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1. About 50 items are required every day for a machine. A fixed cost of 50 per order is incurred for placing an order. The inventory carrying cost per item amounts to 0.02 per day. The lead period is 32 days.

What will be the Economic Order Quantity?

- (a) 125 (b) 9552 (c) 500 (d) 26

2. Anuradha Company has a Mumbai Plant that manufactures OTG. One component is an XY chip. Expected demand is for 10,000 of these chips in the year 2009. Anuradha estimates the ordering cost per purchase order to be ₹ 250. The carrying cost for one unit of XY in stock is ₹ 5 per annum.

Compute the number of deliveries of XY in March, 2009.

- (a) 10 (b) 31.64 or 32 (c) 500 (d) 26

3. The average annual consumption of a material is 18,250 units at a price of ₹36.50 per unit. The storage cost is 20% on an average inventory and the cost of placing an order is ₹ 50. How much quantity is to be purchased at a time?

- (a) 1000 (b) 2000 (c) 750 (d) 500

4. 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:

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

- (a) 9,000 kg & 6,000 kg respectively
- (b) 18,000 kg & 12,000 kg respectively
- (c) 27,000 kg & 18,000 kg respectively
- (d) 30,000 kg & 20,000 kg respectively.

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

- (a) 13,856 kg & 16,181 kg respectively
- (b) 16,197 kg. & 17,327 kg respectively
- (c) 16,181 kg & 17,165 kg respectively
- (d) 13,197 kg & 17,165 kg respectively

(3) What would the maximum stock level for material A:

- (a) 18,200 kg. (b) 12,000 kg.
- (c) 16,000 kg. (d) 16,200 kg.

(4) Calculate saving/ loss in purchase of Material A if the purchase order quantity is equal to EOQ

- (a) Profit of ₹ 3,21,201, (b) Loss of ₹ 3,21,201.
- (c) Profit of ₹ 2,52,500. (d) Loss of ₹ 2,52,500.

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

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

5. Tropic Pvt Ltd was engaged in the business of manufacturing Product P. The product P required 2 units of Material R. The company intends to sell 24,000 units of Product P and does not wish to retain any closing stock. However the opening stock of Product P is 4,000 units. Raw Material R has to be procured after considering the opening stock of R amounting to 10,000 units. The technical team further confirms that the yield in the course of manufacture of Product P is 80% of the input.

The company presently procures its annual requirement of materials on a quarterly basis from its regular supplier enjoying a discount of 2.5% on the invoice price of the material of ₹ 20 per unit. Every time the company places orders for Material R, it incurs 125 for each of the order placed.



The company also has taken a rented warehouse for storing material R and the annual cost of storage is ₹ 10 per unit. The company appointed Mr. Ta Chartered Accountant to review the cost of inventory and provide measures of improvement of cost. After reviewing the material purchase and consumption pattern, Mr. T suggested that the implementation of Wilson's EOQ would be beneficial to the company. He emphasized that the change in the quantity ordered would result in reduction of inventory carrying costs.

Mr. T further reviewed the labour costing and identified that the employees were paid overtime wages to ensure timely completion of projects. Overtime wages comprised of daily wage and 100% of daily wages as overtime premium. Based on the cost record it was understood that every month had 180 hours of regular working hours which was remunerated at ₹ 200 per hour and Overtime of 20 hours which was remunerated at ₹ 400 per hour. Mr. T suggested that the above time taken may be considered as standard and a scheme of Incentive be introduced to reduce overtime cost. He further indicated that Rowan scheme of incentive be used to measure performance and the improved productivity per hour would be 125 units per hour.

In this regard, address the following queries in line with the suggestions provided by Mr. T to Tropic Pvt Ltd.

1. The annual requirement of Material R to meet the target sales of 24,000 units of Product P is:
 - (a) 48,000 units
 - (b) 60,000 units
 - (c) 40,000 units
 - (d) 50,000 units
2. The ordering quantity as per the current inventory policy and the proposed Wilson's Economic order quantity of Material R are:
 - (a) Order Quantity as per the current inventory policy 10,000 units & Economic Order Quantity 1,000 units
 - (b) Order Quantity as per the current inventory policy 15,000 units & Economic Order Quantity 1,225 units
 - (c) Order Quantity as per the current inventory policy 12,000 units & Economic Order Quantity 1,095 units
 - (d) Order Quantity as per the current inventory policy 12,500 units & Economic Order Quantity - 1,118 units
3. The net savings to inventory cost on migration from the current inventory policy to the Wilson's Economic Order Quantity policy would be:





- (a) Savings from EOQ as compared to current discount policy - ₹ 26,820
 (b) Savings from EOQ as compared to current discount policy - ₹ 20,500
 (c) Savings from EOQ as compared to current discount policy - ₹ 33,253
 (d) Savings from EOQ as compared to current discount policy - ₹ 25,546

4. Incentive payable under the Rowan Incentive scheme amounts to:

- (a) ₹ 7,500 (b) ₹ 6,400 (c) ₹ 6,000 (d) ₹ 8,000

5. The savings in labour cost achieved by implementation of incentive scheme over the overtime payments amounts to:

- (a) ₹ 9,600 (b) ₹ 5,600 (c) ₹ 8,000 (d) ₹ 3,200

6. Mr. Vikas, a toy importer has understood the importance of manufacturing in India. He is backed up by the new govt. policies that motivate him to manufacture in India. As per the custom department any import made for the manufacturing under "Made in India", custom duty will be refunded upto 80%. Vikas decided not to import toy from China anymore, instead import raw material from Srilanka, for the manufacturing of toys in India, under an agreement of Govt. Of India with Srilankan Govt., any import from Srilanka will receive tax benefits.

Vikas ordered material Xendga & material Zenga from Srilanka. Details are given below:-

Srilankan Rupees (SLR)

Material Xendga (12,000 units * 125 SLR) 15,00,000

Material Zenga (8,000 units * 225 SLR) 18,00,000

Factory cost 33,00,000

Add: Containers cost 2,00,000

Add: Freight upto loading shipment on ship (paid by exporter) 50,000

F.O.B. 35,50,000

- Ocean Freight is \$ 2,000

- Insurance is \$ 1,500

When shipment reached India, it was unloaded at Chennai port. Vikas requested to put the goods in custom port's warehouse. Vikas due to cash crunch was not in a position to pay custom duty and therefore did not file the bill of exchange (B.O.E). Custom authorities charged a penalty of INR 15,000.





Finally, after a month Vikas filled (BO.E.) and paid custom duty of 20% on CIF value of the shipment. IGST was also applicable @ 18% on the combined value of CIF & custom duty paid. He spent further a sum of INR 12,500 to bring the imported goods to his factory. An inspection was done on the goods and it was found that 5% of the goods were broken. This This came to imports is 8%. management as a surprise because generally such rate of defects on

Additional Information:

- Exchange rates:
 - 1) 1 SLR0.25 INR
 - 2) 1 USD = 75 INR
- IGST credits are available.
- Containers were refunded at INR 38,000.
- Indian and Srilankan brokers were paid commission by Vikas on factory cost. Indian broker charged 6% whereas Srilankan broker charged 12%.
- CIF (cost, insurance and Freight) includes F.O.B (Free on Board), Insurance & Ocean freight.

You are required to answer the following 5 questions:

1. What is the total cost of shipment to be recorded by Vikas?
 - (a) INR 13,17,000
 - (b) INR 13,04,500
 - (c) INR 13,54,500
 - (d) INR 13,32,500
2. What is the absorption rate of total cost per unit of Zenga?
 - (a) INR 90.28
 - (b) INR 84.44
 - (c) INR 93.62
 - (d) INR 85.77
3. What is the absorption rate of total cost per unit of Xendga?
 - (a) INR 52.01
 - (b) INR 54.24
 - (c) INR 58.13
 - (d) INR 68.65
4. Amount of refundable taxes?
 - (a) INR 4,13,600
 - (b) INR 4,57,600
 - (c) INR 2,20,000
 - (d) INR 2,37,600
5. If loss of goods was 9% instead of 5%, what will be the amount that will be charged to statement of profit & loss?
 - (a) INR 13,045
 - (b) INR 19,898.4
 - (c) INR 14,178.4
 - (d) INR 24,045





7. 'Axe Trade', an unregistered supplier under GST, purchased material from Vye Lt(D) which is registered supplier under GST. During the month of June 2024, the Axe Traders has purchased a lot of 5,000 units on credit from Vye Ltd. The information related to the purchase are as follows:

Listed price of one lot of 5,000 units	- ₹ 2,50,000
Trade discount	- @ 10% on listed price CGST and SGST
(Credit available)	- 18% (9% CGST + 9% SGST)
Cash discount	- @ 10%
(Will be given only if payment is made within 30 days.)	
Toll Tax paid	₹ 5,000
Freight and Insurance	₹17,220
Demurrage paid to transporter	₹ 5,000
Commission and brokerage on purchases	₹ 10,000
Amount deposited for returnable containers	₹ 30,000
Amount of refund on returning the container	₹ 20,000
Other Expenses	@ 2% of total cost

A 20% shortage in material on receipt is expected considering the nature of the raw material. The payment to the supplier was made within 21 days of the purchases.

1. If Axe Traders pays the supplier within 30 days of purchase, then, what is the total amount of cash discount received from the supplier and how it is treated to calculate material cost?
 - (a) ₹ 25,000 & it will not be deducted from the material cost
 - (b) ₹ 26,550 & it will be deducted from the material cost
 - (c) ₹ 26,550 & it will not be deducted from the material cost
 - (d) ₹ 22,500 & it will not be deducted from the material cost
2. What will be the amount of other expenses and how it is treated in material cost?
 - (a) ₹ 6,154.40 & it will be added with the material cost
 - (b) ₹ 6,280.00 & it will be added with the material cost
 - (c) ₹ 5,344.40 & it will be added with the material cost
 - (d) ₹ 5,453.47 & it will not be added with the material cost
3. What is the amount of GST and how will it be treated in cost sheet of Axe Traders?
 - (a) ₹ 40,500 & it will not be added with material cost
 - (b) ₹ 40,500 & it will be added with material cost
 - (c) ₹ 45,000 & it will not be added with material cost
 - (d) ₹ 45,000 & it will be added with material cost



4. What is the total material cost chargeable in the cost sheet of Axe Traders?

- (a) ₹ 3,14,000 (b) ₹ 2,73,500
(c) ₹ 2,72,673 (d) ₹ 3,13,874

5. The number of good units and cost per unit of the materials received are:

- (a) 5,000 units & ₹ 62.80 (b) 5,000 units & ₹ 54.70
(c) 4,000 units & ₹ 78.50 (d) 4,000 units & ₹ 68.38

8. ABC Ltd is a manufacturer of specialized components & needs to maintain an efficient inventory system for its raw materials. The company has the following data regarding one of its essential raw materials

- annual demand: 36000 units
- ordering cost per order: ₹ 600
- carrying cost per unit per annum: ₹ 15
- Re-order level: 4500 units
- Lead time: 5 days
- Daily usage: 100 units
- maximum Stock level: 6000 units

Based on this information calculate:

1. What is the EOQ for ABC Ltd?

- a) 1700 b) 1697 c) 1694 d) 1691

2. What is Minimum stock Level?

- a) 3000 b) 3500 c) 5000 d) 4500

3. Calculate average stock level

- a) 5849 b) 4349 c) 5349 d) 3849

9. XYZ Ltd has the following information available:

Product X requires 2kgs of raw material Y, opening stock of Y and X is 1000kgs and 500 units respectively. Demand for X is 3000 units for each quarter

- Ordering cost per order = 1000
- EOQ = 700kgs
- Cost of raw material Y is Rs.125 per unit

Instead of placing order at EOQ, company places order at 2000kgs in order to get bulk discount.

1. Calculate carrying cost per unit per annum

- a) 89 b) 86 c) 86.8 d) 89.8



ANSWERS

1. (c) 500 units

$$EOQ = \sqrt{\frac{2 \times AD \times OCPO}{CCPuPa}} = \sqrt{\frac{2 \times 50 \times 365 \times 50}{0.02 \times 365}}$$

$$= 500 \text{ units}$$

2. (a) 10

$$EOQ = \sqrt{\frac{2 \times 10,000 \times ₹250}{₹5}} = 1,000 \text{ chips}$$

$$\text{Number of deliveries} = \frac{\text{Annual Demand}}{EOQ} = \frac{10,000}{1,000}$$

$$= 10$$

3. (d) 500 units

$$\text{Economic Order Quantity (EOQ)} = \sqrt{\frac{2 \times AD \times Ocpo}{Ccpupa}}$$

Where;

AD = Annual Demand,

Ocpo = Ordering cost per order,

ccpu = Carrying Cost per unit per annum

$$= \sqrt{\frac{2 \times 18,250 \text{ units} \times ₹50}{₹36.5 \times 20\%}}$$

$$= \sqrt{\frac{1825000}{7.3}} = 500 \text{ units}$$

4. (i) (d) 30,000 kg & 20,000 kg respectively

Monthly Production of X = 30000kgs

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

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

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





(ii) (a) 13,856 kg & 16,181 kg respectively

Calculation of Economic Order Quantity (EOQ):

$$\begin{aligned} \text{Material A} &= \sqrt{\frac{2 \times \text{Annual consumption} \times \text{Order cost}}{\text{Carrying cost per unit p.a.}}} \\ &= \sqrt{\frac{2 \times (30,000 \times 12) \times 1,200}{15\% \text{ of } 30}} = 13,856 \text{ kg.} \\ \text{Material B} &= \sqrt{\frac{2 \times (20,000 \times 12) \times 1,200}{5\% \text{ of } 44}} = 16,181 \text{ kg.} \end{aligned}$$

(iii) (b) 12,000 kg.

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

$$= \frac{30,000}{25} \times 10 \text{ days} = 12,000 \text{ kg.}$$

(b) Maximum Stock Level for Material A:

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

Where, Re-order Quantity = 15,000 kg.

Re-order level = Max. Consumption* x Max. Lead time

$$\text{Maximum stock Level} = 15,000 \text{ kg.} + 2,400 \text{ kg.} - \left(\frac{30,000}{25} \times 1 \text{ days} \right)$$

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) Loss of ₹ 3,21,201

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 (₹1200 × 30)	₹36,000 (₹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 × Average Re- order Period)

= 2400 - (1200 × 1.5) = **600 kgs**

Re-order level = Max. Consumption* × Max. Lead time

= $\frac{30,000}{25} \times 2 \text{ days} = 2,400 \text{ kg.}$

Average Consumption Rate = $\frac{\left(\frac{30,000}{25} + \frac{30,000}{25}\right)}{2} = 1,200 \text{ Kg}$

Average Re-order Period = $\frac{(1+2)}{2} = 1.5 \text{ days}$



5. **1.(c) 40,000**

Annual Demand of finished goods	24,000
Less: Opening Stock	(4,000)
Annual Demand of finished goods to manufacture	20,000
× Kgs required per unit	2 kgs
Annual demand of raw material	40,000
÷ yield	80%
Annual demand of raw material	50,000
(-) Opening Stock of raw material;	(10,000)
Annual demand of raw material to buy	40,000

2.(a) Order Quantity as per the current inventory policy units 10,000 units & Economic

Order Quantity 1,000

Current order size : Quaterly basis

40,000 kgs - 4 Quarters

∴ per quarter : $\frac{40,000}{4} = 10,000$ kgs.

$$\text{EOQ} : \sqrt{\frac{2 \times \text{Annual Demand} \times \text{CCPO}}{\text{CCPU}}} = \sqrt{\frac{2 \times 40,000 \times 125}{10}}$$

$$= 1000 \text{ kgs}$$

3.(b) Savings from EOQ as compared to current discount policy - ₹ 20,500

Total Variable Cost (TVC) @ EOQ Total Variable Cost (TVC)

EOQ = 1000 kgs

@ Current terms Order size = 10,000 kgs.

$$\text{TOC} : \frac{\text{Annual Demand}}{\text{EOQ}} \times \text{CCPO}$$

$$\text{TOC} : \frac{\text{Annual Demand}}{\text{Ordersize}} \times \text{CCPO}$$

$$: \frac{40,000}{1000} \times 125 = 5000$$

$$= \frac{40,000}{10000} \times 125 = 500$$

$$\text{TCC} = \text{TOC} @ \text{EOQ} = 5000$$

$$\text{TCC} = \frac{1}{2} \times \text{ordersize} \times \text{CCPU} = \frac{1}{2} \times 10,000 \times 10 = 50000$$

$$= 40000 \times 20 = 8,00,000$$

Mat. purchase cost =

$$\text{Total Cost} = 8,10,000$$

$$= 40000 \times 20 - 2.5\% = \underline{780,000}$$

$$\text{Total Variable Cost} = 830,500$$

Therefore Extra Cost : 8,30,500 - 8,10,000 = 20,500/-

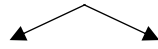




4.(b) ₹ 6,400

Time allowed: $180 + 20 = 200$ hrs (given)

Time taken - 125 F.G. - 1 hr



for 20,000 F.G. 160 hrs.

∴ Time saved : 200 hrs - 160 hrs = 40 hrs

Rate/hr - 200 /hr

Bonus as per rowan:

$$\text{Bonus} = \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \right) \text{rate/hr}$$

$$= \left(\frac{40}{200} \times 160 \right) 200$$

$$= 6400$$

5.(b) ₹ 5,600

Total Labour cost under the current scheme

$$\text{Basic} : 180 \text{ hrs} \times 200 \text{ /hr} = 36,000$$

$$\text{Overtime} : 20 \text{ hrs} \times 400 \text{ /hr} = 8,000$$

$$\underline{44,000}$$

Earnings as per rowan:

$$\text{Earnings} = \text{hours worked} \times \text{rate/hr} + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \right) \text{rate/hr}$$

$$= 160 \times 200 + \left(\frac{40}{200} \times 160 \right) 200$$

$$= 38400$$

$$\text{Savings} = 44,000 - 38,400 = 5,600/-$$



6. **1.(a) 13,04,500**

Working notes:

Factory cost (33,00,000 × 0.25) INR 8,25,000

Add: Freight (50,000 × 0.25) INR 12,500

F.O.B. (Free On Board) INR 8,37,500

Containers (2,00,000 × 0.25) INR 50,000

Insurance (1,500 × 75) INR 1,12,500

Ocean freight (2,000 × 75) INR 1,50,000

CIF (Cost, Insurance and Freight) = 8,37,500 + 1,12,500 + 1,50,000

= INR 11,00,000

Custom duty = 20% × 11,00,000 = INR 2,20,000

IGST = 18% × (11,00,000 + 2,20,000)

= INR 2,37,600

Penalty = INR 15,000

Commission

Indian = 6% × 8,25,000 = INR 49,500

Srilankan = 12% × 8,25,000 = INR 99,000

Particulars	Amount (INR)
Factory cost	8,25,000
Containers (50,000-38,000)	12,000
Insurance	1,12,500
Ocean freight	1,50,000
Freight inwards	12,500
Commission (49,500+99,000)	1,48,500
Custom duty non-refundable 20%* 2,20,000	44,000
TOTAL	13,04,500

2.(a) INR 90.28

Good units = 8,000* (1-5%) = 7,600 UNITS

Normal loss to be absorbed in good units. No abnormal loss.





Particulars	Product Zenga (INR)
Factory cost	4,50,000
Other cost except commission, insurance and custom duty to be absorbed on the basis of quantity i.e. 12:8 or 3:2 $(12,000+1,50,000+12,500)*2/5$	69,800
Commission, insurance and custom duty to be absorbed on value basis 15:18 or 5:6 $(1,48,500+1,12,500+44,000)*6/11$	1,66,363.63
Total Cost	6,86,163.63
Number of good units	7,600 units
Per unit Cost	90.28

3.(b) INR 54.24

Good units = $12000 * (1-5\%) = 11400$ units

Particulars	Product Xendga (INR)
Factory cost	3,75,000
Other cost except commission, insurance and custom duty to be absorbed on the basis of quantity i.e. 12:8 or 3:2 $(12,000+1,50,000+12,500)*3/5$	1,04,700
Commission, insurance and custom duty $(1,48,500+1,12,500+44,000)*5/11$	1,38,636.36
Total Cost	618,336.36
Number of good units	11,400 units
Per unit Cost	54.24

4.(a) INR 4,13,600

Custom duty $80\% \times 2,20,000 = 1,76,000$

Add: IGST = 2,37,600

4,13,600



5.(c) INR 14,178.4

Normal loss upto 8%

Abnormal loss 1%

Total cost of xendga INR 6,18,336.36

Total cost of zenga INR 6,86,163.63

Particulars	XENGDA (INR)	ZENGA (INR)	(INR)
Normal loss of 8%	960 units	640 units	
Good units after normal loss	11,040 units	7,360 units	
Per unit cost to be absorbed in good units (total costs/no of good units after normal loss)	56 (6,18,336.36/11,040)	93.23 (6,86,163.63/7,360)	
Abnormal loss in units 1%	120 units	80 units	
Loss in Profit & Loss	56 x 120 = 6,720	93.23 x 80 = 7,458.4	14,178.4

7. i.(a) ₹ 25,000 & it will not be deducted from the material cost

List Price	2,50,000
(-) Trade discount 10% of List Price	(25,000)
Net Price	2,25,000

Cash Discount 10% of 2,25,000 = 22,500 to be deducted.

ii.(b) ₹ 6,280.00 & it will be added with the material cost

Particulars	Units	(₹)
Listed price of Materials	5,000	2,50,000
Less: Trade discount @10% on invoice price		(25,000)
Net		2,25,000
Add: GST @18% of ₹ 2,25,000		40,500
		2,65,000



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 $\left(\frac{₹3,07,720}{98\%} \times 2\%\right)$		6,280	
Total cost of Material		3,14,000	
Less: Shortage material due to normal reasons @20%	1,000	-	
Total cost of material of goods units	4,000	3,14,000	
Cost per unit (₹ 3,14,000/4,000 units)		₹ 78.5	

iii.(b) ₹ 40,500 & it will be added with material cost

Axe Traders in 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) ₹ 3,14,000

Please refer the solution above

v.(c) 4,000 units & ₹ 78.50

Please refer the solution above

8. 1.(c) 1,694 units

$$\sqrt{\frac{2 \times \text{Annual Demand} \times \text{Ordering cost per order}}{\text{Carrying cost p.u.p.a}}}$$

$$\sqrt{\frac{2 \times 36000 \times 600}{15}} = 1697 \text{ units}$$

2.(c) 4,000 units

Minimum stock level = Re-order level - (Avg cons × Avg LT)

= 4500 - (100 units × 5 days)

= 4000 units



3.(c) 5000 units

Average stock level:

$$\text{Average stock level} = \frac{\text{Min.stock level} + \text{Max stock level}}{2}$$

$$= \frac{4000 + 6000}{2} = 5000$$

9. **1.(d) 89.8**

Annual demand of FG (x) - 3000 × 4 Qtr	= 12000 units	
(-) Opening Stock	500 units	
A.D. of FG to manufacture	11500	
× Kgs required of raw material (y)	2 kgs	
Total raw material required	23000 kgs	
(-) Opening stock	(1000 kgs)	
Raw materials to buy	22000 kgs	

$$EOQ = \sqrt{\frac{2 \times AD \times OCPO}{CCpupa}}$$

$$700 = \sqrt{\frac{2 \times 22000 \times 1000}{CCpupa}}$$

$$700^2 = \frac{2 \times 22000 \times 1000}{CCpupa}$$

$$490,000 = \frac{4,40,00,000}{CCpupa}$$

$$\therefore CCpupa = \frac{4,40,00,000}{490,000}$$

$$\therefore CCpupa = 89.79 \text{ or } 89.8$$



3 Employee Costs & Direct Expenses

1. S.G Co. Ltd. Supplies you the following information: -
- | | |
|---|-----|
| No. of workers at the beginning of the year | 400 |
| No. of workers at the end of the year | 500 |
| No. of workers resigned | 35 |
| No. of workers discharged | 10 |
| No. of replaced workers | 40 |
- The Labour Turnover Rate under Flux Method will be
- | | |
|-----------------|-------------------|
| (a) 7.77% or 8% | (b) 2.22% |
| (c) 8.88% or 9% | (d) 18.88% or 19% |
2. Hourly rate of wages guaranteed 0.50 paisa per hour.
Standard time for producing one dozen articles - 3 hours.
Actual time taken by the workers to produce 20 dozen articles - 48 hours.
Earnings under Rowan Will be:
- | | |
|----------|----------|
| (a) 28.8 | (b) 30 |
| (c) 26 | (d) 29.4 |
3. The cost accountant of Y Ltd. has computed labour turnover rates for the quarter ended 31st March, 2009 as 5% under 'Replacement method' If the number of workers replaced during that quarter is 30, find out the number of average workers on payroll.
- | | |
|--------|----------|
| (a) 6 | (b) 600 |
| (c) 60 | (d) 6000 |
4. A worker takes 15 hours to complete a piece of work for which time allowed is 20 hours. His wage rate is ₹ 5 per hour. Following additional information are also available:
- | | |
|-----------------------|---------------|
| Material cost of work | ₹ 50 |
| Factory overheads | 100% of wages |
- Calculate the factory cost of work under the following methods of wage payments:
- | | |
|-----------------------------------|---------------------------------|
| (i) Rowan Plan | (ii) Halsey Plan |
| (a) Rowan - 103.75 & Halsey 108.5 | (b) Rowan - 93.75 & Halsey 87.5 |
| (c) Rowan - 83.75 & Halsey 77.5 | (d) Rowan - 94.75 & Halsey 85.5 |

5. 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:

- (i) The number of workers recruited and joined; and
 - (ii) The number of workers left and discharged.
- (a) Recruited & joined - 450 & Left & Discharged 27
 - (b) Recruited & joined - 27 & Left & Discharged 27
 - (c) Recruited & joined - 36 & Left & Discharged 27
 - (d) Recruited & joined - 63 & Left & Discharged 27

6. 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

7. The board of the J Ltd. has been appraised by the General Manager (HR) that the employee attrition rate in the company has increased. The following facts has been presented by the GM(HR):

- (1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.
- (2) 20% of the output during training period was defective. Cost of rectification of a defective unit was 25.
- (3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.
- (4) Selling price per unit is 180 and P/V ratio is 20%.
- (5) Settlement cost of the workers leaving the organization was 1,83,480.
- (6) Recruitment cost was 1,56,340
- (7) Training cost was 1,13,180

You being an associate finance to GM(HR), has been asked the following questions:

- (1) How much quantity of output is lost due to labour turnover?
 - (a) 10,000 units
 - (b) 8,000 units
 - (c) 12,000 units
 - (d) 12,600 units

- (2) How much loss in the form of contribution, the company incurred due to labour turnover?
- (a) ₹ 4,32,000 (b) ₹ 4,20,000
(c) ₹ 4,36,000 (d) ₹ 4,28,000
- (3) What is the cost repairing of defective units?
- (a) ₹ 75,000 (b) ₹ 15,000
(c) ₹ 50,000 (d) ₹ 25,000
- (4) Calculate the profit lost by the company due to increased labour turnover.
- (a) ₹ 7,50,000 (b) ₹ 15,00,000
(c) ₹ 5,00,000 (d) ₹ 9,00,000
- (5) How much quantity of output is lost due to inexperience of the new worker?
- (a) 1,000 units (b) 2,600 units
(c) 2,000 units (d) 12,600 units

8. Green Manufacturing Ltd. is a medium-sized manufacturing company that uses different wage incentive schemes to motivate its workers. The company recently adopted the Halsey Piece Rate System for its production workers in Division A and the Rowan Piece Rate System for its workers in Division B. Both divisions manufacture similar products but differ in performance, employee turnover, and worker satisfaction.

In Division A (Halsey system), the standard time to complete a job is 5 hours, and the hourly rate is ₹100. An employee named Ravi completes the job in 4 hours. Under the Halsey scheme, the worker is entitled to 50% of the time saved, which directly influences Ravi's total earnings.

In Division B (Rowan system), the standard time to complete a job is 6 hours, and the hourly rate is also ₹100. An employee named Sita completes the job in 5 hours. The Rowan scheme provides a proportionate increase in wages based on the time saved relative to the standard time, affecting Sita's total earnings. Employee Turnover has also been a point of concern for Green Manufacturing Ltd. In Division A, the employee turnover ratio stands at 20%, while Division B has a lower employee turnover ratio of 15%. Management is evaluating whether the incentive schemes are influencing worker retention and overall productivity.

Furthermore, the company conducted an employee satisfaction survey. In Division A, 65% of workers reported feeling dissatisfied with the incentive system, citing that they don't feel adequately rewarded for their performance. On the other hand, Division B's satisfaction level was much higher, with 85% of employees expressing satisfaction with the Rowan system, indicating a potential correlation between the wage system and employee retention.

1. Calculate Bonus to be paid to Ravi as per Rowan system

(a) ₹ 70

(b) ₹ 60

(c) ₹ 50

(d) ₹ 80

2. Calculate effective hourly rate of Sita

(a) ₹ 111

(b) ₹ 110

(c) ₹ 117

(d) ₹ 120

9. ABC Manufacturing Ltd. employs 500 workers. Over the past year, 80 employees left the company (30 were separations, and 50 were replacements). The company has also been analyzing labor efficiency using both the Halsey and Rowan plans to incentivize workers.

- Total wages paid under the time-rate system: ₹2,00,000.
- The standard time to produce 100 units is 50 hours.
- Worker A took 40 hours to complete 100 units.
- Time rate: ₹50 per hour.

Based on the given case, answer the following:

1. What is the Labour Turnover Rate using the Flux Method?

(a) 10%

(b) 16%

(c) 18%

(d) 20%

2. What is the Separation Rate?

(a) 5%

(b) 6

(c) 10%

(d) 12%

3. If Worker A is paid under the Halsey Plan with a 50% bonus, what is Worker A's total earnings for producing 100 units?

(a) ₹2,250

(b) ₹2,500

(c) ₹2,750

(d) ₹3,000

4. If Worker A is paid under the Rowan Plan, what will be his total earnings for producing 100 units?

(a) ₹2,400

(b) ₹2,500

(c) ₹2,600

(d) ₹2,700

ANSWERS:

1. (d) 18.88% or 19%

Calculation of average no. of workers during the period:-

Average no. of workers

$$= \frac{(\text{No. of workers in the beginning of the period} + \text{No. of workers at the end of the period})}{2}$$

$$= \frac{(400 + 500)}{2}$$

$$= 450$$

Labour Turnover Rate =

$$= \frac{(\text{No. of workers left during the period} + \text{No. of workers replaced during the period})}{(\text{Average no. of workers during the period})} \times 100$$

$$= \frac{(45 + 40)}{450} \times 100 = 18.8\%$$

2. (a) 28.8

A. Wage rate per hour = 0.50

B. Standard time allowed = 3 hours per dozen

C. Actual production = 20 dozens

D. Standard time allowed for 20 dozens [B x C] 3 hours x 20 dozens = 60 hours

E. Actual time taken to produce 20 dozens = 48 hours

F. Time saved [D - E] = 60 - 48 = 12 hours

Earnings =

Under Rowan Plan

$$(\text{Actual Time Taken} \times \text{Time Rate}) + \left[\text{Time saved} \times \left(\frac{\text{Time taken}}{\text{Time allowed}} \right) \times \text{time rate} \right]$$

$$= (48 \text{ hours} \times 0.50) + \left[12 \times \left(\frac{48}{60} \right) \times 0.50 \right]$$

$$= (48 \text{ hours} \times 0.50) + (12 \times (48/60) \times 0.50]$$

$$= 24 + 4.80$$

$$= \text{Rs. } 28.80$$

3. (b) 600

Average number of workers on payroll:

$$\text{Labour turnover rate (Replacement method)} = \frac{\text{Number of workers replaced}}{\text{Average number on payroll}} \times 100$$

$$\text{or, } \frac{5}{100} = \frac{30}{\text{Average number on payroll}}$$

$$\text{Or, Average number of workers on payroll} = \frac{30 \times 100}{5} = 600$$

4. (b) Rowan - 93.75 & Halsey 87.5

	₹
(i) Rowan Plan: Normal time wage = 15 hours @ 5 /hr	75
Bonus = $\left[\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \right] \text{rate/hr} = \left[\frac{5}{20} \times 15 \right] 5$	18.75
	93.75
(ii) Halsey Plan: Normal time wage = 15 hours @ 5/hr	75
Bonus = 50% of (Time saved) rate/hr 50% (5 hrs) x 5/hr	12.5
	87.5

5. (c) Recruited & Joined 36 & left 27

$$\text{Labour Turnover Rate (Replacement method)} = \frac{\text{No. of workers replaced}}{\text{Average No. of workers}}$$

$$\text{Or, } \frac{8}{100} = \frac{36}{\text{Average No. of workers}}$$

$$\text{Or, Average No. of workers} = 450$$

$$\text{Labour Turnover Rate (Separation method)} = \frac{\text{No. of workers separated}}{\text{Average No. of workers}}$$

$$\text{Or, } \frac{6}{100} = \frac{\text{No. of workers separated}}{450}$$

$$\text{Or, No. of workers separated} = 27$$

$$\begin{aligned} \text{Labour Turnover Rate (Flux Method)} \\ = \frac{\text{No. of separations} + \text{No. of accession (Joinings)}}{\text{Average No. of workers}} \end{aligned}$$

$$\text{Or, } \frac{14}{100} = \frac{27 + \text{No. of accession (Joinings)}}{450}$$

$$\text{Or, } 100 (27 + \text{No. of Accessions}) = 6300$$

$$\text{Or, No. of Accessions} = 36$$

(i) The No. of workers recruited and joined = 36

(ii) The No. of workers left and discharged = 27

6. **(a) 2 hours**

Let the time taken be x

Time Allowed = 8 hrs (given)

Time Taken = x hrs

Time saved = $(8 - x)$ hrs

Rate/hr = 60

Wages = 420.

Earnings as per halsey

Earnings = hrs worked \times rate/hr + [50% Time saved \times rate/hr]

$$420 = x \times 60 + 50\% (8 - x) \times 60$$

$$420 = 60x + (8 - x)30$$

$$420 = 60x + 240 - 30x$$

$$420 - 240 = 30x$$

$$180 = 30x$$

$$\therefore x = 6 \text{ hrs.}$$

Time saved will be $8 - x$ hrs i.e. $8 - 6$ hrs = 2 hrs

7. **(c) 12,000 units**

if 50,000 hrs were by experienced workers, output would have been (50,000hrs/10 hrs)	5,000 units
but output by inexperienced workers in 50,000 hrs $\frac{50,000 \text{ hrs}}{16.666 \text{ hr}}$	3,000 units
10 hrs \swarrow 60% work \searrow 100% work $\therefore \uparrow$	
16.6666 hr	
\therefore Output lost due to inexperience of new worker	2,000 units
Output Lost due to delay in filling various 100,000 hrs/10 hrs pu	10,000 units

Total output lost	12,000 units
	× 180 pu
	× 20%
Loss of contribution	4,32,000
Defective rectification cost (3000 units × 20% × 25)	15,000
Recruitment	1,56,340
Settlement	1,83,480
Training	1,13,180
Total Loss due to employee turnover	9,00,000

2. (a) ₹ 4,32,000 - refer working note above

3. (b) ₹ 15,000 - refer working note above

4. (a) ₹ 9,00,000 - refer working note above

5. (c) 2,000 units - refer working note above

8. 1.(d) ₹ 80

Time allowed - 5 hours

Time taken - 4 hours

Time saved - 1 hour

rate /hr - 100/hr

$$\begin{aligned} \text{Bonus Under rowan :} &= \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \right) \text{rate/hr} \\ &= \left(\frac{1}{5} \times 4 \right) 100 \\ &= 80 \end{aligned}$$

2.(c) ₹ 117

Time allowed - 6 hours

Time taken - 5 hours

Time saved - 1 hour

Rate/hr - 100

Earnings under rowan,

$$\text{Earnings} = \text{hours worked} \times \text{rate/hr} + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \right) \text{rate/hr}$$

$$= 5 \times 100 + \left(\frac{1}{6} \times 5 \right) 100$$

$$= 583.33$$

$$\therefore \text{Effective hourly rate} = \frac{583.33}{5 \text{ hours}} = 116.66 \text{ or } 117$$

5 hours

9. **1. (b) 16%**

workers @ the beginning - 500

workers @ the end -

@the beginning - 500

Less: Left - (30)

Add: replaced - 50

workers @ the end - 520

Average number of workers - $\frac{\text{@the beginning} + \text{@ the end}}{2}$

$$= \frac{500 + 520}{2} = 510$$

Flux method: $\frac{\text{separated} + \text{replaced} + \text{newly recruited}}{\text{Average no. of workers}}$

$$= \frac{30 + 50 + 0}{510} \times 100 = 15.68\% \text{ or } 16\%$$

2. (b) 6%

Separation method = $\frac{\text{no. of workere separated}}{\text{Average no. of workers}} \times 100$

$$= \frac{30}{510} \times 100 = 5.88\% \text{ or } 6\%$$

3.(a) ₹ 2,250

Time allowed : 50hrs

Time taken : 40 hrs

Time saved : 10 hrs

rate /hr : 50/hr

Earnings under halsey:

$$\begin{aligned}\text{Earnings} &= \text{hrs worked} \times \text{rate/hr} + (50\% \times \text{time saved} \times \text{rate/hr}) \\ &= 40 \times 50 + 50\% \cdot (10) \times 50 \\ &= 2,250\end{aligned}$$

4. (a) ₹ 2,400

Time allowed: 50hrs

Time taken : 40 hrs

Time saved : 10 hrs

rate /hr : 50/hr

Earnings under Rowan:

$$\begin{aligned}\text{Earnings} &= \text{hrs wkd} \times \text{rate/hr} + \left(\frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \right) \text{rate/hr} \\ &= 40 \times 50 + \left(\frac{10}{50} \times 40 \right) 50 \\ &= 2,400\end{aligned}$$



1. The following data relate to the overhead expenditure of a contract cleaner at two activity levels:

Square meters cleaned	6,375	7,550
Overheads	₹ 36,975	₹ 41,792.5

What is the estimate of the overheads if 8,100 square meters are to be cleaned?

- (a) 44047.5 (b) 44074.5 (c) 44704.5 (d) 47074.5

2. 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

3. 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

Sales:

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



4. ABC Manufacturing allocates its factory overhead costs based on machine hours. The total estimated overhead cost for the year is ₹ 6,00,000, and the company expects to use 30,000 machine hours. During the year, job A used 300 machine hours. What amount of overhead costs should be allocated to this job?

- (a) ₹ 4,000 (b) ₹ 6,000
(c) ₹ 10,000 (d) ₹ 8,000

5. 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

6. Litto Ltd. is a manufacturing company which has as a machine shop cost centre that contains three machines of equal capacities. To operate these three machines nine operators are required i.e. three operators on each machine. Operators are paid ₹ 20 per hour. The factory works for forty eight hours in a week which includes 4 hours set up time. The work is jointly done by operators. The operators are paid fully for the forty eight hours. In addition they are paid a bonus of 10 per cent of productive time. Costs are reported for this company on the basis of thirteen four-weekly periods

- The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available:
- Depreciation 10% per annum on original cost of the machine. Original cost of each machine is ₹ 52,000.
- Maintenance and repair per week per machine is ₹ 60.
- Consumable stores per week per machine are ₹ 75.
- Power: 20 units per hour per machine at the rate of 80 paise per unit. No power is used during the set-up hours.



Apportionment to the cost centre: Rent per annum ₹ 5,400, Heat and Light per annum ₹ 9,720, foreman's salary per annum ₹ 12,960 and other miscellaneous expenditure per annum ₹ 18,000.

i. What is the effective machine hour for four-week period?

- (a) 170 hours (b) 176 hours
(c) 189 hours (d) 192 hours

ii. What is the bonus charges and power expenses for four-week period?

- (a) ₹ 1,056 and ₹ 2,816 (b) ₹ 1,562 and ₹ 3,560
(c) ₹ 1,240 and ₹ 3,325 (d) ₹ 860 and ₹ 2,450

iii. What is the machine expenses for four-week period?

- (a) ₹ 10,000 (b) ₹ 17,914
(c) ₹ 15,944 (d) ₹ 15,024

v. What is the machine hour rate?

- (a) ₹ 99.51 (b) ₹ 92.25
(c) ₹ 105.22 (d) ₹ 86.90

7. XYZ Ltd. manufactures two products, A and B, in its factory, which has three departments: two production departments (Machining and Assembly) and one service department (Maintenance). The following details are provided for the apportionment and accounting of overheads:

- Machining department overheads: ₹ 1,50,000
- Assembly department overheads: ₹ 75,000
- Maintenance department overheads: ₹ 40,000
- Machine hours in the Machining department: 5,000 hours
- Labour hours in the Assembly department: 10,000 hours
- The overheads of the Maintenance department are to be reapportioned to Machining and Assembly departments in the ratio 3 : 2.
- Additional Information:
- Product A uses 1,200 machine hours and 3,000 labour hours.
- Product B uses 800 machine hours and 2,000 labour hours.



1. What is the Machine Hour Rate for the Machining department?

- (a) ₹ 35 per hour (b) ₹ 36.40 per hour
(c) ₹ 34.80 per hour (d) ₹ 32.60 per hour

2. What is the total overhead cost allocated to Product A?

- (a) ₹ 69,060 (b) ₹ 68,060
(c) ₹ 70,900 (d) ₹ 69,090

8. ABC Manufacturing Ltd. maintains separate financial and cost accounting records. The company uses absorption costing for its cost accounting system. The following information is available for the month of September:

- Total overheads incurred (financial accounts): ₹1,50,000
- Total overheads absorbed (cost accounts): ₹1,40,000
- Direct materials cost: ₹80,000
- Direct labour cost: ₹60,000
- Selling and distribution overheads: ₹20,000
- Administrative overheads: ₹15,000

Over/under absorption of overheads: Not adjusted in the cost accounts for September.

At the end of the month, a reconciliation statement is prepared to compare the profit as per the cost accounts with the profit in the financial accounts. The cost accounts do not account for over/under-absorbed overheads directly, but it is adjusted in the reconciliation statement.

1. What is the amount of over/under absorption of overheads for September?

- (a) ₹ 5,000 Over-absorbed (b) ₹ 10,000 Over-absorbed
(c) ₹ 10,000 Under-absorbed (d) ₹ 5,000 Under-absorbed

2. If the profit as per the cost accounts is ₹ 50,000 before reconciliation, what will be the reconciled profit after adjusting for the under-absorbed overheads?

- (a) ₹ 40,000 (b) ₹ 50,000 (c) ₹ 45,000 (d) ₹ 60,000

3. In overhead accounting, what would typically happen if overheads are consistently under-absorbed?

- (a) The company may need to increase its overhead absorption rate
(b) The company should decrease its overhead absorption rate
(c) The company will always show higher profits in cost accounts
(d) There is no need to adjust the overhead absorption rate



ANSWERS

1. (a) ₹ 410

1. Variable overheads per square metre:

$$\text{Extra m}^2 \text{ cleaned} = 7,550 - 6,375 = 1,175$$

$$\text{Extra overhead cost} = ₹ 41792.5 - ₹ 36,975 = ₹ 4817.5$$

$$\text{Variable overhead per m}^2 = \frac{4,817.5}{1,175} = ₹ 4.10$$

2. Fixed overhead:

	₹
Total overheads of cleaning 6375 m ²	36,975
Variable overheads = 6375 × ₹ 4.10	<u>26,137.5</u>
∴ Fixed overhead (₹ 36,975 - ₹ 26,137.5)	<u>10,837.5</u>

3. Total overheads for 8100 m²:

	₹
Variable overhead = 8100 × ₹ 4.10	33,210
Fixed overhead	10,837.5
Total Overheads	<u>44,047.5</u>

2. (a) Overabsorbed by ₹ 25,000

$$\text{Predetermined Overhead Rate} = \frac{\text{Budgeted Overhead}}{\text{Budgeted hours}}$$

$$\text{i.e. } \frac{130,000}{8,000} = ₹ 16.25 \text{ per hour.}$$

$$\text{Hence, absorbed overhead} = 10,000 \text{ hrs} \times 16.25 = ₹ 1,62,500.$$

Since actual overhead incurred were ₹ 1,37,500

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



3. (i) (d) ₹ 840

Budgeted Machine hour rate (Blanket rate)

$$= \frac{₹50,40,000}{₹6,000\text{hours}} = ₹840\text{perhour}$$

(ii) (a) ₹ 25,20,000

(iii) (a) 1,18,000 over-absorbed

	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) ₹ 0.472 per unit

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

$$= ₹ 1,18,000 \times 40\% = ₹ 47,200.$$

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

(v) **(c) ₹ 18,880**

Apportionment of over absorbed production overheads over WIP, Finished goods and Cost of sales:

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

4. **(b) ₹ 6,000**

Budgetd Overheads = $\frac{6,00,000}{30,000 \text{ hrs}} = 20 / \text{hr}$

For Job: 300 m/c hrs × 20/hr = ₹ 6,000

5. **(b) 8,800 under absorbed**

Budgeted overheads = $\frac{₹ 525,000}{17,500} = 30 / \text{machine hr}$

Amount recovered (17,040 m/c hrs × 30/ m/c hr) ₹ 5,11,200

Amount incurred ₹ 5,20,000

Under-absorbed ₹ 8,800



6. Statement showing TC for one machine, four weeks

Operator's wages	12,576
Depreciation $\frac{52000 \times 10\%}{52 \text{ weeks}} \times 4 \text{ weeks}$	400
Maint. (60/week \times 4 weeks)	240
Stores (75/ weeks \times 4 weeks)	300
Power (44 hrs/ week \times 4 weeks \times 20 units \times 0.8)	2,816
Apportioned Costs: Rent 5,400	
Heat 9,720	
Salary 12,960	
Other Misc 18,000	
$\frac{46,080}{52 \text{ weeks}} \times 4 \text{ weeks} \times \frac{1}{3} \text{ machines}$	1,182
Total Cost	17,514
\div Productive hrs. rate [48 hrs - 4 hrs \times 4 weeks]	176 hrs
Machine hour rate	99.51

Operator's wages : 52.4 hrs/week \times 4 weeks \times 30 prs \times 20/hr

↑

[48 hrs + 10% of 44 hrs] {Bonus hours}

i) (b) 176 hours

refer basic solution above

ii) (a) ₹ 1,056 and ₹ 2,816

bonus : 44 hrs \times 10% = 4.4 hrs/week \times 4 weeks \times 3 operators \times 20/hr

= 1056

power : 2816 - refer working above

iii) (b) - refer solution above

iv) (a) ₹ 99.51

refer Solution above



7. **1. (c) ₹ 34.80 per hour**

	Maintenance Dept.	Machining Dept.	Assembly Dept.
O/H as per primary distribution	₹ 40,000	₹ 1,50,000	₹ 75,000
Reapportion Maint. Dept (3:2)	(₹ 40,000)	₹ 24,000	₹ 16,000
O/H as per Secondary distribution	-	₹ 1,74,000	₹ 91,000
÷ hours		5000	10,000
		{ Machine hours }	{ Labour hours }
rate/hr		{ 34.8/hr }	{ 9.1/hr }

2. (a) ₹ 69,060

Total overhead Cost of Product A.

Product A: $1200/\text{m/c hrs} \times 34.8/\text{hr} +$

$3000/\text{Lab. Hrs} \times 9.1 \text{ hr} \quad \quad \quad \text{₹ 69,060}$

8. **1. (c) ₹ 10,000 Under-absorbed** ₹

Overheads incurred 1,50,000

Overheads absorbed 1,40,000

Overheads under - absorbed 70,000

2. (a) ₹ 40,000 ₹

Profit as per cost accounts 50,000

Less: Under - absorbed overheads (10,000)

Profit as per financial books 40,000

3. (a) The company may need to increase its overhead absorption rate.

5 Activity Based Cost sheet



1. 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

2. One of Pintu Company's cost pools is parts administration. The budgeted overhead cost for that cost pool was ₹ 4,00,000 and the expected activity was 4,000 part types. The actual overhead cost for the cost pool was ₹ 4,20,000 at an actual activity of 5,000 part types. The activity rate for that cost pool was:

- (a) ₹ 80 per part type (b) ₹ 100 per part type
(c) ₹ 105 per part type (d) ₹ 84 per part type

3. A company uses Activity-Based Costing (ABC) to allocate overheads. The overhead costs are divided into three cost pools with the following data:

- Machine setup: ₹100,000 (20 setups)
- Quality inspection: ₹150,000 (30 inspections)
- Material handling: ₹ 50,000 (5,000 material movements)

Product A requires 2 setups, 5 inspections, and 1,000 material movements.(500 units)

1. What is the total overhead cost allocated to Product A?

- (a) ₹20,000 (b) ₹30,000
(c) ₹45,000 (d) ₹40,000

2. If the company wants to price Product A at 25% above its total cost and the direct cost is ₹100 per unit, what should be the selling price of Product A?

- (a) ₹162.50 (b) ₹237.50
(c) ₹180.00 (d) ₹200.00



3. If the number of material movements increases to 1,500 for Product A, what will be the revised total overhead cost for Product A?
- (a) ₹62,500 (b) ₹35,000
(c) ₹50,000 (d) ₹40,000
4. If machine setup costs increase by 10%, and the company produces 500 units of Product A, what will be the per-unit overhead cost increase?
- (a) ₹10 (b) ₹20
(c) ₹30 (d) ₹40

ANSWERS

1. (c) A = ₹ 1,60,000; B = ₹ 3,75,000

Activity	Activity Cost Pool	Cost Driver	Cost Driver Volume	Cost Driver rate
Ordering cost	4,00,000	No. of orders	320 (100 + 220)	1250/order
Delivery cost	1,35,000	No. of deliveries	270 (70 + 200)	500/delivery

	A	B
Ordering cost	1,25,000 (1250 × 100)	2,75,000 (11,250 × 220)
Delivery cost	35,000 (500 × 70)	1,00,000 (500 × 200)
Total cost	1,60,000	3,75,000

2. (b) ₹ 100 per part type

$$\text{Cost driver rate} = \frac{\text{Activity cost Pool}}{\text{Cost driver Volume}} = \frac{400000}{4000} = 100/\text{part type}$$





3.

Activity	Activity Cost Pool	Cost Driver	Cost Driver Volume	Cost Driver rate
Machine Setup	1,00,000	Setups	20	5000/setup
Quality Inspections	1,50,000	Inspections	30	5000/inspection
Material handling	50,000	Material movements	5000	10/movement

1. (c) ₹ 45,000

Set up (2 × 5000)	₹ 10,000
Quality Inspections (5 × 5000)	₹ 25000
Material movements (1000 × 10)	₹ 10,000
Total overhead costs	₹ 45,000

2. (b) ₹ 237.50

Direct costs (100 pu × 500 units)	₹ 50,000
Overheads (as above)	₹ 45,000
Total Costs	₹ 95,000
+ Profit @ 25% total cost	₹ 23,750
Total Sales	₹ 118,750
÷ Units	500
Selling Price per unit	₹ 237.5

3. (c) ₹ 50,000

Set up (2 × 5000)	₹ 10,000
Quality Inspections (5 × 5000)	₹ 25000
Material movements (1500 × 10)	₹ 15,000
Total overhead costs	₹ 50,000

4. (b) ₹ 20

Increase in setup costs = 1,00,000 × 10%	₹ 10,000
÷ Units	500
Increase in per unit overhead costs	₹ 20/-



1. What would be Prime cost from 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

(c) ₹ 1,50,000

2. M Ltd. is producing a single product and may expand into product diversification in next one to two years. M Ltd. is amongst a labour-intensive company where. majority of processes are done manually. Employee cost is a major cost element in the total cost of the company. The company conventionally uses performance parameters Earnings per manshift (EMS) to measure cost paid to an employee for a shift of 8 hours, and Output per manshift (OMS) to measure an employee's output in a shift of 8 hours.

The Chief Manager (Finance) of the company has emailed you few information. related to the last month. The email contains the following data related to the last month:

During the last month, the company has produced 2,34,000 tonnes of output.

Expenditures for the last months are:

(i) Raw materials consumed ₹ 50,00,000

(ii) Power consumed 13,000 Kwh @B per Kwh to run the machines for production.

(iii) Diesel consumed 2,000 litres 93 per litre to run power generator used as alternative or backup for power cuts.

(iv) Wages & salary paid - 6,40,00,000

(v) Gratuity & leave encashment paid - 64,20,000

(vi) Hiring charges paid for HEMM - 30,00,000. HEMM are directly used in production.

(vii) Hiring charges paid for cars used for official purpose - 66,000

(viii) Reimbursement of diesel cost for the cars - 22,000

(ix) The hiring of cars attracts GST under RCM 5% without credit.

(x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of dispatch) - 12,000

(xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of dispatch) and factory premises is 8,000 and 18,000 per month respectively.



(xii) TA/ DA and hotel bill paid for sales manager - 36,000

(xiii) The company has 1,800 employees works for 26 days in a month.

You are asked to calculate the following:

1. What is the amount of prime cost incurred during the last month:

- (a) ₹ 7,54,20,000 (b) ₹ 7,57,10,000
(c) ₹ 7,56,06,000 (d) ₹ 7,87,10,000

2. What is the total and per shift cost of production for last month:

- (a) ₹ 7,87,10,000 and 336.37 respectively
(b) ₹ 7,87,10,000 and 1,681.84 respectively
(c) ₹ 7,87,28,000 and 1,682.22 respectively
(d) ₹ 7,87,28,000 and 336.44 respectively

3. What is the value of administrative cost incurred during the last month:

- (a) ₹ 92,400 (b) ₹ 88,000
(c) ₹ 1,48,400 (d) ₹ 1,44,000

4. What is the value of selling and distribution cost and total cost of sales:

- (a) ₹ 36,000 & ₹ 7,88,76,400 respectively
(b) ₹ 56,000 & ₹ 7,88,76,400 respectively
(c) ₹ 36,000 & ₹ 7,88,72,000 respectively
(d) ₹ 56,000 & ₹ 7,88,72,000 respectively

5. What is the value EMS and OMS for the last month:

- (a) ₹ 1,504.70 & 5 tonnes respectively
(b) ₹ 1,367.52 & 5 tonnes respectively.
(c) ₹ 1,504.70 & 4.37 tonnes respectively
(d) ₹ 1,367.52 & 4.37 tonnes respectively



Answers

1. (b) ₹ 1,27,500

Direct material consumed	67,500
Direct labour	45,000
Direct Expenses	15,000
Prime Cost	1,27,500

2. Cost sheet for M. Ltd. for the month.

Raw Material consumed		50,00,000
Direct Labour	6,40,00,000	
Gratuity & leave encashment	64,20,000	7,04,20,000

Direct expenses:

Power 13000 kwh × 8/kwm	₹ 1,04,000	
Diesel 2000 Ltrs × 93 / Ltr	₹ 1,86,000	
Hiring charges for HEMM	₹ 30,00,000	32,90,000
Prime Cost		7,87,10,000
Factory overheads: AMC of CCTV @ Factory		18,000
Gross factory cost/Net factory cost/		7,87,28,000
Cost of production/Cost of goods sold.		

General Administration Overheads

Hirin charges for cars	66,000	
Reimbursement of dies	22,000	
	88,000	
+ GST on RCM basis @5% of 88000	4400	92,400

Selling & Distribution on Costs

Maintenance cost for weighing bridge	12000	
AMC cost for CCTV @ weighing bridge	8000	
TA/TD & hotel bill paid for sale manager	36000	56,000
Cost of Sales		7,88,76,400



1.(d) ₹ 7,87,10,000

refer solution above.

2.(c) ₹ 7,87,28,000 and 1,682.22 respectively

Cost of Production	7,87,28,000	(refer solution above)
÷ man shifts (1800 men × 26 days)	46800	
	1682.22	

3.(a) ₹ 92,400

General Administration Overheads

Hirin charges for cars	66,000
Reimbursement of diesel	22,000
	88,000
+ GST on RCM basis @ 5% of 88000	4400
Total General Admini O/H	92,400

4.(b) ₹ 56,000 & ₹ 7,88,76,400 respectively

Refer Solution above

5.(a) ₹ 1,504.70 & 5 tonnes respectively

Earnings per manshift = $\frac{\text{Total earnings for employees}}{\text{Total manshifts}}$

Total earnings (Direct Labour Cost)	₹ 7,04,20,000
÷ Total manshifts (1800 men × 2 days)	46,800
	₹ 1504.70

$\frac{\text{Total Output}}{\text{Total manshifts}} = \frac{2,34,000 \text{ tonnes}}{46,800}$ (given)

= 5 tonnes



1. The following information has been obtained from financial accounting and cost accounting records.

	Financial Accounting	Cost Accounting
	₹	₹
(i) Factory Overhead	94,750	90,000
(ii) Administrative Overhead	60,000	57,000
(iii) Selling Overhead	55,000	61,000
(iv) Opening Stock	17,500	22,500
(v) Closing Stock	12,500	15,000

Required:

Indicate under-recovery and over-recovery and their effects on cost accounting profit.

[Note: You are not required to prepare reconciliation statement.]

Answer

1.

	Financial Accounting	Cost Accounting	Difference	Under/Over recovery	Effect on Cost Accounting Profit	Net Effect on Cost Accounting Profit
	₹	₹				
(i) Factory Overhead	94,750	90,000	4,750	Under-recovery	Increased	To be reduced/deducted
(ii) Administrative Overhead	60,000	57,000	3,000	Under-recovery	Increased	To be reduced/deducted
(iii) Selling Overhead	55,000	61,500	-6,500	Over-recovery	Decreased	To be added
(iv) Opening Stock	17,500	22,500	-5,000	Over-recovery	Decreased	To be added
(v) Closing Stock	12,500	15,000	2,500	Over-recovery	Increased	To be reduced/deducted

*Taking Cost Accounting Profit as base



1. A company uses batch costing and incurs a setup cost of ₹ 20,000 for a batch of 300 units. If direct materials cost ₹ 20 per unit and direct labor costs ₹ 10 per unit, what is the total cost of the batch?

(a) ₹ 25,000	(b) ₹ 29,000
(c) ₹ 32,000	(d) ₹ 7,000

2. A FMCG company has an annual demand of 50,000 units for its specific product whose setting up cost per batch is ₹ 10,000 and carrying cost per unit per month is ₹ 1. What is the Economic Batch Quantity?

(a) 7,071 units	(b) 10,000 units
(c) 12,641 units	(d) 9,129 units

3. 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 optimum run size of cap manufacture?

(a) 6831 units	(b) 23664 units
(c) 404 units	(d) 548 units

4. 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%.
 - (i) The current price of Large, Medium and Small are ₹150, ₹ 90 and ₹ 50 respectively.
 - (ii) 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.
 - (iii) 20 direct workers are required. The workers are paid ₹ 880 for 8 hours shift of work.
 - (iv) The average packing cost per bottle is ₹ 3
 - (v) Power cost is ₹ 7 per Kilowatt -hour (Kwh)
 - (vi) Other variable cost is ₹ 30,000 per batch.
 - (vii) Fixed cost (Administration and marketing) is ₹ 4,90,00,000.
 - (viii) 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

The following information has been sought from you for the purpose of performance review meeting:

- Number of large size bottles that can be processed in a batch?
 - 5,000 bottles
 - 1,666 bottles
 - 3,333 bottles
 - 8,333 bottles
- Total number of batches to be run to process medium size bottles
 - 180
 - 225
 - 240
 - 645
- Material -W required for small size bottles
 - 1,26,00,000 ltrs
 - 1,68,00,000 ltrs
 - 1,57,50,000 ltrs
 - 1,51,50,000 ltrs

ANSWERS

1.	(b) 29,000	₹
	Material Cost (300 units × 20 pu)	6,000
	Labour Cost (300 units × 10 pu)	3,000
	Setup Cost	20,000
	Total Cost	29,000

2. **(d) 9,129 units**

$$\text{Economic batch Quantity} = \sqrt{\frac{2 \times \text{Annual demand} \times \text{Setup cost}}{\text{Carrying cost per unit per annum}}}$$

$$\sqrt{\frac{2 \times 50,000 \times 10,000}{1 \times 12}} = 9128.7 \text{ or } 9129 \text{ units}$$

3. **(a) 6831 units**

$$\sqrt{\frac{2 \times \text{Annual demand} \times \text{Setup cost}}{\text{Carrying cost Pupa}}}$$

$$\sqrt{\frac{2 \times 80,000 \times 3,500}{1 \times 12}} = 6,831 \text{ units}$$





4. **1.(b) 1666.66 bottles**

No. of large bottles that can be consumed:

$$\frac{\text{Total capacity}}{\text{Size (Litres)}} = \frac{5,000 \text{ Litres}}{3 \text{ Litres}} = 1,666.66 \text{ bottles}$$

2.(b) 225 batches

$$\text{Medium bottles in a batch} = \frac{5,000 \text{ Ltrs}}{1.5 \text{ Ltrs}} = 3,333 \text{ bottles}$$

Demand for medium bottles = 7,50,000

$$\therefore \text{No. of batches} = \frac{7,50,000}{3,333} = 225 \text{ batches.}$$

3.(b) 1,68,00,000

Small size bottles needed 20,00,000

× Qty Per bottle 600 mL

Total Litres needed 12,00,000

1 Ltr beverage - 14 Litres of raw material w.

∴ 120,000 Litres 1,68,00,000 Litres of material req.



1. 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
2. 1,200 Kg of a material were input to a process in a period. The normal loss is 8% of input. There is no opening or closing work-in-progress. Output in the period was 1,100 Kg. What was the abnormal gain/loss in the period?
- (a) Abnormal gain of 12 Kg (b) Abnormal loss of 12 kg
(c) Abnormal gain of 108 Kg (d) Abnormal gain of 4 kg
3. Arnav Ltd. manufactures chemical solutions used in paint and adhesive products. Chemical solutions are produced in different processes. Some of the processes are hazardous in nature which may results in fire accidents.
- At the end of the last month, one fire accident occurred in the factory. The fire destroyed some of the paper files containing records of the process operations for the month.
- You being an associate to the Chief Manager (Finance), are assigned to prepare the process accounts for the month during which the fire occurred. From the documents and files of other sources, following information could be retrieved:
- Opening work-in-process at the beginning of the month was 500 litres, 80% complete for labour and 60% complete for overheads. Opening work-in- process was valued at ₹ 2,78,000.
- Closing work-in-process at the end of the month was 100 litres, 20% complete for labour and 10% complete for overheads.
- Normal loss is 10% of input (fresh) and total losses during the month were 800 litres partly due to the fire damage.
- Output transferred to finished goods was 3,400 litres.
- Losses have a scrap value of ₹ 20 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit is ₹ 660 for the month made up as follows:
- Raw Material ₹ 300 Labour ₹ 200 Overheads ₹ 160
- The company uses FIFO method to value work-in-process and finished goods.
- The following information are required for managerial decisions:



1. How much quantity of raw material introduced during the month?

- (a) 4,300 Litres (b) 3,500 Litres
(c) 4,200 Litres (d) 3,800 Litres

2. The Quantity of normal loss and abnormal loss are:

- (a) Normal loss-380 litres & Abnormal loss-420 litres
(b) Normal loss- 350 litres & Abnormal loss 450 litres
(c) Normal loss-430 litres & Abnormal loss-370 litres
(d) Normal loss-420 litres & Abnormal loss - 380 litres.

3. Value of raw material added to the process during the month is:

- (a) ₹ 10,10,000 (b) ₹ 10,33,600
(c) ₹ 10,18,400 (d) ₹ 10,20,000

4. 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

5. Value of output transferred to finished goods is:

- (a) ₹ 22,57,200 (b) ₹ 20,06,400
(c) ₹ 22,44,000 (d) ₹ 19,27,200

4. 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 be ready with the following information:

1. What is the equivalent unit of labour

(a) 9,800 units

(b) 8,808 units

(c) 9030 units

(d) 8,838 units

2. What is the total cost of per equivalent units

(a) ₹ 9.08

(b) ₹ 10.10

(c) ₹ 8.08

(d) ₹ 8.68

3. What is the total cost of abnormal gain?

(a) ₹ 1743.36

(b) ₹ 1209.52

(c) ₹ 2506.25

(d) ₹ 3728.16

4. What is the total cost of closing work in progress

(a) ₹ 5709.20

(b) ₹ 5709.20

(c) ₹ 5806.20

(d) ₹ 5734.80

5. What is the cost of the units to be transferred to the next process using the FIFO method?

(a) ₹ 50,900.15

(b) ₹ 80,303.20

(c) ₹ 80,800.36

(d) ₹ 50,300.80

ANSWERS:

1. (a) ₹ 2,000

	(Units)
Input	8,000
(-) NL@ 10% of Input	<u>(800)</u>
Expected Output	7,200
Actual Output	<u>7,600</u>
Abnormal gain	400



$$\begin{aligned} \text{Expected cost per unit} &= \frac{40,000 - (800 \times 5)}{7200} \\ &= 5. \end{aligned}$$

Value of abnormal gain:

$$5 \text{ pu} \times 400 \text{ units} = ₹ 2,000/-$$

2. (d) Abnormal gain of 4 kg

	(kgs)
Input	1,200
(-) NL@ 8% of Input	<u>(96)</u>
Expected Output	1,104
Actual Output	<u>1,100</u>
Abnormal gain	4

3. Basic Working:

Particulars	Units	Particulars	Units
To Opening WIP	500	By NL	800
Material introduced	3800	Ab Loss	
		Trf →	3400
		Clg WIP →	100

$$\text{Normal Loss : } 10\% \text{ of Input} = 3800 \times 10\% = 380 \text{ Ltrs}$$

$$\text{Abnormal Loss : Total Loss} - \text{Abnormal Loss} = 800 - 380 = 420 \text{ Ltrs}$$

Step I:	Ltrs		
Op WIP	500	Transferred - 3400 Clg WIP - 100 Ab Loss - 420	OP - 500 Units introduced completed & transferred (UICT) - 2900
+ Introduced	<u>3800</u>		
Units in process	4300		
(-) NL @10% Input	<u>380</u>		
Expected Output	3920		



Particulars	Physical Units		Mat.		Lab.		O/H.
Op WIP	500	-	-	20%	100	40%	200
UICT	2900	100%	2900	100%	2900	100%	2900
Clg Stock	100	100%	100	20%	20	10%	10
Ab loss	420	100%	420	100%	420	100%	420
Equivalent units	3920		3420		3440		3530

$$\text{Materials Cost pu(CPU)} = \frac{\text{Raw mat added(RM)}}{\text{Equivalent units}}$$

$$300 = \frac{(300 \times 20)}{3420}$$

$$\therefore 3420 \times 300 = \text{RM} - 7600$$

$$\therefore 102600 + 7600 = \text{RM}$$

$$\therefore \text{Raw material added} = 10,33,600.$$

Valuation:

Transfer	OP stk : Cost already incurred + further costs added	
	= 278000 + 100(200) + 200(160)	₹ 3,30,000
	UICT : 2900 units (660pu)	₹ 19,14,000
	Value of output transferred to Finished goods	₹ 22,44,000
Closing WIP : Material	100 units × 300	₹ 30,000
	Labour	20 units × 200
	Overheads	10 units × 160
		₹ 1,600
		₹ 35,600

1.(d) 3,800 Litres - refer basic working above

2.(a) Normal loss-380 litres & Abnormal loss - 420 litres - refer basic working above

3.(b) ₹ 10,33,600 - refer basic working above

4.(a) ₹ 4,000 & ₹ 1,600 respectively - refer basic working above

5.(c) ₹ 22,44,000 - refer basic working above

4. Step I:

Op Stock	600	Transferred - 8900	OP Stock - 600
+ Introduced	9,200		
Units in Process	9,800	Clg WIP - 700	UICT - 8300
(-) NL @4%	(392)		
Expected Output	9,408	Ab gain (192)	



Statement of Equivalent units

Particulars	Physical Units	Material		Labour		Overheads	
Op Stock	600	-	-	40%	240	40%	240
UICT	8,300	100%	8,300	100%	8,300	100%	8300
Clg	700	100%	700	70%	490	70%	490
Ab gain	(192)	100%	(192)	100%	(192)	100%	(192)
Equivalent units	9,408		8,808		8,838		8,838

Cost pu	Material	Labour	Overheads
Current Cost	55,200	18,600	8,630
(-) Scrap value of Normal Loss	(392 × 6)		
Equivalent units	8808	8838	8838
Cost Per Equivalent units	₹ 6	₹ 2.1045	₹ 0.9765

Total Cost per unit : 9.081 or 9.08

Valuation:

Transfer:	OP stk : Cost already incurred + further costs added	
	= 4200 + 240(2.1045 + 0.9765)	₹ 4,939
	UICT : 8300 (9.081)	₹ <u>75,372</u>

Value of output transferred to Finished goods ₹ 80,311

Closing WIP :	Material	700 × 6	₹ 4,200
	Labour	490 × 2.1045	₹ 1,031
	Overheads	490 × 0.9765	₹ <u>478</u>
			₹ 5,709

Abnormal gain :	Material	192 × 6	₹ 1,152
	Labour	192 × 2.1045	₹ 404
	Overheads	192 × 0.9765	₹ <u>178</u>
			₹ 1,743



1.(d) 8,838 units - refer basic working above

2.(a) ₹ 9.08 - refer basic working above

3.(a) ₹ 1743.36- refer basic working above

4.(a) ₹ 5709.20 - refer basic working above

5.(b) ₹ 80,303.20 - round off errors may happen refer basic working above



1. ALC Ltd. is a insurance company. It launched a new term insurance policy Named as Protection Plus. The total cost for the policy during the year is ₹ 1,60,00,000. Total number of policies sold are 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

2. Calculate total passenger kilometres from the following information:

Number of buses 12, number of days operating in a month 25, trips made by each bus per day 10, distance covered 20 kilometres (one side), capacity of bus 40 passengers, normally 90% of capacity utilization.

- (a) ₹ 21,60,000 (b) ₹ 48,00,000
(c) ₹ 36,00,000 (d) ₹ 43,20,000

3. 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

5. 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



6. A truck carrying 10 tons of goods over 200 kilometres per day for 26 days in a month. The ton kms applicable is -

- (a) 52,000 (b) 20,000
(c) 5200 (d) 260

7. 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. The expected questions that may be asked by the management are as follows:

1. What would be the depreciable value of CNG Car and EV Car respectively?
 - (a) ₹ 13,50,000 and ₹ 14,40,000
 - (b) ₹ 15,20,000 and ₹ 8,25,000
 - (c) ₹ 8,25,000 and ₹ 14,40,000
 - (d) ₹ 8,25,000 and ₹12,00,000
2. What would be the monthly cost of fuel and electricity for an CNG and EV car respectively?
 - (a) ₹ 4,500 and ₹ 1,425
 - (b) ₹ 1,500 and ₹ 4,500
 - (c) ₹1,525 and ₹ 1,450
 - (d) ₹ 1,525 and ₹ 1,425
3. What would be the total cost to be incurred for replacement of tyres for CNG and EV car respectively?
 - (a) ₹ 222.22 and ₹ 333.33
 - (b) ₹ 177.78 and ₹ 133.33
 - (c) ₹ 155.55 and ₹ 133.33
 - (d) ₹ 177.78 and ₹ 111.11
4. What would be the total cost to be incurred for replacement of battery for CNG and EV car respectively?
 - (a) ₹ 5,40,000 and ₹ 12,000
 - (b) ₹ 12,000 and ₹ 5,40,000
 - (c) ₹ 2,00,000 and ₹ 12,000
 - (d) ₹ 1,00,000 and ₹2,00,000
5. What would be the operating cost of vehicle per month per car for both CNG & EV options?
 - (a) ₹ 36,627.78 and ₹ 43,708.33
 - (b) ₹ 36,627.78 and ₹ 48,523.26
 - (c) ₹ 48,523.26 and ₹ 28,510.29
 - (d) ₹ 48,523.26 and ₹ 28,510.29



Total cost	80	2,66,11,200
+ Profit	20	<u>66,52,800</u>
Takings	100	3,32,64,000

Let the room rent per day of a deluxe room be 'x'

∴ the room rent per day of a premium room be '2x'

Thus

$$31,680(x) + 21,120(2x) = 3,32,64,000$$

$$73920x = 3,32,64,000$$

$$\therefore x = 450$$

$$\therefore \text{Rent of a premium room} = 2x = 2(450) = 900 \text{ per room day}$$

5. (b) 0.8

Total cost	₹ 5,25,000
Tonne kms	₹ 6,55,000
Cost per tonne-km	<u>₹ 5,25,000</u> <u>₹ 0.801</u>
	6,55,000

6. (a) 52,000

$$10\text{tons} \times 200 \text{ kms} \times 26 \text{ days} = 52000 \text{ ton-kms}$$

7. 1.(a) ₹ 4,500 and ₹ 1,425

$$\begin{aligned} \text{Depreciable value: CNG} &= \text{Purchase price} - \text{Residual value} \\ &= 920,000 - 95000 \\ &= 825000. \end{aligned}$$

$$\begin{aligned} \text{Depreciable value: EV} &= \text{Purchase price} - \text{Govt. subsidy} - \text{Residual value} \\ &= 1520,000 - 150,000 - 170,000 \\ &= 12,00,000. \end{aligned}$$



2. (a) 4500 & 1425

CNG : 1kg = 20 km

EV : 30 kwh = 240 kms

1500 km
75 kgs

1500 km
187.5 kwh

× 60/kg

× 7.6/kwh

4500/-

1425/-

3. (b) 177.78 and 133.33

Cost of tyres	CNG	EV
Life	15 years	10 years
Replacement interval	5 years	5 years
No. of replacements required	2 times	1 time
(∴ first set of tyres will be replaced after 5 years)		
Cost per set of tyres	₹ 16,000	₹ 16,000
Total replacement cost	₹ 32,000	₹ 16,000
÷ total Life	15 years	10 years
Cost per year	₹ 2133.33	₹ 1,600
Cost per month	₹ 177.78	₹ 133.33

4. (b) ₹ 66.66 and ₹ 4,500

	CNG	EV
Life	15 years	10 years
Replacement interval	8 years	8 years
No. of replacements required.	1 time	1 time
(∴ first battery will be replaced after 8 years)		
Cost of battery for each replacement	₹ 12,000	₹ 540,000
Total cost (cost × no. of times replaced)	₹ 12,000	₹ 54,0000
∴ Cost per year (Total Cost ÷ Life)	₹ 800	₹ 54,000
	(12,000 ÷ 15 years)	(5,40,000 ÷ 10 years)
∴ Cost per month	₹ 66.66	₹ 4,500



1. In a period, 5640 kg of material were used at a total standard cost of ₹ 23,124. The material usage variance was ₹ 246 adverse. What was the standard allowed weight of material for the period?

- (a) 5580 (b) 5520
(c) 5850 (d) 5250

2. 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% every time 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 Favourable 3,000 Favourable, Cost Variance 5,000
(c) Price variance Adverse 3,000 Favourable, Cost Variance 8,000
(d) Price variance Favourable 5,000 Adverse, Cost Variance 3,000

(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

3. K Ltd. is a manufacturer of a single product A. 8,000 units of the product A has been produced in the month of March 2024. At the beginning of the year a total 1,20,000 units of the product-A has been planned for production. The cost department has provided the following estimates of overheads:

Fixed	₹ 12,00,000	Variable	₹ 6,00,000
Semi-Variable	₹ 1,80,000		

Semi-variable charges are considered to include 60 per cent expenses of fixed nature and 40 per cent of variable character

The records of the production department shows that the company could have operated for 20 days but there was a festival holiday during the month.

The actual cost data for the month of March 2024 are as follows:

Fixed	₹ 1,19,000	Variable	₹ 48,000
Semi-Variable	₹ 19,200		



5. A furniture company uses premium wood for sofa. Standard quantity of premium wood per sofa is 5 sq. ft. Standard price per sq. ft. of premium wood is ₹ 10. Actual production of sofa is 1,000. Premium wood actually used is 5,300 sq. ft. Actual purchase price of premium wood per sq. ft. is ₹ 10. What is material cost variance?

(a) ₹ 3,000 (A)

(b) ₹ 4,300 (A)

(c) ₹ 7,300 (A)

(d) ₹ 5,300 (F)

6. 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

7. ABC Pvt Ltd is engaged in the manufacture of a Product Q. The product has the following standard production requirements determined by the technical team of the company post satisfactory completion of test run.

Raw Material Z - 2 units @ ₹ 2 per unit

Skilled labour of - 2.5 hours @ ₹ 5 per hour

Fixed Overheads - ₹ 7.5 per unit

The input of Raw material Z has a yield of 80% everytime when infused into production. The actual quantity of Raw material Z consumed for production during the year was 24,000 units.

The Usage variance of Material Z was 2,000 Favourable. Further the actual amount of material cost for the material consumed amounted to ₹ 45,000.

During the said year, the actual working hours were 30,000 for which the labour cost paid by the company amounted to ₹ 1,20,000. The idle time variance amounted to 10,000 Adverse.

The actual fixed overheads incurred for the year amounted to ₹ 1,50,000 and the expenditure variance was ₹ 25,000 Favourable.



In the context of the above, the following needs to be determined:

1. The Actual output of Product Q produced during the year is:
 - (A) 10,000 units
 - (B) 12,500 units
 - (C) 25,000 units
 - (D) 15,000 units
2. The Material price and material cost variance are:
 - (A) Price variance - 3,000 Adverse, Cost Variance - 5,000 Adverse
 - (B) Price variance - 3,000 Favourable, Cost Variance - 5,000 Favourable
 - (C) Price variance - 3,000 Favourable, Cost Variance - 8,000 Adverse
 - (D) Price variance - 5,000 Adverse, Cost Variance - 3,000 Favourable
3. The Standard Hours, Net Actual hours and the idle time are:
 - (A) Standard Hours - 27,500 Net Actual Hours - 28,000 hours Idle Time - 2,000 hours
 - (B) Standard Hours - 22,500 Net Actual Hours - 28,500 hours Idle Time - 1,500 hours
 - (C) Standard Hours - 24,000 Net Actual Hours - 29,000 hours Idle Time - 1,000 hours
 - (D) Standard Hours - 25,000 hours Net Actual Hours - 28,000 hours Idle Time - 2,000 hours
4. Labour Efficiency variance and Labour rate variance are:
 - (A) Labour Efficiency Variance - 30,000 Favourable Labour rate Variance - 25,000 Adverse
 - (B) Labour Efficiency Variance - 25,000 Favourable, Labour rate Variance - 30,000 Adverse
 - (C) Labour Efficiency Variance - 15,000 Adverse, Labour rate Variance - 30,000 Favourable
 - (D) Labour Efficiency Variance - 30,000 Adverse Labour rate Variance - 25,000 Favourable
5. Fixed Overhead volume variance is:
 - (A) Fixed Overhead volume variance - 1,00,000 Favourable
 - (B) Fixed Overhead volume variance - 50,000 Adverse
 - (C) Fixed Overhead volume variance - 1,00,000 Adverse
 - (D) Fixed Overhead volume variance - 50,000 Favourable



8. Following is the data of BROS Ltd relating to standard and actual labour

- Standard Data
 - Grade 1 : Takes 1 hr p.u. @ ₹ 20 per hour
 - Grade 2 : Takes 0.5 hr p.u @ ₹ 10 per hour
- Actual Data
 - Production : 1500 units
 - Grade 1 : Took 1750 hrs costing ₹ 31500
 - Grade 2 : Took 600 hrs costing ₹ 6600
- Actual and expected yield percentage is the same
- Idle time : G1 = 50 hrs , G2 = 50 hrs

1. Calculate Total Labour Idle time Variance :

- | | |
|---------------------|-------------------|
| A) 1500 unfavorable | B) 1500 favorable |
| C) 1450 unfavorable | D) 1450 favorable |

2. Calculate Total Labour Efficiency Variance

- | | |
|---------------------|-------------------|
| A) 4000 unfavorable | B) 4000 Favorable |
| C) 3600 unfavorable | D) Nil |

3. Calculate labour rate Variance of Grade 2 labour

- | | |
|-------------------|--------------------|
| A) 600 favorable | B) 600 unfavorable |
| C) 2900 favorable | D) 750 unfavorable |

4. Calculate labour Time Variance of Grade 1 labour

- | | |
|---------------------|-------------------|
| A) 3350 unfavorable | B) 3350 favorable |
| C) 5000 unfavorable | D) 2000 favorable |

9. A company manufactures a product with the following standard cost per unit:

- Direct Material: 5 kg @ ₹10 per kg
- Direct Labor: 2 hours @ ₹15 per hour
- Variable Overheads: 2 hours @ ₹8 per hour

The standard output is 1,000 units. The actual production was 900 units, with actual usage of 4,800 kg of material at ₹11 per kg, 1,850 labor hours at ₹16 per hour, and actual variable overheads of ₹14,800.



1. What is the material price variance?
 - A) ₹ 4,800 favorable
 - B) ₹ 4,800 unfavorable
 - C) ₹ 5,000 favorable
 - D) ₹ 5,000 unfavorable
2. What is the labor efficiency variance?
 - A) ₹ 750 favorable
 - B) ₹ 750 unfavorable
 - C) ₹ 800 favorable
 - D) ₹ 800 unfavorable
3. What is the variable overhead expenditure variance?
 - A) ₹ 400 favorable
 - B) ₹ 400 unfavorable
 - C) no variance
 - D) ₹ 3,00 unfavorable
4. What is the total variable cost variance?
 - A) ₹10,800 favorable
 - B) ₹11,100 unfavorable
 - C) ₹11,100 favorable
 - D) ₹10,800 unfavorable

10. XYZ Manufacturing Ltd. produces kitchen appliances and implements a standard costing system to monitor performance. The company has provided the following data for the month of September:

- Budgeted Output: 10,000 units
- Actual Output: 9,000 units
- Budgeted Hours: 20,000 hours
- Actual Hours Worked: 18,500 hours
- Standard Time per Unit: 2 hours
- Actual Time per Unit: 2.05 hours
- Standard Rate per Labor Hour: ₹25
- Actual Rate per Labor Hour: ₹28

XYZ Ltd. management is analyzing these ratios to assess the company's operational performance for the month.

1. What is XYZ Ltd.'s Capacity Ratio for September?
 - (A) 0.925
 - (B) 0.900
 - (C) 0.9255
 - (D) 0.9257
2. Based on the information provided, what is XYZ Ltd.'s Efficiency Ratio?
 - (A) 0.9729
 - (B) 1.005
 - (C) 0.993
 - (D) 1.010



3. What is the Labor Rate Variance for XYZ Ltd. for the month of September?

(A) ₹ 55,500 Unfavorable (B) ₹ 64,750 Unfavorable

(C) ₹ 64,750 Favorable (D) ₹ 55,500 favorable

4. What is XYZ Ltd.'s Labor Efficiency Variance for September?

(A) ₹ 12,500 Unfavorable (B) ₹ 12,500 Favorable

(C) ₹ 37,500 Favorable (D) ₹ 37,500 Unfavorable

ANSWERS

1. (a) 5580

The usage must have been higher than standard because the usage variance is adverse.

Usage variance is equal to the excess usage multiplied by the standard price per kg of material.

Standard price per kilogram of material : $\frac{₹23,124}{₹5640} = ₹ 4.10$

Number of kilogram excess usage : $\frac{₹246}{₹4.1} = 60\text{kg}$

Standard usage : 5640 kg - 60 kg = 5580 kg.

2. (i) (a) 10,000 units

Usage variance of Material Z = 2,000 F

Usage Variance = SQ × SP - AQ × SP

SP = ₹ 2

AQ = 24,000 units

2 (SQ - 24,000) = 2,000

2SQ = 50,000

Therefore SQ = 25000

No of units of Input required per output = 2

Yield of input = 80%

= $\left(\frac{25000}{2}\right) \times 80\% = 10,000 \text{ units.}$

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

Cost Variance 5,000 Favourable

Price variance = AQ(SP - AP)

24000(2 - 1.875) = 3,000 Favourable.



$$\begin{aligned}\text{Cost variance} &= \text{SQ} \times \text{SP} - \text{AQ} \times \text{AP} \\ &= 50000 - 45000 = 5000 \text{ Favourable.}\end{aligned}$$

(iii) (d) Standard Hours - 25,000 hours Net Actual Hours -28,000 hours Idle Time - 2,000 hours

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 × 2.5 = 25,000 hours.

Idle time variance = SR × (Net AH - AH)

5 × (Net AH - 30,000) = 10,000 Adverse

5 Net AH - 1,50,000 = - 10000

5 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

Labour Efficiency Variance - 25,000 Adverse,

Labour rate Variance - 30,000 Favourable

Efficiency Variance = SR × (SH - AH)

= 5 × (25,000 - 30,000)

= 25,000 Adverse

Rate Variance = AH × (SR - AR)

= 30,000 (5 - 4) $\left[\frac{1,20,000}{30,000} \right]$

= 30,000 Favourable.

(v) (c) Fixed Overhead Volume variance - 10,000 Adverse

Overhead Volume variance = Actual Output × SR per unit - Budgeted FOH

Budgeted FOH = Actual FOH (+ / -) Expenditure variance

1,50,000 + 25,000 = 1,75,000

AO × SR = 10,000 × 7.5 = 75,000

Therefore volume variance = 75,000 - 1,75,000

= 1,00,000 Adverse.





3.	Units p.a : 120,000	Fixed cost p.a.	12,00,000
	∴ Units P.m : 10,000	+ FC of Semi-Var O/H	1,08,000
		(180,000 × 60%)	13,08,000
			→ 109000 pm

Actual Amt

Fixed	-	119,000
+ FC of S. VOH O/H		<u>11,520</u>
(19200 × 60%)		130,520

	Budget	Actual	AB rates
D	20	19	$\frac{109000}{20} = 5450/\text{days}$
H	-	-	$\frac{109000}{10000} = 10.9/\text{unit}$
U	10,000	8000	
A	109000	130,520	

FOH Cost: (Absorbed - Actual) (8000 × 10.9) - 130,520

$$87200 - 130,520 = 43,320A$$

FOH expenditure variance	FOH volume variance
(109000 - 130,520)	(1000 - 8000)10.9
21,520A:	21800A

Calendar variance

$$(20 - 19) 5450$$

5450A

		Actual amt	
VOH P.a.	600,00	Variable	48000
VOH of SVOH	<u>72,000</u>	V of SVOH	7680
(180,000 × 40%)	672000 - 120,000 units	(192000 × 40%)	
∴ VOH Pu : 5.6 Pu			55680





Actual O/T - 8000 units

Std			Actual		
U	R	A	U	R	A
8000	5%	44800	8000	6.96	55680

VOH Cost/VOH Exp Var: $44800 - 55680 = 10880A$

O/H Cost : VOH cost + FOH Cost
 $10880A + 34320 A$
 $= 45200A$

i) (c) 10,880(A)

refer working above

ii) (c) 21,800(a)

refer working above

iii) (a) 21,520(A)

refer working above

iv) (b) 5,450(A)

refer working above

v) (a) 43,320(A)

refer working above

4.

Standard labour cost	₹
(1,000 hours × ₹ 0.50)	500
Actual wages paid	360
Actual rate per hour: ₹ 360/800 hours = ₹ 0.45	

Calculation of Variances

(i) Rate variance = Actual time (Standard rate - Actual rate)
 $= 800 \text{ hours } (\text{₹ } 0.50 - \text{₹ } 0.45) = \text{₹ } 40 \text{ (F)}$

(ii) Efficiency variance = Standard rate per hour (Standard time - Actual time)
 $= \text{₹ } 0.50 (1,000 \text{ hrs.} - 800 \text{ hrs.}) = \text{₹ } 100 \text{ (F)}$



(iii) Total labour cost variance = Standard labour cost - Actual labour cost
 = (Standard rate × standard time) - (Actual rate × Actual time)
 = (₹ 50 × 1,000 hrs.) - (₹ 45 × 800 hrs.)
 = ₹ 500 - ₹ 360
 = ₹ 140(F).

5. (a) 3000A

1 sofa - 5 sq.ft

1000 sofa 5000 sq.ft.

Actual Output - 100 sofa.

Standard			Actual		
Qty.	rate	Amt	Qty.	rate	Amt
5000	10	50,000	5300	10	53,000

Mat. cost variance = (Std. cost - Actual cost)
 = (50,000 - 53,000)
 = 3000A

6. (c) ₹ 50.50

1 unit - 30 mins

30,000 units 90,000 mins or 15,000 hrs.

Actual Output : 30,000 units

Standard			Actual		
Hours	rate	Amt.	Hours	rate	Amt
15000	10	75,000	15000		

∴ The efficiency variable is NIL, the standard & Actual hours are NIL.

Labour rate variance = (std rate - Actual rate) Actual hours

7500A = (50 - AR) 15000

$$\frac{7500A}{15000} = 50 - AR$$

0.5A = 50 - AR

∴ AR = 50.5**

**∴ The rate variance is (A), the actual rate is more than the standard rate.



7. **1.(a) 10,000 units**

1FG - 2 units @ 80% yield

∴ for 1 FG - 2.5 units.

Mat usage variance = (Std Qty - Actual Qty) Std rate

$$2000 F = (\text{Std Qty} - 24000) \times 2$$

$$\frac{2000F}{2} = (\text{Std Qty} - 24000)$$

$$1000F = \text{Std Qty} - 24000$$

$$\therefore \text{Std Qty} = 25000 \text{ units}$$

∴ the usage variance is favourable, the actual Qty is lesser than the Std Qty.

If 1 unit requires 2.5 units

∴ in 25000 units - 10,000 FG will be Produced as actual Output.

2.(b) Price variance - 3,000 Favourable, Cost Variance - 5,000 Favourable

Actual Output - 10,000

Standard			Actual		
Qty	rate	Amount	Qty	rate	Amount
25000	2	50000	24000	1.875	45000

Mat Cost variance = Std Cost - Actual Cost

$$= 50,000 - 45,000 = 5000F$$

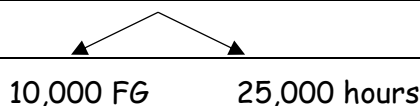
Mat Price variance = (Std rate - Actual rate) Actual Qty.

$$= (2 - 1.875) \times 24000$$

$$= 3000F$$

3.(d) Standard Hours - 25,000 hours Net Actual Hours -28,000 hours Idle Time - 2,000 hours

1 FG = 2.5 hours



Idle time variance = idle hrs × std rate

$$10,000A = \text{idle hrs} \times 5$$

$$10,000 \times 5 = \text{idle hrs} \times 5$$

$$\therefore \text{Standard hours} = 25000 \text{ hours}$$

Idle hours = 2000 hours

Net Actual hours = (Total hours - idle hours) = (30,000 hrs - 2000 hrs) = 28000 hours





4.(c) Labour Efficiency Variance - 15,000 Adverse, Labour rate Variance - 30,000 Favourable

$$\begin{aligned} \text{Labour efficiency variance} &= [\text{Std. hrs} - \text{Actual hrs}] \text{ Std rate} \\ &= [25,000 - 28,000]5 \\ &= 15,000A \end{aligned}$$

Net off idle hrs.

$$\begin{aligned} \text{Labour rate variance} &= [\text{Std rate} - \text{Actual rate}] \text{ Actual hrs} \\ &= \left[5 - \left(\frac{120000}{30000\text{hrs}} \right) \right] 30,000 \\ &= 30,000F \end{aligned}$$

5.(c) Fixed Overhead volume variance - 1,00,000 Adverse

$$\begin{aligned} \text{Fixed overhead volume variance} &= [\text{Bud. Units} - \text{Actual units}] \text{ Ab rate p.u.} \\ &= [23,333.33 - 10,000]7.5 \\ &= 100,000A. \end{aligned}$$

Bud units:

$$\begin{aligned} \text{Expenditure variance} &= (\text{Bud. Amt} - \text{Actual Amt}) \\ 25000F &= (\text{Bud Amt} - 150,000) \end{aligned}$$

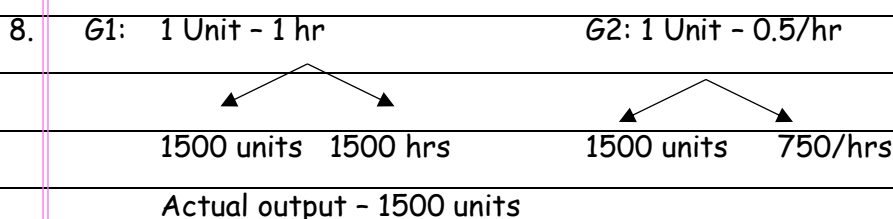
$$\therefore \text{Bud. Amt} = 175000$$

\therefore Expenditure variance is (F), the budgeted amt is more than the actual amt.

$$\frac{\text{Bud.Amt}}{\text{Bud.units}} = \text{Ad.rate p.u.}$$

$$\frac{17,5000}{\text{Bud.units}} = 7.5$$

$$\therefore \text{Bud. Units} = \frac{17,5000}{7.5} = 23333.33\text{units}$$





Standard			Actual		
Hrs.	Rate	Amount	Hrs	Rate	Amount
1500	20	30,000	1750	18	31500
750	10	7500	600	11	6600
2250	16.66	37500	2350		38100

1.(A) 1500 unfavorable

$$\begin{aligned} \text{Labour idle time variance} &= \text{idle hrs} \times \text{std rate} \\ &= G1 = 50 \text{ hrs} \times 20/\text{hr} = 1000A \\ &= G2 = 50 \text{ hrs} \times 20/\text{hr} = \underline{500A} \\ &= 1500A \end{aligned}$$

2.(d) Nil

$$\begin{aligned} \text{Labour efficiency variance} &= (\text{Total std. hrs} - \text{Total Actual hrs}) \text{ wt Avg. std rate} \\ &= (2250 - 2250) 16.66 \\ &= \text{NIL} \end{aligned}$$

Net off idle hrs (50 + 50) = 100 hrs

3.(b) 600 unfavorable

$$\begin{aligned} \text{Labour rate variance} &= (\text{std rate} - \text{Actual rate}) \text{ Actual hours} \\ G2 &= (10 - 11) 600 \\ &= 600A \end{aligned}$$

4.(c) 5000 unfavorable

$$\begin{aligned} \text{Labour time variance} &= (\text{Std rate} - \text{Actual hrs}) \text{ Std rate} \\ G1 &= (1500 - 1750) 20 \\ &= 5000S \end{aligned}$$

9. **1(b) ₹ 4,800 unfavorable**

$$\begin{aligned} \text{Material price variance} &= (\text{Std. rate} - \text{Actual rate}) \text{ Actual Qty. } (10-11)4800 = 4800 \\ &= (10 - 11)4800 \\ &= 4800A \end{aligned}$$



2.(b) ₹ 750 unfavorable

$$\begin{aligned}\text{Labour Efficiency variance} &= (\text{Std hrs} - \text{Actual hrs}) \text{ Std. rate} \\ &= [(900 \text{ units} \times 2 \text{ hrs}) - 1850] 15 \\ &= 750A\end{aligned}$$

3. (d) ₹ 3,00 unfavorable

$$\begin{aligned}\text{Variable O/M Cost variance} &= (\text{Std rate} - \text{Actual rate}) \text{ Actual hrs} \\ &= \left[8 - \left(\frac{14800}{1850} \right) \right] 1850 = \text{NTL}\end{aligned}$$

4.(d) ₹10,800 unfavorable

Total variable Cost variance:

	Standard	Actual
Mat. Cost	45000	52800
	[5 kgs pu. × 10 /kg] 900 units	[4800 kgs × 11/kg]
Direct Labour	27,000	29600
	[2 hrs. pu × 15/hr] 900 units	[1850 hrs × 16 hr]
Variable O/H	14,400	14800
	[2 hrs pu. × 8/hr] 900 units	
	86,400	97,200

$$\begin{aligned}&= (\text{Std cost} - \text{Actual Cost}) \\ &= (86,400 - 97,200) \\ &= 10,800A\end{aligned}$$

10. 1(a) 0.925

$$\begin{aligned}\text{Capacity ratio} &= \frac{\text{Actual hours for actual output}}{\text{Budgeted hours}} \times 100 \\ &= \frac{18500 \text{ hrs}}{10,000 \text{ units} \times 2 \text{ hrs}} \times 100 \\ &= 92.5\% \text{ or } 0.925\end{aligned}$$

2.(a) 0.9729

$$\text{Efficiency ratio} = \frac{\text{Standard hours for Actual output}}{\text{Actual hours for Actual output}} \times 100$$



$$\begin{aligned} &= \frac{9000 \text{ units} \times 2 \text{ hrs}}{18500 \text{ hrs}} \times 100 \\ &= 97.29\% \text{ or } 0.9729 \end{aligned}$$

3.(a) ₹ 55,500 Unfavorable

$$\begin{aligned} \text{Labour rate variance} &= (\text{std rate} - \text{Actual rate}) \text{ Actual hrs} \\ &= (25 - 28) 18500 \\ &= 55500A \end{aligned}$$

4.(a) ₹ 12,500 Unfavorable

$$\begin{aligned} \text{Labour efficiency variance} &= (\text{Std hrs} - \text{Actual hrs}) \text{ Std rate} \\ &= (18000 \text{ hrs} - 18500 \text{ hrs}) 25 \\ &= 12500A. \end{aligned}$$



1. A meeting of the heads of departments of the Arnav Ltd. has been called to review the operating performance of the company in the last financial year. The head of the production department appraised that during the last year the company could operate at 70% capacity level but in the coming financial year 95% capacity level can be achieved if an additional amount of ₹ 100 Crore on capex and working capital is incurred.

The head of the finance department has presented that during the last financial year the company had a P/V ratio of 40%, margin of safety and the break-even were ₹ 50 crore and ₹ 200 crore respectively.

To the reply to the proposal of increasing the production capacity level to 95%, the head of the finance department has informed that this could be achieved if the selling price and variable cost are reduced by 8% and 5% of sales respectively. Fixed cost will also increase by ₹ 20 crore due to increased depreciation on additional assets. The additional capital will be arranged at a cost of 15% p.a. from a bank.

In the coming financial year, it has been aimed to achieve an additional profit of ₹ 10 crore over and above the last year's profit after adjusting the interest cost on the additional capital.

The following points is required to be calculated on urgent basis to put the same in the meeting.

You being an assistant to the head of finance, has been asked the followings:

1. What will be the revised sales for the coming financial year?

- | | |
|--------------------|--------------------|
| (a) ₹ 322.22 Crore | (b) ₹ 311.11 Crore |
| (c) ₹ 300.00 Crore | (d) ₹ 324.24 Crore |

2. What will be the revised break-even point for the coming financial year?

- | | |
|--------------------|--------------------|
| (a) ₹ 222.22 Crore | (b) ₹ 252.22 Crore |
| (c) ₹ 244.44 Crore | (d) ₹ 255.56 Crore |

3. What will be the revised margin of safety for the coming financial year?

- | | |
|-------------------|-------------------|
| (a) ₹ 100 Crore | (b) ₹ 58.89 Crore |
| (c) ₹ 55.56 Crore | (d) ₹ 66.66 Crore |

4. The profit of the last year and for the coming year are:

- | |
|---|
| (a) ₹ 50 Crore & ₹ 95 Crore respectively |
| (b) ₹ 20 Crore & ₹ 65 Crore respectively |
| (c) ₹ 20 Crore & ₹ 30 Crore respectively |
| (d) ₹ 45 Crore & ₹ 66.66 Crore respectively |



5. The total cost of the last year and for the coming year are:

- (a) ₹ 230 Crore & ₹ 292.22 (b) ₹ 230 Crore & ₹ 275 Crore
(c) ₹ 220 Crore & ₹ 282.22 Crore (d) ₹ 220 Crore & ₹ 292.22 Crore

2.

Fixed Cost	₹ 1,20,000
Variable costs	₹ 3 per unit
Selling price	₹ 7 per unit
Output	50,000 units

Determine the profit for each of the following situation with the above data:

- (i) with the data above
(ii) with a 10% increase in sales.
(iii) with a 10% increase in fixed costs.
(iv) with a 10% increase in variable costs.
(v) with a 10% increase in selling price.
(vi) taking all the above situations

3. State with reasons whether following statements are true or false:

- (i) 5% decrease in selling price per unit and 10% increase in sales volume will increase the P/V ratio.
(ii) Decrease in the angle of incidence will increase the P/V ratio.
(iii) Differential cost analysis can be made only in marginal costing and not in absorption costing.
(iv) Valuation of stock is higher in absorption costing as compared to marginal costing.

4. A company has made a profit of ₹ 50,000 during the year 2008-09. If the selling price and marginal cost of the product are ₹ 15 and ₹ 12 per unit respectively, find out the amount of margin of safety.



5. Following figures have been extracted from the books of M/s. RST Private Limited:

Financial Year	Sales (₹)	Profit/Loss (₹)
2016-17	4,00,000	15,000(loss)
2017-18	5,00,000	15,000 (Profit)

You are required to calculate:

- Profit Volume Ratio
- Fixed Costs
- Break Even Point
- Sales required to earn a profit of ₹ 45,000.
- Margin of Safety in Financial Year 2017-18.

6. A company's fixed costs are ₹ 5,00,000, the selling price per unit is ₹ 200, and the variable cost per unit is ₹ 100. How many units must the company sell to earn the targeted profit of ₹ 2,00,000?

- (a) 2,000 units (b) 5,000 units
(c) 10,000 units (d) 7,000 units

7. XYZ Manufacturing Pvt. Ltd is a prominent company in the electric appliances industry, known for producing a diverse range of high-quality products. The company has built a reputation for reliability and innovation in the manufacturing of household appliances, including fans, mixers, and heaters. XYZ Manufacturing Pvt. Ltd is dedicated to delivering products that meet the needs of its customers while adhering to the highest standards of quality and performance. The company operates a state-of-the-art factory that is fully equipped with advanced machinery and technology to ensure efficient and consistent production. The factory operates 25 days a month, running multiple shifts to meet the growing demand for its products. The company have spare capacity for additional orders. Each product type-fans, mixers, and heaters-undergoes a meticulous manufacturing process that includes assembly, quality testing, and packaging.

Cost Category	Amount (₹)
Fixed Costs (per month)	
Factory Rent	₹ 3,00,000
Depreciation	₹ 2,00,000
Administrative Expenses	₹ 1,00,000



Salaries	₹ 4,00,000
Total Fixed Costs	₹ 10,00,000
Number of units produced per month	10,000 units

(Note: Last month there was an additional special order of 2000 units which resulted in higher production)

Selling price per unit	₹ 1,500
------------------------	---------

Additional Info: Raw Materials include Copper, Plastic, and Other Materials. The per unit cost of Copper is 80 more than the cost of Plastic, while the cost of Other Materials is twice that of Plastic And the total Raw Material Cost per unit is 210 more than the combined cost of Copper & Plastic.

The Labour Hour Rate is 100 per hour. The total labour hours used in the last month were 36,000 Hours. The Utilities Cost per unit is 100, and the Packaging Cost per unit is 50. Being a finance manager of the company, you are required to answer the following:

- Calculate the contribution margin per unit.
(a) ₹ 550 (b) ₹ 600
(c) ₹ 650 (d) ₹ 700
- Determine the break-even point in sales revenue.
(a) ₹ 31,28,593 (b) ₹ 25,85,153
(c) ₹ 27,27,025 (d) ₹ 27,05,983
- If the company wants to achieve a target profit of 5,00,000, what should be the sales volume (in units)?
(a) 2,000 units (b) 2,727 units
(c) 2,750 units (d) 3,000 units
- What would be the impact on the break-even point if the variable cost per unit increases by 10%?
(a) 2,178 units (b) 2,198 units
(c) 2,248 units (d) 2.258 units
- Calculate the margin of safety in percentage if the company sells 4,000 units if the variable cost per unit increases by 10%
(a) 44.85% (b) 42.55%
(c) 45.05% (d) 45.75%



8. Miniso Pvt Ltd a company engaged in the business of manufacturing wireless Bluetooth earphones. The company wishes to track its operating profitability and the margin it needs to maintain to sustain profitability in the long run Further the company has adopted the marginal costing technique to identify and define operational levels. In this regard the company has provided the following information for the current year:

Opening stock of earphones	30,000 units
Selling Price of the earphones	₹ 450 per unit
Variable costs incurred in manufacture	₹ 270 per unit
Units produced during the previous year	1,80,000 units
Expected production for the current year	2,25,000 units
Expected sales for the current year	2,40,000 units
Fixed cost per unit for last year was	₹ 60 per unit
Expected rise in Fixed Cost	10%
Expected Increase in Variable cost	2.5%

Based on the above information available, the following needs to be determined.

- The profit that the company will make on achieving its targeted sales amount to
 - ₹ 1,51,20,000
 - ₹ 1,62,00,000
 - ₹ 1,71,45,000
 - ₹ 1,72,00,000
- The units to be sold by the company to achieve break even is
 - 57,600
 - 87,600
 - 1,05,600
 - 96,000
- The total fixed cost for the current year post the cost increase amounts to
 - 1,08,00,000
 - 1,48,50,000
 - 1,18,80,000
 - 1,44,00,000
- The quantity of closing stock and its value amounts to
 - Nil & Nil
 - 15,000 & ₹ 40,50,000
 - 15,000 & ₹ 50,62,500
 - 15,000 & ₹ 58,05,000
- Margin of safety in units
 - 87,600
 - 1,52,400
 - 162,000
 - 1,60,000



9. Gamma Foods Ltd. produces gourmet snacks. The management is considering whether to continue producing one of its products, Product P, based on its contribution margin. Below are the relevant details for the last financial year.

Cost Information:

- Selling Price per Unit: ₹100
- Variable Costs per Unit:
 - Direct Materials: ₹30
 - Direct Labor: ₹20
 - Variable Overhead: ₹10
- Total Fixed Costs: ₹ 15,00,000
- Units Produced and Sold: 50,000 units

Additional Information:

- A market analysis indicates that sales could increase by 10% if they offer a special discount of 15% on the selling price.
- If the special discount is applied, the company believes that it can keep the fixed costs unchanged but anticipates an increase in variable costs by 5% due to higher production volume and potential wastage.

1. If Gamma Foods Ltd. decides to discontinue Product P, what would be the impact on total contribution margin if the product has a current contribution margin of ₹40 per unit and total fixed costs are unaffected?

- (a) Total contribution margin remains the same
- (b) Total contribution margin decreases by ₹ 20,00,000 (right answer)
- (c) Total contribution margin increases by ₹ 20,00,000
- (d) Total contribution margin decreases by ₹ 15,00,000

2. Calculate the break-even point in units for Product P after the special discount is applied and the variable costs have increased.

- (a) 68,182 units
- (b) 61,225 units
- (c) 60,000 units
- (d) 40,541 units

3. If the sales increase by 10% due to the discount, what will be the total contribution margin after applying the discount and the new variable costs?

- (a) ₹ 15,00,000
- (b) ₹ 10,00,000
- (c) ₹ 9,00,000
- (d) ₹ 12,10,000



10. Gamma Ltd. manufactures Product A, and the company uses a standard costing system to control costs. The standard cost per unit of Product A includes:

- Direct Material: ₹6
- Direct Labor: ₹4 (0.5 hours @ ₹8 per hour)
- Variable Overheads: ₹2
- Fixed Overheads: ₹8
- The selling price per unit is ₹20.

The company expected to produce 5,000 units in October, with fixed costs budgeted at ₹40,000. However, due to inefficiencies in labour, the actual labour hours worked were higher than expected, resulting in a labour efficiency variance of ₹5,000 adverse.

Gamma Ltd. wants to calculate the new break-even point after incorporating this labour efficiency variance, and how this variance affects their profit margins.

1. What was Gamma Ltd.'s original break-even point before considering any variances?

(a) 12,500 units	(b) 4,167 units
(c) 10,000 units	(d) 5000 units
2. What is the revised variable cost per unit after considering the labour efficiency variance?

(a) ₹12.50	(b) ₹13.00
(c) ₹14.00	(d) ₹15.00
3. What is the new break-even point after factoring in the labour efficiency variance?

(a) 15,000 units	(b) 10,000 units
(c) 12,500 units	(d) 14,286 units
4. How much additional profit would Gamma Ltd. lose for each unit sold if it fails to control its labour efficiency?

(a) ₹2 per unit	(b) ₹1 per unit
(c) ₹3 per unit	(d) ₹5 per unit

ANSWERS:

1. Total Sales 250 crs.

$\frac{\text{FC}}{\text{P/V}}$	$\frac{\text{FC}}{\text{P/V}} + \text{Profit}$
Break-even sales (BES)	MOS Sales (MOS)
BES 200 Crs	MOS 50 Crs
$\times \frac{\text{P/V}}{\text{P/V}} \times 40\%$	$\times \frac{\text{P/V}}{\text{P/V}} \times 40\%$
FC 80 crs.	Profit 20 Crs.



Revised Fixed Cost

Current	-	80 Crs
+ Increase	-	20 Crs
+ Int. on additional capital (100 crs × 15%)		<u>15 crs</u>
Revised fixed costs		115 crs

Revised Profit

Current Profit	20 Crs
+ Additional	<u>10 crs</u>
	30 crs

Revised P/V ratio

If current SP pu assumed	-	100 (100%)
∴ Current VC PV will be	-	<u>60 (60%)</u>
∴ Current contribution will be	-	40 (40%)

Then, new SP pu - (100 - 8%) = 92

New VC pu (60% - 5%) of 92 = 50.6

Revised contribution p.u = 41.4

P/V ratio = 41.4/92 × 100 = 45%

1) (A) ₹ 322.22 Crore

Sales		$\frac{\text{Contribution}}{\text{pv ratio}} = \text{Sales}$
- VC		
Contribution	145 Crs	<u>145 Crs = 322.22 Crs</u>
- FC	(115 Crs)	45%
Profit	30 Crs	

2.(D) ₹255.56 Crore

$$\text{Breakeven Sales} = \frac{\text{FC}}{\text{p/v ratio}} = \frac{115\text{Crs}}{45\%} = 255.56 \text{ Crs}$$





3.(D) ₹ 66.66 Crore

$$\text{Margin of Safety} = \frac{\text{Profit}}{\text{p/v ratio}} = \frac{30\text{Crs}}{45\%} = ₹ 66.66 \text{ Crs}$$

4.(A) ₹ 50 Crore & ₹ 95 Crore respectively

refer working above

5.(A) ₹ 230 Crore & ₹ 292.22

Total Cost for Last year		Total Cost for Current year	
Sales	250 Crs.	Sales	322.22 Crs.
× Variable Cost (60%)	<u>150 Crs.</u>	× Variable Cost (55%)	<u>177.22 Crs.</u>
+ Fixed Costs	80 Crs.	+ Fixed Costs	<u>115.00 Crs.</u>
Total Cost	230 Crs.	Total Cost	292.22 Crs.

2. **(i)**

SP pu	7
<u>VC pu</u>	<u>(3)</u>
Contribution Pu	4
<u>× units</u>	<u>50,000</u>
Total Contribution	200,000
<u>(-) FC</u>	<u>(1,20,000)</u>
Profit	80,000

(ii)

SP pu	7
<u>VC pu</u>	<u>(3)</u>
Contribution Pu	4
× units (50,000 + 10%)	55,000
Total Contribution	220,000
<u>(-) FC</u>	<u>(1,20,000)</u>
Profit	100,000



(iii)

SP pu	7
VC pu	(3)
<u>Contribution Pu</u>	<u>4</u>
× units	50,000
Total Contribution	200,000
(-) FC (120,000 + 10%)	(1320000)
<u>Profit</u>	<u>68,000</u>

(iv)

SP pu	7
VC pu (3 + 10%)	(3.3)
<u>Contribution Pu</u>	<u>3.7</u>
× units	50,000
Total Contribution	185,000
(-) FC	(120000)
<u>Profit</u>	<u>65,000</u>

(v)

SP pu (7 + 10%)	7.7
VC pu	(3)
<u>Contribution Pu</u>	<u>4.7</u>
× units	50,000
Total Contribution	235,000
(-) FC (120,000 + 10%)	(120000)
<u>Profit</u>	<u>115,000</u>



(vi)

SP pu (7 + 10%)	7.7
VC pu (3 + 10%)	3.3
Contribution Pu	4.4
<u>× units (50,000 + 10%)</u>	<u>55,000</u>
Total Contribution	220,000
<u>(-) FC (120,000 + 10%)</u>	<u>(1320000)</u>
Profit	88,000

3.

	Particulars	True/False with reasons
(i)	5% decrease in selling price per unit and 10% increase in sales volume will increase the P/V ratio.	False. Reason: Increase or decrease in physical sales volume will not change P/V ratio. Hence, 5% decrease in selling price per unit will decrease P/V ratio.
(ii)	Decrease in the angle of incidence will increase the P/V ratio.	False. Reason: Angle of incidence is the angle at which sales line cuts the total cost line. If it is small, it indicates that the profits are being made at lower rate. Hence, decrease in the angle of incidence will decrease the P/V ratio.
(iii)	Differential cost analysis can be made only in marginal costing and not in absorption costing.	False. Reason: Differential Cost represents the increase or decrease in total cost that result from any variation in operations. Differential cost, thus, includes both fixed and variable costs. Hence differential cost analysis can be made both in marginal costing and absorption costing.



(iv)	Valuation of stock is higher in absorption costing as compared to marginal costing.	True Reason: Both fixed and variable costs are considered for inventory valuation in absorption costing, whereas only variable costs are considered for inventory valuation in marginal costing.
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4.

SP pu 15

VC pu 12

Contribution Pu 3

$$P/V \text{ ratio} = \frac{\text{Contribution pu}}{\text{SP pu}} = \frac{3}{15} \times 100 = 20\%$$

$$\text{Margin of Safety} = \frac{\text{Profit}}{P/V \text{ ratio}} = \frac{50,000}{20\%} = 250,000$$

5.

$$\frac{\Delta \text{ in Profit } - 15,000 - (15,000) - 30,000}{\Delta \text{ in Sales } 500,000 - 4,00,000 100,000} \times 100$$

∴ P/U ratio = 30%

Sales 500,000

VC (3,50,000)

Contribution 30% 1,50,000

(-) FC ∴ (1,35,000)

Profit 15,000 - given

i) P/U ratio - 30% - Check working above

ii) Fixed Costs - 135,000 - Check working above

iii) Break even point - $\frac{\text{Fixed Cost}}{P/U} = \frac{135,000}{30\%} = 450,000$



iv)

Sales		
- VC		
Contribution	180,000	
(-) FC	(135,000)	
<u>Profit</u>	<u>45,000</u>	
$\frac{\text{Contribution}}{\text{P/U ratio}} = \frac{180,000}{30\%} = 600,000$		

v)

$$\text{Margin of safety} = \frac{\text{Profit}}{\text{P/U ratio}} = \frac{15,000}{30\%} = 50,000 / -$$

6. (d) 7,000 units

Sales	200		
- VC	100		
<u>Contribution pu -</u>	<u>100</u>		
Sales			
- VC		100	- 1 unit
<u>Contribution pu -</u>	<u>700,000</u>	700,000	7000 units
FC	(500,000)		
<u>Profit</u>	<u>200,000</u>		

7. Let the cost p.u. of plastic = x

$$\therefore \text{Cost pu of Copper} = x + 80$$

$$\therefore \text{Other materials p.u.} = 2x$$

Total Raw mat cost = 210 + cost of copper & plastic

$$x + x + 80 + 2x = 210 + x + 80 + x$$

$$4x + 80 = 290 + 2x$$

$$4x - 2x = 290 - 80$$

$$2x = 210$$

$$x = 105$$

$$x = 105.$$



Raw mat cost : Plastic + Copper + Other materials
 : $x + x + 80 + 2x$
 : $105 + 105 + 80 + 2(105) = 500$

Direct labour $\left[\begin{array}{l} 12,000 \text{ units} - 36000 \text{ hrs} \\ \swarrow \quad \searrow \\ 1 \text{ unit} \quad 3 \text{ hrs} \times 100/\text{hr} \end{array} \right] 300$

Utilities Cost 100
 Packing Cost 50
 Variable cost p.u. 950

1.(a) ₹ 550

Selling price p.u 1500
 Variable cost p.u 950
 Contribution p.u 550

2.(c) ₹ 27,27,025

Break-even Sales

$$\frac{\text{Contribution p.u}}{\text{Selling price p.u}} = \frac{550}{1500} \times 100 = 36.66\%$$

$$\text{BES} = \frac{\text{Fixed costs}}{\text{P/U ratio}} = \frac{10,00,000}{36.66\%} = 27,27,272 \text{ approx}$$

3.(b) 2,727 units

Sales		1 unit -	550 contribution
- Variable costs			15,00,000
Contribution	15,00,000		2727 units
- Fixed costs	(10,00,000)		
Profit	500,000		





4.(b) 2,198 units

Variable cost p.u.	950
+ Increase	+ 10%
Revised V.c. p.u.	1045
Selling price p.u.	1500
Contribution pu	4500
BEP = $\frac{\text{Fixedcosts}}{\text{Contribution p.u}}$	$\frac{10,00,000}{455}$
	= 2197.8 or 2198 units

5.(c) 45.05%

Total units sold	4000
(-) Break-even units	2198
Margin of safety units	1802
MOS% = $\frac{\text{Mosunits}}{\text{Totalunits}} \times 100$	
	$= \frac{1802}{4000} \times 100$
	= 45.05%

8. Opening Stock - 30,000 units
+ Production - 2,25,000 units
- Sales - (2,40,000) units
Closing Stock 15,000 units

Fixed cost p.u. in the previous year	60
(x) units produced in the last year	<u>780,000 units</u>
Total Fixed cost in the Last year	1,08,000
(+) Increase in the current year	<u>10%</u>
Fixed Cost in the Current year	1,18,80,000



	Opening Stock	Current Production
SP pu	450	450
(-) vc pu	(270)	(337.5)
		(270 + 25%)
Contribution pu	180	112.5

Sales - 240,000 units

Opening Stock

Current Production

30,000 units

∴ 210,000 units

X Contⁿ pu 180

112.5

54,00,000

2,36,25,000

Total Contribution 2,90,25,000

(-) Fixed Costs 1,18,80,000

Profit 1,71,45,000

Break even points:

Total Fixed costs: 1,18,80,000

Recovered out of
opening stock

30,000 units × 180 pu
= 54,00,000

Balance from current
production:

1,18,80,000
(-) 54,00,000

64,80,000

÷ 112.5 pu

57,600 units

Break even: 30,000 units

+ 57,600 units

87,600 units

Closing stock will be valued @ variable cost:

15,0000 units × 337.5 pu = 50,62,500



Margin of safety units: Total Sales units - 2,40,000

(-) BEP sales units 87,600

MOS units 1,52,400 unit

1) (c) 1,71,45,000

Refer working above

2) (b) 87,600 units

Refer working above

3) (c) 1,18,80,000 units

Refer working above

4) (c) 15,000 & 50,62,500

Refer working above

5) (b) 152,400 units

Refer working above

9. i.(b) Total contribution margin decreases by ₹2,00,000

Current Profit

Contribution pu 40

× Units 50,000

Total Contribution 2000000

If P, is discontinued, then contribution would fall by 20,00,000

ii.(a) 68182 units

SP pu - (100 - 15%) 85/-

VC pu - (30 + 20 + 10) + 5% 63/-

Contribution p.u. 22/-

Fixed costs - 10,00,000

$$\therefore \text{Break-even point} = \frac{\text{Fixed costs}}{\text{Contribution p.u.}} = \frac{10,00,000}{22}$$

= 68181.8 or 68182 units



iii.(d) ₹ 1,210,000

Revised contribution per unit (refer above)	22 pu
× units sold (50,000 + 10%)	<u>55000</u>
Revised contribution	12,10,000

10. i.(d) 5000 units

SP pu	20
VC pu : Direct material	(6)
Direct Labour	(4)
Variable overheads	(2)
Contribution per unit	8/-
$\text{BEP} = \frac{\text{Fixed costs}}{\text{Contribution p.u.}} = \frac{40,000}{8} = 5000 \text{ units}$	

ii.(b) ₹13.00

Labour efficiency variance	= 500A
÷ no. of units produced	= 5000
Increase in variable cost p.u.	1
<u>Original variable cost p.u.</u>	<u>12</u>
Revised variable cost p.u.	13

iii.

SP pu	20
<u>Revised VC pu</u>	<u>13</u>
Contribution pu	7
$\text{BEP} = \frac{\text{Fixed costs}}{\text{Contribution p.u.}} = \frac{40,000}{7} = 5714.28 \text{ units}$	

iv. (b) ₹1 per unit

Check (ii) above. Increase in cost p.u. is 1.

Thus, if they fail to control Labour efficiency, there will be an increase by 1 Pu.

15 Budgets & Budgetary Control



1. AB Ltd. is currently preparing its production budget for product Z for the forthcoming year. The sales director has confirmed that he requires 60,000 units of product Z. Opening inventory is estimated to be 6,500 units and the company wishes to reduce inventory at the end of the year by 50 %. How many units of product Z will need to be produced?
- (a) 63,250 (b) 69,750
(c) 50,250 (d) 56,750
2. 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
3. If activity ratio of a company is 104% and its capacity ratio is 96%, find out its efficiency ratio.
- (a) 99.84% (b) 92.30%
(c) 108.33% (d) 98%
4. A factory has a capacity utilization ratio of 85% and its activity ratio is 95%. Which one of the following is the efficiency ratio?
- (a) 120% (b) 110%
(c) 112% (d) 90%
5. Standard hours required for doing a work is 100 hours and budgeted hours is 120 hrs while the same work is actually completed by workers in 110 hrs. You are required to calculate the activity ratio:
- (a) 109.09% (b) 83.33%
(c) 90.90% (d) 110%
6. 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) ₹ 32,00,000 (b) ₹ 34,00,000
(c) ₹ 30,00,000 (d) ₹ 36,00,000

7. 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.

8. GHI Ltd. is preparing its budget for the coming year. The company is divided into three responsibility centers: a cost center (Production), a profit center (Sales), and an investment center (Regional Office). The following information is available:

- Production department's expected cost: ₹5,00,000 (fixed) and ₹50 per unit (variable)
- Sales department expects to sell 12,000 units at ₹150 per unit.
- The Regional Office is expected to earn a return of 10% on the capital employed of ₹20,00,000.

1. What is the total cost for the production department if 12,000 units are produced?

- (a) ₹6,00,000 (b) ₹11,00,000
(c) ₹10,00,000 (d) ₹12,00,000

2. What is the budgeted profit for the sales department?

- (a) ₹18,00,000 (b) ₹7,00,000
(c) ₹9,00,000 (d) ₹20,00,000

3. If the actual sales are 10,000 units, who is accountable for the variance, and in which responsibility center?

- (a) Production department - Cost Center
(b) Sales department - Profit Center
(c) Regional Office - Investment Center
(d) Production department - Profit Center



ANSWERS

1. **(d) 56,750**

Sales budget	60,000
+ Closing stock (65000 × 50%)	3250
- Opening Stock	<u>(6,500)</u>
Production Budget	56,750

2. **(b) 1,90,000**

Sales budget	2,00,000
+ Closing stock (25000 × 40%)	15000
- Opening Stock	<u>(25000)</u>
Production Budget	1,90,000

3. **(c) 108.33%**

$$\begin{aligned}\text{Activity ratio} &= \text{Capacity ratio} \times \text{Efficiency ratio} \\ 104\% &= 96\% \times \text{Efficiency ratio} \\ \therefore \text{Efficiency ratio} &= \frac{104\%}{96\%} = 108.33\%\end{aligned}$$

4. **(c) 112%**

$$\begin{aligned}\text{Activity ratio} &= \text{Capacity ratio} \times \text{Efficiency ratio} \\ 95\% &= 85\% \times \text{Efficiency ratio} \\ \frac{95\%}{85\%} &= \text{Efficiency ratio} = 111.76\% \text{ or } 112\%\end{aligned}$$

5. **(b) 83.33%**

$$\begin{aligned}\text{Budgeted hours} &= 120 \text{ hrs} \\ \text{Standard hours for Actual hours} &= 100 \text{ hrs} \\ \text{Actual hours} &= 110 \text{ hrs} \\ \text{Activity ratio} &= \frac{\text{Standard hours}}{\text{Budgeted hours}} \times 100 \\ &= \frac{100 \text{ hrs}}{120 \text{ hrs}} \times 100 = 83.33\%\end{aligned}$$



6. **(b) ₹ 34,00,000**

$$\frac{\Delta \text{in total overheads}}{\Delta \text{in \% activity}} = \frac{40,00,000 - 30,00,000}{75\% - 50\%} = \frac{10,00,000}{25\%}$$

∴ 4,00,000 per 10% = Variable overheads.

@ 50% - Total overheads = 30,00,000	[Variable O/H = $\frac{4,00,000 \times 50\%}{10\%}$
		₹ 20,00,000
		∴ Fixed O/H ₹ 10,00,000

@ 60%	[Variable Overheads = $\frac{4,00,000}{10\%} \times 60\% = ₹ 24,00,000$
		Fixed Overheads ₹ 10,00,000
		Total overheads @60% ₹ 34,00,000

7. **(c) It is probably the least time consuming and least costly approach to budgeting.**

Explanation: ZBB is a budgeting method that requires starting from scratch each year, analyzing every line of business for its needs and costs, and justifying all expenses for each new period. It can help companies identify and eliminate unnecessary costs, and focus on high-profit initiatives. However, it can be problematic to explain every item and cost, and may require training for managers.

8. **1.(b) ₹11,00,000**

Total cost : Fixed Cost =	₹ 5,00,000
Variable Cost = 50 pu × 12000 units	₹ <u>6,00,000</u>
Total cost of production	₹ 11,00,000

2.(b) ₹7,00,000

Sales (12,000 units 150 pu)	₹ 18,00,000
(-) Total Cost	₹ <u>(11,00,000)</u>
Budgeted Profit	₹ 7,00,000

3.(b) Sales department - Profit Center

Explanation: As they were responsible for generating Sales.