CA INTER COSTING - MCQ BRAHMASTRA SEPT 2025

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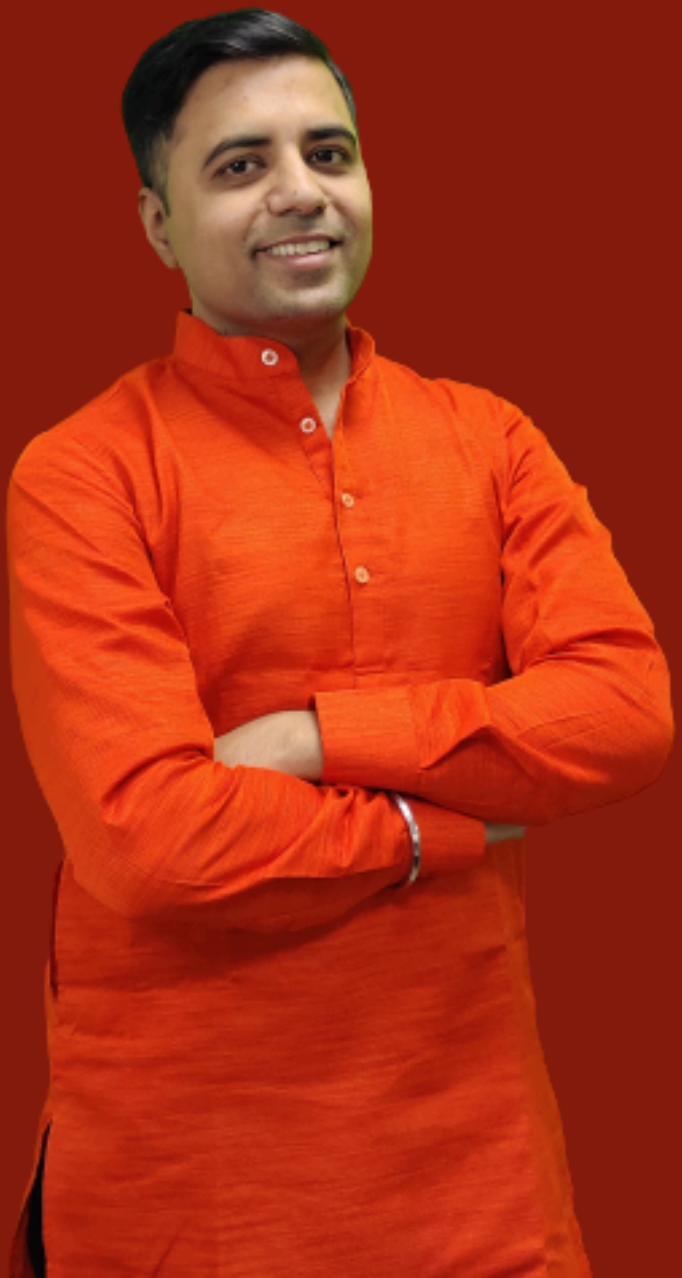

MCQ QUESTION BOOK

BY CA NITIN GURU

Employee Cost & Direct Expenses (Labour Costing)

Case Scenario (MTP July 2024)

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

The company presently procures its annual requirement of materials on a quarterly basis from its regular supplier enjoying a discount of 2.5% on the invoice price of the material of ₹ 20 per unit. Every time the company places orders for Material R, it incurs ₹ 125 for each of the order placed. The company also has taken a rented warehouse for storing material R and the annual cost of storage is ₹ 10 per unit. The company appointed Mr. T a Chartered Accountant to review the cost of inventory and provide measures of improvement of cost. After reviewing the material purchase and consumption pattern, Mr. T suggested that the implementation of Wilson's EOQ would be beneficial to the company. He emphasized that the change in the quantity ordered would result in reduction of inventory carrying costs.

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

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

Question 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

Question 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

Question 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

Question 4.

Incentive payable under the Rowan Incentive scheme amounts to:

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

Question 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

Solution

Solution 1.

c. 40,000 units.

Projected Sales of Product P – 24,000 units
Less: Opening stock of Product P- (4,000 units)
Product P to be produced- 20,000 units
Raw Material required- 50,000 units (20,000 x 2/80% yield)
Opening stock of Material R available- 10,000 units
Material to be procured- 40,000 units.

Solution 2.

a. Order Quantity as per the current inventory policy – 10,000 units and EOQ – 1,000 units

Annual requirement - Procurement- 40,000 units
Order Quantity as per the current inventory policy (Quarterly) - 10,000 units
Ordering Cost- ₹125 per order
Carrying Cost- ₹ 10 per unit p.a.
EOQ - 1,000 units.

Solution 3.

b. Savings from EOQ as Compared to current discount policy –₹ 20,500

Associated Costs under EOQ:
Ordering Costs = No. of orders x Ordering cost per order
No of orders = Annual Requirement/ EOQ (or) current order quantity
Hence No of orders = 40
Therefore Ordering Cost = 40 x 125 = ₹ 5,000.
Carrying cost = Average Inventory x Carrying cost per unit per annum
Average Inventory = (EOQ/ current order quantity)/2
= 1,000/2 = 500
Carrying cost = 500 x 10 = ₹ 5,000
Associated Costs under EOQ = Ordering cost + Carrying Cost
= ₹ 10,000---------- A
Associated Costs under current inventory policy:
No of orders = 4 (Quarterly)
Ordering cost = 4 x 125 = ₹ 500
Average inventory = 10,000/2 = 5,000
Carrying cost = 5,000x10 = 50,000
Associated Costs = 50,000+500 = 50,500
Less: Discount = 20,000
Net cost = 30,500---------- B
Incremental Cost = B – A = 20,500

Solution 4.

b. ₹ 6,400

Time taken under the Overtime regime 180 Hours + 20 Hours overtime= 200 Hours
Time to be taken under the Incentive regime
Units to be produced = 20,000 units
Units produced per hour under incentive scheme = 125 units
Time taken = 160 Hours
Time saved = 200 – 160 = 40 hours.

Incentive under Rowan scheme = (Time saved/Time allowed) x time taken x Rate
= (40/200) x 160x200 = ₹ 6,400.

Solution 5.

b. ₹ 5,600

Cost under the Overtime scheme:
Base wage = 200 x 200 = 40,000
OT Premium = 20 x 200 = 4,000
Total Wages under Overtime scheme = 44,000
Cost under Incentive scheme:
Base Wage = 160 hours x 200 = 32,000
Incentive = 6,400
Total wages paid = 38,400
Savings in Incentive scheme over Overtime scheme = ₹ 5,600.

Material Costing

Case Scenario (Sept 24)

FW Limited manufactures various types of footwear and covers a considerable market share. The footwear made by company are stylish and durable. The management calls for an urgent meeting because it has come to their notice that two of their old permanent customers have moved on to its competitors.

Marketing Manager has stated that there are circumstances when company cannot fulfill the demand of their customers due to shortage of supply and this is the main reason for move on.

Production Manager has stated that production team is working efficiently but workers have to wait long enough for raw material which leads to idle time and low production.

The cost accounts department of FW Limited has furnished the following data for the component B :

Purchase Price	₹ 4,800 per unit
Trade Discount	2% of purchase price
Total duties (No Credit availed)	8% of purchase price
Insurance Charges	₹ 62,000 per year
Units purchased during the year	60,000 units
Opening Stock	5,000 units @ ₹ 5,150 per unit
Closing Stock	4,500 units

Usages per week		Delivery period	
Minimum	1,050 units	Minimum	5 weeks
Maximum	1,200 units	Maximum	9 weeks
Average	1,125 units	Average	7 weeks

Lead time for emergency purchases is 2 weeks. Additional Information :

- Normal wastage during the storage is 80 units (no realizable value) and abnormal wastage is 40 units.
- Factory works for 365 days in a year.

You are required to calculate the followings (MCQs 6 to 10):

1. Calculate per unit cost of material by using Average Price Method.
(A) ₹ 5,100
(B) ₹ 5,119
(C) ₹ 5,094
(D) ₹ 5,133

2. Calculate minimum stock level.
(A) 10,800 units
(B) 7,825 units
(C) 5,250 units
(D) 2,925 units

3. What will be danger level of stock ?
(A) 2,400 units
(B) 7,875 units
(C) 2,250 units
(D) 2,240 units

4. Calculate average number of days (round off) for which average inventory level to be held.
(A) 27 days
(B) 29 days
(C) 26 days
(D) 30 days

5. Calculate amount of Abnormal Loss during storage to be transferred to Costing Profit & Loss Account (based on average price)
(A) ₹ 2,04,000
(B) ₹ 2,04,760
(C) ₹ 2,03,760

(D) ₹ 2,05,320

Solution

1. A
2. D
3. C
4. B
5. A

Case Scenario (May 2025)

Skylark Electronics Company assembles and sells laptops in India. An important component of laptop is it's rechargeable battery. The company buys its monthly requirement of 4,500 batteries and it would buy its annual requirement in 10 equal instalments. The purchase cost of one battery is ₹ 800.

The batteries are used evenly throughout the year in the assembling process on 360 days per year. The ordering cost is ₹ 9000 per order and the inventory carrying cost is 37.50% per annum. The high carrying cost results from the need to keep the batteries in carefully controlled temperature under humid conditions along with high cost of insurance.

Delivery of the batteries from the vendor generally takes 6 days but it may go up to as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the table below:

Delivery Time (Days)	6	7	8	9	10
Percentage of Occurrence (%)	70	15	5	5	5

On the basis of above case scenario, you are required to answer the following MCQs 1 to 5.

Question 1.

At what quantity of purchase of batteries, the ordering costs will be equal to the inventory carrying costs?

(A) 1,600
(B) 1,700
(C) 1,800
(D) 1,900

Question 2.

What will be the total annual cost of purchases as per the quantity calculated in Q-1 above?

(A) ₹ 3,84,80,000
(B) ₹ 4,37,40,000
(C) ₹ 4,29,30,000
(D) ₹ 5,80,84,000

Question 3.

Assuming that the company is willing to take a 15% risk of being out of stock, what would be the safety stock and the Re-order point?

(A) Safety stock 1050 batteries and Re-order point 2250 batteries
(B) Safety stock 2250 batteries and Re-order point 1050 batteries
(C) Safety stock 1450 batteries and Re-order point 2850 batteries
(D) Safety stock 1250 batteries and Re-order point 2650 batteries

Question 4.

Assuming that the company is willing to take a 5% risk of being out of stock what would be the safety stock and Re-order point?

(A) Safety stock 1100 batteries and Re-order point 2800 batteries
(B) Safety stock 1350 batteries and Re-order point 2550 batteries
(C) Safety stock 1280 batteries and Re-order point 2900 batteries
(D) Safety stock 1550 batteries and Re-order point 3280 batteries

Question 5.

Assuming 5% risk of out of stock what would be the total cost of ordering and carrying inventory for one year?

(A) ₹ 5,40,000
(B) ₹ 8,15,000
(C) ₹ 9,45,000

(D) ₹ 10,80,000

1. **C**
2. **B**
3. **None**
4. **None**
5. **None.**

Overheads

Case Scenario (Jan 2025)

ABC Company produces three products X. Y and Z. Similar type of material is used in the production of all the three products. The company has been using traditional absorption costing method, using direct labour hours to allocate overheads to its products. The Cost Accountant has suggested considering an activity based costing system. The following information is available in the records of the company.

	X	Y	Z
Production Volume p.a. (In units)	16,000	17,000	15,000
Direct Material per unit	3 kg	4 kg	5 kg
Labour hours per unit	0.10	0.15	0.20
Machine hours per unit	0.5	0.7	0.9
No. of Production runs p.a	50	65	60
No. of purchase orders p.a	5	10	15
No. of order shipped p.a	25	35	32

Activity	Cost (₹)	Cost Driver
Machine setup costs	49,000	Production Runs
Machine running costs	64,128	Machine hours
Purchase cost	52,050	Purchase orders
Delivery cost	46,460	Orders shipped

The price of Raw Material is ₹ 2 per kg.
Direct labour cost per hour is ₹ 20.
On the basis of above Case Scenario, you are required to answer the following MCQs 1 to 5:

Question 1.
What is overhead absorption rate per hour as per traditional absorption costing method?
(A) ₹ 29.60
(B) ₹ 29.32
(C) ₹ 13.78
(D) ₹ 15.82

Question 2.
What is the full cost per unit of product Y under the traditional absorption costing method?
(A) ₹ 19.92
(B) ₹ 4.44
(C) ₹ 46.32
(D) ₹ 15.44

Question 3.
Under an activity based costing system, what is the cost driver rate for machine set up costs?
(A) ₹ 280
(B) ₹ 1.467
(C) ₹ 6.85
(D) ₹ 230

Question 4.
Under an activity based costing system, the amount of allocated overheads attributable to machine running hours to product X is:
(A) ₹ 22,848
(B) ₹ 15,360
(C) ₹ 25,920
(D) ₹ 14,000

Question 5.
The total cost of product Z as per activity based costing method is : (A) ₹ 2,86,073
(B) ₹ 2,94,905

(C) ₹ 84,905
(D) ₹ 2,60,660

Solution

MCQ No.	Correct Option
1.	(A)
2.	(D)
3.	(A)
4.	(B)
5.	(B)

Case Scenario (MTP August 2024)

Mr. Vikas, a toy importer, has understood the importance of manufacturing in India. He is backed up by the new government. 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 toys 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 B.O.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 came to management as a surprise because generally such rate of defects on imports is 8%.

Additional Information:

- Exchange rates:

1) 1 SLR = 0.25 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:

Question 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

Question 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

Question 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

Question 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

Question 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

Solution1.

(a) Working notes:

Factory cost (33,00,000 x 0.25)	INR 8,25,000
Add: Freight (50,000 x 0.25)	INR 12,500
F.O.B. (Free On Board)	INR 8,37,500
Containers (2,00,000 x 0.25)	INR 50,000
Insurance (1,500 x 75)	INR 1,12,500
Ocean freight (2,000 x 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% x 11,00,000 = INR 2,20,000

IGST = 18% x (11,00,000 + 2,20,000)
= INR 2,37,600

Penalty = INR 15,000

Commission

Indian = 6% x 8,25,000 = INR 49,500

Srilankan = 12% x 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

Solution 2.

(a) 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**

Solution 3.

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

Particulars	Product Xendga (INR)
Factory cost	3,75,000
Other cost (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**

Solution 4

(a) Custom duty 80% x 2,20,000 = 1,76,000
Add: IGST = 2,37,600
4,13,600

Solution 5.

(c) 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	56 (6,18,336.36/11,040)	93.23 (6,86,163.63/7,360)	
good units (total costs/no of good units after normal loss)			
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

Cost Sheet

Question 2 (MTP March 2024)

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

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

During the last month, the company has produced 2,34,000 tonnes of output. Expenditures for the last months are:

(i) Raw materials consumed ₹ 50,00,000
(ii) Power consumed 13,000 Kwh @ ₹ 8 per Kwh to run the machines for production.
(iii) Diesels consumed 2,000 litres @ ₹ 93 per litre to run power generators used as alternative or backup for power cuts.
(iv) Wages & salary paid – ₹ 6,40,00,000
(v) Gratuity & leave encashment paid – ₹ 64,20,000
(vi) Hiring charges paid for HEMM- ₹ 30,00,000. HEMM are directly used in production.
(vii) Hiring charges paid for cars used for official purpose – ₹ 66,000
(viii)Reimbursement of diesel cost for the cars – ₹ 22,000
(ix) The hiring of cars attracts GST under RCM @5% without credit.
(x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of dispatch) – ₹ 12,000
(xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of dispatch) and factory premises is ₹ 8,000 and ₹ 18,000 per month respectively.
(xii) TA/ DA and hotel bill paid for sales manager- ₹ 36,000
(xiii) The company has 1,800 employees who work for 26 days in a month.

You are asked to calculate the followings:

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.

Solution -

1. D

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

3. A Car hire charges including GST @5%, please refer the cost sheet

4. B Selling and distribution cost includes the following:

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

For Cost of Sale please refer the cost sheet

5. A Manshift = 1,800 employees × 26 days = 46,800 manshifts
Computation of earnings per manshift (EMS):

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

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

Workings
Cost Sheet of M Ltd. for the last month

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

Standard Costing

Case Scenario (MTP August 2024)

Hilfy textiles Ltd. has been a major player in the textile industry, producing high- quality polyester mix cotton fabric. The production process is complex and involves multiple stages, including spinning, weaving, quality control, and packaging. The company has been facing challenges in controlling costs and maintaining profitability, mainly due to fluctuating material costs and labor inefficiencies.

To address these challenges, the company's management has decided to implement a standard costing system to better manage costs, set benchmarks, and identify variances. The goal is to gain better control over production costs, improve budgeting accuracy, and enhance decision-making.

Hilfy textiles Ltd. had prepared the following estimation for the month of April:

	Quantity/Time	Rate (₹)	Amount (₹)
Cotton	8,000 m	50.00	4,00,000
Polyester	6,000 m	40.00	2,40,000
Skilled labour	1,000 hours	37.50	37,500
Unskilled labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

The company has produced 14,800 m finished product by using the followings:

	Quantity/Time	Rate (₹)	Amount (₹)
Cotton	9,000 m	48.00	4,32,000
Polyester	6,500 m	37.00	2,40,500
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

On the basis of analysis of standard costing system, company's management wants to take actions like supplier negotiation, process optimisation, employee training, etc.

Being the cost manager of the company, you are required to answer the following five requirements of the management:

Question 1.

Compute Material mix variance and Material Yield Variance

(a) ₹ 1430 (A) & 43,200 (F)
(b) ₹ 1430 (F) & 43,200 (F)
(c) ₹ 24,000 (A) & 37,500 (F)
(d) ₹ 19,300 (A) & 37,500 (F)

Question 2.

Compute Material Price Variance for supplier negotiation

(a) ₹ 18,000 (A)
(b) ₹ 43,200 (F)
(c) ₹ 37,500 (A)
(d) ₹ 37,500 (F)

Question 3.

Compute Material Cost Variance

(a) ₹ 32,500 (F)
(b) ₹ 24,500 (A)
(c) ₹ 79,270 (F)
(d) ₹ 79,270 (A)

Question 4.

Compute Labour Efficiency Variance and Labour Yield Variance.

(a) ₹ 940 (A) & 1,140 (A)
(b) ₹ 2,424 (A) & 1,556 (A)

(c) ₹ 2,424 (A) & 1,556 (A)
(d) ₹ 940 (A) & 1,140 (F)

Question 5.
Compute Labour Cost Variance.
(a) ₹ 884 (A)
(b) ₹ 1,556 (F)
(c) ₹ 884 (F)
(d) ₹ 1,556 (A)

Solution -

Solution 1.
(a) Material Mix Variance (Cotton + Polyester) = {(RSQ × SP) – (AQ × SP)}
= {7,08,570- 7,10,000}
= 1,430 (A)
Material Yield Variance (Cotton + Polyester) = {(SQ × SP) – (RSQ × SP)}
= {7,51,770 – 7,08,570}
= 43,200 (F)

Solution 2.
(d) Material Price Variance (Cotton + Polyester) = {(AQ × SP) – (AQ × AP)
= {7,10,000 – 6,72,500}
= 37,500 (F)

Solution 3.
(c) Material Cost Variance (Cotton + Polyester) = {(SQ × SP) – (AQ × AP)}
= {7,51,770 – 6,72,500}
= 79,270 (F)

Working Note
Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
Cotton	9,397 m	50	4,69,850	8,857 m	4,42,850	9,000 m	4,50,000	48	4,32,000
Polyester	7,048 m	40	2,81,920	6,643 m	2,65,720	6,500 m	2,60,000	37	2,40,500
	16,445 m		**7,51,770**	**15,500 m**	**7,08,570**	**15,500 m**	**7,10,000**		**6,72,500**

WN-1: Standard Quantity (SQ):
Cotton - $\left(\frac{8,000\ m}{0.9\times 14,000\ m} \times 14,800\ m\right)$ = 9,396.8 or 9,397 m
Polyester- $\left(\frac{6,000\ m}{0.9\times 14,000\ m} \times 14,800\ m\right)$ = 7,047.6 or 7048 m
WN- 2: Revised Standard Quantity (RSQ):
Cotton - $\left(\frac{8,000\ m}{14,000\ m} \times 15,500\ m\right) = 8,857.1\ or\ 8857\ m$
Polyester - $\left(\frac{6,000\ m}{14,000\ m} \times 15,500\ m\right)$ = 6,642.8 or 6,643

Solution 4.
(b) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
= {61,496 – 63,920}
= 2,424 (A)
Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}
= {61,496 – 63,052}
= 1,556 (A)

Solution 5.
(a) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
= {61,496 – 62,380}
= 884 (A)
Working Note

Labour Variances:

Labour	SH (WN-3)	SR (₹)	SH × SR (₹)	RSH (WN-4)	RSH × SR (₹)	AH	AH × SR (₹)	AR (₹)	AH × AR (₹)
Skilled	1,116 hrs	37.50	41,850	1144	42,900	1,200	45,000	35.50	42,600
Unskilled	893 hrs	22.00	19,646	916	20,152	860	18,920	23.00	19,780
	2,009 hrs		61,496	2,060	63,052	2,060	63,920		62,380

WN- 3: Standard Hours (SH):

Skilled labour-$\left(\frac{0.95\times1,000\ hr.}{0.90\times14,000\ m.} \times 14,800\ m.\right) = 1,115.87\ or\ 1,116\ hrs.$

Unskilled labour-$\left(\frac{0.95\times800\ hr.}{0.90\times14,000 m.} \times 14,800\ m.\right) = 892.69\ or\ 893\ hrs.$

WN- 4: Revised Standard Hours (RSH):

Skilled labour-$\left(\frac{1,000hr}{1,800\ hr} \times 2,060\ hr.\right) = 1,144.44\ or\ 1,144\ hrs.$

Unskilled labour- $\left(\frac{800\ hr.}{1,800\ hr.} \times 2,060\ hr.\right)$= 915.56 or 916 hrs.

Case Scenario (MTP Nov 2024)

XYZ Manufacturing Ltd. is a mid-sized enterprise that has established a strong reputation in the field of precision engineering. The company specializes in producing high-quality engineering components that meet the stringent requirements of various industries including automotive, aerospace, medical devices, and industrial machinery. With a commitment to precision and excellence, XYZ Manufacturing Ltd. has positioned itself as a reliable supplier of critical components that demand the highest levels of accuracy and durability.

To maintain stringent control over its production costs and enhance cost efficiency, XYZ Manufacturing Ltd. operates under a standard costing system. This system plays a pivotal role in the company's financial and operational management. Standard costing involves setting predetermined costs for each production element, including materials, labor, and overheads. These predetermined costs, known as standard costs, serve as benchmarks against which actual production costs are measured.

Particulars	Budgeted Data	Actual Data
Units Produced	10,000 units	9,500 units
Fixed Overheads	₹ 20,00,000	₹ 19,50,000 + ₹ 1,00,000 (additional quality control cost for 1,000 units chosen on sample basis)
Hours Worked	15,000 hours	14,250 hours
Variable Overhead Rate	₹ 50 per hour	₹ 50 per hour (first 10,000 hours) ₹ 60 per hour (additional hours)

Based on the given information, you are being required to answer the following questions (MCQs 1 to 5):

Question 1.

What is the Fixed Overhead Cost Variance for XYZ Manufacturing Ltd. in May 2024?

(a) ₹ 50,000 (A)
(b) ₹ 1,00,000 (A)
(c) ₹ 1,50,000 (A)
(d) ₹ 2,00,000 (A)

Question 2.

What is the Fixed Overhead Volume Variance for XYZ Manufacturing Ltd. in May 2024?

(e) ₹ 50,000 (F)
(f) ₹ 50,000 (A)
(g) ₹ 1,00,000 (F)
(h) ₹ 1,00,000 (A)

Question 3.

What is the Variable Overhead Efficiency Variance for XYZ Manufacturing Ltd. in May 2024?

(a) ₹ 37,500 (A)
(b) ₹ 42,500 (A)

(c) ₹ 0
(d) ₹ 25,000 (A)

Question 4.
What is the Variable Overhead Expenditure Variance for XYZ Manufacturing Ltd. in May 2024?
(a) ₹ 40,000 (A)
(b) ₹ 42,500 (A)
(c) ₹ 45,000 (A)
(d) ₹ 45,030 (A)

Question 5.
What is the Fixed Overhead Expenditure Variance for XYZ Manufacturing Ltd. in May 2024?
(i) ₹ 50,000 (F)
(j) ₹ 50,000 (A)
(k) ₹ 1,00,000 (F)
(l) ₹ 1,00,000 (A)

Solution

Solution 1.
(c) ₹ 1,50,000 (A)
Fixed Overhead Cost Variance = Absorbed Fixed Overheads - Actual Fixed Overheads
Absorbed Fixed Overheads = (Budgeted Fixed Overheads / Budgeted Production) x Actual Production
= (₹ 20,00,000 / 10,000 units) x 9,500 units = ₹ 19,00,000
Adjusted Actual Fixed Overheads = ₹ 19,50,000 + ₹ 1,00,000 = ₹ 20,50,000
Fixed Overhead Cost Variance = ₹ 19,00,000 - ₹ 20,50,000 = ₹ 1,50,000 (Adverse)

Solution 2.
(d) ₹ 1,00,000 (A)
Fixed Overhead Volume Variance = (Actual Production - Budgeted Production) x Standard Fixed Overhead Rate per Unit
Standard Fixed Overhead Rate per Unit = ₹ 20,00,000 / 10,000 units = ₹ 200 per unit
Fixed Overhead Volume Variance = (9,500 units - 10,000 units) x ₹ 200
= 500 units x ₹ 200 = ₹ 1,00,000 (Adverse)

Solution 3.
(c) 0
Variable Overhead Efficiency Variance = (Standard Hours for Actual Production - Actual Hours Worked) x Standard Variable Overhead Rate
Standard Hours for Actual Production = 9,500 units x 1.5 hours/unit = 14,250 hours
Variable Overhead Efficiency Variance = (14,250 – 14,250) x ₹ 50 = 0

Solution 4.
(b) ₹ 42,500 (A)
Variable Overhead Expenditure Variance = (Standard Rate - Actual Rate) x Actual Hours Worked
Total Variable Overhead for Actual Hours: (10,000 x ₹ 50) + (4,250 x ₹ 60) = ₹ 5,00,000 + ₹ 2,55,000 = ₹ 7,55,000
Variable Overhead Expenditure Variance = (₹ 50 x 14,250 hours) - ₹ 7,55,000 = ₹ 42,500 (Adverse)

Solution 5.
(b) ₹ 50,000 (A)
Fixed Overhead Expenditure Variance = Budgeted Fixed Overheads - Actual Fixed Overheads
= ₹ 20,00,000 - ₹ 20,50,000= ₹ 50,000 (Adverse)

Case Scenario (MTP March 2025)

A company is working in the manufacturing sector and uses a labour-force, which consists of skilled, semi-skilled, and unskilled workers.
The rate of Labour per week for skilled worker is ₹ 120, for semi-skilled workers is ₹ 80 and for unskilled worker is ₹ 60.

It had planned the labour for a job that would take 60 weeks to be completed, ideally. Ratio of workers employed in skilled, semi-skilled, and unskilled would be 5:3:4. The management consultant who was employed to handle this job died in an accident. Board hired a new consultant to take over this job.
This new consultant had a different approach for doing this job. He thought that workers actually required would be in the ratio of 7:3:8. He changed the composition of the labour-force and employed the workers in the new ratio.
Project was carried out successfully and it turned out that this change in Mix of labour-force saved the company ₹ 76,800 in the job but at the same time the company also lost ₹ 1,29,600 due to poor productivity of the labourers.
As a result, a management consultant was promoted and the labour force was fired & was replaced with a more experienced labour-force.
As the new management consultant was promoted, the company found a new one to replace him. This 3rd management consultant was asked to understand and analyse the previous job done by the 2nd management consultant. Data in addition to above-given information was provided as follows:-
• Total time period taken for the job was 64 weeks.
• Net extra cost spent, in comparison to planned cost, was ₹ 1,04,000.
• Total number of weeks worked by all the type of labourers was 23,040 weeks.
• Skilled and semi-skilled labourers in reality charged ₹ 20 extra per week, whereas unskilled labourers were negotiated to charge ₹ 20 less per week, than what they had charged earlier.
Let say, you are the 3rd management consultant, and you have been given all this information. Work out calculations and answer the following questions (MCQs 6 to 10) based on the information given above.

Question 1.
If the total labour efficiency variance of skilled and semiskilled labourers is ₹ 1,29,600 (Favourable), what is the labour efficiency variance of unskilled labour?
(a) 1,82,400 (Adverse)
(b) 52,800 (Adverse)
(c) 1,29,600 (Adverse)
(d) 76,800 (Favourable)

Question 2.
What are the amounts that company saved & paid extra to labourers, respectively?
(a) 2,56,000 & 2,04,800
(b) 1,79,200 & 204,800
(c) 2,04,800 & 2,56,000
(d) 204,800 & 1,79,200

Question 3.
If in total 1,440 weeks were worked in addition to what was planned, how many extra/less workers were used in actual, compared to standard? (Answer in sequence of skilled, semi-skilled, & unskilled).
(a) -10, -30, -40
(b) -10, -30, +40
(c) +10, +30, -40
(d) +10, +30, +40

Question 4.
Calculate revised standard weeks for all 3 types of labour forces? (Answer in sequence of skilled, semi-skilled, & unskilled).
(a) 9,400, 5,650, & 7,990
(b) 9,550, 6,280, & 7,210
(c) 8,520, 6,850, & 7,670
(d) 9,600, 5,760, & 7,680

Question 5.
If standard rates charged by skilled, semi-skilled, and unskilled were ₹ 120, ₹ 80, & ₹ 60, respectively, then which labour force performed worst, better, & best, due to change in labour composition?
(a) Semi-skilled, skilled, & unskilled
(b) Skilled, semi-skilled, unskilled

(c) Unskilled, skilled, & semi-skilled
(d) Unskilled, semi-skilled, & skilled

Solution

Answer 1.

(a) 1,82,400 (Adverse)

Working Note

Total actual weeks = 23,040
Ratio of actual workers = 7:3:8
Let's assume that total number of workers is 'X'
(7/18 x X x64) + (3/18 x X x 64) + (8/18 x X x 64) = 23,040
X = 360

	Standard		Actual	
	Workers	Rate per week	Workers	Rate per week
Skilled	150	120	140	140
Semi-skilled	90	80	60	100
unskilled	120	60	160	40

Standard time = 60 weeks
Actual time = 64 weeks

	Standard			Actual		
	Weeks	Rate	Amount	Weeks	Rate	Amount
Skilled	9,000	120	10,80,000	8,960	140	12,54,400
Semi skilled	5,400	80	4,32,000	3,840	100	3,84,000
unskilled	7,200	60	4,32,000	10,240	40	4,09,600
Total	21,600		19,44,000	23,040		20,48,000

1. Cost Variance = 19,44,000 – 20,48,000 = 1,04,000(A)
2. Rate Variance =

Skilled	8,960x(120-140)	1,79,200 (A)
Semi-skilled	3,840x(80-100)	76,800 (A)
unskilled	10,240x(60-40)	2,04,800 (F)
		51,200 (A)

3. Efficiency Variance =

Skilled	120x(9,000-8,960)	4,800(F)
Semi-skilled	80x(5,400-3,840)	1,24,800(F)
unskilled	60x(7,200-10,240)	1,82,400(A)
		52,800(A)

4. Revised Labour Efficiency Rate=

Skilled	120x(9,000-9,600)	72,000(A)
Semi-skilled	80x(5,400-5,760)	28,800(A)
unskilled	60x(7,200-7,680)	28,800(A)
		1,29,600(A)

5. Labour Mix Variance=

Skilled	120x(9,600-8,960)	76,800(F)
Semi-skilled	80x(5,760-3,840)	1,53,600(F)
unskilled	60x(7,680-10,240)	1,53,600(A)
		76,800(F)

Labour Mix Variance (76,800 F) + Revised Labour Efficiency Variance (1,29,600 A) = Total Labour Efficiency (52,800 A)

Total Lab Efficiency Variance – Labour Efficiency Variance of Skilled And Semi Skilled = Labour Efficiency Variance of Unskilled
52,800A – 1,29,600A = 1,82,400A,
So, Labour Efficiency Variance of Unskilled = 1,82,400A

	No. of workers	Weeks worked
Skilled	140	140x64= 8,960
Semi-skilled	60	60x64= 3,840
unskilled	160	160x64= 10,240

Answer 2.
(c) 2,04,800 & 2,56,000
Money saved or spent:

	Weeks worked	Saved/spent extra, per week	Total
Skilled	8,960	20 spent extra	-1,79,200
Semi-skilled	3,840	20 spent extra	-76,800
unskilled	10,240	20 saved	+2,04,800

Saved = 2,04,800
Spent = 2,56,000

Answer 3.
(b) -10, -30, +40
Actual weeks = 23,040
(-) extra = (1,440)
Planned weeks = 21,600
Original standard ratio = 5:3:4

Standard weeks chart:

	Weeks	Workers
Skilled	21,600x5/12 = 9,000	9,000/60 weeks = 150
Semi-skilled	21,600x3/12 = 5,400	5,400/60 weeks = 90
unskilled	21,600x4/12 = 7,200	7,200/60 weeks = 120

	Planned workers	Actual workers	Actual compared to standard
Skilled	150	140	-10
Semi-skilled	90	60	-30
unskilled	120	160	+40

Answer 4.
(d) 9,600, 5,760, & 7,680
Actual weeks is divided in standard ratio of workers
23,040 in 5:3:4

	Revised Standard Weeks
Skilled	9,600
Semi-skilled	5,760
unskilled	7,680

Answer 5.
(c) Unskilled, skilled, & semi-skilled
Change in performance of workers, due to change in labour composition can be evaluated through labour mix variance. We have already calculated labour mix variance above. Answers are:

	Labour mix variance
Skilled	76,800 F
Semi-skilled	1,53,600 F
unskilled	1,53,600 A

This means unskilled labour performed the worst, skilled labour performed better than unskilled, and semi skilled performed the best.

Service Sector Costing

Case Scenario (MTP Dec 2024)

A truck driver, named Raju, owns a truck which can carry 5 tonnes of material at a time. Raju has no other truck and he has listed himself with various carriage services agencies, to offer his services. He gets his work from these agencies and they pay him as per the load and the distance. Raju has one condition that he must be paid for at least 75% of his total capacity. Raju charges freight at ₹ 10 per tonne- km.

He received a work contract from one of these agencies, where he has to take 4 tonnes from Delhi in the morning and drop it off at Chandigarh. After that he will move to Ludhiana, where he again loads 3 tonnes and comes back to Delhi by evening. This contract is for nearly 3 months.

Raju is excited to accept the order but it is not physically possible for Raju to complete this project alone. He decides to hire a helper cum driver who will assist him in this work contract and will also drive in turns with Raju. Thus, such a long contract will be managed comfortably. This helper will take ₹ 15,000 per month.

The contract will start from 15th June, 2024 and will run till 14th September, 2024. Throughout this time period there are only 2 days of holidays, both falling in August (1 for Independence Day and 1 for Raksha Bandhan).

Some information about the Truck and its associated costs:

- Truck was purchased on 1st April, 2021 by taking a loan of ₹ 20,00,000 @ 10% p.a. from Punjab national bank for 5 years. Raju mortgaged jewellery of his wife to get this loan.
- Every year-end he has to pay ₹ 5,27,595 as instalment.
- Scrap value after 10 years is expected to be ₹ 500,000.
- Depreciation is charged on a straight-line method.
- Services and maintenance charges each month is ₹ 80,000.
- Truck runs on diesel and its running average is 8 kms/ litre.
- Diesel cost per litre:

June	80.30
July	80.50
August	81.25
September	80.90

Yearly interest amount of loan and yearly depreciation is charged to a work contract on the basis of days worked in a year in the contract.

Distance between these places:

(1) Delhi to Chandigarh = 250 kms
(2) Chandigarh to Ludhiana = 100 kms
(3) Ludhiana to Delhi = 150 kms

Answer the following questions (MCQs 1 to 5):

Question 1.

What would be the amount of profit Raju would have earned if he had no minimum charges limit of 75% of total capacity on absolute Tonne-km basis? (If the vehicle runs empty then he would only charge for Diesel expenses).

a. 3,34,249
b. 4,43,249
c. 5,96,977
d. 4,34,249

Question 2.

If payment was made on a commercial Tonne-km basis and Raju had no minimum charges limit of 75%, how much would he have lost due to no minimum requirement?

A. ₹ 6,37,500
B. ₹ 5,93,750
C. ₹ 4,92,438
D. ₹ 3,91,126

Question 3.

What should be the minimum amount charged on the basis of absolute Tonne- km if Raju wants to earn ₹ 2,70,000?

A. ₹ 4.58

B. ₹ 6.13
C. ₹ 8.39
D. ₹ 3.21

Question 4.

Choose the correct amount of depreciation and interest that should be charged to this work contract.

A. 56,983 & 22,588
B. 36,986 & 22,578
C. 63,963 & 12,568
D. 63,953 & 12,558

Question 5.

What is the profit as per current rate charged by Raju? (Use absolute Tonne-Km).

A. 7,34,249
B. 9,44,863
C. 5,96,977
D. 4,34,249

Solution

Solution 1.

C Profit if no minimum charges are there, on absolute tonne basis, but he will charge for diesel petrol when running empty

Absolute tonne-kms: (250 kms x 4 tonnes + 150 kms x 3 tonnes) x 90 days = 1,30,500 tonne-kms

Vacant moving (Chandigarh to Ludhiana) = 100kms x 90 days = 9,000 kms

Charges for vacant running:

	(₹)
June (80.30 x 16 x 100)/8	16,060
July (80.50 x 31 x 100) /8	31,194
August (81.25 x 29 x 100) /8	29,453
September (80.90 x 14 x 100) /8	14,158
Total Charges	**90,864**

	(₹)
Total revenue (1,30,500 x 10)	13,05,000
Add: diesel recovery for vacant running	90,864
Less: service & maintenance (80,000 x 3)	(2,40,000)
Less: salary (15,000 x 3)	(45,000)
Less: diesel cost	(4,54,323)
Less: interest	(22,578)
Less: depreciation	(36,986)
Profit	**5,96,977**

Bifurcation of principal and interest

Years	Calculation of interest (₹)	Interest (₹)	Principal repayment (₹)	Loan balance (₹)
0	-	-	-	20,00,000
1	20,00,000 x 10%	2,00,000	3,27,595	16,72,405
2	16,72,405 x 10%	1,67,241	3,60,354	13,12,051
3	13,12,051 x 10%	1,31,205	3,96,390	9,15,661
4	9,15,661 x 10%	91,566	4,36,029	4,79,632
5	4,79,632 x 10%	47,963	4,79,632	-

Interest allocated to this job = 91,566 x 90 / 365 = 22,578

Depreciation = $\frac{20,00,000 - 5,00,000}{10} \times \frac{90}{365}$ = 36,986

Diesel expenses:

	(₹)
June (80.30 x 16 x 500)/8	80,300
July (80.50 x 31 x 500)/8	1,55,969
August (81.25 x 29 x 500)/8	1,47,266
September (80.90 x 14 x 500)/8	70,788
Total diesel expenses	**4,54,322**

Solution 2.

A

	With minimum Limit (₹)	Without minimum limit (₹)
Commercial tonne kms	3.75 x 500 x 90 = 1,68,750	((4+0+3)/3) x 500 x 90 =1,05,000
revenue	1,68,750 x 10 = 16,87,500	1,05,000 x 10 = 10,50,000
Less: costs	(7,98,887)	(7,98,887)
Profit/(loss)	**8,88,613**	**2,51,113**

Loss arising due to no minimum limit = 8,88,613-2,51,113 = 6,37,500

Solution 3.

B

Total Revenue = Cost + Profit = 7,98,887+ 2,70,000 = ₹ 10,68,887 Absolute Tonne-Kms =1,74,375

Rate = 10,68,887/1,74,375 = ₹ 6.13

Solution 4.

B

Solution 5.

B Profit at current rate (based on minimum charges of 75%)

Absolute tonne-kms: (250 kms x 4 tonnes + 100 kms x 3.75 tonnes + 150 kms x 3.75 tonnes) x 90 days = 1,74,375 tonne-kms

	(₹)
Total revenue (1,74,375 x 10)	17,43,750
Less: service & maintenance (80,000 x 3)	(2,40,000)
Less: salary (15,000 x 3)	(45,000)
Less: diesel cost	(4,54,323)
Less: interest	(22,578)
Less: depreciation	(36,986)
Profit	**9,44,863**

Case Scenario (MTP April 2025)

ABC Transport Services Pvt. Ltd. is a private bus company renowned for providing reliable and comfortable intercity passenger services. The company operates a fleet of buses that connect two major cities, Mumbai and Pune, which are 150 kilometers apart. By ensuring timely and efficient services, ABC Transport Services has become a preferred choice for travelers commuting between these two bustling cities.

Fleet and Operations

The company operates a total of 10 buses, each designed for optimal comfort and safety. Every bus in the fleet has a seating capacity of 50 passengers, equipped with modern amenities to enhance the travel experience. The buses adhere to strict maintenance schedules to ensure safety and reliability on the road. The company operates multiple trips daily to accommodate the high demand for travel between Mumbai and Pune. The buses normally operate at 80% capacity.

Cost Data:

Cost Category	Amount (₹)
Fixed Costs (per month)	

Insurance	2,00,000
License Fees	50,000
Salaries to Driver and Conductor	5,00,000
Garage Rent	1,00,000
Depreciation	3,00,000
Administration Expenses	1,50,000
Variable Costs (per kilometer)	
Fuel	₹ 35 per km
Lubricants and Oils	₹ 5 per km
Wages per bus (additional per trip)	₹ 10,000 per trip
Operational Data	
Number of round trips per bus in this month	20 trips
Average occupancy rate	80%

Additional Info:
In the past few months, the repairs and maintenance costs for ABC Transport Services Pvt. Ltd. have shown some variability due to fluctuating operational conditions. For instance, in April, the total repairs & maintenance costs amounted to ₹ 1,40,000, with the company reporting 18 trips per bus. In May, these costs increased to ₹ 1,60,000 due to additional maintenance activities and 22 trips per bus.
You are required to answer the following requirements (MCQs 6 to 10)

Question 1.
Calculate the cost per trip per bus.
(a) ₹ 21,750
(b) ₹ 29,250
(c) ₹ 23,450
(d) ₹ 28,250

Question 2.
Determine the total cost of operating one bus for a month.
(a) ₹ 5,20,000
(b) ₹ 4,45,000
(c) ₹ 6,10,000
(d) ₹ 5,85,000

Question 3.
What is the monthly revenue if each ticket is priced at ₹1,000 per trip?
(a) ₹ 90,00,000
(b) ₹ 1,00,00,000
(c) ₹ 80,00,000
(d) ₹ 75,00,000

Question 4.
Calculate the break-even number of passengers per trip if the ticket price is ₹635.
(a) 44 passengers
(b) 49 passengers
(c) 47 passengers
(d) 50 passengers

Question 5.
Calculate the cost per passenger-kilometer.
(a) ₹ 2.438
(b) ₹ 4.88
(c) ₹ 3.75
(d) ₹ 5.25

Answer 1.

(b) ₹ 29,250

Fixed Costs per Trip per Bus $= \frac{Total\ Fixed\ Costs}{Number\ of\ Buses\ x\ Number\ of\ Trips}$

= ₹ 13,00,000 / (10 x 20) = ₹ 6,500

Semi-Variable Costs (Repairs & Maintenance) per Trip per Bus $= \frac{Total\ Semi-Variable\ Cost}{Number\ of\ Buses\ x\ Number\ of\ Trips}$

= ₹ 1,50,000 / (10 x 20) = ₹ 750

Variable Costs per Trip per Bus = (Fuel + Lubricants and Oils) x Distance per Trip + Wages

= (₹ 35 + ₹ 5) x (150 kms x 2) + ₹ 10,000 = ₹ 22,000

Total Cost per Trip per Bus = ₹ 6,500 + ₹ 750 + ₹ 22,000 = ₹ 29,250

Total Fixed Costs:

- Insurance: ₹ 2,00,000
- License Fees: ₹ 50,000
- Salaries to Driver and Conductor: ₹ 5,00,000
- Garage Rent: ₹ 1,00,000
- Depreciation: ₹ 3,00,000
- Administration Expenses: ₹ 1,50,000
- **Total Fixed Costs: ₹ 13,00,000**

Repairs & Maintenance calculation

- Let x be the fixed portion of the semi-variable costs.
- Let y be the variable cost per trip.

Formulate Equations from Given Data:

- April: x + 18y = 1,40,000
- May: x + 22y = 1,60,000

Solve for y:

- Subtract the April equation from the May equation:
- (x+22y) − (x+18y) = 1,60,000 − 1,40,000
- y = 5,000
- Using the April equation:
- x + 18 x (5,000) = 1,40,000
- x = 50,000

Calculate Semi-Variable Costs for 20 Trips:

- Semi-variable costs = x + 20y
- Semi-variable costs = 50,000 + 20 x 5,000 = 1,50,000

Answer 2.

(d) **₹ 5,85,000**

Fixed Costs per Bus per Month	= ₹ 13,00,000 / 10 = ₹ 1,30,000
Semi-Variable Costs per Bus per Month	= ₹ 1,50,000 / 10 = ₹ 15,000
Variable Costs per Trip	= (Fuel + Lubricants and Oils) x Distance per Trip + Wages = (₹ 35 + ₹ 5) x 300 + ₹ 10,000 = ₹ 22,000
Variable Costs for 20 trips	= ₹ 4,40,000
Total Cost per Bus per Month	= ₹ 1,30,000 + ₹ 15,000 + ₹ 4,40,000 = ₹ 5,85,000

Answer 3.

(c) ₹ 80,00,000

Monthly Revenue = Number of Buses x Number of Trips x Average Occupancy Rate x Ticket Price

= 10 x 20 x 50 x 80% x ₹ 1,000 = ₹ 80,00,000

Answer 4.

(c) 47 passengers

No. of Passengers per trip to recover total cost = Total Cost per Trip / Ticket Price

= ₹ 29,250 / ₹ 635 = 46.03 passengers per trip ≈ 47 passengers per trip

Answer 5.

(a) ₹ 2.438

Total Passenger-Kilometers	= 10 buses x 20 trips x 40 passengers (50 x 80%) x 150 km x 2 = 24,00,000 passenger-kms
Cost per Passenger-Kilometer	= Total Monthly Cost / Total Passenger-Kilometers = ₹ 29,250 x (10x20) / 24,00,000 = ₹ 58,50,000/24,00,000 = ₹ 2.438 per passenger-kilometer

Marginal Costing

Case Scenario (MTP July 2024)

XYZ Manufacturing Pvt. Ltd. is a prominent company in the electric appliances industry, known for producing a diverse range of high-quality products. The company has built a reputation for reliability and innovation in the manufacturing of household appliances, including fans, mixers, and heaters. XYZ Manufacturing Pvt. Ltd. is dedicated to delivering products that meet the needs of its customers while adhering to the highest standards of quality and performance.

The company operates a state-of-the-art factory that is fully equipped with advanced machinery and technology to ensure efficient and consistent production. The factory operates 25 days a month, running multiple shifts to meet the growing demand for its products. The company have spare capacity to additional orders. Each product type—fans, mixers, and heaters—undergoes a meticulous manufacturing process that includes assembly, quality testing, and packaging.

Cost Category	Amount (₹)
Fixed Costs (per month)	
Factory Rent	₹ 3,00,000
Depreciation	₹ 2,00,000
Administrative Expenses	₹ 1,00,000
Salaries	₹ 4,00,000
Total Fixed Costs	₹ 10,00,000
Number of units produced per month	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:

Question 1.

Calculate the contribution margin per unit.

(a) ₹ 550
(b) ₹ 600
(c) ₹ 650
(d) ₹ 700

Question 2.

Determine the break-even point in sales revenue.

(a) ₹ 31,28,593
(b) ₹ 25,85,153
(c) ₹ 27,27,025
(d) ₹ 27,05,983

Question 3.

If the company wants to achieve a target profit of ₹ 5,00,000, what should be the sales volume (in units)?

(a) 2,000 units
(b) 2,727 units
(c) 2,750 units
(d) 3,000 units

Question 4.

What would be the impact on the break-even point if the variable cost per unit increases by 10%?

(a) 2,178 units
(b) 2,198 units
(c) 2,248 units

(d) 2,258 units

Question 5.

Calculate the margin of safety in percentage if the company sells 4,000 units if the variable cost per unit increases by 10%

(a) 44.85%
(b) 42.55%
(c) 45.05%
(d) 45.75%

Solution

Solution 1.

a ₹ 550

Contribution Margin per Unit = Selling Price per Unit - Variable Cost per Unit
= Variable Cost per unit = ₹ 500*+ ₹ 300**+ ₹ 100+ ₹ 50
Contribution Margin per Unit = ₹ 1,500 - ₹ 950 = ₹ 550
*Raw Material Cost Calculation Let the cost of Plastic be x

1. The cost of Copper is ₹ 80 more than the cost of Plastic: Cost of Copper = x + 80
2. The cost of Other Materials is twice that of Plastic: Cost of Other Materials = 2x
3. The total Raw Material Cost per unit is ₹ 210 more than the combined cost of Copper & Plastic: x + (x+80) + 2x = (x + (x+80)) + 210

Solving for X = 105
Now, calculate the total cost of Raw Materials:
105 + (105+80) +210 = 500
So, the total cost of Raw Materials is ₹ 500.
** Labour Cost Calculation

1. The Labour Hour Rate is ₹ 100 per hour.
2. The total labour hours used in the last month were 36,000 hours.
3. The production units last month were 12,000 units (10000 normal units plus 2000 special order).

Total Labour Cost = Labour Hour Rate × Total Labour Hours
Total Labour Cost= ₹ 100 /hour × 36,000 hours = ₹ 3,600,000
Per Unit Labour Cost = Total Labour Cost/Production Units
Per Unit Labour Cost = ₹ 3,600,000/12000
Per Unit Labour Cost = ₹ 300
So, the per unit labour cost is ₹ 300.

Solution 2.

c ₹ 27,27,025

- Break-even Point (Sales Revenue) = Total Fixed Costs / Contribution Margin Ratio
- Contribution Margin Ratio = Contribution Margin per Unit / Selling Price per Unit
- = ₹ 550 / ₹ 1,500 = 0.3667
- Break-even Point = ₹ 10,00,000 / 0.3667 ≈ ₹ 27,27,025

Solution 3.

b 2,727 units

- Required Sales Volume (Units) = (Total Fixed Costs + Target Profit) / Contribution Margin per Unit
- = (₹ 10,00,000 + ₹ 5,00,000) / ₹ 550 ≈ 2,727.27 units ≈ 2,727 units (rounded up)

Solution 4.

b 2,198 units

- New Variable Cost per Unit = ₹ 950 + 10% of ₹ 950 = ₹ 950 + ₹ 95 = ₹ 1,045
- New Contribution Margin per Unit = ₹ 1,500 - ₹ 1,045 = ₹ 455
- New Break-even Point (Units) = Total Fixed Costs / New Contribution Margin per Unit
- = ₹ 10,00,000 / ₹ 455 ≈ 2198 units

Solution 5.

c 45.05%

- Margin of Safety (Units) = Actual Sales - Break-even Sales
- = 4,000 - 2198 = 1,802 units
- Margin of Safety (%) = (Margin of Safety in Units / Actual Sales in Units) * 100
- = (1,802 / 4,000) * 100 ≈ 45.05%

Case Scenario (MTP Nov 2024)

A garment manufacturer has been producing and selling T-shirts exclusively for the Indian market. His T-shirts are made of a specific material which is eco-friendly. It means that T-shirts are biodegradable in soil after it becomes unsuitable for use.

This invention has been applauded throughout the country. Owner, Vikas, registered for the patent rights for his invention so that no one else could use it.

Vikas feels that this invention will also be liked in foreign markets, and thus plans to expand his business outside India. He feels that the US market is the first foreign market he should tap into.

Current cost structure (each T-shirt):

Direct material	90
Direct labour	60
Special service (Used in T-shirt making, 50% fixed)	80
Fixed overhead	50
Administration overhead (fixed)	20
Total cost per T-shirt	300
(+) Profit margin	200
Selling price in India	**500**

There is no limitation of any resources in India. Vikas is able to sell 80,000 T-shirts each year. He is currently working at 80% of his total capacity.

After searching for potential customers in the US, Vikas received an inquiry for 30,000 units from a wholesale distributor in California. As per the inquiry, order will be placed if price per T-shirt is reasonable and the order has to be satisfied in full.

Vikas decided to send a quote and the order was placed by the foreign client, on the same day. Vikas, without a second thought accepted the order, but did not feel the need to extend the manufacturing capacity; therefore he decided to forgo a few Indian clients.

This foreign order also required special packaging. It is spent at 20% of the total prime cost per T-shirt. The production was done quickly and foreign consignment was transported to the custom port via services from a carriage agency. It charged

₹ 80,000 for 1 truck, whose capacity was 500 kg, to transport the whole of the consignment. Truck was 20% vacant after loading the consignment.

Bill of lading was filed and a professional fee of ₹ 25,000 for filing this was paid to a Chartered accountant. Customs also charged ₹ 80 per kg per day to handle the material, storing it in warehouses, and for loading the goods on ship.

The shipping company, which was booked by Vikas for taking the consignment to the US, got delayed due to bad weather. Stock was held at port for 5 days and on the 6th day it was loaded on ship. Shipping company charged ₹ 2,800/ 10kg of goods. Insurance was charged flat at ₹ 1,11,000.

There is no custom duty on such exports.

Answer the following questions (MCQs 6 to 10):

Question 1.

Vikas had sufficient funds in his hands but he still raised a short-term working capital loan @ 6.5% p.a. for the satisfaction of this foreign order because he found a one time investment opportunity which was giving him 9.25% returns. Foreign order was accepted on 1st June and loan was taken on the same day. Repayment of the loan will be made on 1st September. Calculate net cash outflow due to this export order. Which of the following is correct?

(a) ₹ 73,91,000
(b) ₹ 75,47,750
(c) ₹ 74,76,500
(d) ₹ 71,06,000

Question 2.

What would have been the minimum price that Vikas could have quoted per T-shirt in US dollars? (exchange rate on 1st June, $1 = ₹ 83.86)

(a) $ 4.23
(b) $ 4.20
(c) $ 4.17
(d) $4.05

Question 3.

Payment from foreign client was received on 8th October when the exchange rate was ₹ 86 for each US $. Calculate the profit earned from this export order if the actual quoted price was $4.90 per T-shirt. Select the correct amongst following:

(a) ₹ 40,65,500
(b) ₹ 41,51,000
(c) ₹ 39,94,250
(d) ₹ 44,36,000

Question 4.

What is the net cash Inflow from this export order?

(a) ₹ 55,36,000
(b) ₹ 51,65,500
(c) ₹ 52,51,000
(d) ₹ 50,94,250

Question 5.

What is the Incremental benefit from this export order?

(a) ₹ 19,94,250
(b) ₹ 21,51,000
(c) ₹ 20,65,500
(d) ₹ 24,36,000

Solution

Solution 1.

(b) ₹ 75,47,750

Funds required for foreign order:

Costs	Amounts
Direct material per unit	90
Add: Direct labour per unit	60
Add: special services per unit	40
	190
Add: packaging per unit (20% x prime cost, 20% x (90 + 60 + 80))	46
Variable cost per unit	236
Total variable cost (236x30,000)	70,80,000
Add: freight	80,000
Add: professional fees	25,000
Add: custom charges (500kg x 80% x 80 x 6)	1,92,000
	73,77,000
Add: shipping ((500x80%/10) x 2,800)	1,12,000
Add: insurance	1,11,000
Funds required	**76,00,000**

Net amount of interest earned (interest earned in 9.25% and paid is 6.50% for 3 months) = 76,00,000 x (9.25% - 6.50%) x 3/12 = 52,250

So, net cash outflow due to export order = 76,00,000 - 52,250 = 75,47,750

Solution 2.

(a) $ 4.23

Minimum price :-

Variable cost (net)	75,47,750
Add: fixed cost recovery (110 x 10,000 units)	11,00,000
Add: loss of profit (200 x 10,000 units)	20,00,000
Minimum price	**1,06,47,750**
Minimum price per unit 1,06,47,750/30,000	₹ 354.925
Minimum price is $ ($1 = ₹ 83.864)	$4.23

Solution 3.

(c) ₹ 39,94,250

PROFIT EARNED:

SALES ($4.90 x 30,000 x RS. 86)	₹ 1,26,42,000
(-) Variable cost (net)	(75,47,750)
(-) allotted fixed cost (10,000 units x110)	(11,00,000)
PROFIT	**₹ 39,94,250**

Solution 4.

(d) ₹ 50,94,250

CASH INFLOW:

SALES ($4.90 x 30,000 x RS. 86)	₹ 1,26,42,000
(-) Variable cost (net)	(75,47,750)
CASH INFLOW	**₹ 50,94,250**

Solution 5.

(a) ₹ 19,94,250

Incremental benefits:

SALES ($4.90 x 30,000 x ₹ 86)	₹ 1,26,42,000
(-) Variable cost (net)	(75,47,750)
(-) allotted fixed cost (10,000 units x110)	(11,00,000)
(-) loss of profit (10,000x200)	(20,00,000)
Incremental benefits	**19,94,250**

Case Scenario (MTP April 2025)

Company Rontomax maintains its accounts in Delhi head office. All the records of Rontomax are safely kept in this office only. In the 2nd quarter the Delhi office went under repair. Thus, for the 2nd quarter records were maintained in Gurugram branch office. This branch's main work is to bring business to the company and thus generally no records are maintained in this branch office.

So for 2nd quarter all the records were recorded and maintained in this Gurugram office only. At the end of 2nd quarter, fire broke out in this branch and unfortunately all the records were burned.

In the beginning of 3rd quarter a board meeting was going to be conducted and performance of 2nd quarter were to be discussed. Company secretary, Mr. Manoj, was responsible for preparing a report of performance to be presented to the board. Now he is under immense pressure as the records were burned and thus he was not able to prepare a performance report.

Manoj contacted the Delhi head office and received a copy of 1st quarter records. He also got some information through emails shared between head office and branch office. He somehow got a lot of information but this information doesn't make any sense as it is in parts and pieces. He called out for help of Finance and cost head, Miss Bharti, who is also a Chartered accountant.

Now both of them are at task to work out this information and be able to present a summary performance report to be presented to the board in the board meeting. Data that Manoj was able to gather was:

• Rontomax garnered revenue of ₹ 80,00,000 in 1st quarter of 2023. Its tax provision expense was ₹ 4,50,000 calculated on earning before tax in the same period.

• Cost of Goods Sold (COGS) and Operating expenses in 1st quarter were Rs, 38,00,000 and ₹ 12,50,000 respectively.

• Quarterly interest expense was ₹ 1,50,000.

• Non-operating expense other than interest was ₹ 13,00,000 in the 1st quarter.

• Selling price was reduced by 8% & no. of units sold increased by 25% from 1st quarter to 2nd quarter.

• Variable cost per unit for maintaining the day-to-day business operations is 30% of variable cost per unit of producing the goods.
• EBIT per unit for 2nd quarter is ₹ 38.857 which has gone down by ₹ 8.285 from 1st quarter.
Manoj tells Bharti about the general format of questions that board asks from him, every quarter. So, they decide to find out the answers of such questions before-hand so that meeting can be conducted smoothly.

Following are those questions that they are seeking for solutions. Consider yourself as their assistant trainee and help to find these answers (MCQs 5 to 10).

Question 1.
Find out the sales amount of Quarter 2. Select the correct answer.
(a) ₹ 76,50,000
(b) ₹ 86,00,000
(c) ₹ 92,00,000
(d) ₹ 96,50,000

Question 2.
What is the total variable cost & fixed cost in quarter 1 as per marginal costing income statement, respectively?
(a) ₹ 49,40,000 & ₹ 1,10,000
(b) ₹ 3,26,000 & ₹ 17,90,000
(c) ₹ 17,90,000 & ₹ 3,26,000
(d) ₹ 4,94,000 & ₹ 11,10,000

Question 3.
If Fixed cost & total variable cost as per marginal costing doesn't change, what is the cost change in 2nd quarter?
(a) Operating expenses increased by ₹ 11,50,000
(b) Non-operating expense decreased by ₹ 11,50,000
(c) Operating expenses decreased by ₹ 11,50,000
(d) Non-operating expenses increased by ₹ 11,50,000

Question 4.
If operating fixed cost, total variable cost, & interest cost remains same in quarter 2, what is the tax provision for 2nd quarter?
(a) ₹ 4,65,000
(b) ₹ 4,75,000
(c) ₹ 4,85,000
(d) ₹ 4,45,000

Question 5.
What is the amount of profit excluding non-operating expenses in quarter 2?
(a) ₹ 38,50,000
(b) ₹ 36,50,000
(c) ₹ 41,50,000
(d) ₹ 29,50,000

Solution

Answer 1. (c) ₹ 92,00,000

Quarter 1:

	Amount (₹)
Sales	80,00,000
(-) COGS	(38,00,000)
(-) Operating expenses	(12,50,000)
(-) Non-operating expenses	(13,00,000)
EBIT of 1ST Quarter	**16,50,000**

Let's assume no. of units sold in 1st quarter = X
EBIT per unit of 1st quarter = 38.857 + 8.285 = ₹ 47.142

Then, 16,50,000/X	= 47.142
X	= 35,000 units
Number of units sold in 2nd Qtr.	= 35,000 + 35,000x0.25 = 43,750 units Selling price in Qtr 1 = 80,00,000/35,000 = ₹ 228.571
Selling price in Qtr 2	= ₹ 210.285
Sales in Qtr 2	= 210.285 x 43,750 = ₹ 92,00,000

Answer 2.

(a) **₹ 49,40,000 & ₹ 1,10,000**

COGS is 100% variable

VC per unit of operating expenses	= 30% of COGS per unit
COGS per unit = 38,00,000/35,000	= ₹ 108.571
VC per unit of operating expenses	= 30% x 108.571 = ₹ 32.571
VC in operating expenses	= 32.571 x 35,000 = 11,40,000
Fixed cost in operating expenses	= 12,50,000 – 11,40,000 = ₹ 1,10,000
Total Variable Cost	= 11,40,000 + 38,00,000 = ₹ 49,40,000
Total fixed cost	= ₹ 1,10,000

Answer 3.

(d) **Non-operating expenses increased by ₹ 11,50,000**

EBIT in Qtr 2	= 38.857 x 43,750 = ₹ 17,00,000
Non operating expenses in 2nd Qtr	= Revenue – VC – FC - EBIT = 92,00,000 – 49,40,000 – 1,10,000 – 17,00,000 = ₹ 24,50,000
Non operating expenses in 1st Qtr	= ₹ 13,00,000

NOE increased by 11,50,000

Answer 4.

(a) **₹ 4,65,000**

EBIT of 1ST Qtr	= ₹ 16,50,000
EBT of 1ST Qtr = EBIT – Int	= 16,50,000 – 1,50,000 = ₹ 15,00,000 Tax Provision for 1st Qtr = ₹ 4,50,000
Tax rate	= 4,50,000/15,00,000 = 30%
EBT for 2nd Qtr	= 17,00,000 – 1,50,000 = ₹ 15,50,000
Tax provision for 2nd Qtr	= 15,50,000 x 30% = ₹ 4,65,000

Answer 5.

(c) ₹ 41,50,000

Profit in 2nd Qtr as per Marginal Costing

= Sales – VC – FC

= 92,00,000 - 49,40,000 - 1,10,000 = ₹ 41,50,000

Case Scenario (RTP Jan 2025)

Question 1.

Popular companies produce various articles for student purposes. It has been in the industry for the last 25 years. Company had a very humble start but gained popularity over the years due to excellent quality products which were sold at very competitive prices. Company has huge reserves and feel that it is also obligated to give back to the society from which it has grown.

Last year management decided to produce and supply special quality school bags, water bottles, & geometry boxes to NGOs, at no price, as a social responsibility. These articles were simple looking but were more durable, that would not have worn-off easily and could have been used for long-term.

This year management wants to add another dimension to this social work. It approached charitable schools and government run schools and offered them the supply of the same articles, at cost. This will help students in these schools to get these things at a very low price compared to the market.

The variable costs are ₹ 100, ₹ 80, and ₹ 40 for school bags, water bottles, and geometry boxes, respectively. These articles are made using a single machine. 0.20 hours of machine operation is required for manufacturing 1 unit of school bag. Similarly, machine hours required for each unit of water bottle and geometry box is 0.15 hours and 0.10 hours, respectively. Fixed overhead related to machines is ₹ 7,40,000 per year. Machine can operate for 8,000 hours in a year.

Company has decided to sell its 80% capacity production in markets. Rest is divided amongst the 2 undergoing social works, equally.
All Schools request these items in the ratio of 2:3:5, as per their demand by the school students.
Company wants to set a price for these articles to be offered to the schools. Management has few questions they need the answers to. They assigned the task to their team. Team made rough calculations but as there were too many people on the team, each came up with different answers. As a Chartered accountant, you have been approached. Understand the case closely, find the correct answers and help management to set a price.

Answer the following:

1. What is the allocated fixed cost per unit of School bags, water bottles, and geometry boxes?
(a) 18.5, 13.875, 9.75
(b) 18.5, 13.875, 9.25
(c) 18.5, 13.785, 9.25
(d) 18.5, 13.785, 9.50

2. If the prices were ₹ 200, ₹ 160, and ₹ 100, what would be the overall break-even point in units in relation to fixed cost allocated to these supplies?
(a) 308.33 units
(b) 500 units
(c) 508.33 units
(d) 1,000 units

3. Find out the maximum number of units of each article that can be given at the prices given in Part (ii).
(a) 61, 92, 154
(b) 200, 300, 500
(c) 101, 152, 254
(d) 100, 150, 250

4. What will be the maximum units that can be supplied to the schools of each article?
(a) 1103, 1645, 2726
(b) 1093, 1655, 2748
(c) 1185, 1777, 2962
(d) 1133, 1675, 2958

5. What should be the correct price for each item as per the management's decision?
(a) 118.50, 93.875, 49.75
(b) 118.50, 93.785, 49.25
(c) 118.50, 93.785, 49.50
(d) 118.50, 93.875, 49.25

Solution

1. **(b)**Fixed overhead = 740000
Total machine hours = 8000 hours
Fixed OH per hour= ₹ 92.5
Fixed OH per unit of:
- School bag = 0.20 x 92.5 = ₹ 18.5
- Water bottle = 0.15 x 92.5 = ₹ 13.875
- Geometry box = 0.10 x 92.5 = ₹ 9.25

2. **(d)** Hours allocated = 8000 x 10% = 800 hours
Fixed overhead allocated = 800 x 92.5 = ₹ 74,000
Contribution:
- Bag = 200-100 = 100
- Bottle = 160-80=80
- Geometry = 100- 40 = 60

Composite contribution = 100 x 2/10 + 80 x 3 / 10 + 60 x 5/10 = ₹ 74
Overall breakeven point for this assignment is = fixed cost allocated/composite contribution = 74,000/74 = **1,000 units**

3. **(b)** 1000 units are to be distributed in the ratio of 2:3:5
Bag = 200 units, bottle = 300 units, geometry = 500 units

4. **(c)** Total hours = 800 hours
let total no of units = X
Supply: bag 2/10 x X; bottle 3/10 x X; geometry 5/10 x X
Hours: (2X/10) x 0.20 + (3X/10) x 0.15 + (5X/10) x 0.10 = 800 hours
X = 5925
Units of :
- Bag = 2/10 x 5925 = 1185
- Bottle = 3/10 x 5925 = 1777.5 or 1777
- Geometry = 5/10 x 5925 = 2962.5 or 2962

5. **(d)** Correct price is AT COST.
COST = Marginal Cost Per Unit + Fixed Overhead Cost Allocated Per Unit

	Bag	Bottle	Geometry
Variable cost per unit	100	80	40
Fixed cost per unit	18.5	13.875	9.25
Total	**118.5**	**93.875**	**49.25**

Case Scenario (RTP May 2025)

Mr. Linde is a German national, who came to India again on 1st April, 2024. He represents his company and wants to start business in India as well. His company expertise in the manufacturing of Industrial machines. Recently launched "Make in India" movement has motivated Mr. Linde thinks that this might be the perfect opportunity for his company to establish his company in India.

Last, Mr. Linde came to India on 1st April, 2012. He purchased a land for ₹ 50,00,000 and constructed a building by spending ₹ 16,00,000. After that he opened a Private limited company in that building. He spent another ₹ 2,80,000 for this. He also employed 3 people for survey and to understand the need of Indian customers and spent ₹ 1,50,000 in salaries.

He was disappointed in the response of market, who were importing everything from China back then. He closed the office & went back to Germany. All these years the office was closed and only an amount of ₹ 12,500 per month was paid to a guard and property tax was also paid. Property tax was paid on an average of ₹ 18,000 per year.

Now when Mr. Linde is back, he opens the office and starts to plan on how this time he will capture the Indian market.

Expenses started to incur as soon as the office opened:
• Salaries of staff ₹ 2,50,000 per month.
• Electricity, water, & maintenance of office at ₹ 50,000 per month.
• Security staff at ₹ 15,000 per month.

Linde plans to purchase a land in Manesar which will be used for the factory. After a search he found an appropriate land and purchased a land for ₹ 1.50 crores. He handed over the land to a SPV company of a REIT to build a state of the art facility for their factory. Factory will be built in 2 years. They will spend ₹ 85 lacs each year for this construction.

Linde, back in the Noida office, made 3 departments:
(1) Office and administration
(2) Sales and marketing
(3) Account and Finance

Expenses for these departments (except for salaries) are expected to be:-
• Office and administration = ₹ 95,000 per year
• Sales and marketing = ₹ 1,12,000 per year
• Accounts and Finance = ₹ 88,000 per year

Office overheads are to be bifurcated in these departments on the basis of their individual spending ratio.

Technology is developed in Germany but at present its execution is not required. Therefore, they do not require any expert as of now and also because the factory is not ready.

Mr. Linde, being the only person representing his company and lone German in the Indian office feels difficult to manage everything as he finds Indian corporate environment very challenging. He asked his company to

deploy another German manager to India. This will cost the company additional two million Indian national rupee per year to relocate this additional manager in India. The German management is divided on this decision. The ones who disagree say "Mr. Linde is competent enough to run a small extension of our company in India. We will allocate more resources to Indian subsidiary when actual operations will start, till then everything can be managed by Mr. Linde alone. Right Indian Company is itself a cost centre and we are already paying him 3.5 million INR annually, therefore we are not ready to invest until it starts generating revenue".

Linde has another opportunity to relocate the head office, also, to Manesar, where the factory building is being constructed. The distance between head office and factory will reduce greatly, which will be highly beneficial when the factory will become operative. He will have to sale the old office in Noida, which will be sold at ₹ 2.50 crores and purchase a ready-made building in Manesar for ₹ 3.75 crores. This new building will have larger space that can accommodate the future needs for space, when company will grow. It seems to be like perfect investment opportunity to Linde.

Expenses in this new building are expected to be:-

- Salaries of staff ₹ 3,00,000 per month
- Electricity, water, & maintenance of office at ₹ 80,000 per month.
- Security at ₹ 30,000 per month.

Indexed cost of building in Noida is ₹ 2.25 crores and tax on long-term capital gain is 12.5%.

On the basis of above information, answer the following 5 MCQs:

1. Find out an avoidable cost till the factory becomes operative. What is its value?
(a) 20,00,000
(b) 49,20,000
(c) 98,40,000
(d) 40,00,000

2. Find out the total of Sunk and shut down cost in the given case study. Select the correct option from below.
(a) 4,30,000
(b) 70,30,000
(c) 24,46,000
(d) 90,46,000

3. What is total out-of-pocket cost for the company in Noida branch, after factory land in Manesar is purchased, till the factory operation begins?
(a) 3,21,50,000
(b) 1,51,50,000
(c) 81,50,000
(d) 40,75,000

4. What will be out of pocket expenses incurred in relocation of Head office to Manesar?
(a) 3,75,00,000
(b) 1,28,12,500
(c) 1,25,00,000
(d) 4,24,20,000

5. How much is the unexpired cost of the Noida office as on 1st October, 2024, if salaries to all the employees are paid till 31st March, 2025?
(a) 33,40,000
(b) 30,00,000
(c) 15,90,000
(d) 15,00,000

Answer 1.

1. (d) Only avoidable cost is a new managers salary for 2 years = ₹ 20,00,000 x 2 = ₹ 40,00,000

2. (d) Shut down cost is the cost spent when the company was shut down for 12 years in India
= 12,500 x 12 x 12 + 18,000 x 12 = ₹ 20,16,000
Sunk cost are all the costs that was spent in 2012

= 50,00,000+16,00,000+2,80,000+1,50,000
= ₹ 70,30,000
Total = ₹ 90,46,000

3. (a) **Calculation**

Particulars		Amount (₹)
Salary	2,50,000 x 12 x 2	60,00,000
Electricity, etc	50,000 x 12 x 2	12,00,000
Security	15,000 x 12months x 2 years	3,60,000
O&A	95,000 x 2 years	1,90,000
Sales	1,12,000 x 2 years	2,24,000
Accounts	88,000 x 2 years	1,76,000
Salary of linde	35,00,000 x 2	70,00,000
Construction	85,00,000 x 2	1,70,00,000
Total		3,21,50,000

4. (b) Cost of new office = ₹ 3,75,00,000
Money received from sale of Noida office
= 2,50,00,000 – (2,50,00,000 – 2,25,00,000) x 12.5%
= ₹ 2,46,87,500
Out of pocket expenses for relocation of head office
= 3,75,00,000 – 2,46,87,500 = ₹ 1,28,12,500

5. (a) Unexpired cost = advance salary paid till march of next year = (2,50,000+15,000) x 6months + 35,00,000/2 = ₹ 33,40,000

Budgetary Control

Case Scenario (Jan 2025)

XYZ Limited produces the product P. The cost accountant of the company has to prepare its budget for a particular year.
The following information are made available for this purpose:
The expected sales of the product P is 1,00,000 units during the year at a selling price of ₹ 50 per unit.
Each unit of product P requires 3 kgs of raw material Q and 4 kgs of raw material R. The expected stock levels are as follows:

	Beginning of year	End of year
Finished product P in units	12,000	15,000
Raw material Q in kgs	26,000	20,000
Raw material R in kgs	36,000	42,000

Raw material Q costs ₹ 2 per kg and R costs ₹ 3 per kg.
It requires 10 minutes of direct labour time to produce one unit of product P.
Labour cost is ₹ 50 per hour.
Variable manufacturing overheads are ₹ 10 per unit.
Fixed manufacturing cost is ₹ 3,00,000 per year.
Fixed Administration and selling expenses are ₹ 25,000 per year.
On the basis of above Case Scenario, you are required to answer the following MCQs 6 to 10:

Question 1.
The total number of units to be produced of product P is:
(A) 1,03,000 units
(B) 97,000 units
(C) 92,000 units
(D) 1,27,000 units

Question 2.
The total quantity of raw material R to be purchased during the year -
(A) 4,06,000 kgs
(B) 4,18,000 kgs
(C) 3,82,000 kgs
(D) 3,75,000 kgs

Question 3.
The total cost of purchase of Raw Material Q during the year is -
(A) ₹ 6,00,000
(B) ₹ 6,06,000
(C) ₹ 5,88,000
(D) ₹ 6,12,000

Question 4.
The budgeted variable cost of production of one unit of product P is -
(A) ₹ 46.33
(B) ₹ 36.38
(C) ₹ 25.33
(D) ₹ 36.33

Question 5.
What is the budgeted net income for the year?
(A) ₹ 10,41,667
(B) ₹ 13,66,650
(C) ₹ 10,67,000
(D) ₹ 10,37,000

Solution

1. A
2. B
3. B
4. D
5. A

Case Scenario (May 2025)

Allure Metallurgy Ltd. is a stainless-steel manufacturing company which manufactures two grades of stainless steel products namely SS304 & SS316 made of a common raw material iron procured at ₹ 52 per kg from the market. The usage of the raw material is expected to be at a constant rate over the entire period. The raw material supplier to the company charges ₹ 24,000 per order but its delivery is limited to 1200 tons per annum. There is no alternate source to procure the raw material. In consideration of the above limitations, the company decided to review its inventory management policies for the forthcoming year.

The following forecasted information has been extracted from departmental estimates for the budget year ending on 31 March 2025:

	SS304	SS316
Sales (units)	56,000	86,000
Finished Goods stock increase by year end (units)	1,614	1,215
Post Production rejection rate (%)	3	7
Iron usage in kg (per completed unit, net of wastage)	5.5	8
Iron wastage (%)	8	11

You are required to **calculate** the following (MCQ's 6 to 10):

Question 1.

The minimum number of units of SS304 & SS316, the company shall produce to justify the sales forecast would be:

(A) 56,000 & 86,000
(B) 57,614 & 87,215
(C) 59,396 & 93,780
(D) 64,561 & 1,05,371

Question 2.

The ratio in which the raw material utilized for SS304 & SS316 from the total quantity of raw material procured, to produce the number of units desired in Q-6 above?

(A) 29.59% & 70.24%
(B) 29.64% & 70.36%
(C) 30.33% & 69.67%
(D) 38.77% & 61.23%

Question 3.

Assuming that all the available 1200 tons of raw material is procured per annum and would be utilized for production, what would be the raw material needed for production of SS 304 in order to maintain the same production mix arrived in Q-7 above?

(A) 3,26,678 kg
(B) 3,27,209 kg
(C) 3,55,085 kg
(D) 3,55,663 kg

Question 4.

Assuming that all the available 1200 tons of raw material is procured per annum and would be utilized for production, what would be the raw material needed for production of SS 316 in order to maintain the same production mix arrived in Q-7 above?

(A) 7,50,240 kg
(B) 7,51,460 kg

(C) 8,42,966 kg
(D) 8,44,337 kg

Question 5.
Keeping the management purchase policy & production quantity mix in consideration for SS304 & SS316, the maximum number of units of each product that company would produce (in units) respectively by utilizing 1200 tons of raw material:
(A) 59,396 & 93,780
(B) 59,493 & 93,933
(C) 64,561 & 1,05,371
(D) 64,666 & 1,05,542

1. C
2. B
3. D
4. D
5. B

Process Costing

Case Scenario I (Sept 24)

Sagar Limited, an oil refinery uses Process Costing for determining the cost of each process. Management of Sagar Limited is confused about method of valuation of WIP. They have FIFO and Weighted Average Cost methods under consideration.

Finance manager Mr. Sahil has put forward that Weighted Average Cost method is suitable when there are significant fluctuations in. price and quantity. In this method, calculation has to be done at every purchase and it is a complex and time-consuming method.

He also stated that price and quantity of input and output material of Sagar Limited is almost same for whole year; hence FIFO method would be more suitable for the company. He also revealed that in oil refinery industry; FIFO method is preferred over Weighted Average Cost method and switching to FIFO method will save time and money.

He further stated that by using FIFO method closing WIP is valued at current cost and provided the following information:

Opening WIP : 12,000 Units, Total cost ₹ 1,66,200.

Degree of Completion : Material - 100%
Labour and Overhead - 80%

Material introduced: (74,500 Units) ₹ 4,76,465
Direct Labour ₹ 3,70,395
Direct Overhead ₹ 2,96,316

Units Scrapped : 1,900 units Degree of Completion :
Material 100%
Labour and Overhead 70%

Closing WIP : 2,600 units Degree of Completion:
Material 100%
Labour and Overhead 60%

Rest of the units were transferred to next process.

Normal Loss is 2% of total input unit including opening work-in-process. Realizable value of normal loss is ₹ 2 per unit deducted from cost of material introduced.

You are required to calculate the following using FIFO method (MCQs 1 to 5) :

1. Equivalent units of Material and Material cost per unit
(A) 86,500 units and ₹ 5.50 per unit
(B) 74,500 units and ₹ 6.39 per unit
(C) 72,770 units and ₹ 6.50 per unit
(D) 72,600 units and ₹ 6.56 per unit

2. Equivalent units of labour and overheads and total cost per unit
(A) 82,490 units and ₹ 8.08 per unit
(B) 74,079 units and ₹ 9.00 per unit
(C) 75,290 units and ₹ 8.85 per unit
(D) 79,790 units and ₹ 8.35 per unit

3. Value of abnormal loss to be shown in process account
(A) ₹ 2,176.00
(B) ₹ 2,182.00
(C) ₹ 2,168.35
(D) ₹ 1,896.52

4. Value of units transferred to next process
(A) ₹ 11,10,660
(B) ₹ 12,75,600
(C) ₹ 12,51,200
(D) ₹ 12,72,800

5. Value of closing WIP
(A) ₹ 31,096

(B) ₹ 31,044
(C) ₹ 30,940
(D) ₹ 28,340

Solution

1. **C**
2. **B**
3. **A**
4. **D**
5. **C**

Question 1. (MTP May 2024)

Arnav Ltd. manufactures chemical solutions used in paint and adhesive products. Chemical solutions are produced in different processes. Some of the processes are hazardous in nature which may results in fire accidents.

At the end of the last month, one fire accident occurred in the factory. The fire destroyed some of the paper files containing records of the process operations for the month.

You, being an associate to the Chief Manager (Finance), are assigned to prepare the process accounts for the month during which the fire occurred. From the documents and files of other sources, following information could be retrieved:

Opening work-in-process at the beginning of the month was 500 litres, 80% complete for labour and 60% complete for overheads. Opening work-in- process was valued at ₹ 2,78,000.

Closing work-in-process at the end of the month was 100 litres, 20% complete for labour and 10% complete for overheads.

Normal loss is 10% of input (fresh) and total losses during the month were 800 litres partly due to the fire damage.

Output transferred to finished goods was 3,400 litres.

Losses have a scrap value of ₹ 20 per litre.

All raw materials are added at the commencement of the process.

The cost per equivalent unit is ₹ 660 for the month made up as follows: Raw Material ₹ 300 Labour ₹ 200 Overheads ₹ 160

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

1. How much quantity of raw material was introduced during the month?
A. 4,300 Litres
B. 3,500 Litres
C. 4,200 Litres
D. 3,800 Litres

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

Solution

1. D

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

2. A

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

3. B

Calculation of Equivalent production units

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

Value of raw materials introduced during the month

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

4. A

Value of labour and overhead in closing Work in process

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

5. C

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

Joint & By Product

Case Scenario (MTP Dec 2024)

eSalt is the biggest producer of sodium hydroxide in India. This main product of the company has a strong reactivity with other organic compounds. It is highly versatile and is alkaline in nature. However, the basic material required for the production of this product is salt along with the electricity.

The manufacturing process involves electrolysis which produces Halogen as co- product. Modern use of Halogen is widespread. However, the common use is in disinfection like for purifying drinking water or swimming pool water. It is also an important ingredient of toothpaste. Thus, the company's management affirmed the simultaneous production of Halogen.

During the previous financial year, the company purchased the base material of ₹ 5,34,000. For the current year, the company decided to increase the production by 2 times. Due to increased production, the total conversion cost hiked to 3 times. Last year, the conversion cost accounted for ₹ 8,01,000 up to the point at which two products i.e. sodium hydroxide and Halogen are separated.

The production and sales information for current year is provided as below:

	Sodium hydroxide	Halogen
Production/ Sales(in tonne)	24,030	16,020
Selling price per tonne (₹)	100	150

During the current year, the management of the company pointed to the extensive use of Vinyl which can be produced by further processing Halogen. Having selling price of ₹ 250 per tonne higher than that of the Halogen, it was decided not to sell Halogen and further process it into Vinyl. The incremental processing cost took ₹ 8,01,000 producing 10,012.50 tonnes of Vinyl.

You are required to FIGURE OUT the following for managerial decision (MCQs 6 to 10):

Question 1.

For the current year, the amount of base material purchased and the conversion cost up to the point at which two products i.e. Sodium hydroxide and Halogen are separated would be:

A. base material ₹ 10,68,000 and conversion cost ₹ 24,03,000
B. base material ₹ 10,68,000 and conversion cost ₹ 16,02,000
C. base material ₹ 16,02,000 and conversion cost ₹ 24,03,000
D. base material ₹ 24,03,000 and conversion cost ₹ 16,02,000

Question 2.

Joint cost to be apportioned between Sodium hydroxide and Halogen as per the physical unit method would be:

A. Sodium hydroxide ₹ 24,03,000 and Halogen ₹ 10,68,000
B. Sodium hydroxide ₹ 10,68,000 and Halogen ₹ 16,02,000
C. Sodium hydroxide ₹ 16,02,000 and Halogen ₹ 24,03,000
D. Sodium hydroxide ₹ 24,03,000 and Halogen ₹ 16,02,000

Question 3.

Joint cost to be apportioned between Sodium hydroxide and Halogen as per the sales value at split- off point method would be:

A. Sodium hydroxide ₹ 20,02,500 and Halogen ₹ 20,02,500
B. Sodium hydroxide ₹ 16,02,000 and Halogen ₹ 24,03,000
C. Sodium hydroxide ₹ 24,03,000 and Halogen ₹ 16,02,000
D. Sodium hydroxide ₹ 10,68,000 and Halogen ₹ 20,02,500

Question 4.

Joint cost to be apportioned between Sodium hydroxide and Halogen as per the estimated net realisable value method would be:

A. Sodium hydroxide ₹ 23,44,390 and Halogen ₹ 16,60,610
B. Sodium hydroxide ₹ 17,16,429 and Halogen ₹ 22,88,571
C. Sodium hydroxide ₹ 22,88,571 and Halogen ₹ 17,16,429
D. Sodium hydroxide ₹ 16,60,610 and Halogen ₹ 23,44,390

Question 5.

Considering that the decision relating to further processing Halogen is not approved, suggest whether this would be in favour of the management by calculating incremental revenue /loss from further processing Halogen into Vinyl.

A. Incremental loss would be ₹ 16,02,000, thus the decision of not further processing Halogen is correct.
B. Incremental loss would be ₹ 8,01,000, thus the decision of not further processing Halogen is correct.
C. Incremental revenue would be ₹ 8,01,000, thus the decision relating to further processing Halogen needs to be approved.
D. Incremental revenue would be ₹ 16,02,000, thus the decision relating to further processing Halogen needs to be approved.

Solution

Solution 1.

C

Particulars	Base Material	Conversion cost
Previous year cost (₹)	5,34,000	8,01,000
Increased by	2 times	-
Increased to		3 times
Current year cost (₹)	5,34,000 + (5,34,000 x 2) = 16,02,000	8,01,000 x 3 = 24,03,000

Solution 2.

D

Products	Production/ Sales(in tonne)	Joint Cost Apportioned (₹)
Sodium hydroxide	24,030	24,03,000
Halogen	16,020	16,02,000
Total	40,050	40,05,000

Joint cost = base material + conversion cost = 16,02,000 + 24,03,000 = 40,05,000

Apportioned joint cost = $\frac{Total\ Joint\ Cost}{Total\ physical\ value}$ x Physical units of each product

For Sodium Hydroxide = $\frac{₹\ 40,05,000}{40,050\ tonnes}$ x 24,030 tonnes = ₹ 24,03,000

For Halogen = $\frac{₹\ 40,05,000}{40,050\ tonnes}$ x 16,020 tonnes = ₹ 16,02,000

Solution 3.

A

Products	Sales (in Tonne)	Selling Price per Tonne (₹)	Sales Revenue (₹)	Joint Cost Apportioned (₹)
Sodium hydroxide	24,030	100	24,03,000	20,02,500
Halogen	16,020	150	24,03,000	20,02,500
Total	**40,050**		**48,06,000**	**40,05,000**

Apportioned joint cost = $\frac{Total\ Joint\ Cost}{Total\ Sale\ Revenue}$ x Sale revenue of each product

For Sodium Hydroxide = $\frac{₹\ 40,05,000}{₹\ 48,06,000}$ x 24,03,000 = ₹ 20,02,500

For Halogen = $\frac{₹\ 40,05,000}{₹\ 48,06,000}$ x 24,03,000 = ₹ 20,02,500

Solution 4.

B

Products	Sales (in Tonne)	Selling Price per Tonne (₹)	Sales Value (₹)	Post split-off cost (₹)	Net Realisable Value (₹)	Joint Cost Apportioned (₹)
Sodium hydroxide	24,030	100	24,03,000	-	24,03,000	17,16,429
Halogen (Vinyl after further processing)	10,012.50	150 + 250 = 400	40,05,000	8,01,000	32,04,000	22,88,571
Total					**56,07,000**	**40,05,000**

Apportioned joint cost = $\frac{Total\ Joint\ Cost}{Total\ Net\ Realisable\ Value}$ x Net Realisable Value of each product

For Sodium Hydroxide = $\frac{₹\ 40,05,000}{₹\ 56,07,000}$ x ₹ 24,03,000 = ₹ 17,16,429

For Halogen = $\frac{₹\ 40,05,000}{₹\ 56,07,000}$ x ₹ 32,04,000 = ₹ 22,88,571

Solution 5.

C

Particulars	Amount (in ₹)
Revenue from sales of Vinyl if Halogen further processed (10,012.50 tonnes × ₹ 400) (A)	40,05,000
Revenue from sales of Halogen if no further processing done (16,020 tonnes × ₹ 150)(B)	24,03,000
Incremental revenue from further processing of Halogen into Vinyl (A-B)	**16,02,000**
Incremental cost of further processing Halogen into Vinyl	8,01,000
Incremental operating income from further processing	**8,01,000**

Incremental revenue would be ₹ 8,01,000, thus the decision relating to further processing Halogen needs to be approved.

Case Scenario (MTP March 2025)

Rinku Ltd is a manufacturing company which is producing bags of different varieties. The company is planning to establish a new plant in the neighboring country to produce the bags. New plant has a production capacity of 2,00,000 units per year. As per the studies, normal capacity utilization is 90% of the production capacity. The company will be able to sell the whole production after making price adjustments.

The following are the annual cost data on the basis of cost studies for the new plant in the neighboring country:

Material Cost = ₹ 42,00,000 (100% variable)
Labour = ₹ 40,00,000 (70% variable)
Factory Overheads = ₹ 35,00,000 (60% variable)
Administrative Overheads = ₹ 10,00,000 (30% variable)

Bags are being produced and sold on a steady basis. It is estimated that it costs ₹ 1 as inventory holding cost per bag per month and that the set up cost per run of bag manufacture is ₹ 1,000.

The production of the new plant will be sold only to the sales agent in the neighboring country who will receive ₹ 5 per bag. There are no other selling expenses other than commission. Fixed cost are calculated on the basis of normal capacity utilization of the plant.

Assume 365 days in a year.

Being a cost manager of the company, you are required answer the following questions being asked by the management of the company:

Question 1.

What is the total variable cost of the bags being produced?

(a) ₹ 80,00,000
(b) ₹ 93,00,000
(c) ₹ 1,03,00,000
(d) ₹ 33,00,000

Question 2.

What is the total fixed cost of the bags being produced?

(a) ₹ 40,00,000
(b) ₹ 35,00,000
(c) ₹ 53,00,000
(d) ₹ 33,00,000

Question 3.

Calculate the break-even point if the sales price is ₹100 per bag?

(a) 65,159 bags
(b) 77,139 bags
(c) 93,000 bags
(d) 86,503 bags

Question 4.
Calculate the optimum run size and number of runs for bag manufacturing?
(a) 7,746 bags and 24 runs
(b) 8,000 bags and 23 runs
(c) 6,503 bags and 28 runs
(d) 5,478 bags and 33 runs

Question 5.
What is the interval between two consecutive runs?
(a) 11 days
(b) 10 days
(c) 15 days
(d) 19 days

Answer 1.
(c) ₹ 1,03,00,000

Answer 2.
(d) ₹ 33,00,000
Working note

Particulars	₹
Variable Cost:	
Material	42,00,000
Labour (40,00,000 x 70%)	28,00,000
Factory Overheads (35,00,000 x 60%)	21,00,000
Administrative Overheads (10,00,000 x 30%)	3,00,000
Commission (1,80,000 x 5)	9,00,000
Total Variable cost	1,03,00,000
Fixed Cost:	
Labour (40,00,000 x 30%)	12,00,000
Factory Overheads (35,00,000 x 40%)	14,00,000
Administrative Overheads (10,00,000 x 70%)	7,00,000
Total Fixed Cost	33,00,000

Answer 3.
(b) 77,139 bags
Variable cost per bag = ₹ 1,03,00,000/1,80,000 = ₹ 57.22
Contribution per bag = ₹ 100 – ₹ 57.22 = ₹ 42.78
Break-even point (in number of bags) = Fixed cost/Contribution per bag
= ₹33,00,000/₹42.78
= 77,139 bags

Answer 4.
(d) 5,478 bags and 33 runs

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

Where,
D = no. of bags to be produced annually
S = Set up cost per production run
C = Carrying cost per unit per annum

EBQ = $\sqrt{\frac{2\ x\ 1,80,000\ x\ 1000}{1\ x\ 12}}$ = 5,478 bags
No. of optimum runs = 1,80,000/5,478 = 32.86 or 33 runs

Answer 5.
(a) 11 days
Interval between 2 runs (in days) = 365 days/33 = 11 days

Activity Based Costing

Case Scenario (MTP May 2025)

The HomeMart is the latest trending brand offering home improvement appliances with broadest selection of products with highly competitive prices. The sale is increasing year by year with huge multiples. Current year also the sales reached triple the last year. The reason being company having good customer support where it provides after sales assistance over phone per item sold. Though it costs only Re. 1 per item sold to the company, it enhanced to ₹ 49,15,200 last year making a huge impact on the total support cost.

All the company's appliances have been majorly categorised into three product lines namely Fancy fans, Home decors, Assembled furniture. During the current year, the company's revenue as generated is ₹ 3,80,88,000, ₹ 10,08,28,800 and ₹ 5,80,75,200 respectively. However, the cost of god sold is ₹ 2,88,00,000, ₹ 7,20,00,000 and ₹ 4,32,00,000 respectively.

In business, there's a saying "The packaging sells the product the first time, but what's inside sells the product a second time". Following the saying, the company has the policy of taking back the cartons of the products sold relating to Fancy fans to reduce the packaging cost. However, for smooth returning of cartons, the company has to incur certain carrier cost on its own which is ₹ 5,76,000 for the current year and allocating the same directly to the said product.

Some other information relating to each of the product lines is provided below:

	Fancy fans	Home decors	Assembled furniture
Items sold	12,09,600	1,05,98,400	29,37,600
Number of deliveries received	600	4,380	1,320
Number of purchase orders placed	720	1,680	720
Hours of shelf-stocking time	1,080	10,800	5,400

The company also provides the following basis of cost allocation:

Activity	Description of activity	Total Cost	Cost-allocation base
Delivery	Physical delivery and receipt of products	1,20,96,000	6,300 deliveries
Ordering	Placing of orders for purchases	74,88,000	3,120 purchase orders
Shelf stocking	Stocking of products in warehouse	82,94,400	17,280 hours of shelf stocking time

The company wants you to FIGURE OUT the following to ascertain which of the product line is more profitable:

1. The total support cost and its percentage to the cost of goods sold would be:
(a) ₹ 3,33,69,600 and 23.17%
(b) ₹ 4,32,00,000 and 30%
(c) ₹ 3,33,69,600 and 30%
(d) ₹ 4,32,00,000 and 23.17%

2. Operating income as a percentage of revenues of each product line, namely Fancy fans, Home decors, Assembled furniture, when all the support costs are allocated on the basis of cost of goods sold would be:
A. 6.87%, 12.05% and 8.38% respectively
B. 12.05%, 6.87% and 8.38% respectively
C. 1.70%, 7.17% and 3.30% respectively
D. 7.17%, 3.30% and 1.70% respectively

3. The cost driver rate relating to Delivery, Ordering, Shelf stocking and Customer support would be:
(a) Delivery- ₹ 1,920 per delivery, Ordering- ₹ 2,400 per purchase order, Shelf stocking- ₹ 480 per stocking hour and Customer support- Re. 1 per item sold
(b) Delivery- ₹ 2,400 per delivery, Ordering- ₹ 1,920 per purchase order, Shelf stocking- ₹ 480 per stocking hour and Customer support- Re. 1 per item sold
(c) Delivery- ₹ 1,920 per delivery, Ordering- ₹ 2,400 per purchase order, Shelf stocking- ₹ 480 per stocking hour and Customer support- ₹ 3 per item sold

(d) Delivery- ₹ 480 per delivery, Ordering- ₹ 2,400 per purchase order, Shelf stocking- ₹1,920 per stocking hour and Customer support- ₹ 3 per item sold

4. Operating income of each product line, namely Fancy fans, Home decors, Assembled furniture, when all the support costs are allocated using an activity-based costing system would be:
(a) ₹ 16,84,800, ₹ -2,05,92,000 and ₹ -7,92,000 respectively
(b) ₹ 3,64,03,200, ₹ 12,14,20,800 and ₹ 5,88,67,200 respectively
(c) ₹ 92,88,000, ₹ 2,88,28,800 and ₹ 1,48,75,200 respectively
(d) ₹ 41,04,000, ₹ 6,04,800 and ₹ 50,83,200 respectively

5. Operating income as a percentage of revenues of each product line, namely Fancy fans, Home decors, Assembled furniture, when all the support costs are allocated using an activity-based costing system would be:
(a) 4.42%, -20.42% and -1.36% respectively
(b) 10.78%, 0.60% and 8.75% respectively
(c) 24.39%, 28.59% and 25.61% respectively
(d) 4.39%, 8.59% and -1.36% respectively

Solution

1. (b)

Total support cost	(₹)
Cartons returned	5,76,000
Delivery	1,20,96,000
Ordering	74,88,000
Shelf stocking	82,94,400
Customer support (₹ 49,15,200 x 3)	1,47,45,600
Total support cost	4,32,00,000
	(₹)
Fancy fans	2,88,00,000
Home decors	7,20,00,000
Assembled furniture	4,32,00,000
Total cost of goods sold (COGS)	14,40,00,000

Percentage of support cost to the cost of goods sold (COGS): = $\frac{Total\ support\ cost}{Total\ cost\ of\ goods\ sold\ (COGS)}$ x 100

$\frac{4,32,00,000}{14,40,00,000}$ x 100 = 30%

2. (c)

Particulars	Fancy Fans (₹)	Home decors (₹)	Assembled furniture (₹)
Revenue: (A)	3,80,88,000	10,08,28,800	5,80,75,200
Cost of Goods sold (COGS): (B)	2,88,00,000	7,20,00,000	4,32,00,000
Support cost (30% of COGS): (C) (as calculated in i. above)	86,40,000	2,16,00,000	1,29,60,000
Total cost: (D) = {(B) + (C)}	3,74,40,000	9,36,00,000	5,61,60,000
Operating income: E= {(A)-(D)}	6,48,000	72,28,800	19,15,200
Operating income as a percentage of revenues: (E/A) × 100)	**1.70%**	**7.17%**	**3.30%**

3. (a)

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Delivery	1,20,96,000	6,300 deliveries	₹ 1,920 per delivery
Ordering	74,88,000	3,120 purchase orders	₹ 2,400 per purchase order

Shelf-stocking	82,94,400	17,280 hours of shelf-stocking time	₹ 480 per stocking hour
Customer support	1,47,45,600	1,47,45,600 items sold	Re. 1 per item sold (given)

4. (d)

	Fancy Fans (₹)	Home decors (₹)	Assembled furniture (₹)
Revenues: (A)	3,80,88,000	10,08,28,800	5,80,75,200
Cost & Goods sold	2,88,00,000	7,20,00,000	4,32,00,000
Carton return costs (Directly attributable to Fancy fans)	5,76,000	0	0
Delivery cost (₹ 1,920 per delivery)	11,52,000 (600 x ₹ 1,920)	84,09,600 (4,380 x ₹ 1,920)	25,34,400 (1,320 x ₹ 1,920)
Ordering cost (₹ 2,400 per purchase order)	17,28,000 (720 x ₹ 2,400)	40,32,000 (1,680 x ₹ 2,400)	17,28,000 (720 x ₹ 2,400)
Shelf stocking cost (₹ 480 per stocking hour)	5,18,400 (1,080 x ₹ 480)	51,84,000 (10,800 x ₹ 480)	25,92,000 (5,400 x ₹ 480)
Customer Support cost (₹ 1 per item sold)	12,09,600 (12,09,600 x ₹ 1)	1,05,98,400 (1,05,98,400 x ₹ 1)	29,37,600 (29,37,600 x ₹ 1)
Total Cost: (B)	3,39,84,000	10,02,24,000	5,29,92,000
Operating income: (C) = (A) - (B)	41,04,000	6,04,800	50,83,200

5. (b)

	Fancy Fans (₹)	Home decors (₹)	Assembled furniture (₹)
Operating income (from iv. Above) (A)	41,04,000	6,04,800	50,83,200
Revenues (B)	3,80,88,000	10,08,28,800	5,80,75,200
Operating income as a percentage of revenues: (A/B) × 100)	10.78%	0.60%	8.75%

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