance was charged flat at ₹ 1,11,000.

There is no custom duty on such exports.

Answer the following questions (MCQs 1 to 5):

1. Vikas had sufficient funds in his hands but he still raised a short-term working capital loan @ 6.5% p.a. for the satisfaction of this foreign order because he found a one time investment opportunity which was giving him 9.25% returns. Foreign order was accepted on 1st June and loan was taken on the same day. Repayment of the loan will be made on 1st September. Calculate net cash outflow due to this export order. Which of the following is correct?
   (a) ₹ 73,91,000
   (b) ₹ 75,47,750
   (c) ₹ 74,76,500
   (d) ₹ 71,06,000

Ans: (b)

2. What would have been the minimum price that Vikas could have quoted per T-shirt in US dollars? (exchange rate on 1st June, $1 = ₹ 83.86)
   (a) $ 4.23
   (b) $ 4.20
   (c) $ 4.17
   (d) $4.05

Ans: (a)

3. Payment from foreign client was received on 8th October when exchange rate was ₹ 86 for each US $. Calculate the profit earned from this export order if actual quoted price was $4.90 per T-shirt. Select the correct amongst following:
   (a) ₹ 40,65,500
   (b) ₹ 41,51,000
   (c) ₹ 39,94,250
   (d) ₹ 44,36,000

Ans: (c)

4. What is the net cash Inflow from this export order?
   (a) ₹55,36,000
   (b) ₹ 51,65,500
   (c) ₹ 52,51,000
   (d) ₹ 50,94,250

Ans: (d)

5. What is the Incremental benefit from this export order?
   (a) ₹19,94,250
   (b) ₹ 21,51,000
   (c) ₹ 20,65,500
   (d) ₹ 24,36,000

Ans: (a)

CS 20 (MTP 10 Marks Dec'24) (Chapter 12- Service Costing)

A truck driver, named Raju, owns a truck which can carry 5 tonne of material at a time. Raju has no other truck and he has listed himself with various carriage services agencies, to offer his services. He gets his work from these agencies and they pay him as per the load and the distance. Raju has one condition that he must be paid for at least 75% of his total capacity. Raju charges freight at ₹ 10 per tonne- km.

He received a work contract, from one of these agencies, where he has to take 4 tonne from Delhi in the morning and drop it off at Chandigarh. After that he will move to Ludhiana, where he again loads 3 tonne and come back to Delhi by evening. This contract is for nearly 3 months.

Raju is excited to accept the order but it is not physically possible for Raju to complete this project alone. He decides to hire a helper cum driver who will assist him in this work contract and will also drive in turns with Raju. Thus, such a long contract will be managed comfortably. This helper will take ₹ 15,000 per month.

The contract will start from 15th June, 2024 and will run till 14th September, 2024. Throughout this time period

there are only 2 days holidays, both falling in August (1 for Independence Day and 1 for Raksha Bandhan).
Some information about the Truck and its associated costs:

- Truck was purchased on 1st April, 2021 by taking a loan of ₹ 20,00,000 @ 10% p.a. from Punjab national bank for 5 years. Raju mortgaged jewellery of his wife to get this loan.
- Every year-end he has to pay ₹ 5,27,595 as instalment.
- Scrap value after 10 years is expected to be ₹ 500,000.
- Depreciation is charged on straight-line method.
- Services and maintenance charges each month is ₹ 80,000.
- Truck runs on diesel and its running average is 8kms/ litre.
- Diesel cost per litre:

June	80.30
July	80.50
August	81.25
September	80.90

Yearly interest amount of loan and yearly depreciation is charged to a work contract on the basis of days worked in a year in the contract.
Distance between these places:

(1) Delhi to Chandigarh = 250 kms
(2) Chandigarh to Ludhiana = 100 kms
(3) Ludhiana to Delhi = 150 kms

Answer the following questions (MCQs 1 to 5):

1. What would be the amount of profit Raju would have earned if he had no minimum charges limit of 75% of total capacity on absolute Tonne-km basis? (If the vehicle runs empty then he would only charge for Diesel expenses).
   (a) 3,34,249
   (b) 4,43,249
   (c) 5,96,977
   (d) 4,34,249

Ans: (c)

2. If payment was made on commercial Tonne-km basis and Raju had no minimum charges limit of 75%, how much he would have lost due to no minimum requirement?
   (a) ₹ 6,37,500
   (b) ₹ 5,93,750
   (c) ₹ 4,92,438
   (d) ₹ 3,91,126

Ans: (a)

3. What should be the minimum amount charged on basis of absolute Tonne- km if Raju wants to earn ₹ 2,70,000?
   (a) ₹ 4.58
   (b) ₹ 6.13
   (c) ₹ 8.39
   (d) ₹ 3.21

Ans: (b)

4. Choose the correct amount of depreciation and interest that should be charged to this work contract.
   (a) 56,983 & 22,588
   (b) 36,986 & 22,578
   (c) 63,963 & 12,568
   (d) 63,953 & 12,558

Ans: (b)

5. What is the profit as per current rate charged by Raju? (Use absolute Tonne-Km).
   (a) 7,34,249
   (b) 9,44,863
   (c) 5,96,977
   (d) 4,34,249

Ans: (b)

CS 21 (MTP 10 Marks Dec'24) (Chapter 11- Joint Products and By Products)

eSalt is the biggest producer of sodium hydroxide in India. This main product of the company has a strong reactivity with other organic compounds. It is highly versatile and is alkaline in nature. However, the basic material required for the production of this product is salt along with the electricity.

The manufacturing process involve electrolysis which produces Halogen as co- product. Modern use of Halogen is widespread. However, the common use is in disinfection like for purifying drinking water or swimming pool water. It is also an important ingredient of toothpaste. Thus, the company's management affirmed the simultaneous production of Halogen.

During the previous financial year, the company purchased the base material of ₹ 5,34,000. For the current year, company decided to increase the production by 2 times. Due to increased production, the total conversion cost hiked to 3 times. Last year, the conversion cost accounted to ₹ 8,01,000 up to the point at which two products i.e. sodium hydroxide and Halogen are separated.

The production and sales information for current year is provided as below:

	Sodium hydroxide	Halogen
Production/ Sales(in tonne)	24,030	16,020
Selling price per tonne (₹)	100	150

During the current year, the management of the company pointed the extensive use of Vinyl which can be produced by further processing Halogen. Having selling price of ₹ 250 per tonne higher than that of the Halogen, it was decided not to sell Halogen and further process it into Vinyl. The incremental processing cost took ₹ 8,01,000 producing 10,012.50 tonnes of Vinyl.

You are required to FIGURE OUT the following for managerial decision (MCQs 1 to 5):

1. For the current year, the amount of base material purchased and the conversion cost up to the point at which two products i.e. Sodium hydroxide and Halogen are separated would be:
   (a) base material ₹ 10,68,000 and conversion cost ₹ 24,03,000
   (b) base material ₹ 10,68,000 and conversion cost ₹ 16,02,000
   (c) base material ₹ 16,02,000 and conversion cost ₹ 24,03,000
   (d) base material ₹ 24,03,000 and conversion cost ₹ 16,02,000

Ans: (c)

2. Joint cost to be apportioned between Sodium hydroxide and Halogen as per the physical unit method would be:
   (a) Sodium hydroxide ₹ 24,03,000 and Halogen ₹ 10,68,000
   (b) Sodium hydroxide ₹ 10,68,000 and Halogen ₹ 16,02,000
   (c) Sodium hydroxide ₹ 16,02,000 and Halogen ₹ 24,03,000
   (d) Sodium hydroxide ₹ 24,03,000 and Halogen ₹ 16,02,000

Ans: (d)

3. Joint cost to be apportioned between Sodium hydroxide and Halogen as per the sales value at split- off point method would be:
   (a) Sodium hydroxide ₹ 20,02,500 and Halogen ₹ 20,02,500
   (b) Sodium hydroxide ₹ 16,02,000 and Halogen ₹ 24,03,000
   (c) Sodium hydroxide ₹ 24,03,000 and Halogen ₹ 16,02,000
   (d) Sodium hydroxide ₹ 10,68,000 and Halogen ₹ 20,02,500

Ans: (a)

4. **Joint cost to be apportioned between Sodium hydroxide and Halogen as per the estimated net realisable value method would be:**
   (a) Sodium hydroxide ₹ 23,44,390 and Halogen ₹ 16,60,610
   (b) Sodium hydroxide ₹ 17,16,429 and Halogen ₹ 22,88,571
   (c) Sodium hydroxide ₹ 22,88,571 and Halogen ₹ 17,16,429
   (d) Sodium hydroxide ₹ 16,60,610 and Halogen ₹ 23,44,390

Ans: (b)

5. **Considering that the decision relating to further processing Halogen is not approved, suggest whether this would be in favour of the management by calculating incremental revenue /loss from further processing Halogen into Vinyl.**
   (a) Incremental loss would be ₹ 16,02,000, thus the decision of not further processing Halogen is correct.
   (b) Incremental loss would be ₹ 8,01,000, thus the decision of not further processing Halogen is correct.
   (c) Incremental revenue would be ₹ 8,01,000, thus the decision relating to further processing Halogen needs to be approved.
   (d) Incremental revenue would be ₹ 16,02,000, thus the decision relating to further processing Halogen needs to be approved.

Ans: (c)