

EDU91 PRESENTS

COSTING PRACTICE SHEETS

**SEPT 24 -
JAN 25**

CA NITIN GURU



Dear CA Intermediate Students,

I am pleased to present to you this practice booklet, specially compiled to aid your preparation for the CA Intermediate exams. This comprehensive resource, brought to you by EDU91 and meticulously compiled by CA Nitin Guru, is designed to provide you with an invaluable study aid.

Inside this booklet, you will find past years' exam questions, revision test papers, and mock test paper questions presented by ICAI. These have been simplified and organized in a chapter-wise manner to facilitate easier understanding and revision. Additionally, this booklet includes multiple-choice questions (MCQs) and case-based questions, also provided by ICAI, to help you practice and perfect your exam techniques.

Every effort has been made to ensure that this booklet is error-free. However, if you come across any mistakes, please do not hesitate to bring them to our attention so we can correct them. Your feedback is invaluable to us.

I extend my heartfelt thanks to my students for their continuous appreciation, hard work, and consistent support. Your dedication is the driving force behind this initiative. This practice booklet is a small token of gratitude from EDU91 and CA Nitin Guru to help you succeed in your exams.

Best wishes for your preparation!

Yours
CA Nitin Guru

Compiled by: CA Nitin Guru
Presented by: EDU91

ABOUT THE AUTHOR

CA Nitin Guru is a Post Graduate in Commerce & a Member of The Institute of Chartered Accountants of India.

- He is the lead trainer for various courses for Costing and Financial management at **Edu91** and **Learn91**.
- He is a First Class Graduate from Delhi College of Arts and Commerce.
- He is a College Topper & a Gold Medallist.
- His areas of specialisation are Cost & Management Accounting, Financial Management, Economics for Finance and Strategic Financial Management.
- At a young age, he has amassed vast experience of teaching over 25,000 students.
- His style of teaching, techniques and guidelines for preparing for examination are well accepted & acknowledged by all the students. His friendly and interactive approach makes him popular amongst the students.
- He has maintained a very high passing rate. He has been a Visiting Faculty to various Professional Institutes & MBA Colleges in the past.

CLASS ATTRACTIONS

- Start the topic from the base.
- Explains reasons and logic inbuilt behind concepts and has a unique method of making students understand them.
- Real life examples make classes interesting & lively.

CLASSES AVAILABLE ON WWW.EDU91.ORG

- CA Inter - Cost & Management Accounting (Regular & Fast Track)
- CA Inter - Financial Management (Regular & Fast Track)
- CA Final - Advanced Financial Management (Regular & Fast Track)

Thank You !!
CA Nitin Guru

INDEX

<u>Chapter No.</u>	<u>Name of the Chapter</u>	<u>Page No.</u>
0	Cased Based Questions and MCQs	1-19
1	Material Costing	1.1-1.5
2	Employee Costs	2.1-2.5
3	Overheads	3.1-3.8
4	Activity Based Costing	4.1-4.12
5	Cost Sheet	5.1-5.8
6	Cost Accounting System	6.1-6.7
7	Reconciliation	7.1-7.1
8	Unit, Job & Batch Costing	8.1-8.6
9	Process Costing	9.1-9.9
10	Joint & By Product	10.1-10.6
11	Service Sector Costing	11.1-11.11
12	Standard Costing	12.1-12.7
13	Marginal Costing	13.1-13.9
14	Budgetary Costs	14.1-14.10

Material Costing**Question 1 : (RTP Sept 2024)**

'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.

(i) 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

(ii) 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

(iii) 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

(iv) 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

(v) 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

Solution 1 :

(i) (d) Cash discount is received when credit amount is paid within the stipulated period of 30 days. The amount of cash discount to be received from the supplier is:

	Particulars	Amount (₹)
A.	Listed price	2,50,000
B.	Less: Trade Discount @10%	(25,000)
C.	Taxable value (A-B)	2,25,000
D.	Add: GST@18% (18% of C)	40,500

E.	Total amount payable to the supplier	2,65,500
F.	Cash discount @10% (10% of C)	(22,500)
G.	Net amount to be paid to the supplier (E-F)	2,43,000

(ii) (b)

Particulars	Units	(₹)
Listed Price of Materials	5,000	2,50,000
Less: Trade discount @ 10% on invoice price		(25,000)
		2,25,000
Add: GST @ 18% of ₹ 2,25,000		40,500
		2,65,500
Add: Toll Tax		5,000
Freight and Insurance		17,220
Commission and Brokerage Paid		10,000
Add: Cost of returnable containers:		
Amount deposited ₹ 30,000		
Less: Amount refunded ₹ 20,000		10,000
		3,07,720
Add: Other Expenses @ 2% of Total Cost ($\frac{3,07,720}{98} \times 2$)		6,280
Total cost of material		3,14,000
Less: Shortage material due to normal reasons @ 20%	1,000	-
Total cost of material of good units	4,000	3,14,000
Cost per unit (₹ 3,14,000/4,000 units)		78.5

(iii) (b) Axe Traders is an unregistered supplier in the GST; thus, GST credit is not applicable for it. GST paid on the purchase of the material will be the part of the material cost.

(iv) (a) Please refer the solution above

(v) (c) Please refer the solution above

Question 2 : (RTP May 2024)

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 in a 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 a month and production is carried out evenly.

The following queries/ calculations to be kept ready for purchase committees' reference:

(i) For the month of January 2024, what would be the quantity of the materials to be requisitioned for both material A and B:

- 9,000 kg & 6,000 kg respectively
- 18,000 kg & 12,000 kg respectively
- 27,000 kg & 18,000 kg respectively
- 30,000 kg & 20,000 kg respectively.

(ii) The economic order quantity (EOQ) for both the material A & B:

- 13,856 kg & 16,181 kg respectively
- 16,197 kg & 17,327 kg respectively
- 16,181 kg & 17,165 kg respectively

(d) 13,197 kg & 17,165 kg respectively

(iii) 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.

(iv) 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.

(v) What would the minimum stock level for material A:

- (a) 1,800 kg.
- (b) 1,200 kg.
- (c) 600 kg.
- (d) 2,400 kg.

Solution 2 :

(i) (d) Monthly Production of X = 30,000 kgs.

Raw Material Required = $\frac{30,000}{3} \times 5 = 50,000$ kgs.

Material A = $\frac{50,000}{5} \times 3 = 30,000$ kg.

Material B = $\frac{50,000}{5} \times 2 = 20,000$ kg.

(ii) (a) Calculation of Economic Order Quantity (EOQ):

Material A = $\sqrt{\frac{2 \times \text{Annual Consumption} \times \text{Order Cost}}{\text{Carrying Cost per unit p.a}}}$
 $= \sqrt{\frac{2 \times (30,000 \times 12) \times 1,200}{15\% \text{ of } 30}} = 13,856$ kg

Material B = $\sqrt{\frac{2 \times (20,000 \times 12) \times 1,200}{5\% \text{ of } 44}} = 16,181$ kg.

(iii) (b) Calculation of Maximum Stock level:

Since, the Material A is perishable in nature and it required to be used within 10 days, hence, the Maximum Stock Level shall be lower of two:

(a) Stock equal to 10 days consumption = $\frac{30,000}{25} \times 10$ Days = 12,000 kg

(b) Maximum Stock Level for Material A:

Re-order Quantity + Re-order level – (Min consumption* × Min. lead time)

Where,

Re-order Quantity = 15,000 kg.

Re-order level = Max. Consumption* × Max. Lead time = $30,000/25 \times 2$ days = 2,400 kg.

Maximum stock Level = 15,000 kg + 2,400 kg. - $(30,000/25 \times 1 \text{ day}) = 17,400 - 1,200 = 16,200$ kg.

Stock required for 10 days consumption is lower than the maximum stock level calculated through the formula. Therefore, Maximum Stock Level will be 12,000 kg.

(*Since, production is processed evenly throughout the month hence material consumption will also be even.)

(iv) (b) Calculation of Savings/ loss in Material A if purchase quantity equals to EOQ.

	Purchase Quantity = 15,000 kg.	Purchase Quantity = EOQ i.e. 13,856 kg.
Annual consumption	3,60,000 kg. (30,000 × 12 months)	3,60,000 kg. (30,000 × 12 months)
No. of orders [Note- (i)]	30 (3,60,000 ÷ 12,000)	30 (3,60,000 ÷ 12,000)
Ordering Cost (a)	₹36,000	₹36,000

	(₹1200 × 30)	(₹1200 × 30)
Carrying Cost (b) [Note- (ii)]	₹30,375 (15% of ₹27 × 7,500)	₹31,176 (15% of ₹30 × 6,928)
Purchase Cost (c) (for good portion)	₹97,20,000 (₹27 × 3,60,000)	₹1,08,00,000 (₹30 × 3,60,000)
Loss due to obsolescence (d) [Note- (iii)]	₹24,30,000 [₹27 × (30 × 3,000)]	₹16,70,400 [₹30 × (30 × 1,856)]
Total Cost [(a) + (b) + (c) + (d)]	₹ 1,22,16,375	₹ 1,25,37,576

Purchasing of material -A at present policy of 15,000 kg. saves ₹ 3,21,201.

Notes: (i) Since, material gets obsolete after 10 days, the quantity in excess of 10 days consumption i.e. 12,000 kg. are wasted. Hence, after 12,000 kg. a fresh order needs to be given.

(ii) Carrying cost is incurred on average stock of Materials purchased.

(iii) The excess quantity of material becomes obsolete and loss has to be incurred.

(v) (C) Minimum Stock Level for Material A

= Re-order level – (Average Consumption Rate x Average Re- order Period) = 2400 – (1200 x 1.5) = 600 kgs

Re-order level = Max. Consumption* x Max. Lead time = 30,000/25 x 2 days = 2,400 kg.

Average Consumption Rate = (30,000/25 + 30,000/25)/2 = 1,200 Kg

Average Re-order Period = (1 + 2)/2 = 1.5 Days

Stock required for 10 days consumption is lower than the maximum stock level calculated through the formula. Therefore, Maximum Stock Level will be 12,000 kg.

(*Since, production is processed evenly throughout the month hence material consumption will also be even.)

Labour Costing

Question 3 :(RTP May 2024)

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:

(i) 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

(ii) 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

(iii) What is the cost of repairing defective units?

- (a) ₹ 75,000
- (b) ₹ 15,000
- (c) ₹ 50,000
- (d) ₹ 25,000

(iv) 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

(v) 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

Solution 3 :

- (i)(c) Output by experienced workers in 50,000 hours = $\frac{50,000}{10} = 5,000$ units
 Output by new recruits = 60% of 5,000 = 3,000 units
 Loss of output = 5,000 – 3,000 = 2,000 units
 Total loss of output = Due to delay recruitment + Due to inexperience
 = 10,000 + 2,000 = **12,000 units**
- (ii) (a) Contribution per unit = 20% of ₹ 180 = ₹ 36
 Total contribution lost = ₹ 36 × 12,000 units = **₹ 4,32,000**
- (iii)(b) Cost of repairing defective units = 3,000 units × 0.2 × ₹ 25 = **₹ 15,000**

(iv)(d) **Calculation of loss of profit due to labour turnover**

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2022-23	9,00,000

- (v) (c) Output by experienced workers in 50,000 hours = $\frac{50,000}{10} = 5,000$ units
 Output by new recruits = 60% of 5,000 = 3,000 units
 Loss of output = 5,000 – 3,000 = 2,000 units

Overhead

Question 4 : (RTP Sept 2024)

The accountant for Brilliant Tools Ltd applies overhead based on machine hours. The budgeted overhead and machine hours for the year are ₹ 1,30,000 and 8,000 hours, respectively. The actual overhead and machine hours incurred were ₹ 1,37,500 and 10,000 hours. The cost of goods sold and inventory data compiled for the year is as follows:

Direct Material ₹ 25,000
 Cost of Goods Sold ₹ 2,25,000
 Units: WIP 50,000 and Finished Goods 75,000

What is the amount of over/under absorbed overhead for the year?

- (a) Over absorbed by ₹ 25,000
 (b) Under absorbed by ₹ 25,000
 (c) Over a absorbed by ₹ 32,500
 (d) Under absorbed by ₹ 32,500

Solution 4 :

(a) Overabsorbed by ₹ 25,000

Predetermined Overhead Rate = Budgeted Overhead / Budgeted hours
 i.e. 130,000 / 8,000 = ₹ 16.25 per hour.

Hence, absorbed overhead = 10,000 X 16.25 = ₹ 1,62,500.

Since actual overhead incurred were ₹ 1,37,500

Hence the overhead were over absorbed by $1,62,500 - 1,37,500 = ₹ 25,000$.

Question 5 : (RTP May 2024)

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 payments made:

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:

(i) How much was the budgeted machine hour rate used to recover overhead?

- (a) ₹ 760
- (b) ₹ 820
- (c) ₹ 780
- (d) ₹ 840

(ii) 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

(iii) 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

(iv) 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

(v) 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

Solution 5 :

(i) (d) Budgeted Machine hour rate (Blanket rate) = $\frac{\text{₹ } 50,40,000}{6,000 \text{ hours}} = \text{₹ } 840 \text{ per hour}$

(ii) (a) ₹ 25,20,000

(iii) (a)

	Amount (₹)	Amount (₹)
Total production overheads actually incurred during the period		34,08,000
Less: Amount paid to worker as per court order	4,50,000	
Expenses of previous year booked in the current year	1,00,000	
Wages paid for the strike period under an award	4,20,000	
Obsolete stores written off	36,000	10,06,000
		24,02,000
Less: Production overheads absorbed as per machine hour rate (3,000 hours × ₹ 840*)		25,20,000
Amount of over absorbed production overheads		1,18,000

* Budgeted Machine hour rate (Blanket rate) calculated in part (i)

(iv) (b) **Accounting treatment of over absorbed production overheads:** As, 40% of the over absorbed overheads were due to defective production policies, this being abnormal, hence should be credited to Costing Profit and Loss Account.

Amount to be credited to Costing Profit and Loss Account = ₹ 1,18,000 × 40% = ₹ 47,200.

Balance of over absorbed production overheads should be distributed over Works in progress, Finished goods and Cost of sales by applying supplementary rate*.

Amount to be distributed = ₹ 1,18,000 × 60% = ₹ 70,800

Supplementary rate = $\frac{\text{₹ } 70,800}{1,50,000 \text{ units}} = \text{₹ } 0.472 \text{ per unit}$

(v) (c) Apportionment of over absorbed production overheads over WIP, Finished goods and Cost of sales:

	Equivalent completed units	Amount (₹)
Work-in-Progress	40,000	18,880
(80,000 units × 50% × 0.472)		
Finished Goods	20,000	9,440
(20,000 units × 0.472)		
Cost of Sales	90,000	42,480
(90,000 units × 0.472)		
Total	1,50,000	70,800

Process Costing**Question 6 : (RTP Sept 2024)**

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:

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

Solution 6 :

(d) ₹ 2093.2

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

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

Question 7 : (MTP March 2024)

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 the FIFO method to value work-in-process and finished goods. The following information are required for managerial decisions:

(i). How much quantity of raw material was introduced during the month?

- A. 4,300 Litres
- B. 3,500 Litres
- C. 4,200 Litres
- D. 3,800 Litres

(ii). 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.

(iii). 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

(iv). Value of labour and overhead in closing Work-in-process are:

- A. ₹ 4,000 & ₹ 1,600 respectively
- B. ₹ 20,000 & ₹ 16,000 respectively
- C. ₹ 16,000 & ₹ 9,000 respectively
- D. ₹ 13,200 & ₹ 6,600 respectively

(v). Value of output transferred to finished goods is:

- A. ₹ 22,57,200
- B. ₹ 20,06,400

- C. ₹ 22,44,000
D. ₹ 19,27,200

Solution 7 :

(i).D

Inflow into process	Litres	Outflow from process	Litres
Opening WIP	500	Transferred to finished goods	3,400
Quantity introduced (Balancing figure)	3,800	Total loss	800
		Closing WIP	100
	4,300		4,300

(ii). A

Total loss	800 litres
Normal loss (10% of fresh input i.e. 3,800)	380 litres
Abnormal loss	420 litres

(iii). B

Calculation of Equivalent production units

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening WIP	500	From Opening WIP	500	-	-	20	100	40	200
Fresh inputs	3,800	From fresh units	2900	100	2900	100	2900	100	2900
		Normal loss	380	-	-	-	-	-	-
		Closing WIP	100	100	100	20	20	10	10
		Abnormal loss	420	100	420	100	420	100	420
	4,300		4,300		3,420		3,440		3,530

Value of raw materials introduced during the month

	Equivalent units	Cost per EU (₹)	Total cost (₹)
Total value of raw material	3420	300	10,26,000
Add: Scrap value of normal loss	380	20	7,600
Value of raw material introduced			10,33,600

(iv). A

Value of labour and overhead in closing Work in process

Cost elements	Equivalent units	Cost per EU (₹)	Total cost (₹)
Labour	20	200	4,000
Overheads	10	160	1,600

(v). C

Value of output transferred to finished goods Output transferred (Units) × Equivalent cost per unit 3,400 Litres
× ₹660 = ₹22,44,000

Cost Sheet**Question 8 : (MTP March 2024)**

M Ltd. is producing a single product and may expand into product diversification in the next one to two years. M Ltd. is amongst a labour-intensive company where the 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 generators 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 who work for 26 days in a month.

You are asked to calculate the followings:

- (i). 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

- (ii). 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

- (iii). 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

- (iv). 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

- (v). 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

Solution 8 :

- (i). D

- (ii). C Please refer cost sheet below for cost of production Cost of production per manshift = Cost of production ÷ Total manshift, ₹ 7,87,28,000 ÷ 46,800 = ₹1,682.22

- (iii). A Car hire charges including GST @5%, please refer the cost sheet

- (iv). B Selling and distribution cost includes the following:

Maintenance cost for weighing bridge	12,000
AMC cost of CCTV installed at weigh bridge	8,000
TA/ DA & hotel bill of sales manager	36,000
	56,000

For Cost of Sale please refer the cost sheet

(v). A Manshift = 1,800 employees × 26 days = 46,800 manshifts

Computation of earnings per manshift (EMS):

$$\text{EMS} = \frac{\text{Total employee benefits paid}}{\text{Manshift}} = \frac{\text{₹ 7,04,20,000}}{46,800} = \text{₹ 1504.70}$$

$$\text{Computation of Output per manshift (OMS): } \frac{\text{Total Output/ Production}}{\text{Manshift}} = \frac{2,34,000 \text{ Tonne}}{46,800} = 5 \text{ tonnes}$$

Workings

Cost Sheet of M Ltd. for the last month

Particulars	Amount (₹)	Amount (₹)
Materials consumed		50,00,000
Wages & Salary	6,40,00,000	
Gratuity & leave encashment	64,20,000	7,04,20,000
Power cost (13,000 kwh × ₹8)	1,04,000	
Diesel cost (2,000 ltr × ₹93)	1,86,000	2,90,000
HEMM hiring charges		30,00,000
Prime Cost		7,87,10,000
AMC cost of CCTV installed at factory premises		18,000
Cost of Production/ Cost of Goods Sold		7,87,28,000
Hiring charges of cars	66,000	
Reimbursement of diesel cost	22,000	
	88,000	
Add: GST @5% on RCM basis	4,400	92,400
Maintenance cost for weighing bridge	12,000	
AMC cost of CCTV installed at weighbridge	8,000	20,000
TA/ DA & hotel bill of sales manager		36,000
Cost of Sales		7,88,76,400

Marginal Costing

Question 9 : (MTP April 2024)

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 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 are required to be calculated on an urgent basis to put the same in the meeting. You being an assistant to the head of finance, has been asked the followings:

(i). 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

(ii). 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

(iii). 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

(iv). 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

(v). 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

Solution 9 :

(i). A Revised Sale = $\frac{\text{Revised Fixed Cost} + \text{Expected Profit}}{P/V \text{ Ratio}} = \{\text{₹}115 + (20+10)\} \div 45\% = \text{₹} 322.22 \text{ crores}$

(ii). D Revised Break – even Point = $\frac{\text{Fixed Cost}}{P/V \text{ Ratio}} = \text{₹}115 \text{ Crore} \div 45\% = \text{₹}255.56 \text{ Crore}$ (Refer working notes)

(iii). D Revised Margin of Safety = Revised Sales – Revised Break-even Sales
= ₹ 322.22 Crores – ₹ 255.56 Crores = ₹ 66.66 Crores.

(iv). C ₹ 20 Crore & ₹30 Crore respectively (Refer working note)

(v). A Total cost in last year = ₹230 Crore

Total cost in coming year = Variable Cost + Fixed Cost Revised sales × 55% + 115 Crore
= ₹ 322.22 Crore × 55% + ₹ 115 Crore = ₹ 292.22 Crore

Working Note

Present Sales and Profit

Total Sales = Break – even Sales + Margin of Safety = ₹ 200 Crores + ₹ 50 Crores = ₹ 250 Crores

P/V Ratio = 40%

Variable Cost = 60% of Sales = ₹ 250 Crores × 60% = ₹ 150 Crores

Fixed Cost = Break – even Sales × P/V Ratio = ₹ 200 Crores × 40% = ₹ 80 Crores

Total Cost = ₹ 150 Crores + ₹ 80 Crores = ₹ 230 Crores

Profit = Total Sales – Total Cost = ₹ 250 Crores – ₹ 230 Crores = ₹ 20 Crores

Revised Sales

(₹ in Crores)

Present Fixed Cost	80.00
Increase in Fixed Cost	20.00
Interest at 15 per cent on Additional Capital (₹100Crores × 15%)	15.00
Total Revised Fixed Cost (in crore)	115.00
Assuming that the Present Selling Price is ₹100	
Revised Selling Price will be (8% Less)	92.00
New Variable Cost (Reduced from 60% to 55%) of Sales (₹ 92 × 55%)	50.60
Contribution (₹92.00 – ₹ 50.60)	41.40

New P / V Ratio = $\frac{\text{₹} 41.40}{\text{₹} 92.00} \times 100 = 45\%$

Standard Costing

Question 10 : (RTP Sept 2024)

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:

(i) 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

(ii) 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

(iii) 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

(iv) 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

(v) 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

Solution 10:

(i)(a) 10,000 units

Usage variance of Material Z = 2,000 F

Usage Variance = $SQ \times SP - AQ \times SP$

SP = ₹ 2

AQ = 24,000 units

$2 \times (SQ - 24,000) = 2,000$

$2SQ = 50,000$

Therefore SQ = 25,000

No of units of Input required per output = 2

Yield of input = $80\% = (25000/2) \times 80\% = 10,000$ units.

(ii)(b) Price variance – 3,000 Favourable,

Cost Variance – 5,000 Favourable

Price variance = $AQ \times (SP - AP)$

$24,000 \times (2 - 1.875) = 3,000$ Favourable.

Cost variance = $SQ \times SP - AQ \times AP = 50,000 - 45,000 = 5,000$ Favourable.

(iii)(d) Standard Hours – 25,000 hours

Net Actual Hours – 28,000 hours

Idle Time – 2,000 hours
 Actual output = 10,000 units
 Standard hours per unit = 2.5
 Therefore standard hours = $10,000 \times 2.5 = 25,000$ hours.
 Idle time variance = $SR \times (\text{Net AH} - \text{AH})$
 $5 \times (\text{Net AH} - 30,000) = 10,000$ Adverse
 $5 \text{ Net AH} - 1,50,000 = -10,000$
 $5 \text{ Net AH} = 1,40,000$
 Net AH = 28,000 hours
 Idle time = 2,000 hours

(iv) (C) Labour Efficiency Variance – 25,000 Adverse,

Labour rate Variance – 30,000 Favourable
 Efficiency Variance = $SR \times (\text{SH} - \text{AH})$
 $= 5 \times (25,000 - 30,000)$
 $= 25,000$ Adverse
 Rate Variance = $\text{AH} \times (\text{SR} - \text{AR})$
 $= 30,000 (5 - 4) [1,20,000/30,000]$
 $= 30,000$ Favourable.

(v) (C) Fixed Overhead Volume variance – 1,00,000 Adverse

Overhead Volume variance = $\text{Actual Output} \times \text{SR per unit} - \text{Budgeted FOH}$
 Budgeted FOH = $\text{Actual FOH (+/-) Expenditure variance}$
 $1,50,000 + 25,000 = 1,75,000$
 $\text{AO} \times \text{SR} = 10,000 \times 7.5 = 75,000$
 Therefore volume variance = $75,000 - 1,75,000 = 1,00,000$ Adverse.

Question 11 : (MTP April 2024)

K Ltd. is a manufacturer of a single product A. 8,000 units of product A have been produced in the month of March 2024. At the beginning of the year a total 1,20,000 units of the product-A had been planned for production. The cost department 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 percent 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:

(i). 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)

(ii). 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)

(iii). 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)

(iv). 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)

(v). 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)

Solution 11 :

(i). D Variable Overhead Cost Variance = Standard Variable Overheads for Production – Actual Variable Overheads
 $= ₹ 44,800 - ₹ 55,680 = ₹ 10,880 (A)$

(ii). C Fixed Overhead Volume Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads
 $= ₹ 87,200 - ₹ 1,09,000 = ₹ 21,800 (A)$

(iii). A Fixed Overhead Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads
 $= ₹ 10.9 \times 10,000 \text{ units} - ₹ 1,30,520 = ₹ 21,520 (A)$

(iv). B Calendar Variance = Possible Fixed Overheads – Budgeted Fixed Overheads
 $= ₹ 1,03,550 - ₹ 1,09,000 = ₹ 5,450 (A)$

(v). A Fixed Overhead Cost Variance = Absorbed Fixed Overheads – Actual Fixed Overheads
 $= ₹ 87,200 - ₹ 1,30,520 = ₹ 43,320 (A)$

WORKING NOTE

Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = 12,00,000 \div 1,20,000$	₹ 10.00
Fixed Overheads element in Semi-Variable Overheads i.e. 60% of ₹ 1,80,000	₹ 1,08,000
Fixed Overheads = $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Output}} = ₹ 1,08,000 / 120,000$	₹ 0.90
Standard Rate of Absorption of Fixed Overheads per unit (₹ 10.00 + ₹ 0.90)	₹ 10.90
Fixed Overheads Absorbed on 8,000 units @ ₹10.90	₹ 87,200
Budgeted Variable Overheads	₹ 6,00,000
Add: Variable element in Semi-Variable Overheads 40% of ₹ 1,80,000	<u>₹ 72,000</u>
Total Budgeted Variable Overheads	₹ 6,72,000
Standard Variable Cost per unit $\frac{\text{Budgeted Variable Overheads}}{\text{Budgeted Output}}$	₹ 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
Possible Fixed Overheads $\frac{\text{Budgeted Fixed Overheads} \times \text{Actual Days}}{\text{Budgeted Days}}$ = 1,09,000/20 days × 19 days	₹ 1,03,550
Actual Fixed Overheads (₹ 1,19,000 + 60% of ₹ 19,200)	₹ 1,30,520
Actual Variable Overheads (₹ 48,000 + 40% of ₹ 19,200)	₹ 55,680

Service Costing

Question 12 :(RTP Sept 2024)

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.

- (a) ₹ 450 per room day
- (b) ₹ 900 per room day
- (c) ₹ 380 per room day
- (d) ₹ 760 per room day

Solution 12 :

(b) ₹ 900 per room day

Total Revenue (2,66,11,200/80%) = 3,32,64,000

Calculation of Room Days:

	Deluxe	Premium
Summer	120 rooms x 80% x 30 days x 8 months = 23,040	80 rooms x 80% x 30 days x 8 months = 15,360
Winter	120 rooms x 60% x 30 days x 4 months = 8,640	80 rooms x 60% x 30 days x 4 months = 5,760
Total room days	31,680	21,120

Let's assume the room rent of Deluxe room be 'x'

Then rent of Premium room will be '2x'

Therefore: 31,680x + 42,240x = 3,32,64,000 , X = 450

Rent of Premium room will be 450 x 2 = ₹ 900 per room day

Question 13 : (RTP Sept 2024)

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?

- (a) ₹ 0.0017
- (b) ₹ 0.18
- (c) ₹ 575
- (d) ₹ 2.24

Solution 13 :

(a) ₹ 0.0017

Cost per rupee of insured value

= Total Cost/ Total Insured Value

= 1.6 cr/920 cr = ₹ 0.0017

Budget And Budgeting control

Question 14 : (RTP Sept 2024)

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?

- (a) 1,95,000 units
- (b) 1,90,000 units
- (c) 1,84,000 units
- (d) 1,75,000 units

Solution 14 :

(b) 1,90,000 units

	Units
Sales budget	2,00,000
Add: Closing Inventory (25,000 x 0.6)	15,000
Less: Opening Inventory	(25,000)
Production Budget	1,90,000

Mixed MCQs**Question 15 : (MTP March 2024)**

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

- A. ₹ 50
- B. ₹ 25.50
- C. ₹ 50.50
- D. ₹ 25.25

Solution 15 :

D. Labour rate variance = Standard time for actual production (SR- AR)

7,500 (A) = (30,000 × 30 minutes/60 minutes) × (50-AR)

AR = (7,50,000 + 7,500)/15,000 = ₹50.50 per hour

Actual wages per unit = 50.50/2 = ₹25.25

Question 16 : (MTP March 2024)

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:

- A. ₹ 32,00,0000
- B. ₹ 34,00,000
- C. ₹ 30,00,000
- D. ₹ 36,00,000

Solution 16 :

B

Variable overhead for each % of level of activity = $\frac{40,00,000 - 30,00,000}{75 - 50} = 40,000$

Fixed cost = 30,00,000 – (40,000 × 50) = 10,00,000

Total overheads for 60% level of activity

= 10,00,000 + (40,000 × 60) = 34,00,000

Question 17 : (MTP March 2024)

Which of the following statements relating to Zero Based Budgeting (ZBB) is false:

- A. It is a method of budgeting whereby all activities are re-evaluated each time a budget is formulated.
- B. ZBB attempts to eliminate unnecessary expenditure being retained in budgets.
- C. It is probably the least time consuming and least costly approach to budgeting.
- D. It requires that budgets are built up from scratch.

Solution 17:

C

Question 18 : (MTP March 2024)

Based on the data below, what is the amount of the overhead under-/over- absorbed?

Budgeted overhead – ₹ 5,25,000 Budgeted machine hours- 17,500 Actual machine hours- 17,040 Actual overheads- ₹ 5,20,000

- A. 5,000 under-absorbed
- B. 8,800 under-absorbed
- C. 8,800 over-absorbed
- D. 5,000 over-absorbed

Solution 18:

B Actual Overhead – (Actual machine hours × machine hour rate)

5,20,000 – (17040 × 30) = 8,800 under absorbed

Question 19 : (MTP March 2024)

A customer has been ordering 80,000 caps during the year. It is estimated that it costs ₹ 1 as inventory holding cost per cap per month and that the set up cost per run of cap manufacture is ₹ 3,500. What is the optimum run size of cap manufacture?

- A. 12 runs
- B. 10 runs
- C. 15 runs
- D. 7 runs

Solution 19 :

A Optimum batch size or Economic Batch Quantity (EBQ):

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 80,000 \times 3,500}{12}} = 6,832 \text{ units.}$$

Number of Optimum runs = $80,000 \div 6,832 = 11.70$ or 12 run

Question 20 : (MTP April 2024)

If the amount of wages under Halsey plan is ₹ 420, total time allowed is 8 hours and the guaranteed time rate is ₹ 60 per hour. What is the total time saved by the worker?

- A. 2 hours
- B. 3 hours
- C. 6 hours
- D. 3.5 hours

Solution 20 :

A $(TT \times 60) + [0.50 \times (8 - TT) \times 60] = 420$ $TT^* = 6$ hours, Time saved = $8 - 6 = 2$
* TT=Total Time Taken

Question 21 : (MTP April 2024)

From the following information, calculate the Total cost of Product A and B using the ABC analysis:

	Product A	Product B
Units	5,000	5,000
Number of purchase orders placed	100	220
Number of deliveries received	70	200
Ordering Cost	₹ 4,00,000	
Delivery Cost	₹ 1,35,000	

- A. A = ₹ 47,500; B = ₹ 1,27,500
- B. A = ₹ 2,67,500; B = ₹ 2,67,500
- C. A = ₹ 1,60,00; B = ₹ 3,75,000
- D. A = ₹ 1,47,500; B = ₹ 1,47,500

Solution 21:

C Ordering Cost = $4,00,000/320 = 1,250$, Delivery Cost = $1,35,000/270 = 500$
 $A = 1,250 \times 100 + 500 \times 70 = 1,60,000$
 $B = 1,250 \times 220 + 500 \times 200 = 3,75,000$

Question 22 : (MTP April 2024)

What would be the Prime cost from the below information?

Direct materials Purchased	:	₹ 75,000
Direct labour	:	₹ 45,000
Direct expenses	:	₹ 15,000
Manufacturing overheads	:	₹ 22,500
Direct materials consumed	:	₹ 67,500

- A. ₹ 1,35,000
- B. ₹ 1,27,500
- C. ₹ 1,57,500
- D. ₹ 1,50,000

Solution 22 :

B	Direct labour	:	₹ 45,000
	Direct expenses	:	₹ 15,000
	Direct materials consumed	:	<u>₹ 67,500</u>
	<u>Prime Cost</u>		₹ 1,27,500

Question 23 : (MTP April 2024)

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 next process. If the total cost incurred under Process-I was ₹ 40,000, then amount of abnormal gain/(loss) is:

- A. ₹ 2,000
- B. (₹ 5,000)
- C. (₹ 2,500)
- D. ₹ 3,000

Solution 23 :

$$\begin{aligned} \text{A} \quad \text{Abnormal gain units} &= 7600 - [8000 - 800] = 400 \text{ Abnormal gain} \\ &= [40,000 - (800 \times 5)] / 7200 \text{ units} \times 400 \text{ units} = 2,000 \end{aligned}$$

Question 24 : (MTP April 2024)

Find out the most appropriate unit cost from the following information of ZMD Transport Services Ltd. dealing in goods carriage:

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

Solution 24 :

B	Total cost	= ₹ 5,25,000
	Tonnes Km carried	= 6,55,000
	Unit Cost	= ₹ 525000/655000 Km = ₹ 0.801

Question 1 : (NOV 2023)

ABC Limited manufactures a product 'AM25' using material 'CEE'. The following information is available regarding material 'CEE':

Purchase price per unit	₹ 300
Cost of placing an order	₹ 150
Carrying cost per unit per annum	6% of purchase price
Consumption of material 'CEE' per annum	1,94,400 units
Lead time	Average 6 days, Maximum 8 days, Minimum 4 days

Maximum consumption of material 'CEE' per day is 200 kg more than the average consumption per day.

Required:

Calculate the following in relation to material 'CEE':

- Economic Order Quantity.
- Reorder Level
- Maximum Stock Level. (Assume 360 days in a year)

Solution 1 :

(i) Economic Order Quantity (EOQ) = $\sqrt{\frac{2AO}{C}}$

Where, A = Annual demand for the material CEE = 1,94,400 Kgs

O = Ordering cost = ₹ 150

C = Carrying cost per unit per annum = 6% of ₹ 300 = 18

EOQ = $\sqrt{\frac{2 \times 1,94,400 \times 150}{18}} = 1,800 \text{ Units (Kgs.)}$

(ii) Re-order level (ROL) = Maximum consumption# × Maximum lead time

ROL = 740 × 8 = **5,920 Kg.**

Maximum Consumption = Average consumption + 200 kg

= $\frac{1,94,400}{360} + 200 = 540 + 200 \text{ Kg} = 740 \text{ Kg.}$

Maximum lead time = 8 days

(iii) Maximum Stock level = Re-order quantity + Re-order level – (Min. consumption* × Min. lead time)

= 1,800 + 5,920 – (340 × 4)

= 7,720 – 1,360 = **6,360 Kg**

*Minimum consumption = 2 × Average consumption – Maximum Consumption

= 2 × 540 – 740

= 1080 – 740 = 340 kg.

Question 2 : (May 2024)

Tesco Cycles Ltd. uses about 3,60,000 cycle locks per annum and the usage is fairly constant at 30,000 per month. The cycle lock costs ₹240 each at wholesale rates and carrying cost is estimated to be 10% of the annual average inventory value. The cost to place an order is ₹1,200. It takes 45 days to receive delivery from the date of order. In order to avoid any kind of disruption in assembly line, safety stock of 6,500 cycle locks is always maintained by Tesco Cycles Ltd.

(Assume 360 days in a year).

Compute:

- E.O.Q.
- The re-order level.
- The company has been offered a quantity discount of 2% on the purchase of cycle locks provided the order size is 30,000 units at a time. Advise whether quantity discount offer can be accepted?

Question 3 : (MTP Sept 2023)

Sky & Co., an unregistered supplier under GST, purchased material from Vye Ltd. which is registered under GST. The following information is available for one lot of 5,000 units of material purchased:

Listed price of one lot	₹ 2,50,000
Trade discount	@ 10% on listed price
CGST and SGST (Credit Not available)	12% (6% CGST + 6% SGST)
Cash discount	@ 10%

(Will be given only if payment is made within 30 days.)

Toll Tax paid	₹ 5,000
Freight and Insurance	₹ 17,000
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

20% of material shortage is due to normal reasons.

The payment to the supplier was made within 21 days of the purchases.

You are required to CALCULATE cost per unit of material purchased by Sky & Co.

Solution 3 :

Calculation of cost per unit:

Particulars	Units	(₹)
Listed Price of Materials	5,000	2,50,000
Less: Trade discount @ 10% on invoice price		(25,000)
		2,25,000
Add: CGST @ 6% of ₹ 2,25,000		13,500
Add: SGST @ 6% of ₹ 2,25,000		13,500
		2,52,000
Add: Toll Tax		5,000
Freight and Insurance		17,000
Commission and Brokerage Paid		10,000
Add: Cost of returnable containers:		
Amount deposited ₹ 30,000		
Less: Amount refunded ₹ 20,000		10,000
		2,94,000
Add: Other Expenses @ 2% of Total Cost ($\frac{₹2,94,000}{98} \times 2$)		6,000
Total cost of material		3,00,000
Less: Shortage material due to normal reasons @ 20%	1,000	-
Total cost of material of good units	4,000	3,00,000
Cost per unit (₹ 3,00,000/4,000 units)		75

Note:

1. GST is payable on net price i.e., listed price less discount.
2. Cash discount is treated as interest and finance charges; hence it is ignored.
3. Demurrage is penalty imposed by the transporter for delay in uploading or off-loading of materials. It is an abnormal cost and not included.
4. Shortage due to normal reasons should not be deducted from cost to ascertain total cost of good units

Question 4 : (MTP Oct 2023)

P Limited produces product 'P'. It uses annually 60,000 units of a material 'Rex' costing ₹ 10 per unit. Other relevant information are:

Cost of placing an order : ₹ 800 per order

Carrying cost : 15% per annum of average inventory

Re-order period : 10 days

Safety stock : 600 units

The company operates 300 days in a year.

You are required to calculate:

- (i) Economic Order Quantity for material 'Rex'.
- (ii) Re-order Level.
- (iii) Maximum Stock Level.
- (iv) Average Stock Level.

Solution 4 :

(i) Economic Order Quantity (E.O.Q)

$$= \sqrt{\frac{2 \times \text{Annual requirement of 'Rex'} \times \text{Ordering cost per order}}{\text{Annual carrying cost per unit per annum}}}$$

$$= \sqrt{\frac{2 \times 60,000 \text{ units} \times ₹800}{₹10 \times 15\%}} = \sqrt{\frac{9,60,00,000}{₹1.5}} = 8,000 \text{ units}$$

(ii) Re-order Level = Safety Stock + (Normal daily Usage × Re-order period)

$$= 600 + \left(\frac{60,000 \text{ units}}{300 \text{ days}} \times 10 \text{ days} \right)$$

$$= 600 + 2,000$$

$$= 2,600 \text{ units}$$

(iii) Maximum Stock Level = E.O.Q (Re-order Quantity) + Safety Stock

$$= 8,000 \text{ units} + 600 \text{ units}$$

$$= 8,600 \text{ units}$$

(iv) Average Stock Level = Minimum Stock level + $\frac{1}{2}$ Re-order Quantity

$$= 600 + \frac{1}{2} \times 8,000 \text{ units} = 4,600 \text{ units}$$

OR

Average Stock Level = (Maximum Stock level + Minimum Stock level) / 2

$$= (8,600 \text{ units} + 600 \text{ units}) / 2 = 4,600 \text{ units}$$

* Minimum Stock Level = Re-order level – (Normal daily usage × Re-order period)

$$= 2,600 - (60,000 \text{ units} / 300 \text{ days})$$

$$= 2,600 - 2,000 = 600 \text{ units} \quad \text{OR}$$

Minimum Stock Level = Safety Stock level = 600 units

Question 5 : (MTP March 2024)

S & Sons, an unregistered supplier under GST, purchases material from V Ltd. which is a GST registered supplier. The following information is available for one lot of 5,000 units of material purchased:

Listed price of one lot	₹ 5,00,000
Trade discount	@ 10% on listed price
CGST and SGST (Credit Not available)	18% (9% CGST + 9% SGST)
Cash discount	@ 10%

(Will be given only if payment is made within 30 days.)

Toll Tax paid	₹ 1,800
Freight and Insurance	₹ 36,000
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	₹ 26,000
Other Expenses	@ 2% of total cost

5% of material shortage is due to normal reasons.

The payment to the supplier was made within 21 days of the purchases.

You are required to calculate cost per unit of material purchased by S & Sons.

Solution 5 :

Calculation of cost per unit:

Particulars	Units	(₹)
Listed Price of Materials	5,000	5,00,000
Less: Trade discount @ 10% on invoice price		(50,000)
		4,50,000
Add: GST @18% of ₹ 4,50,000		81,000
		5,31,000
Add: Toll Tax		1,800
Freight and Insurance		36,000
Commission and Brokerage Paid		10,000
Add: Cost of returnable containers: Amount deposited ₹ 30,000		
Less: Amount refunded ₹ 26,000		4,000
		5,82,800
Add: Other Expenses @ 2% of Total Cost		11,894

($\frac{₹ 5,82,800}{98} \times 2$)		
Total cost of material		5,94,694
Less: Shortage material due to normal reasons @ 5%	250	-
Total cost of material of good units	4,750	5,94,694
Cost per unit (₹ 5,94,694/4,750 units)		125.20

Note:

1. GST is payable on net price i.e., listed price less discount.
2. GST paid on purchase is added with cost as ITC on GST cannot be claimed
3. Cash discount is treated as interest and finance item; hence it is ignored.
4. Demurrage is penalty imposed by the transporter for delay in uploading or off-loading of materials. It is an abnormal cost and not included.
5. Shortage due to normal reasons should not be deducted from cost to ascertain total cost of good units.

Question 6 : (MTP April 2024)

DSM Ltd manufactures speed boats which require propeller TP-M4. The following particulars are collected for the year 2023-24:

- (i) Annual demand of TP-M4 12,000 units
- (ii) Cost of placing an order ₹1,200 per order
- (iii) Cost per unit of TP-M4 is ₹1,740/-
- (iv) Carrying cost p.a. 12%

The company has been offered a quantity discount of 5 % on the purchase of TP-M4, provided the order size is 6,000 units at a time.

Required to:

- (i) COMPUTE the economic order quantity (EOQ)
- (ii) ADVISE whether the quantity discount offer can be accepted.

Solution 6 :

(i) Calculation of Economic Order Quantity

$$EOQ = \sqrt{\frac{2 \times \text{Annual Demand} \times \text{Carrying Cost}}{\text{Carrying Cost per Unit per annum}}} = \sqrt{\frac{2 \times 12,000 \text{ Units} \times ₹ 1,200}{₹ 1,740 \times 0.12}} = 371 \text{ units (Approx)}$$

(ii) Evaluation of Profitability of Different Options of Order Quantity

(a) When EOQ is ordered

		(₹)
Purchase Cost	(12,000 units x ₹ 1,740)	2,08,80,000.00
Ordering Cost*	[(12,000 units ÷ 371 units) i.e. 33 x ₹ 1,200]	39,600.00
Carrying Cost**	(371 units x ₹ 1,740 x ½ x 12/100)	38,732.40
Total Cost		2,09,58,332.40

(b) When a Quantity Discount of 5% is offered.

		(₹)
Purchase Cost	(12,000 units x ₹ 1,740 x 0.95)	1,98,36,000.00
Ordering Cost*	[(12,000 units ÷ 6,000 units) x ₹ 1,200]	2,400.00
Carrying Cost**	(6,000 units x ₹ 1,653 x ½ x 12/100)	5,95,080.00
Total Cost		2,04,33,480.00

Advise – The total cost of inventory is lower if a quantity discount offer is accepted. Hence, the company is advised to accept the quantity discount.

$$* \text{ Ordering Cost} = \frac{\text{Annual Demand}}{\text{Order Quantity}} \times \text{Cost of placing an order}$$

$$** \text{ Carrying Cost} = \frac{\text{Cost per unit} \times \text{Quantity ordered} \times \text{Carrying Cost}}{2}$$

Question 7 : (RTP Nov 2023)

Following details are related to a manufacturing concern:

Reorder Level	1,60,000 units
Economic Order Quality	90,000
Minimum Stock Level	1,00,000 units

Maximum Stock Level	1,90,000 units
Average Lead Time	6 days
Difference between minimum lead time and Maximum lead time	4 days

Calculate:

- (i) Maximum consumption per day
- (ii) Minimum consumption per day

Solution 7 :

Difference between Minimum lead time Maximum lead time = 4 days

Max. lead time – Min. lead time = 4 days

Or, Max. lead time = Min. lead time + 4 days..... (i)

Average lead time is given as 6 days i.e.

$\frac{\text{Max.lead time} + \text{Min.lead time}}{2} = 6 \text{ days} \dots\dots\dots (ii)$

Putting the value of (i) in (ii),

$\frac{\text{Min. lead time} + 4 \text{ days} + \text{Min.lead time}}{2} = 6 \text{ Days}$

Or, Min. lead time + 4 days + Min. lead time = 12 days

Or, 2 Min. lead time = 8 days

Or, Minimum lead time = $\frac{8 \text{ Days}}{2} = 4 \text{ Days}$

Putting this Minimum lead time value in (i), we get

Maximum lead time = 4 days + 4 days = 8 days

(i) Maximum consumption per day:

Re-order level = Max. Re-order period × Maximum Consumption per day

1,60,000 units = 8 days × Maximum Consumption per day

Or, Maximum Consumption per day = $\frac{1,60,000 \text{ units}}{8 \text{ Days}} = 20,000 \text{ units}$

(ii) Minimum Consumption per day:

Maximum Stock Level = Re-order level + Re-order Quantity – (Min. lead time × Min. Consumption per day) **Or,**

1,90,000 units = 1,60,000 units + 90,000 units – (4 days × Min. Consumption per day) **Or,**

4 days × Min. Consumption per day = 2,50,000 units – 1,90,000 units

Or, Minimum Consumption per day = $\frac{60,000 \text{ units}}{4 \text{ Days}} = 15,000 \text{ units}$

Question 1 : (Nov 2023)

A worker took 60 hours to complete a job in a factory. The normal rate of wages is ₹ 80 per hour. The worker is entitled to receive bonus according to the Halsey Premium Plan. Factory overhead is recovered on the job at ₹ 60 per man hour actually worked. The factory cost of the job is ₹ 37,280 and material cost of the job is ₹ 28,400. **Required:**

- Calculate the standard time for completing the job and effective hourly rate under the Halsey Premium plan.
- Calculate the effective rate of earnings per hour if wages would have been paid under the Rowan Plan.

Solution 1 :

(i) Calculation of standard time and effective hourly rate:

Standard time = Actual hours worked + time saved = 60 + 12 = 72 hours

Effective hourly rate under Halsey premium plan = $\frac{\text{Total labour cost}}{\text{Actual hour worked}} = \frac{5,280}{60} = ₹ 88$

(ii) Calculation of effective rate earnings under Rowan plan:

(Rate × Actual hours worked) + Rate × $\frac{\text{Time Saved}}{\text{Std. Time}} \times \text{Time taken}$

₹ 80 × 60 hours + ₹ 80 × $\frac{12}{72} \times 60$

₹ 4,800 + 800 = ₹ 5,600

Effective rate per hour = 5,600 ÷ 60 hour = ₹ 93.33

Working Note:

(1) Calculation of labour cost = Factory cost – Material cost – Factory Overhead

= 37,280 – 28,400 – (₹ 60 × 60 hours)

= 37,280 – 28,400 – 3,600 = ₹ 5,280

(2) Calculation of bonus and time saved

Total labour cost = Normal Rate × Actual hours worked + $\frac{1}{2}$ time saved × normal rate

₹ 5,280 = (₹ 80 × 60 hours) + $\frac{1}{2}$ (time saved × ₹ 80)

40 × time saved = ₹ 5,280 – ₹ 4,800

Time saved = (5,280 - 4,800) ÷ 40

Time saved = 12 hours

The solution can also be presented in following way:

Particulars	(₹)
Factory Cost	37,280
Less: Factory Overheads 60 x ₹ 60	3,600
Prime Cost	33,680
Direct material	28,400
Direct wages (Balancing Figure)	5,280

(i) Wages under Halsey Plan (Rate × Actual hours worked) + Rate × $\frac{\text{Time Saved}}{\text{Std. time}} \times \text{time taken}$

₹ 5,280 = 60 × ₹ 80 + (S* – 60)/2 × ₹ 80

₹ 5,280 = ₹ 4,800 + 40S – 2,400

S = ₹ 2,880/40 = 72 hours

*Standard time

Effective rate of earnings per hour = 5,280/60 = ₹ 88

(ii) Wages under Rowan Plan: (Rate × Actual hours worked) + Rate × $\frac{\text{Time Saved}}{\text{Std. Time}} \times \text{time taken}$

= 60 × 80 + $\frac{72-60}{72} \times 60 \times 80$ = ₹ 5,600

Effective rate of earnings per hour = 5,600/60 = ₹ 93.33

Question 2 : (RTP Sept 2024)

The labour turnover rates for the quarter ended 30th June, 2024 are computed as 14%, 8% and 6% under Flux method, Replacement method and Separation method respectively. If the number of workers replaced during 1st quarter of the financial year 2024-25 is 36, COMPUTE the following:

- The number of workers recruited and joined; and
- The number of workers left and discharged.

Solution 2 :

$$\begin{aligned} \text{Labour Turnover Rate (Replacement method)} &= \frac{\text{No. of workers replaced}}{\text{Average no. of workers}} \\ \text{Or, } \frac{8}{100} &= \frac{36}{\text{Average No. of workers}} \\ \text{Or, Average No. of workers} &= 450 \\ \text{Labour Turnover Rate (Separation method)} &= \frac{\text{No. of workers separated}}{\text{Average No. of workers}} \\ \text{Or, } \frac{6}{100} &= \frac{\text{No. of workers separated}}{450} \\ \text{Or, No. of workers separated} &= 27 \\ \text{Labour Turnover Rate (Flux Method)} &= \frac{\text{No. of Separations} + \text{No. of accession (Joinings)}}{\text{Average No. of workers}} \\ \text{Or, } \frac{14}{100} &= \frac{27 + \text{No. of accessions (Joinings)}}{450} \\ \text{Or, } 100 (27 + \text{No. of Accessions}) &= 6,300 \\ \text{Or, No. of Accessions} &= 36 \\ \text{(i) The No. of workers recruited and Joined} &= 36 \\ \text{(ii) The No. of workers left and discharged} &= 27 \end{aligned}$$

Question 3 : (May 2024)

Super Ltd, a manufacturing company is facing the problem of high labour turnover in the factory. Before analysing the causes and taking remedial steps, the management of the company wants to ascertain the profit lost for the year 2022-23 on account of labour turnover. For this purpose, it has given you the following information:

- (i) Sales for the last year 2022-23 was ₹2,16,18,000 and P/V ratio was 15%.
- (ii) The total number of actual hours worked by the direct labour force was 5,00,000 hours. The actual direct labour hours included 60,000 hours attributable to training new recruits, out of which 40% of the hours were unproductive.
- (iii) Due to delays by the Personnel Department in filling vacancies on account of labour turnover, 95,000 potential productive hours (excluding unproductive training hours) were lost.
- (iv) 1,500 units of the output produced during training period were defective. Cost of rectification of defective units was ₹40 per unit.
- (v) Settlement cost of the workers leaving the organization was ₹2,37,880.
- (vi) Recruitment and Selection cost was ₹1,40,000.
- (vii) Cost of Training and Induction was ₹1,61,950.

Assuming that the potential production lost as a consequence of labour turnover could have been sold at prevailing prices, find the profit lost for the year 2022-23 on account of labour turnover.

Question 4 : (MTP Sept 2023)

J Ltd. wants to ascertain the profit lost during the year 2022-23 due to increased labour turnover. For this purpose, they have given you the following information:

- (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 are required to calculate the profit lost by the company due to increased labour turnover during the year 2022-23.

Solution 4 :

$$\begin{aligned} \text{Output by experienced workers in 50,000 hours} &= \frac{50,000}{10} = 5,000 \text{ units} \\ \text{Output by new recruits} &= 60\% \text{ of } 5,000 = 3,000 \text{ units} \\ \text{Loss of output} &= 5,000 - 3,000 = 2,000 \text{ units} \\ \text{Total loss of output} &= \text{Due to delay recruitment} + \text{Due to inexperience} \\ &= 10,000 + 2,000 = 12,000 \text{ units} \\ \text{Contribution per unit} &= 20\% \text{ of } ₹180 = ₹ 36 \end{aligned}$$

Total contribution lost = ₹36 × 12,000 units = ₹ 4,32,000
 Cost of repairing defective units = 3,000 units × 0.2 × ₹ 25 = ₹ 15,000

Profit forgone due to labour turnover

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2022-23	9,00,000

Question 5 : (MTP Oct 2023)

The rate of change of labour force in a company during the year ending 31st March, 2023 was calculated as 13%, 8% and 5% respectively under 'Flux Method', 'Replacement method' and 'Separation method'. The number of workers separated during the year is 40.

You are required to calculate:

- Average number of workers on roll.
- Number of workers replaced during the year.
- Number of new accessions i.e. new recruitment.
- Number of workers at the beginning of the year.

Solution 5 :

(i) Labour Turnover Rate (Separation method)

$$= \frac{\text{No. of workers separated}}{\text{Average no. of workers on roll}}$$

Or, $\frac{5}{100} = \frac{40}{\text{Average no. of workers on roll}}$
 Or, Average no. of workers on roll = 800

(ii) Labour Turnover Rate (Replacement method)

$$= \frac{\text{No. of workers replaced}}{\text{average no. of workers on roll}}$$

Or, $\frac{8}{100} = \frac{\text{No. of workers replaced}}{800}$
 Or, No. of workers replaced = 64

(iii) Labour Turnover Rate (Flux Method)

$$= \frac{\text{No. of Separations} + \text{No. of accessions (new recruitments)}}{\text{Average No. of workers on roll}}$$

Or, $\frac{13}{100} = \frac{40 + \text{No. of accessions (New recruitments)}}{800}$
 Or, 100 (40 + No. of Accessions) = 10,400
 Or, No. of new accessions = 64

(iv) No. of workers at the beginning of the year

Let workers at the beginning of the year were 'X'

$$\text{Average no. of workers on roll} = \frac{\text{Workers at the beginning} + \text{workers at the end}}{2}$$

$$800 = \frac{X + (X + \text{New accessions} - \text{Separations})}{2}$$

$$800 = \frac{X + (X + 64 - 40)}{2}$$

$$800 = \frac{X + (X + 24)}{2}$$

$$2X = 1,600 - 24 \text{ or, } X = 788 \text{ workers}$$

Question 6 : (MTP March 2024)

The following particulars have been compiled in respect of three workers, which are under consideration of the management.

	I	II	III
Actual hours worked	380	100	540
Hourly rate of wages (in ₹)	40	50	60
Productions in units:			

Product X	210	-	600
Product Y	360	-	1350
Product Z	460	250	-
Standard time allowed per unit of each product is:			
	X	Y	Z
Minutes	15	20	30

For the purpose of piece rate, each minute is valued at ₹ 1/- You are required to calculate the wages of each worker under:

- Guaranteed hourly rate basis
- Piece work earning basis, but guaranteed at 75% of basic pay (Guaranteed hourly rate if his earnings are less than 50% of basic pay.)
- Premium bonus basis where the worker received bonus based on Rowan scheme.

Solution 6 :

(i) Computation of wages of each worker under guaranteed hourly rate basis

Worker	Actual hours worked (Hours)	Hourly wage rate (₹)	Wages (₹)
I	380	40	15,200
II	100	50	5,000
III	540	60	32,400

(ii) Computation of Wages of each worker under piece work earning basis

Product	Piece rate per unit (₹)	Worker-I		Worker-II		Worker-III	
		Units	Wages (₹)	Units	Wages (₹)	Units	Wages (₹)
X	15	210	3,150	-	-	600	9,000
Y	20	360	7,200	-	-	1,350	27,000
Z	30	460	13,800	250	7,500	-	-
Total			24,150		7,500		36,000

Since each worker's earnings are more than 50% of basic pay. Therefore, worker-I, II and III will be paid the wages as computed i.e. ₹24,150, ₹7,500 and ₹36,000 respectively.

Working Notes:

1. Piece rate per unit

Product	Standard time per unit in minute	Piece rate each minute (₹)	Piece rate per unit (₹)
X	15	1	15
Y	20	1	20
Z	30	1	30

2. Time allowed to each worker

Worker	Product-X	Product-Y	Product-Z	Total Time (Hours)
I	210 units × 15 = 3,150	360 units × 20 = 7,200	460 units × 30 = 13,800	24,150/60 = 402.50
II	-	-	250 units × 30 = 7,500	7,500/60 = 125
III	600 units × 15 = 9,000	1,350 units × 20 = 27,000	-	36,000/60 = 600

(iii) Computation of wages of each worker under Premium bonus basis (where each worker receives bonus based on Rowan Scheme)

Worker	Time Allowed (Hr.)	Time Taken (Hr.)	Time saved (Hr.)	Wage Rate per hour (₹)	Earnings (₹)	Bonus (₹)*	Total Earning (₹)
I	402.5	380	22.5	40	15,200	850	16,050
II	125	100	25	50	5,000	1,000	6,000
III	600	540	60	60	32,400	3,240	35,640

$$\star \frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{WageRate}$$

$$\text{Worker-I} = \frac{380}{402.5} \times 22.5 \times 40 = 850$$

$$\text{Worker-II} = \frac{100}{125} \times 25 \times 50 = 1,000$$

$$\text{Worker-III} = \frac{540}{600} \times 60 \times 60 = 3,240$$

Question 7 : (MTP April 2024)

A skilled worker in Shanu Ltd. is paid a guaranteed wage rate of ₹ 30 per hour. The standard time per unit for a particular product is 4 hours. Sam, a machine-man, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of ₹ 37.50 on the manufacture of that particular product. WHAT could have been his total earnings and effective hourly rate, had he been put on Halsey Incentive Scheme (50%)?

Solution 7 :

Let T hours be the total time worked in hours by the skilled worker (machine-man Sam); ₹ 30/- is the rate per hour; standard time is 4 hours per unit and effective hourly earning rate is ₹ 37.50 then

$$\text{Earning} = \text{Hours worked} \times \text{Rate per hour} + \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

(Under Rowan incentive plan)

$$\text{₹ } 37.5 T = (T \times \text{₹ } 30) + \frac{(4 - T)}{4} \times T \times \text{₹ } 30$$

$$\text{₹ } 37.5 = \text{₹ } 30 + (4 - T) \times \text{₹ } 7.5$$

$$\text{Or } \text{₹ } 7.5 T = \text{₹ } 22.5$$

$$\text{Or } T = 3 \text{ hours}$$

Total earnings and effective hourly rate of skilled worker (machine man Sam) under Halsey Incentive Scheme (50%)

$$\text{Total earnings} = (\text{Hours worked} \times \text{Rate per hour}) + (\frac{1}{2} \text{ Time saved} \times \text{Rate per hour})$$

(under 50% Halsey Incentive Scheme)

$$= (3 \text{ hours} \times \text{₹ } 30) + (\frac{1}{2} \times 1 \text{ hour} \times \text{₹ } 30)$$

$$\text{Effective hourly rate} = \frac{\text{Total earnings}}{\text{Hours Taken}} = \frac{\text{₹ } 105}{\text{₹ } 35} = 3 \text{ hours}$$

Question 8 : (RTP Nov 2023)

A skilled worker is paid a guaranteed wage rate of ₹120 per hour. The standard time allowed for a job is 6 hour. He took 5 hours to complete the job. He is paid wages under Rowan Incentive Plan.

(i) Calculate his effective hourly rate of earnings under Rowan Incentive Plan.

(ii) If the worker is placed under Halsey Incentive Scheme (50%) and he wants to maintain the same effective hourly rate of earnings, calculate the time in which he should complete the job.

Solution 8 :

(i) Effective hourly rate of earnings under Rowan Incentive Plan

$$\text{Earnings under Rowan Incentive plan} = (\text{Actual time taken} \times \text{wage rate}) + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Wage rate}$$

$$= (5 \text{ hours} \times \text{₹ } 120) + \left(\frac{1 \text{ hour}}{6 \text{ hour}} \times 5 \text{ hours} \times \text{₹ } 120 \right) = \text{₹ } 600 + \text{₹ } 100 = \text{₹ } 700$$

$$\text{Effective hourly rate} = \text{₹ } 700 / 5 \text{ hours} = \text{₹ } 140 / \text{hour}$$

(ii) Let time taken = X

$$\text{Effective hourly rate} = \frac{\text{Earnings under Halsey Scheme}}{\text{Time Taken}}$$

$$\text{Or, Effective hourly rate under Halsey Incentive plan} = \frac{(\text{Time taken} \times \text{Rate}) + 50\% \text{ of Rate} \times (\text{Time allowed} - \text{Time taken})}{\text{Time Taken}}$$

$$\text{Or, } \text{₹ } 140 = \frac{(X \times \text{₹ } 120) + 50\% \text{ of } \text{₹ } 120 \times (6 - X)}{X}$$

$$\text{Or, } 140X = 120X + 360 - 60X$$

$$\text{Or, } 80X = 360$$

$$\text{Or, } X = \frac{360}{80} = 4.5 \text{ hours}$$

Therefore, to earn an effective hourly rate of ₹140 under Halsey Incentive Scheme, a worker has to complete the work in 4.5 hours.

Question 1 : (Nov 2023)

HCP Ltd. is a manufacturing company having two production departments, P and Q and two service departments, R and S. The budgeted cost information for the month of October 2023 is furnished below:

	(₹)	Production Departments		Service Departments	
		P (₹)	Q (₹)	R (₹)	S (₹)
Indirect material	1,77,500	94,750	49,750	18,270	14,730
Indirect Labour	1,55,000	35,000	75,000		
Factory Rent	75,000				
Depreciation on machinery	37,500				
Power	96,000				
Security Expenses for Factory Premises	24,000				
Insurance- machinery	12,000				
Supervisor Expenses	48,000				
Additional information					
Floor Area (Sq. meters)		1250	750	200	300
Net book value of machinery (₹)		21,00,000	5,00,000	1,00,000	3,00,000
H.P. of machines		800	200	80	120
Machine hours		4,000	1,000	600	800
Number of employees		10	30	6	4
Labour hours		2,000	6,000	1,200	600

The overhead costs of the two service department are distributed using step method in the same order viz. R and S respectively on the following basis:

Department R Number of employees

Department S Machine hours

Required:

(i) Prepare a statement showing distribution of overheads to various departments, clearly showing the basis of distribution.

(ii) Calculate the total budgeted overheads for both production departments after the service departments have been re-apportioned to them.

(iii) Calculate the most appropriate overhead absorption rate for each of the production department.

Solution 1 :**(i) Overhead Distribution Statement**

Particular	Basis	Total Amount (₹)	Production Departments		Service Departments	
			P (₹)	Q (₹)	R (₹)	S (₹)
Indirect material	Direct	1,77,500	94,750	49,750	18,270	14,730
Indirect labour	Direct	1,55,000	35,000	75,000	15,000	30,000
Factory rent (125:75:20:30)	Floor Area	75,000	37,500	22,500	6,000	9,000
Depreciation of machinery (21:5:1:3)	Book value of machinery	37,500	26,250	6,250	1,250	3,750
Power (80:20:8:12)	H.P. of machines	96,000	64,000	16,000	6,400	9,600
Security expenses for factory premises (125:75:20:30)	Floor Area	24,000	12,000	7,200	1,920	2,880
Insurance- machinery (21:5:1:3)	Book value of machinery	12,000	8,400	2,000	400	1,200
Supervisor expenses (10:30:6:4)	Number of employees	48,000	9,600	28,800	5,760	3,840
Total		6,25,000	2,87,500	2,07,500	55,000	75,000

(ii) Redistribution of Service Department's Expenses

Particular	Production Departments		Service Departments	
	P (₹)	Q (₹)	R (₹)	S (₹)
Overhead as per primary distribution	2,87,500	2,07,500	55,000	75,000
Expenses of service department R is apportioned among other	12,500	37,500	(55,000)	5,000

departments P, Q & S in the ratio of number of employees (10:30:4)				
Expenses of service department S is apportioned among other departments P & Q in the ratio of Machine hours (40:10)	64,000	16,000		(80,000)
Total Budgeted overheads	3,64,000	2,61,000		

(iii) Calculation of overhead rates for each of the production department

Particular	Production Departments	
	P (₹)	Q (₹)
Total Budgeted overheads	3,64,000	2,61,000
Actual machine hours	4000 hours	
Actual labour hours		6000 hours
Actual machine/labour hour rate	91	43.5

Note: Department P is assumed to be machine oriented and Department Q is assumed to be labour oriented as per information available in the question

The solution 3(a) can also be presented in following way for Distribution of Power expenses:

Overhead Distribution Statement

Particular	Basis	Total Amount (₹)	Production Departments		Service Departments	
			P (₹)	Q (₹)	R (₹)	S (₹)
Indirect material	Direct	1,77,500	94,750	49,750	18,270	14,730
Indirect labour	Direct	1,55,000	35,000	75,000	15,000	30,000
Factory rent (125:75:20:30)	Floor Area	75,000	37,500	22,500	6,000	9,000
Depreciation of machinery (21:5:1:3)	Book value of machinery	37,500	26,250	6,250	1,250	3,750
Power (3200:200:48:96)	H.P. x machine hours	96,000	86,682	5,418	1,300	2,600
Security expenses for factory premises (125:75:20:30)	Floor Area	24,000	12,000	7,200	1,920	2,880
Insurance- machinery (21:5:1:3)	Book value of machinery	12,000	8,400	2,000	400	1,200
Supervisor expenses (10:30:6:4)	Number of employees	48,000	9,600	28,800	5,760	3,840
Total		6,25,000	3,10,182	1,96,918	49,900	68,000

Power can be distributed on the basis of HP of machines x machine hours

$800 \times 4000 = 32,00,000$, $200 \times 1000 = 2,00,000$, $80 \times 600 = 48,000$, $120 \times 800 = 96,000$

Ratio is 3200:200:48:96

(ii) Redistribution of Service Department's Expenses

Particular	Production Departments		Service Departments	
	P (₹)	Q (₹)	R (₹)	S (₹)
Overhead as per primary distribution	3,10,182	1,96,918	49,900	68,000
Expenses of service department R is apportioned among other departments P, Q & S in the ratio of number of employees (10:30:4)	11,340.90	34,022.73	(49,900)	4,536.37
Expenses of service department S is apportioned among other departments P & Q in the ratio of Machine hours (40:10)	58,029.10	14,507.27		(72,536.37)
Total Budgeted overheads	3,79,552	2,45,448		

(iii) Calculation of overhead rates for each of the production department

Particular	Production Departments	
	P (₹)	Q (₹)
Total Budgeted overheads	3,79,552	2,45,448

Actual machine hours	4000 hours	
Actual labour hours		6000 hours
Actual machine/labour hour rate	94.89	40.91

Note: Department P is assumed to be machine oriented and Department Q is assumed to be labour oriented as per information available in the question

Question 2 : (RTP Sept 2024)

From the details furnished below you are required to compute a comprehensive machine-hour rate:

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)	₹ 12,96,000
Normal working hours for the month (The machine works for only 75% of normal capacity)	200 hours
Wages to Machine-man	₹ 800 per day (of 8 hours)
Wages to Helper (machine attendant)	₹ 500 per day (of 8 hours)
Power cost for the month for the time worked	₹ 1,30,000
Supervision charges apportioned for the machine centre for the month	₹ 18,000
Electricity & Lighting (fixed in nature) for the month	₹ 9,500
Repairs & maintenance (machine) including consumable stores per month	₹ 17,500
Insurance of Plant & Building (apportioned) for the year	₹ 18,000
Other general expense per annum	₹ 18,000

The workers are paid a fixed dearness allowance of ₹ 4,500 per month. Production bonus payable to workers in terms of an award is equal to 10% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production.

Solution 2 :

Effective machine hours = 200 hours × 75% = 150 hours

Computation of Comprehensive Machine Hour Rate

	Per month (₹)	Per hour (₹)
Fixed cost		
Supervision charges	18,000.00	
Electricity and lighting	9,500.00	
Insurance of Plant and building (₹ 18,000 ÷ 12)	1,500.00	
Other General Expenses (₹ 18,000 ÷ 12)	1,500.00	
Depreciation (₹ 1,29,600 ÷ 12)	10,800.00	
	41,300.00	275.33
Direct Cost		
Repairs and maintenance	17,500.00	116.67
Power	1,30,000.00	866.67
Wages of machine man		196.00
Wages of Helper		136.00
Machine Hour rate (Comprehensive)		1,590.67

Wages per machine hour

	Machine man	Helper
Wages for 200 hours		
Machine-man (₹ 800 × 25)	₹ 20,000.00	---
Helper (₹ 500 × 25)	---	₹ 12,500.00
Dearness Allowance (DA)	₹ 4,500.00	₹ 4,500.00
	₹ 24,500.00	₹ 17,000.00
Production bonus (10% of Basic and DA)	2,450.00	1,700.00
Leave wages (10% of Basic and DA)	2,450.00	1,700.00
	29,400.00	20,400.00
Effective wage rate per machine hour	196.00	136.00

Question 3 : (MTP Sept 2023)

From the details furnished below you are required to COMPUTE a comprehensive machine-hour rate:

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)	₹ 6,48,000
Normal working hours for the month (The machine works for only 75% of normal capacity)	200 hours
Wages to Machine-man	₹ 400 per day (of 8 hours)
Wages to Helper (machine attendant)	₹ 275 per day (of 8 hours)
Power cost for the month for the time worked	₹ 65,000
Supervision charges apportioned for the machine centre for the month	₹ 18,000
Electricity & Lighting for the month	₹ 9,500
Repairs & maintenance (machine) including Consumable stores per month	₹ 17,500
Insurance of Plant & Building (apportioned) for the year	₹ 18,250
Other general expense per annum	₹ 17,500

The workers are paid a fixed Dearness allowance of ₹ 4,575 per month. Production bonus payable to workers in terms of an award is equal to 33.33% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production.

Solution 3 :

(a) Effective machine hours = 200 hours × 75% = 150 hours

Computation of Comprehensive Machine Hour Rate

	Per month (₹)	Per hour (₹)
Fixed cost		
Supervision charges	18,000.00	
Electricity and lighting	9,500.00	
Insurance of Plant and building (₹ 18,250 ÷ 12)	1,520.83	
Other General Expenses (₹ 17,500 ÷ 12)	1,458.33	
Depreciation (₹ 64,800 ÷ 12)	5,400.00	
	35,879.16	239.19
Direct Cost		
Repairs and maintenance	17,500.00	116.67
Power	65,000.00	433.33
Wages of machine man		139.27
Wages of Helper		109.41
Machine Hour rate (Comprehensive)		1,037.87

Wages per machine hour

	Machine man	Helper
Wages for 200 hours		
Machine-man (₹ 400 × 25)	₹ 10,000.00	---
Helper (₹ 275 × 25)	---	₹ 6,875.00
Dearness Allowance (DA)	₹ 4,575.00	₹ 4,575.00
	₹ 14,575.00	₹ 11,450.00
Production bonus (1/3 of Basic and DA)	4,858.33	3,816.67
Leave wages (10% of Basic and DA)	1,457.50	1,145.00
	20,890.83	16,411.67
Effective wage rate per machine hour	₹ 139.27	₹ 109.41

Question 4 : (May 2024)

The cost variance report was being discussed at a review meeting where in Cost Accountant of the company reported under-absorption of production overheads.

The following information was available from the cost records of the company at the end of financial year 2023-24:

- Actual production overheads incurred were ₹4,50,000 which included ₹42,000 on account of 'written off' obsolete stores.
- 18,000 units were produced during the year out of which 10,000 units were sold and 8,000 units of finished goods were in stock.
- There were also 5,000 units in progress which may be reckoned as 40% complete.
- The actual machine hours worked during the period were 43,000.

ABC Ltd. absorbs the production overheads at a predetermined rate of ₹8 per machine hour.

On investigation, it has been found that 20% of the under-absorption of production overheads was due to defective planning and the rest was attributable to normal increase in costs of indirect materials and indirect labour.

You are required to:

- Calculate the amount of under-absorption of production overheads during the year 2023-24; and
- Show the treatment of under-absorption of production overheads in cost accounts.

Question 5 : (MTP April 2024)

The following information are available for the three machines of a manufacturing department of KBC Ltd.:

	Preliminary estimates of expenses			
	Total	(per annum)		
		Machines		
		P	Q	R
	(₹)	(₹)	(₹)	(₹)
Depreciation	20,000	7,500	7,500	5,000
Spare parts	10,000	4,000	4,000	2,000
Power	40,000			
Consumable stores	10,000	4,000	3,000	3,000
Insurance of machinery	8,000			
Indirect labour	20,000			
Building maintenance expenses	20,000			
Annual interest on capital outlay	60,000	25,000	25,000	10,000
Monthly charge for rent and rates	10,000			
Salary of foreman (per month)	20,000			
Salary of Attendant (per month)	5,000			

(The foreman and the attendant control all the three machines and spend equal time on them.)

The following additional information is also available:

	Machines		
	P	Q	R
Estimated Direct Labour Hours	1,00,000	1,50,000	1,50,000
Ratio of K.W. Rating	3	2	3
Floor space (sq. ft.)	40,000	40,000	20,000

There are 14 holidays besides Sundays in the year, of which two were on Saturdays. The manufacturing department works 8 hours a day but Saturdays are half days. All machines work at 85% capacity throughout the year and 2% is reasonable for breakdown.

You are required to :

CALCULATE predetermined machine hour rates for the above machines after taking into consideration the following factors:

- An increase of 15% in the price of spare parts.
- An increase of 25% in the consumption of spare parts for machine 'Q' & 'R' only.
- 20% general increase in wages rates.
- A 10% decrease in the consumption of consumable stores.

Solution 5 :

Computation of Machine Hour Rate

	Basis of apportionment	Total	Machines		
			P	Q	R
		(₹)	(₹)	(₹)	(₹)
(A) Standing Charges					
Insurance	Depreciation Basis	8,000	3,000	3,000	2,000

Indirect Labour	Direct Labour	24,000	6,000	9,000	9,000
Building Maintenance expenses	Floor Space	20,000	8,000	8,000	4,000
Rent and Rates	Floor Space	1,20,000	48,000	48,000	24,000
Salary of foreman	Equal	2,40,000	80,000	80,000	80,000
Salary of attendant	Equal	<u>60,000</u>	<u>20,000</u>	<u>20,000</u>	<u>20,000</u>
Total standing charges		4,72,000	1,65,000	1,68,000	1,39,000
Hourly rate for standing charges			90.36	92.00	76.12
(B) Machine Expenses:					
Depreciation	Direct	20,000	7,500	7,500	5,000
Spare parts	Final estimates	13,225	4,600	5,750	2,875
Power	K.W. rating	40,000	15,000	10,000	15,000
Consumable Stores	Direct	<u>9,000</u>	<u>3,600</u>	<u>2,700</u>	<u>2,700</u>
Total Machine expenses		82,225	30,700	25,950	25,575
Hourly Rate for Machine expenses			16.81	14.21	14.01
Total (A + B)		5,54,225	1,95,700	1,93,950	1,64,575
Machine Hour rate			107.17	106.22	90.13

Working Notes:

(i) Calculation of effective working hours:

No. of holidays 52 (Sundays) + 14 (other holidays) = 66

Saturday (52 – 2) = 50

No. of days (Work full time) = 365 – 66 – 50 = 249

	Hours
Full days work 249 x 8	= 1,992
Half days work 50 x 4	= <u>200</u>
	2,192

Effective capacity 85% of 2,192

Less: Normal loss of time (Breakdown) 2%

Effective running hour

Hours
1,863 (Rounded off)
<u>37 (Rounded off)</u>
1,826

(ii) Amount of spare parts is calculated as under:

	P	Q	R
	₹	₹	₹
Preliminary estimates	4,000	4,000	2,000
Add: Increase in price @ 15%	600	600	300
	4,600	4,600	2,300
Add: Increase in consumption @ 25%	-	1,150	575
Estimated cost	4,600	5,750	2,875

(iii) Amount of Indirect Labour is calculated as under:

	₹
Preliminary estimates	20,000
Add: Increase in wages @ 20%	4,000
	<u>24,000</u>

(iv) Amount of Consumables Stores is calculated as under:

	₹
Preliminary estimates	10,000
Less: Decrease in consumption @ 10%	1,000
	<u>9,000</u>

(v) Interest on capital outlay is a financial matter and, therefore it has been excluded from the cost accounts.

Question 6 : (MTP April 2024)

The following are the budgeted details are available from the records of a manufacturing company SP Ltd.:

	₹	₹
Direct Materials		2,13,000
Direct Wages:		
Machine Shop (12,000 hours)		
Assembly Shop (10,000 hours)	48,000	1,11,000
Works Overhead:		
Machine Shop	88,200	
Assembly Shop	51,800	1,40,000
Administrative Overhead		92,800
Selling Overhead		81,000
Distribution Overhead		62,100

You are required to:

(a) PREPARE a Schedule of Overhead Rates from the figures available stating the basis of overhead recovery rates used under the given circumstances.

(b) WORK OUT a Cost Estimate for the following job based on overhead calculated on the above basis.

Direct Material:	25 kg @ ₹ 17.20/kg
	15 kg @ ₹ 21.00/kg
Direct labour: (On the basis of hourly rate	Machine shop 30 hours
For machine shop and assembly shop)	Assembly shop 42 hours

Solution 6 :

Job Cost Sheet for the period.....

			₹
Direct materials			2,13,000
Direct wages:			
Machine shop		63,000	
Assembly shop		<u>48,000</u>	<u>1,11,000</u>
	Prime Cost		3,24,000
Works overhead:			
Machine shop		88,200	
Assembly shop		<u>51,800</u>	<u>1,40,000</u>
	Work Cost		4,64,000
Administration overhead			<u>92,800</u>
	Cost of Production		5,56,800
Selling overhead			81,000
Distribution overhead			<u>62,100</u>
	Total Cost		6,99,900

Schedule of Overhead Rate

- (i) Works Overhead: Hourly rate = (Overhead amount ÷ Hours)
Machine shop = $(88,200 \div 12,000) = ₹ 7.35$ per hour
Assembly shop = $(51,800 \div 10,000) = ₹ 5.18$ per hour
- (ii) Administrative Overhead as a % of works cost = $\frac{92,800}{4,64,000} \times 100 = 20\%$
- (iii) Selling and distribution overhead as % of works cost = $\frac{81,000 + 62,100}{4,64,000} \times 100 = 30.84\%$
Labour hour rates are calculated as under:
Machine shop = $₹ 63,000 \div 12,000 \text{ hrs.} = ₹ 5.25$
Assembly shop = $₹ 48,000 \div 10,000 \text{ hrs.} = ₹ 4.80$

(b) Cost Estimate for Job

Direct Materials		₹	₹
(i)	25 kg @ ₹ 17.20 per kg	430	
(ii)	15 kg @ ₹ 21 per kg	315	745.00
Direct Labour			

Machine shop (30 hrs. @ ₹ 5.25)	157.50	
Assembly shop (42 hrs. @ ₹ 4.80)	201.60	359.10
Prime Cost		1104.10
Works Overhead		
Machine shop (30 hours @ ₹ 7.35)	220.50	
Assembly shop (42 hours @ ₹ 5.18)	217.56	438.06
Works Cost		1542.16
Administration overhead (20% of works cost)		308.43
Cost of Production		1850.59
Selling and distribution cost (30.84% of works cost)		475.60
Total Estimated Cost		2326.19

Question 7 : (RTP Nov 2023)

The following particulars refer to process used in the treatment of material subsequently incorporated in a component forming part of an electrical appliance:

(i) The original cost of the machine used (Purchased in June 2018) was ₹ 10,00,000. Its estimated life is 10 years, the estimated scrap value at the end of its life is ₹ 10,000, and the estimated working time per year (50 weeks of 44 hours) is 2,200 hours. Out of which machine maintenance etc., is estimated to take up 200 hours. No other loss of working time expected, setting up time, estimated at 100 hours, is regarded as productive time. (Holiday to be ignored).

(ii) Electricity used by the machine during production is 16 units per hour at a cost of ₹ 7 per unit. No power is consumed during maintenance or setting up.

(iii) The machine required a chemical solution which was replaced at the end of week at a cost of ₹ 2,000 each time.

(iv) The estimated cost of maintenance per year is ₹ 1,20,000.

(v) Two attendants control the operation of the machine together with five other identical machines. Their combined weekly wages, insurance and the employer's contribution to holiday pay amount is ₹ 9,000.

(vi) Departmental and general works overhead allocated to this machine for the current year amount to ₹ 20,000.

You are required to calculate the machine hour rate of operating the machine.

Solution 7 :

Working Notes:

(i) Total Productive hours = Estimated Working hours – Machine Maintenance hours
 $= 2,200 \text{ hours} - 200 \text{ hours} = 2,000 \text{ hours}$

(ii) Depreciation per annum = $\frac{10,00,000 - 10,000}{10} = ₹ 99,000$

(iii) Chemical solution cost per annum = ₹ 2,000 × 50 weeks = ₹ 1,00,000

(iv) Wages of attendants (per annum) = $\frac{9,000 \times 50 \text{ weeks}}{6 \text{ machines}} = ₹ 75,000$

Calculation of Machine hour rate

Particulars	Amount (per annum)	Amount (per hour)
A. Standing Charge		
(i) Wages of attendants	75,000	
(ii) Departmental and general works overheads	20,000	
Total Standing Charge	95,000	
Standing Charges per hour		47.50
B. Machine Expense		
(iii) Depreciation	99,000	49.50
(iv) Electricity (7 × 1,900 × 16 units) ÷ 2,000	-	106.40
(v) Chemical solution	1,00,000	50.00
(vi) Maintenance cost	1,20,000	60.00
Machine operating cost per hour (A + B)		313.40

Question 1 : (Nov 2023)

JH Plastics Limited manufactures three products S, M and L. To date, simple traditional absorption costing system has been used to allocate overheads to products. Total production overheads are allocated on the basis of machine hours. The machine hour rate for allocating production overheads is ₹ 240 per machine hour under the traditional absorption costing system. Selling prices are calculated by adding mark up of 40% of the product cost. Information related to products for the most recent year is as under:

	Products		
	S	M	L
Units produced and sold	7,500	12,500	9,000
Direct material cost per unit (₹)	158	179	250
Direct labour cost per unit (₹)	40	45	60
Machine hours per unit	0.30	0.45	0.50
Number of Machine setups	120	120	160
Number of purchase orders	90	135	125
Number of inspections	100	160	140

The management wishes to introduce activity-based method (ABC) system of attributing production overheads to products and has identified major cost pools for production overheads and their associated cost drivers as follows:

Cost pool	Amount	Cost driver
Purchasing Department Cost	₹ 7,00,000	Number of Purchase orders
Machine setup Cost	₹ 9,00,000	Number of Machine setups
Quality Control Cost	₹ 6,56,000	Number of inspections
Machining Cost	₹ 5,64,000	Machine hours

Required:

- (i) Calculate the total cost per unit and selling price per unit for each of the three products using:
 - (a) The traditional costing approach currently used by JH Plastics Limited;
 - (b) Activity based costing (ABC) approach.
- (ii) Calculate the difference in selling price per unit as per (a) and (b) above and show which product is under-priced or over-priced.

Solution 1 :

- (i) (a) Statement showing 'Cost per unit & Selling price per unit – Traditional Method'.

Particular	Products		
	S (₹)	M (₹)	L (₹)
Direct material cost per unit	158	179	250
Direct labour cost per unit	40	45	60
Production overhead @ ₹ 240 per machine hour	72 (₹ 240 x 0.3)	96 (₹ 240 x 0.4)	120 (₹ 240 x 0.5)
Cost per unit	270	320	430
Add: Profit @ 40%	108	128	172
Selling price per unit	378	448	602

- (b) Statement showing 'Cost per unit & Selling price per unit – Activity Based Costing'.

Particular	Activity Drivers	Total Amount (₹)	Products		
			S	M	L
Production (units)	-	-	7500	12500	9000
Machine hours	-	-	2250 (7500 x 0.3)	5000 (12500 x 0.4)	4500 (9000 x 0.5)
			(₹)	(₹)	(₹)
Direct material cost per unit (i)			158	179	250
Direct labour cost per unit (ii)			40	45	60
Overheads					

Purchasing department cost (90:135:125)	Number of purchase orders	7,00,000	1,80,000	2,70,000	2,50,000
Machine setup cost (120:120:160)	Number of machine setups	9,00,000	2,70,000	2,70,000	3,60,000
Quality control cost (100:160:140)	Number of inspections	6,56,000	1,64,000	2,62,400	2,29,600
Machining cost (225:500:450)	Machine hours	5,64,000	1,08,000	2,40,000	2,16,000
Total Overhead			7,22,000	10,42,400	10,55,600
Overhead Cost per unit (iii)			96.27	83.39	117.29
Total Cost per unit (i+ii+iii)			294.27	307.39	427.29
Add: Profit @ 40%			117.71	122.96	170.92
Selling price per unit			411.98	430.35	598.21

Note: The question may also be solved by calculating cost driver rate & allocating various cost based on cost driver rate. However, there will be no change in any of the answer.

(ii)

Particular	Products		
	S (₹)	M (₹)	L (₹)
Selling price per unit as per Traditional Costing	378	448	602
Selling price per unit as per Activity Based Costing	411.98	430.35	598.21
Difference	(33.98)	17.65	3.79

Product S is underpriced while product M and L is overpriced using Traditional costing approach.

Question 2 : (RTP Sept 2024)

SOFTHUG is a global brand created by Green-lush Ltd. The company manufactures three range of beauty soaps i.e. SOFTHUG- Gold, SOFTHUG- Pearl, and SOFTHUG- Diamond. The budgeted costs and production for the month of May, 2024 are as follows:

(Units)	SOFTHUG- Gold		SOFTHUG- Pearl		SOFTHUG- Diamond	
Production of soaps	4,000		3,000		2,000	
Resources per Unit:	Qty	Rate	Qty	Rate	Qty	Rate
Essential Oils	60 ml	₹ 200/100 ml	55 ml	₹ 300/100 ml	65 ml	₹ 300/100 ml
Cocoa Butter	20 g	₹ 200/100 g	20 g	₹ 200/100 g	20 g	₹ 200/100 g
Filtered Water	30 ml	₹ 15/100 ml	30 ml	₹ 15/100 ml	30 ml	₹ 15/100 ml
Chemicals	10 g	₹ 30/100 g	12 g	₹ 50/100 g	15 g	₹ 60/100 g
Direct Labour	30 minutes	₹ 10/hour	40 minutes	₹ 10/hour	60 minutes	₹ 10 / hour

Green-lush Ltd. followed an Absorption Costing System and absorbed its production overheads, to its products using direct labour hour rate, which were budgeted at ₹ 1,98,000.

Now, Green-lush Ltd. is considering adopting an Activity Based Costing system. For this, additional information regarding budgeted overheads and their cost drivers is provided below:

Particulars	(₹)	Cost drivers
Forklifting cost	58,000	Weight of material lifted
Supervising cost	60,000	Direct labour hours
Utility cost	80,000	Number of Machine operations

The number of machine operators per unit of production are 5, 5, and 6 for SOFTHUG- Gold, SOFTHUG- Pearl, and SOFTHUG- Diamond respectively.

(Consider (i) Mass of 1 litre of Essential Oils and Filtered Water equivalent to 0.8 kg and 1 kg respectively (ii) Mass of output produced is equivalent to the mass of input materials taken together.)

You are required to:

- PREPARE a statement showing the unit costs and total costs of each product using the absorption costing method.
- PREPARE a statement showing the product costs of each product using the ABC approach.
- STATE what are the reasons for the different product costs under the two approaches?

Solution 2 :

(i)

Traditional Absorption Costing

	SOFTHUG- Gold	SOFTHUG - Pearl	SOFTHUG - Diamond	Total
(a) Production of soaps (Units)	4,000	3,000	2,000	9,000
(b) Direct labour (minutes)	30	40	60	-
(c) Direct labour hours (a × b)/60 minutes	2,000	2,000	2,000	6,000

Overhead rate per direct labour hour:

= Budgeted overheads , Budgeted labour hours

= ₹ 1,98,000 , 6,000 hours = ₹ 33 per direct labour hour

Unit Costs:

	SOFTHUG-Gold (₹)	SOFTHUG-Pearl (₹)	SOFTHUG-Diamond (₹)
Direct Costs:			
- Direct Labour	5.00 $\left(\frac{10 \times 30}{60}\right)$	6.67 $\left(\frac{10 \times 40}{60}\right)$	10.00 $\left(\frac{10 \times 60}{60}\right)$
- Direct Material (Refer working note 1)	167.50	215.50	248.50
Production Overhead:	16.50 $\left(\frac{33 \times 30}{60}\right)$	22.00 $\left(\frac{33 \times 40}{60}\right)$	33.00 $\left(\frac{33 \times 60}{60}\right)$
Total unit costs	189.00	244.17	291.50
Number of units	4,000	3,000	2,000
Total costs	7,56,000	7,32,510	5,83,000

Working note -1**Calculation of Direct material cost**

	SOFTHUG- Gold (₹)	SOFTHUG- Pearl (₹)	SOFTHUG- Diamond (₹)
Essential oils	120.00 $\left(\frac{200 \times 60}{100}\right)$	165.00 $\left(\frac{300 \times 55}{100}\right)$	195.00 $\left(\frac{300 \times 65}{100}\right)$
Cocoa Butter	40.00 $\left(\frac{200 \times 20}{100}\right)$	40.00 $\left(\frac{200 \times 20}{100}\right)$	40.00 $\left(\frac{200 \times 20}{100}\right)$
Filtered water	4.50 $\left(\frac{15 \times 30}{100}\right)$	4.50 $\left(\frac{15 \times 30}{100}\right)$	4.50 $\left(\frac{15 \times 30}{100}\right)$
Chemicals	3.00 $\left(\frac{30 \times 10}{100}\right)$	6.00 $\left(\frac{50 \times 12}{100}\right)$	9.00 $\left(\frac{60 \times 15}{100}\right)$
Total costs	167.50	215.50	248.50

(ii) Activity Based Costing

	SOFTHUG-Gold	SOFTHUG-Pearl	SOFTHUG- Diamond	Total
Quantity (units)	4,000	3,000	2,000	-
Weight per unit (grams)	108 $\{(60 \times 0.8) + 20 + 30 + 10\}$	106 $\{(55 \times 0.8) + 20 + 30 + 12\}$	117 $\{(65 \times 0.8) + 20 + 30 + 15\}$	-
Total weight (grams)	4,32,000	3,18,000	2,34,000	9,84,000
Direct labour (minutes)	30	40	60	-
Direct labour hours	2,000 $\left(\frac{4,000 \times 30}{60}\right)$	2,000 $\left(\frac{3,000 \times 40}{60}\right)$	2,000 $\left(\frac{2,000 \times 60}{60}\right)$	6,000
Machine operations per unit	5	5	6	-
Total operations	20,000	15,000	12,000	47,000

Forklifting rate per gram = ₹ 58,000 , 9,84,000 grams = ₹ 0.06 per gram

Supervising rate per direct labour hour

= ₹ 60,000 , 6,000 hours = ₹ 10 per labour hour

Utilities rate per machine operations

= ₹ 80,000 , 47,000 machine operations

= ₹ 1.70 per machine operations

Unit Costs under ABC:

	SOFTHUG - Gold (₹)	SOFTHUG - Pearl (₹)	SOFTHUG - Diamond (₹)
Direct Costs:			
Direct Labour	5.00	6.67	10.00
Direct material	167.50	215.50	248.50
Production Overheads:			
Forklifting cost	6.48 (0.06 x 108)	6.36 (0.06 x 106)	7.02 (0.06 x 117)
Supervising cost	5.00 $\left(\frac{10 \times 30}{60}\right)$	6.67 $\left(\frac{10 \times 40}{60}\right)$	10.00 $\left(\frac{10 \times 60}{60}\right)$
Utilities	8.50 (1.70 x 5)	8.50 (1.70 x 5)	10.20 (1.70 x 6)
Total unit costs	192.48	243.70	285.72
Number of units	4,000	3,000	2,000
Total costs	7,69,920	7,31,100	5,71,440

(iii)Comments: The difference in the total costs under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more precise.

Question 3 : (May 2024)

Luxury Designer Pvt. Ltd. is a manufacturing company, which manufactures readymade designer shirts. It has four customers: two wholesale category customers and two retail category customers. It has developed the following Activity-Based Costing system:

Activity	Cost Driver Rate (₹)
Order Processing	1,260 per purchase order
Customer Visits	1,500 per customer visit
Regular Delivery	30 per delivery Km. travelled
Expedited Delivery	4,490 per expedited delivery

List selling price per shirt is ₹1,000 and average cost per shirt is ₹600. CEO of Luxury Designer Pvt. Ltd. wants to evaluate the profitability of his Company in the next year 2024. The following data in context of four customers are available for 2023:

	Wholesale Customers		Retail Customers	
	WC-1	WC-2	RC-1	RC-2
Number of Purchase Orders	50	65	224	245
Number of Customers visits	10	13	25	22
Regular Deliveries	46	52	175	198
Kilometres travelled per delivery	20	15	10	25
Expedited Deliveries	5	16	50	62
Average Number of Shirts per order	215	110	18	15
Average Selling Price per Shirt	₹700	₹800	₹900	₹950

You are required to:

Calculate the customer-level operating income and operating income as a % of revenues in 2023 and rank them on the basis of relative profitability.

Question 4 : (MTP Sept 2023)

PCP Limited belongs to the apparel industry. It specializes in the distribution of fashionable garments. It buys from the industry and resells the same to the following two different supermarkets:

(i) Supermarket A dealing in Adults' garments (Age group 15 - 30)

(ii) Supermarket B dealing in Kids' garments (Age group 5 - 10)

The following data for the month of April in respect of PCP Limited has been reported :

	Supermarket A (₹)	Supermarket B (₹)
Average revenue per delivery	1,69,950	57,750
Average cost of goods sold per delivery	1,65,000	55,000

Number of deliveries	660	1,650
----------------------	-----	-------

In the past, PCP Limited has used gross margin percentage to evaluate the relative profitability of its supermarket segments.

The company plans to use activity –based costing for analysing the profitability of its supermarket segments.

The April month's operating costs (other than cost of goods sold) of PCP Limited are ₹ 16,55,995. These operating costs are assigned to five activity areas. The cost in each area and Activity analysis including cost driver for the month of April are as follows:

Activity Area	Total costs (₹)	Cost Driver
Store delivery	3,90,500	Store deliveries
Cartons dispatched to store	4,15,250	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	64,845	Hours of shelf-stocking
Line-item ordering	3,45,400	Line-items per purchase order
Customer purchase order processing	4,40,000	Purchase orders by customers

Other data for the month of April include the following:

	Supermarket A	Supermarket B
Total number of store deliveries	1,100	2,805
Average number of cartons shipped per store delivery	250	50
Average number of hours of shelf-stocking per store delivery	6	1.5
Average number of line items per order	14	12
Total number of orders	770	1,980

Required:

(i) COMPUTE gross-margin percentage for each of its supermarket segments and compute PCP Limited's operating income.

(ii) COMPUTE the operating income of each supermarket segments using the activity-based costing information.

Solution 4 :

(i) **PCP Limited's**
Statement of operating income and gross margin percentage
for each of its supermarket segments

Particulars	Supermarket A	Supermarket B	Total
Revenues: (₹)	11,21,67,000 (660 × ₹ 1,69,950)	9,52,87,500 (1,650 × ₹ 57,750)	20,74,54,500
Less: Cost of goods sold: (₹)	10,89,00,000 (660 × ₹ 1,65,000)	9,07,50,000 (1650 × ₹ 55,000)	19,96,50,000
Gross Margin: (₹)	32,67,000	45,37,500	78,04,500
Less: Other operating costs: (₹)			16,55,995
Operating income: (₹)			61,48,505
Gross Margin	2.91%	4.76 %	3.76%
Operating income %			2.96%

(ii) **Operating Income Statement of each distribution channel**
in April (Using the Activity based Costing information)

	Supermarket A	Supermarket B
Gross margin (₹) : (A) (Refer to (i) part of the answer)	32,67,000	45,37,500
Operating cost (₹): (B) (Refer to working note)	6,55,600	10,00,395
Operating income (₹): (A-B)	26,11,400	35,37,105
Operating income (in %) (Operating income/Revenue) × 100	2.33	3.71

Working note:

Computation of rate per unit of the cost allocation base for each of the five activity areas for the month of April

	(₹)
--	-----

Store delivery [₹ 3,90,500/ (1,100 + 2,805 store deliveries)]	100 per delivery
Cartons dispatched [₹ 4,15,250/ {(250×1,100) + (50×2,805)} carton dispatches]	1 per carton dispatch
Shelf-stocking at customer store (₹) [₹ 64,845/ {(6×1,100) + (1.5×2,805)} hours]	6 per hour
Line item ordering [₹ 3,45,400/ {(14×770) + (12×1,980)} line items]	10 per line item order
Customer purchase order processing [₹ 4,40,000/ (770 + 1,980 orders)]	160 per order

Computation of operating cost of each distribution channel:

	Supermarket A (₹)	Supermarket B (₹)
Store delivery	1,10,000 (₹ 100 × 1,100 deliveries)	2,80,500 (₹ 100 × 2,805 deliveries)
Cartons dispatched	2,75,000 (₹ 1 × 250 cartons × 1,100 deliveries)	1,40,250 (₹ 1 × 50 cartons × 2,805 deliveries)
Shelf stocking	39,600 (₹ 6 × 1,100 deliveries × 6 Av.hrs.)	25,245 (₹ 6 × 2,805 deliveries × 1.5 Av.hrs)
Line item ordering	1,07,800 (₹ 10 × 14 line item × 770 orders)	2,37,600 (₹ 10 × 12 line item × 1,980 orders)
Customer purchase order processing	1,23,200 (₹ 160 × 770 orders)	3,16,800 (₹ 160 × 1,980 orders)
Operating cost	6,55,600	10,00,395

Question 5 : (MTP Oct 2023)

HP bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity-based costing methods.

The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget:

Activity	Present Cost (₹)	Estimation for the budget period
ATM Services:		
Machine Maintenance	4,00,000	All fixed, no change. Fully fixed, no change.
Rents	2,00,000	Expected to double during budget period.
Currency Replenishment Cost	1,00,000	
	7,00,000	(This activity is driven by no. of ATM transactions)
Computer Processing	5,00,000	Half this amount is fixed and no change is expected. The variable portion is expected to increase to three times the current level. (This activity is driven by the number of computer transactions)
Issuing Statements	18,00,000	Presently, 3 lakh statements are made. In the budget period, 5 lakh statements are expected. For every increase of one lakh statement, one lakh rupees is the budgeted increase. (This activity is driven by the number of statements)
Computer Inquiries	2,00,000	Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes)

The activity drivers and their budgeted quantifies are given below:

Activity Drivers	Deposits	Loans	Credit Cards
No. of ATM Transactions	1,50,000	---	50,000
No. of Computer Processing Transactions	15,00,000	2,00,000	3,00,000
No. of Statements to be issued	3,50,000	50,000	1,00,000
Telephone Minutes	3,60,000	1,80,000	1,80,000

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card Accounts.

Required:

- Calculate the budgeted rate for each activity.
- Prepare the budgeted cost statement activity wise.
- Compute the budgeted product cost per account for each product using (i) and (ii) above.

Solution 5 :

Statement Showing "Budgeted Cost per unit of the Product"

Activity	Activity Cost (Budgeted) (₹)	Activity Driver	No. of Units of Activity Driver (Budget)	Activity Rate (₹)	Deposits	Loans	Credit Cards
ATM Services	8,00,000	No. of ATM Transaction	2,00,000	4.00	6,00,000	---	2,00,000
Computer Processing	10,00,000	No. of Computer processing Transaction	20,00,000	0.50	7,50,000	1,00,000	1,50,000
Issuing Statements	20,00,000	No. of Statements	5,00,000	4.00	14,00,000	2,00,000	4,00,000
Customer Inquiries	3,60,000	Telephone Minutes	7,20,000	0.50	1,80,000	90,000	90,000
Budgeted Cost	41,60,000				29,30,000	3,90,000	8,40,000
Units of Product (as estimated in the budget period)					58,600	13,000	14,000
Budgeted Cost per unit of the product					50	30	60

Working Note

Activity	Budgeted Cost (₹)	Remark
ATM Services:		
(a) Machine Maintenance	4,00,000	-All fixed, no change.
(b) Rents	2,00,000	-Fully fixed, no change.
(c) Currency Replenishment Cost	2,00,000	-Doubled during budget period.
Total	8,00,000	
Computer Processing	2,50,000	₹ 2,50,000 (half of ₹5,00,000) is fixed and no change is expected.
	7,50,000	₹ 2,50,000 (variable portion) is expected to increase to three times the current level.
Total	10,00,000	
Issuing Statements	18,00,000	-Existing.
	2,00,000	-2 lakh statements are expected to be increased in budgeted period. For every increase of one lakh statement, one lakh rupees is the budgeted increase.
Total	20,00,000	
Computer Inquiries	3,60,000	-Estimated to increase by 80% during the budget period.
Total	3,60,000	(₹2,00,000 × 180%)

Question 6 : (MTP March 2024)

The following budgeted information relates to Pinku Ltd. for the year 2024:

	Products		
	A	B	C
Production and Sales (units)	1,00,000	80,000	60,000
	(₹)	(₹)	(₹)
Selling price per unit	90	180	140
Direct cost per unit	50	90	95

	Hours	Hours	Hours
Machine department (machine hours per unit)	3	4	5
Assembly department (direct labour hours per unit)	6	4	3

The estimated overhead expenses for the year 2024 will be as below:

Machine Department ₹ 73,60,000

Assembly Department ₹ 55,00,000

Overhead expenses are apportioned to the products on the following basis:

Machine Department On the basis of machine hours Assembly Department On the basis of labour hours

After a detailed study of the activities the following cost pools and their respective cost drivers are found:

Cost Pool	Amount (₹)	Cost Driver	Quantity
Machining services	64,40,000	Machine hours	9,20,000 hours
Assembly services	44,00,000	Direct labour hours	11,00,000 hours
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups
Order processing	7,20,000	Customer orders	7,200 orders
Purchasing	4,00,000	Purchase orders	800 orders

As per an estimate the activities will be used by the three products:

	Products		
	A	B	C
Machine set-ups	4,500	3,000	1,500
Customer orders	2,200	2,400	2,600
Purchase orders	300	350	150

Prepare a product-wise profit statement using Activity-based methods.

Solution 6 :

Profit Statement using Activity based costing (ABC) method:

	Particulars	Product			Total
		A	B	C	
A.	Sales Quantity	1,00,000	80,000	60,000	
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads: (Refer working note-3)				
(i)	Machining services (₹)	21,00,000	22,40,000	21,00,000	64,40,000
(ii)	Assembly services (₹)	24,00,000	12,80,000	7,20,000	44,00,000
(iii)	Set-up costs (₹)	4,50,000	3,00,000	1,50,000	9,00,000
(iv)	Order processing (₹)	2,20,000	2,40,000	2,60,000	7,20,000
(v)	Purchasing (₹)	1,50,000	1,75,000	75,000	4,00,000
G.	Total Cost (₹) [E+F]	1,03,20,000	1,14,35,000	90,05,000	3,07,60,000
H.	Profit (₹) (C-G)	(13,20,000)	29,65,000	(6,05,000)	10,40,000

Working Notes: 1.

		Products			Total
		A	B	C	
A.	Production (units)	1,00,000	80,000	60,000	
B.	Machine hours per unit	3	4	5	
C.	Total Machine hours [A×B]	3,00,000	3,20,000	3,00,000	9,20,000
D.	Rate per hour (₹)	8	8	8	
E.	Machine Dept. cost [C×D]	24,00,000	25,60,000	24,00,000	73,60,000
F.	Labour hours per unit	6	4	3	
G.	Total labour hours [A×F]	6,00,000	3,20,000	1,80,000	11,00,000
H.	Rate per hour (₹)	5	5	5	
I.	Assembly Dept. cost [G×H]	30,00,000	16,00,000	9,00,000	55,00,000

$$\text{Machine hour rate} = \frac{\text{₹73,60,000}}{9,20,000 \text{ hours}} = \text{₹8}$$

$$\text{Labour hour rate} = \frac{\text{₹55,00,000}}{11,00,000 \text{ hours}} = \text{₹5}$$

2. Calculation of cost driver rate

Cost Pool	Amount (₹)	Cost Driver	Quantity	Driver rate (₹)
Machining services	64,40,000	Machine hours	9,20,000 hours	7.00
Assembly services	44,00,000	Direct labour hours	11,00,000 hours	4.00
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups	100.00
Order processing	7,20,000	Customer orders	7,200 orders	100.00
Purchasing	4,00,000	Purchase orders	800 orders	500.00

3. Calculation of activity-wise cost

		Products			Total
		A	B	C	
A.	Machining hours (Refer Working note-1)	3,00,000	3,20,000	3,00,000	9,20,000
B.	Machine hour rate (₹) (Refer Working note-2)	7	7	7	
C.	Machining services cost (₹) [A×B]	21,00,000	22,40,000	21,00,000	64,40,000
D.	Labour hours (Refer Working note-1)	6,00,000	3,20,000	1,80,000	11,00,000
E.	Labour hour rate (₹) (Refer Working note-2)	4	4	4	
F.	Assembly services cost (₹) [D×E]	24,00,000	12,80,000	7,20,000	44,00,000
G.	Machine set-ups	4,500	3,000	1,500	9,000
H.	Rate per set-up (₹) (Refer Working note-2)	100	100	100	
I.	Set-up cost (₹) [G×H]	4,50,000	3,00,000	1,50,000	9,00,000
J.	Customer orders	2,200	2,400	2,600	7,200
K.	Rate per order (₹) (Refer Working note-2)	100	100	100	
L.	Order processing cost (₹) [J×K]	2,20,000	2,40,000	2,60,000	7,20,000
M.	Purchase orders	300	350	150	800
N.	Rate per order (₹) (Refer Working note-2)	500	500	500	
O.	Purchasing cost (₹) [M×N]	1,50,000	1,75,000	75,000	4,00,000

Question 7 : (MTP April 2024)

Anju Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

Activity	Cost Driver	Capacity	Cost (₹)
Power	Kilowatt hours	60,000 kilowatt hours	60,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	90,00,000

The company makes three products A, B and C. For the year ended March 31, 20XX, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
A	10,000	3,500
B	20,000	2,500
C	15,000	3,000

Required:

- PREPARE a statement showing cost allocation to each product from each activity.
- CALCULATE the cost of unused capacity for each activity.

Solution 7 :

(i) Statement of cost allocation to each product from each activity

	Product			
	A (₹)	B (₹)	C (₹)	Total (₹)
Power (Refer to working note)	10,00,000	20,00,000	15,00,000	45,00,000
	(10,000 kWh × ₹ 100)	(20,000 kWh × ₹ 100)	(15,000 kWh × ₹ 100)	
Quality	31,50,000	22,50,000	27,00,000	81,00,000

Inspections (Refer to working note)	(3,500 inspections × ₹ 900)	(2,500 inspections × ₹ 900)	(3,000 inspections × ₹ 900)	
---	-----------------------------------	-----------------------------------	-----------------------------------	--

Working Note:**Rate per unit of cost driver:**

Power : (₹ 60,00,000 ÷ 60,000 kWh) = ₹100/kWh

Quality Inspection: (₹ 90,00,000 ÷ 10,000 inspections) = ₹900 per inspection

(ii) Calculation of cost of unused capacity for each activity:

	(₹)
Power (₹60,00,000 – ₹45,00,000)	15,00,000
Quality Inspections (₹90,00,000 – ₹81,00,000)	9,00,000
Total cost of unused capacity	24,00,000

Question 8 : (RTP Nov 2023)

L Limited manufactures three products P, Q and R which are similar in nature and are usually produced in production runs of 100 units. Product P and R require both machine hours and assembly hours, whereas product Q requires only machine hours. The overheads incurred by the company during the first quarter are as under:

	₹
Machine Department expenses	18,48,000
Assembly Department expenses	6,72,000
Setup costs	90,000
Stores receiving cost	1,20,000
Order processing and dispatch	1,80,000
Inspect and Quality control cost	36,000

The data related to the three products during the period are as under:

	P	Q	R
Units produced and sold	15,000	12,000	18,000
Machine hours worked	30,000 hrs.	48,000 hrs.	54,000 hrs.
Assembly hours worked (direct labour hours)	15,000 hrs.	-	27,000 hrs.
Customers' orders executed (in numbers)	1,250	1,000	1,500
Number of requisitions raised on the stores	40	30	50

Prepare a statement showing details of overhead costs allocated to each product type using activity-based costing.

Solution 8 :**Calculation of "Activity Rate"**

Cost Pool	Cost (₹) [A]	Cost Driver [B]	Cost Driver Rate (₹)
Machine Department Expenses	18,48,000	Machine Hours (1,32,000 hrs.)	14.00
Assembly Department Expenses	6,72,000	Assembly Hours (42,000 hrs.)	16.00
Setup Cost	90,000	No. of Production Runs (450*)	200.00
Stores Receiving Cost	1,20,000	No. of Requisitions Raised on the Stores (120)	1,000.00
Order Processing and Dispatch	1,80,000	No. of Customers Orders Executed (3,750)	48.00
Inspection & Quality Control Cost	36,000	No. of Production Runs (450*)	80.00
Total (₹)	29,46,000		

*Number of Production Run is 450 (150 + 120 + 180)

Statement Showing "Overheads Allocation"

Particulars of Cost	Cost Driver	P	Q	R	Total
Machine Department Expenses	Machine Hours	4,20,000 (30,000 × ₹14)	6,72,000 (48,000 × ₹14)	7,56,000 (54,000 × ₹14)	18,48,000

Assembly Department Expenses	Assembly Hours	2,40,000	---	4,32,000	6,72,000
		(15,000 × ₹16)		(27,000 × ₹16)	
Setup Cost	No. of Production Runs	30,000	24,000	36,000	90,000
		(150 × ₹200)	(120 × ₹200)	(180 × ₹200)	
Stores Receiving Cost	No. of Requisitions Raised on the Stores	40,000	30,000	50,000	1,20,000
		(40 × ₹1,000)	(30 × ₹1,000)	(50 × ₹1,000)	
Order Processing and Dispatch	No. of Customers Orders Executed	60,000	48,000	72,000	1,80,000
		(1,250 × ₹48)	(1,000 × ₹48)	(1,500 × ₹48)	
Inspection and Quality Control Cost	No. of Production Runs	12,000	9,600	14,400	36,000
		(150 × ₹80)	(120 × ₹80)	(180 × ₹80)	
Overhead (₹)		8,02,000	7,83,600	13,60,400	29,46,000

Question 9 : (RTP May 2024)

The sales department of A Limited is analysing the customer profitability for its Product Z. It has decided to analyse the profitability of its five new customers using activity-based costing method. It buys Product Z at ₹ 5,400 per unit and sells to retail customers at a listed price of ₹ 6,480 per unit. The data pertaining to five customers are:

	Customers				
	A	B	C	D	E
Units sold	4,500	6,000	9,500	7,500	12,750
Listed Selling Price	₹6,480	₹6,480	₹6,480	₹6,480	₹6,480
Actual Selling Price	₹6,480	₹6,372	₹5,940	₹6,264	₹5,832
Number of Purchase orders	15	25	30	25	30
Number of Customer visits	2	3	6	2	3
Number of deliveries	10	30	60	40	20
Kilometers travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

After a detailed analysis and computation, the following activities has been identified and respective cost has been calculated:

Activity	Cost Driver Rate
Order taking	₹4,500 per purchase order
Customer visits	₹ 3,600 per customer visit
Deliveries	₹ 7.50 per delivery Km travelled
Product handling	₹ 22.50 per case sold
Expedited deliveries	₹ 13,500 per expedited delivery

You are required to COMPUTE the customer-level operating income of each of five retail customers.

Solution 9 :

Working note:

1. **Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:**

	Customers				
	A	B	C	D	E
Units sold: (a)	4,500	6,000	9,500	7,500	12,750
Revenues (at listed price) (₹): (b) {(a) × ₹6,480}	2,91,60,000	3,88,80,000	6,15,60,000	4,86,00,000	8,26,20,000
Revenues (at listed price) (₹): © {(a) × Actual selling price}	2,91,60,000 (4,500 × 6,480)	3,82,32,000 (6,000 × 6,372)	5,64,30,000 (9,500 × 5,940)	4,69,80,000 (7,500 × 6,264)	7,43,58,000 (12,750 × 5,832)
Discount (₹) (d) {(b) – (c)}	0	6,48,000	51,30,000	16,20,000	82,62,000
Cost of goods sold (₹) : (e) {(a) × ₹5,400}	2,43,00,000	3,24,00,000	5,13,00,000	4,05,00,000	6,88,50,000

Customer level operating activities costs					
Order taking costs (₹): (No. of purchase orders × ₹ 4,500)	67,500	1,12,500	1,35,000	1,12,500	1,35,000
Customer visits costs (₹) (No. of customer visits × ₹ 3,600)	7,200	10,800	21,600	7,200	10,800
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles × ₹ 7.50 per km.)	1,500	1,350	2,250	3,000	4,500
Product handling costs (₹) {(a) × ₹ 22.50}	1,01,250	1,35,000	2,13,750	1,68,750	2,86,875
Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 13,500}	-	-	-	-	13,500
Total cost of customer level operating activities (₹)	1,77,450	2,59,650	3,72,600	2,91,450	4,50,675

Computation of Customer level operating income

	Customers				
	A	B	C	D	E
	(₹)	(₹)	(₹)	(₹)	(₹)
Revenues (At list price) (Refer to working note)	2,91,60,000	3,82,32,000	5,64,30,000	4,69,80,000	7,43,58,000
Less: Cost of goods sold (Refer to working note)	(2,43,00,000)	(3,24,00,000)	(5,13,00,000)	(4,05,00,000)	(6,88,50,000)
Gross margin	48,60,000	58,32,000	51,30,000	64,80,000	55,08,000
Less: Customer level operating activities costs (Refer to working note)	(1,77,450)	(2,59,650)	(3,72,600)	(2,91,450)	(4,50,675)
Customer level operating income	46,82,550	55,72,350	47,57,400	61,88,550	50,57,325

Question 1 : (Nov 2023)

The following data relates to the manufacture of product BXE for the year ended 31st March, 2023:

	Amount (₹)
Value of stock as on 1st April, 2022	
Raw materials	27,00,000
Work in progress	10,60,000
Finished Goods	25,00,000
Material purchased	2,48,00,000
Freight inward	7,50,000
Direct wages	42,00,000
Power & Fuel	18,75,000
Cost of special drawings	3,60,000
Trade Discount	4,50,000
Insurance on material procured	15,000
Rent of Factory Building (1/5th used for office purpose)	7,00,000
Depreciation on machinery	6,25,000
Depreciation on Delivery Vans	1,20,000
Consumable stores and indirect wages	15,20,000
Quality Control cost	9,00,000
Primary packing cost	12,90,000
General Administrative overheads (excluding rent of building)	17,50,000
Salary paid to Marketing Staff	9,60,000
Packing cost for transportation	1,84,000
Value of stock as on 31st March, 2023	
Raw materials	32,60,000
Work in progress	11,80,000
Finished Goods	28,38,000

Additional Information:

- Further, some of the finished product was found defective and the defective products were rectified by incurring expenditure of additional factory overheads to the extent of ₹ 33,600. The cost of rectification is not included in details mentioned above.
- An amount of ₹ 1,20,600 was realised by selling scrap and waste generated during the year.

Prepare Cost sheet for the year ended 31st March, 2023 showing:

- Prime cost,
- Factory cost,
- Cost of production.
- Cost of goods sold, and
- Cost of sales.

Solution 1 :**Cost Sheet for the product BXE**

Sl. No.	Particulars	(₹)	(₹)
(i)	Material Consumed:		
	Raw materials purchased	2,48,00,000	
	Freight inwards	7,50,000	
	Insurance on material procured	15,000	
	Less: Trade discount	(4,50,000)	
	Add: Opening stock of raw materials	27,00,000	
	Less: Closing stock of raw materials	(32,60,000)	2,45,55,000
(ii)	Direct wages		42,00,000
(iii)	Direct expenses:		
	Power & fuel	18,75,000	
	Cost of special drawings	3,60,000	22,35,000
	Prime Cost		3,09,90,000
(iv)	Works/ Factory overheads:		
	Rent of factory building (4/5th of 7,00,000)	5,60,000	
	Depreciation on machinery	6,25,000	

	Defective rectification cost	33,600	
	Consumable stores & indirect wages	15,20,000	27,38,600
	Gross works cost		3,37,28,600
	Add: Opening work in process		10,60,000
	Less: Closing work in process		(11,80,000)
	Factory cost		3,36,08,600
(v)	Quality control cost		9,00,000
(vi)	Primary packing cost		12,90,000
(vii)	Less: Amount realised from scrap sale		(1,20,600)
	Cost of production		3,56,78,000
	Add: Opening stock of finished goods		25,00,000
	Less: Closing stock of finished goods		(28,38,000)
	Cost of Goods Sold		3,53,40,000
	Administrative overheads:		
(viii)	Rent of factory building (1/5th of 7,00,000)		1,40,000
	General administrative overheads		17,50,000
	Selling and Distribution overheads:		
(x)	Salary paid to marketing staff		9,60,000
(xi)	Packing cost for transportation		1,84,000
(xii)	Depreciation on delivery vans		1,20,000
	Cost of Sales		3,84,94,000

Alternatively, Power and fuel expenses of ₹ 18,75,000 can be taken as a part of factory overhead.

Accordingly, prime cost will be 2,91,15,000. However, there will be no change in factory cost, cost of production, cost of goods sold and cost of sales.

Question 2 : (Nov 2023)

The following data relate to the manufacture of a product 'VD-100*' during the month of October 2023:

Good units produced	12,600
Units Sold	11,800
Direct wages	₹ 8,82,000
Administrative Overheads	₹ 4,72,000
Selling price per unit	₹ 416

Each unit produced requires 2 kg. of material 'Z'. Cost of material 'Z' is ₹ 72 per kg. 10% of the production has been scrapped as bad and fetches ₹ 45 per unit. Factory overheads are 80% of wages. Selling and distribution overheads are ₹ 54 per unit sold. There is no opening or closing stock of material and work in progress.

You are required to find out total cost of sales and profit for the month of October 2023.

Solution 2 :

Since 10% units are scrapped.

Units produced (total) is 14,000 (12,600/90%)

Calculation of cost of sales and profit

Particulars	₹
Raw Material (28,000 × ₹ 72)	20,16,000
Wages	8,82,000
Prime Cost	28,98,000
Factory overheads	7,05,600
Factory Cost	36,03,600
Sale of Scrap (1,400 × ₹ 45)	(63,000)
Cost of Production	35,40,600
Less: Closing Stock of finished goods	2,24,800
Cost of goods sold	33,15,800
Add: Administration overheads	4,72,000
Add: Selling & Distribution overheads (₹ 54 × 11,800)	6,37,200
Cost of Sales	44,25,000
Sales (11,800 × ₹ 416)	49,08,800
Profit	4,83,800

Question 3 : (RTP Sept 2024)

From the following data of Appu Ltd., CALCULATE (i) Material Consumed; (ii) Prime Cost and (iii) Cost of production.

		Amount (₹)
(i)	Repair & maintenance paid for plant & machinery	9,80,500
(ii)	Insurance premium paid for inventories	26,000
(iii)	Insurance premium paid for plant & machinery	96,000
(iv)	Raw materials purchased	64,00,000
(v)	Opening stock of raw materials	2,88,000
(vi)	Closing stock of raw materials	4,46,000
(vii)	Wages paid	23,20,000
(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100
(x)	Quality control cost for the products in manufacturing process	86,000
(xi)	Research & development cost for improvement in production process	92,600
(xii)	Administrative cost for:	
	- Factory & production	9,00,000
	- Others	11,60,000
(xiii)	Amount realised by selling scrap generated during the manufacturing process	9,200
(xiv)	Packing cost necessary to preserve the goods for further processing	10,200
(xv)	Salary paid to Director (Technical)	8,90,000

Solution 3 :**Calculation of Cost of Production of Appu Ltd.**

Particulars	Amount (₹)
Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)
Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for inventories	26,000
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,43,100
Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,47,000
Less: Amount realised by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,48,000

Notes:

- Other administrative overhead does not form part of cost of production.
- Salary paid to Director (Technical) is an administrative cost.

Question 4 : (MTP Oct 2023)

Following figures has been extracted from the books of M/s A&R Brothers:

	Amount (₹)
Stock on 1st March, 2023	
- Raw materials	6,06,000
- Finished goods	3,59,000
Stock on 31st March, 2023	
- Raw materials	7,50,000
- Finished goods	3,09,000
Work-in-process:	
- On 1st March, 2023	12,56,000
- On 31st March, 2023	14,22,000
Purchase of raw materials	28,57,000
Sale of finished goods	1,34,00,000
Direct wages	37,50,000
Factory expenses	21,25,000
Office and administration expenses	10,34,000
Selling and distribution expenses	7,50,000
Sale of scrap	26,000

You are required to compute:

- Value of material consumed
- Prime cost
- Cost of production
- Cost of goods sold
- Cost of sales
- Profit/ loss

Solution 4 :

Cost Sheet of M/s A&R Brothers for the month ended March 2023:

	Particulars	Amount (₹)	Amount (₹)
(i)	Materials consumed:		
	- Opening stock	6,06,000	
	- Add: Purchases	28,57,000	
		34,63,000	
	- Less: Closing stock	(7,50,000)	27,13,000
	Direct wages		37,50,000
(ii)	Prime cost		64,63,000
	Factory expenses		21,25,000
			85,88,000
	Add: Opening W-I-P		12,56,000
	Less: Closing W-I-P		(14,22,000)
	Factory cost		84,22,000
	Less: Sale of scrap		(26,000)
(iii)	Cost of Production		83,96,000
	Add: Opening stock of finished goods		3,59,000
	Less: Closing stock of finished goods		(3,09,000)
(iv)	Cost of Goods Sold		84,46,000
	Office and administration expenses		10,34,000
	Selling and distribution expenses		7,50,000
(v)	Cost of Sales		1,02,30,000
(vi)	Profit (balancing figure)		31,70,000
	Sales		1,34,00,000

Question 5 : (MTP April 2024)

Following information relate to a manufacturing concern for the year ended 31st March, 2023:

	(₹)
Raw Material (opening)	2,28,000

Raw Material (closing)	3,05,000
Purchases of Raw Material	43,50,000
Freight Inwards	1,20,000
Direct wages paid	12,56,000
Direct wages-outstanding at the end of the year	1,50,000
Factory Overheads	20% of prime cost
Work-in-progress (opening)	1,92,500
Work-in-progress (closing)	1,40,700
Administrative Overheads (related to production)	1,73,000
Distribution Expenses	₹ 16 per unit
Finished Stock (opening)- 1,320 Units	6,08,500
Sale of scrap of material	7,000

The firm produced 14,350 units of output during the year. The stock of finished goods at the end of the year is valued at cost of production. The firm sold 14,903 units at a price of ₹579 per unit during the year.

PREPARE cost sheet of the firm.

Solution 5 :

Cost sheet for the year ended 31st March, 2023.

Units produced - 14,000 units Units sold - 14,153 units

Particulars	Amount (₹)
Raw materials purchased	43,50,000
Add: Freight Inward	1,20,000
Add: Opening value of raw materials	2,28,000
Less: Closing value of raw materials	(3,05,000)
	43,93,000
Less: Sale of scrap of material	(7,000)
Materials consumed	43,86,000
Direct Wages (12,56,000 + 1,50,000)	14,06,000
Prime Cost	57,92,000
Factory overheads (20% of Prime Cost)	11,58,400
Add: Opening value of W-I-P	1,92,500
Less: Closing value of W-I-P	(1,40,700)
Factory Cost	70,02,200
Add: Administrative overheads	1,73,000
Cost of Production	71,75,200
Add: Value of opening finished stock	6,08,500
Less: Value of closing finished stock [₹ 500(71,75,200/14,350) × 767] (1,320 + 14,350 – 14,903 = 767 units)	(3,83,500)
Cost of Goods Sold	74,00,200
Distribution expenses (₹16 × 14,903 units)	2,38,448
Cost of Sales	76,38,648
Profit (Balancing figure)	9,90,189
Sales (₹ 579 × 14,903 units)	86,28,837

Question 6 : (RTP Nov 2023)

A Ltd. produces a single product X. During the month of July 2023, the company produced 14,560 tonnes of X. The details for the month of July 2023 are as follows:

- Materials consumed ₹ 15,00,000
- Power consumed in operating production machinery 13,000 Kwh @ ₹ 7 per Kwh
- Diesels consumed in operating production machinery 1,000 litres @ ₹ 93 per litre
- Wages & salary paid – ₹ 64,00,000
- Gratuity & leave encashment paid – ₹ 44,20,000
- Hiring charges paid for Heavy Earth Moving machines (HEMM) engaged in production - ₹ 13,00,000. Hiring charges is paid on the basis of production.
- Hiring charges paid for cars used for official purpose – ₹ 80,000

- (viii) Reimbursement of diesel cost for the cars – ₹ 20,000
 (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 despatch) – ₹ 7,000
 (xi) AMC cost of CCTV installed at the weighing bridge (used for weighing of final goods at the time of despatch) and factory premises is ₹ 6,000 and ₹ 18,000 per month respectively.
 (xii) TA/ DA and hotel bill paid for sales manager- ₹ 16,000
 (xiii) The company has 180 employees works for 26 days in a month. Required:
 PREPARE a Cost sheet for the month of July 2023.

Solution 6 :**Cost Sheet of A Ltd. for the month of July 2023**

Particulars	Amount (₹)	Amount (₹)
Materials consumed		15,00,000
Wages & Salary	64,00,000	
Gratuity & leave encashment	44,20,000	1,08,20,000
Power cost (13,000 kwh × ₹ 7)	91,000	
Diesel cost (1,000 ltr × ₹ 93)	93,000	1,84,000
HEMM hiring charges		13,00,000
Prime Cost		1,38,04,000
AMC cost of CCTV installed at factory premises		18,000
Cost of Production/ Cost of Goods Sold		1,38,22,000
Hiring charges of cars	80,000	
Reimbursement of diesel cost	20,000	
	1,00,000	
Add: GST @5% on RCM basis	5,000	1,05,000
Maintenance cost for weighing bridge	7,000	
AMC cost of CCTV installed at weigh bridge	6,000	13,000
TA/ DA & hotel bill of sales manager		16,000
Cost of Sales		1,39,56,000

Question 7 : (RTP May 2024)

P Ltd. has gathered cost information from ledgers and other sources for the year ended 31st December 2023. The information are tabulated below:

Sl. No.		Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	Freight inward		9,20,600
(iii)	Wages paid to factory workers		25,20,000
(iv)	Royalty paid for production		1,80,000
(v)	Amount paid for power & fuel		3,50,000
(vi)	Job charges paid to job workers		3,10,000
(vii)	Stores and spares consumed		1,10,000
(viii)	Depreciation on office building		50,000
(ix)	Repairs & Maintenance paid for:		
	- Plant & Machinery	40,000	
	- Sales office building	20,000	60,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	28,200	
	- Factory building	18,800	47,000
(xi)	Expenses paid for quality control check activities		18,000
(xii)	Research & development cost paid for improvement in production process		20,000
(xiii)	Expenses paid for pollution control and engineering & maintenance		36,000
(xiv)	Salary paid to Sales & Marketing managers		5,60,000
(xv)	Salary paid to General Manager		6,40,000
(xvi)	Packing cost paid for:		
	- Primary packing necessary to maintain quality	46,000	
	- For re-distribution of finished goods	80,000	1,26,000

(xvii)	Fee paid to independent directors		1,20,000
(xviii)	Performance bonus paid to sales staffs		1,20,000
(xix)	Value of stock as on 1 st January, 2023:		
	- Raw materials	10,00,000	
	- Work-in-process	8,60,000	
	- Finished goods	12,00,000	30,60,000
(xx)	Value of stock as on 31 st December, 2023:		
	- Raw materials	8,40,000	
	- Work-in-process	6,60,000	
	- Finished goods	10,50,000	25,50,000

Amount realized by selling of scrap and waste generated during manufacturing process – ₹ 48,000/-

The board meeting is scheduled to be held next week and you, being an associate to the chief cost controller of the company, has been asked to PREPARE a cost sheet.

Solution 7 :

Statement of Cost of P Ltd. for the year ended 31st December, 2023:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	- Raw materials purchased	5,00,00,000	
	- Freight inward	9,20,600	
	Add: Opening stock of raw materials	10,00,000	
	Less: Closing stock of raw materials	(8,40,000)	5,10,80,600
(ii)	Direct employee (labour) cost:		
	- Wages paid to factory workers		25,20,000
(iii)	Direct expenses:		
	- Royalty paid for production	1,80,000	
	- Amount paid for power & fuel	3,50,000	
	- Job charges paid to job workers	3,10,000	8,40,000
	Prime Cost		5,44,40,600
(iv)	Works/ Factory overheads:		
	- Stores and spares consumed	1,10,000	
	- Repairs & Maintenance paid for plant & machinery	40,000	
	- Insurance premium paid for plant & machinery	28,200	
	- Insurance premium paid for factory building	18,800	
	- Expenses paid for pollution control and engineering & maintenance	36,000	2,33,000
	Gross factory cost		5,46,73,600
	Add: Opening value of W-I-P		8,60,000
	Less: Closing value of W-I-P		(6,60,000)
	Factory Cost		5,48,73,600
(v)	Quality control cost:		
	- Expenses paid for quality control check activities		18,000
(vi)	Research & development cost paid for improvement in production process		20,000
(vii)	Less: Realisable value on sale of scrap and waste		(48,000)
(viii)	Add: Primary packing cost		46,000
	Cost of Production		5,49,09,600
	Add: Opening stock of finished goods		12,00,000
	Less: Closing stock of finished goods		(10,50,000)
	Cost of Goods Sold		5,50,59,600
(ix)	Administrative overheads:		
	- Depreciation on office building	50,000	
	- Salary paid to General Manager	6,40,000	
	- Fee paid to independent directors	1,20,000	8,10,000
(x)	Selling overheads:		
	- Repairs & Maintenance paid for sales office building	20,000	

(xi)	- Salary paid to Manager- Sales & Marketing	5,60,000	7,00,000
	- Performance bonus paid to sales staffs	1,20,000	
	Distribution overheads:		
	- Packing cost paid for re-distribution of finished goods		80,000
	Cost of Sales		5,66,49,600

Question 1 : (Nov 2023)

Construct journal entries in the following situations assuming that cost and financial transactions are integrated:

- | | | |
|-------|---|------------|
| (i) | Purchase of raw material | ₹ 4,40,000 |
| (ii) | Direct Material issued to production | ₹ 3,60,000 |
| (iii) | Wages charged to production | ₹ 80,000 |
| (iv) | Manufacturing overheads charged to production | ₹ 1,32,000 |

Solution 1 :

Journal entries are as follows

		DR. (₹)	Cr. (₹)
Stores Ledger Control A/c	Dr.	4,40,000	
To Payables (Creditors)/ Bank A/c (Materials purchased)			4,40,000
Work-in-Process Control A/c	Dr.	3,60,000	
To Stores Ledger Control A/c (Materials issued to production)			3,60,000
Work-in-Process Control A/c To Wages Control A/c (Direct wages charged to production)	Dr.	80,000	
			80,000
Work-in-Process Control A/c	Dr.	1,32,000	
To Factory Overhead Control A/c (Manufacturing overhead charged to production)			1,32,000

Question 2 : (RTP Sept 2024)

A manufacturing company disclosed a net loss of ₹ 3,47,000 as per their cost accounts for the year ended March 31, 2024. The financial accounts however disclosed a net loss of ₹ 5,10,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

	(₹)
(i) Factory Overheads under-absorbed	40,000
(ii) Administration Overheads over-absorbed	60,000
(iii) Depreciation charged in Financial Accounts	3,25,000
(iv) Depreciation charged in Cost Accounts	2,75,000
(v) Interest on investments not included in Cost Accounts	96,000
(vi) Income-tax provided	54,000
(vii) Interest on loan funds in Financial Accounts	2,45,000
(viii) Transfer fees (credit in financial books)	24,000
(ix) Stores adjustment (credit in financial books)	14,000
(x) Dividend received	32,000

PREPARE a memorandum Reconciliation Account

Solution 2 :**Memorandum Reconciliation Accounts**

Dr.			Cr.		
		(₹)			(₹)
To	Net Loss as per Costing books	3,47,000	By	Administration overheads over recovered in cost accounts	60,000
To	Factory overheads under absorbed in Cost Accounts	40,000	By	Interest on investment not included in Cost Accounts	96,000
To	Depreciation under charged in Cost Accounts	50,000	By	Transfer fees in financial books	24,000
To	Income-Tax not provided in Cost Accounts	54,000	By	Stores adjustment (Credit in financial books)	14,000
To	Interest on Loan Funds in Financial Accounts	2,45,000	By	Dividend received in financial books	32,000
			By	Net loss as per financial books	5,10,000
		7,36,000			7,36,000

Question 3 : (MTP Sept 2023)

G Ltd. has the following expenditures for the year ended 31 st March, 2023:

Sl. No.		Amount (₹)	Amount (₹)
(i)	Raw materials purchased		20,00,00,000
(ii)	Freight inward		22,41,200
(iii)	Wages paid to factory workers		58,40,000
(iv)	Royalty paid for production		3,45,200
(v)	Amount paid for power & fuel		9,24,000
(vi)	Job charges paid to job workers		16,24,000
(vii)	Stores and spares consumed		2,24,000
(viii)	Depreciation on office building		1,12,000
(ix)	Repairs & Maintenance paid for:	96,000	
	- Plant & Machinery		
	- Sales office building	36,000	1,32,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	62,400	
	- Factory building	36,200	98,600
(xi)	Expenses paid for quality control check activities		39,200
(xii)	Research & development cost paid improvement in production process		36,400
(xiii)	Expenses paid for pollution control and engineering & maintenance		53,200
(xiv)	Salary paid to Sales & Marketing mangers:		20,24,000
(xv)	Salary paid to General Manager		25,12,000
(xvi)	Packing cost paid for:		
	- Primary packing necessary to maintain quality	1,92,000	
	- For re-distribution of finished goods	2,24,000	4,16,000
(xvii)	Performance bonus paid to sales staffs		7,20,000
(xviii)	Value of stock as on 1st April, 2022:		
	- Raw materials	36,00,000	
	- Work-in-process	18,40,000	
	- Finished goods	22,00,000	76,40,000
(xix)	Value of stock as on 31st March, 2023:		
	- Raw materials	19,20,000	
	- Work-in-process	17,40,000	
	- Finished goods	36,40,000	73,00,000

Amount realized by selling of scrap and waste generated during manufacturing process –

₹1,72,000/-

From the above data you are requested to PREPARE Statement of cost for G Ltd. for the year ended 31st March, 2023, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

Solution 3 :**Statement of Cost of G Ltd. for the year ended 31st March, 2023:**

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	Raw materials purchased	20,00,00,000	
	Freight inward	22,41,200	
	Add: Opening stock of raw materials	36,00,000	
	Less: Closing stock of raw materials	(19,20,000)	20,39,21,200
(ii)	Direct employee (labour) cost:		
	Wages paid to factory workers		58,40,000
(iii)	Direct expenses:		
	Royalty paid for production	3,45,200	

	Amount paid for power & fuel	9,24,000	
	Job charges paid to job workers	16,24,000	28,93,200
	Prime Cost		21,26,54,400
(iv)	Works/ Factory overheads:		
	Stores and spares consumed	2,24,000	
	Repairs & Maintenance paid for plant & machinery	96,000	
	Insurance premium paid for plant & machinery	62,400	
	Insurance premium paid for factory building	36,200	
	Expenses paid for pollution control and engineering & maintenance	53,200	4,71,800
	Gross factory cost		21,31,26,200
	Add: Opening value of W-I-P		18,40,000
	Less: Closing value of W-I-P		(17,40,000)
	Factory Cost		21,32,26,200
(v)	Quality control cost:		
	Expenses paid for quality control check activities		39,200
(vi)	Research & development cost paid improvement in production process		36,400
(vii)	Less: Realisable value on sale of scrap and waste		(1,72,000)
(viii)	Add: Primary packing cost		1,92,000
	Cost of Production		21,33,21,800
	Add: Opening stock of finished goods		22,00,000
	Less: Closing stock of finished goods		(36,40,000)
	Cost of Goods Sold		21,18,81,800
(ix)	Administrative overheads:		
	Depreciation on office building	1,12,000	
	Salary paid to General Manager	25,12,000	26,24,000
(x)	Selling overheads:		
	Repairs & Maintenance paid for sales office building	36,000	
	Salary paid to Manager- Sales & Marketing	20,24,000	
	Performance bonus paid to sales staffs	3,60,000	24,20,000
(xi)	Distribution overheads:		
	Packing cost paid for re-distribution of finished goods		2,24,000
	Cost of Sales		21,71,49,800

Question 4 : (RTP Nov 2023)

The financial books of a company reveal the following data for the year ended 31st March, 2023:

	(₹)
Opening Stock:	
Finished goods 625 units	1,06,250
Work-in-process	92,000
01.04.2022 to 31.03.2023	
Raw materials consumed	16,80,000
Direct Labour	12,20,000
Factory overheads	8,44,000
Administration overheads (production related)	3,96,000
Dividend paid	2,44,000
Bad Debts	36,000
Selling and Distribution Overheads	1,44,000
Interest received	76,000
Rent received	92,000
Sales 12,615 units	45,60,000
Closing Stock: Finished goods 415 units	91,300
Work-in-process	82,400

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.

- Selling and distribution overheads are charged at ₹ 6 per unit sold.
- Opening Stock of finished goods is valued at ₹ 240 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(i) Prepare statements for the year ended 31st March, 2023 showing:

- the profit as per financial records
- the profit as per costing records.

(ii) Prepare a statement reconciling the profit as per costing records with the profit as per financial records.

Solution 4 :

(i) Statement of Profit as per financial records (for the year ended March 31, 2023)

	(₹)		(₹)
To Opening stock of Finished Goods	1,06,250	By Sales	45,60,000
To Work-in-process	92,000	By Closing stock of finished Goods	91,300
To Raw materials consumed	16,80,000	By Work-in-Process	82,400
To Direct labour	12,20,000	By Rent received	92,000
To Factory overheads	8,44,000	By Interest received	76,000
To Administration overheads	3,96,000		
To Selling & distribution overheads	1,44,000		
To Dividend paid	2,44,000		
To Bad debts	36,000		
To Profit	1,39,450		
	49,01,700		49,01,700

Statement of Profit as per costing records (for the year ended March 31, 2023)

	(₹)
Sales revenue (A) (12,615 units)	45,60,000
<u>Cost of sales:</u>	
Opening stock (625 units × ₹ 240)	1,50,000
Add: Cost of production of 12,405 units (Refer to working note 2)	43,28,140
Less: Closing stock	(1,44,795)
$\frac{₹ 43,28,140 \times 415 \text{ units}}{12,405 \text{ units}}$	
Production cost of goods sold (12,615 units)	43,33,345
Selling & distribution overheads (12,615 units × ₹6)	75,690
Cost of sales: (B)	44,09,035
Profit: {(A) – (B)}	1,50,965

(ii) **Statement of Reconciliation**

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		1,50,965
Add: Administration overheads over absorbed (₹5,64,540 – ₹3,96,000)	1,68,540	
Opening stock overvalued (₹1,50,000 – ₹ 1,06,250)	43,750	
Interest received	76,000	
Rent received	92,000	
Factory overheads over recovered (₹ 8,54,000 – ₹ 8,44,000)	10,000	3,90,290
Less: Selling & distribution overheads under recovery (₹ 1,44,000 – ₹ 75,690)	68,310	5,41,255
Closing stock overvalued (₹1,44,795 – ₹ 91,300)	53,495	
Dividend	2,44,000	
Bad debts	36,000	(4,01,805)
Profit as per financial accounts		1,39,450

Working notes:

1. Number of units produced

	Units
Sales	12,615
Add: Closing stock	415
Total	13,030
Less: Opening stock	(625)
Number of units produced	12,405

2. Cost Sheet

	(₹)
Raw materials consumed	16,80,000
Direct labour	12,20,000

Prime cost	29,00,000
Factory overheads (70% of direct wages)	8,54,000
Factory cost	37,54,000
Add: Opening work-in-process	92,000
Less: Closing work-in-process	(82,400)
Factory cost of goods produced	37,63,600
Administration overheads (15% of factory cost)	5,64,540
Cost of production of 12,405 units (Refer to working note 1)	
Cost of production per unit:	43,28,140
$= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹43,28,140}{12,405 \text{ units}} = ₹348.90$	

Question 5 : (RTP May 2024)

The financial books of a company reveal the following data for the year ended 31st March, 2023:

	(₹)
Opening Stock:	
Finished goods 875 units	76,525
Work-in-process	33,000
01.04.2022 to 31.03.2023	
Raw materials consumed	7,84,000
Direct labour	4,65,000
Factory overheads	2,65,000
Goodwill written off	95,000
Administration overheads	3,15,000
Income tax paid	72,000
Bad debts	21,000
Selling and distribution overheads	65,000
Interest received	18,500
Rent received	72,000
Sales 14,500 units	20,80,000
Closing Stock: Finished goods 375 units	43,250
Work-in-process	48,200

The management of the company, for preparing cost sheet and variance analysis uses the following cost recovery basis which has been elaborated by the cost controller of the company:

Factory overheads are absorbed at 60% of direct wages.

Administration overheads (production related) are recovered at 20% of factory cost.

Selling and distribution overheads are charged at ₹ 5 per unit sold.

Opening Stock of finished goods is valued at ₹105 per unit.

The company values work-in-process at factory cost for both financial and cost accounting purpose.

You being an associate to the cost controller of the company has been asked to:

- PREPARE a statement of profit as per costing records and financial records.
- CALCULATE cost of production per unit.
- PREPARE a statement reconciling the profit as per costing records with the profit as per financial records.

Solution 5 :
Statement of Profit as per financial records (for the year ended March 31, 2023)

	(₹)		(₹)
To Opening stock:		By Sales	20,80,000
Finished goods	76,525	By Closing stock:	
Work-in-process	33,000	Finished Goods	43,250
To Raw materials consumed	7,84,000	Work-in-Process	48,200
To Direct labour	4,65,000	By Rent received	72,000
To Factory overheads	2,65,000	By Interest received	18,500
To Goodwill written off	95,000		
To Administration overheads	3,15,000		
To Selling & distribution overheads	65,000		
To Income tax paid	72,000		
To Bad debts	21,000		
To Profit	70,425		
	22,61,950		22,61,950

Statement of Profit as per costing records (for the year ended March 31, 2023)

	(₹)	(₹)
Sales revenue (14,500 units) (A)		20,80,000
<u>Cost of Sales:</u>		
Opening stock (875 units x ₹ 105)	91,875	
Add: Cost of production of 14,000 units (Refer to Working Note 1 & 2)	18,15,360	
Less: Closing stock $\left(\frac{₹18,15,360 \times 375 \text{ units}}{14,000 \text{ Units}} \right)$	(48,626)	
Production cost of goods sold (14,500 units)	18,58,609	
Selling & distribution overheads (14,500 units x ₹ 5)	72,500	
Cost of sales: (B)	19,31,109	19,31,109
Profit: {(A) – (B)}		1,48,891

Workings:
1. Number of units produced

	Units
Sales	14,500
Add: Closing stock	375
Total	14,875
Less: Opening stock	875
Number of units produced	14,000

Cost Sheet

(₹)	(₹)
Raw materials consumed	7,84,000
Direct labour	4,65,000
Prime cost	12,49,000
Factory overheads (60% of direct wages)	2,79,000
Factory cost	15,28,000
Add: Opening work-in-process	33,000
Less: Closing work-in-process	(48,200)
Factory cost of goods produced	15,12,800
Administration overheads (20% of factory cost)	3,02,560
Cost of production of 14,000 units	18,15,360

Cost of production per unit: $\frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹18,15,360}{14,000 \text{ units}} = ₹129.67$

Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		1,48,891
Add: Factory overheads over absorbed (₹ 2,79,000 – ₹ 2,65,000)	14,000	
S & D overheads over absorbed (₹ 72,500 - ₹ 65,000)	7,500	
Opening stock overvalued (₹ 91,875 – ₹ 76,525)	15,350	
Interest received	18,500	
Rent received	72,000	1,27,350
		2,76,241
Less: Administration overheads under recovery (₹ 3,15,000 – ₹ 3,02,560)	12,440	
Closing stock overvalued (₹ 48,626 – ₹ 43,250)	5,376	
Goodwill written off	95,000	
Income tax paid	72,000	
Bad debts	21,000	2,05,816
Profit as per financial accounts		70,425

Question 1 : (May 2024)

S.K. Manufacturing Co. Ltd. showed a net profit of ₹5,40,400 as per their cost accounts for the year ended 31.03.2024. However, the financial books disclosed a net profit of ₹2,60,500 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books:

	₹
Factory overheads under absorbed	84,800
Administrative overheads over absorbed	24,000
Interest paid on bank borrowings	50,000
Interest & Dividend received	65,200
Notional rent of own premises charged in cost accounts	60,000
Losses on the sales of fixed assets and investments	48,000
Donations and subscriptions	18,800
Overvaluation of closing stock of finished goods in Cost accounts	1,25,000
Store adjustments (credited in financial books)	7,500
Depreciation over charged in cost accounts	40,000
Income tax provided	1,50,000

You are required to:

- (i) Prepare a reconciliation statement taking net profit as per cost accounts as base.
- (ii) State when is the reconciliation statement of Cost and Financial accounts not required?

Question 1 : (RTP Sept 2024)

A jobbing factory has undertaken to supply 300 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is ₹ 8 per piece. From the following data CALCULATE the cost and profit per piece of each batch order and overall position of the order for 1,800 pieces.

Month	Batch Output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	310	1150	120	240
February	300	1140	140	280
March	320	1180	150	280
April	280	1130	140	270
May	300	1200	150	300
June	320	1220	160	320

The other details are:

Month	Chargeable expenses (₹)	Direct labour (Hours)
January	12,000	4,800
February	10,560	4,400
March	12,000	5,000
April	10,580	4,600
May	13,000	5,000
June	12,000	4,800

Solution 1 :**Statement of Cost and Profit per batch**

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	310	300	320	280	300	320	1,830
Sale value (₹)	2,480	2,400	2,560	2,240	2,400	2,560	14,640
Material cost (₹)	1,150	1,140	1,180	1,130	1,200	1,220	7,020
Direct wages (₹)	120	140	150	140	150	160	860
Chargeable expenses* (₹)	600	672	672	621	780	800	4,145
Total cost (₹)	1,870	1,952	2,002	1,891	2,130	2,180	12,025
Profit per batch (₹)	610	448	558	349	270	380	2,615
Total cost per unit (₹)	6.03	6.51	6.26	6.75	7.10	6.81	6.57
Profit per unit (₹)	1.97	1.49	1.74	1.25	0.90	1.19	1.43

Overall position of the order for 1,800 units

Sales value of 1,800 units @ ₹ 8 per unit ₹ 14,400

Total cost of 1,800 units @ ₹ 6.57 per unit ₹ 11,826

Profit ₹ 2,574

* $\frac{\text{Chargeable expenses}}{\text{Direct labour hour for the month}} \times \text{Direct labour hours for batch}$

Question 2 : (MTP sept 2023)

AT Ltd. manufactures machine parts used in industrial plants. As per market research it is expected that the annual demand for the parts will be 9,20,000 units. It is estimated that it costs ₹1.50 as inventory holding cost per unit per month and that the set-up cost per run is ₹ 3,500.

(i) DETERMINE the optimum run size for parts manufacturing?

(ii) Assuming that the company has a policy of manufacturing 40,000 parts per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

Solution 2 :

(i) Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2 \times D \times S}{C}}$

Where, D = Annual demand = 9,20,000 units

S = Set-up cost per run = ₹ 3,500

C = Inventory holding cost per unit per annum

= ₹ 1.5 × 12 months = ₹ 18

$$EBQ = \sqrt{\frac{2 \times 9,20,000 \text{ units} \times ₹3,500}{₹18}} = 18,915 \text{ units}$$

(ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set- ups	Set-up Cost (₹)	Inventory holding cost (₹)	Total Cost (₹)
A	40,000 units	23 $\left(\frac{9,20,000}{40,000}\right)$	80,500 (23 × ₹ 3,500)	3,60,000 $\left(\frac{40,000 \times ₹18}{2}\right)$	4,40,500
B	18,915 units	49 $\left(\frac{9,20,000}{18,915}\right)$	1,71,500 (49 × ₹ 3,500)	1,70,235 $\left(\frac{18,915 \times ₹18}{2}\right)$	3,41,735
	Extra Cost (A – B)				98,765

Question 3 : (MTP Oct 2023)

In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administrative overheads are absorbed on a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period:

	Job 101	Job 102
	(₹)	(₹)
Direct materials	54,000	37,500
Direct wages	42,000	30,000
Selling price	1,66,650	1,28,250
Profit percentage on Total Cost	10%	20%

Required:

(i) Computation of percentage recovery rates of factory overheads and administrative overheads.

(ii) Calculation of the amount of factory overheads, administrative overheads and profit for each of the two jobs.

(iii) Using the above recovery rates determine the selling price of job 103. The additional data being:

Direct materials	₹ 24,000
Direct wages	₹ 20,000
Profit percentage on selling price	12½%

Solution 3 :

(i) **Computation of percentage recovery rates of factory overheads and administrative overheads.**

Let the factory overhead recovery rate as percentage of direct wages be F and administrative overheads recovery rate as percentage of factory cost be A.

Factory Cost of Jobs:

Direct materials + Direct wages + Factory overhead

For Job 101 = ₹ 54,000 + ₹ 42,000 + ₹ 42,000F

For Job 102 = ₹ 37,500 + ₹ 30,000 + ₹ 30,000F

Total Cost of Jobs:

Factory cost + Administrative overhead

For Job 101 = (₹ 96,000 + ₹ 42,000F) + (₹ 96,000 + ₹ 42,000F) A = ₹ 1,51,500*

For Job-102 = (₹ 67,500 + ₹ 30,000F) + (₹ 67,500 + ₹ 30,000F) A = ₹ 1,06,875**

The value of F & A can be found using following equations

$$96,000 + 42,000F + 96,000A + 42,000AF = 1,51,500 \quad \text{.....eqn (i)}$$

$$67,500 + 30,000F + 67,500A + 30,000AF = 1,06,875 \quad \text{.....eqn (ii)}$$

Multiply equation (i) by 5 and equation (ii) by 7

$$4,80,000 + 2,10,000F + 4,80,000A + 2,10,000AF = 7,57,500 \quad \text{.....eqn (iii)}$$

$$4,72,500 + 2,10,000F + 4,72,500A + 2,10,000AF = 7,48,125 \quad \text{.....eqn (iv)}$$

$$\begin{array}{rcl} - & - & - \\ 7,500 + 7,500A & = & 9,325 \end{array}$$

$$7,500A = 9,325 - 7,500$$

$$A = 0.25$$

Now put the value of A in equation (i) to find the value of F

$$96,000 + 42,000F + 24,000 + 10,500F = 1,51,500$$

$$52,500F = 1,51,500 - 1,20,000$$

$$F = 0.6$$

On solving the above relations: F = 0.60 and A = 0.25

Hence, percentage recovery rates of:

Factory overheads = 60% of wages and

Administrative overheads = 25% of factory cost.

Working note:

$$\text{Total Cost} = \frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$$

$$\text{*For Job 101} = \frac{₹1,66,650}{(100\% + 10\%)} = ₹1,51,500$$

$$\text{**For Job 102} = \frac{₹1,28,250}{(100\% + 20\%)} = ₹1,06,875$$

(ii) Statement of jobs, showing amount of factory overheads, administrative overheads and profit:

	Job 101	Job 102
	(₹)	(₹)
Direct materials	54,000	37,500
Direct wages	42,000	30,000
Prime cost	96,000	67,500
Factory overheads		
60% of direct wages	25,200	18,000
Factory cost	1,21,200	85,500
Administrative overheads		
25% of factory cost	30,300	21,375
Total cost	1,51,500	1,06,875
Profit (10% & 20% respectively)	15,150	21,375
Selling price	1,66,650	1,28,250

(iii) Selling price of Job 103

	(₹)
Direct materials	24,000
Direct wages	20,000
Prime cost	44,000
Factory overheads (60% of Direct Wages)	12,000
Factory cost	56,000
Administrative overheads (25% of factory cost)	14,000
Total cost	70,000
Profit margin (balancing figure)	10,000
Selling price $\frac{\text{Total Cost}}{87.5\%}$	80,000

Question 4 : (RTP May 2024)

Arnav Ltd. operates in beverages industry where it manufactures soft- drink in three sizes of Large (3 litres), Medium (1.5 litres) and Small (600 ml) bottles. The products are processed in batches. The 5,000 litres capacity processing plant consumes electricity of 90 Kilowatts per hour and a batch takes 1 hour 45 minutes to complete. Only symmetric size of products can be processed at a time. The machine set-up takes 15 minutes to get ready for next batch processing. During the set-up power consumption is only 20%.

- The current price of Large, Medium and Small are ₹ 150, ₹ 90 and ₹ 50 respectively.
- To produce a litre of beverage, 14 litres of raw material-W and 25 ml of Material-C are required which costs ₹ 0.50 and ₹ 1,000 per litre respectively.
- 20 direct workers are required. The workers are paid ₹ 880 for an 8 hours shift of work.
- The average packing cost per bottle is ₹ 3
- Power cost is ₹ 7 per Kilowatt -hour (Kwh)
- Other variable cost is ₹ 30,000 per batch.
- Fixed cost (Administration and marketing) is ₹ 4,90,00,000.
- The holding cost is ₹ 1 per bottle per annum.

The marketing team has surveyed the following demand (bottle) of the product:

Large	Medium	Small
3,00,000	7,50,000	20,00,000

You are required to CALCULATE profit/ loss per batch and also COMPUTE Economic Batch Quantity (EBQ).

Solution 4 :

Workings:

1. **Maximum number of bottles that can be processed in a batch:** $\frac{5,000 \text{ ltrs}}{\text{Bottle volume}}$

Large		Medium		Small	
Qty (ltr)	Max bottles	Qty (ltr)	Max bottles	Qty (ltr)	Max bottles
3	1,666	1.5	3,333	0.6	8,333

*For simplicity of calculation small fractions has been ignored.

2. **Number of batches to be run:**

		Large	Medium	Small	Total
A	Demand	3,00,000	7,50,000	20,00,000	
B	Bottles per batch (Refer WN-1)	1,666	3,333	8,333	
C	No. of batches [A÷B]	180	225	240	645

*For simplicity of calculation small fractions has been ignored.

Quantity of Material-W and Material C required to meet demand:

	Particulars	Large	Medium	Small	Total
A	Demand (bottle)	3,00,000	7,50,000	20,00,000	
B	Qty per bottle (Litre)	3	1.5	0.6	
C	Output (Litre) [A×B]	9,00,000	11,25,000	12,00,000	32,25,000
D	Material-W per litre of output (Litre)	14	14	14	
E	Material-W required (Litre) [C×D]	1,26,00,000	1,57,50,000	1,68,00,000	4,51,50,000
F	Material-C required per litre of output (ml)	25	25	25	
G	Material-C required (Litre) [(C×F)÷1000]	22,500	28,125	30,000	80,625

3. **No. of Man-shift required:**

		Large	Medium	Small	Total
A	No. of batches	180	225	240	645
B	Hours required per batch (Hours)	2	2	2	
C	Total hours required (Hours) [A×B]	360	450	480	1,290
D	No. of shifts required [C÷8]	45	57	60	162
E	Total manshift [D×20 workers]	900	1,140	1,200	3,240

4. **Power consumption in Kwh**

		Large	Medium	Small	Total
For processing					
A	No. of batches	180	225	240	645
B	Hours required per batch (Hours)	1.75	1.75	1.75	1.75
C	Total hours required (Hours) [A×B]	315	393.75	420	1,128.75
D	Power consumption per hour	90	90	90	90
E	Power consumption in Kwh [C×D]	28,350	35,437.5	37,800	1,01,587.5
F	Per batch consumption (Kwh) [E÷A]	157.5	157.5	157.5	157.5
For set-up					
G	Hours required per batch (Hours)	0.25	0.25	0.25	0.25
H	Total hours required (Hours) [A×G]	45	56.25	60	161.25
I	Power consumption per hour [20%×90]	18	18	18	18

J	Power consumption in Kwh [H×I]	810	1,012.5	1,080	2,902.5
K	Per batch consumption (Kwh) [J÷A]	4.5	4.5	4.5	4.5

Calculation of Profit/ loss per batch:

	Particulars	Large	Medium	Small	Total
A	Demand (bottle)	3,00,000	7,50,000	20,00,000	30,50,000
B	Price per bottle (₹)	150	90	50	
C	Sales value (₹) [A×B]	4,50,00,000	6,75,00,000	10,00,00,000	21,25,00,000
	Direct Material cost:				
E	Material-W (₹) [Qty in WN-3 × ₹ 0.50]	63,00,000	78,75,000	84,00,000	2,25,75,000
F	Material-C (₹) [Qty in WN-3 × ₹1,000]	2,25,00,000	2,81,25,000	3,00,00,000	8,06,25,000
G	[E+F]	2,88,00,000	3,60,00,000	3,84,00,000	10,32,00,000
H	Direct Wages (₹) [Man-shift in WN- 4 × × ₹ 880]	7,92,000	10,03,200	10,56,000	28,51,200
I	Packing cost (₹) [A×₹3]	9,00,000	22,50,000	60,00,000	91,50,000
	Power cost (₹)				
J	For processing (₹) [WN-5 × ₹7]	1,98,450	2,48,062.5	2,64,600	7,11,112.5
K	For set-up time (₹) [WN-5 × ₹7]	5,670	7,087.5	7,560	20,317.5
L	[J+K]	2,04,120	2,55,150	2,72,160	7,31,430
M	Other variable cost (₹) [No. of batch in WN-2 × ₹ 30,000]	54,00,000	67,50,000	72,00,000	1,93,50,000
N	Total Variable cost per batch [G+H+I+L+M]	3,60,96,120	4,62,58,350	5,29,28,160	13,52,82,630
O	Profit/ loss before fixed cost [C-N]	89,03,880	2,12,41,650	4,70,71,840	7,72,17,370
P	Fixed Cost				4,90,00,000
Q	Total Cost [O-P]				2,82,17,370

Computation of Economic Batch Quantity (EBQ): $\sqrt{\frac{2 \times D \times S}{C}}$

D = Annual Demand for the Product = Refer A below

S = Set-up cost per batch = Refer D below

C = Carrying cost per unit per annum =Refer E below

	Particulars	Large	Medium	Small
A	Annual Demand (bottle)	3,00,000	7,50,000	20,00,000
	Set-up Cost:			
B	Power cost for set-up time (₹) [Consumption per batch in WN-5 × ₹7]	31.50	31.50	31.50
C	Other variable cost (₹) *	30,000	30,000	30,000
D	Total Set-up cost [B+C]	30,031.50	30,031.50	30,031.50
E	Holding cost:	1.00	1.00	1.00
F	EBQ (Bottle)	1,34,234	2,12,243	3,46,592

* Other variable cost is assumed to be part of set-up cost.

Question 5 : (RTP Nov 2023)

SM Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2022-23:

	(₹)
(i) Opening Stock of Material	15,00,000
(ii) Closing Stock of Material	20,00,000
(iii) Purchase of Material	1,80,50,000
(iv) Direct Labour	90,50,000
(v) Factory Overhead	30,80,000
(vi) Administrative Overhead	20,50,400

During the FY 2023-24, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 40,50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost.

Cost of delivery of the components at customer's premises is estimated at ₹ 4,50,000. You are required to:

- Calculate the overhead recovery rates based on actual costs for 2022-23.
- Prepare a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

Solution 5 :**(i) Calculation of Overhead Recovery Rate:**

Factory Overhead Recovery Rate = $\frac{₹ 30,80,000}{₹ 90,50,000} \times 100 = 34\%$ of Direct labour

Administrative Overhead Recovery Rate = $\frac{₹ 20,50,400}{₹ 2,96,80,000} \times 100 = 6.91\%$ of Factory Cost

Working Note: Calculation of Factory Cost in 2022-23

Particulars	Amount (₹)
Opening Stock of Material	15,00,000
Add: Purchase of Material	1,80,50,000
Less: Closing Stock of Material	(20,00,000)
Material Consumed	1,75,50,000
Direct Labour	90,50,000
Prime Cost	2,66,00,000
Factory Overhead	30,80,000
Factory Cost	2,96,80,000

(ii) Job Cost Sheet for the order received in 2023-24

Particulars	Amount (₹)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of ₹ 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of ₹ 1,34,27,000)	9,27,806
Cost of delivery	4,50,000
Total Cost	1,48,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	49,34,935
Sales value (Price to be quoted for the order)	1,97,39,741

Hence the price to be quoted is ₹ 1,97,39,741.

Question 1 : (Nov 2023)

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
Normal 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.

Solution 1 :

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 = $\frac{8,42,400}{78,000 \text{ units} - 7,800 \text{ units}} = ₹ 12 \text{ unit}$

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:

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

Question 2 : (RTP Sept 2024)

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:

Materials	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.

Solution 2 :

(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
Fresh inputs	9,200	Closing W-I-P	700	100	700	70	490	70	490
		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 p.u.	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
	<u>4,93,944.00</u>
(iii) Cost of 8,300 completed units	
8,300 units @ ₹ 932.13 p.u.	<u>77,36,679.00</u>
Total cost [(i) + (ii) + (iii)]	<u>86,50,623.00</u>

Question 3 : (May 2024)

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. 3/4th of 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:

- Process P Account
- Process Q Account
- Abnormal Loss and Abnormal Gain Account
- Costing Profit & Loss Account.

Question 4 : (MTP Sept 2023)

A 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 August 2023.

Process-I

Input:	
Material A	6,000 kilograms at ₹ 50 per kilogram
Material B	4,000 kilograms at ₹ 100 per kilogram
Labour	430 hours at ₹ 50 per hour
Normal loss	5% of inputs. Scrap is disposed off at ₹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 ₹ 125 per kilogram
Material D	4,200 kilograms at ₹ 75 per kilogram
Flavouring Essence	₹ 3,300
Labour	370 hours at ₹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 labour and overhead were concerned.

Overhead of ₹ 92,000 incurred to be absorbed on the basis of labour hours.

Solution 4 :**Process-I A/c**

Particulars	Qty. (kgs)	Amount)	Particulars	Qty. (kgs)	Amount (₹)
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	—	49,450			

$\left(\frac{₹92,000 \times 430 \text{ hrs}}{800 \text{ hrs}} \right)$					
	10,000	7,70,950		10,000	7,70,950

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

Process-II A/c

Particulars	Qty. (kgs)	Amount (₹)	Particulars	Qty. (kgs)	Amount (₹)
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 $\left(\frac{₹92,000 \times 370 \text{ hrs}}{800 \text{ hrs}} \right)$	--	42,550			
	20,000	19,43,207		20,000	19,43,207

Abnormal loss A/c

Particulars	Qty. (kgs)	Amount (₹)	Particulars	Qty. (kgs)	Amount (₹)
To 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 (₹)	Equivalent units	Cost per unit (₹)
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

$$= 18,000 \text{ unit} \times \text{₹}102.3609 = 18,42,496$$

Value of WIP: For Materials- 1,000 units \times ₹99.0609

$$= \text{₹}99,061$$

For Labour & Overheads 500 units \times ₹3.30

$$= \text{₹}1,650$$

$$\underline{\text{₹}1,00,711}$$

Question 5 : (MTP Oct 2023)

G K Ltd. produces a product "XYZ" which passes through two processes, viz. Process -A and Process-B. The details for the year ending 31st March, 2023 are as follows:

	Process- A	Process - B
40,000 units of input introduced at a cost of	₹ 3,60,000	

Material consumed	₹ 2,42,000	2,25,000
Direct wages	₹ 2,58,000	1,90,000
Manufacturing expenses	₹ 1,96,000	1,23,720
Output in units	37,000	27,000
Normal wastage of inputs	5%	10%
Scrap value (per unit)	₹ 15	20
Selling price (per unit)	₹ 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 were ₹ 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 I net loss for the year.

Solution 5 :

(i) Process- A Account

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

$$\text{Cost per unit} = \frac{₹10,56,000 - ₹30,000}{40,000 \text{ units} - 2,000 \text{ units}} = ₹27 \text{ per unit}$$

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 (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	29,600	7,99,200	By Normal wastage (2,960 units × ₹ 20)	2,960	59,200
To Material	---	2,25,000	By Profit & Loss A/c (27,000 units × ₹ 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 × ₹ 48)	360	17,280			
	29,960	13,55,200		29,960	13,55,200

$$\text{Cost per unit} = \frac{₹13,37,920 - ₹59,200}{29,600 \text{ units} - 2,960 \text{ units}} = ₹ 48 \text{ per unit}$$

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

	19,55,880	19,55,880
--	-----------	-----------

Working Notes:

Normal wastage (Loss) Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	2,000	30,000	By Abnormal Gain A/c (360 units × ₹ 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 (₹)	Particulars	Units	Amount (₹)
To Process- A A/c	1,000	27,000	By Bank A/c (1,000 units × ₹ 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 (₹)	Particulars	Units	Amount (₹)
To Normal loss A/c (360 units × ₹ 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 6 : (MTP April 2024)

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.

Solution 6 :

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 7 : (RTP Nov 2023)

The following information is furnished by ABC 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

Solution 7 :

(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 8 : (RTP May 2024)

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:
 - Materials 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,
 - (iv) CALCULATE the cost of the units to be transferred to the next process.

Solution 8 :

(i) Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production					
Details	Units	Details	Units	Materials		Labour		Overheads	
				%	Units	%	Units	%	Units
Opening Stock	600	Finished goods transferred to next process:							
		-From opening stock	600	- 100	- 8,300	40	240	40	240
		-From fresh materials	8,300	100	700	100	8,300	100	8,300
				-	-				

Fresh inputs	9,200	Closing W-I-P	700			70	490	70	490
		Normal loss	392			-	-	-	-
		Less:	9,992		9,000		9,030		9,030
		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 per equivalent Unit (₹)
Material Cost	55,200			
Less: Scrap realisation 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.	<u>235.20</u>
	739.20
(iii) Cost of 8,300 completed units	
8,300 units @ ₹ 9.08 p.u.	<u>75,364.00</u>
Total cost [(i) + (ii) + (iii)]	<u>80,303.20</u>

Question 1 : (Nov 2023)

XYZ 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 upto the split off point at which A, B and C become separable products is ₹ 57,26,000.

Required:

- Prepare a statement showing apportionment of joint cost to the products using Net realizable value method.
- Assume XYZ 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?

Solution 1 :**(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 (₹) D Limited offer accepted	Product C (₹) PQR Limited offer accepted
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**.

Question 2 : (RTP Sept 2024)

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.

Solution 2 :

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 split-off cost	Total Cost	Selling Price	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

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

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

Question 3 : (May 2024)

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:

- Physical unit method.
- 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.

Question 4 : (MTP Sept 2023)

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 (₹)	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:

- Prepare a statement showing the apportionment of joint costs to A, B and X.
- Present a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.
- Prepare a statement showing the product wise and total profit for the period.

State with supporting calculations as to whether any or all the products should be further processed or not.

Solution 4 :

(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 (₹)	9,00,000 (₹ 50 x 18,000)	4,00,000 (₹ 40 x 10,000)	5,40,000 (₹ 10 x 54,000)	18,40,000
Joint cost	6,30,000	2,80,000	3,78,000	12,88,000
apportionment on the basis of sales value at the point of split off (₹)	$\left(\frac{₹12,88,000}{18,40,000} \times 9,00,000 \right)$	$\left(\frac{₹12,88,000}{18,40,000} \times 4,00,000 \right)$	$\left(\frac{₹12,88,000}{18,40,000} \times 5,40,000 \right)$	

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

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

Products	A	B	X	Total
Sales value (₹)	12,24,000	2,50,000	7,92,000	
Add: Closing stock value (₹) (Refer to Working note 2)	45,000	2,15,000	90,000	
Value of production (₹)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (₹)	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (₹)	1,80,000	1,50,000	1,08,000	
Total cost (₹)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (₹)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

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

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 (₹)	45	43	9	
Closing stock value (₹)	45,000 (₹ 45 x 1,000 kg)	2,15,000 (₹ 43 x 5,000 kg)	90,000 (₹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 (₹)	50	40	10
Selling price per kg after further processing (₹) (Refer to working Note 1)	72	50	18
Incremental selling price per kg (₹)	22	10	8
Less: Further processing cost per kg (₹)	(10)	(15)	(2)
Incremental profit (loss) per kg (₹)	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 5 : (MTP Oct 2023)

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
	<u>₹10,000</u>

Subsequent cost in ₹ are given below:

	A	B
Material	3,000	1,500
Labour	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.

Solution 5 :

(a) 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 6 : (RTP Nov 2023)

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
Labour	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.

Solution 6 :

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 1 : (NOV 2023)

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.

Solution 1 :

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

Question 2 : (RTP Sept 2024)

BK Infra Ltd. built and operates a 110 k.m. long highway on the basis of Built-Operate-Transfer (BOT) model for a period of 25 year. A traffic assessment has been carried out to estimate the traffic flow per day. The details are as below:

Sl. 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:

Sl. No.	Activities	Amount (₹ in lakh)
1	Site clearance	170.70
2	Land development and filling work	9,080.35
3	Sub base and base courses	10,260.70
4	Bituminous work	35,070.80
5	Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	29,055.60
6	Drainage and protection work	9,040.50
7	Traffic sign, marking and road appurtenance	8,405.00
8	Maintenance, repairing and rehabilitation	12,429.60
9	Environmental management	982.00
	Total Project cost	114,495.25

An average cost of ₹ 1,120 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:

Sl. 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 to earn a profit of 15% on total cost.

[Note: Concession period is a period for which an infrastructure is allowed to operate and recovers its investment]

Solution 2 :

(i) **Calculation of total project cost per day of concession period:**

Activities	Amount (₹ in lakh)
Site clearance	170.70

Land development and filling work	9,080.35
Sub base and base courses	10,260.70
Bituminous work	35,070.80
Bridge, flyovers, underpasses, Pedestriansubway,footbridge, etc.	29,055.60
Drainage and protection work	9,040.50
Traffic sign, marking and road appurtenance	8,405.00
Maintenance, repairing and rehabilitation	12,429.60
Environmental management	982.00
Total Project cost	114,495.25
Administration and toll plaza operation cost	1,120.00
Total Cost	115,615.25
Concession period in days (25 years × 365 days)	9,125
Cost per day of concession period (₹ in lakh)	12.67

(ii) Computation of toll fee:

Cost to be recovered per day = Cost per day of concession period + 15% profit on cost
= ₹ 12,67,000 + ₹ 1,90,050
= ₹ 14,57,050

Cost per equivalent vehicle = $\frac{₹14,57,050}{76,444 \text{ units (Refer working note)}}$
= ₹ 19.06 per equivalent vehicle

Vehicle type-wise toll fee:

Sl. No.	Type of vehicle	Equivalent cost [A]	Weight [B]	Toll fee per vehicle [A×B]
1.	Two wheelers	₹ 19.06	1	19.06
2.	Car and SUVs	₹ 19.06	4	76.24
3.	Bus and LCV	₹ 19.06	6	114.36
4.	Heavy commercial vehicles	₹ 19.06	9	171.54

Working Note:

The cost per day has to be recovered from the daily traffic. Each type of vehicle is to be converted into equivalent unit. Let's convert all vehicle types equivalent to Two-wheeler

Sl. No.	Type of vehicle	Daily traffic volume [A]	Weight Ratio [B]	Equivalent Two-wheeler [A×B]
1.	Two wheelers	44,500	0.05	44,500
2.	Car and SUVs	3,450	0.20	13,800
3.	Bus and LCV	1,800	0.30	10,800
4.	Heavy commercial vehicles	816	0.45	7,344
	Total			76,444

Question 3 : (May 2024)

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:

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

Question 4 : (MTP Sept 2023)

A transport company has a fleet of three trucks of 10 tonnes 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	16	4	6
2	40	2	9
3	30	3	12

The analysis of maintenance cost and the total distance travelled during the last two years is as under. The following are the details of expenses for the year under review:

Diesel	₹ 65 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	₹ 24,000 per month
Licence and taxes	₹ 25,000 per annum per truck
Insurance	₹ 45,000 per annum for all the three vehicles
Purchase Price per truck	₹ 30,00,000, Life 10 years. Scrap value at the end of life is ₹ 1,00,000.
Oil and sundries	₹ 250 per 100 km run.
General Overhead	₹ 1,15,600 per annum

The vehicles operate 24 days per month on an average.

On the basis of commercial tone-km, you are required to:

- PREPARE an Annual Cost Statement covering the fleet of three vehicles.
- CALCULATE the cost per km. run.
- DETERMINE the freight rate per tonne km. to yield a profit of 10% on freight.

Solution 4:**(i) Annual Cost Statement of three vehicles**

	(₹)
Diesel {(1,34,784 km. ÷ 4 km) × ₹ 65} (Refer to Working Note 1)	21,90,240
Oil & sundries {(1,34,784 km. ÷ 100 km.) × ₹ 250}	3,36,960
Maintenance {(1,34,784 km. × ₹ 0.25) + ₹ 6,000} (Refer to Working Note 2)	39,696
Drivers' salary {(₹24,000 × 12 months) × 3 trucks}	8,64,000
Licence and taxes (₹ 25,000 × 3 trucks)	75,000
Insurance	45,000
Depreciation {(₹ 29,00,000 ÷ 10 years) × 3 trucks}	8,70,000
General overhead	1,15,600
Total annual cost	45,36,496

(ii) Cost per km. run

$$\text{Cost per kilometre run} = \frac{\text{Total annual cost of vehicles}}{\text{Total kilometre travelled annually}} \quad (\text{Refer to Working Note 1})$$

$$= \frac{₹45,36,496}{1,34,784 \text{ Kms}} = ₹33.66$$

(iii) Freight rate per tonne km (to yield a profit of 10% on freight)

$$\text{Cost per tonne km.} = \frac{\text{Total annual cost of three vehicles}}{\text{Total effective tonnes kms. per annum}} \quad (\text{Refer to Working Note 1})$$

$$= \frac{₹45,36,496}{6,06,528 \text{ kms}} = ₹ 7.48$$

$$\text{Freight rate per tonne km.} = \frac{₹7.48}{0.9} \times 1$$

Working Notes:**1. Total kilometer travelled and Commercial tonnes kilometer (load carried) by three trucks in one year**

Truck	One way distance in kms	No. of trips	Total distance covered in km per day (with load)	Total distance covered in km per day (up & down)	Load carried per trip / day in tonnes	Total effective tonnes km
	a	b	c = a × b	d = c × 2	e	f = 27/3 × c

1	16	4	64	128	6	576
2	40	2	80	160	9	720
3	30	3	90	180	12	810
Total			234	468	27	2,106

Total kilometre travelled by three trucks in one year

(468 km. × 24 days × 12 months) = 1,34,784

Total effective tonnes kilometre of load carried by three trucks during one year

(2,106 tonnes km. × 24 days × 12 months) = 6,06,528 tonne-km

2. Fixed and variable component of maintenance cost:

$$\text{Variable maintenance cost per km.} = \frac{\text{Difference in maintenance cost}}{\text{Difference in distance travelled}} \\ = \frac{₹46,050 - ₹45,175}{1,60,200 \text{ kms} - 1,56,700 \text{ kms}} = ₹ 0.25$$

Fixed maintenance cost = Total maintenance cost – Variable maintenance cost
= ₹ 46,050 – 1,60,200 kms × ₹ 0.25 = ₹ 6,000

Question 5 : (MTP Oct 2023)

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 –

(i) Calculate profit per patient day, if the hospital recovers on an average ₹ 2,000 per day from each patient.

(ii) Find out breakeven point for the hospital.

Solution 5 :

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

(i) 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

(ii) Breakeven Point = Fixed Cost / Contribution per Patient- day

= ₹ 48,61,000 / ₹1,299.375

= 3,741 patient days

Question 6 : (MTP March 2024)

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:

Sl. 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.

Solution 6 :

(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 {(30,00,000/720,000×21,420km)×4}	3,57,000.00	7,91,564.31
B. Repairs & Maintenance		77,112.00
Cost (36,000/10,000×21,420)		
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 7 : (MTP April 2024)

A hotel having 20 single rooms has 80% occupancy in normal season (8 months) and 50% in off- season (4 months) in a year (take 30 days a 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.

Solution 7 :

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

$$= (\text{₹ } 78,45,000 + 19,61,250) \div 5,040 = \text{₹ } 1,945.68$$

(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 8 : (RTP Nov 2023)

P Holiday Resorts offers three types of rooms to its guests, viz deluxe room, super deluxe room and luxury suite. You are required to ascertain 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 (₹ lakhs)
Staff salaries	680
Lighting, Heating and Power	300
Repairs, Maintenance and Renovation	180
Linen	30
Laundry charges	24
Interior decoration	75
Sundries	30.28

An attendant for each room was provided when the room was occupied and he was paid ₹ 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on ₹ 900 lakhs, furniture and fixtures @ 10% on ₹ 90 lakhs and air conditioners @ 10% on ₹ 75 lakhs. Profit is to be provided @ 25% on total taking and assume 360 days in a year.

Solution 8 :

Operating cost statement of P Holiday Resorts

Particulars	Cost per annum (₹ In lakhs)
Staff Salaries	680.00
Room Attendant's Wages (Refer WN-3)	286.20
Lighting, Heating & Power	300.00
Repairs, Maintenance & Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior Decoration	75.00
Sundries	30.28
Depreciation: (Refer WN-4)	
Building	45.00
Furniture & Fixture	9.00
Air Conditioners	7.50
Total cost for the year	1666.98

Computation of profit:

Let ₹ x be the rent for deluxe from.

Equivalent deluxe room days are 90,720 (Refer WN-2)

Total takings = ₹ 90,720x

Profit is 25% of total takings.

Profit = 25% of ₹ 90,720x = ₹ 22,680x

Total takings = Total Cost + Profit

₹ 90,720x = ₹ 16,66,98,000 + ₹ 22,680x

₹ 90,720x - ₹ 22,680x = ₹ 16,66,98,000

₹ 68,040x = ₹ 16,66,98,000

$X = \frac{₹ 16,66,98,000}{₹ 68,040} = ₹ 2,450$

Rent to be charged for deluxe room	₹ 2,450
Rent to be charged for super deluxe room = Rent of deluxe room x 2 = ₹ 2,450 x 2	₹ 4,900
Rent to be charged for luxury suite = Rent of Deluxe room x 3 = ₹ 2,450 x 3	₹ 7,350

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 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 @ ₹ 500 per day = 57,240 days × ₹ 500 per day = ₹ 2,86,20,000

4. Computation of Depreciation per annum:

Particulars	Cost (₹)	Rate of Depreciation	Depreciation (₹)
Building	900,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

Question 9 : (RTP May 2024)

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.

Solution 9 :

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. Amortised 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	Amortised cost per year (₹) [E÷A]	2,133.33	1,600
E	Cost per month (₹) [F÷12]	177.78	133.33

4. Amortised 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	Amortised cost per year (₹) [E÷A]	800	54,000
E	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
	Amortised cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortised 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

Question 1 : (Nov 2023)

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 Favourable (F):

- Variable factory overhead expenditure variance.
- Fixed factory overhead expenditure variance.
- Fixed factory overhead efficiency variance.
- Fixed factory overhead capacity variance.

Solution 1 :**Calculation of actual hours**

$$\text{Standard rate per hour} = \frac{\text{Variable factory overhead per unit}}{\text{Standard time for one unit of output}} = \frac{16}{0.8} = ₹ 20$$

Variable Overhead Efficiency Variance:

$$(\text{Standard hours for actual production} - \text{Actual hours}) \times \text{Standard rate per hour}$$

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)

$$\left[\left(\frac{13,44,000}{67,200} \times 73,440 \right) - 14,37,000 \right] = 31,800 \text{ F}$$

(ii) Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead – Actual fixed overhead.

$$(6,72,000 - 7,05,000) = 33,000 \text{ A}$$

(iii) Fixed Factory Overhead Efficiency Variance:

(Standard hours for actual production – Actual hours) × Standard rate per hour

$$(70,080 - 73,440) \times 10 = 33,600 \text{ A}$$

(iv) Fixed Overhead Capacity Variance:

(Actual hours - Budgeted hours) × Standard rate per hour

$$(73,440 - 67,200) \times 10 = 62,400 \text{ F}$$

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)

$$-67,200 = (16 \times 87,600) - 16 \times x$$

$$-67,200 = 14,01,600 - 16 \times x$$

$$x = 14,68,800 / 16 = 91,800 \text{ (SQ for actual hours worked)}$$

(i) Variable Factory Overhead Expenditure Variance:

(SR x SQ for actual hour worked – Actual variable overheads)

$$16 \times 91,800 - 14,37,000 \text{ or } 14,68,800 - 14,37,000 = 31,800 \text{ F}$$

(ii) Fixed Factory Overhead Expenditure Variance:
 Budgeted fixed overhead – Actual fixed overhead.
 $(6,72,000 - 7,05,000) = 33,000 \text{ A}$

(iii) Fixed Factory Overhead Efficiency Variance:
 Standard rate per unit (SR) = $6,72,000 / 84,000 = ₹ 8 \text{ per unit}$
 $(SR \times AQ) - (SR \times \text{standard quantity for Actual hours})$
 $(8 \times 87,600) - (8 \times 91,800)$
 $(7,00,800 - 7,34,400) = 33,600 \text{ A}$

(iv) Fixed Overhead Capacity Variance:
 $(SR \times \text{standard quantity for Actual hours} - \text{Budgeted fixed overheads})$
 $(8 \times 91,800) - (6,72,000)$
 $(7,34,400 - 6,72,000) = 62,400 \text{ F}$

Question 2 : (MTP Sept 2023)

Essel Minerals Ltd. operates in iron ore mining through open cast mining method. Explosives and detonators are used for excavation of iron ores 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. for Overburden (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 iron ore).

During the month of December 2021, the company produces 20,000 tonnes of iron ore 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

Required:

- COMPUTE the material price variance
 - COMPUTE the material quantity variance
- COMPUTE the material cost variance

Solution 2 :

Workings:

1. Calculation of Standard Qty. of Explosives and Detonators for actual output:

	Particulars	Iron ore	Overburden (OB)	Total
SME:				
A	Actual Output	20,000 tonne	58,000 M3	
B	Standard Qty per unit	2.4 kg./tonne	1.9 kg./M3	
C	Standard Qty. for actual production [A×B]	48,000 kg.	1,10,200 kg.	1,58,200 kg.
Detonators:				
D	Standard Qty per 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

(i) 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)

(ii) 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)

(iii) 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 3: (MTP Oct 2023)

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:

- For each element, equivalent units of performance and the actual cost per equivalent unit.
- Actual cost of return-in-process on July 31.
- The standard cost per return.
- The labour rate and labour efficiency variance as well as overhead volume and overhead expenditure variance.

Solution 3 :**(a) (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

Overhead 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 4 : (MTP March 2024)

SARA 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.

Solution 4 :

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 × 4,800 units) – ₹ 4,70,000 = ₹ 38,000 (A)

OR

= (Budgeted Rate × Std. Hours) – Actual Overhead

= (₹ 15 × 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 5 : (RTP Nov 2023)

The following information has been provided by a company:

Number of units produced and sold	6,000
Standard labour rate per hour	₹ 8
Standard hours required for 6,000 units	-
Actual hours required	17094 hours
Labour efficiency	105.3%
Labour rate variance	₹ 68,376 (A)

You are required to calculate:

- Actual labour rate per hour
- Standard hours required for 6,000 units
- Labour Efficiency variance
- Standard labour cost per unit
- Actual labour cost per unit.

Solution 5 :

SR – Standard labour Rate per Hour

AR – Actual labour rate per hour

SH – Standard Hours AH – Actual hours

$$\begin{aligned}
 \text{(i) Labour rate Variance} &= \text{AH} (\text{SR} - \text{AR}) \\
 \text{Or } 17,094 (8 - \text{AR}) &= 68,376(\text{A}) \\
 \text{Or } 17,094 (8 - \text{AR}) &= - 68,376 \\
 \text{Or } 8 - \text{AR} &= -4 \text{ Or AR} = ₹12
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) Labour Efficiency} &= \frac{\text{SH}}{\text{AH}} \times 100 = 105.3 \\
 &= \text{SH} = \frac{\text{AH} \times 105.3}{100} = \frac{17,094 \times 105.3}{100} = 17,999.982 \\
 &= \text{SH} = 18,000 \text{ hours}
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii) Labour Efficiency Variance} &= \text{SR} (\text{SH} - \text{AH}) \\
 &= 8(18,000 - 17,094) \\
 &= 8 \times 906 \\
 &= ₹ 7,248(\text{F})
 \end{aligned}$$

$$\text{(iv) Standard Labour Cost per Unit} = \frac{18,000 \times 8}{6,000} = ₹ 24$$

$$(v) \text{Actual Labour Cost Per Unit} = \frac{17,094 \times 12}{6,000} = ₹ 34.19$$

Question 6 : (RTP May 2024)

EML operates in coal mining through an 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. for Overburden (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 EML is required to COMPUTE the material price variance, material quantity variance and material cost variance.

Solution 6 :

Workings:

1. Calculation of Standard Qty. of Explosives and Detonators for actual 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 Qty per 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:

$$\begin{aligned} \text{Material Price Variance} &= \text{Actual Qty.} \times (\text{Std. Price} - \text{Actual Price}) \text{ SME} \\ &= 1,67,200 \text{ kg.} \times (\text{₹}40 - \text{₹}38) = \text{₹}3,34,400 \text{ (F)} \\ \text{Detonators} &= 1,18,400 \text{ pcs} \times (\text{₹}20 - \text{₹}20.5) = \text{₹}59,200 \text{ (A)} \\ \text{Total} &= \text{₹}2,75,200 \text{ (F)} \end{aligned}$$

Computation of material quantity variance:

$$\begin{aligned} \text{Material Qty. Variance} &= \text{Std. Price} \times (\text{Std. Qty for actual output} - \text{Actual Qty.}) \\ \text{SME} &= \text{₹}40 \times (1,58,200 \text{ kg.} - 1,67,200 \text{ kg.}) = \text{₹}3,60,000 \text{ (A)} \\ \text{Detonators} &= \text{₹}20 \times (1,56,000 \text{ pcs} - 1,18,400 \text{ pcs}) = \text{₹}7,52,000 \text{ (F)} \\ \text{Total} &= \text{₹}3,92,000 \text{ (F)} \end{aligned}$$

Computation of material cost variance:

$$\begin{aligned} \text{Material cost variance} &= \text{Std. cost} - \text{Actual Cost} \\ &\text{Or, } (\text{Std. Price} \times \text{Std. Qty}) - (\text{Actual Price} \times \text{Actual Qty.}) \text{ SME} \\ &= (\text{₹}40 \times 1,58,200 \text{ kg.}) - (\text{₹}38 \times 1,67,200 \text{ kg.}) \\ &= \text{₹}63,28,000 - \text{₹}63,53,600 = \text{₹}25,600 \text{ (A)} \end{aligned}$$

$$\begin{aligned}\text{Detonators} &= (\text{₹ } 20 \times 1,56,000 \text{ pcs}) - (\text{₹ } 20.50 \times 1,18,400 \text{ pcs}) \\ &= \text{₹}31,20,000 - \text{₹}24,27,200 = 6,92,800 \text{ (F)} \\ \text{Total} &= \text{₹}6,67,200 \text{ (F)}\end{aligned}$$

Question 1 : (Nov 2023)

R Ltd. produces and sells 60,000 units of product 'AN', at its Noida Plant. The selling price of the product is ₹ 15 per unit. The variable cost is 80% of selling price per unit. Fixed cost during this period is ₹ 4,20,000. The company is continuously suffering losses, and management plans to shut down the Noida Plant.

The fixed cost is expected to be reduced by ₹ 2,50,000.

Additional costs of plant shut down are expected at ₹ 25,000.

You are required to comment on:

- Whether the Noida plant be shut down?
- Find the shut-down point in units.

Solution 1 :**Statement of profit**

Particulars	₹
Selling Price	15 per unit
Less : Variable cost	12 per unit
Contribution	3 per unit
Capacity	60,000 units
Total contribution (60,000 units × ₹ 3)	1,80,000
Less: Fixed Cost	4,20,000
Loss	(2,40,000)

Shut down cost

Particular	₹
Fixed cost	1,70,000
Additional cost	25,000
Shut down cost	1,95,000

- Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

- Shut down point: $\frac{\text{Total fixed cost} - \text{Shut down cost}}{\text{Contribution per unit}}$
 $\frac{4,20,000 - 1,95,000}{3} = 75,000 \text{ units}$

The solution can also be presented in following way

Statement of profit

Particulars	If plant is continued ₹	If plant is shut down ₹
Selling Price	15 per unit	-
Less : Variable cost	12 per unit	-
Contribution	3 per unit	-
Capacity	60,000 units	-
Total contribution (60,000 units × ₹ 3)	1,80,000	-
Less : Fixed Cost	4,20,000	1,70,000
Additional Fixed Cost	-	25,000
Loss	2,40,000	1,95,000

- Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

- Shut down point: $\frac{\text{Total fixed cost} - \text{Shut down cost}}{\text{Contribution per unit}}$
 $\frac{4,20,000 - 1,95,000}{3} = 75,000 \text{ units}$

Question 2 : (RTP Sept 2024)

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.

Solution 2 :

- Contribution per unit = Selling price – Variable cost

$$\begin{aligned}
 &= ₹ 100 - ₹ 60 \\
 &= ₹ 40 \\
 \text{Break-even Point} &= \frac{₹24,00,000}{₹40} \\
 &= 60,000 \text{ units} \\
 \text{Percentage Margin of Safety} &= \frac{\text{Actual Sales} - \text{Break-even sales}}{\text{Actual sales}} \\
 \text{Or, 60\%} &= \frac{\text{Actual Sales} - 60,000 \text{ units}}{\text{Actual Sales}} \\
 \text{Actual Sales} &= 1,50,000 \text{ units}
 \end{aligned}$$

	(₹)
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

$$\text{Rate of Net Return on Sales} = 14.40\% \left(\frac{₹21,60,000}{₹1,50,00,000} \times 100 \right)$$

(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:

$$\begin{aligned}
 \text{Contribution per unit} &= \left(\frac{40}{8} \times 5 \right) + \left(\frac{50}{8} \times 3 \right) \\
 &= 25 + 18.75 = ₹ 43.75
 \end{aligned}$$

$$\text{Break-even Sale} = 64,000 \text{ units} \left(\frac{₹28,00,000}{₹43.75} \right)$$

Break-even Sales Mix:

$$X (64,000 \text{ units} \times 5/8) = 40,000 \text{ units}$$

$$Y (64,000 \text{ units} \times 3/8) = 24,000 \text{ units}$$

Question 3 : (May 2024)

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 price will remain same. Calculate the sales volume to earn a profit of ₹15,00,000.

Question 4 : (MTP Sept 2023)

LK 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?

Solution 4 :

$$\begin{aligned}
 \text{(i) Break-even sales} &= \frac{\text{Fixed Cost}}{\text{P/V Ratio}} \\
 \text{P/V Ratio} &= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 \text{ or, } \frac{₹37,50,000}{₹7,80,60,000 - ₹5,93,10,000} \times 100
 \end{aligned}$$

$$\text{Or, } \frac{₹37,50,000}{₹1,87,50,000} \times 100 \text{ or } 20\%$$

$$\text{Break-even sales} = \frac{₹98,50,000}{20\%} = ₹4,92,50,000$$

$$\begin{aligned} \text{(ii) Profit/ loss} &= \text{Contribution} - \text{Fixed Cost} \\ &= ₹8,20,00,000 \times 20\% - ₹98,50,000 \\ &= ₹1,64,00,000 - ₹98,50,000 = ₹65,50,000 \end{aligned}$$

(iii) To earn same amount of profit in 2022-23 as was in 2021-22, it has to earn the same amount of contribution as in 2021-22.

Sales – Variable cost = Contribution equal to 2021-22 contribution

$$\begin{aligned} \text{Contribution in 2021-22} &= \text{Sales in 2021-22} \times \text{P/V Ratio in 2021-22} \\ &= ₹5,93,10,000 \times 20\% = ₹1,18,62,000 \end{aligned}$$

Let the number of units to be sold in 2022-23 = X

Sales in 2022-23 – Variable cost in 2022-23 = Desired Contribution

$$90 X - 80 X = ₹1,18,62,000$$

$$\text{Or, } 10 X = 1,18,62,000$$

$$\text{Or, } X = 11,86,200 \text{ units}$$

Therefore, Sales amount required to earn a profit equal to 2021-22 profit
= ₹ 90 × 11,86,200 units = ₹ 10,67,58,000

Question 5 : (MTP Oct 2023)

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 shutdown 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.

Solution 5 :

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.

$$\text{Shut Down Point} = \frac{₹3,50,000 - ₹1,45,000}{₹8 - ₹6} = 1,02,500 \text{ units}$$

Capacity Level at Shut Down Point (%)

At 100% Level – Production Capacity

$$= 1,18,750 \times \frac{95,000 \text{ units}}{0.80}$$

Capacity Level at Shut Down Point

$$= 86.32\% \left(\frac{1,02,500 \text{ units}}{1,18,750 \text{ units}} \right)$$

Question 6 : (MTP Oct 2023)

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.

Solution 6 :

(a) (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 7 : (MTP MArch 2024)

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

Actual/budget information for each month was as follows:

Direct materials	4 kilograms at ₹ 120 per kilogram
Direct labour	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:

- Prepare a profit statement for each of the three months using absorption costing principles.
- Prepare a profit statement for each of the three months using marginal costing principles.
- Present a reconciliation of the profit or loss figures given in your answer to (i) and (ii).

Solution 7 :

(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 Absorption Costing	22,59,000	24,10,000	29,19,000
Add: Opening Stock	0	40,000 (400 × ₹100)	30,000 (300 × ₹100)
Less: Closing Stock	40,000 (400 × ₹100)	30,000 (300 × ₹100)	60,000 (600 × ₹100)
Profit under Marginal Costing	22,19,000	24,20,000	28,89,000

Question 8 : (MTP March 2024)

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.

Solution 8 :

Total Fixed Cost = ₹ 6,00,000 + ₹20,00,000 + ₹8,00,000 + ₹ 2,00,000 = ₹ 36,00,000

Contribution per unit = ₹600 - ₹470 = ₹130

P/V Ratio = $\frac{\text{Contribution Per Unit}}{\text{Selling Price}} \times 100 = \frac{₹130}{₹600} \times 100 = 21.67\%$

Break-even Point = $\frac{\text{Total Fixed Cost}}{\text{Contribution Per Unit}} = \frac{₹36,00,000}{₹130} = 27,692.31 \text{ or } 27,693 \text{ units}$

$$\text{Break-even Sales} = \frac{\text{Total Fixed Cost}}{P/V \text{ Ratio}} = \frac{\text{₹}36,00,000}{21.67\%} = \text{₹}1,66,12,829$$

Calculation of Profit/ (loss):

Total Contribution (₹130 × 35,000 units)	= ₹45,50,000
Less: Fixed Cost	= ₹36,00,000
Profit	= ₹ 9,50,000

Question 9 : (RTP Nov 2023)

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 had an opening stock of 20,000 packets whose variable cost was ₹ 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.

Solution 9 :

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

$$= \frac{\text{₹ } 55,20,000}{\text{₹ } 300 - \text{₹ } 225} = 73,600 \text{ packets.}$$

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

Question 10 : (RTP Nov 2023)

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?

Solution 10 :**(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 11 :(RTP May 2024)

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 :

- Break-even Sales (in rupees),
- Profit earned during last year,
- Margin of safety (in %) and
- The profit if the sales were 10% less than the actual sales.

Solution 11 :

Workings:

Calculation of Cost of Goods Sold (COGS):

$$\begin{aligned}\text{COGS} &= \{(\text{DM}- 0.3 \text{ COGS}) + (\text{DL}- 0.15 \text{ COGS}) + (\text{FOH}- 0.10 \text{ COGS} + \\ &\text{₹ 2,30,000}) + (\text{G\&AOH}- 0.02 \text{ COGS} + \text{₹ 71,000})\} \text{ Or } \text{COGS} = 0.57 \text{ COGS} + \text{₹ 3,01,000} \\ \text{Or COGS} &= \frac{\text{₹ 3,01,000}}{0.43} = \text{₹ 7,00,000}\end{aligned}$$

Calculation of Cost of Sales (COS):

$$\begin{aligned}\text{COS} &= \text{COGS} + (\text{S\&DOH}- 0.04 \text{ COS} + \text{₹ 68,000}) \\ \text{Or COS} &= \text{₹ 7,00,000} + (0.04 \text{ COS} + \text{₹ 68,000}) \\ \text{Or COS} &= \frac{\text{₹ 7,68,000}}{0.96} = \text{₹ 8,00,000}\end{aligned}$$

Calculation of total Fixed Costs:

Factory Overhead	₹ 2,30,000
General & Administration OH	₹ 71,000
Selling & Distribution OH	₹ 68,000
	<u>₹ 3,69,000</u>

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
		<u>₹ 4,31,000</u>

Calculation of P/V Ratio:

$$\begin{aligned} \text{P/V Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}} \times 100 \\ &= \frac{(\text{₹}185 \times 5,000 \text{ units}) - \text{₹}4,31,000}{\text{₹}185 \times 5,000 \text{ units}} \times 100 = 53.41\% \end{aligned}$$

$$(i) \quad \text{Break-Even Sales} = \frac{\text{Fixed Costs}}{\text{P / V Ratio}} = \frac{\text{₹}3,69,000}{53.41\%} = \text{₹ } 6,90,882$$

$$\begin{aligned} (ii) \quad \text{Profit earned during the last year} &= (\text{Sales} - \text{Total Variable Costs}) - \text{Total Fixed Costs} \\ &= (\text{₹ } 9,25,000 - \text{₹ } 4,31,000) - \text{₹ } 3,69,000 \\ &= \text{₹ } 1,25,000 \end{aligned}$$

$$\begin{aligned} (iii) \quad \text{Margin of Safety (\%)} &= \frac{\text{Sales} - \text{Break Even Sales}}{\text{Sales}} \times 100 \\ &= \frac{\text{₹}9,25,000 - \text{₹}6,90,882}{\text{₹}9,25,000} \times 100 = 25.31\% \end{aligned}$$

$$\begin{aligned} (iv) \quad \text{Profit if the sales were 10\% less than the actual sales:} \\ \text{Profit} &= 90\% (\text{₹ } 9,25,000 - \text{₹ } 4,31,000) - \text{₹ } 3,69,000 \\ &= \text{₹ } 4,44,600 - \text{₹ } 3,69,000 = \text{₹ } 75,600 \end{aligned}$$

Question 1 : (Nov 2023)

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.

Solution 1 :**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	2,10,000	2,38,000	3,36,000	60,000
(in units)	[1,40,000+ (1,40,000 x 50%)]	[3,40,000- (3,40,000 x 30%)]	[4,20,000- (4,20,000 x 20%)]	
October 2023	42,00,000	95,20,000	67,20,000	12,00,000
(Sales Value in ₹)	(2,10,000 x ₹ 20)	(2,38,000 x ₹ 40)	(3,36,000 x ₹ 20)	(60,000 x ₹ 20)
November 2023	3,15,000	1,66,600	3,36,000	50,000

(in units)	[2,10,000+ (2,10,000 x 50%)]	[2,38,000- (2,38,000 x 30%)]		
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 (4,72,500x ₹ 20)	46,64,800 (1,16,620x ₹ 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

Question 2 : (RTP Sept 2024)

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?

- (a) 1,95,000 units
(b) 1,90,000 units
(c) 1,84,000 units
(d) 1,75,000 units

Solution 2 :

(b) 1,90,000 units

	Units
Sales budget	2,00,000
Add: Closing Inventory (25,000 x 0.6)	15,000
Less: Opening Inventory	(25,000)
Production Budget	1,90,000

Question 3 : (RTP Sept 2024)

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

- (i) Actual Hours worked.
- (ii) Standard Hours for actual output.
- (iii) Activity Ratio.
- (iv) Standard Capacity Usage Ratio.

Question 5 : (May 2024)

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 increase 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.

Question 6 : (MTP Sept 2023)

G Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 36 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following information has been extracted from departmental estimates for the year ended 31st March 2023 (the budget period):

	Product M	Product N
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 ₹ 320 per order.
- The management of G Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

Required:

- (a) Prepare functional budgets for the year ended 31st March 2023 under the following headings:
 - (i) Production budget for Products M and N (in units).
 - (ii) Purchases budget for Material Z (in kgs and value).
- (b) Calculate the Economic Order Quantity for Material Z (in kgs).

Solution 6 :

(a) (i) Production Budget (in units) for the year ended 31st March 2023

	Product M	Product N
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	14,000
	$\left(\frac{28,320}{0.96} \right)$	$\left(\frac{13,160}{0.94} \right)$

(ii) Purchase budget (in kgs and value) for Material Z

	Product M	Product N
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	₹36	
Total purchase price	₹90,83,160	

(b) Calculation of Economic Order Quantity for Material Z

$$EOQ = \sqrt{\frac{2 \times 2,52,310 \text{ kg} \times ₹320}{36 \times 11\%}} = \sqrt{\frac{16,14,78,400}{₹3.96}} = 6,385.72 \text{ kg.}$$

Question 7 : (MTP Oct 2023)

N 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 ₹5,71,400 is incurred and sold through dealers at a uniform selling price of ₹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 -

- Prepare Production budget (in nos.) for the month of October, November, December and January.
- Prepare a Purchase budget for Part-X (in units) for the months of October, November and December.
- Calculate the budgeted gross profit for the quarter October to December

Solution 7 :**(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 (52,300 × 4 units)	2,24,800 (56,200 × 4 units)	2,89,600 (72,400 × 4 units)
Less: Opening Stock	(48,000)	(59,200) (14,800 × 4 units)	(76,800) (19,200 × 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 (₹ in lakh)	2,91,414	2,54,987.25	3,27,840.75	8,74,242
Less: Cost of Sales (₹ in lakh) (Sales unit × Cost per unit)	2,28,560	1,99,990.00	2,57,130.00	6,85,680
Gross Profit (₹ 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 8 : (MTP MARCH 2024)

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:

- (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).
- (b) Prepare Purchases budget for Material Z (in kgs and value) for the year ended 31st March 2025.
- (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.

Solution 8 :

- (a) (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

$$EOQ = \sqrt{\frac{2 \times 2,52,310 \times 15,600}{72 \times 11\%}} = \sqrt{\frac{5,04,620 \times 15,600}{72 \times 11\%}} = 31,526.95 \text{ kg.}$$

- (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.	88,421 kg.

	$\left(\frac{1,47,500}{0.90}\right)$	$\left(\frac{84,000}{0.95}\right)$
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 9 : (MTP April 2024)

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-even level of student if the school proposes to collect ₹ 400 per student?

Solution 9 :

(a) Flexible Budget for different levels

	₹	₹	₹	₹	₹
No. of Students	60	90	120	150	180
VARIABLE COST					
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
<u>Less Variable Cost</u>	<u>180</u>
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 10 : (RTP Nov 2023)

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 Managers) 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.

Solution 10 :

Statement Showing Sales Budget for 2023-24

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)

East	5001	10	5,000	4003	20	8,000	13,000
West	7002	10	7,000	6004	20	12,000	19,000
Total	1,200		12,000	1,000		20,000	32,000

Workings

- $400 \times 110\% + 60 = 500$ units
- $600 \times 105\% + 70 = 700$ units
- $300 \times 120\% + 40 = 400$ units
- $500 \times 110\% + 50 = 600$ 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 11: (RTP May 2024)

M Ltd. is a public sector undertaking (PSU), producing a product A. The company is in the process of preparing its revenue budget for the year 2024. The company has the following information which can be useful in preparing the budget:

- It has anticipated 12% growth in sales volume from the year 2023 of 4,20,000 tonnes.
 - The sales price of ₹ 23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.
 - 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%.
 - The projected increase in WPI for 2024 is 4%
 - A total of 6,000 employees works for the company. The company works 26 days in a month.
 - 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.
 - The casual employees are getting a daily wage of ₹ 850. The wages are 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - 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.

Solution 11 :**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 material cost [(i)×(ii)]	43,470	48,686.40
E	Wages & Salary Cost:		
(i)	Wages to casual employees (15%×6,000 = 900 employees)	2,386.80 [900×26×12×₹850]	2,508.47 [900×26×12×₹893.33]
(ii)	Salary to permanent employees (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)