

INDEX

2.	Material Cost	2.1 - 2.45
3.	Employee Cost and Direct Expenses	3.1 - 3.35
4.	Overheads Absorption Costing Method	4.1 - 4.54
5.	Activity Based Costing	5.1 - 5.46
6.	Cost Sheet	6.1 - 6.31
7.	Cost Accounting Systems	7.1 - 7.56
8.	Unit & Batch Costing	8.1 - 8.19
9.	Job Costing	9.1 - 9.16
10.	Process & Operation Costing	10.1 - 10.38
11.	Joint Products and By Products	11.1- 11.25
12.	Service Costing	12.1 - 12.50
13.	Standard Costing	13.1 - 13.53
14.	Marginal Costing	14.1 - 14.48
15.	Budgets and Budgetary Control	15.1 - 15.43



02

MATERIAL COST

**QUESTION 1. (ILLUSTRATION 1)**

An invoice in respect of a consignment of chemicals A and B provides the following information:

	(₹)
Chemical A: 10,000 kgs. at ₹ 10 per kg.	1,00,000
Chemical B: 8,000 kgs. at ₹ 13 per kg.	1,04,000
Basic custom duty @ 10% (Credit is not allowed)	20,400
Railway freight	3,840
Total cost	2,28,240

A shortage of 500 kgs. in chemical A and 320 kgs. in chemical B is noticed due to normal breakages. You are required to COMPUTE the rate per kg. of each chemical, assuming a provision of 2% for further deterioration.

ANSWER :

Working:

Computation of effective quantity of each chemical available for use

	Chemical A (kg.)	Chemical B (kg.)
Quantity purchased	10,000	8,000
Less: Shortage due to normal breakages	500	320
	9,500	7,680
Less: Provision for deterioration 2%	190	153.6
Quantity available	9,310	7,526.4

Statement showing the computation of rate per kg. of each chemical

	Chemical A (₹)	Chemical B (₹)
Purchase price 10,000@ ₹10 per kg, 8,000@₹13 per kg	1,00,000	1,04,000
Add: Basic Custom Duty @10%	10,000	10,400
Add: Railway freight (in the ratio of quantity purchased i.e., 5:4)	2,133	1,707
Total cost (A)	1,12,133	1,16,107
Effective Quantity (see working) (B)	9,310 kg.	7,526.4 kg.
Rate per kg. (A ÷ B)	12.04	15.43

**QUESTION 2. (ILLUSTRATION 2)**

At WHAT price per unit would Part No. A 32 be entered in the Stores Ledger, if the following invoice was received from a supplier:

Invoice	(₹)
200 units Part No. A 32 @ ₹ 5	1,000.00
Less: 20% discount	(200.00)
	800.00
Add: GST @ 12%	96.00



	896.00
Add: Packing charges (5 non-returnable boxes)	50.00
	946.00

- (i) A 2 per cent cash discount will be given if payment is made in 30 days.
(ii) Documents substantiating payment of GST are enclosed for claiming Input credit.

ANSWER :

Computation of cost per unit

	(₹)
Net purchase Price	800.00
Add: Packing charges (5 non-returnable boxes)	50.00
	850.00
No. of units purchased	200 units
Cost per unit	4.25

Note:

- (i) Cash discount is treated as interest and finance charges, hence, it is not considered for valuation of material.
(ii) Input credit is available for GST paid; hence it will not be added to purchase cost.

**QUESTION 3. (ILLUSTRATION 3)**

CALCULATE the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials per annum	: 10,000 kg.
Order placing cost per order	: ₹ 50
Cost per kg. of raw materials	: ₹ 2
Storage costs	: 8% on average inventory

ANSWER :

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}}$$

A = Units consumed during year = 10,000

O = Ordering cost per order = 50

C = Inventory carrying cost per unit per annum. = 8% of ₹ 2

$$EOQ = \sqrt{\frac{2 \times 10,000 \times 50}{2 \times 8}} = \sqrt{\frac{2 \times 10,000 \times 50 \times 25}{4}} = 2,500 \text{ kg}$$

No. of orders to be placed in a year

$$= \frac{\text{Total consumption of materials per annum}}{EOQ}$$

$$= \frac{10,000 \text{ kg.}}{2,500 \text{ kg.}} = 4 \text{ Orders per year}$$

**QUESTION 4. (ILLUSTRATION 4)**

(i) COMPUTE E.O.Q. and the total variable cost for the following:

Annual Demand	=	5,000 units
Unit price	=	₹ 20.00
Order cost	=	₹ 16.00
Storage rate	=	2% per annum
Interest rate	=	12% per annum
Obsolescence rate	=	6% per annum

(ii) DETERMINE the total cost that would result for the items if a new price of ₹ 12.80 is used.

ANSWER :

(i) Carrying cost (C) =	Storage rate	=	2%
	Interest Rate	=	12%
	Obsolescence Rate	=	6%
	Total	=	20% per annum
C = 20% of ₹ 20	= ₹ 4 per unit per annum.		

$$\text{E.O.Q} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 5000 \times 16}{4}} = \sqrt{40,000}$$

Total cost:

Purchase price of 5,000 units @ ₹ 20.00 per unit = ₹ 1,00,000

Ordering cost = $\frac{5000}{200} = 25$ orders @ ₹ 16 = ₹ 400

Carrying cost of average Inventory

$$= \frac{200}{2} = 100 \text{ orders @ ₹ 4} = ₹ 400$$

Total cost = ₹ 1,00,800

(ii) If the new price of ₹ 12.80 is used:

C = 20% of 12.80 = ₹ 2.56 per unit per annum.

$$\text{E.O.Q} = \sqrt{\frac{2 \times 5,000 \times 16}{2.56}} = 250 \text{ units}$$

Total cost:

Purchase price of 5,000 units @ ₹ 12.80 per unit = ₹ 64,000

Ordering cost = $\frac{5000}{200} = 25$ orders @ ₹ 16 = ₹ 400

Carrying cost (of average inventory) =

$$= \frac{250}{2} = 125 \text{ orders @ ₹ 2.56} = ₹ 320$$

Total variable cost = ₹ 64,640

**QUESTION 5. (ILLUSTRATION 5)**

Two components, A and B are used as follows:

Normal usage	50 per week each
Maximum usage	75 per week each
Minimum usage	25 per week each
Re-order quantity	A: 300; B: 500
Re-order period	A: 4 to 6 weeks B: 2 to 4 weeks

CALCULATE for each component (a) Re-ordering level, (b) Minimum level, (c) Maximum level, (d) Average stock level.

ANSWER :

(a) Re-ordering level:

Maximum usage per week $\times$ Maximum delivery period.

Re-ordering level for component A = 75 units $\times$ 6 weeks = 450 units

Re-ordering level for component B = 75 units $\times$ 4 weeks = 300 units

(b) Minimum level:

Re-order level – (Normal usage $\times$ Average period)

Minimum level for component A = 450 units – (50 units $\times$ 5 weeks) = 200 units

Minimum level for component B = 300 units – (50 units $\times$ 3 weeks) = 150 units

(c) Maximum level:

Re-order level + Re-order quantity – (Min. usage $\times$ Minimum period)

Maximum level for component A = (450 units + 300 units) – (25 units $\times$ 4 weeks) = 650 units

Maximum level for component B = (300 units + 500 units) – (25 units $\times$ 2 weeks) = 750 units

(d) Average stock level:

$\frac{1}{2}$ (Minimum + Maximum) stock level

Average stock level for component A = $\frac{1}{2}$ (200 units + 650 units) = 425 units.

Average stock level for component B = $\frac{1}{2}$ (150 units + 750 units) = 450 units.

**QUESTION 6. (ILLUSTRATION 6)**

From the details given below, CALCULATE:

- (i) Re-ordering level
- (ii) Maximum level
- (iii) Minimum level
- (iv) Danger level.

Re-ordering quantity is to be calculated on the basis of following information: Cost of placing a purchase order is ₹ 20 Number of units to be purchased during the year is 5,000 Purchase price per unit inclusive of transportation cost is ₹ 50 Annual cost of storage per units is ₹ 5.

Details of lead time : Average- 10 days, Maximum- 15 days, Minimum- 5 days.
For emergency purchases- 4 days.

Rate of consumption : Average: 15 units per day,
Maximum: 20 units per day.

**ANSWER :**

Basic Data:

A (Number of units to be purchased annually) = 5,000 units

O (Ordering cost per order) = ₹ 20

C (Annual cost of storage per unit) = ₹ 5

Purchase price per unit inclusive of transportation cost = ₹ 50.

Computations:

(i) Re-ordering level (ROL) = Maximum usage per period × Maximum lead time
 = 20 units per day × 15 days
 = 300 units

(ii) Maximum level (Refer to working notes 1 and 2) = ROL + ROQ – [Min. rate of consumption × Min. lead time]
 = 300 units + 200 units – [10 units per day × 5 days]
 = 450 units

(iii) Minimum level = ROL – Average rate of consumption × Average re-order-period
 = 300 units – (15 units per day × 10 days)
 = 150 units

(iv) Danger level = Average consumption × Lead time for emergency purchases
 = 15 units per day × 4 days
 = 60 units

Working Notes:

1. Minimum rate of consumption per day

$$\text{Av. rate of consumption} = \frac{\text{Minimum rate of consumption} + \text{Maximum rate of consumption}}{2}$$

$$15 \text{ units per day} = \frac{X \text{ units/day} + 20 \text{ units per day}}{2} \text{ or } X = 10 \text{ units per day.}$$

2. Re-order Quantity (ROQ) or Economic Order Quantity (EOQ) =

$$\sqrt{\frac{2 \times 5,000 \text{ units} \times ₹ 20}{5}} = 200 \text{ units}$$

**QUESTION 7. (ILLUSTRATION 7)**

M/s Tyrotubes trades in four-wheeler tyres and tubes. It stocks sufficient quantity of tyres of almost every vehicle. In year end 2022-23, the report of sales manager revealed that M/s Tyrotubes experienced stock-out of tyres.

The stock-out data is as follows:

Stock-out of Tyres	No. of times of Stock Out
100	2
80	5
50	10
20	20
10	30
0	33



M/s Tyrotubes loses ₹ 150 per unit due to stock-out and spends ₹ 50 per unit on carrying of inventory.

DETERMINE optimum safest stock level.

ANSWER :

Computation of Stock-out and Inventory carrying cost

Safety Stock Level (units) (1)	Stock- out (units) (2)	Probability (3)	Stock- out cost (₹) (4) = (2) × ₹ 150	Expected stock-out cost (₹) (5)=(3)×(4)	Inventory carrying cost (₹) (6) =(1)×₹ 50	Total cost (₹) (7) = (5)+(6)
100	0	0.33	0	0	5,000	5,000
80	20	0.02	3,000	60	4,000	4,060
50	50	0.02	7,500	150		
	30	0.05	4,500	225		
			12,000	375	2,500	2,875
20	80	0.02	12,000	240		
	60	0.05	9,000	450		
	30	0.10	4,500	450		
			25,500	1,140	1,000	2,140
10	90	0.02	13,500	270		
	70	0.05	10,500	525		
	40	0.10	6,000	600		
	10	0.20	1,500	300		
			31,500	1,695	500	2,195
0	100	0.02	15,000	300		2,700
	80	0.05	12,000	600		
	50	0.10	7,500	750		
	20	0.20	3,000	600		
	10	0.30	1,500	450		
			39,000	2,700	0	2,700

At safety stock level of 20 units, total cost is least i.e., ₹ 2,140.

Working Note:

Computation of Probability of Stock-out

Stock-out (units)	100	80	50	20	10	0	Total
Nos. of times	2	5	10	20	30	33	100
Probability	0.02	0.05	0.10	0.20	0.30	0.33	1.00

Explanation:

Stock-out means the demand of an item that could not be fulfilled because of insufficient stock level.

Safety stock is the level of stock of any item which is maintained in excess of lead time consumption. It is kept as cushion against any unexpected demand for that item.



Safety stock level	Impact
100 units	Any unexpected demand up-to 100 units can be met.
80 units	Stock out will only arise if unexpected demand will be for 100 units. In this case 20 units will remain unsatisfied. The probability of any unexpected demand for 100 units is 0.02.
50 units	Any unexpected demand beyond 50 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02) 50 units will be unsatisfied. Similarly, if unexpected demand for 80 units arises (probability is 0.05), 30 units will be unsatisfied.
20 units	Any unexpected demand beyond 20 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02), 80 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 60 units will remain unsatisfied. Similarly, when unexpected demand for 50 units arises (probability is 0.10), 30 units will remain unsatisfied.
10 units	Any unexpected demand beyond 10 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02), 90 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 70 units will remain unsatisfied. If unexpected demand for 50 units arises (probability is 0.10), 40 units will remain unsatisfied. Similarly, when unexpected demand for 20 units arises (probability is 0.20), 10 units will remain unsatisfied.
0 unit	When no safety stock level is maintained, any unexpected demand cannot be satisfied. If unexpected demand for 100 units arises (probability is 0.02), 100 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 80 units will remain unsatisfied. If unexpected demand for 50 units arises (probability is 0.10), 50 units will remain unsatisfied. If unexpected demand for 20 units arises (probability is 0.20), 20 units will remain unsatisfied. Similarly, unexpected demand for 10 units (probability is 0.30), 10 units will remain unsatisfied.

**QUESTION 8. (ILLUSTRATION 8)**

From the following details, DRAW a plan of ABC selective control:

Item	Units	Unit cost (₹)
1	7,000	5.00
2	24,000	3.00
3	1,500	10.00
4	600	22.00
5	38,000	1.50
6	40,000	0.50
7	60,000	0.20
8	3,000	3.50
9	300	8.00
10	29,000	0.40
11	11,500	7.10
12	4,100	6.20

**ANSWER :**

Statement of Total Cost and Ranking

Item	Units	% of Total units	Unit cost (₹)	Total cost (₹)	% of Total cost	Ranking
1	7,000	3.1963	5.00	35,000	9.8378	4
2	24,000	10.9589	3.00	72,000	20.2378	2
3	1,500	0.6849	10.00	15,000	4.2162	7
4	600	0.2740	22.00	13,200	3.7103	8
5	38,000	17.3516	1.50	57,000	16.0216	3
6	40,000	18.2648	0.50	20,000	5.6216	6
7	60,000	27.3973	0.20	12,000	3.3730	9
8	3,000	1.3699	3.50	10,500	2.9513	11
9	300	0.1370	8.00	2,400	0.6746	12
10	29,000	13.2420	0.40	11,600	3.2605	10
11	11,500	5.2512	7.10	81,650	22.9502	1
12	4,100	1.8721	6.20	25,420	7.1451	5
	2,19,000	100		3,55,770	100	

Basis for selective control (Assumed)

₹ 50,000 & above -- 'A' items

₹ 15,000 to 50000 -- 'B' items

Below ₹ 15,000 -- 'C' items

On this basis, a plan of A B C selective control is given below:

Ranking	Item Nos.	% of Total units	Cost (₹)	% of Total Cost	Category
1	11	5.2512	81,650	22.9502	
2	2	10.9589	72,000	20.2378	
3	5	17.3516	57,000	16.0216	
Total	3	33.5617	2,10,650	59.2096	A
4	1	3.1963	35,000	9.8378	
5	12	1.8721	25,420	7.1451	
6	6	18.2648	20,000	5.6216	
7	3	0.6849	15,000	4.2162	
Total	4	24.0181	95,420	26.8207	B
8	4	0.2740	13,200	3.7103	
9	7	27.3973	12,000	3.3730	
10	10	13.2420	11,600	3.2605	
11	8	1.3699	10,500	2.9513	
12	9	0.1370	2,400	0.6746	
Total	5	42.4202	49,700	13.9697	C
Grand Total	12	100	3,55,770	100	

Advantages of ABC analysis: The advantages of ABC analysis are the following:

- (i) Continuity in production: It ensures that, without there being any danger of interruption of production for want of materials or stores, minimum investment will be made in inventories of stocks of materials or stocks to be carried.



- (ii) Lower cost: The cost of placing orders, receiving goods and maintaining stocks is minimised specially if the system is coupled with the determination of proper economic order quantities.
- (iii) Less attention required: Management time is saved since attention need to be paid only to some of the items rather than all the items, as would be the case if the ABC system was not in operation.
- (iv) Systematic working: With the introduction of the ABC system, much of the work connected with purchases can be systematized on a routine basis, to be handled by subordinate staff.

**QUESTION 9. (ILLUSTRATION 9)**

A factory uses 4,000 varieties of inventory. In terms of inventory holding and inventory usage, the following information is compiled:

No. of varieties of inventory	%	% value of inventory holding (average)	% of inventory usage (in end-product)
3,875	96.875	20	5
110	2.750	30	10
15	0.375	50	85
4,000	100.00	100	100

CLASSIFY the items of inventory as per ABC analysis with reasons.

ANSWER :

Classification of the items of inventory as per ABC analysis

1. 15 number of varieties of inventory items should be classified as 'A' category items because of the following reasons:
 - (i) Constitute 0.375% of total number of varieties of inventory handled by stores of factory, which is minimum as per given classification in the table.
 - (ii) 50% of total use value of inventory holding (average), which is maximum, according to the given table.
 - (iii) Highest in consumption, about 85% of inventory usage (in end-product).
2. 110 number of varieties of inventory items should be classified as 'B' category items because of the following reasons:
 - (i) Constitute 2.750% of the total number of varieties of inventory items handled by stores of factory.
 - (ii) Requires moderate investment of about 30% of total use value of inventory holding (average).
 - (iii) Moderate in consumption, about 10% of inventory usage (in end-product).
3. 3,875 number of varieties of inventory items should be classified as 'C' category items because of the following reasons:
 - (i) Constitute 96.875% of total varieties of inventory items handled by stores of factory.
 - (ii) Requires about 20% of total use value of inventory holding (average).
 - (iii) Minimum inventory consumption, i.e., about 5% of inventory usage (in end-product).

**QUESTION 10. (ILLUSTRATION 10)**

The following data are available in respect of material X for the year ended 31st March, 2023.

	(₹)
Opening stock	90,000
Purchases during the year	2,70,000
Closing stock	1,10,000

CALCULATE:

- Inventory turnover ratio, and
- The number of days for which the average inventory is held.

ANSWER :

Inventory turnover ratio

$$\begin{aligned} \text{(Refer to working note)} &= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}} \\ &= \frac{₹2,50,000}{₹1,00,000} = 2.5 \end{aligned}$$

Average number of days for which the average inventory is held

$$= \frac{365}{\text{Inventory turnover ratio}} = \frac{365 \text{ days}}{2.5} = 146 \text{ days}$$

Working Note:

	(₹)
Opening stock of raw material	90,000
Add: Material purchases during the year	2,70,000
Less: Closing stock of raw material	1,10,000
Cost of stock of raw material consumed	2,50,000

**QUESTION 11. (ILLUSTRATION 11)**

From the following data for the year ended 31st March, 2023, CALCULATE the inventory turnover ratio of the two items and put forward your comments on them.

	Material A (₹)	Material B (₹)
Opening stock 1.04.2022	10,000	9,000
Purchase during the year	52,000	27,000
Closing stock 31.03.2023	6,000	11,000

ANSWER :

First of all, it is necessary to find out the material consumed:

Cost of materials consumed	Material A (₹)	Material B (₹)
Opening stock	10,000	9,000
Add: Purchases	52,000	27,000
	62,000	
6,000	36,000	
11,000		
Less: Closing stock		
Materials consumed	56,000	25,000
Average inventory: (Opening Stock + Closing Stock) ÷ 2	8,000	10,000



Inventory Turnover ratio: (Consumption / Average inventory)	7 times	2.5 times
Inventory Turnover (Number of Days in a year/IT ratio)	52 days	146 days
Comments: Material A is moving faster than Material B.		

**QUESTION 12. (ILLUSTRATION 12)**

The following transactions in respect of material Y occurred during the six months ended 30th September, 2022:

Month	Purchase (units)	Price per unit (₹)	Issued Units
April	200	25	Nil
May	300	24	250
June	425	26	300
July	475	23	550
August	500	25	800
September	600	20	400

Required:

- The Chief Accountant argues that the value of closing stock remains the same no matter which method of pricing of material issues is used. Do you agree? Why or why not? EXPLAIN. Detailed stores ledgers are not required.
- STATE when and why would you recommend the LIFO method of pricing material issues?

ANSWER :

- Total number of units purchased = 2,500 Total number of units issued = 2,300
The closing stock at the end of six months' period i.e., on 30th September, 2022 will be 200 units
Upto the end of August 2022, total purchases coincide with the total issues i.e., 1,900 units. It means that at the end of August 2022, there was no closing stock. In the month of September 2022, 600 units were purchased out of which 400 units were issued. Since there was only one purchase and one issue in the month of September, 2022 and there was no opening stock on 1st September 2022, the Closing Stock of 200 units is to be valued at ₹ 20 per unit.
In the view of this, the argument of the Chief Accountant appears to be correct. Where there is only one purchase and one issue in a month with no opening stock, the method of pricing of material issues becomes irrelevant. Therefore, in the given case one should agree with the argument of the Chief Accountant that the value of closing stock remains the same no matter which method of pricing the issue is used.
It may, however, be noted that the argument of Chief Accountant would not stand if one finds the value of the Closing Stock at the end of each month.
- LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:
 - The cost of the materials issued will be either nearer or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues.
 - The use of the method during the period of rising prices does not reflect undue high profit in the income statement, as it was under the first-in-first-out or average method.



In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.

- (iii) In the case of falling prices, profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.
- (iv) During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

**QUESTION 13. (ILLUSTRATION 13)**

The following information is provided by Sunrise Industries for the fortnight of April, 2023:

Material Exe:

Stock on 1-4-2023 100 units at ₹ 5 per unit.

Purchases

5-4-2023, 300 units at ₹ 6

8-4-2023, 500 units at ₹ 7

12-4-2023, 600 units at ₹ 8

Issues

6-4-2023, 250 units

10-4-2023, 400 units

14-4-2023, 500 units

Required:

(A) CALCULATE using FIFO and LIFO methods of pricing issues:

- (a) the value of materials consumed during the period
- (b) the value of stock of materials on 15-4-2023.

(B) EXPLAIN why the figures in (a) and (b) in part A of this question are different under the two methods of pricing of material issues used. You need not draw up the Stores Ledgers.

ANSWER :

A) (a) Value of Material Exe consumed during the period
1-4-2023 to 15-4-2023 by using FIFO method.

Date	Description Units	Qty. (Units)	Rate (₹)	Amount (₹)
1-4-2023	Opening balance	100	5	500
5-4-2023	Purchased	300	6	1,800
6-4-2023	Issued	100	5	1,400
		150	6	
8-4-2023	Purchased	500	7	3,500
10-4-2023	Issued	150	6	2,650
		250	7	
12-4-2023	Purchased	600	8	4,800
14-4-2023	Issued	250	7	3,750
		250	8	
15-4-2023	Balance	350	8	2,800



Total value of material Exe consumed during the period under FIFO method comes to (₹ 1,400 + ₹ 2,650 + ₹ 3,750) ₹ 7,800 and balance on 15-4-2023 is of ₹ 2,800.

Value of material Exe consumed during the period 01-4-2023 to 15-4-2023 by using LIFO method

Date	Description	Qty. (Units)	Rate (₹)	Amount (₹)
1-4-2023	Opening balance	100	5	500
5-4-2023	Purchased	300	6	1,800
6-4-2023	Issued	250	6	1,500
8-4-2023	Purchased	500	7	3,500
10-4-2023	Issued	400	7	2,800
12-4-2023	Purchased	600	8	4,800
14-4-2023	Issued	500	8	4,000
15-4-2023	Balance	350	—	2,300*

Total value of material Exe issued under LIFO method comes to (₹ 1,500 + ₹ 2,800 + ₹ 4,000) ₹ 8,300.

*The balance 350 units on 15-4-2023 of ₹ 2,300, relates to opening balance on 1-4-2023 and purchases made on 5-4-2023, 8-4-2023 and 12-4-2023. (100 units @ ₹ 5, 50 units @ ₹ 6, 100 units @ ₹ 7 and 100 units @ ₹ 8).

(b) As shown in (a) above, the value of stock of materials on 15-4-2023:

Under FIFO method ₹ 2,800

Under LIFO method ₹ 2,300

(B) Total value of material Exe issued to production under FIFO and LIFO methods comes to ₹ 7,800 and ₹ 8,300 respectively. The value of closing stock of material Exe on 15-4-2023 under FIFO and LIFO methods comes to ₹ 2,800 and ₹ 2,300 respectively.

The reasons for the difference of ₹ 500 (₹ 8,300 – ₹ 7,800) as shown by the following table in the value of material Exe, issued to production under FIFO and LIFO is as follows:

Date	Quantity Issued	Value	Total	Value	Total
		FIFO		LIFO	
	(Units)	(₹)	(₹)	(₹)	(₹)
6-4-2023	250	1,400		1,500	
10-4-2023	400	2,650		2,800	
14-4-2023	500	3,750	7,800	4,000	8,300

1. On 6-4-2023, 250 units were issued to production. Under FIFO their value comes to ₹ 1,400 (100 units × ₹ 5 + 150 units × ₹ 6) and under LIFO ₹ 1,500 (250 × ₹ 6). Hence, ₹ 100 more was charged to production under LIFO.

2. On 10-4-2023, 400 units were issued to production. Under FIFO their value comes to ₹ 2,650 (150 × ₹ 6 + 250 × ₹ 7) and under LIFO ₹ 2,800 (400 × ₹ 7). Hence, ₹ 150 more was charged to production under LIFO.

3. On 14-4-2023, 500 units were issued to production. Under FIFO their value comes to ₹ 3,750 (250 × ₹ 7 + 250 × ₹ 8) and under LIFO ₹ 4,000 (500 × ₹ 8). Hence, ₹ 250 more was charged to production under LIFO.

Thus, the total excess amount charged to production under LIFO comes to ₹ 500.



The reasons for the difference of ₹ 500 (₹ 2,800 – ₹ 2,300) in the value of 350 units of Closing Stock of material Exe under FIFO and LIFO are as follows:

1. In the case of FIFO, all the 350 units of the closing stock belongs to the purchase of material made on 12-4-2023, whereas under LIFO these units were from opening balance and purchases made on 5-4-2023, 8-4-2023 and 12-4-2023.
2. Due to different purchase price paid by the concern on different days of purchase, the value of closing stock differed under FIFO and LIFO. Under FIFO 350 units of closing stock were valued @ ₹ 8 p.u. Whereas under LIFO first 100 units were valued @ ₹ 5 p.u., next 50 units @ ₹ 6 p.u., next 100 units @ ₹ 7 p.u. and last 100 units @ ₹ 8 p.u. Thus, under FIFO, the value of closing stock increased by ₹ 500.



QUESTION 14. (ILLUSTRATION 14)

Imbrios India Ltd. is recently incorporated start-up company back in the year 2019. It is engaged in creating Embedded products and Internet of Things (IoT) solutions for the Industrial market. It is focused on innovation, design, research and development of products and services. One of its embedded products is LogMax, a system on module (SoM) Carrier board for industrial use. It is a small, flexible and embedded computer designed as per industry specifications. In the beginning of the month of September 2022, company entered into a job agreement of providing 4800 LogMax to NIT, Mandi. Following details w.r.t. issues, receipts, returns of Store Department handling Micro-controller, a component used in the designated assembling process have been extracted for the month of September, 2022:

Sep. 1	Opening stock of 6,000 units @ ₹ 285 per unit
Sep. 8	Issued 4875 units to mechanical division vide material requisition no. Mech 009/22
Sep. 9	Received 17,500 units @ ₹ 276 per unit vide purchase order no. 159/22
Sep. 10	Issued 12,000 units to technical division vide material requisition no. Tech 012/22
Sep. 12	Returned to stores 2375 units by technical division against material requisition no. Tech 012/22.
Sep. 15	Received 9,000 units @ ₹ 288 per units vide purchase order no. 160/ 2222
Sep. 17	Returned to supplier 700 units out of quantity received vide purchase order no. 160/22.
Sep. 20	Issued 9,500 units to technical division vide material requisition no. Tech 165/22

On 25th September, 2022, the stock manager of the company expressed his need to leave for his hometown due to certain contingency and immediately left the job same day. Later, he also switched his phone off.

As the company has the tendency of stock-taking every end of the month to check and report for the loss due to rusting of the components, the new stock manager, on 30th September, 2022, found that 900 units of Micro-controllers were missing which was apparently misappropriated by the former stock manager. He, further, reported loss of 300 units due to rusting of the components.

From the above information you are required to prepare the Stock Ledger account using 'Weighted Average' method of valuing the issues.

**ANSWER :**

Store Ledger of Imbrios India Ltd. (Weighted Average Method)

Date	Receipts			Issues			Balance of Stock		
Sep.	Qty (kg.)	Rate (₹)	Amount (₹)	Qty (kg.)	Rate (₹)	Amount (₹)	Qty (kg.)	Rate (₹)	Amount (₹)
1	-	-	-	-	-	-	6,000	285.00	17,10,000
8	-	-	-	4,875	285.00	13,89,375	1,125	285.00	3,20,625
9	17,500	276.00	48,30,000	-	-	-	18,625	276.54	51,50,625
10	-	-	-	12,000	276.54	33,18,480	6,625	276.54	18,32,145
12	2,375	276.54	6,56,783	-	-	-	9,000	276.54	24,88,928
15	9,000	288.00	25,92,000	-	-	-	18,000	282.27	50,80,928
17	-	-	-	700	288.00	2,01,600	17,300	282.04	48,79,328
20	-	-	-	9,500	282.04	26,79,380	7,800	282.04	21,99,948
30	-	-	-	900*	282.04	2,53,836	6,900	282.04	19,46,112
30	-	-	-	300**	-	-	6,600	294.87	19,46,112

* 900 units is abnormal loss, hence it will be transferred to Costing Profit & Loss A/c.

** 300 units is normal loss; hence it will be absorbed by good units.

**QUESTION 16. (PP1)**

Anil & Company buys its annual requirement of 36,000 units in 6 instalments. Each unit costs ₹ 1 and the ordering cost is ₹25. The inventory carrying cost is estimated at 20% of unit value. FIND the total annual cost of the existing inventory policy. CALCULATE, how much money can be saved by Economic Order Quantity?

ANSWER :

(a) Total Annual Cost in Existing Inventory Policy

	(₹)
Ordering cost (6 orders @ ₹ 25)	150
Carrying cost of average inventory (36,000 ÷ 6) = 6,000 units per order	
Average inventory = 3,000 units	
Carrying cost = 20% of ₹ 1 × 3,000 = 3,000 × 0.20	600
Total cost	A 750

(b) Total Annual Cost in E.O.Q

$$EOQ = \sqrt{\frac{2 \times 36,000 \times 25}{₹1 \times 20\%}} = 3000 \text{ units}$$

	(₹)
No. of orders = 36,000 ÷ 3,000 units = 12 orders	
Ordering cost (12 × ₹25) =	300
Carrying cost of average inventory (3,000 × 0.20) ÷ 2 =	300
Total Cost	B 600
Savings due to E.O.Q ₹ (750 – 600) (A – B)	150

Note: As the units purchase cost of ₹ 1 does not change in both the computation, the same has not been considered to arrive at total cost of inventory for the purpose of savings.

**QUESTION 17. (PP2)**

A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2022-23:

- (i) Annual demand of Alpha 8,000 units
- (ii) Cost of placing an order ₹ 200 per order
- (iii) Cost per unit of Alpha ₹ 400
- (iv) Carrying cost p.a. 20%

The company has been offered a quantity discount of 4 % on the purchase of 'Alpha' provided the order size is 4,000 components at a time.

Required:

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

ANSWER :

- (i) Calculation of Economic Order Quantity

$$EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 8,000 \text{ units} \times ₹200}{₹400 \times 20 / 100}} = 200 \text{ units}$$

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

- (a) When EOQ is ordered

		(₹)
Purchase Cost	(8,000 units x ₹ 400)	32,00,000
Ordering Cost	[(8,000 units/200 units) x ₹ 200]	8,000
Carrying Cost	(200 units x ₹400 x ½ x 20/100)	8,000
Total Cost		32,16,000

- (b) When Quantity Discount is accepted

		(₹)
Purchase Cost	(8,000 units x ₹ 384*)	30,72,000
Ordering Cost	[(8,000 units/4000 units) x ₹ 200]	400
Carrying Cost	(4000 units x ₹ 384 x ½ x 20/100)	1,53,600
Total Cost		32,26,000

*Unit Cost ₹400

Less Quantity Discount @ 4% = 16

Purchase Cost = 400 - 16 = ₹384

Advise – The total cost of inventory is lower if EOQ is adopted. Hence, the company is advised not to accept the quantity discount.

**QUESTION 18. (PP3)**

The complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer - Super Grow and Nature's Own. The following information is collected:

	FERTILIZER	
	Super Grow	Nature's Own
Annual demand	2,000 bags	1,280 bags
Relevant ordering cost per purchase order	₹ 1,200	₹ 1,400
Annual relevant carrying cost per bag	₹ 480	₹ 560



Required:

- COMPUTE EOQ for Super Grow and Nature's own.
- For the EOQ, WHAT is the sum of the total annual relevant ordering costs and total annual relevant carrying costs for Super Grow and Nature's own?
- For the EOQ, COMPUTE the number of deliveries per year for Super Grow and Nature's own.

ANSWER :

$$EOQ = \sqrt{\frac{2AO}{C}}$$

Where,

A = Annual Demand

O = Ordering cost per order

C = Inventory carrying cost per unit per annum

- Calculation of EOQ

Super Grow	Nature's Own
$EOQ = \sqrt{\frac{2 \times 2,000 \times 1,200}{480}}$ $= \sqrt{10,000} \text{ or } 100 \text{ bags}$	$EOQ = \sqrt{\frac{2 \times 1,280 \times 1,400}{560}}$ $= \sqrt{6,400} \text{ or } 80 \text{ bags}$

- Total annual relevant cost = Total annual relevant ordering costs +
Total annual relevant carrying cost

	Super Grow	Nature's Own
Number of Orders = Annual Requirement ÷ EOQ	2,000/100 = 20 orders	1,280/80 = 16 orders
Ordering Cost	20 × 1200 = ₹ 24,000	16 × 1400 = ₹ 22,400
Carrying Cost	½ × 100 × 480 = ₹ 24,000	½ × 80 × 560 = ₹ 22,400
Total of Ordering and Carrying Cost	= ₹ 24,000 + ₹ 24,000 = ₹ 48,000	₹ 22,400 + ₹ 22,400 = ₹ 44,800

- Number of deliveries for Super Grow and Nature's own fertilizer per
year Annual demand for fertilizer bags

EOQ

Super Grow	Nature's Own
$= \frac{2,000 \text{ bags}}{100 \text{ bags}} = 20 \text{ orders}$	$= \frac{1,280 \text{ bags}}{80 \text{ bags}} = 16 \text{ orders.}$

**QUESTION 19. (PP4)**

Raw Material	Usage per unit of Product (Kgs.)	Re-order quantity (Kgs.)	Price per Kg.	Delivery period (in weeks)			Re-order level (Kgs)	Minimum level (Kgs.)
				Minimum	Average	Maximum		
A	10	10,000	10	1	2	3	8,000	?
B	4	5,000	30	3	4	5	4,750	?
C	6	10,000	15	2	3	4	?	2,000

Weekly production varies from 175 to 225 units, averaging 200 units of the said product.

COMPUTE the following quantities:

- Minimum stock of A,
- Maximum stock of B,
- Re-order level of C,
- Average stock level of A.

ANSWER :

- (i) Minimum stock of A

Re-order level – (Average rate of consumption × Average time required to obtain fresh delivery)

$$= 8,000 - (200 \times 10 \times 2) = 4,000 \text{ kgs.}$$

- (ii) Maximum stock of B

Re-order level + Re-order quantity – (Minimum consumption × Minimum delivery period)

$$= 4,750 + 5,000 - (175 \times 4 \times 3)$$

$$= 9,750 - 2,100 = 7,650 \text{ kgs.}$$

- (iii) Re-order level of C

Maximum delivery period × Maximum usage

$$= 4 \times 225 \times 6 = 5,400 \text{ kgs.}$$

OR

Re-order level of C

= Minimum level of C + [Average rate of consumption × Average time required to obtain fresh delivery]

$$= 2,000 + [(200 \times 6) \times 3] \text{ kgs} = 5,600 \text{ kgs.}$$

- (iv) Average stock level of A

= Minimum stock level of A + $\frac{1}{2}$ Re-order quantity of A

$$= 4,000 + \frac{1}{2} \times 10,000 = 4,000 + 5,000 = 9,000 \text{ kgs}$$

OR

Average Stock level of A

= $\frac{\text{Minimum stock level of A} + \text{Maximum stock level of A}}{2}$

2



(Refer to working note)

$$= \frac{4,000 + 16,250}{2} = 10,125 \text{ kgs}$$

Working note:

$$\begin{aligned} \text{Maximum stock of A} &= \text{ROL} + \text{ROQ} - (\text{Minimum consumption} \times \text{Minimum re-order period}) \\ &= 8,000 + 10,000 - [(175 \times 10) \times 1] = 16,250 \text{ kgs} \end{aligned}$$



QUESTION 19. (PP5)

(a) EXE Limited has received an offer of quantity discounts on its order of materials as under:

Price per ton (₹)	Ton (Nos.)
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tons. The ordering cost per order is ₹ 1,200 and the stock holding cost is estimated at 20% of material cost per annum. You are required to COMPUTE the most economical purchase level.

(b) WHAT will be your answer to the above question if there are no discounts offered and the price per ton is ₹ 1,500?

ANSWER :

(a)

Total annual requirement (A)	Order size (Tonne) (q)	No. of orders A/q	Cost of inventory A x Per tonne cost (₹)	Ordering cost A/q x ₹ 1200 (₹)	Carrying cost p.t. p.a 1/2 x q x 20% of cost p.t. (₹)	Total Cost (4+5+6) (₹)
1	2	3	4	5	6	7
5,000	400	12.5	60,00,000	15,600	48,000	60,63,600
		(13)*				
Ton			(5,000 x ₹1200)		(200 x ₹ 240)	
	500	10	59,00,000	12,000	59,000	59,71,000
			(5,000 x ₹ 1180)		(250 x ₹ 236)	
	1,000	5	58,00,000	6,000	1,16,000	59,22,000
			(5,000 x ₹ 1160)		(500 x ₹ 232)	
	2,000	2.5	57,00,000		2,28,000	
		(3)*		3,600		59,31,600
			(5,000 x ₹ 1140)		(1,000 x ₹228)	
	3,000	1.666	56,00,000		3,36,000	
		(2)*		2,400		
			(5,000 x ₹ 1120)		(1,500 x ₹224)	59,38,400

* Since number of orders cannot be in decimals, thus 12.5 orders are taken as 13 orders, 2.5 are taken as 3 order and 1.66 orders are taken as 2 orders.



The above table shows that the total cost of 5,000 units including ordering and carrying cost is minimum (₹ 59,22,000) when the order size is 1,000 units. Hence the most economical purchase level is 1,000 units.

(b) If there will be no discount offer then the purchase quantity should be equal to EOQ. The EOQ is as follows:

$$EOQ = \sqrt{\frac{2AO}{C}}$$

where A = annual inventory requirement,

O = ordering cost per order and

C = carrying cost per unit per annum.

$$= \sqrt{\frac{2 \times 5,000 \text{ units} \times ₹1,200}{20\% \times ₹1,500}} = 200 \text{ units}$$



QUESTION 20. (PP6)

From the details given below, CALCULATE:

- (i) Re-ordering level
- (ii) Maximum level
- (iii) Minimum level
- (iv) Danger level.

Re-ordering quantity is to be calculated on the basis of following information: Cost of placing a purchase order is ₹ 4,000

Number of units to be purchased during the year is 5,00,000

Purchase price per unit, inclusive of transportation cost is ₹ 50

Annual cost of storage per unit is ₹ 10.

Details of lead time : Average - 10 days, Maximum - 15 days Minimum - 5 days,
for emergency purchases - 4 days.

Rate of consumption: Average: 1,500 units per day,
Maximum: 2,000 units per day.

ANSWER :

A (Number of units to be purchased annually) = 5,00,000 units

O (Ordering cost per order) = ₹ 4,000

C (Annual cost of storage per unit) = ₹ 10

Purchase price per unit inclusive of transportation cost = ₹ 50

Computations:

(i) Re-ordering level (ROL) = Maximum usage per period × Maximum lead time

$$= 2,000 \text{ units per day} \times 15 \text{ days}$$

$$= 30,000 \text{ units}$$

(ii) Maximum level = ROL + ROQ - [Min. rate of consumption × Min. lead time] (Refer to working notes 1 and 2)

$$= 30,000 \text{ units} + 20,000 \text{ units} - [1,000 \text{ units per day} \times 5 \text{ days}]$$

$$= 45,000 \text{ units}$$

(iii) Minimum level = ROL - Average rate of consumption ×



Average re-order-period

$$= 30,000 \text{ units} - (1,500 \text{ units per day} \times 10 \text{ days})$$

$$= 15,000 \text{ units}$$

(iv) Danger level = Average consumption $\times$ Lead time for emergency purchases

$$= 1,500 \text{ units per day} \times 4 \text{ days}$$

$$= 6,000 \text{ units}$$

Working Notes:

1. Minimum rate of consumption per day

$$\text{Av. rate of consumption} = \frac{\text{Minimum rate of consumption} + \text{Maximum rate of consumption}}{2}$$

$$1,500 \text{ units per day} = \frac{X \text{ units/day} + 2,000 \text{ units per day}}{2} \text{ or } X$$

$$= 1,000 \text{ units per day.}$$

$$2. \text{ Re-order Quantity (ROQ)} = \sqrt{\frac{2 \times 5,00,000 \text{ units} \times ₹4,000}{10}} = 20,000 \text{ units}$$



QUESTION 21. (PP7)

G. Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at ₹ 20. For every finished product, one unit of component is required. The ordering cost is ₹ 120 per order and the holding cost is 10% p.a.

You are required to CALCULATE:

- Economic order quantity.
- If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur?
- What is the minimum carrying cost, the company has to incur?

ANSWER :

(a) (i) Economic order quantity:

A (Annual requirement or Component 'X')

$$= 4,000 \text{ units per month} \times 12 \text{ months}$$

$$= 48,000 \text{ units}$$

C (Purchase cost p.u.) = ₹ 20

O (Ordering cost per order) = ₹ 120

C_i (Holding cost) = 10% per annum

$$\text{E.O.Q.} = \sqrt{\frac{2AO}{C_i}} = \sqrt{\frac{2 \times 48,000 \text{ units} \times ₹120}{10\% \text{ of } ₹20}} = 2,400 \text{ units}$$



(ii) Extra cost incurred by the company:

A. Total cost when order size is equal 4,000 units: Total cost = Total ordering cost + Total carrying cost

$$= \frac{A}{Q} \times O + \frac{1}{2} Q (C_c)$$

$$= \left(\frac{48,000 \text{ units} \times ₹120}{4,000 \text{ units}} \right) + \left(\frac{1}{2} \times 4,000 \text{ units} \times 10\% \times ₹20 \right)$$

$$= ₹ 1,440 + ₹ 4,000 = ₹ 5,440$$

B. Total cost when order size is equal EOQ i.e. 2,400 units:

$$= \left(\frac{48,000 \text{ units} \times ₹120}{2,400 \text{ units}} \right) + \left(\frac{1}{2} \times 2,400 \text{ units} \times 10\% \times ₹20 \right)$$

$$= ₹ 2,400 + ₹ 2,400 = ₹ 4,800$$

Extra cost that the company has to incur = (A) – (B)

$$= ₹ 5,440 - ₹ 4,800$$

$$= ₹ 640$$

(iii) Minimum carrying cost: Carrying cost depends upon the size of the order. It will be minimum on the least order size. (In this part of the question the two order sizes are 2,400 units and 4,000 units. Here 2,400 units is the least of the two order sizes. At this order size carrying cost will be minimum.)

The minimum carrying cost in this case can be computed as under:

$$\text{Minimum carrying cost} = \frac{1}{2} \times 2,400 \text{ units} \times 10\% \times ₹ 20 = ₹ 2,400.$$



QUESTION 22. (PP8)

'AT' Ltd. furnishes the following store transactions for September, 2022:

1-9-22	Opening balance	25 units value ₹ 162.50
4-9-22	Issues Req. No. 85	8 units
6-9-22	Receipts from B & Co. GRN No. 26	50 units @ ₹ 5.75 per unit
7-9-22	Issues Req. No. 97	12 units
10-9-22	Return to B & Co.	10 units
12-9-22	Issues Req. No. 108	15 units
13-9-22	Issues Req. No. 110	20 units
15-9-22	Receipts from M & Co. GRN. No. 33	25 units @ ₹ 6.10 per unit
17-9-22	Issues Req. No. 121	10 units
19-9-22	Received replacement from B & Co. GRN No. 38	10 units
20-9-22	Returned from department, material of M & Co. MRR No. 4	5 units
22-9-22	Transfer from Job 182 to Job 187 in the dept. MTR 6	5 units
26-9-22	Issues Req. No. 146	10 units
29-9-22	Transfer from Dept. "A" to Dept. "B" MTR 10	5 units
30-9-22	Shortage in stock taking	2 units



PREPARE the priced stores ledger on FIFO method and STATE how would you treat the shortage in stock taking.

ANSWER :

Working Notes:

1. The material received as replacement from vendor is treated as fresh supply.
2. In the absence of any information, the price of the material returned from a user department on 20-9-22 has been taken at the price of the latest issue made on 17-9-22. In FIFO method, physical flow of the material is irrelevant, and issue price is based on first in first out.
3. The issue of material on 26-9-22 is made out of the material received from a user department on 20-9-22.
4. The entries for transfer of materials from one job and department to another on 22-9-22 and 29-9-22 respectively, do not affect the store ledger. However, adjustment entries to calculation of cost of respective jobs and departments are made in cost accounts.
5. The material found short as a result of stock taking has been written off at relevant issue price.

Stores Ledger of AT Ltd. for the month of September, 2022 (FIFO Method)

Date	RECEIPT				ISSUE				BALANCE		
	GRN No MRR No.	Qty. Units	Rate (₹)	Amount (₹)	Requisition No	Qty. Units	Rate (₹)	Amount (₹)	Qty. Units	Rate (₹)	Amount (₹)
1	2	3	4	5	6	7	8	9	10	11	12
1-9-22	—	—	—	—	—	—	—	—	25	6.50	162.50
4-9-22	—	—	—	—	85	8	6.50	52	17	6.50	110.50
6-9-22	26	50	5.75	287.50	—	—	—	—	1	6.50	398.00
									50	5.75	
7-9-22	-	-	-	-	97	12	6.50	78	5	6.50	320.00
									50	5.75	
10-9-22	-	-	-	-	Return	10	5.75	57.50	5	6.50	262.50
									40	5.75	
12-9-22	-	-	-	-	108	5	6.50	90	30	5.75	172.50
						10	5.75				
13-9-22	—	—	—	—	110	20	5.75	115	10	5.75	57.50
15-9-22	33	25	6.10	152.50	—	—	—	—	10	5.75	210.00
									25	6.10	
17-9-22	—	—	—	—	121	10	5.75	57.50	25	6.10	152.50
19-9-22	38	10	5.75	57.50	—	—	—	—	25	6.10	210.00
									10	5.75	
									5	5.75	
20-9-22	4	5	5.75	28.75	—	—	—	—	25	6.10	
									10	5.75	238.75
26-9-22	-	-	-	-	146	5	5.75	59.25	20	6.10	179.50
						5	6.10		10	5.75	



30-9-22	-	-	-	-	Shortage	2	6.10	12.20	18	6.10	167.30
									10	5.75	

**QUESTION 23. (PP9)**

The following information is extracted from the Stores Ledger:

Material X

Opening Stock Nil

Purchases:

Jan. 1 100 @ ₹ 1 per unit

Jan. 20 100 @ ₹ 2 per unit

Issues:

Jan. 22 60 for Job W 16

Jan. 23 60 for Job W 17

Complete the receipts and issues valuation by adopting the First-In-First-Out, Last-In-First-Out and the Weighted Average Method. TABULATE the values allocated to Job W 16, Job W 17 and the closing stock under the methods aforesaid and discuss from different points of view which method you would prefer.

ANSWER :

From the point of view of cost of material charged to each job, it is minimum under FIFO and maximum under LIFO (Refer to Tables). During the period of rising prices, the use of FIFO give rise to high profits and that of LIFO low profits. In the case of weighted average, there is no significant adverse or favourable effect on the cost of material as well as on profits.

From the point of view of valuation of closing stock, it is apparent from the above statement, that it is maximum under FIFO, moderate under weighted average and minimum under LIFO.

It is clear from the tables that the use of weighted average evens out the fluctuations in the prices. Under this method, the cost of materials issued to the jobs and the cost of material in hands reflects greater uniformity than under FIFO and LIFO. Thus, from different points of view, weighted average method is preferred over LIFO and FIFO.

Statement of receipts and issues by adopting First-in-First-Out Method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)
Jan. 1	Purchase	100	1	100	—	—	—	100	1	100
Jan. 20	Purchase	100	2	200	—	—	—	100	1	100
								100	2	200
Jan. 22	Issue to Job W 16	—	—	—	60	1	60	40	1	40
								100	2	200
Jan. 23	Issue to Job W 17	—	—	—	40	1	40	80	2	160
					20	2	40			



Statement of receipts and issues by adopting Last-In-First-Out method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)
Jan. 1	Purchase	100	1	100	—	—	—	100	1	100
Jan. 20	Purchase	100	2	200	—	—	—	100	1	100
								100	2	200
Jan. 22	Issue to Job W 16	—	—	—	60	2	120	100	1	100
								40	2	80
Jan. 23	Issue to Job W 17	—	—	—	40	2	80	80	1	80
					20	1	20			

Statement of Receipt and Issues by adopting Weighted Average method

Date	Particulars	Receipts			Issues			Balance		
		Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)	Units No.	Rate (₹)	Value (₹)
Jan. 1	Purchase	100	1	100	—	—	—	100	1	100
Jan. 20	Purchase	100	2	200	—	—	—	200	1.50	300
Jan. 22	Issue to Job W 16	—	—	—	60	1.50	90	140	1.50	210
Jan. 23	Issue to Job W 17	—	—	—	60	1.50	90	80	1.50	120

Statement of Material Values allocated to Job W 16, Job 17 and Closing Stock, under aforesaid methods

	FIFO (₹)	LIFO (₹)	Weighted Average (₹)
Material for Job W 16	60	120	90
Material for Job W 17	80	100	90
Closing Stock	160	80	120
	300	300	300



REVISION TEST PAPER



RTP MAY 18

Aditya Brothers supplies surgical gloves to nursing homes and polyclinics in the city. These surgical gloves are sold in pack of 10 pairs at price of ₹ 250 per pack.

For the month of April 2018, it has been anticipated that a demand for 60,000 packs of surgical gloves will arise. Aditya Brothers purchases these gloves from the manufacturer at ₹ 228 per pack within a 4 to 6 days lead time. The ordering and related cost is ₹ 240 per order. The storage cost is 10% p.a. of average inventory investment.

Required:

- CALCULATE the Economic Order Quantity (EOQ)
- CALCULATE the number of orders needed every year
- CALCULATE the total cost of ordering and storage of the surgical gloves.
- DETERMINE when should the next order to be placed. (Assuming that the company does maintain a safety stock and that the present inventory level is 10,033 packs with a year of 360 working days).

ANSWER :

- Calculation of Economic Order Quantity:

$$\text{EOQ} = \sqrt{\frac{2 \times A \times O}{C_i}} = \sqrt{\frac{2 \times (60,000 \text{ packs} \times 12 \text{ months}) \times ₹ 240}{₹ 228 \times 10\%}}$$

$$= 3,893.3 \text{ packs or } 3,893 \text{ packs.}$$

- Number of orders per year

$$\frac{\text{Annual requirements}}{\text{E.O.Q}} = \frac{7,20,000 \text{ packs}}{3,893 \text{ packs}} = 184.9 \text{ or } 185 \text{ orders a year}$$

- Ordering and storage costs

	(₹)
Ordering costs :- 185 orders ₹ 240	44,400.00
Storage cost :- $\frac{1}{2}$ (3,893 packs 10% of ₹228)	44,380.20
Total cost of ordering & storage	88,780.20

- Timing of next order

- Day's requirement served by each order.

$$\text{Number of days requirements} = \frac{\text{No. of working days}}{\text{No. of order in a year}} = \frac{360 \text{ days}}{185 \text{ order}} = 1.94 \text{ days}$$

supply.



This implies that each order of 3,893 packs supplies for requirements of 1.94 days only.

(b) Days requirement covered by inventory

$$= \frac{\text{Units in inventory}}{\text{Economic order quantity}} \times (\text{Day's requirement served by an order})$$

$$\therefore \frac{10,033 \text{ packs}}{3,893 \text{ packs}} \times 1.94 \text{ days} = 5 \text{ days requirement}$$

(c) Time interval for placing next order

Inventory left for day's requirement – Average lead time of delivery

5 days – 5 days = 0 days

This means that next order for the replenishment of supplies has to be placed immediately.



RTP NOV 18

Rounak Ltd. is the manufacturer of monitors for PCs. A monitor requires 4 units of Part-M. The following are the details of its operation during 20X8:

Average monthly market demand	2,000 Monitors
Ordering cost	₹ 1,000 per order
Inventory carrying cost	20% per annum
Cost of Part	₹ 350 per part
Normal usage	425 parts per week
Minimum usage	140 parts per week
Maximum usage	710 parts per week
Lead time to supply	3-5 weeks

COMPUTE from the above:

- Economic Order Quantity (EOQ). If the supplier is willing to supply quarterly 30,000 units of Part-M at a discount of 5%, is it worth accepting?
- Reorder level
- Maximum level of stock
- Minimum level of stock.

ANSWER :

- (1) A = Annual usage of parts = Monthly demand for monitors × 4 parts × 12 months
= 2,000monitors × 4 parts × 12 months = 96,000units
- O = Ordering cost per order = ₹ 1,000/- per order
- C₁ = Cost per part = ₹ 350/-
- iC₁ = Inventory carrying cost per unit per annum
= 20% × ₹ 350 = ₹ 70/- per unit, per annum
- Economic order quantity (EOQ):

$$E.O.Q = \sqrt{\frac{2AO}{iC_1}} = \sqrt{\frac{2 \times 96,000 \text{ units} \times ₹1,000}{₹70}}$$



= 1,656 parts (approx.)

The supplier is willing to supply 30,000 units at a discount of 5%, therefore cost of each part shall be ₹350 – 5% of 350 = ₹332.5

Total cost (when order size is 30,000 units):

= Cost of 96,000 units + Ordering cost + Carrying cost.

$$= (96,000 \text{ units} \times ₹ 332.50) + \left(\frac{96,000 \text{ units}}{30,000 \text{ units}} \times ₹ 1,000 \right) + \frac{1}{2} (30,000 \text{ units} \times 20\% \times ₹ 332.50)$$

$$= ₹3,19,20,000 + ₹3,200^* + ₹9,97,500 = ₹3,29,20,700$$

Total cost (when order size is 1,656 units):

$$= (96,000 \text{ units} \times ₹350) + \left(\frac{96,000 \text{ units}}{1,656 \text{ units}} \times ₹ 1,000 \right) + \frac{1}{2} (1,656 \text{ units} \times 20\% \times ₹350)$$

$$= ₹3,36,00,000 + ₹57,970^* + ₹57,960 = ₹3,37,15,930$$

Since, the total cost under the supply of 30,000 units with 5% discount is lower than that when order size is 1,656 units, therefore the offer should be accepted.

Note: While accepting this offer consideration of capital blocked on order size of 30,000 units has been ignored.

*Order size can also be taken in absolute figure.

(2) Reorder level

= Maximum consumption × Maximum re-order period

$$= 710 \text{ units} \times 5 \text{ weeks} = 3,550 \text{ units}$$

(3) Maximum level of stock

= Re-order level + Reorder quantity – (Min. usage × Min. reorder period)

$$= 3,550 \text{ units} + 1,656 \text{ units} - (140 \text{ units} \times 3 \text{ weeks}) = 4,786 \text{ units.}$$

(4) Minimum level of stock

= Re-order level – Normal usage × Average reorder period

$$= 3,550 \text{ units} - (425 \text{ units} \times 4 \text{ weeks}) = 1,850 \text{ units.}$$



RTP MAY 19

Ananya Ltd. produces a product 'Exe' using a raw material Dee. To produce one unit of Exe, 2 kg of Dee is required. As per the sales forecast conducted by the company, it will be able to sell 10,000 units of Exe in the coming year. The following is the information regarding the raw material Dee:

- (i) The Re-order quantity is 200 kg. less than the Economic Order Quantity (EOQ).
- (ii) Maximum consumption per day is 20 kg. more than the average consumption per day.
- (iii) There is an opening stock of 1,000 kg.
- (iv) Time required to get the raw materials from the suppliers is 4 to 8 days.



(v) The purchase price is ₹125 per kg.

There is an opening stock of 900 units of the finished product Exe. The rate of interest charged by bank on Cash Credit facility is 13.76%.

To place an order company has to incur ₹ 720 on paper and documentation work. From the above information FIND OUT the followings in relation to raw material Dee:

- (a) Re-order Quantity
- (b) Maximum Stock Level
- (c) Minimum Stock level
- (d) CALCULATE the impact on the profitability of the company by not ordering the EOQ.
[Take 364 days for a year]

ANSWER :

Working Notes:

(i) Computation of Annual consumption & Annual Demand for raw material 'Dee':

Sales forecast of the product 'Exe'	10,000 units
Less: Opening stock of 'Exe'	900 units
Fresh units of 'Exe' to be produced	9,100 units

Raw material required to produce 9,100 units of 'Exe' (9,100 units × 2 kg.)	18,200 kg.
Less: Opening Stock of 'Dee'	1,000 kg.
Annual demand for raw material 'Dee'	17,200 kg.

(ii) Computation of Economic Order Quantity (EOQ):

$$EOQ = \sqrt{\frac{2 \times \text{Annual demand of 'Dee'} \times \text{Ordering cost}}{\text{Carrying cost per unit per annum}}}$$

$$= \sqrt{\frac{2 \times 17,200 \text{ kg.} \times ₹720}{₹125 \times 13.76\%}} = \sqrt{\frac{2 \times 17,200 \text{ kg.} \times ₹720}{₹17.2}} = 1,200 \text{ kg.}$$

(iii) Re- Order level:

= (Maximum consumption per day × Maximum lead time)

$$= \left\{ \left(\frac{\text{Annual Consumption of 'Dee'} + 20 \text{ kg.}}{364 \text{ days}} \right) \times 8 \text{ days} \right\}$$

$$= \left\{ \left(\frac{18,200 \text{ kg.} + 20 \text{ kg.}}{364 \text{ days}} \right) \times 8 \text{ days} \right\} = 560 \text{ kg.}$$

(iv) Minimum consumption per day of raw material 'Dee':

Average Consumption per day = 50 Kg.

Hence, Maximum Consumption per day = 50 kg. + 20 kg. = 70 kg.



So Minimum consumption per day will be

$$\text{Average Consumption} = \frac{\text{Min.consumption} + \text{Max.consumption}}{2}$$

$$\text{Or, 50 kg.} = \frac{\text{Min.consumption} + 70\text{kg.}}{2}$$

$$\text{Or, Min. consumption} = 100 \text{ kg} - 70 \text{ kg.} = 30 \text{ kg}$$

(a) Re-order Quantity :

$$\text{EOQ} - 200 \text{ kg.} = 1,200 \text{ kg.} - 200 \text{ kg.} = 1,000 \text{ kg.}$$

(b) Maximum Stock level:

$$\begin{aligned} &= \text{Re-order level} + \text{Re-order Quantity} - (\text{Min. consumption per day} \times \text{Min. lead time}) \\ &= 560 \text{ kg.} + 1,000 \text{ kg.} - (30 \text{ kg.} \times 4 \text{ days}) \\ &= 1,560 \text{ kg.} - 120 \text{ kg.} = 1,440 \text{ kg.} \end{aligned}$$

(c) Minimum Stock level:

$$\begin{aligned} &= \text{Re-order level} - (\text{Average consumption per day} \times \text{Average lead time}) \\ &= 560 \text{ kg.} - (50 \text{ kg.} \times 6 \text{ days}) = 260 \text{ kg.} \end{aligned}$$

(d) Impact on the profitability of the company by not ordering the EOQ.

		When purchasing the ROQ	When purchasing the EOQ
I	Order quantity	1,000 kg.	1,200 kg.
II	No. of orders a year	$\frac{17,200\text{kg}}{1,000\text{kg}} = 17.2 \text{ or } 18 \text{ orders}$	$\frac{17,200\text{kg}}{1,200\text{kg}} = 14.33 \text{ or } 15 \text{ orders}$
III	Ordering Cost	18 orders $\times$ ₹ 720 = ₹12,960	15 orders $\times$ ₹ 720 = ₹10,800
IV	Average Inventory	$\frac{1,000\text{kg.}}{2} = 500\text{kg.}$	$\frac{1,200\text{kg.}}{2} = 600\text{kg.}$
V	Carrying Cost	500 kg. $\times$ ₹ 17.2 = ₹ 8,600	600 kg. $\times$ ₹ 17.2 = ₹ 10,320
VI	Total Cost	₹ 21,560	₹ 21,120

$$\text{Extra Cost incurred due to not ordering EOQ} = ₹ 21,560 - ₹ 21,120 = ₹ 440$$



RTP NOV 19

HBL Limited produces product 'M' which has a quarterly demand of 20,000 units. Each product requires 3 kg. and 4 kg. of material X and Y respectively. Material X is supplied by a local supplier and can be procured at factory stores at any time, hence, no need to keep inventory for material X. The material Y is not locally available, it requires to be purchased from other states in a specially designed truck container with a capacity of 10 tons.

The cost and other information related with the materials are as follows:

Particulars	Material -X	Material-Y
Purchase price per kg. (excluding GST)	₹140	₹640
Rate of GST	18%	18%
Freight per trip (fixed, irrespective of quantity)	-	₹28,000
Loss of materials in transit*	-	2%
Loss in process*	4%	5%



*On purchased quantity

Other information:

- The company has to pay 15% p.a. to bank for cash credit facility.
- Input credit is available on GST paid on materials.

Required:

- CALCULATE cost per kg. of material X and Y
- CALCULATE the Economic Order quantity for both the materials.

ANSWER :

Working Notes:

- Annual purchase quantity for material X and Y:

Annual demand for product M- 20,000 units × 4 = 80,000 units

Particulars	Mat-Y	Mat-X
Quantity required for per unit of product M	4 kg.	3 kg.
Net quantity for materials required	3,20,000 kg.	2,40,000 kg.
Add: Loss in transit	6,881 kg.	-
Add: Loss in process	17,204 kg.	10,000 kg.
Purchase quantity	3,44,085 kg.	2,50,000 kg.

Note - Input credit on GST paid is available; hence, it will not be included in cost of material.

- Calculation of cost per kg. of material X and Y:

Particulars	Mat-X	Mat-Y
Purchase quantity	2,50,000 kg.	3,44,085 kg.
Rate per kg.	₹140	₹640
Purchase price	₹3,50,00,000	₹22,02,14,400
Add: Freight	0	₹9,80,000*
Total cost	₹3,50,00,000	₹22,11,94,400
Net Quantity	2,40,000 kg.	3,20,000 kg.
Cost per kg.	₹145.83	₹691.23

*No. of trucks = $\frac{3,44,085 \text{ kg.}}{10 \text{ ton} \times 1,000} = 34.40$ trucks or 35 trucks

Therefore, total freight = 35 trucks × ₹28,000 = ₹9,80,000

- Calculation of Economic Order Quantity (EOQ) for Mat.-X and Y:

$$\text{EOQ} = \sqrt{\frac{2 \times \text{Annual Requirement} \times \text{Order cost}}{\text{Carrying cost per unit p.a.}}}$$

Particulars	Mat-X	Mat-Y
Annual Requirement	2,50,000 kg.	3,44,085 kg.
Ordering cost	0	₹28,000
Cost per unit	₹145.83	₹691.23
Carrying cost	15%	15%
Carrying cost per unit p.a.	0*	₹103.68
EOQ	0	13,632.62 kg.

**RTP MAY 20**

Arnav Electronics manufactures electronic home appliances. It follows weighted average Cost method for inventory valuation. Following are the data of component X:

Date	Particulars	Units	Rate per unit (₹)
15-12-19	Purchase Order- 008	10,000	9,930
30-12-19	Purchase Order- 009	10,000	9,780
01-01-20	Opening stock	3,500	9,810
05-01-20	GRN*-008 (against the Purchase Order- 008)	10,000	-
05-01-20	MRN**-003 (against the Purchase Order- 008)	500	-
06-01-20	Material Requisition-011	3,000	-
07-01-20	Purchase Order- 010	10,000	9,750
10-01-20	Material Requisition-012	4,500	-
12-01-20	GRN-009 (against the Purchase Order- 009)	10,000	-
12-01-20	MRN-004 (against the Purchase Order- 009)	400	-
15-01-20	Material Requisition-013	2,200	-
24-01-20	Material Requisition-014	1,500	-
25-01-20	GRN-010 (against the Purchase Order- 010)	10,000	-
28-01-20	Material Requisition-015	4,000	-
31-01-20	Material Requisition-016	3,200	-

*GRN- Goods Received Note; **MRN- Material Returned Note

Based on the above data, you are required to CALCULATE:

- Re-order level
- Maximum stock level
- Minimum stock level
- PREPARE Store Ledger for the period January 2020 and DETERMINE the value of stock as on 31-01-2020.
- Value of components used during the month of January, 2020.
- Inventory turnover ratio.

ANSWER :

Workings:

Consumption is calculated on the basis of material requisitions:

Maximum component usage = 4,500 units (Material requisition on 10-01-20)

Minimum component usage = 1,500 units (Material requisition on 24 -01-20)

Lead time is calculated from purchase order date to material received date

Maximum lead time = 21 days (15-12-2019 to 05-01-2020)

Minimum lead time = 14 days (30-12-2019 to 12-01-2020)

Calculations:

- Re-order level
 = Maximum usage × Maximum lead time
 = 4,500 units × 21 days = 94,500 units



(ii) Maximum stock level

$$= \text{Re-order level} + \text{Re-order Quantity} - (\text{Min. Usage} \times \text{Min. lead time})$$

$$= 94,500 \text{ units} + 10,000 \text{ units} - (1,500 \text{ units} \times 14 \text{ days})$$

$$= 1,04,500 \text{ units} - 21,000 \text{ units} = 83,500 \text{ units}$$

(iii) Minimum stock level

$$= \text{Re-order level} - (\text{Avg. consumption} \times \text{Avg. lead time})$$

$$= 94,500 \text{ units} - (3,000 \text{ units} \times 17.5 \text{ days})$$

$$= 94,500 \text{ units} - 52,500 \text{ units}$$

$$= 42,000 \text{ units}$$

(iv) Store Ledger for the month of January 2020:

Date	Receipts				Issue				Balance		
	GRN/ MRN	Units	Rate ₹	Amt. (₹ '000)	MRN/ MR	Units	Rate ₹	Amt. (₹ '000)	Units	Rate ₹	Amt. (₹ '000)
01-01-20	-	-	-	-	-	-	-	-	3,500	9,810	34,335
05-01-20	008	10,000	9,930	99,300	003	500	9,930	4,965	13,000	9,898	1,28,670
06-01-20	-	-	-	-	011	3,000	9,898	29,694	10,000	9,898	98,980
10-01-20	-	-	-	-	012	4,500	9,898	44,541	5,500	9,898	54,439
12-01-20	009	10,000	9,780	97,800	004	400	9,780	3,912	15,100	9,823	1,48,327
15-01-20	-	-	-	-	013	2,200	9,823	21,611	12,900	9,823	1,26,716
24-01-20	-	-	-	-	014	1,500	9,823	14,734	11,400	9,823	1,11,982
25-01-20	010	10,000	9,750	97,500	-	-	-	-	21,400	9,789	2,09,482
28-01-20	-	-	-	-	015	4,000	9,789	39,156	17,400	9,789	1,70,326
31-01-20	-	-	-	-	016	3,200	9,789	31,325	14,200	9,789	1,39,001

[Note: Decimal figures may be rounded-off to the nearest rupee value wherever required]

Value of stock as on 31-01-2020 ('000) = ₹1,39,001

(v) Value of components used during the month of January 2020:

Sum of material requisitions 011 to 016 ('000)

$$= ₹ 29,694 + ₹ 44,541 + ₹ 21,611 + ₹ 14,734 + ₹ 39,156 + ₹ 31,325 = ₹ 1,81,061$$

(vi) Inventory Turnover Ratio

$$= \frac{\text{Value of materials used}}{\text{Average stock value}}$$

$$= \frac{₹ 1,81,061}{₹ (1,39,001 + 34,335) / 2} = \frac{₹ 1,81,061}{₹ 86,668} = 2.09$$

**RTP NOV 20**

A company uses four raw materials A, B, C and D for a particular product for which the following data apply :-

Raw Material	Usage per unit of product (Kg.)	Re-order Quantity (Kg.)	Price per Kg. (₹)	Delivery period (in weeks)			Re-order level (Kg.)	Minimum level (Kg.)
				Minimum	Average	Maximum		
A	12	12,000	12	2	3	4	60,000	?
B	8	8,000	22	5	6	7	70,000	?
C	6	10,000	18	3	5	7	?	25,500
D	5	9,000	20	1	2	3	?	?

Weekly production varies from 550 to 1,250 units, averaging 900 units of the said product. What would be the following quantities:-

- Minimum Stock of A?
- Maximum Stock of B?
- Re-order level of C?
- Average stock level of A?
- Re-order level of D?
- Minimum Stock level of D?

ANSWER :

- (i) Minimum stock of A
 Re-order level – (Average consumption × Average time required to obtain delivery)
 = 60,000 kg. – (900 units × 12 kg. × 3 weeks) = 27,600 kg.

- (ii) Maximum stock of B
 Re-order level + Re-order quantity – (Min. Consumption × Min. Re-order period)
 = 70,000 kg. + 8,000 kg. – (550 units × 8 kg. × 5 weeks).
 = 78,000 – 22,000 = 56,000 kg.

- (iii) Re-order level of C
 Maximum re-order period × Maximum Usage
 = 7 weeks × (1,250 units × 6 kg.) = 52,500 kg.
 OR
 = Minimum stock of C + (Average consumption × Average delivery time)
 = 25,500 kg. + [(900 units × 6 kg.) × 5 weeks] = 52,500 kg.

- (iv) Average stock level of A
 = $\frac{\text{Minimum stock} + \text{Maximum stock}}{2}$ (Refer to Working Note)
 = $\frac{27,600 + 58,800}{2}$ = 43,200 kg.

Working note

Maximum stock of A = ROL + ROQ – (Minimum consumption × Minimum re-order period)
 = 60,000 kg. + 12,000 kg. – [(550 units × 12 kg.) × 2 weeks] = 58,800 kg.



- (v) Re-order level of D
 $\text{Maximum re-order period} \times \text{Maximum Usage}$
 $= 3 \text{ weeks} \times (1,250 \text{ units} \times 5 \text{ kg.}) = 18,750 \text{ kg}$
- (vi) Minimum stock of D
 $\text{Re-order level} - (\text{Average consumption} \times \text{Average time required to obtain delivery})$
 $= 18,750 \text{ kg.} - (900 \text{ units} \times 5 \text{ kg.} \times 2 \text{ weeks}) = 9,750 \text{ kg.}$

**RTP MAY 21**

A Ltd. produces a product 'X' using a raw material 'D'. To produce one unit of X, 4 kg of D is required. As per the sales forecast conducted by the company, it will be able to sale 20,000 units of X in the coming year.

The following are the information related to the raw material D:

- The Re-order quantity is 400 kg. less than the Economic Order Quantity (EOQ).
- Maximum consumption per day is 40 kg. more than the average consumption per day.
- There is an opening stock of 2,000 kg.
- Time required to get the raw materials from the suppliers is 4 to 8 days.
- The purchase price is ₹ 250 per kg.

There is an opening stock of 1,800 units of the finished product X. The carrying cost of inventory is 14% p.a.

To place an order company has to incur ₹ 1,340 on paper and documentation work. From the above information FIND OUT the followings in relation to raw material D:

- Re-order Quantity
- Maximum Stock Level
- Minimum Stock level
- Calculate the impact on the profitability of the company by not ordering the EOQ. [Take 300 days for a year]

ANSWER :

Working Notes:

- (i) Computation of Annual consumption & Annual Demand for raw material 'D':

Sales forecast of the product 'X'	20,000 units
Less: Opening stock of 'X'	1,800 units
Fresh units of 'X' to be produced	18,200 units
Raw material required to produce 18,200 units of 'X' (18,200 units × 4 kg.)	72,800 kg.
Less: Opening Stock of 'D'	2,000 kg.
Annual demand for raw material 'D'	70,800 kg.

- (ii) Computation of Economic Order Quantity (EOQ):

$$\text{EOQ} = \sqrt{\frac{2 \times \text{Annual demand of 'D'} \times \text{Ordering cost}}{\text{Carrying cost per unit per annum}}}$$

$$= \sqrt{\frac{270,800 \text{ kg.} \times ₹ 1,340}{₹ 250 \times 14\%}} = \sqrt{\frac{270,800 \text{ kg.} \times ₹ 1,340}{₹ 35}} = 2,328 \text{ kg.}$$



(iii) Re- Order level:

= (Maximum consumption per day × Maximum lead time)

$$= \left\{ \left(\frac{\text{Annual Consumption of 'D' } \times 40\text{kg.}}{300 \text{ days}} \right) \times 8 \text{ days} \right\}$$

$$= \left\{ \left(\frac{70,800\text{kg}}{300 \text{ days}} \times 40\text{kg.} \right) \times 8 \text{ days} \right\} = 2,208 \text{ kg.}$$

(iv) Minimum consumption per day of raw material 'D':

Average Consumption per day = 236 Kg.

Hence, Maximum Consumption per day = 236 kg. + 40 kg. = 276 kg.

So Minimum consumption per day will be

Average Consumption = $\frac{\text{Min.consumption} + \text{Max.consumption}}{2}$

Or, 236 kg. = $\frac{\text{Min.consumption} + 276 \text{ kg.}}{2}$

Or, Min. consumption = 472 kg – 276 kg. = 196 kg.

(a) Re-order Quantity :

EOQ – 400 kg. = 2,328 kg. – 400 kg. = 1,928 kg.

(b) Maximum Stock level:

= Re-order level + Re-order Quantity – (Min. consumption per day × Min. lead time)

= 2,208 kg. + 1,928 kg. – (196 kg. × 4 days) = 4,136 kg. – 784 kg. = 3,352 kg.

(c) Minimum Stock level:

= Re-order level – (Average consumption per day × Average lead time)

= 2,208 kg. – (236 kg. × 6 days) = 792 kg.

(d) Impact on the profitability of the company by not ordering the EOQ.

		When purchasing the ROQ	When purchasing the EOQ
I	Order quantity	1,928 kg.	2,328 kg.
II	No. of orders a year	$\frac{70,800\text{kg.}}{1,928\text{kg.}} = 36.72$ or 37 orders	$\frac{70,800\text{kg.}}{2,328\text{kg.}} = 30.41$ or 31 orders
III	Ordering Cost	37 orders × ₹ 1,340 = ₹ 49,580	31 orders × ₹ 1,340 = ₹ 41,540
IV	Average Inventory	$\frac{1,928\text{kg.}}{2} = 964\text{kg.}$	$\frac{2,328\text{kg.}}{2} = 1,164\text{kg.}$
VI	Total Cost	₹ 83,320	₹ 82,280

Extra Cost incurred due to not ordering EOQ = ₹83,320 – ₹82,280 = ₹1,040

**RTP NOV 21**

The following data are available in respect of material X for the year ended 31st March, 2021:

	(₹)
Opening stock	9,00,000
Purchases during the year	1,70,00,000
Closing stock	11,00,000

(i) CALCULATE:

(a) Inventory turnover ratio, and

(b) The number of days for which the average inventory is held.

(ii) INTERPRET the ratio calculated as above if the industry inventory turnover rate is 10.

ANSWER :

(i) (a) Inventory turnover ratio (Refer to working note)

$$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}}$$

$$= \frac{\text{₹ } 1,68,00,000}{\text{₹ } 10,00,000} = 16.8$$

(b) Average number of days for which the average inventory is held

$$= \frac{365}{\text{Inventory turnover ratio}} = \frac{365 \text{ days}}{16.8} = 21.73 \text{ days}$$

Working Note:

Particulars	(₹)
Opening stock of raw material	9,00,000
Add: Material purchases during the year	1,70,00,000
Less: Closing stock of raw material	11,00,000
	1,68,00,000

(ii) The Inventory turnover ratio for material X is 16.8 which mean an inventory item takes only 21.73 or 22 days to issue from stores for production process. The rate is better than the industry rate which is 10 time or 36.5 days. This inventory turnover ratio indicates better inventory management system and good demand for the final product in market.

**RTP MAY 22**

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

Listed price of one lot	₹ 2,50,000
Trade discount	@ 10% on listed price
CGST and SGST (Credit Not available)	12% (6% CGST + 6% SGST)
Cash discount	@ 10%
(Will be given only if payment is made within 30 days.)	
Toll Tax paid	₹ 5,000
Freight and Insurance	₹ 17,000
Demurrage paid to transporter	₹ 5,000



Commission and brokerage on purchases	₹ 10,000
Amount deposited for returnable containers	₹ 30,000
Amount of refund on returning the container	₹ 20,000
Other Expenses	@ 2% of total cost
20% of material shortage is due to normal reasons.	
The payment to the supplier was made within 21 days of the purchases.	
You are required to CALCULATE cost per unit of material purchased by Sky & Co.	

ANSWER :

Calculation of cost per unit:

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

Note:

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

**RTP NOV 22**

M/s Tanishka Materials Private Limited produces a product which names "ESS". The consumption of raw material for the production of "ESS" is 210 Kgs to 350 Kgs per week. Other information is as follows:

Procurement Time:	5 to 9 Days
Purchase price of Raw Materials:	₹ 100 per kg
Ordering Cost per Order:	₹ 200
Storage Cost: 1% per month plus	₹ 2 per unit per annum



Consider 365 days a year.

You are required to CALCULATE:

- Economic Order Quantity
- Re-Order Level (ROL)
- Maximum Stock Level
- Minimum Stock Level
- Average Stock Level
- Number of Orders to be placed per year
- Total Inventory Cost
- If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders, whether offer is acceptable?
- If the answer is no, what should be the counteroffer w.r.t. percentage of discount?

ANSWER :

As procurement time is given in days, consumption should also be calculated in days:

$$\text{Maximum Consumption per Day: } \frac{350}{7} = 50 \text{ Kgs}$$

$$\text{Minimum Consumption per Day: } \frac{210}{7} = 30 \text{ Kgs}$$

$$\text{Average Consumption per Day: } \frac{(50+30)}{2} = 40 \text{ Kgs}$$

- (a) Calculation of Economic Order Quantity (EOQ)

Annual consumption of Raw Materials (A): $40 \text{ Kgs} \times 365 \text{ days} = 14,600 \text{ Kgs}$

Storage or Carrying Cost per unit per annum (C): $(₹ 100 \times 1\% \times 12 \text{ months}) + ₹ 2$
 $= ₹ 14$

Ordering Cost (O): ₹ 200 per Order

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2 \times A \times O}{C}} \\ &= \sqrt{\frac{2 \times 14,600 \times 200}{14}} = 646 \text{ Kgs.} \end{aligned}$$

- (b) Re-Order Level (ROL) = (Maximum consumption Rate $\times$ Maximum Procurement Time)

$$= 50 \text{ kgs per day} \times 9 \text{ days}$$

$$= 450 \text{ kgs}$$

- (c) Maximum Stock Level = Recorder Level + Recorder Quantity – (Minimum Consumption Rate $\times$ Minimum Procurement Time)

$$= 450 \text{ kgs} + 646 \text{ kgs} - (30 \text{ kgs} \times 5 \text{ days})$$

$$= 946 \text{ kgs}$$

- (d) Minimum Stock Level = Recorder Level – (Average consumption Rate $\times$ Average Procurement Time)

$$= 450 \text{ kgs} - (40 \text{ kgs} \times 7 \text{ days})$$

$$= 170 \text{ kgs}$$



(e)	Average Stock Level	=	$\frac{\text{Maximum Stock Level} + \text{Minimum Stock Level}}{2}$	
		=	$\frac{946 \text{ kgs} + 170 \text{ kgs}}{2}$	
		=	558 kgs	
(f)	Number of Orders to be placed per year	=	$\frac{\text{Annual Consumption of Raw Materials}}{\text{EOQ}}$	
		=	$\frac{14600 \text{ kgs}}{646 \text{ kgs}}$	
		=	22.60 Orders or 23 Orders	
(g)	Total Inventory Cost			
	Cost of Materials (A x Purchase Price) (14600 kgs x ₹ 100)	=		₹ 14,60,000
	Total Ordering Cost (No. of Orders x O) (23 Orders x 200)	=		₹ 4,600
	Total Carrying Cost (EOQ / 2 x C) (646 kgs / 2 x ₹ 14)	=		₹ 4,522
	Total Inventory Cost			₹ 14,69,122
(h)	If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders:			
	Offer Price	= ₹ 100 x 99%	=	₹ 99
	Revised Carrying Cost = (₹ 99 x 1% x 12 months) + ₹ 2	=		₹ 13.88
	Revised Order Quantity = 14600 kgs / 2 Orders	=		7300 kgs
	Total Inventory Cost at Offer Price			
	Cost of Materials (A x Purchase Price) (14600 kgs x ₹ 99)	=		₹ 14,45,400
	Total Ordering Cost (No. of Orders x O) (2 Orders x 200)	=		₹ 400
	Total Carrying Cost (EOQ / 2 x C) (7300 kgs / 2 x ₹ 13.88)	=		₹ 50,662
	Total Inventory Cost			₹ 14,96,462
	Advice: As total inventory cost at offer price is ₹ 27,340 (14,96,462 - 14,69,122) higher, offer should not be accepted.			
(i)	Counter-offer:			
	Let Discount Rate	= z%		
	Counter-Offer Price	= ₹ 100 - z% = ₹ 100 - z		
	Revised Carrying Cost = [(₹ 100 - z) x 1% x 12 months] + ₹ 2 = ₹ 12 - 0.12z + ₹ 2			
	= ₹ 14 - 0.12z			
	Total Inventory Cost at Counter-Offer Price			
	Cost of Materials (A x Purchase Price) [14600 kgs x (₹ 100 - z)]	=	₹ 14,60,000 - 14,600z	
	Total Ordering Cost (No. of Orders x O) (2 Orders x 200)	=	₹ 400	
	Total Carrying Cost (EOQ / 2 x C) [7300 kgs / 2 x (₹ 14 - 0.12z)]	=	₹ 51,100 - 438z	
	Total Inventory Cost		₹ 15,11,500 - 15038z	
	₹ 14,69,122	=	₹ 15,11,500 - 15038z	
	Or 15038z	=	42,378	
	Or z	=	2.82	
	Therefore, discount should be at least 2.82% in offer price.			

**RTP MAY 23**

Reliable India Pvt Ltd is a startup company engaged in manufacturing of Agro Tech product from a raw material, which is purchased at ₹190 per kg. The company incurs a handling cost of ₹1,470 plus, freight of ₹770 per order. The incremental carrying cost of inventory of raw material is ₹3 per kg per month. In addition, the cost of working capital finance on the investment in inventory of raw material is ₹20 per kg per annum. The annual production of the product is 1,50,000 units and 3 units are obtained from one kg. of raw material. Assume 360 days in a year.

Required:

- Calculate the economic order quantity of raw materials.
- Determine, how frequently company should order for procurement be placed.
- If the company proposes to rationalize placement of orders on quarterly basis, determine the percentage of discount in the price of raw materials should be negotiated?

ANSWER :

- Calculation of Economic Order Quantity (E.O.Q)

Annual requirement (usage) of raw material in kg. (A) = $\frac{1,50,000 \text{ units}}{3 \text{ units per kg.}} = 50,000 \text{ kg.}$

Ordering Cost (Handling & freight cost) (O) = ₹1,470 + ₹770 = ₹2,240

Carrying cost per unit per annum (C) i.e. inventory carrying cost + working capital cost = (₹3 × 12 months) + ₹20 = ₹56 per kg.

$$\text{E.O.Q} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 50,000 \text{ kg.} \times ₹2,240}{₹56}} = 2,000 \text{ kg.}$$

- Frequency of placing orders for procurement :

Annual consumption (A) = 50,000 kg.

Quantity per order (E.O.Q) = 2,000 kg.

$$\text{No. of orders per annum} = \frac{A}{\text{E.O.Q}} = \frac{50,000 \text{ kg}}{2,000 \text{ kg.}} = 25 \text{ orders}$$

$$\text{Frequency of placing orders (in days)} = \frac{360 \text{ days}}{25 \text{ orders}} = 14.4 \text{ Days}$$

- Percentage of discount in the price of raw materials to be negotiated:

Particulars	On Quarterly Basis	On E.O.Q Basis
1. Annual Usage (in Kg.)	50,000 kg.	50,000 kg.
2. Size of the order	12,500 kg.	2,000 kg.
3. No. of orders (1 ÷ 2)	4	25
4. Cost of placing orders or Ordering cost	₹ 8,960	₹ 56,000
(No. of orders × Cost per order)	(4 order × ₹ 2,240)	(25 orders × ₹ 2,240)
5. Inventory carrying cost	₹3,50,000	₹56,000



(Average inventory × Carrying cost per unit)	(12,500 kg. × ½ × ₹ 56)	(2,000 kg. × ½ × ₹ 56)
6. Total Cost (4 + 5)	₹ 3,58,960	₹ 1,12,000

When order is placed on quarterly basis the ordering cost and carrying cost increased by ₹2,46,960 (₹3,58,960 - ₹1,12,000). So, discount required = ₹ 2,46,960

Total annual purchase = 50,000 kg. × ₹190 = ₹95,00,000 So, Percentage of discount to be negotiated = $\frac{2,46,960}{₹ 95,00,000} \times 100 = 2.60\%$

**RTP NOV 23**

Following details are related to a manufacturing concern:

Re-order Level	1,60,000 units
Economic Order Quantity	90,000
Minimum Stock Level	1,00,000 units
Maximum Stock Level	1,90,000 units
Average Lead Time	6 days
Difference between minimum lead time and Maximum lead time	4 days

Calculate:

- Maximum consumption per day
- Minimum consumption per day

ANSWER :

Difference between Minimum lead time Maximum lead time = 4 days

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

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

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

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

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

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

$$\text{Or, Min. lead time} + 4 \text{ days} + \text{Min. lead time} = 12 \text{ days}$$

$$\text{Or, } 2 \text{ Min. lead time} = 8 \text{ days}$$

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

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

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

- Maximum consumption per day:

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

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

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



- (ii) Minimum Consumption per day:
Maximum Stock Level =
Re-order level + Re-order Quantity – (Min. lead time × Min. Consumption per day)
Or, 1,90,000 units = 1,60,000 units + 90,000 units – (4 days × Min. Consumption per day)
Or, 4 days × Min. Consumption per day = 2,50,000 units – 1,90,000 units

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

**RTP MAY 24**

The purchase committee of A Ltd. has been entrusted to review the material procurement policy of the company. The chief marketing manager has appraised the committee that the company at present produces a single product X by using two raw materials A and B in the ratio of 3:2. Material A is perishable in nature and has to be used within 10 days from Goods received note (GRN) date otherwise material becomes obsolete. Material B is durable in nature and can be used even after one year. Material A is purchased from the local market within 1 to 2 days of placing order. Material B, on the other hand, is purchased from neighbouring state and it takes 2 to 4 days to receive the material in the store.

The purchase price of per kilogram of raw material A and B is ₹30 and ₹44 respectively exclusive of taxes. To place an order, the company has to incur an administrative cost of ₹1,200. Carrying cost for Material A and B is 15% and 5% respectively. At present material A is purchased in a lot of 15,000 kg. to avail 10% discount on market price. GST applicable for both the materials is 18% and the input tax credit is availed.

The sales department has provided an estimate that the company could sell 30,000 kg. in January 2024 and also projected the same trend for the entire year.

The ratio of input and output is 5:3. Company works for 25 days in a month and production is carried out evenly.

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

- (i) For the month of January 2024, what would be the quantity of the materials to be requisitioned for both material A and B:
- (a) 9,000 kg & 6,000 kg respectively
 - (b) 18,000 kg & 12,000 kg respectively
 - (c) 27,000 kg & 18,000 kg respectively
 - (d) 30,000 kg & 20,000 kg respectively.
- (ii) The economic order quantity (EOQ) for both the material A & B:
- (a) 13,856 kg & 16,181 kg respectively
 - (b) 16,197 kg & 17,327 kg respectively
 - (c) 16,181 kg & 17,165 kg respectively
 - (d) 13,197 kg & 17,165 kg respectively



- (iii) What would the maximum stock level for material A: (a) 18,200 kg.
(b) 12,000 kg.
(c) 16,000 kg.
(d) 16,200 kg.
- (iv) Calculate saving/ loss in purchase of Material A if the purchase order quantity is equal to EOQ.
(a) Profit of Rs. 3,21,201.
(b) Loss of Rs. 3,21,201.
(c) Profit of Rs. 2,52,500.
(d) Loss of Rs. 2,52,500.
- (v) What would the minimum stock level for material A:
(a) 1,800 kg.
(b) 1,200 kg.
(c) 600 kg.
(d) 2,400 kg.

ANSWER :

- (i) (d) Monthly Production of X = 30,000 kgs.
Raw Material Required = $\frac{30,000}{3} \times 5 = 50,000$ kgs.
Material A = $\frac{50,000}{5} \times 3 = 30,000$ kg.
Material B = $\frac{50,000}{5} \times 2 = 20,000$ kg.
- (ii) (a) Calculation of Economic Order Quantity (EOQ):
Material A = $\sqrt{\frac{2 \times \text{Annual consumption} \times \text{Ordercost}}{\text{Carrying cost per unit p.a.}}}$
 $= \sqrt{\frac{2 \times (30,000 \times 12) \times 1,200}{15\% \text{ of } 30}} = 13,856$ kg.
Material B = $\sqrt{\frac{2 \times (20,000 \times 12) \times 1,200}{5\% \text{ of } 44}} = 16,181$ kg.
- (iii) (b) Calculation of Maximum Stock level: Since, the Material A is perishable in nature and it required to be used within 10 days, hence, the Maximum Stock Level shall be lower of two:
(a) Stock equal to 10 days consumption
= $\frac{30000}{25} \times 10 \text{ days} = 12,000$ kg.
(b) Maximum Stock Level for Material A:
Re-order Quantity + Re-order level – (Min consumption* × Min. lead time)
Where, Re-order Quantity = 15,000 kg.



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

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

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

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

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

	Purchase Quantity = 15,000 kg.	Purchase Quantity = EOQ i.e. 13,856 kg.
Annual consumption	3,60,000 kg. (30,000 × 12 months)	3,60,000 kg. (30,000 × 12 months)
No. of orders [Note- (i)]	30 (3,60,000 ÷ 12,000)	30 (3,60,000 ÷ 12,000)
Ordering Cost (a)	₹36,000 (₹1200 × 30)	₹36,000 (₹1200 × 30)
Carrying Cost (b) [Note- (ii)]	₹30,375 (15% of ₹27 × 7,500)	₹31,176 (15% of ₹30 × 6,928)
Purchase Cost (c) (for good portion)	₹97,20,000 (₹27 × 3,60,000)	₹1,08,00,000 (₹30 × 3,60,000)
Loss due to obsolescence (d) [Note- (iii)]	₹24,30,000 (₹27 × (30 × 3,000))	₹16,70,400 (₹30 × (30 × 1,856))
Total Cost [(a) + (b) + (c) + (d)]	₹ 1,22,16,375	₹ 1,25,37,576

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

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

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

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

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

= Re-order level – (Average Consumption Rate × Average Re- order Period)

= $2400 - (1200 \times 1.5) = 600 \text{ kgs}$

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

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

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

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

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



03

EMPLOYEE COST AND
DIRECT EXPENSES**QUESTION 1. (ILLUSTRATION 1)**

'X' an employee of ABC Co. gets the following emoluments and benefits:

(a)	Basic pay	₹ 10,000 p.m.
(b)	Dearness allowance	₹ 2,000 p.m.
(c)	Bonus	20% of salary and D.A.
(d)	Other allowances	₹ 2,500 p.m.
(e)	Employer's contribution to P.F.	10% of salary and D.A.

'X' works for 2,400 hours per annum, out of which 400 hours are non-productive and treated as normal idle time. You are required to COMPUTE the effective hourly cost of employee 'X'.

ANSWER :

Statement showing computation of effective hourly cost of employee 'X'

	Per month (₹)	Per annum (₹)
(A) Earning of Employee 'X':		
Basic pay	10,000	1,20,000
Dearness Allowance	2,000	24,000
Bonus	2,400	28,800
Employer's contribution to provident fund	1,200	14,400
Other allowances	2,500	30,000
	18,100	2,17,200
(B) Effective working hours (refer workings)		2,000 hours
(C) Effective hourly cost {(A) ÷ (B)}		₹108.60

Workings:

Calculation of effective working hours:

Annual working hours less Normal idle time = 2,400 hours – 400 hours = 2,000 hours.

**QUESTION 2. (ILLUSTRATION 2)**

In a factory working six days in a week and eight hours each day, a worker is paid at the rate of ₹ 100 per day basic plus D.A. @ 120% of basic. He is allowed to take 30 minutes off during his hours shift for meals-break and a 10 minutes recess for rest. During a week, his card showed that his time was chargeable to :

Job X	15 hrs.
Job Y	12 hrs.
Job Z	13 hrs.

The time not booked was wasted while waiting for a job. In Cost Accounting, STATE how would you allocate the wages of the workers for the week?

**ANSWER :**

Working notes:

- (i) Total effective hours in a week:
 $[(8 \text{ hrs.} - (30 \text{ mts.} + 10 \text{ mts.})) \times 6 \text{ days}] = 44 \text{ hours}$
- (ii) Total wages for a week:
 $(₹ 100 + 120\% \text{ of } ₹ 100) \times 6 \text{ days} = ₹ 1,320$
- (iii) Wage rate per hour = $1320 \div 44 \text{ hours} = ₹ 30$
- (iv) Time wasted waiting for job (Abnormal idle time):
 $= 44 \text{ hrs.} - (15 \text{ hrs.} + 12 \text{ hrs.} + 13 \text{ hrs.}) = 4 \text{ hrs.}$

Allocation of wages in Cost Accounting

		(₹)
Allocated to Job X	: 15 hours $\times$ ₹ 30	450
Allocated to Job Y	: 12 hours $\times$ ₹ 30	360
Allocated to Job Z	: 13 hours $\times$ ₹ 30	390
Charged to Costing Profit & Loss A/c	: 4 hours $\times$ ₹ 30	120
Total		1,320

**QUESTION 3. (ILLUSTRATION 3)**

CALCULATE the earnings of A and B from the following particulars for a month and allocate the employee cost to each job X, Y and Z:

	A	B
(i) Basic Wages (₹)	10,000	16,000
(ii) Dearness Allowance	50%	50%
(iii) Contribution to provident Fund (on basic wages)	8%	8%
(iv) Contribution to Employee's State Insurance (on basic wages)	2%	2%
(v) Overtime (Hours)	10	--

The normal working hours for the month are 200. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contribution to state Insurance and Provident Fund are at equal rates with employees' contributions. The two workers were employed on jobs X, Y and Z in the following proportions:

Jobs	X	Y	Z
Worker A	40%	30%	30%
Worker B	50%	20%	30%

Overtime was done on job Y.

ANSWER :

Statement showing Earnings of Workers A and B

	A (₹)	B (₹)
Basic wages	10,000	16,000
Dearness Allowance (50% of Basic Wages)	5,000	8,000
Overtime wages (Refer to Working Note 1)	1,500	--
Gross wages earned	16,500	24,000
Less: Contribution to Provident fund	(800)	(1,280)
Less: Contribution to ESI	(200)	(320)
Net wages earned	15,500	22,400



Statement of Employee Cost:

	A (₹)	B (₹)
Gross Wages (excluding overtime)	15,000	24,000
Add: Employer's contribution to PF	800	1,280
Add: Employer's contribution to ESI	200	320
Gross wages earned	16,000	25,600
Normal working hours	200	200
Ordinary wages rate per hour	80	128

Statement Showing Allocation of Wages to Jobs

	Total Wages (₹)	Jobs		
		X (₹)	Y (₹)	Z (₹)
Worker A:				
- Ordinary Wages (4: 3 : 3)	16,000	6,400	4,800	4,800
- Overtime	1,500	--	1,500	--
Worker B:				
- Ordinary Wages (5 : 2 : 3)	25,600	12,800	5,120	7,680
	43,100	19,200	11,420	12,480

Working Notes

1. Normal Wages are considered as basic wages

Over time = $\frac{2 \times (\text{Basic wage} + \text{DA}) \times 10 \text{ hours}}{200}$

$$= 2 \times \left(\frac{₹15,000}{200} \right) \times 10 \text{ hours} = ₹150 \times 10 \text{ hours} = ₹1,500$$



QUESTION 4. (ILLUSTRATION 4)

It is seen from the job card for repair of the customer's equipment that a total of 154 labour hours have been put in as detailed below:

	Worker 'A' paid at ₹ 200 per day of 8 hours	Worker 'B' paid at ₹ 100 per day of 8 hours	Worker 'C' paid at ₹ 300 per day of 8 hours
Monday (hours)	10.5	8.0	10.5
Tuesday (hours)	8.0	8.0	8.0
Wednesday (hours)	10.5	8.0	10.5
Thursday (hours)	9.5	8.0	9.5
Friday (hours)	10.5	8.0	10.5
Saturday (hours)	--	8.0	8.0
Total (hours)	49.0	48.0	57.0

In terms of an award in employee conciliation, the workers are to be paid dearness allowance on the basis of cost of living index figures relating to each month which works out @ ₹ 968 for the relevant month. The dearness allowance is payable to all workers irrespective of wages rate if they are present or are on leave with wages on all working days.

Each worker has to work for 8 hours on weekdays. Saturday and Sunday will be weekly holiday, however workers may work on Saturdays due to exigency of work for 4 hours, though full payment of 8 hours will be made with no other payments.



Overtime is paid twice of ordinary wage rate if a worker works for more than nine hours in a day. Excluding holidays, the total number of hours works out to 176 in the relevant month. The company's contribution to Provident Fund and Employees State Insurance Premium are absorbed into overheads.

CALCULATE the wages payable to each worker.

ANSWER :

(1) Calculation of hours to be paid for worker A:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	1	1½	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	--	--	--	--	--
Total	40	4	5	10	54

Calculation of hours to be paid for worker B:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	---	---	---	8
Tuesday	8	---	---	---	8
Wednesday	8	---	---	---	8
Thursday	8	---	---	---	8
Friday	8	---	---	---	8
Saturday	4	4*	---	---	8
Total	44	4	---	---	48

(*Worker-B has not worked more than 9 hours in any day)

Calculation of hours to be paid for worker C:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	1	1½	3	12
Tuesday	8	---	---	---	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	8*	---	---	---	8
Total	48	4	5	10	62

(*Worker-C will be paid for equivalent 8 hours, though 4 hours of working is required on Saturday. Further, no overtime will be paid for working beyond 4 hours since it is paid for working beyond 9 hours.)



Wages payable:

	A	B	C
Basic Wages per hour (₹)	25.00	12.50	37.50
Dearness allowance per hour (₹)	5.50	5.50	5.50
Hourly rate (₹)	30.50	18.00	43.00
Total normal hours	54.00	48.00	62.00
Total Wages payable (₹)	1,647.00	864.00	2,666.00

**QUESTION 5. (ILLUSTRATION 5)**

In a factory, the basic wage rate is ₹100 per hour and overtime rates are as follows:

Before and after normal working hours	175% of basic wage rate
Sundays and holidays	225% of basic wage rate
During the previous year, the following hours were worked	
- Normal time	1,00,000 hours
- Overtime before and after working hours	20,000 hours
Overtime on Sundays and holidays	5,000 hours
Total	1,25,000 hours

The following hours have been worked on job 'Z'

Normal	1,000 hours
Overtime before and after working hrs.	100 hours.
Sundays and holidays	25 hours.
Total	1,125 hours

You are required to CALCULATE the labour cost chargeable to job 'Z' and overhead in each of the following instances:

- Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.
- Where overtime is worked irregularly to meet the requirements of production.
- Where overtime is worked at the request of the customer to expedite the job.

ANSWER :

Workings

Basic wage rate	:	₹ 100 per hour
Overtime wage rate before and after working hours	:	₹ 100 × 175%
		= ₹ 175 per hour
Overtime wage rate for Sundays and holidays	:	₹ 100 × 225%
		= ₹ 225 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	(₹)
Annual wages for the previous year for normal time (1,00,000 hrs. × ₹100)	1,00,00,000
Wages for overtime before and after working hours (20,000 hrs. × ₹175)	35,00,000
Wages for overtime on Sundays and holidays (5,000 hrs. × ₹225)	11,25,000
Total wages for 1,25,000 hrs.	1,46,25,000

$$\text{Average inflated wage rate} = \frac{\text{₹1, 46,25,000}}{1,25,000 \text{ hours}} = ₹117$$



- (a) Where overtime is worked regularly as a policy due to workers' shortage:
The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate. Hence, employee cost chargeable to job Z

$$= \text{Total hours} \times \text{Inflated wage rate} = 1,125 \text{ hrs.} \times ₹ 117 = ₹ 1,31,625$$
- (b) Where overtime is worked irregularly to meet the requirements of production:
Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:
 Employee cost chargeable to Job Z: 1,125 hours @ ₹100 per hour = ₹ 1,12,500
 Factory overhead: {100 hrs. $\times$ ₹ (175 – 100)} + {25 hrs. $\times$ ₹ (225 – 100)} =
 $\{₹7,500 + ₹3,125\} = ₹10,625$
- (c) Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under:
- | | | | (₹) |
|---------------------|--------------------------|---|----------|
| Job Z Employee cost | 1,125 hrs. @ ₹ 100 | = | 1,12,500 |
| Overtime premium | 100 hrs. @ ₹ (175 – 100) | = | 7,500 |
| | 25 hrs. @ ₹ (225 – 100) | = | 3,125 |
| | Total | | 1,23,125 |

**QUESTION 6. (ILLUSTRATION 6)**

CALCULATE the earnings of a worker under Halsey System. The relevant data is as below:

Time Rate (per hour)	₹ 60
Time allowed	8 hours
Time taken	6 hours
Time saved	2 hours

ANSWER :

Calculation of total earnings:

$$= \text{Time taken} \times \text{Time rate} + 50\% (\text{Time Allowed} - \text{Time Taken}) \times \text{Time rate}$$

$$= 6 \text{ hrs.} \times ₹60 + 1/2 \times (2 \text{ hrs.} \times ₹60) \text{ or } ₹360 + ₹60 = ₹420$$

Of his total earnings, ₹360 is on account of the time worked and ₹60 is on account of his share of the premium bonus.

**QUESTION 7. (ILLUSTRATION 7)**

CALCULATE the earnings of a worker under Rowan System. The relevant data is given as below:

Time rate (per Hour)	₹ 60
Time allowed	8 hours.
Time taken	6 hours.
Time saved	2 hours.

ANSWER :

Calculation of total earnings:

$$= \text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

$$= 6 \text{ hours} \times ₹60 + \frac{2 \text{ hours}}{8 \text{ hours}} \times 6 \text{ hours} \times ₹ 60 = ₹ 360 + ₹ 90 = ₹ 450$$

**QUESTION 8. (ILLUSTRATION 8)**

Two workmen, 'A' and 'B', produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to the Rowan system, while 'B' is paid bonus according to the Halsey system. The time allowed to make the product is 50 hours. 'A' takes 30 hours while 'B' takes 40 hours to complete the product. The factory overhead rate is ₹ 5 per man-hour actually worked. The factory cost for the product for 'A' is ₹ 3,490 and for 'B' it is ₹ 3,600.

Required:

- COMPUTE the normal rate of wages;
- COMPUTE the cost of materials cost;
- PREPARE a statement comparing the factory cost of the products as made by the two workmen.

ANSWER :

Step 1 : Let X be the cost of material and Y be the normal rate of wages per hour.

Step 2 : Factory Cost of Workman 'A'

Particulars	(₹)
A. Material Cost	X
B. Wages (Rowan Plan)	30 Y
C. Bonus = $\frac{30}{50} \times (50 - 30) \times Y$	12 Y
D. Overheads (30 × ₹5)	150
E. Factory Cost	3,490
Or, $X + 42 Y = ₹3,490$ (Given) – ₹150 = ₹3,340.....equation (i)	

Step 3 : Factory Cost of Workman 'B'

Particulars	(₹)
A. Material Cost	X
B. Wages (Halsey Plan)	40 Y
C. Bonus = 50% of (SH - AH) × R = 50% of (50 - 40) R	5 Y
D. Overheads (40 ₹5)	200
E. Factory Cost	3,600
Or, $X + 45 Y = ₹3,600$ (Given) – ₹200 = ₹3,400.....equation (ii)	

Step 4 : Subtracting equation (i) from equation (ii)

$$3Y = ₹60$$

$$Y = ₹60/3 = ₹20 \text{ per hour.}$$

- The normal rate of wages: ₹20 per hour
- The cost of material: $X + 45 ₹20 = ₹3,400$ or, $X = ₹3,400 - ₹900 = ₹2,500$
- Comparative Statement of the Factory Cost of the product made by the two workmen.

	'A' (₹)	'B' (₹)
Material cost	2,500	2,500
Direct Wages	600	800
	(30 × ₹20)	(40 × ₹20)



Bonus	240	100
	(12 × ₹20)	(5 × ₹20)
Factory Overhead	150	200
Factory Cost	3,490	3,600

**QUESTION 9. (ILLUSTRATION 9)**

- (a) Bonus paid under the Halsey Plan with bonus at 50% for the time saved equals the bonus paid under the Rowan System. When will this statement hold good? (Your answer should contain the proof).
- (b) The time allowed for a job is 8 hours. The hourly rate is ₹ 8. PREPARE a statement showing:
- The bonus earned
 - The total earnings of employee and
 - Hourly earnings.
- Under the Halsey System with 50% bonus for time saved and Rowan System for each hour saved progressively.

ANSWER :

$$(a) \text{ Bonus under Halsey Plan} = \frac{50}{100} \times (SH - AH) \times R \quad (i)$$

$$\text{Bonus under Rowan Plan} = \frac{AH}{SH} \times (SH - AH) \times R \quad (ii)$$

Bonus under Halsey Plan will be equal to the bonus under Rowan Plan when the following condition holds good:

$$\frac{50}{100} \times (SH - AH) \times R = \frac{AH}{SH} \times (SH - AH) \times R$$

$$\frac{50}{100} = \frac{AH}{SH}$$

Hence, when the actual time taken (AH) is 50% of the time allowed (SH), the bonus under Halsey and Rowan Plans is equal.

- (b) Statement of Bonus, total earnings of Employee and hourly earnings under Halsey and Rowan Systems.

SH	AH	Time saved	Basic wages (AH × ₹8) (B × ₹8) $\left[\frac{50}{100} \times C \times 8 \right]$	Bonus under Halsey System $\left[\frac{B}{A} \times C \times 8 \right]$	Bonus under Rowan system D+E	Total Earnings under Halsey System D+E	Total Earnings under Rowan System D+F	Hourly Earnings under Halsey System G/B	Hourly Earnings under Rowan System H/B
A Hours	B Hours	C = (A-B) Hours	D (₹)	E (₹)	F (₹)	G (₹)	H (₹)	I (₹)	J (₹)
8	8	-	64	-	-	64	64	8.00	8.00
8	7	1	56	4	7	60	63	8.57	9.00
8	6	2	48	8	12	56	60	9.33	10.00
8	5	3	40	12	15	52	55	10.40	11.00
8	4	4	32	16	16	48	48	12.00	12.00
8	3	5	24	20	15	44	39	14.67	13.00



8	2	6	16	24	12	40	28	20.00	14.00
8	1	7	8	28	7	36	15	36.00	15.00

**QUESTION 10. (ILLUSTRATION 10)**

A skilled worker in XYZ Ltd. is paid a guaranteed wage rate of ₹ 30 per hour. The standard time per unit for a particular product is 4 hours. Mr. P, a machine man, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of ₹ 37.50 on the manufacture of that particular product.

STATE what could have been his total earnings and effective hourly rate, had he been put on Halsey Incentive Scheme (50%)?

ANSWER :

$$\begin{aligned}
 \text{Total earnings (under 50\% Halsey Scheme)} &= \text{Hours worked Rate per hour} + \\
 &\quad \frac{1}{2} \text{ time saved Rate per hour} \\
 &= 3 \text{ hours } ₹ 30 + \frac{1}{2} 1 \text{ hour } ₹ 30 \\
 &= ₹ 105
 \end{aligned}$$

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

Working Note:

Let T hours be the total time worked in hours by the skilled workers (machine man P), ₹ 30 is the rate per hour; standard time is 4 hours per unit and effective hourly earnings rate is ₹ 37.50 then

$$\text{Earning (under Rowan plan)} = \text{Hours worked} \times \text{Rate per hr} + \frac{\text{Time saved}}{\text{Time allowed}} \times$$

$$\begin{aligned}
 &\quad \text{Time taken Rate per hr} \\
 ₹ 37.5 T &= T ₹ 30 + \frac{(4-T)}{4} \times T \times ₹ 30
 \end{aligned}$$

(both sides are divided by T)

$$₹ 37.5 = ₹ 30 + (4 - T) ₹ 7.5$$

$$₹ 37.5 = ₹ 30 + ₹ 30 - 7.5T$$

$$\text{or, } ₹ 7.5 T = ₹ 60 - ₹ 37.5$$

$$\text{or, } ₹ 7.5 T = ₹ 22.5$$

$$\text{or, } T = 3 \text{ hours.}$$

**QUESTION 11. (ILLUSTRATION 11)**

A factory having the latest sophisticated machines wants to introduce an incentive scheme for its workers, keeping in view the following:

- The entire gains of improved production should not go to the workers.
- In the name of speed, quality should not suffer.
- The rate setting department being newly established are liable to commit mistakes.

You are required to PREPARE a suitable incentive scheme and DEMONSTRATE by an illustrative numerical example how your scheme answers to all the requirements of the management.

**ANSWER :**

Rowan Scheme of premium bonus (variable sharing plan) is a suitable incentive scheme for the workers of the factory. If this scheme is adopted, the entire gains due to time saved by a worker will not pass to him.

Another feature of this scheme is that a worker cannot increase his earnings or bonus by merely increasing its work speed. The reason for this is that the bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.

Lastly, Rowan System provides a safeguard in the case of any loose fixation of the standards by the rate-setting department. It may be observed from the following illustration that in the Rowan Scheme the bonus paid will be low due to any loose fixation of standards. Workers cannot take undue advantage of such a situation. The above three features of Rowan Plan can be discussed with the help of the following illustration:

(i)

Time allowed	=	4 hours
Time taken	=	3 hours
Time saved	=	1 hour
Rate	=	₹5 per hour
Bonus	=	$\frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$
	=	$\frac{3 \text{ hours}}{4 \text{ hours}} \times 1 \text{ hour} \times ₹5 = ₹3.75$

In the above illustration time saved is 1 hour and, therefore, total gain is ₹ 5. Out of ₹5 according to Rowan Plan only ₹ 3.75 is given to the worker in the form of bonus and the remaining ₹ 1.25 remains with the management. In other words, a worker is entitled for 75 percent of the time saved in the form of bonus.

(ii) The figures of bonus in the above illustration when the time taken is 2 hours and 1 hour respectively are as below:

Bonus = $\frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate}$

= $\frac{2 \text{ hours}}{4 \text{ hours}} \times 2 \text{ hours} \times ₹5 = ₹5$

= $\frac{1 \text{ hours}}{4 \text{ hours}} \times 3 \text{ hours} \times ₹5 = ₹3.75$

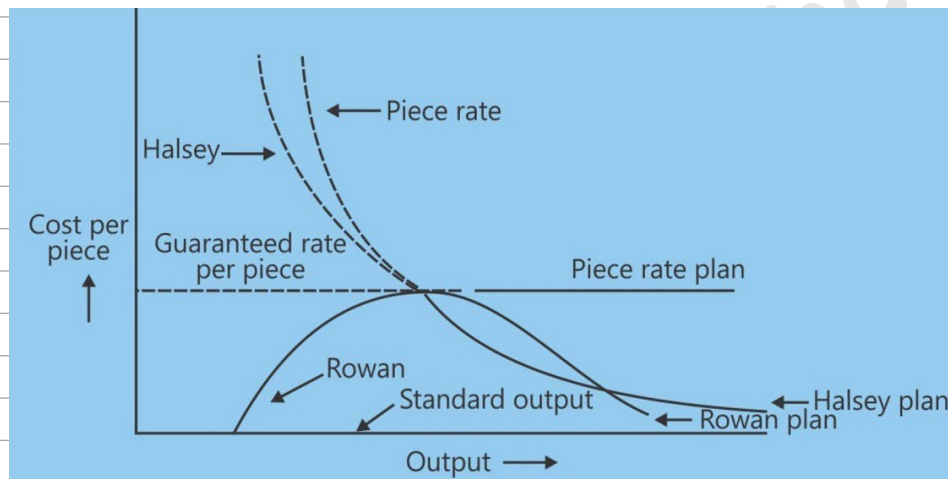
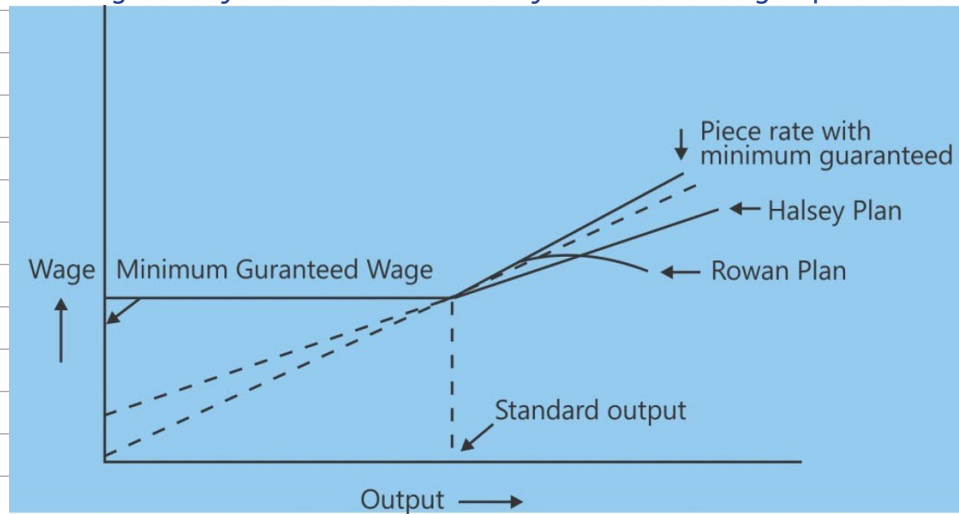
The above figures of bonus clearly show that when time taken is half of the time allowed, the bonus is maximum. When the time taken is reduced from 2 to 1 hour, the bonus figure fell by ₹1.25. Hence, it is quite apparent to workers that it is of no use to increase speed of work. This feature of Rowan Plan thus protects the quality of output.

(iii) If the rate-setting department erroneously sets the time allowed as 10 hours instead of 4 hours, in the above illustration; then the bonus paid will be as follows:

Bonus = $\frac{3 \text{ hours}}{10 \text{ hours}} \times 7 \text{ hours} \times ₹5 = ₹10.50$



The bonus paid for saving 7 hours thus is ₹10.50 which is approximately equal to the wages of 2 hours. In other words, the bonus paid to the workers is low. Hence workers cannot take undue advantage of any mistake committed by the time setting department of the concern.



QUESTION 12. (ILLUSTRATION 12)

A worker is paid ₹10,000 per month and a dearness allowance of ₹2,000 p.m. Worker contribution to provident fund is @ 10% and employer also contributes the same amount as the employee. The Employees State Insurance Corporation premium is 6.5% of wages of which 1.75% is paid by the employees. It is the firm's practice to pay 2 months' wages as bonus each year. The number of working days in a year are 300 of 8 hours each. Out of these the worker is entitled to 15 days leave on full pay. CALCULATE the wage rate per hour for costing purposes.

ANSWER :

	(₹)
Wages paid to worker during the year {(₹ 10,000 + 2,000) × 12}	1,44,000
Add: Employer Contribution to:	
Provident Fund @ 10%	14,400
E.S.I. Premium @ 4.75% (6.5 – 1.75)	6,840
Bonus at 2 months' wages (Basic + DA)	24,000
Total	1,89,240

Effective hours per year: 285 days × 8 hours = 2,280 hours

Wage-rate per hour (for costing purpose): ₹1,89,240/2,280 hours = ₹83

**QUESTION 13. (ILLUSTRATION 13)**

CALCULATE the Employee hour rate of a worker X from the following data:

Basic pay ₹ 10,000 p.m.

D.A. ₹ 3,000 p.m.

Fringe benefits ₹ 1,000 p.m.

Number of working days in a year 300. 20 days are availed off as holidays on full pay in a year.

Assume a day of 8 hours.

ANSWER :

(i)	Effective working days in a year	300
	Less: Leave days on full pay	20
	Effective working days	280 days
	Total effective working hours (280 days × 8 hours)	2,240
(ii)	Total wages paid in a year	(₹)
	Basic pay	1,20,000
	D.A.	36,000
	Fringe benefits	12,000
	Total wages	1,68,000
(iii)	Hourly rate : ₹1,68,000/2,240 hours	₹75.00

**QUESTION 14. (ILLUSTRATION 14)**

The Accountant of Y Ltd. has computed employee turnover rates for the quarter ended 31st March, 2023 as 10%, 5% and 3% respectively under 'Flux method', 'Replacement method' and 'Separation method' respectively. If the number of workers replaced during that quarter is 30, FIND OUT the number of workers for the quarter

(i) recruited and joined and (ii) left and discharged and (iii) Equivalent employee turnover rates for the year.

ANSWER :

Working Note:

Average number of workers on roll (for the quarter):

Employee Turnover rate using Replacement method

$$= \frac{\text{No. of replacements}}{\text{Average number of workers on roll}} \times 100$$

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

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

(i) Number of workers recruited and joined:

Employee turnover rate (Flux method)

$$= \frac{\text{No. of Separations (S)} + \text{No. of Accessions (A)}}{\text{Average number of workers on roll}}$$

$$\text{Or, } \frac{10}{100} = \frac{18 + A}{600} \quad \text{Or, } A = \left[\frac{6000 - 1800}{100} \right] = 42$$



No. of workers recruited and joined 42.

(ii) Number of workers left and discharged:

Employee turnover rate (Separation method)

$$= \frac{\text{No. of Separations(S)}}{\text{Average number of workers on roll}} \times 100 = \frac{3}{100} = \frac{S}{600} \quad \text{Or, } S^* = 18$$

Hence, number of workers left and discharged comes to 18

(iii) Calculation of Equivalent employee turnover rates:

$$= \frac{\text{Employee Turnover rate for the quarter(s)}}{\text{Number of quarter(s)}} \times 4 \text{ quarters}$$

$$\text{Using Flux method} = \frac{10\%}{1} \times 4 = 40\%$$

$$\text{Using Replacement method} = \frac{5\%}{1} \times 4 = 20\%$$

$$\text{Using Separation method} = \frac{3\%}{1} \times 4 = 12\%$$



QUESTION 15. (ILLUSTRATION 15)

The management of B.R Ltd. is worried about their increasing employee turnover in the factory and before analyzing the causes and taking remedial steps; it wants to have an idea of the profit foregone as a result of employee turnover in the last year.

Last year sales amounted to ₹ 83,03,300 and P/V ratio was 20 per cent. The total number of actual hours worked by the direct employee force was 4.45 lakhs. The actual direct employee hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive. As a result of the delays by the Personnel Department in filling vacancies due to employee turnover, 1,00,000 potentially productive hours (excluding unproductive training hours) were lost.

The costs incurred consequent on employee turnover revealed, on analysis, the following:

Settlement cost due to leaving ₹ 43,820

Recruitment costs ₹ 26,740

Selection costs ₹ 12,750

Training costs ₹ 30,490

Assuming that the potential production lost as a consequence of employee turnover could have been sold at prevailing prices, FIND the profit foregone last year on account of employee turnover.

ANSWER :

Workings:

(i) Computation of productive hours

Actual hours worked (given) 4,45,000

Less: Unproductive training hours 15,000

Actual productive hours 4,30,000

(ii) Productive hours lost:

Loss of potential productive hours + Unproductive training hours

$$= 1,00,000 + 15,000 = 1,15,000 \text{ hours}$$



(iii) Loss of contribution due to unproductive hours:

$$= \frac{\text{Sales value}}{\text{Actual productive hours}} \times \text{Total unproductive hours}$$

$$= \frac{\text{₹ 83,03,300}}{4,30,000 \text{ hrs}} \times 1,15,000 \text{ hours} = \text{₹ 22,20,650}$$

$$\text{Contribution lost for 1,15,000 hours} = \frac{\text{₹ 22,20,650}}{100} \times 20 = \text{₹ 4,44,130}$$

Computation of profit forgone on account of employee turnover

	(₹)
Contribution foregone (as calculated above)	4,44,130
Settlement cost due to leaving	43,820
Recruitment cost	26,740
Selection cost	12,750
Training costs	30,490
Profit foregone	5,57,930



QUESTION 16. (ILLUSTRATION 16)

Aditya Ltd. is an engineering manufacturing company producing job order on the basis of specification given by the customers. During the last the month it has completed three job works namely A, B and C. The following are the items of expenditures which are incurred apart from direct materials and direct employee cost:

- Office and administration cost- ₹ 3,00,000.
- Product blueprint cost for job A – ₹ 1,40,000
- Hire charges paid for machinery used for job work B- ₹ 40,000
- Salary to office attendants- ₹ 50,000
- One time license fee paid for software used to make computerised graphics for job C- ₹ 50,000.
- Salary paid to marketing manager- ₹ 1,20,000. Required:
CALCULATE direct expenses attributable to each job.

ANSWER :

Calculation of Direct expenses

Particulars	Job A (₹)	Job B (₹)	Job C (₹)
Product blueprint cost	1,40,000	--	--
Hire charges paid for machinery	--	40,000	--
license fee paid for software	--	--	50,000
Total Direct expenses	1,40,000	40,000	50,000

Note:

- Office and administration cost is classified as overheads.
- Salary paid to office attendants is classified under office and administration cost.
- Salary paid to marketing manager is classified under selling overheads

**QUESTION 17. (PP1)**

Mr. A. is working by employing 10 skilled workers. He is considering the introduction of some incentive scheme - either Halsey Scheme (with 50% bonus) or Rowan Scheme - of wage payment for increasing the Employee productivity to cope with the increased demand for the product by 25%. He feels that if the proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers, it could act as sufficient incentive for them to produce more and he has accordingly given this assurance to the workers.

As a result of the assurance, the increase in productivity has been observed as revealed by the following figures for the current month:

Hourly rate of wages (guaranteed)	₹40
Average time for producing 1 piece by one worker at the previous performance (This may be taken as time allowed)	2 hours
No. of working days in the month	25
No. of working hours per day for each worker	8
Actual production during the month	1,250 units

Required:

- CALCULATE effective rate of earnings per hour under Halsey Scheme and Rowan Scheme.
- CALCULATE the savings to Mr. A in terms of direct labour cost per piece under the schemes.

ANSWER :

Working Notes:

- Actual time taken to produce 1,250 pieces

$$= \text{No. of working days in the month} \times \text{No. of working hours per day of each worker} \times \text{No. of workers}$$

$$= 25 \text{ days} \times 8 \text{ hrs.} \times 10 \text{ workers} = 2,000 \text{ hours}$$
- Total time wages of 10 workers per month:

$$= \text{No. of working days in the month} \times \text{No. of working hours per day of each worker} \times \text{Hourly rate of wages} \times \text{No. of workers}$$

$$= 25 \text{ days} \times 8 \text{ hrs.} \times ₹40 \times 10 \text{ workers} = ₹80,000$$
- Time saved per month:

Time allowed per piece to a worker	2 hours
No. of units produced during the month by 10 workers	1,250 pieces
Total time allowed to produce 1,250 pieces (1,250 × 2 hours)	2,500 hours
Actual time taken to produce 1,250 pieces	2,000 hours
Time saved (2,500 hours – 2,000 hours)	500 hours
- Bonus under Halsey scheme to be paid to 10 workers:

$$\text{Bonus} = (50\% \text{ of time saved}) \times \text{hourly rate of wages}$$

$$= 50/100 \times 500 \text{ hours} \times ₹40 = ₹10,000$$

Total wages to be paid to 10 workers are (₹80,000 + ₹10,000) ₹90,000, if Mr. A considers the introduction of Halsey Incentive Scheme to increase the employee productivity.
- Bonus under Rowan Scheme to be paid to 10 workers:

$$\text{Bonus} = \frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{hourly rate}$$

$$= \frac{2,000 \text{ hours}}{2,500 \text{ hours}} \times 500 \text{ hours} \times ₹40 = ₹16,000$$



Total wages to be paid to 10 workers are (₹80,000 + ₹16,000)

₹ 96,000, if Mr. A considers the introduction of Rowan Incentive Scheme to increase the Employee productivity.

(i) (a) Effective hourly rate of earnings under Halsey scheme:

(Refer to Working Notes 1, 2, 3 and 4)

$$\begin{aligned} &= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}} \\ &= \frac{\text{₹ 80,000} + \text{₹ 10,000}}{2,000 \text{ hours}} = \text{₹45} \end{aligned}$$

(b) Effective hourly rate of earnings under Rowan scheme: (Refer to Working Notes 1, 2, 3 and 5)

$$\begin{aligned} &= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Rowan scheme}}{\text{Total hours worked}} \\ &= \frac{\text{₹ 80,000} + \text{₹16,000}}{2,000 \text{ hours}} = \text{₹48} \end{aligned}$$

(ii) (a) Saving in terms of direct Employee cost per piece under Halsey scheme: (Refer to Working Note 4)

Employee cost per piece (under time wage scheme)

$$= 2 \text{ hours} \times \text{₹40} = \text{₹80.}$$

Employee cost per piece (under Halsey scheme)

$$= \frac{\text{Total wages paid under the scheme}}{\text{Total number of units produced}} = \frac{\text{₹ 90,000}}{1,250} = \text{₹72}$$

$$\text{Saving per piece: } (\text{₹80} - \text{₹72}) = \text{₹8}$$

(b) Saving in terms of direct Employee cost per piece under Rowan Scheme: (Refer to Working Note 5)

Employee cost per piece under Rowan scheme

$$= \text{₹96,000} / 1,250 \text{ units} = \text{₹76.80}$$

$$\text{Saving per piece} = \text{₹80} - \text{₹76.80} = \text{₹3.20}$$



QUESTION 18. (PP2)

Wage negotiations are going on with the recognised employees' union, and the management wants you as an executive of the company to formulate an incentive scheme with a view to increase productivity.

The case of three typical workers A, B and C who produce respectively 180, 120 and 100 units of the company's product in a normal day of 8 hours is taken up for study.

Assuming that day wages would be guaranteed at ₹ 75 per hour and the piece rate would be based on a standard hourly output of 10 units, CALCULATE the earnings of each of the three workers and the employee cost per 100 pieces under (i) Day wages, (ii) Piece rate, (iii) Halsey scheme, and (iv) The Rowan scheme.

Also CALCULATE under the above schemes the average cost of labour for the company to produce 100 pieces.

**ANSWER :**

Calculation of earnings under different wage schemes:

(i) Day wages

Worker	Day wages (₹)	Actual Output (Units)	Labour cost per 100 pieces (₹)
A	600	180	333.33
B	600	120	500.00
C	600	100	600.00
Total	1,800	400	

Average labour cost to produce 100 pieces:

$$= \frac{\text{Total wages paid}}{\text{Total output}} \times 100 = \frac{₹1,800}{400 \text{ units}} \times 100 = ₹450$$

(ii) Piece rate

Worker	Actual Output (Units)	Piece rate (₹)	Wages earned (₹)	Labour cost per 100 pieces (₹)
A	180	7.50	1,350	750.00
B	120	7.50	900	750.00
C	100	7.50	750	750.00
Total	400		3,000	

Average cost of labour for the company to produce 100 pieces:

$$= \frac{₹3,000}{400 \text{ units}} \times 100 = ₹750$$

(iii) Halsey Scheme

Worker	Actual Output (Units)	Std. time (Hrs.)	Actual time (Hrs.)	Time saved (Hrs.)	Bonus hours (50% of time saved)	Rate per hour (₹)	Total wages (₹)	Labour cost per 100 pieces (₹)
	A	B	C	D=B-C	E	F	G = F × (C+E)	H=G/A*100
A	180	18	8	10	5	75	975	541.67
B	120	12	8	4	2	75	750	625.00
C	100	10	8	2	1	75	675	675.00
Total	400						2,400	

Average cost of labour for the company to produce 100 pieces =

$$= \frac{₹2,400}{400 \text{ units}} \times 100 = ₹600$$



(iii) Rowan Scheme:

Worker	Actual Output (Units)	Std. time (Hrs.)	Actual time (Hrs.)	Time saved (Hrs.)	Bonus hours*	Rate per hour (₹)	Total wages including bonus (₹)	Labour cost per 100 pieces (₹)
	A	B	C	D=B-C	E	F	G=F×(C+E)	H=G/A*100
A	180	18	8	10	4.44	75	933	518.33
B	120	12	8	4	2.67	75	800	666.67
C	100	10	8	2	1.60	75	720	720.00
Total	400						2,453	

$$\text{* Bonus hours} = \frac{\text{Time Saved}}{\text{Std. Time}} \times \text{Actual time}$$

Average cost of labour for the company to produce 100 pieces

$$= \frac{₹ 2,453}{400 \text{ units}} \times 100 = ₹ 613.25$$

**QUESTION 19. (PP3)**

The following expenditures were incurred in Aditya Ltd. For the month of March 2023:

		(₹)
(i)	Paid for power & fuel	4,80,200
(ii)	Wages paid to factory workers	8,44,000
(iii)	Bill paid to job workers	9,66,000
(iv)	Royalty paid for production	8,400
(v)	Fee paid to technician hired for the job	96,000
(vi)	Administrative overheads	76,000
(vii)	Commission paid to sales staffs	1,26,000

You are required to CALCULATE direct expenses for the month.

ANSWER :

		(₹)
(i)	Paid for power & fuel	4,80,200
(ii)	Bill paid to job workers	9,66,000
(iii)	Royalty paid for production	8,400
(iv)	Fee paid to the technician	96,000
	Total Direct expenses	15,50,600

Notes:

- (i) Wages paid to factory workers is direct employee cost.
- (ii) Administrative overhead is indirect expense.
- (iii) Commission paid to sales staffs comes under selling expenses.



REVISION TEST PAPER



RTP MAY 18

Jyoti Ltd. wants to ascertain the profit lost during the year 2017-18 due to increased labour turnover. For this purpose, it has given you the following information:

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

Required:

CALCULATE the profit lost by the company due to increased labour turnover during the year 2017-18.

ANSWER :

Output by experienced workers in 50,000 hours = $\frac{50,000}{10} = 5,000$ units

∴ Output by new recruits = 60% of 5,000 = 3,000 units

Loss of output = 5,000 – 3,000 = 2,000 units

Total loss of output = Due to delay recruitment + Due to inexperience
= 10,000 + 2,000 = 12,000 units

Contribution per unit = 20% of ₹180 = ₹ 36

Total contribution lost = ₹36 × 12,000 units = ₹ 4,32,000

Cost of repairing defective units = 3,000 units × 0.2 × ₹ 25 = ₹ 15,000

Profit forgone due to labour turnover

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2017-18	9,00,000

**RTP NOV 18**

A job can be executed either through workman A or B. A takes 32 hours to complete the job while B finishes it in 30 hours. The standard time to finish the job is 40 hours.

The hourly wage rate is same for both the workers. In addition workman A is entitled to receive bonus according to Halsey plan (50%) sharing while B is paid bonus as per Rowan plan. The works overheads are absorbed on the job at ₹ 7.50 per labour hour worked. The factory cost of the job comes to ₹ 2,600 irrespective of the workman engaged.

INTERPRET the hourly wage rate and cost of raw materials input. Also show cost against each element of cost included in factory cost.

ANSWER :

Calculation of :

1. Time saved and wages:

Workmen	A	B
Standard time (hrs.)	40	40
Actual time taken (hrs.)	32	30
Time saved (hrs.)	8	10
Wages paid @ ₹ x per hr. (₹)	32x	30x

2. Bonus Plan:

	Halsey	Rowan
Time saved (hrs.)	8	10
	4x	7.5x
	$\frac{8 \text{ hrs} \times ₹ x}{2}$	$\frac{10 \text{ hrs}}{40 \text{ hrs}} \times ₹ x$

3. Total wages:

Workman A: $32x + 4x = ₹ 36x$

Workman B: $30x + 7.5x = ₹ 37.5x$

Statement of factory cost of the job

Workmen	A (₹)	B (₹)
Material cost (assumed)	y	y
Wages (shown above)	36x	37.5x
Works overhead	240	225
Factory cost (given)	2,600	2,600

The above relations can be written as follows:

$$36x + y + 240 = 2,600 \quad (i)$$

$$37.5x + y + 225 = 2,600 \quad (ii)$$

Subtracting (i) from (ii) we get

$$1.5x - 15 = 0$$

$$\text{Or, } 1.5x = 15$$

$$\text{Or, } x = ₹ 10 \text{ per hour}$$

On substituting the value of x in (i) we get $y = ₹ 2,000$

Hence the wage rate per hour is ₹ 10 and the cost of raw material is ₹ 2,000 on the job.

**RTP MAY 19**

A Company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three workers. Which are under consideration of the management.

	I	II	III
Actual hours worked	380	100	540
Hourly rate of wages (in ₹)	40	50	60
Productions in units:			
- Product A	210	-	600
- Product B	360	-	1350
- Product C	460	250	-
Standard time allowed per unit of each product is:			
	A	B	C
Minutes	15	20	30

For the purpose of piece rate, each minute is valued at ₹ 1/-

You are required to CALCULATE the wages of each worker under:

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

ANSWER :

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

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

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

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

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



Working Notes:

1. Piece rate per unit

Product	Standard time per unit in minute	Piece rate each minute (₹)	Piece rate per unit (₹)
A	15	1	15
B	20	1	20
C	30	1	30

2. Time allowed to each worker

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

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

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

$$* \frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Wage Rate}$$

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

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

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



RTP NOV 19

ADV Pvt. Ltd. manufactures a product which requires skill and precision in work to get quality products. The company has been experiencing high labour cost due to slow speed of work. The management of the company wants to reduce the labour cost but without compromising with the quality of work. It wants to introduce a bonus scheme but is indifferent between the Halsey and Rowan scheme of bonus.

For the month of November 2019, the company budgeted for 24,960 hours of work. The workers are paid ₹80 per hour.



Required:

- (i) CALCULATE and suggest the bonus scheme where the time taken (in %) to time allowed to complete the works is (a) 100% (b) 75% (c) 50% & (d) 25% of budgeted hours.

ANSWER :

The Cost of labour under the bonus schemes are tabulated as below:

Time Allowed	Time taken	Wages (₹)	Bonus (₹)		Total Wages (₹)		Earning per hour (₹)	
			Halsey*	Rowan**	Halsey	Rowan	Halsey	Rowan
(1)	(2)	(3) = (2) × ₹ 80	(4)	(5)	(6) = (3) + (4)	(7) = (3) + (5)	(8) = (6)/(2)	(9) = (7)/(2)
24,960	24,960	19,96,800	-	-	19,96,800	19,96,800	80.00	80.00
24,960	18,720	14,97,600	2,49,600	3,74,400	17,47,200	18,72,000	93.33	100.00
24,960	12,480	9,98,400	4,99,200	4,99,200	14,97,600	14,97,600	120.00	120.00
24,960	6,240	4,99,200	7,48,800	3,74,400	12,48,000	8,73,600	200.00	140.00

* Bonus under Halsey Plan = 50% of (Time Allowed – Time Taken) × Rate per hour

** Bonus under Rowan Plan = $\frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Rate per hour}$

Rowan scheme of bonus keeps checks on speed of work as the rate of incentive increases only upto 50% of time taken to time allowed but the rate decreases as the time taken to time allowed comes below 50%. It provides incentives for efficient workers for saving in time but also puts check on careless speed. On implementation of Rowan scheme, the management of ADV Pvt. Ltd. would resolve issue of the slow speed work while maintaining the skill and precision required maintaining the quality of product.



RTP MAY 20

From the following information, CALCULATE employee turnover rate using – (i) Separation Method, (ii) Replacement Method, (iii) New Recruitment Method, and (iv) Flux Method:

No. of workers as on 01.01.2019 = 3,600 No. of workers as on 31.12.2019 = 3,790

During the year, 40 workers left while 120 workers were discharged. 350 workers were recruited during the year, of these 150 workers were recruited because of exits and the rest were recruited in accordance with expansion plans.

ANSWER :

Employee turnover rate using:

- (i) Separation Method:

$$= \frac{\text{No. of workers left} + \text{No. of workers discharged}}{\text{Average number of workers}} \times 100$$

$$= \frac{(40+120)}{(3,600+3,790) / 2} \times 100 = \frac{160}{3,695} \times 100 = 4.33\%$$

- (ii) Replacement Method:

$$= \frac{\text{No. of workers replaced}}{\text{Average number of workers}} \times 100 = \frac{150}{3,695} \times 100 = 4.06\%$$



(iii) New Recruitment Method:

$$= \frac{\text{No. of workers newly recruited}}{\text{Average number of workers}} \times 100$$

$$= \frac{\text{No. Recruitments} - \text{No. of Replacements}}{\text{Average number of workers}} \times 100$$

$$= \frac{350-150}{3,695} \times 100 = \frac{200}{3,695} \times 100 = 5.41\%$$

(iv) Flux Method:

$$= \frac{\text{No. of separations} + \text{No. of accessions}}{\text{Average number of workers}} \times 100$$

$$= \frac{(160+350)}{(3,600+3,790) / 2} \times 100 = \frac{510}{3,695} \times 100 = 13.80\%$$



RTP NOV 20

GZ Ld. pays the following to a skilled worker engaged in production works. The following are the employee benefits paid to the employee:

(a)	Basic salary per day	₹1,000
(b)	Dearness allowance (DA)	20% of basic salary
(c)	House rent allowance	16% of basic salary
(d)	Transport allowance	₹50 per day of actual work
(e)	Overtime	Twice the hourly rate (considers basic and DA), only if works more than 9 hours a day otherwise no overtime allowance. If works for more than 9 hours a day then overtime is considered after 8th hours.
(f)	Work of holiday and Sunday	Double of per day basic rate provided works atleast 4 hours. The holiday and Sunday basic is eligible for all allowances and statutory deductions.
(h)	Earned leave & Casual leave	These are paid leave.
(h)	Employer's contribution to Provident fund	12% of basic and DA
(i)	Employer's contribution to Pension fund	7% of basic and DA

The company normally works 8-hour a day and 26-day in a month. The company provides 30 minutes lunch break in between.

During the month of August 2020, Mr.Z works for 23 days including 15 th August and a Sunday and applied for 3 days of casual leave. On 15th August and Sunday he worked for 5 and 6 hours respectively without lunch break.

On 5th and 13th August he worked for 10 and 9 hours respectively. During the month Mr. Z worked for 100 hours on Job no.HT200.



You are required to CALCULATE:

- (i) Earnings per day
- (ii) Effective wages rate per hour of Mr. Z.
- (iii) Wages to be charged to Job no. HT200.

ANSWER :

Workings:

1. Normal working hours in a month = (Daily working hours – lunch break) × no. of days
= (8 hours – 0.5 hours) × 26 days = 195 hours
2. Hours worked by Mr. Z = No. of normal days worked + Overtime + holiday/ Sunday worked
= (21 days × 7.5 hours) + (9.5 hours + 8.5 hours) + (5 hours + 6 hours)
= 157.5 hours + 18 hours + 11 hours = 186.50 hours.

- (i) Calculation of earnings per day

Particulars	Amount (₹)
Basic salary (₹1,000 × 26 days)	26,000
Dearness allowance (20% of basic salary)	5,200
	31,200
House rent allowance (16% of basic salary)	4,160
Employer's contribution to Provident fund (12% × ₹31,200)	3,744
Employer's contribution to Pension fund (7% × ₹31,200)	2,184
	41,288
No. of working days in a month (days)	26
Rate per day	1,588
Transport allowance per day	50
Earnings per day	1,638

- (ii) Calculation of effective wage rate per hour of Mr. Z:

Particulars	Amount (₹)
Basic salary (₹1,000 × 26 days)	26,000
Additional basic salary for Sunday & holiday (₹1,000 × 2 days)	2,000
Dearness allowance (20% of basic salary)	5,600
	33,600
House rent allowance (16% of basic salary)	4,480
Transport allowance (₹50 × 23 days)	1,150
Overtime allowance (₹160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × ₹33,600)	4,032
Employer's contribution to Pension fund (7% × ₹33,600)	2,352
Total monthly wages	46,254
Hours worked by Mr. Z (hours)	186.5
Effective wage rate per hour	248

*(Daily Basic + DA) ÷ 7.5 hours
= (1,000 + 200) ÷ 7.5 = ₹160 per hour

- (iii) Calculation of wages to be charged to Job no. HT200
= ₹ 248 × 100 hours = ₹ 24,800

**RTP MAY 21**

JBL Sisters operates a boutique which works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 8 hours for boutique work on a piece of garment. In the month of December 2020, two workers M and J were given 15 pieces and 21 pieces of garments respectively for boutique work. The following are the details of their work:

	M	J
Work assigned	15 pcs.	21 pcs.
Time taken	100 hours	140 hours

Workers are paid bonus as per Halsey System. The existing rate of wages is ₹ 60 per hour. As per the new wages agreement the workers will be paid ₹ 72 per hour w.e.f. 1st January 2021. At the end of the month December 2020, the accountant of the company has wrongly calculated wages to these two workers taking ₹ 72 per hour.

Required:

- CALCULATE the loss incurred due to incorrect rate selection.
- CALCULATE the loss incurred due to incorrect rate selection, had Rowan scheme of bonus payment followed.
- CALCULATE the loss/ savings if Rowan scheme of bonus payment had followed.
- DISCUSS the suitability of Rowan scheme of bonus payment for JBL Sisters?

ANSWER :

Workings Notes:

Calculation of Total hours saved:

	M	J
No. of garments assigned (Pieces.)	15	21
Hour allowed per piece (Hours)	8	8
Total hours allowed (Hours)	120	168
Hours Taken (Hours)	100	140
Hours Saved (Hours)	20	28

- Calculation of loss incurred due to incorrect rate selection:

(While calculating loss only excess rate per hour has been taken)

	M (₹)	J (₹)	Total (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	120 (50% of 20 Hrs. × ₹12)	168 (50% of 28 Hrs. × ₹12)	288

- Calculation of loss incurred due to incorrect rate selection had Rowan scheme of bonus payment followed:

	M (₹)	J (₹)	Total (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880



Bonus (as per Rowan Scheme)	200	280	480
$\left(\frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Excess Rate} \right)$	$\left(\frac{100}{120} \times 20 \times ₹12 \right)$	$\left(\frac{140}{168} \times 28 \times ₹12 \right)$	
Excess Wages Paid	1,400	1,960	3,360

(iii) Calculation of amount that could have been saved if Rowan Scheme were followed

	M (₹)	J (₹)	Total (₹)
Wages paid under Halsey Scheme	1,320	1,848	3,168
Wages paid under Rowan Scheme	1,400	1,960	3,360
Difference (loss)	(80)	(112)	(192)

(iv) Rowan Scheme of incentive payment has the following benefits, which is suitable with the nature of business in which JBL Sisters operates:

- Under Rowan Scheme of bonus payment, workers cannot increase their earnings or bonus by merely increasing its work speed. Bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.
- If the rate setting department commits any mistake in setting standards for time to be taken to complete the works, the loss incurred will be relatively low.



RTP NOV 21

Textile Ltd. pays following overtime premium for its labour beside normal wages of ₹ 100 per hour:

Before and after normal working hours	80% of basic wage rate
Sundays and holidays	150% of basic wage rate

During the previous year 2019-20, the following hours were worked:

Normal time	3,00,000 hours
Overtime before and after normal working hours	60,000 hours
Overtime on Sundays and holidays	15,000 hours
Total	3,75,000 hours

During the current year 2020-21, the following hours have been worked on job 'Spinning':

Normal	4,000 hours
Overtime before and after normal working hours	400 hours
Overtime on Sundays and holidays	100 hours
Total	4,500 hours

You are required to CALCULATE the labour cost chargeable to job 'Spinning' and overhead in each of the following instances:

- Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.
- Where overtime is worked irregularly to meet the requirements of production.
- Where overtime is worked at the request of the customer to expedite the job.

**ANSWER :**

Workings:

Basic wage rate	= ₹ 100 per hour
Overtime wage rate before and after working hours	= ₹ 100 + (₹ 100 × 80%) = ₹ 180 per hour
Overtime wage rate for Sundays and holidays	= ₹ 100 + (₹ 100 × 150%) = ₹ 250 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	Amount (₹)
Annual wages for the previous year for normal time (3,00,000 hrs. × ₹ 100)	3,00,00,000
Wages for overtime before and after normal working hours (60,000 hrs. × ₹ 180)	108,00,000
Wages for overtime on Sundays and holidays (15,000 hrs. × ₹ 250)	37,50,000
Total wages for 3,75,000 hrs.	4,45,50,000

$$\text{Average inflated wage rate} = \frac{\text{₹ 4,45,50,000}}{3,75,000 \text{ hours}} = \text{₹ 118.80}$$

- (a) Where overtime is worked regularly as a policy due to workers' shortage
The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate. Hence, employee cost chargeable to job 'Spinning'
= Total hours × Inflated wage rate = 4,500hrs. × ₹ 118.80 = ₹ 5,34,600
- (b) Where overtime is worked irregularly to meet the requirements of production
Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:
- | | | |
|--|--|--|
| Employee cost chargeable to Job 'Spinning' | = 4,500hours @ ₹ 100 per hour | |
| | = ₹ 4,50,000 | |
| Factory overhead | = {400 hrs. × (₹ 100 × 80%)} + {100 hrs. × (₹ 100 × 150%)} | |
| | = {₹ 32,000 + ₹ 15,000} = ₹ 47,000 | |
- (c) Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under:
- | | | |
|---|---|----------|
| Job 'Spinning' Employee cost: 4,500hrs. @ ₹ 100 | = | 4,50,000 |
| Overtime premium: 400 hrs. @ (₹ 100 × 80%) | = | 32,000 |
| 100 hrs. @ (₹ 100 × 150%) | = | 15,000 |
| Total | | 4,97,000 |

**RTP MAY 22**

A total of 108 labour hours have been put in a particular job card for repair work engaging a semi-skilled and skilled labour (Mr. Deep and Mr. Sam respectively).

The hours devoted by both the workers individually on daily basis for this particular job are given below:



Monday	Tuesday	Wednesday	Thursday	Friday
10.5	8.0	10.5	9.5	10.5

The skilled labour also worked on Saturday for 10 hours.

Sunday is a weekly holiday and each worker has to work for 8 hours on all week days and 5 hours on Saturdays; the workers are however paid full wages for Saturday (8 hours for 5 hours worked).

Semi-skilled and skilled worker is paid ordinary wage @ ₹ 400 and ₹ 600 respectively per day of 8 hours labour. Further, the workers are also paid dearness allowance @ 20%.

Extra hours worked over and above 8 hours are also paid at ordinary wage rate however, overtime premium of 100% of ordinary wage rate is paid if a worker works for more than 9 hours in a day AND 48 hours in a week.

You are required to COMPUTE the wages payable to Mr. Deep (Semi-skilled) and Mr. Sam (Skilled).

ANSWER :

Calculation of total normal hours to be paid for Mr. Deep (Semi-skilled):

Day	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
	A	B	C	D = C×2	E = A+B+D
Monday	8	1	1½	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	--	--	--	--	--
Total	40	4	5	10	54

Calculation of total normal hours to be paid for Mr. Sam (Skilled):

Day	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
	A	B	C	D = C×2	E = A+B+D
Monday	8	1	1½	3	12
Tuesday	8	---	---	---	8
Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	5	3* + 1	1**	2	11
Total	45	8	6	12	65

*Mr. Sam will be paid for equivalent 8 normal working hours at ordinary wage rate, though 5 hours of working is required on Saturday. Further, extra 9th hour worked will also be paid at ordinary wage rate.

** Overtime of 1 hour worked over and above 9 hours will be paid at overtime rate.



Wages payable:

	Mr. Deep	Mr. Sam
Basic Wages per hour (₹ 400/8, ₹ 600/8) (₹)	50	75
Dearness allowance per hour (@ 20%) (₹)	10	15
Hourly rate (₹)	60	90
Total equivalent normal hours	54	65
Total Wages payable (₹)	3,240	5,850



RTP NOV 22

HR Ltd. is progressing in its legal industry. One of its trainee executives, Mr. H, in the Personnel department has calculated labour turnover rate 24.92% for the last year using Flux method.

Following is the data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Records clerk	810	1,620	90	2,340
Human Resource Manager	?	30	90	60
Legal Secretary	?	90	---	?
Staff Attorney	?	30	30	?
Associate Attorney	?	30	---	45
Senior Staff Attorney	6	---	---	18
Senior Records clerk	12	---	---	51
Litigation attorney	?	---	---	?
Employees transferred from the Subsidiary Company				
Senior Staff Attorney	---	12	---	---
Senior Records clerk	---	39	---	---
Employees transferred to the Subsidiary Company				
Litigation attorney	---	---	90	---
Associate Attorney	---	---	15	---

At the beginning of the year there were total 1,158 employees on the payroll of the company. The opening strength of the Legal Secretary, Staff Attorney and Associate Attorney were in the ratio of 3 : 3 : 2.

The company has decided to abandon the post of Litigation attorney and consequently all the Litigation attorneys were transferred to the subsidiary company.

The company and its subsidiary are maintaining separate set of books of account and separate Personnel Department.

You are required to:

- CALCULATE Labour Turnover rate using Replacement method and Separation method.
- VERIFY the Labour turnover rate calculated under Flux method by Mr. H

ANSWER :

Working Notes:

- Calculation of no. of employees at the beginning and end of the year

	At the Beginning of the year	At the end of the year
Records clerk	810	2,340
Human Resource Manager [Left- 90 + Closing- 60 - Joined- 30]	120	60



Legal Secretary*	45	135
Staff Attorney*	45	45
Associate Attorney*	30	45
Senior Staff Attorney	6	18
Senior Records clerk	12	51
Litigation attorney	90	0
Total	1,158	2,694

(*) At the beginning of the year:

Strength of Legal Secretary, Staff Attorney and Associate Attorney =

[1158 – {810 + 120 + 6 + 12 + 90} employees] or [1158 – 1038 = 120 employees]

[(Legal Secretary - $120 \times \frac{3}{8} = 45$, Staff Attorney - $120 \times \frac{3}{8} = 45$ & Associate Attorney - $120 \times \frac{2}{8} = 30$) employees]

At the end of the year:

[Legal Secretary - (Opening 45 + 90 Joining) = 135; Staff Attorney - (Opening 45 + 30 Joined - 30 Left) = 45]

(ii) No. of Employees Separated, Replaced and newly recruited during the year

Particulars	Separations	New Recruitment	Replacement	Total Joining
Records clerk	90	1,530	90	1,620
Human Resource Manager	90	--	30	30
Legal Secretary	--	90	--	90
Staff Attorney	30	--	30	30
Associate Attorney	15	15	15	30
Senior Staff Attorney	--	12	--	12
Senior Records clerk	--	39	--	39
Litigation attorney	90	--	--	--
Total	315	1,686	165	1,851

(Since, HR Ltd. and its subsidiary are maintaining separate Personnel Department, so transfer-in and transfer-out are treated as recruitment and separation respectively.)

(a) Calculation of Labour Turnover rate:

$$\begin{aligned} \text{Replacement Method} &= \frac{\text{No. of employees replaced during the year}}{\text{Average no. of employees on roll}} \times 100 \\ &= \frac{165}{(1,158 + 2,694)/2} \times 100 = \frac{165}{1,926} \times 100 = 8.57\% \end{aligned}$$



Separation Method = $\frac{\text{No. of employees separated during the year}}{\text{Average no. of employees on roll}} \times 100$

$$= \frac{315}{1,926} \times 100 = 16.36\%$$

(b) Labour Turnover rate under Flux Method:

= $\frac{\text{No. of employees (Joined Separated) during the year}}{\text{Average no. of employees on roll}} \times 10$

= $\frac{\text{No. of employees (Replaced + New recruited + Separated) during the year}}{\text{Average no. of employees on roll}} \times 100$

$$= \frac{1,851 + 315}{1,926} \times 100 = 112.46\%$$

Labour Turnover rate calculated by Mr. H is incorrect as it seems he has not taken the No. of new recruitment while calculating the labour turnover rate under Flux method.



RTP MAY 23

Following information are available from the cost records of BMR Limited, CALCULATE Labour turnover rate and Labour flux rate:

No. of Employees as on 01.04.2021 = 9,400 No. of Employees as on 31.03.2022 = 10,600

During the year, 160 Employees left while 640 Employees were discharged and 1,500 Employees were recruited during the year; of these, 400 Employees were recruited because of exits and the rest were recruited in accordance with expansion plans.

ANSWER :

Employee turnover rate:

It comprises of computation of Employee turnover by using following methods:

(i) Separate Method: = $\frac{\text{Number of employees separated during the period}}{\text{Average number of employees during the period on roll}} \times 100$

OR, = $\frac{\text{Number of employees left + Number of employees discharged}}{\text{Average number of employees during the period on roll}} \times 100$

$$= \frac{(160 + 640)}{(9,400 + 10,600)} \times 100$$

$$= \frac{800}{10,000} \times 100 = 8\%$$

(ii) Replacement Method = $\frac{\text{Number of employees replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$



$$= \frac{400}{10,000} \times 100 = 4\%$$

$$(iii) \text{ New Recruitment} = \frac{\text{Number of employees joining in a period (excluding replacement)}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{\text{Number of Recruitments} - \text{Number of Replacements}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{1500 - 400}{10,000} \times 100$$

$$= \frac{1,100}{10,000} \times 100 = 11\%$$

$$\text{Flux Method} = \frac{\text{Number of separation} + \text{Number of replacement} + \text{Number of new joining}}{\text{Average number of employees during the period on roll}} \times 100$$

$$= \frac{(800 + 400 + 1,100)}{(9,400 + 10,600) \div 2} \times 100$$

$$= \frac{2,300}{10,000} \times 100 = 23\%$$

**RTP NOV 23**

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

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

ANSWER :

- Effective hourly rate of earnings under Rowan Incentive Plan

Earnings under Rowan Incentive plan =

$$(\text{Actual time taken} \times \text{wage rate}) + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Wage rate}$$

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

$$= ₹ 600 + ₹ 100 = ₹ 700$$

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



(ii) Let time taken = X

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

Or, Effective hourly rate under Halsey Incentive plan =

$$\frac{(\text{Time taken} \times \text{Rate}) + 50\% \text{ of Rate} \times (\text{Time allowed} - \text{Time taken})}{\text{Time Taken}}$$

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

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

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

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

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



RTP MAY 24

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

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

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

- (i) How much quantity of output is lost due to labour turnover?
 - (a) 10,000 units
 - (b) 8,000 units
 - (c) 12,000 units
 - (d) 12,600 units
- (ii) How much loss in the form of contribution, the company incurred due to labour turnover?
 - (a) ₹ 4,32,000
 - (b) ₹ 4,20,000
 - (c) ₹ 4,36,000
 - (d) ₹ 4,28,000



- (iii) What is the cost repairing of defective units? (a) ₹ 75,000
(b) ₹ 15,000
(c) ₹ 50,000
(d) ₹ 25,000
- (iv) Calculate the profit lost by the company due to increased labour turnover.
(a) ₹ 7,50,000
(b) ₹ 15,00,000
(c) ₹ 5,00,000
(d) ₹ 9,00,000
- (v) How much quantity of output is lost due to inexperience of the new worker?
(a) 1,000 units
(b) 2,600 units
(c) 2,000 units
(d) 12,600 units

ANSWER :

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

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

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

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



04

OVERHEADS- ABSORPTION COSTING METHOD



QUESTION 1. (ILLUSTRATION 1)

XL Ltd., has three production departments and four service departments. The expenses for these departments as per Primary Distribution Summary are as follows:

Production Departments:	(₹)	(₹)
Dept. -A	30,00,000	
Dept. -B	26,00,000	
Dept. -C	24,00,000	80,00,000
Service Departments:	(₹)	(₹)
Stores	4,00,000	
Time-keeping and Accounts	3,00,000	
Power	1,60,000	
Canteen	1,00,000	9,60,000

The following information is also available in respect of the production departments:

	Dept. A	Dept. B	Dept. C
Horse power of Machine	300	300	200
Number of workers	20	15	15
Value of stores requisition in (₹)	2,50,000	1,50,000	1,00,000

PREPARE a statement apportioning the costs of service departments over the production departments using direct re-distribution method.

ANSWER:

Secondary Overhead Distribution Statement

Items of cost (as per primary distribution summary)	Basis of apportionment	Total (₹)	Production Departments		
			A (₹)	B (₹)	C (₹)
Cost as per primary distribution summary	80,00,000	30,00,000	26,00,000	24,00,000	
Stores (5:3:2)	Value of Store requisition	4,00,000	2,00,000	1,20,000	80,000
Time-keeping and Accounts (4:3:3)	No. of workers	3,00,000	1,20,000	90,000	90,000
Power (3:3:2)	H.P. of Machine	1,60,000	60,000	60,000	40,000
Canteen (4:3:3)	No. of workers	1,00,000	40,000	30,000	30,000
		89,60,000	34,20,000	29,00,000	26,40,000

**QUESTION 2. (ILLUSTRATION 2)**

Suppose the expenses of two production departments A and B and two service departments X and Y are as under:

Department	Amount (₹)	Apportionment Basis		
		Y	A	B
Dept.-X	2,00,000	25%	40%	35%
Dept.-Y	1,50,000	—	40%	60%
Dept.-A	3,00,000			
Dept.-B	3,20,000			

PREPARE a statement apportioning the costs of service departments over the production departments using step method.

ANSWER:

Summary of Overhead Distribution

Departments	X (₹)	Y (₹)	A (₹)	B (₹)
Amount as given above	2,00,000	1,50,000	3,00,000	3,20,000
Expenses of service dept.-X is apportioned among other departments- Y, A and B in the ratio (5:8:7)	(2,00,000)	50,000	80,000	70,000
		2,00,000	3,80,000	3,90,000
Expenses of Dept.-Y apportioned between department A and B in the ratio (2:3)	-	(2,00,000)	80,000	1,20,000
Total	Nil	Nil	4,60,000	5,10,000

**QUESTION 3. (ILLUSTRATION 3)**

Service departments' expenses

	(₹)
Boiler house	3,00,000
Pump room	60,000
Total	3,60,000

The allocation basis is:

	Production Department		Service Department	
	A	B	Boiler House	Pump Room
Boiler House	60%	35%	-	5%
Pump Room	10%	40%	50%	-

ANSWER:

The total expenses of the two service departments will be determined as follows: Let B stand for Boiler House expenses and P for Pump Room expenses.

Then



$$B = 3,00,000 + 0.50 P$$

$$P = 60,000 + 0.05 B$$

Substituting the value of B,

$$P = 60,000 + 0.05 (3,00,000 + 0.5 P)$$

$$= 60,000 + 15,000 + 0.025 P$$

$$= 75,000 + 0.025 P$$

$$P - 0.025P = 75,000$$

$$P = \left(\frac{75,000}{0.975} \right) = ₹ 76,923$$

The total of expenses of the Pump Room is ₹76,923 and that of the Boiler House is ₹3,38,462 i.e., ₹3,00,000 + 0.5 × ₹ 76,923.

The expenses will be allocated to the production departments as under:

	Production Department	
	Dept. - A	Dept. - B
Boiler House (60% and 35% of ₹ 3,38,462)	2,03,077	1,18,462
Pump Room (10% and 40% of ₹ 76,923)	7,692	30,769
Total	2,10,769	1,49,231

The total of expenses apportioned to A and B is ₹ 3,60,000.



QUESTION 4. (ILLUSTRATION 4)

Sanz Ltd., is a manufacturing company having three production departments, 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December 2022:

	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct material		1,00,000	2,00,000	4,00,000	2,00,000	1,00,000
Direct wages		5,00,000	2,00,000	8,00,000	1,00,000	2,00,000
Factory rent	4,00,000					
Power	2,50,000					
Depreciation	1,00,000					
Other overheads	9,00,000					

Additional information:

Area (Sq. ft.)	500	250	500	250	500
Capital value of assets (₹ lakhs)	20	40	20	10	10
Machine hours	1,000	2,000	4,000	1,000	1,000
Horse power of machines	50	40	20	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	C	X	Y
Service Dept. 'X' (%)	45	15	30	–	10
Service Dept. 'Y' (%)	60	35	–	5	–



Required:

- PREPARE a statement showing distribution of overheads to various departments.
- PREPARE a statement showing re-distribution of service departments expenses to production departments using Trial and error method.

ANSWER:

(i) Overhead Distribution Summary

	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct materials	Direct	—	—	—	—	2,00,000	1,00,000
Direct wages	Direct	—	—	—	—	1,00,000	2,00,000
Factory rent (2:1:2:1:2)	Area	4,00,000	1,00,000	50,000	1,00,000	50,000	1,00,000
Power (10:16:16:3:5)*	H.P. × Machine Hrs.	2,50,000	50,000	80,000	80,000	15,000	25,000
Depreciation (2:4:2:1:1)	Capital value	1,00,000	20,000	40,000	20,000	10,000	10,000
Other overheads (1:2:4:1:1)	Machine hrs.	9,00,000	1,00,000	2,00,000	4,00,000	1,00,000	1,00,000
		16,50,000	2,70,000	3,70,000	6,00,000	4,75,000	5,35,000

*{(1000×50) : (2000×40) : (4000×20) : (1000×15) : (1000×25)}

(50000 : 80000 : 80000 : 15000 : 25000)

(ii) Redistribution of Service Department's expenses:

	Service Departments	
	X (₹)	Y (₹)
Overheads as per primary distribution	4,75,000	5,35,000
(i) Apportionment of Dept-X expenses to Dept-Y (10% of ₹ 4,75,000)	---	47,500
	---	5,82,500
(ii) Apportionment of Dept-Y expenses to Dept-X [5% of (₹ 5,35,000 + ₹ 47,500)]	29,125	---
(i) Apportionment of Dept-X expenses to Dept-Y (10% of ₹ 29,125)	---	2,913
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 2,913)	146	---
Total	5,04,271	5,85,413

Distribution of Service departments' overheads to Production departments

	Production Departments		
	A (₹)	B (₹)	C (₹)
Overhead as per primary distribution	2,70,000	3,70,000	6,00,000
Dept- X (90% of ₹ 5,04,300)	2,26,900	75,600	1,51,300
Dept- Y (95% of ₹ 5,85,400)	3,51,300	2,04,900	---
	8,48,200	6,50,500	7,51,300

**QUESTION 5. (ILLUSTRATION 5)**

Taking all the information from Illustration 4 above, PREPARE a statement showing re- distribution of service departments' expenses to production departments using repeated distribution method. Also CALCULATE machine hour rates of the production departments 'A', 'B' and 'C'.

ANSWER:

Redistribution of Service Department's expenses using 'repeated distribution method':

	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Total overheads {Refer (i) of Solution to Illustration 4}	2,70,000	3,70,000	6,00,000	4,75,000	5,35,000
Dept. X overhead apportioned in the ratio (45:15:30: -:10)	2,13,750	71,250	1,42,500	(4,75,000)	47,500
Dept. Y overhead apportioned in the ratio (60:35: -:5: -)	3,49,500	2,03,875	-	29,125	(5,82,500)
Dept. X overhead apportioned in the ratio (45:15:30: -:10)	13,106	4,369	8,738	(29,125)	2,912
Dept. Y overhead apportioned in the ratio (60:35: -:5: -)	1,747	1,019	-	146	(2,912)
Dept. X overhead apportioned in the ratio (45:15:30: -:10)	65	22	44	(146)	15
Dept. Y overhead apportioned in the ratio (60:35: -:5: -)	9	6	-	-	(15)
	8,48,177	6,50,541	7,51,282	-	-

Calculation of machine hour rate:

		A	B	C
A	Total overheads (₹)	8,48,177	6,50,541	7,51,282
B	Machine hours	1,000	2,000	4,000
C	Machine hour rate (₹) [A ÷ B]	848.18	325.27	187.82

**QUESTION 6. (ILLUSTRATION 6)**

A machine costing ₹ 1,00,00,000 is expected to run for 10 years. At the end of this period its scrap value is likely to be ₹ 9,00,000. Repairs during the whole life of the machine are expected to be ₹ 18,00,000 and the machine is expected to run 4,380 hours per year on the average. Its electricity consumption is 15 units per hour, the rate per unit being ₹ 5. The machine occupies one-fourth of the area of the department and has two points out of a total of ten for lighting. The foreman has to devote about one sixth of his time to the machine. The monthly rent of the department is ₹ 30,000 and the lighting charges amount to ₹ 8,000 per month. The foreman is paid a monthly salary of ₹ 19,200. FIND OUT the machine hour rate, assuming insurance is @ 1% p.a. and the expenses on oil, etc., are ₹ 900 per month.

ANSWER:

Total number of hours per annum- 4,380

Total number of hours per month- 365



Computation of Machine Hour Rate

	Per month (₹)	Per hour (₹)
Fixed costs (Standing Charges)		
Depreciation (Refer working note-1)	75,833	
Rent (₹30,000 × ¼)	7,500	
Lighting charges {(₹8,000 × 2 points) ÷ 10 points}	1,600	
Foreman's salary (₹19,200 × 1/6)	3,200	
Sundry expenses (oil etc.)	900	
Insurance {(1% of ₹ 1,00,00,000) ÷ 12 months}	8,333	
	97,366	266.76
Variable costs:		
Repairs (Refer working note -2)		41.10
Electricity (15 units × ₹ 5)		75.00
Machine Hour rate		382.86

Working Notes:

(1) Depreciation per month = $\frac{\text{Cost of Machine} - \text{Scrap value}}{\text{Life of the machine}}$

$$= \frac{₹1,00,00,000 - ₹9,00,000}{(10 \text{ years} \times 12 \text{ months})} = ₹75,833$$

*In the question the life of the machine is given as 10 years and it is also mentioned the machine will run for 4,380 hours per annum. The depreciation can be calculated either on the basis of time i.e. 10 years or on the basis of activity of 43,800 hours (4,380 hours p.a.)

(2) Repairs for the whole life is ₹ 18,00,000, which can be linked to activity level of 43,800 hours. Thus, Repairs cost per hour = $\frac{₹18,00,000}{43,800 \text{ hours}} = ₹41.10$

**QUESTION 7. (ILLUSTRATION 7)**

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

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available:

- Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is ₹52,000.
- Maintenance and repairs per week per machine is ₹60.
- Consumable stores per week per machine are ₹75.
- Power: 20 units per hour per machine at the rate of 80 paise per unit. No power is used during the set-up hours.
- Apportionment to the cost centre: Rent per annum ₹5,400, Heat and Light per annum ₹9,720, foreman's salary per annum ₹12,960 and other miscellaneous expenditure per annum ₹18,000.



Required:

CALCULATE the cost of running one machine for a four week period.

ANSWER:

Effective Machine hour for four-week period

= Total working hours – unproductive set-up time

= {(48 hours × 4 weeks) – {(4 hours × 4 weeks)}

= (192 – 16 hours) = 176 hours.

(i) Computation of cost of running one machine for a four week period

		(₹)	(₹)
(A)	Standing charges (per annum)		
	Rent	5,400	
	Heat and light	9,720	
	Forman's salary	12,960	
	Other miscellaneous expenditure	18,000	
	Standing charges (per annum)	46,080	
	Total expenses for one machine for four week period		1,181.54
	$\left(\frac{₹46,080}{3 \text{ machines} \times 13 \text{ four-week period}} \right)$		
	Wages (48 hours × 4 weeks × ₹ 20 × 3 operators)		11,520.00
	Bonus {(176 hours × ₹ 20 × 3 operators) 10%}		1,056.00
	Total standing charges		13,757.54
(B)	Machine Expenses		400.00
	Depreciation		
	$\left(52,000 \times 10\% \times \frac{1}{13 \text{ four-week period}} \right)$		
	Repairs and maintenance (₹60 4 weeks)		240.00
	Consumable stores (₹75 4 weeks)		300.00
	Power (176 hours 20 units ₹ 0.80)		2,816.00
	Total machine expenses		3,756.00
(C)	Total expenses (A) + (B)		17,513.54

(ii) Machine hour rate = $\frac{₹ 17,513.54}{176 \text{ hours}} = ₹99.51$



QUESTION 8. (ILLUSTRATION 8)

The total overhead expenses of a factory is ₹ 4,46,380. Taking into account the normal working of the factory, overhead was recovered in production at ₹ 1.25 per hour. The actual hours worked were 2,93,104. STATE how would you proceed to close the books of accounts, assuming that besides 7,800 units produced of which 7,000 were sold, there were 200 equivalent units in work-in-progress?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency.

**ANSWER:**

Calculation of under/ over- absorption of overhead

	(₹)
Actual factory overhead expenses incurred	4,46,380
Overheads absorbed (2,93,104 hours × ₹ 1.25)	3,66,380
Under-absorption of overhead	80,000

Reasons for unabsorbed overheads

- (i) 50% of the unabsorbed overhead was on account of increase in the cost of indirect material and indirect labour.
- (ii) 50% of the unabsorbed overhead was due to factory inefficiency.

Treatment of unabsorbed overheads in Cost Accounting

1. Unabsorbed overhead amounting to ₹ 40,000, which were due to increase in the cost of indirect material and labour should be charged to units produced by using a supplementary rate.

$$\text{Supplementary rate} = \frac{\text{₹ 40,000}}{(7,800 + 200) \text{ units}} = \text{₹ 5 per unit}$$

The sum of ₹ 40,000 (unabsorbed overhead) should be distributed by using a supplementary rate among cost of sales, finished goods and work-in progress A/cs. The amount to be debited is calculated as below:

	(₹)
Stock of finished goods [(7,800-7,000) × ₹ 5]	4,000
Work-in progress (200 units × ₹ 5)	1,000
Cost of sales (7,000 units × ₹ 5)	35,000
Total	40,000

1. The use of cost of sales figure, would reduce the profit for the period by ₹ 35,000 and will increase the value of stock of finished goods and work- in-progress by ₹ 4,000 and ₹ 1,000 respectively.
2. The balance amount of unabsorbed overheads of ₹ 40,000 due to factory inefficiency should be debited to Costing Profit & Loss Account, as this is an abnormal loss.

**QUESTION 9. (ILLUSTRATION 9)**

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

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

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



Required:

- (i) COMPUTATION of percentage recovery rates of factory overheads and administrative overheads.
- (ii) CALCULATION of the amount of factory overheads, administrative overheads and profit for each of the two jobs.
- (iii) Using the above recovery rates DETERMINE the selling price of job 103. The additional data being:

Direct materials	₹ 24,000
Direct wages	₹ 20,000
Profit percentage on selling price	12 - ½%

ANSWER:

- (i) Computation of percentage recovery rates of factory overheads and administrative overheads.
Let the factory overhead recovery rate as percentage of direct wages be F and administrative overheads recovery rate as percentage of factory cost be A.

Factory Cost of Jobs:

Direct materials + Direct wages + Factory overhead

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

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

Total Cost of Jobs:

Factory cost + Administrative overhead

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

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

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

$$\begin{array}{rclcl} \text{₹ 96,000} & + & \text{₹ 42,000F} & + & \text{₹ 96,000A} & + \\ \text{₹ 42,000AF} & & & & & = \text{₹ 1,51,500} \quad \dots \text{eqn (i)} \end{array}$$

$$\begin{array}{rclcl} \text{₹ 67,500} & + & \text{₹ 30,000F} & + & \text{₹ 67,500A} & + \\ \text{₹ 30,000AF} & & & & & = \text{₹ 1,06,875} \quad \dots \text{eqn (ii)} \end{array}$$

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

$$\begin{array}{rclcl} \text{₹ 4,80,000} & + & \text{₹ 2,10,000F} & + & \text{₹ 4,80,000A} & + \\ \text{₹ 2,10,000AF} & & & & & = \text{₹ 7,57,500} \quad \dots \text{eqn (iii)} \end{array}$$

$$\begin{array}{rclcl} \text{₹ 4,72,500} & + & \text{₹ 2,10,000F} & + & \text{₹ 4,72,500A} & + \\ \text{₹ 2,10,000AF} & & & & & = \text{₹ 7,48,125} \quad \dots \text{eqn (iv)} \end{array}$$

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



$$A = 0.25$$

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

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

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

$$F = 0.6$$

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

Hence, percentage recovery rates of:

Factory overheads = 60% of wages and

Administrative overheads = 25% of factory cost.

Working note:

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

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

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

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

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

(iii) Selling price of Job 103

	(₹)
Direct materials	24,000
Direct wages	20,000
Prime cost	44,000
Factory overheads (60% of Direct Wages)	12,000
Factory cost	56,000
Administrative overheads (25% of factory cost)	14,000



Total cost	70,000
Profit margin (balancing figure)	10,000
Selling price $\left(\frac{\text{Total Cost}}{87.5\%} \right)$	80,000

**QUESTION 10. (ILLUSTRATION 10)**

A company which sells four products, some of these are unprofitable. Company proposes to discontinue to sale one of these products. The following information is available regarding income, costs and activity for the year ended 31st March.

Departments	Products			
	A	B	C	D
Sales (₹)	30,00,000	50,00,000	25,00,000	45,00,000
Cost of goods sold (₹)	20,00,000	45,00,000	21,00,000	22,50,000
Area of storage (Sq.ft.)	50,000	40,000	80,000	30,000
Number of parcels sent	1,00,000	1,50,000	75,000	1,75,000
Number of invoices sent	80,000	1,40,000	60,000	1,20,000

Selling and Distribution overheads and the basis of allocation are:

	Amount (₹)	Basis of allocation to products
Fixed Costs		
Rent & Insurance	3,00,000	Area of storage (Sq.ft.)
Depreciation	1,00,000	No. of Parcels sent
Salesmen's salaries & expenses	6,00,000	Sales Volume
Administrative wages and salaries	5,00,000	No. of invoices sent
Variable Costs:		
Packing wages & materials	₹ 2 per parcel	
Commission	4% of sales	
Stationery	₹ 1 per invoice	

You are required to PREPARE Costing Profit & Loss Statement, showing the percentage of profit or loss to sales for each product.

ANSWER:

Statement of Profit or Loss on Various Products during the year ended March 31st.

Departments		Products			
		A	B	C	D
Sales	1,50,00,000	30,00,000	50,00,000	25,00,000	45,00,000
Variable costs:					
Cost of goods sold	1,08,50,000	20,00,000	45,00,000	21,00,000	22,50,000
Commissions 4% of sales	6,00,000	1,20,000	2,00,000	1,00,000	1,80,000
Packing wages & materials @ ₹ 2 per parcel	10,00,000	2,00,000	3,00,000	1,50,000	3,50,000



Stationery @ ₹ 1 per invoice	4,00,000	80,000	1,40,000	60,000	1,20,000
Total variable costs	1,28,50,000	24,00,000	51,40,000	24,10,000	29,00,000
Contribution (Sales – variable cost)	21,50,000	6,00,000	(1,40,000)	90,000	16,00,000
Fixed Costs:					
Rent & Insurance (5:4:8:3)	3,00,000	75,000	60,000	1,20,000	45,000
Depreciation (4:6:3:7)	1,00,000	20,000	30,000	15,000	35,000
Salesmen's salaries & expenses (6:10:5:9)	6,00,000	1,20,000	2,00,000	1,00,000	1,80,000
Administrative wages & salaries (4:7:3:6)	5,00,000	1,00,000	1,75,000	75,000	1,50,000
Total Fixed costs	15,00,000	3,15,000	4,65,000	3,10,000	4,10,000
Profit or Loss (Contribution–fixed Costs)	6,50,000	2,85,000	(6,05,000)	(2,20,000)	11,90,000
Percentage of profit or Loss on sales (%)	4.33	9.50	(12.10)	(8.80)	26.4



QUESTION 11. (PP1)

The ABC Company has the following account balances and distribution of direct charges on 31st March.

	Total	Production Depts.		Service Depts.	
		Machine shop	Packing	Gen. Plant	Store & Maintenance
	(₹)	(₹)	(₹)	(₹)	(₹)
Allocated Overheads:					
Indirect labour	14,650	4,000	3,000	2,000	5,650
Maintenance material	5,020	1,800	700	1,020	1,500
Misc. supplies	1,750	400	1,000	150	200
Superintendent's salary	4,000	–	–	4,000	–
Cost & payroll salary	10,000	–	–	10,000	–
Overheads to be apportioned:					
Power	8,000				
Rent	12,000				
Fuel and heat	6,000				
Insurance	1,000				
Trade License fees	2,000				
Depreciation	1,00,000				
	1,64,420	6,200	4,700	17,170	7,350



The following data were compiled by means of the factory survey made in the previous year:

	Floor Space (Sqft)	Radiator Sections	No. of Employees	Investment (₹)	H.P hours
Machine Shop	2,000	45	20	6,40,000	3,500
Packing	800	90	10	2,00,000	500
General Plant	400	30	3	10,000	-
Store & Maintenance	1,600	60	5	1,50,000	1,000
	4,800	225	38	10,00,000	5,000

Expenses charged to the stores and maintenance departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%; General Plant overheads is distributed on the basis of number of employees:

PREPARE

- An overhead distribution statement.
- Distribution of the service departments' expense to production departments.

ANSWER:

- Overhead Distribution Statement

Particulars	Production Department		Service Department	
	Machine	Packing	General Plant	Stores & Maint.
Allocated Expenses:				
Indirect labour	4,000	3,000	2,000	5,650
Maintenance material	1,800	700	1,020	1,500
Superintendent's salary	-	-	4,000	-
Misc. supplies	400	1,000	150	200
Cost & payroll salaries	-	-	10,000	-
Total Allocated Overheads	6,200	4,700	17,170	7,350
Apportioned expenses (as per schedule below)	77,720	25,800	2,830	22,650
Total overheads	83,920	30,500	20,000	30,000

Schedule of Apportioned Expenses

Item	Basis	Total Amount	Production Depts.		Service Depts.	
			Machine shop	Packing	Gen. Plant	Store & Maint.
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
Power (7:1:-:2)	HP hours	8,000	5,600	800	-	1,600
Rent (5:2:1:4)	Floor Space	12,000	5,000	2,000	1,000	4,000
Fuel and heat (3:6:2:4)	Radiator Secs.	6,000	1,200	2,400	800	1,600
Insurance (64:20:1:15)	Investment	1,000	640	200	10	150



Trade license fees (64:20:1:15)	Investment	2,000	1,280	400	20	300
Depreciation (64:20:1:15)	Investment	1,00,000	64,000	20,000	1,000	15,000
Total		1,29,000	77,720	25,800	2,830	22,650

(b) Distribution of Service Department Expenses

Particulars	Production Depts.		Service Depts.	
	Machine shop	Packing	Gen. Plant	Store & Maint.
	(₹)	(₹)	(₹)	(₹)
Total Expense [as per (a)]	83,920	30,500	20,000	30,000
Dist. of Store & Maint. (5:2:3)	15,000	6,000	9,000	-30,000
Dist. of General plant (4:2:1)	16,571	8,286	-29,000	4,143
Dist. of Store & Maint. (5:2:3)	2,072	829	1,242	-4,143
Dist. of General plant (4:2:1)	710	355	-1,242	177
Dist. of Store & Maint. (5:2:3)	89	35	53	-177
Dist. of General plant (4:2:1)	35	18	-53	0
Total	1,18,397	46,023		

**QUESTION 12. (PP2)**

Modern Manufactures Ltd. has three Production Departments P₁, P₂, P₃ and two Service Departments S₁ and S₂ details pertaining to which are as under:

	P ₁	P ₂	P ₃	S ₁	S ₂
Direct wages (₹)	3,000	2,000	3,000	1,500	195
Working hours	3,070	4,475	2,419	-	-
Value of machines (₹)	60,000	80,000	1,00,000	5,000	5,000
H.P. of machines	60	30	50	10	-
Light points	10	15	20	10	5
Floor space (sq. ft.)	2,000	2,500	3,000	2,000	500

The following figures extracted from the Accounting records are relevant:

	(₹)
Rent and Rates	5,000
General Lighting	600
Indirect Wages	1,939
Power	1,500
Depreciation on Machines	10,000
Sundries	9,695

The expenses of the service departments are allocated as under:

	P ₁	P ₂	P ₃	S ₁	S ₂
S ₁	20%	30%	40%	-	10%
S ₂	40%	20%	30%	10%	-

DETERMINE the total cost of product X which is processed for manufacture in Departments P₁, P₂ and P₃ for 4, 5 and 3 hours respectively, given that its Direct Material Cost is ₹ 50 and Direct Labour Cost is ₹ 30.

**ANSWER:**

Statement Showing Distribution of Overheads of Modern Manufactures Ltd.

Particulars	Basis	Total	Production Departments			Service Departments	
			P ₁	P ₂	P ₃	S ₁	S ₂
		(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
Direct wages	Actual	1,695	-	-	-	1,500	195
Rent & rates	Area	5,000	1,000	1,250	1,500	1,000	250
General lighting	Light points	600	100	150	200	100	50
Indirect wages	Direct wages	1,939	600	400	600	300	39
Power	H.P.	1,500	600	300	500	100	-
Depreciation of machines	Value of machines	10,000	2,400	3,200	4,000	200	200
Sundries	Direct wages	9,695	3,000	2,000	3,000	1,500	195
		30,429	7,700	7,300	9,800	4,700	929

Redistribution of Service Department's Expenses over Production Departments

	P ₁ (₹)	P ₂ (₹)	P ₃ (₹)	S ₁ (₹)	S ₂ (₹)
Total overhead distributed as above	7,700	7,300	9,800	4,700	929
Dept. S ₁ Overheads apportioned (20:30:40:-:10)	940	1,410	1,880	-4,700	470
Dept. S ₂ overheads apportioned (40:20:30:10:-)	559.6	279.8	419.7	139.9	-1,399
Dept. S ₁ Overheads apportioned (20:30:40:-:10)	28	42	56	-139.9	13.9
Dept. S ₂ overheads apportioned (40:20:30:10:-)	6.2	3.1	4.6	-	-13.9
	9,233.8	9,034.9	12,160.3		
Working hours	3070	4475	2419		
Rate per hour	3.00	2.02	5.03		

Determination of total cost of Product 'X'

	(₹)
Direct material cost	50.00
Direct labour cost	30.00
Overhead cost (See working note)	37.19
	117.19



Working Note:

Overhead cost:

(₹ 3 × 4 hrs.) + (₹ 2.02 × 5 hrs.) + (₹ 5.03 × 3 hrs.)

= ₹ 12 + ₹ 10.10 + ₹ 15.09 = ₹ 37.19



QUESTION 13. (PP3)

Deccan Manufacturing Ltd., have three departments which are regarded as production departments. Service departments' costs are distributed to these production departments using the "Step Ladder Method" of distribution. Estimates of factory overhead costs to be incurred by each department in the forthcoming year are as follows. Data required for distribution is also shown against each department:

Department	Factory overhead (₹)	Direct labour hours	No. of employees	Area in sq.m.
Production:				
X	1,93,000	4,000	100	3,000
Y	64,000	3,000	125	1,500
Z	83,000	4,000	85	1,500
Service:				
P	45,000	1,000	10	500
Q	75,000	5,000	50	1,500
R	1,05,000	6,000	40	1,000
S	30,000	3,000	50	1,000

The overhead costs of the four service departments are distributed in the same order, viz. P, Q, R and S respectively on the following basis.

Department	Basis
P	Number of employees
Q	Direct labour hours
R	Area in square metres
S	Direct labour hours

You are required to:

- PREPARE a schedule showing the distribution of overhead costs of the four service departments to the three production departments; and
- CALCULATE the overhead recovery rate per direct labour hour for each of the three production departments.

ANSWER:

- Deccan Manufacturing Limited

Schedule Showing the Distribution of Overhead Costs among Departments

	Production			Service			
	X (₹)	Y (₹)	Z (₹)	P (₹)	Q (₹)	R (₹)	S (₹)
Overhead cost	1,93,000	64,000	83,000	45,000	75,000	1,05,000	30,000
Distribution of Dept.P (100:125:85:-:50:40:50)	10,000	12,500	8,500	-45,000	5,000	4,000	5,000



Distribution of Dept.Q (4:3:4:-:-:6:3)	16,000	12,000	16,000	-	-80,000	24,000	12,000
Distribution of Dept.R (6:3:3:-:-:-:2)	57,000	28,500	28,500	-	-	-1,33,000	19,000
Distribution of Dept.S (4:3:4:-:-:-:-)	24,000	18,000	24,000	-	-	-	-66,000
Total	3,00,000	1,35,000	1,60,000				

(b) Calculation of overhead recovery rate

	Dept-X	Dept-Y	Dept-Z
Total apportioned overheads	₹3,00,000	₹1,35,000	₹1,60,000
Direct labour hours	4,000	3,000	4,000
Overhead recovery rate per labour hour	₹75	₹45	₹40



QUESTION 14. (PP4)

Gemini Enterprises undertakes three different jobs A, B and C. All of them require the use of a special machine and also the use of a computer. The computer is hired and the hire charges work out to ₹ 4,20,000 per annum. The expenses regarding the machine are estimated as follows:

(₹)

Rent for a quarter	17,500
Depreciation per annum	2,00,000
Indirect charges per annum	1,50,000

During the first month of operation the following details were taken from the job register:

Departments	Job		
	B	C	D
Number of hours the machine was used:			
(a) Without the use of the computer	600	900	—
(b) With the use of the computer	400	600	1,000

You are required to COMPUTE the machine hour rate:

- For the firm as a whole for the month when the computer was used and when the computer was not used.
- For the individual jobs A, B and C.

ANSWER:

Working notes:

(i) Total machine hours used (600 + 900 + 400 + 600 + 1,000)	3,500
(ii) Total machine hours without the use of computers (600 + 900)	1,500
(iii) Total machine hours with the use of computer (400 + 600 + 1,000)	2,000



- (iv) Total overheads of the machine per month
- | | |
|---|--------------------|
| Rent (₹ 17,500 ÷ 3 months) | ₹ 5,833.33 |
| Depreciation (₹ 2,00,000 ÷ 12 months) | ₹ 16,666.67 |
| Indirect Charges (₹ 1,50,000 ÷ 12 months) | ₹ 12,500.00 |
| Total | ₹ 35,000.00 |
- (v) Computer hire charges for a month = ₹ 35,000
(₹ 4,20,000 ÷ 12 months)
- (vi) Overheads for using machines without computer
= $\frac{₹ 35,000}{3,500 \text{ hrs.}} \times 1,500 \text{ hrs.} = ₹ 15,000$
- (vii) Overheads for using machines with computer
= $\frac{₹ 35,000}{3,500 \text{ hrs.}} \times 2,000 \text{ hrs.} + ₹ 35,000 = ₹ 55,000$
- (a) Computation of Machine hour rate for the firm as a whole for a month.
- (1) When the Computer was used: $\frac{₹ 55,000}{2,000 \text{ hours}} = ₹ 27.50 \text{ per hour}$
- (2) When the computer was not used: $\frac{₹ 15,000}{1,500 \text{ hrs.}} = ₹ 10 \text{ per hour}$
- (b) Computation of Machine hour rate for the individual job

	Rate per hour	Job					
		A		B		C	
	(₹)	Hrs.	(₹)	Hrs.	(₹)	Hrs.	(₹)
Overheads							
Without Computer	10.0	600	6,000	900	9,000	-	-
With computer	27.5	400	11,000	600	16,500	1,000	27,500
Total		1,000	17,000	1,500	25,500	1,000	27,500
Machine hour rate			17		17		27.5

**QUESTION 15. (PP5)**

A machine shop has 8 identical Drilling machines manned by 6 operators. The machine cannot be worked without an operator wholly engaged on it. The original cost of all these machines works out to ₹ 8 lakhs. These particulars are furnished for a 6 months period:

Normal available hours per month	208
Absenteeism (without pay) hours	18
Leave (with pay) hours	20
Normal idle time unavoidable-hours	10
Average rate of wages per worker for 8 hours a day.	₹800
Production bonus estimated	15% on wages
Value of power consumed	₹80,500
Supervision and indirect labour	₹33,000



Lighting and electricity ₹12,000
 These particulars are for a year
 Repairs and maintenance including consumables- 3% of value of machines. Insurance- ₹ 40,000
 Depreciation- 10% of original cost.
 Other sundry works expenses- ₹ 12,000
 General management expenses allocated- ₹ 54,530.
 You are required to COMPUTE a comprehensive machine hour rate for the machine shop.

ANSWER:

Computation of comprehensive machine hour rate of machine shop

Particulars	(₹)
Operator's wages (Refer to working note 2)	7,38,000
Production bonus (15% on wages)	1,10,700
Power consumed	80,500
Supervision and indirect labour	33,000
Lighting and electricity	12,000
Repairs and maintenance (3% × ₹ 8 lakh × ½)	12,000
Insurance (₹ 40,000 × ½)	20,000
Depreciation (10% × ₹ 8 lakh × ½)	40,000
Sundry works expenses (₹12,000 × ½)	6,000
General management expenses (₹54,530 × ½)	27,265
	10,79,465

Machine hour rate = $\frac{\text{Total overheads of machine shop}}{\text{Hours of machines operation}}$

= $\frac{\text{₹ 10, 79, 465}}{7, 200 \text{ hours}}$ (Refer to working note 1) = ₹149.93

Working notes

1. Computation of hours, for which 6 operators are available for 6 months.

Particulars	For 6 months and 6 operators
Normal available hours (208 × 6 months × 6 operators)	7,48
Less: Absenteeism hours (18 × 6 operators)	(108)
Paid hours	7,380
Less: Leave hours (20 × 6 operators)	(120)
Less: Idle time hours (10 × 6 operators)	(60)
Effective working hours	7,200

As machines cannot be worked without an operator wholly engaged on them therefore, hours for which 6 operators are available for 6 months are the hours for which machines can be used. Hence 7,200 hours represent effective working hours.

2. Computation of operator's wages

Average rate of wages: $\frac{\text{₹800}}{8 \text{ hours}} = \text{₹100 per hour}$



Total wages paid to 6 operators for 6 months = 7,380 hours × ₹ 100 = ₹ 7,38,000

QUESTION 16. (PP6)

Job No. 198 was commenced on October 10, 2022 and completed on November 1, 2022. Materials used were ₹ 6,000 and labour charged directly to the job was ₹ 4,000. Other information is as follows:

Machine No. 215 used for 40 hours, the machine hour rate being ₹ 35.

Machine No. 160 used for 30 hours, the machine hour rate being ₹ 40. Six welders worked on the job for five days of 8 hours each: the Direct labour hour per welder is ₹ 20.

General expenses related to production not included for calculating either the machine hour or direct labour hour rate totaled ₹20,000, total direct wages for the period being ₹2,00,000.

COMPUTE the works costs for job No. 198.

ANSWER:

Computation for works costs for job No. 198

	(₹)	(₹)
Materials		6,000
Direct labour		4,000
		10,000
Factory overheads:		
Machine No. 215 : 40 hours @ ₹35	1,400	
Machine No. 160 : 30 hours @ ₹40	1,200	
*240 hours of welders @ ₹ 20 per hr.	4,800	
**General expenses 10% of wages	400	7,800
Work cost		17,800

* 6 welders × 5 days × 8 hours = 240 hours

** Un- apportioned expenses ₹ 20,000 which works out at 10% of direct wages.



QUESTION 17. (PP7)

In a factory, overheads of a particular department are recovered on the basis of ₹ 5 per machine hour. The total expenses incurred and the actual machine hours for the department for the month of August were ₹ 80,000 and 10,000 hours respectively. Of the amount of ₹ 80,000, ₹ 15,000 became payable due to an award of the Labour Court and ₹ 5,000 was in respect of expenses of the previous year booked in the current month (August). Actual production was 40,000 units, of which 30,000 units were sold. On analysing the reasons, it was found that 60% of the under-absorbed overhead was due to defective planning and the rest was attributed to normal cost increase. SHOW the treatment of over/under-absorbed overhead in the cost accounts?

ANSWER:

Computation of Over/Under-absorbed overhead expenses during the month of August

	(₹)	(₹)
Total expenses incurred in the month of August:		80,000
Less: The amount paid according to labour court award (Assumed to be non-recurring)	15,000	
Expenses of previous year	5000	(20,000)
Net overhead expenses incurred for the month		60,000
Overhead recovered for 10,000 hours @ ₹ 5 per hour		(50,000)



Under-absorbed overheads	10,000

60% of under-absorbed overhead was due to defective planning, it will be charged to costing profit & loss account.

40% of under-absorbed overhead i.e. ₹4,000 may be distributed over Finished Goods and Cost of Sales using supplementary overhead rate:

$$\begin{aligned}\text{Supplementary rate} &= \frac{\text{Under-absorbed OH}}{\text{Units produced}} \\ &= \frac{\text{₹4,000}}{40,000 \text{ units}} = \text{₹0.10}\end{aligned}$$

Amount of under-absorbed overheads charged to finished goods

$$= 10,000 \text{ units} \times \text{₹0.10} = \text{₹1,000}$$

Amount of under-absorbed overheads charged to cost of sales

$$= 30,000 \text{ units} \times \text{₹0.10} = \text{₹3,000}$$



QUESTION 18. (PP8)

In a manufacturing unit, factory overhead was recovered at a pre-determined rate of ₹ 25 per man-day. The total factory overhead expenses incurred and the man-days actually worked were ₹ 41.50 lakhs and 1.5 lakh man-days respectively. Out of the 40,000 units produced during a period, 30,000 were sold.

On analysing the reasons, it was found that 60% of the unabsorbed overheads were due to defective planning and the rest were attributable to increase in overhead costs.

EXPLAIN how would unabsorbed overheads be treated in Cost Accounts?

ANSWER:

Computation of unabsorbed overheads

Man-days worked	1,50,000
	(₹)
Overhead actually incurred	41,50,000
Less: Overhead absorbed @ ₹ 25 per man-day (₹ 25 × 1,50,000)	37,50,000
Unabsorbed overheads	4,00,000
Unabsorbed overheads due to defective planning (i.e. 60% of ₹ 4,00,000)	2,40,000
Balance of unabsorbed overhead	1,60,000

Treatment of unabsorbed overheads in Cost Accounts

- The unabsorbed overheads of ₹ 2,40,000 due to defective planning to be treated as abnormal and therefore be charged to Costing Profit and Loss Account.
- The balance unabsorbed overheads of ₹1,60,000 be charged to production i.e., 40,000 units at the supplementary overhead absorption rate i.e., ₹ 4 per unit (Refer to Working Note)

Charge to Costing Profit and Loss Account as part of the cost of unit sold (30,000 units @ ₹ 4 p.u.)	1,20,000
Add: To closing stock of finished goods	40,000



(10,000 units @ ₹ 4 p.u.)

Total

1,60,000

Working Note:

$$\text{Supplementary overhead absorption rate} = \frac{\text{₹ 1,60,000}}{40,000 \text{ units}} = \text{₹ 4 p.u.}$$

**QUESTION 19. (PP9)**

A factory has three production departments. The policy of the factory is to recover the production overheads of the entire factory by adopting a single blanket rate based on the percentage of total factory overheads to total factory wages. The relevant data for a month are given below:

Department	Direct Materials (₹)	Direct Wages (₹)	Factory Overheads (₹)	Direct Labour hours	Machine hours
Budget:					
Machining	6,50,000	80,000	3,60,000	20,000	80,000
Assembly	1,70,000	3,50,000	1,40,000	1,00,000	10,000
Packing	1,00,000	70,000	1,25,000	50,000	-
Actual:					
Machining	7,80,000	96,000	3,90,000	24,000	96,000
Assembly	1,36,000	2,70,000	84,000	90,000	11,000
Packing	1,20,000	90,000	1,35,000	60,000	

The details of one of the representative jobs produced during the month are as under:

Job No. CW 7083 :

Department	Direct Materials	Direct Wages (₹)	Direct Labour hours	Machine hours
Machining	1,200	240	60	180
Assembly	600	360	120	30
Packing	300	60	40	-

The factory adds 30% on the factory cost to cover administration and selling overheads and profit.

Required:

- COMPUTE the overhead absorption rate as per the current policy of the company and determine the selling price of the Job No. CW 7083.
- Suggest any suitable alternative method(s) of absorption of the factory overheads and CALCULATE the overhead recovery rates based on the method(s) so recommended by you.
- DETERMINE the selling price of Job CW 7083 based on the overhead application rates calculated in (ii) above.
- CALCULATE the department-wise and total under or over recovery of overheads based on the company's current policy and the method(s) recommended by you.

ANSWER:

(i)

Computation of overhead absorption rate
(as per the current policy of the company)

Department	Budgeted factory Overheads	Budgeted direct wages



	(₹)	(₹)
Machinery	3,60,000	80,000
Assembly	1,40,000	3,50,000
Packing	1,25,000	70,000
Total	6,25,000	5,00,000

$$\text{Overhead absorption rate} = \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct wages}} \times 100$$

$$= \frac{₹ 6,25,000}{₹ 5,00,000} \times 100 = 125\% \text{ of Direct wages}$$

Selling Price of the Job No. CW-7083

	(₹)
Direct materials (₹ 1,200 + ₹ 600 + ₹ 300)	2,100.00
Direct wages (₹ 240 + ₹ 360 + ₹ 60)	660.00
Overheads (125% × ₹ 660)	825.00
Total factory cost	3,585.00
Add: Mark-up (30% × ₹ 3,585)	1,075.50
Selling price	4,660.50

(ii) Methods available for absorbing factory overheads and their overhead recovery rates in different departments

1. Machining Department

In the machining department, the use of machine time is the predominant factor of production. Hence machine hour rate should be used to recover overheads in this department. The overhead recovery rate based on machine hours has been calculated as under:

$$\begin{aligned} \text{Machine hour rate} &= \frac{\text{Budgeted factory overheads}}{\text{Budgeted machine hours}} \\ &= \frac{₹ 3,60,000}{80,000 \text{ hours}} = ₹ 4.50 \text{ per hour} \end{aligned}$$

2. Assembly Department

In this department direct labour hours is the main factor of production. Hence direct labour hour rate method should be used to recover overheads in this department. The overheads recovery rate in this case is:

$$\begin{aligned} \text{Direct labour hour rate} &= \frac{\text{Budgeted factory overheads}}{\text{Budgeted direct labour hours}} \\ &= \frac{₹ 1,40,000}{1,00,000 \text{ hours}} = ₹ 1.40 \text{ per hour} \end{aligned}$$

3. Packing Department

Labour is the most important factor of production in this department. Hence direct labour hour rate method should be used to recover overheads in this department. The overhead recovery rate in this case comes to:

$$\text{Direct labour hour rate} = \frac{\text{Budgeted factory overhead}}{\text{Direct labour hours}}$$



$$= \frac{\text{₹}1,25,000}{50,000 \text{ hours}} = \text{₹} 2.50 \text{ per hour}$$

- (iii) Selling Price of Job CW-7083 [based on the overhead application rates calculated in (ii) above]

	(₹)
Direct materials	2,100.00
Direct wages	660.00
Overheads (Refer to Working note)	<u>1,078.00</u>
Factory cost	3,838.00
Add: Mark up (30% of ₹ 3,838)	<u>1,151.40</u>
Selling price	<u>4,989.40</u>

Working note:

Overhead Summary Statement

Dept.	Basis	Hours	Rate (₹)	Overheads (₹)
Machining	Machine hour	180	4.50	810
Assembly	Direct labour hour	120	1.40	168
Packing	Direct labour hour	40	2.50	100
			Total	1,078

- (iv) Department-wise statement of total under or over recovery of overheads

(a) Under current policy

Departments

	Machining (₹)	Assembly (₹)	Packing (₹)	Total (₹)
Direct wages (Actual)	96,000	2,70,000	90,000	
Overheads recovered @ 125% of Direct wages: (A)	1,20,000	3,37,500	1,12,500	5,70,000
Actual overheads: (B)	3,90,000	84,000	1,35,000	6,09,000
(Under)/Over recovery of overheads : (A-B)	(2,70,000)	2,53,500	(22,500)	(39,000)

(b) As per methods suggested

Basis of overhead recovery

	Machine hours	Direct labour hours (Assembly)	Direct labour hours (Packing)	Total (₹)
Hours worked	96,000	90,000	60,000	
Rate/hour (₹)	4.50	1.40	2.50	
Overhead recovered (₹): (A)	4,32,000	1,26,000	1,50,000	7,08,000



Actual overheads (₹): (B)	3,90,000	84,000	1,35,000	6,09,000
(Under)/Over recovery: (AB)	42,000	42,000	15,000	99,000

**QUESTION 20. (PP10)**

A light engineering factory fabricates machine parts for customers. The factory commenced fabrication of 12 nos. machine parts as per customers' specifications, the expenditure incurred on the job for the week ending 21st August is as tabulated below:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @ ₹ 15 per hour		300.00
Machine facilities :		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹ 8 per hour on 20 manual hours		160.00
Total cost		1,810.00

The overhead rate of ₹ 8 per hour is based on 3,000 man hours per week; similarly, the machine hour rates are based on the normal working of Machine Nos. I and II for 40 hours out of 45 hours per week.

After the close of each week, the factory levies a supplementary rate for the recovery of full overhead expenses on the basis of actual hours worked during the week. During the week ending 21st August, the total labour hours worked was 2,400 and Machine Nos. I and II had worked for 30 hours and 32.5 hours respectively.

PREPARE a Cost Sheet for the job for the fabrication of 12 nos. machine parts duly levying the supplementary rates.

ANSWER:

Fabrication of 12 nos. machine parts (job No...)

Date of commencement: 16th August Date of Completion:

Cost sheet for the week ending, August 21st:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @ ₹ 15 per hour		300.00
Machine facilities:		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹ 8 per hour on 20 manual hours		160.00
Total cost		1,810.00
Supplementary Rates		
Overheads 20 hours @ ₹ 2 per hour (Refer WN-1)	40.00	
Machine facilities: (Refer WN-2)		
Machine No. I - 4 hours @ ₹ 15	60.00	
Machine No. II - 6 hours @ ₹ 15	90.00	190.00
Cost		2,000.00

**Working notes (WN):**

1. Overheads budgeted: 3,000 man-hours × ₹8 = ₹24,000

Actual hours: 2,400 man-hours

Actual rate per hour ₹24,000 ÷ 2,400 hours = ₹10

Supplementary charge ₹ 2 (₹10 – ₹ 8) per hour

2. Machine facilities:

	Machine No. I	Machine No. II
Budgeted	₹1,800 (40 × ₹45)	₹2,600 (40 × ₹65)
Actual number of hours	30	32.5
Actual rate per hour	₹60.00	₹80.00
Supplementary rate per hour	₹ 15.00 (₹60.00 – ₹45.00)	₹ 15.00 (₹80.00 – ₹65.00)

**QUESTION 21. (PP11)**

ABC Ltd. manufactures a single product and absorbs the production overheads at a pre-determined rate of ₹ 10 per machine hour.

At the end of current financial year, it has been found that actual production overheads incurred were ₹ 6,00,000. It included ₹ 45,000 on account of 'written off' obsolete stores and ₹ 30,000 being the wages paid for the strike period under an award.

The production and sales data for the current year is as under:

Production :

Finished goods	20,000 units
Work-in-progress	8,000 units
(50% complete in all respects)	

Sales :

Finished goods	18,000 units

The actual machine hours worked during the period were 48,000. It has been found that one-third of the under-absorption of production overheads was due to lack of production planning and the rest was attributable to normal increase in costs.

- CALCULATE the amount of under-absorption of production overheads during the current year; and
- SHOW the accounting treatment of under-absorption of production overheads.

ANSWER:

- Amount of under-absorption of production overheads during the current year

	(₹)	
Total production overheads actually incurred during the current year	6,00,000	
Less : 'Written off' obsolete stores	₹ 45,000	
Wages paid for strike period	₹ 30,000	75,000
Net production overheads actually incurred : (A)	5,25,000	
Production overheads absorbed by 48,000 machine		



hours @ ₹ 10 per hour : (B)	4,80,000
Amount of under – absorption of production overheads : [(A) – (B)]	45,000

(ii) Accounting treatment of under absorption of production overheads

It is given in the statement of the question that 20,000 units were completely finished and 8,000 units were 50% complete, one third of the under-absorbed overheads were due to lack of production planning and the rest were attributable to normal increase in costs.

(₹)

- (33 – 1/3% of ₹ 45,000) i.e., ₹ 15,000 of under-absorbed overheads were due to lack of production planning.
This being abnormal, should be debited to the Costing Profit and Loss A/c. 15,000
 - Balance (66–2/3% of ₹ 45,000) i.e., ₹ 30,000 of under-absorbed overheads should be distributed over work-in-progress, finished goods and cost of sales by using supplementary rate. 30,000
- Total under-absorbed overheads 45,000

Apportionment of unabsorbed overheads of ₹ 30,000 over, work-in progress, finished goods and cost of sales

	Equivalent Completed Units	(₹)
Work-in-Progress (4,000 units × ₹ 1.25) (Refer to working note)	4,000	5,000
Finished goods (2,000 units × ₹ 1.25)	2,000	2,500
Cost of sales (18,000 units × ₹ 1.25)	18,000	22,500
	24,000	30,000

Working Note

Supplementary rate per unit = $\frac{\text{₹ 30,000}}{24,000} = \text{₹ 1.25}$

**QUESTION 22. (PP12)**

A Ltd., manufactures two products A and B. The manufacturing division consists of two production departments P1 and P2 and two service departments S1 and S2. Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P1 is based on direct machine hours, while the rate of Department P2 is based on direct labour hours. In applying overheads, the pre-determined rates are multiplied by actual hours.

For allocating the service department costs to production departments, the basis adopted is as follows:

- Cost of Department S1 to Department P1 and P2 equally, and
- Cost of Department S2 to Department P1 and P2 in the ratio of 2 : 1 respectively.



The following budgeted and actual data are available:

Annual profit plan data:

Factory overheads budgeted for the year:

Production Departments		Service Departments	
P ₁	P ₂	S ₁	S ₂
₹ 25,50,000	₹ 21,75,000	₹ 6,00,000	₹ 4,50,000

Budgeted output in units:

Product A 50,000; B 30,000.

Budgeted raw-material cost per unit:

Product A ₹ 120; Product B ₹ 150.

Budgeted time required for production per unit:

Department P₁ : Product A : 1.5 machine hours

Product B : 1.0 machine hour

Department P₂ : Product A : 2 Direct labour hours

Product B : 2.5 Direct labour hours

Average wage rates budgeted in Department P₂ are:

Product A - ₹ 72 per hour and Product B - ₹ 75 per hour.

All materials are used in Department P₁ only.

Actual data: (for the month of July, 2022)

Units actually produced: Product A: 4,000 units

Product B: 3,000 units

Actual direct machine hours worked in Department P₁:

On product A- 6,100 hours, Product B- 4,150 hours.

Actual direct labour hours worked in Department P₂:

on product A- 8,200 hours, Product B- 7,400 hours.

Costs actually incurred:

	Product A	Product B
Raw materials	₹ 4,89,000	₹ 4,56,000
Wages	₹ 5,91,900	₹ 5,52,000
Overheads: Department P ₁	₹ 2,31,000 S ₁	₹ 60,000
P ₂	₹ 2,04,000 S ₂	₹ 48,000

You are required to:

- COMPUTE the pre-determined overhead rate for each production department.
- PREPARE a performance report for July, 2022 that will reflect the budgeted costs and actual costs.

ANSWER:

- (i) Computation of predetermined overhead rate for each production departments from budgeted data

Particulars	Production Department		Service Department	
	P ₁	P ₂	S ₁	S ₂
Budgeted factory overheads for the year in (₹)	25,50,000	21,75,000	6,00,000	4,50,000



Allocation of service department S1's costs to production departments P1 and P2 equally in (₹)	3,00,000	3,00,000	(6,00,000)	—
Allocation of service department S2's costs to production departments P1 and P2 in the ratio of 2:1 in (₹)	3,00,000	1,50,000	—	(4,50,000)
Total	31,50,000	26,25,000	—	—
Budgeted machine hours in department P1 (working note 1)	1,05,000	—		
Budgeted labour hours in department P2 (working note 1)	—	1,75,000		
Budgeted machine/ labour hour rate (₹)	30.00	15.00		

(ii) Performance report for July, 2022

(When 4,000 and 3,000 units of products A and B respectively were actually produced)

	Budgeted (₹)	Actual (₹)
Raw materials used in Dept. P ₁ :		
A : 4,000 units × ₹ 120	4,80,000	4,89,000
B : 3,000 units × ₹ 150	4,50,000	4,56,000
Direct labour cost (on the basis of labour hours worked in department P ₂)		
A : 4,000 units × 2 hrs. × ₹ 72	5,76,000	5,91,900
B : 3,000 units × 2.5 hrs. × ₹ 75	5,62,500	5,52,000
Overhead absorbed on machine hour basis in Dept. P ₁ :		
A : 4,000 units × 1.5 hrs. × ₹30	1,80,000	1,74,400*
B : 3,000 units × 1 hr. × ₹30	90,000	1,18,649*
Overhead absorbed on labour hour basis in Dept. P ₂ :		
A : 4,000 units × 2 hrs. × ₹ 15	1,20,000	1,31,364**
B : 3,000 units × 2.5 hrs. × ₹ 15	1,12,500	
1,18,548**		
	25,71,000	26,31,861

* (Refer to working note 4) ** (Refer to working note 5)

Working notes:

1.

	Product A	Product B	Total
Budgeted output (in units)	50,000	30,000	
Budgeted machine hours in Dept. P ₁	75,000	30,000	1,05,000
	(50,000 × 1.5 hrs.)	(30,000 × 1 hr.)	
Budgeted labour hours in Dept. P ₂	1,00,000	75,000	1,75,000
	(50,000 × 2 hrs.)	(30,000 × 2.5 hrs.)	



2.

	Product A	Product B	Total
Actual output (in units)	4,000	3,000	
Actual machine hours utilized in Dept. P ₁	6,100	4,150	10,250
Actual labour hours utilised in Dept. P ₂	8,200	7,400	15,600

3. Computation of actual overhead rates for each production department from actual data

	Production Department		Service Department	
	P ₁	P ₂	S ₁	S ₂
Actual factory overheads for the month of July, 2022 in (₹)	2,31,000	2,04,000	60,000	48,000
Allocation of service Dept. S ₁ 's costs to production Dept. P ₁ and P ₂ equally in (₹)	30,000	30,000	(60,000)	-
Allocation of service Dept. S ₂ 's costs to production Dept. P ₁ and P ₂ in the ratio of 2:1 in (₹)	32,000	16,000	-	(48,000)
Total	2,93,000	2,50,000	--	--
Actual machine hours in Dept. P ₁ (working note 2)	10,250	--		
Actual labour hours in Dept. P ₂ (working note 2)	--	15,600		
Actual machine/ labour hour rate (₹)	28.59	16.02		

4. Actual overheads absorbed (based on machine hours)

A : 6,100 hrs × ₹ 28.59 = ₹ 1,74,400

B : 4,150 hrs × ₹ 28.59 = ₹ 1,18,649

5. Actual overheads absorbed (based on labour hours)

A : 8,200 hrs × ₹ 16.02 = ₹ 1,31,364

B : 7,400 hrs × ₹ 16.02 = ₹ 1,18,548



REVISION TEST PAPER



RTP MAY 18

PQR manufacturers – a small scale enterprise, produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The annual budgeted production overheads for the year 2017-18 are ₹ 44,00,000 and budgeted annual machine hours are 2,20,000.

For a period of first six months of the financial year 2017-18, following information were extracted from the books:

Actual production overheads	₹ 24,88,200
Amount included in the production overheads:	
Paid as per court's order	₹ 1,28,000
Expenses of previous year booked in current year	₹ 1,200
Paid to workers for strike period under an award	₹ 44,000
Obsolete stores written off	₹ 6,700

Production and sales data of the concern for the first six months are as under:

Production:

Finished goods	24,000 units
Works-in-progress (50% complete in every respect)	18,000 units

Sale:

Finished goods	21,600 units

The actual machine hours worked during the period were 1,16,000 hours. It is revealed from the analysis of information that $\frac{1}{4}$ of the under/ over absorption was due to defective production policies and the balance was attributable to increase/decrease in costs.

Required:

- DETERMINE the amount of under/over absorption of production overheads for the six-month period of 2017-18.
- EXAMINE the accounting treatment of under/ over absorption of production overheads, and
- CALCULATE the apportionment of the under/ over absorbed overheads over the items.

ANSWER :

- Amount of under/ over absorption of production overheads during the period of first six months of the year 2017-2018:

	Amount (₹)	Amount (₹)
Total production overheads actually incurred during the period		24,88,200
Less: Amount paid to worker as per court order	1,28,000	



Expenses of previous year booked in the current year	1,200	
Wages paid for the strike period under an award	44,000	
Obsolete stores written off	6,700	(1,79,900)
		23,08,300
Less: Production overheads absorbed as per machine hour rate (1,16,000 hours × ₹20*)		23,20,000
Amount of over absorbed production overheads		11,700

*Budgeted Machine hour rate (Blanket rate) = $\frac{₹44,00,000}{2,20,000 \text{ hours}} = ₹ 20 \text{ per hour}$

- (ii) Accounting treatment of over absorbed production overheads: As, one fourth of the over absorbed overheads were due to defective production policies, this being abnormal, hence should be transferred to Costing Profit and Loss Account.

Amount to be transferred to Costing Profit and Loss Account = $(11,700 \times \frac{1}{4}) = ₹ 2,925$

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

Amount to be distributed = $(11,700 \times \frac{3}{4}) = ₹ 8,775$

Supplementary rate = $\frac{₹ 8,775}{33,000 \text{ units}} = ₹ 0.2659 \text{ per unit}$

- (iii) Apportionment of under absorbed production overheads over WIP, Finished goods and Cost of sales:

	Equivalent completed units	Amount (₹)
Work-in-Progress (18,000 units × 50% × ₹ 0.2659)	9,000	2,393
Finished goods (2,400 units × ₹ 0.2659)	2,400	638
Cost of sales (21,600 units × ₹ 0.2659)	21,600	5,744
Total	33,000	8,775



RTP NOV 18

Sree Ajeet Ltd. having fifteen different types of automatic machines furnishes information as under for 20X8-20X9

- (i) Overhead expenses: Factory rent ₹ 1,80,000 (Floor area 1,00,000 sq. ft.), Heat and gas ₹ 60,000 and supervision ₹ 1,50,000.
- (ii) Wages of the operator are ₹ 200 per day of 8 hours. Operator attends to one machine when it is under set up and two machines while they are under operation.

In respect of machine B (one of the above machines) the following particulars are furnished:

- (i) Cost of machine ₹1,80,000, Life of machine- 10 years and scrap value at the end of its life ₹ 10,000
- (ii) Annual expenses on special equipment attached to the machine are estimated as ₹ 12,000
- (iii) Estimated operation time of the machine is 3,600 hours while set up time is 400 hours per annum



- (iv) The machine occupies 5,000 sq. ft. of floor area.
 (v) Power costs ₹ 5 per hour while machine is in operation.

ESTIMATE the comprehensive machine hour rate of machine B. Also find out machine costs to be absorbed in respect of use of machine B on the following two work orders

	Work order- 1	Work order-2
Machine set up time (Hours)	15	30
Machine operation time (Hours)	100	190

ANSWER :

Sree Ajeet Ltd.

Statement showing comprehensive machine hour rate of Machine B

	(₹)
Standing Charges:	
Factory rent {(₹ 1,80,000/1,00,000 sq. ft.) × 5,000 Sq. ft.}	9,000
Heat and Gas (₹ 60,000/15 machines)	4,000
Supervision (₹ 1,50,000/ 15 machines)	10,000
Depreciation [(₹ 1,80,000 – ₹ 10,000)/ 10 years]	17,000
Annual expenses on special equipment	12,000
	52,000
Fixed cost per hour (₹ 52,000/ 4,000 hrs.)	13/-

	Set up rate Per hour (₹)	Operational rate Per hour (₹)
Fixed cost	13.00	13.00
Power	--	5.00
Wages	25.00	12.50
Comprehensive machine hour rate per hr.	38.00	30.50

Statement of 'B' machine costs
to be absorbed on the two work orders

	Work order-1			Work order-2		
	Hours	Rate	Amount	Hours	Rate	Amount
		₹	₹	₹	₹	₹
Set up time cost	15	38	570	30	38	1,140
Operation time cost	100	30.5	3,050	190	30.5	5,795
Total cost			3,620			6,935

**RTP MAY 19**

The Union Ltd. has the following account balances and distribution of direct charges on 31st March, 2019.

	Total	Production Depts.		Service Depts.	
		Machine Shop	Packing	General Plant	Stores
Allocated Overheads:	(₹)	(₹)	(₹)	(₹)	(₹)
Indirect labour	29,000	8,000	6,000	4,000	11,000



Maintenance Material	9,900	3,400	1,600	2,100	2,800
Misc. supplies	5,900	1,500	2,900	900	600
Supervisor's salary	16,000	--	--	16,000	--
Cost & payroll salary	80,000	--	--	80,000	--

Overheads to be apportioned:

Power	78,000
Rent	72,000
Fuel and Heat	60,000
Insurance	12,000
Taxes	8,400
Depreciation	1,20,000

The following data were compiled by means of the factory survey made in the previous year:

	Floor Space	Radiator Section	No. of employees	Investment	H.P. hours
Machine Shop	2,000 Sq. ft.	45	20	8,00,000	3,500
Packing	800 Sq. ft.	90	12	2,40,000	500
General Plant	400 Sq. ft.	30	4	80,000	-
Stores & maintenance	1,600 Sq. ft.	60	8	1,60,000	1,000

Expenses charged to the stores departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%;

General Plant overheads is distributed on the basis of number of employees.

- (a) PREPARE an overhead distribution statement with supporting schedules to show computations and basis of distribution.
- (b) DETERMINE the service department distribution by simultaneous equation method.

ANSWER :

(a) Overhead Distribution Statement

	Production Departments		Service Departments	
	Machine Shops	Packing	General Plant	Stores
Allocated Overheads:	(₹)	(₹)	(₹)	(₹)
Indirect labour	8,000	6,000	4,000	11,000
Maintenance Material	3,400	1,600	2,100	2,800
Misc. supplies	1,500	2,900	900	600
Supervisor's salary	--	--	16,000	--
Cost & payroll salary	--	--	80,000	--
Total allocated overheads	12,900	10,500	1,03,000	14,400
Add: Apportioned Overheads (As per Schedule below)	1,84,350	70,125	22,775	73,150
	1,97,250	80,625	1,25,775	87,550



Schedule of Apportionment of Overheads

Item of Cost	Basis	Production Departments		Service Departments	
		Machine Shops (₹)	Packing (₹)	General Plant (₹)	Stores (₹)
Power	HP hours (7 : 1 : - : 2)	54,600	7,800	--	15,600
Rent	Floor space (5 : 2 : 1 : 4)	30,000	12,000	6,000	24,000
Fuel & Heat	Radiator sec. (3 : 6 : 2 : 4)	12,000	24,000	8,000	16,000
Insurance	Investment (10 : 3 : 1 : 2)	7,500	2,250	750	1,500
Taxes	Investment (10 : 3 : 1 : 2)	5,250	1,575	525	1,050
Depreciation	Investment (10 : 3 : 1 : 2)	75,000	22,500	7,500	15,000
		1,84,350	70,125	22,775	73,150

(b) Re-distribution of Overheads of Service Departments to Production Departments:

Let, the total overheads of General Plant = 'a' and the total overheads of Stores = 'b'

$$a = 1,25,775 + 0.3b \dots\dots\dots (i)$$

$$b = 87,550 + 0.2a \dots\dots\dots (ii)$$

Putting the value of 'b' in equation no. (i)

$$a = 1,25,775 + 0.3 (87,550 + 0.2a)$$

$$\text{Or } a = 1,25,775 + 26,265 + 0.06a$$

$$\text{Or } 0.94a = 1,52,040 \quad \text{Or } a = 1,61,745 \text{ (appx.)}$$

Putting the value of a = 1,61,745 in equation no. (ii) to get the value of 'b'

$$b = 87,550 + 0.2 \times 1,61,745 = 1,19,899$$

Secondary Distribution Summary

Particulars	Total (₹)	Machine Shops (₹)	Packing (₹)
Allocated and Apportioned overheads as per Primary distribution	2,77,875	1,97,250.00	80,625.00
- General Plant	1,61,745	80,872.50 $\left(1,61,745 \times \frac{5}{10}\right)$	48,523.50 $\left(1,61,745 \times \frac{3}{10}\right)$
- Stores	1,19,899	59,949.50 $(1,19,899 \times 50\%)$	23,979.80 $(1,19,899 \times 20\%)$
		3,38,072.00	1,53,128.30



RTP NOV 19

PLR Ltd. manufactures a single product and recovers the overheads by adopting a single blanket rate based on machine hours. The budgeted production overheads of the factory for the FY 2019-20 are ₹50,40,000 and budgeted machine hours are 6,000.



For a period of first six months of the financial year 2019-20, following information were extracted from the books:

Actual production overheads ₹34,08,000

Amount included in the production overheads:

Paid as per court's order ₹4,50,000

Expenses of previous year booked in current year ₹1,00,000

Paid to workers for strike period under an award ₹4,20,000

Obsolete stores written off ₹36,000

Production and sales data of the concern for the first six months are as under: Production:

Finished goods 1,10,000 units

Works-in-progress

(50% complete in every respect) 80,000 units

Sale:

Finished goods 90,000 units

The actual machine hours worked during the period were 3,000 hours. It is revealed from the analysis of information that 40% of the over/under-absorption was due to defective production policies and the balance was attributable to increase in costs.

You are required:

- to determine the amount of over/ under absorption of production overheads for the period,
- to show the accounting treatment of over/ under-absorption of production overheads, and
- to apportion the over/ under-absorbed overheads over the items.

ANSWER :

- Amount of over/ under absorption of production overheads during the period of first six months of the year 2019-20:

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

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

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

Amount to be credited to Costing Profit and Loss Account

= ₹1,18,000 × 40% = ₹47,200.



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

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

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

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

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



RTP MAY 20

ABC Ltd. has three production departments P1, P2 and P3 and two service departments S₁ and S₂. The following data are extracted from the records of the company for the month of January, 2020:

	(₹)
Rent and rates	6,25,000
General lighting	7,50,000
Indirect wages	1,87,500
Power	25,00,000
Depreciation on machinery	5,00,000
Insurance of machinery	2,00,000

Other Information:

	P ₁	P ₂	P ₃	S ₁	S ₂
Direct wages (₹)	3,75,000	2,50,000	3,75,000	1,87,500	62,500
Horse Power of Machines used	60	30	50	10	
Cost of machinery (₹)	30,00,000	40,00,000	50,00,000	2,50,000	2,50,000
Floor space (Sq. ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	-	-

Expenses of the service departments S₁ and S₂ are reapportioned as below:

	P ₁	P ₂	P ₃	S ₁	S ₂
S ₁	20%	30%	40%	-	10%
S ₂	40%	20%	30%	10%	-

Required:

- COMPUTE overhead absorption rate per production hour for each production department.
- DETERMINE the total cost of product X which is processed for manufacture in department P₁, P₂ and P₃ for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is ₹6,250 and direct labour cost is ₹3,750.

**ANSWER :****Primary Distribution Summary**

Item of cost	Basis of apportionment	Total (₹)	P ₁ (₹)	P ₂ (₹)	P ₃ (₹)	S ₁ (₹)	S ₂ (₹)
Direct wages	Actual	2,50,000	--	--	--	1,87,500	62,500
Rent and rates	Floor area (4 : 5 : 6 : 4 : 1)	6,25,000	1,25,000	1,56,250	1,87,500	1,25,000	31,250
General lighting	Light points (2 : 3 : 4 : 2 : 1)	7,50,000	1,25,000	1,87,500	2,50,000	1,25,000	62,500
Indirect wages	Direct wages (6 : 4 : 6 : 3 : 1)	1,87,500	56,250	37,500	56,250	28,125	9,375
Power	Horse Power of machines used (6 : 3 : 5 : 1)	25,00,000	10,00,000	5,00,000	8,33,333	1,66,667	
Depreciation of machinery	Value of machinery (12:16:20:1:1)	5,00,000	1,20,000	1,60,000	2,00,000	10,000	10,000
Insurance of machinery	Value of machinery (12:16:20:1:1)	2,00,000	48,000	64,000	80,000	4,000	4,000
		50,12,500	14,74,250	11,05,250	16,07,083	6,46,292	1,79,625

Overheads of service cost centres:

Let S₁ be the overhead of service cost centre S₁ and S₂ be the overhead of service cost centre S₂.

$$S_1 = 6,46,292 + 0.10 S_2$$

$$S_2 = 1,79,625 + 0.10 S_1$$

Substituting the value of S₂ in S₁ we get

$$S_1 = 6,46,292 + 0.10 (1,79,625 + 0.10 S_1)$$

$$S_1 = 6,46,292 + 17,962.5 + 0.01 S_1$$

$$0.99 S_1 = 6,64,254.5$$

$$\therefore S_1 = ₹6,70,964$$

$$\therefore S_2 = 1,79,625 + 0.10 \times 6,70,964$$

$$= ₹2,46,721.4$$

Secondary Distribution Summary

Particulars	Total (₹)	P ₁ (₹)	P ₂ (₹)	P ₃ (₹)
Allocated and Apportioned overheads as per primary distribution	41,86,583	14,74,250	11,05,250	16,07,083
S ₁	6,70,964	1,34,192.8	2,01,289.2	2,68,385.6
S ₂	2,46,721.4	98,688.6	49,344.3	74,016.5
		17,07,131.4	13,55,883.5	19,49,485.1

(i) Overhead rate per hour

Particulars	P ₁	P ₂	P ₃
Total overheads cost (₹)	17,07,131.4	13,55,883.5	19,49,485.1
Production hours worked	6,225	4,050	4,100
Rate per hour (₹)	274.24	334.79	475.48



(ii) Cost of Product X

	(₹)
Direct material	6,250.00
Direct labour	3,750.00
Prime cost	10,000.00
Production on overheads	
P ₁ 5 hours ₹ 274.24 = 1,371.20	
P ₂ 3 hours ₹ 334.79 = 1,004.37	
P ₃ 4 hours ₹ 475.48 = 1,901.92	4,277.49
Factory cost	14,277.49

**RTP NOV 20**

You are given the following information of the three machines of a manufacturing department of X Ltd.:

	Preliminary estimates of expenses (per annum)			
	Total (₹)	Machines		
		A (₹)	B (₹)	C (₹)
Depreciation	2,00,000	75,000	75,000	50,000
Spare parts	1,00,000	40,000	40,000	20,000
Power	4,00,000			
Consumable stores	80,000	30,000	25,000	25,000
Insurance of machinery	80,000			
Indirect labour	2,00,000			
Building maintenance expenses	2,00,000			
Annual interest on capital outlay	1,00,000	40,000	40,000	20,000
Monthly charge for rent and rates	20,000			
Salary of foreman (per month)	42,000			
Salary of Attendant (per month)	12,000			

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

The following additional information is also available:

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

There are 12 holidays besides Sundays in the year, of which two were on Saturdays. The manufacturing department works 8 hours in a day but Saturdays are half days. All machines work at 90% capacity throughout the year and 2% is reasonable for breakdown.

You are required to :

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

- An increase of 15% in the price of spare parts.
- An increase of 25% in the consumption of spare parts for machine 'B' & 'C' only.
- 20% general increase in wages rates.

**ANSWER :****(a) Computation of Machine Hour Rate**

	Basis of apportionment	Total (₹)	Machines		
			A (₹)	B (₹)	C (₹)
(A) Standing Charges					
Insurance	Depreciation Basis (3:3:2)	80,000	30,000	30,000	20,000
Indirect Labour	Direct Labour (2:3:3)	2,40,000	60,000	90,000	90,000
Building maintenance expenses	Floor Space (2:2:1)	2,00,000	80,000	80,000	40,000
Rent and Rates	Floor Space (2:2:1)	2,40,000	96,000	96,000	48,000
Salary of foreman	Equal	5,04,000	1,68,000	1,68,000	1,68,000
Salary of attendant	Equal	1,44,000	48,000	48,000	48,000
Total standing charges		14,08,000	4,82,000	5,12,000	4,14,000
Hourly rate for standing charges			247.43	262.83	212.53
(B) Machine Expenses:					
Depreciation	Direct	2,00,000	75,000	75,000	50,000
Spare parts	Final estimates	1,32,250	46,000	57,500	28,750
Power	K.W. rating (3:2:3)	4,00,000	1,50,000	1,00,000	1,50,000
Consumable Stores	Direct	80,000	30,000	25,000	25,000
Total Machine expenses		8,12,250	3,01,000	2,57,500	2,53,750
Hourly Rate for Machine expenses			154.52	132.19	130.26
Total (A + B)		22,20,250	7,83,000	7,69,500	6,67,750
Machine Hour rate			401.95	395.02	342.79

Working Notes:**(i) Calculation of effective working hours:**

No. of full off-days = No. of Sunday + No. of holidays

= 52 + 12 = 64 days

No. of half working days = 52 days – 2 holidays = 50 days

No. of full working days = 365 days – 64 days – 50 days = 251 days

Total working Hours = {(251 days × 8 hours) + (50 days × 4 hours)}

= 2,008 hours + 200 = 2,208 hours.

Total effective hours = Total working hours × 90% – 2% for break-down

= 2,208 hours × 90% – 2% (2,208 hours × 90%)

= 1,987.2 hours – 39.74 hours

= 1947.46 or Rounded up to 1948 hours.



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

	A (₹)	B (₹)	C (₹)
Preliminary estimates	40,000	40,000	20,000
Add: Increase in price @ 15%	6,000	6,000	3,000
	46,000	46,000	23,000
Add: Increase in consumption @ 25%		11,500	5,750
Estimated cost	46,000	57,500	28,750

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

	(₹)
Preliminary estimates	2,00,000
Add: Increase in wages @ 20%	40,000
	2,40,000

(iv) Interest on capital outlay is a finance cost, therefore it has been excluded from the cost accounts.



RTP MAY 21

A manufacturing unit has purchased and installed a new machine at a cost of ₹ 24,90,000 to its fleet of 5 existing machines. The new machine has an estimated life of 12 years and is expected to realise ₹ 90,000 as scrap value at the end of its working life.

Other relevant data are as follows:

- Budgeted working hours are 2,496 based on 8 hours per day for 312 days. Plant maintenance work is carried out on weekends when production is totally halted. The estimated maintenance hours are 416. During the production hours machine set-up and change over works are carried out. During the set-up hours no production is done. A total 312 hours are required for machine set-ups and change overs.
- An estimated cost of maintenance of the machine is ₹ 2,40,000 p.a.
- The machine requires a component to be replaced every week at a cost of ₹ 2,400.
- There are three operators to control the operations of all the 6 machines. Each operator is paid ₹ 30,000 per month plus 20% fringe benefits.
- Electricity: During the production hours including set-up hours, the machine consumes 60 units per hour. During the maintenance the machine consumes only 10 units per hour. Rate of electricity per unit of consumption is ₹ 6.
- Departmental and general works overhead allocated to the operation during last year was ₹ 5,00,000. During the current year it is estimated to increase by 10%.

Required:

COMPUTE the machine hour rate.

ANSWER :

Working Note:

- Effective machine hour:
= Budgeted working hours – Machine Set-up time
= 2,496 hours – 312 hours = 2,184 hours.



2. Operators' salary per annum:

Salary (3 operators × ₹30,000 × 12 months) ₹ 10,80,000

Add: Fringe benefits (20% of ₹10,80,000) ₹ 2,16,000

₹ 12,96,000

3. Depreciation per annum

 $\frac{₹24,90,000 - ₹90,000}{12 \text{ years}} = ₹ 2,00,000$

Computation of Machine hour Rate

	Amount p.a. (₹)	Amount per hour (₹)
Standing charges		
Operators' Salary $\left(\frac{₹12,96,000}{6 \text{ machines}} \times \frac{1}{2,184 \text{ hours}} \right)$	12,96,000	98.90
Departmental and general overheads: (₹ 5,00,000 × 110%) $\left(\frac{₹5,50,000}{6 \text{ machines}} \times \frac{1}{2,184 \text{ hours}} \right)$		
(A)	18,46,000	140.87
Machine Expenses		
Depreciation $\left(\frac{₹2,00,000}{2,184 \text{ hours}} \right)$	2,00,000	91.58
Electricity:		
During working hours (2,496 hours × 60 units ₹6)	8,98,560	411.43
During maintenance hours (416 hours × 10 units ₹6)	24,960	11.43
Component replacement cost (2,400 × 52 weeks)	1,24,800	57.14
Machine maintenance cost	2,40,000	109.89
(B)	14,88,320	681.47
Machine Hour Rate (A + B)		822.34



RTP NOV 21

PL Ltd. has three production departments P1, P2 and P3 and two service departments S1 and S2. The following data are extracted from the records of the company for the month of October, 2020:

	(₹)
Rent and rates	12,50,000
General lighting	1,50,000
Indirect Wages	3,75,000
Power	5,00,000
Depreciation on machinery	10,00,000
Insurance of machinery	4,00,000

Other Information:

	P1	P2	P3	S1	S2
Direct wages (₹)	7,50,000	5,00,000	7,50,000	3,75,000	1,25,000



Horse Power of Machines used	60	30	50	10	-
Cost of machinery (₹)	60,00,000	80,00,000	1,00,00,000	5,00,000	5,00,000
Floor space (Sq. ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	-	-

Expenses of the service departments S1 and S2 are reapportioned as below:

	P1	P2	P3	S1	S2
S1	20%	30%	40%	-	10%
S2	40%	20%	30%	10%	-

Required:

- COMPUTE overhead absorption rate per production hour of each production department.
- DETERMINE the total cost of product X which is processed for manufacture in department P1, P2 and P3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is ₹ 12,500 and direct labour cost is ₹ 7,500.

ANSWER :

Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P1 (₹)	P2 (₹)	P3 (₹)	S1 (₹)	S2 (₹)
Direct wages	Actual	5,00,000	--	--	--	3,75,000	1,25,000
Rent and Rates	Floor area (4 : 5 : 6 : 4 : 1)	12,50,000	2,50,000	3,12,500	3,75,000	2,50,000	62,500
General lighting	Light points (2 : 3 : 4 : 2 : 1)	1,50,000	25,000	37,500	50,000	25,000	12,500
Indirect wages	Direct wages (6 : 4 : 6 : 3 : 1)	3,75,000	1,12,500	75,000	1,12,500	56,250	18,750
Power	Horse Power of machines used (6 : 3 : 5 : 1)	5,00,000	2,00,000	1,00,000	1,66,667	33,333	
Depreciation of machinery	Value of machinery (12 : 16 : 20 : 1 : 1)	10,00,000	2,40,000	3,20,000	4,00,000	20,000	20,000
Insurance of machinery	Value of machinery (12 : 16 : 20 : 1 : 1)	4,00,000	96,000	1,28,000	1,60,000	8,000	8,000
		41,75,000	9,23,500	9,73,000	12,64,167	7,67,583	2,46,750

Overheads of service cost centres

Let S₁ be the overhead of service cost centre S₁ and S₂ be the overhead of service cost centre S₂.

$$S_1 = 7,67,583 + 0.10 S_2$$

$$S_2 = 2,46,750 + 0.10 S_1$$

Substituting the value of S₂ in S₁ we get

$$S_1 = 7,67,583 + 0.10 (2,46,750 + 0.10 S_1)$$



$$S_1 = 7,67,583 + 24,675 + 0.01 S_1$$

$$0.99 S_1 = 7,92,258$$

$$\therefore S_1 = ₹ 8,00,260$$

$$\begin{aligned} \therefore S_2 &= 2,46,750 + 0.10 \times 8,00,260 \\ &= ₹ 3,26,776 \end{aligned}$$

Secondary Distribution Summary

Particulars	Total (₹)	P ₁ (₹)	P ₂ (₹)	P ₃ (₹)
Allocated and Apportioned over-heads as per primary distribution	31,60,667	9,23,500	9,73,000	12,64,167
S ₁	8,00,260	1,60,052	2,40,078	3,20,104
S ₂	3,26,776	1,30,710	65,355	98,033
		12,14,262	12,78,433	16,82,304

(i) Overhead rate per hour

	P ₁	P ₂	P ₃
Total overheads cost (₹)	12,14,262	12,78,433	16,82,304
Production hours worked	6,225	4,050	4,100
Rate per hour (₹)	195.06	315.67	410.32

(ii) Cost of Product X

	(₹)
Direct material	12,500.00
Direct labour	7,500.00
Prime cost	20,000.00
Production on overheads	
P ₁ 5 hours ₹ 195.06 = 975.30	
P ₂ 3 hours ₹ 315.67 = 947.01	
P ₃ 4 hours ₹ 410.32 = <u>1,641.28</u>	3,563.59
Factory cost	23,563.59



RTP MAY 22

Pretz Ltd. is a manufacturing company having two production departments, 'A' & 'B' and two service departments 'X' & 'Y'. The following is the budget for March, 2022:

	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
Direct material		2,00,000	4,00,000	4,00,000	2,00,000
Direct wages		10,00,000	4,00,000	2,00,000	4,00,000
Factory rent	9,00,000				
Power (Machine)	5,10,000				
Depreciation	2,00,000				
General Lighting	3,00,000				
Perquisites	4,00,000				
Additional information:					
Area (Sq. ft.)		500	250	250	500
Capital value of assets (₹ lakhs)		40	80	20	20
Light Points		10	20	10	10



Machine hours	1,000	2,000	1,000	1,000
Horse power of machines	50	40	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	X	Y
Service Dept. 'X' (%)	55	25	–	20
Service Dept. 'Y' (%)	60	35	5	–

You are required to:

- PREPARE a statement showing distribution of overheads to various departments.
- PREPARE a statement showing re-distribution of service departments expenses to production departments using-
 - Simultaneous equation method
 - Trial and error method
 - Repeated Distribution Method.

ANSWER :

- Primary Distribution of Overheads

	Basis	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
Direct materials	Direct	6,00,000	–	–	4,00,000	2,00,000
Direct wages	Direct	6,00,000	–	–	2,00,000	4,00,000
Factory rent (2:1:1:2)	Area	9,00,000	3,00,000	1,50,000	1,50,000	3,00,000
Power (Machine) (10:16:3:5)*	H.P. × Machine Hrs.	5,10,000	1,50,000	2,40,000	45,000	75,000
Depreciation (2:4:1:1)	Capital value	2,00,000	50,000	1,00,000	25,000	25,000
General Lighting (1:2:1:1)	Light Points	3,00,000	60,000	1,20,000	60,000	60,000
Perquisites (5:2:1:2)	Direct Wages	4,00,000	2,00,000	80,000	40,000	80,000
		35,10,000	7,60,000	6,90,000	9,20,000	11,40,000

*{(1000×50) : (2000×40) : (1000×15) : (1000×25)}

(50000 : 80000 : 15000 : 25000)

(10 : 16 : 3 : 5)

-

- Redistribution of Service Department's expenses using 'Simultaneous equation method'

$$X = 9,20,000 + 0.05 Y$$

$$Y = 11,40,000 + 0.20 X$$

Substituting the value of X,

$$Y = 11,40,000 + 0.20 (9,20,000 + 0.05 Y)$$

$$= 13,24,000 + 0.01 Y$$



$$Y - 0.01Y = 13,24,000$$

$$Y = \frac{13,24,000}{0.99}$$

$$Y = ₹ 13,37,374$$

The total expense of Y is ₹ 13,37,374 and that of X is ₹ 9,86,869 i.e., ₹ 9,20,000 + (0.05 × ₹ 13,37,374).

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	B (₹)
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 13,37,374)	8,02,424	4,68,081
	21,05,202	14,04,798

(ii) Redistribution of Service Department's expenses using 'Trial and Error Method':

	Service Departments	
	X (₹)	Y (₹)
Overheads as per primary distribution	9,20,000	11,40,000
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 9,20,000)	---	1,84,000
	---	13,24,000
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,24,000)	66,200	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 66,200)	---	13,240
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,240)	662	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 662)		132
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 132)	7	
Total	9,86,869	13,37,372

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	B (₹)
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 13,37,372)	8,02,423	4,68,080
	21,05,201	14,04,797

(iii) Redistribution of Service Department's expenses using 'repeated distribution method':

	A (₹)	B (₹)	X (₹)	Y (₹)
Overhead as per primary distribution	7,60,000	6,90,000	9,20,000	11,40,000



Dept. X overhead apportioned in the ratio (55:25:–:20)	5,06,000	2,30,000	(9,20,000)	1,84,000
Dept. Y overhead apportioned in the ratio (60:35:5: –)	7,94,400	4,63,400	66,200	(13,24,000)
Dept. X overhead apportioned in the ratio (55:25:–:20)	36,410	16,550	(66,200)	13,240
Dept. Y overhead apportioned in the ratio (60:35:5: –)	7,944	4,634	662	(13,240)
Dept. X overhead apportioned in the ratio (55:25:–:20)	364	166	(662)	132
Dept. Y overhead apportioned in the ratio (60:35:5: –)	79	46	7	(132)
Dept. X overhead apportioned in the ratio (55:25:–:20)	4	3	(7)	–
	21,05,201	14,04,799		

**RTP NOV 22**

SE Limited manufactures two products- A and B. The company had budgeted factory overheads amounting to ₹ 36,72,000 and budgeted direct labour hour of 1,80,000 hours. The company uses pre-determined overhead recovery rate for product costing purposes.

The department-wise break-up of the overheads and direct labour hours were as follows:

Particulars	Budgeted overheads	Budgeted direct labour hours	Rate per direct labour hour
Department Pie	₹ 25,92,000	90,000 hours	₹ 28.80
Department Qui	₹ 10,80,000	90,000 hours	₹ 12.00
Total	₹ 36,72,000	1,80,000 hours	

Additional Information:

Each unit of product A requires 4 hours in department Pie and 1 hour in department Qui. Also, each unit of product B requires 1 hour in department Pie and 4 hours in department Qui.

This was the first year of the company's operation. There was no WIP at the end of the year. However, 1,800 and 5,400 units of Products A and B were on hand at the end of the year.

The budgeted activity has been attained by the company. You are required to:

- DETERMINE the production and sales quantities of both products 'A' and 'B' for the above year.
- ASCERTAIN the effect of using a pre-determined overhead rate instead of department-wise overhead rates on the company's income due to its effect on stock value.
- CALCULATE the difference in the selling price due to the use of pre-determined overhead rate instead of using department-wise overhead rates. Assume that the direct costs (material and labour costs) per unit of products A and B were ₹ 25 and ₹ 40 respectively and the selling price is fixed by adding 40% over and above these costs to cover profit and selling and administration overhead.

**ANSWER :**

(i) Computation of production and sales quantities:

The products processing times are as under –

Product	A	B	Total
Department Pie	4 hours	1 hour	90,000 hours
Department Qui	1 hour	4 hours	90,000 hours

Let X and Y be the number of units (production quantities) of the two products.

Converting these into equations, we have –

$$4X + Y = 90,000 \text{ \& } X + 4Y = 90,000$$

Solving the above, we get $X = 18,000$; $Y = 18,000$

Hence, the Production and Sales Quantities are determined as under –

Product	Production Quantity	Closing Stock (Given)	Sales Quantity (Balancing Figure)
A	18,000 units	1,800 units	16,200 units
B	18,000 units	5,400 units	12,600 units

(ii) Effect of using pre-determined rate of overheads on the company's profit

Product	Closing Stock Quantity	Overhead included using pre-determined rate	Overhead included using department rate	Difference in overhead in closing stock value / Effect on closing stock value
A	1,800 units	1,800 × 5 hours × ₹ 20.40 = ₹ 1,83,600	Pie = 1,800 units × 4 hours × ₹ 28.80 = ₹ 2,07,360 Qui = 1,800 units × 1 hour × ₹ 12 = ₹ 21,600	(-) ₹ 45,360
B	5,400 units	5,400 × 5 hours × ₹ 20.40 = ₹ 5,50,800	Pie = 5,400 units × 1 hour × ₹ 28.80 = ₹ 1,55,520 Qui = 5,400 units × 4 hours × ₹ 12 = ₹ 2,59,200	(+) ₹ 1,36,080
Total		₹ 7,34,400	₹ 6,43,680	(+) ₹ 90,720

Use of pre-determined overhead rate has resulted in over valuation of stock by

₹ 90,720 due to which the company's income would be affected (increase) by

₹ 90,720. Profit would be affected only to the extent of Overhead contained in closing finished goods and closing WIP, if any.

(iii) Effect of using pre-determined on the products' selling prices

Particulars	Product A	Product B
Selling Price per unit if pre-determined overhead rate is used	₹ 177.80	₹ 198.80
Selling Price per unit if department wise rate is used	₹ 213.08	₹ 163.52



Difference	₹ 35.28	₹ 35.28
	Under-Priced	Over-Priced

Workings:

(1) Pre-determined overhead recovery rate = $\frac{\text{₹ 36,72,000}}{1,80,000 \text{ hours}}$ = ₹ 20.40 per direct labour hour

(2) If pre-determined recovery rate is used

Particulars	Product A in ₹	Product B in ₹
Materials & Labour	25.00	40.00
Add: Production Overhead	102.00	102.00
A = 5 hours x ₹ 20.40 per hour		
B = 5 hours x ₹ 20.40 per hour		
Cost of production	127.00	142.00
Add: 40% of margin	50.80	56.80
	177.80	198.50

(3) If department-wise recovery rate is used

Particulars	Product A in ₹	Product B in ₹
Materials & Labour	25.00	40.00
Add: Production Overhead	127.20	76.80
A = Pie = 4 hours x ₹ 28.80		
Qui = 1 hour x ₹ 12		
B = Pie = 1 hour x ₹ 28.80		
Qui = 4 hours x ₹ 12		
Cost of production	152.20	116.80
Add: 40% of margin	60.88	46.72
Selling Price per unit	213.08	163.52



RTP MAY 23

SANDY Ltd. is a manufacturing company having three production departments, 'A', 'B' and 'C' and two service departments 'X' and 'Y'. The following is the budget for December 2022:

	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct material		1,60,000	3,20,000	6,40,000	3,20,000	1,60,000
Direct wages		8,00,000	3,20,000	12,80,000	1,60,000	3,20,000
Factory rent	6,40,000					
Power	4,00,000					
Depreciation	1,60,000					
Other overheads	14,40,000					
Additional information:						
Area (Sq. ft.)		800	400	800	400	800
Capital value of assets (₹) lakhs		32	64	32	16	16
Machine hours		1,600	3,200	6,400	1,600	1,600



Horsepower of machines		80	64	32	24	40

Apportionment of expenses of service departments is as under:

	A	B	C	X	Y
Service Dept. 'X'	72	24	48	–	16
Service Dept. 'Y'	96	56	–	8	–

Required:

- PREPARE a statement showing distribution of overheads to various departments.
- PREPARE a statement showing re-distribution of service departments expenses to production departments using Repeated Distribution method. Also CALCULATE machine hour rate of the production departments 'A', 'B', 'C'.

ANSWER :

(i) Overhead Distribution Summary

	Basis	Total (₹)	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Direct materials	Direct	–	–	–	–	3,20,000	1,60,000
Direct wages	Direct	–	–	–	–	1,60,000	3,20,000
Factory rent (2:1:2:1:2)	Area	6,40,000	1,60,000	80,000	1,60,000	80,000	1,60,000
Power (10:16:16:3:5)*	H.P. × Machine Hrs.	4,00,000	80,000	1,28,000	1,28,000	24,000	40,000
Depreciation (2:4:2:1:1)	Capital value of assets	1,60,000	32,000	64,000	32,000	16,000	16,000
Other overheads (1:2:4:1:1)	Machine hrs.	14,40,000	1,60,000	3,20,000	6,40,000	1,60,000	1,60,000
		26,40,000	4,32,000	5,92,000	9,60,000	7,60,000	8,56,000

*{(1600×80) : (3200×64) : (6400×32) : (1600×24) : (1600×40)}

(1,28,000 : 2,04,800 : 2,04,800 : 38,400 : 64,000)

(10:16:16:3:5)

(ii) Redistribution of service department's expense using repeated distribution

Method:

	A (₹)	B (₹)	C (₹)	X (₹)	Y (₹)
Total overheads	4,32,000	5,92,000	9,60,000	7,60,000	8,56,000
Dept. X overhead apportioned in the ratio (72:24:48:–:16)	3,42,000	1,14,000	2,28,000	–7,60,000	76,000
Dept. Y overhead apportioned in the ratio (96:56:–:8:–)	5,59,200	3,26,200	–	46,600	–9,32,000



Dept. X overhead apportioned in the ratio (72:24:48: -:16)	20,970	6,990	13,980	-46,600	4,660
Dept. Y overhead apportioned in the ratio (96:56: -:8: -)	2,796	1,631	-	233	-4,660
Dept. X overhead apportioned in the ratio (72:24:48: -:16)	105	35	70	-233	23
Dept. Y overhead apportioned in the ratio (96:56: -:8: -)	15	8	-	-	-23
	13,57,086	10,40,864	12,02,050	-	-

Calculation of machine hour rate

		A	B	C
A	Total overheads (₹)	13,57,086	10,40,864	12,02,050
B	Machine hours	1,600	3,200	6,400
C	Machine hour rate (₹) [A ÷ B]	848.18	325.27	187.82



RTP NOV 23

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

- The original cost of the machine used (Purchased in June 2018) was ₹ 10,00,000. Its estimated life is 10 years, the estimated scrap value at the end of its life is ₹ 10,000, and the estimated working time per year (50 weeks of 44 hours) is 2,200 hours. Out of which machine maintenance etc., is estimated to take up 200 hours.
No other loss of working time expected, setting up time, estimated at 100 hours, is regarded as productive time. (Holiday to be ignored).
- Electricity used by the machine during production is 16 units per hour at cost of a ₹ 7 per unit. No power is consumed during maintenance or setting up.
- The machine required a chemical solution which is replaced at the end of week at a cost of ₹ 2,000 each time.
- The estimated cost of maintenance per year is ₹ 1,20,000.
- Two attendants control the operation of machine together with five other identical machines. Their combined weekly wages, insurance and the employer's contribution to holiday pay amount is ₹ 9,000.
- Departmental and general works overhead allocated to this machine for the current year amount to ₹ 20,000.

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

ANSWER :

Working Notes:

- Total Productive hours = Estimated Working hours – Machine Maintenance hours
= 2,200 hours – 200 hours = 2,000 hours



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

$$(iii) \text{ Chemical solution cost per annum} = ₹ 2,000 \times 50 \text{ weeks} = ₹ 1,00,000$$

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

Calculation of Machine hour rate

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



RTP MAY 24

During half year ending inter departmental review meeting of P Ltd., cost variance report was discussed and the performance of the departments were assessed. The following figures were presented.

For a period of first six months of the financial year, following information were extracted from the books:

Actual production overheads ₹ 34,08,000

The above amount is inclusive of the following payments made:

Paid as per court's order ₹ 4,50,000

Expenses of previous year booked in current year ₹ 1,00,000

Paid to workers for strike period under an award ₹ 4,20,000

Obsolete stores written off ₹ 36,000

Production and sales data for the six months are as under:

Production:

Finished goods 1,10,000 units

Works-in-progress

(50% complete in every respect) 80,000 units

Sale:

Finished goods 90,000 units

Machine worked during the period was 3,000 hours.

At the of preparation of revenue budget, it was estimated that a total of ₹ 50,40,000 would be



required for budgeted machine hours of 6,000 as production overheads for the entire year. During the meeting, a data analytic report revealed that 40% of the over/under-absorption was due to defective production policies and the balance was attributable to increase in costs. You were also present at the meeting; the chairperson of the meeting has asked you to be ready with the followings for the performance appraisal of the departmental heads:

- (i) How much was the budgeted machine hour rate used to recover overhead?
- (a) ₹ 760
(b) ₹ 820
(c) ₹ 780
(d) ₹ 840
- (ii) How much amount of production overhead has been recovered (absorbed) upto the end of half year end?
- (a) ₹ 25,20,000
(b) ₹ 34,08,000
(c) ₹ 24,00,000
(d) ₹ 24,60,000
- (iii) What is the amount of overhead under/ over absorbed?
- (a) 1,18,000 over-absorbed
(b) 1,18,000 under-absorbed
(c) 18,000 over-absorbed
(d) 18,000 under-absorbed
- (iv) What is the supplementary rate for apportionment of over/under absorbed overheads over WIP, Finished goods and Cost of sales?
- (a) ₹ 0.315 per unit
(b) ₹ 0.472 per unit
(c) ₹ 0.787 per unit
(d) ₹ 1 per unit
- (v) What is the amount of over/under absorbed overhead apportioned to Work in Progress?
- (a) ₹ 9,440
(b) ₹ 42,480
(c) ₹ 18,880
(d) ₹ 70,800

ANSWER :

- (i)
- (d) Budgeted Machine hour rate (Blanket rate)
- $$= \frac{\text{₹ 50,40,000}}{6,000 \text{ hours}} = \text{₹ 840 per hour}$$
- (ii) (a) ₹ 25,20,000



(iii) (a)

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

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

(iv)

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

Amount to be credited to Costing Profit and Loss Account

= ₹ 1,18,000 × 40% = ₹ 47,200.

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

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

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

(v)

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

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



05

ACTIVITY BASED
COSTING**QUESTION 1. (ILLUSTRATION 1)**

ABC Ltd. is a multiproduct company, manufacturing three products A, B and C. The budgeted costs and production for the year ending 31st March are as follows:

	A	B	C
Production quantity (Units)	4,000	3,000	1,600
Resources per Unit:			
- Direct Materials (Kg.)	4	6	3
- Direct Labour (Minutes)	30	45	60

The budgeted direct labour rate was ₹ 10 per hour, and the budgeted material cost was ₹ 2 per kg. Production overheads were budgeted at ₹ 99,450 and were absorbed to products using the direct labour hour rate. ABC Ltd. followed the Absorption Costing System.

ABC Ltd. is now considering to adopt an Activity Based Costing system. The following additional information is made available for this purpose.

1. Budgeted overheads were analysed into the following:

	(₹)
Material handling	29,100
Storage costs	31,200
Electricity	39,150

2. The cost drivers identified were as follows:

Material handling	Weight of material handled
Storage costs	Number of batches of material
Electricity	Number of Machine operations

3. Data on Cost Drivers was as follows:

	A	B	C
For complete production:			
Batches of material	10	5	15
Per unit of production:			
Number of Machine operations	6	3	2

You are requested to:

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

**ANSWER**

1. Traditional Absorption Costing

	A	B	C	Total
(a) Quantity (units)	4,000	3,000	1,600	8,600
(b) Direct labour (minutes)	30	45	60	-
(c) Direct labour hours (a × b)/60 minutes	2,000	2,250	1,600	5,850

Overhead rate per direct labour hour:

= Budgeted overheads Budgeted labour hours

= ₹ 99,450 5,850 hours

= ₹ 17 per direct labour hour

Unit Costs:

	A (₹)	B (₹)	C (₹)
Direct Costs:			
- Direct Labour	5.00	7.50	10.00
- Direct Material	8.00	12.00	6.00
Production Overhead:	8.50	12.75	17.00
	$\left(\frac{₹17 \times 30}{60} \right)$	$\left(\frac{₹17 \times 45}{60} \right)$	$\left(\frac{₹17 \times 60}{60} \right)$
Total unit costs	21.50	32.25	33.00
Number of units	4,000	3,000	1,600
Total costs	86,000	96,750	52,800

2. Activity Based Costing

	A	B	C	Total
Quantity (units)	4,000	3,000	1,600	-
Material Weight per unit (Kg.)	4	6	3	-
Total material weight	16,000	18,000	4,800	38,800
Machine operations per unit	6	3	2	-
Total operations	24,000	9,000	3,200	36,200
Total batches of Material	10	5	15	30

Material handling rate per kg. = ₹ 29,100 38,800 kg.

= ₹ 0.75 per kg.

Electricity rate per machine operations = ₹ 39,150 36,200

= ₹ 1.081 per machine operations

Storage rate per batch = ₹ 31,200 30 batches

= ₹ 1,040 per batch

Unit Costs:

	A (₹)	B (₹)	C (₹)
Direct Costs:			
Direct Labour	5.00	7.50	10.00
Direct material	8.00	12.00	6.00
Production Overheads:			
Material Handling	3.00	4.50	2.25
	(₹0.75 4)	(₹0.75 6)	(₹0.75 3)



Electricity	6.49 (₹1.081 6)	3.24 (₹1.081 3)	2.16 (₹1.081 2)
Storage	2.60 $\left(₹10 \times \frac{₹1,040}{4,000} \right)$	1.73 $\left(₹5 \times \frac{₹1,040}{3,000} \right)$	9.75 $\left(₹15 \times \frac{₹1,040}{4,000} \right)$
Total unit costs	25.09	28.97	30.16
Number of units	4,000	3,000	1,600
Total costs	₹ 1,00,360	₹ 86,910	₹ 48,256

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

**QUESTION 2. (ILLUSTRATION 2)**

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

Activity	Cost Driver	Capacity	Cost
Power	Kilowatt hours	50,000 kilowatt hours	₹ 2,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	₹ 3,00,000

The company makes three products M, S and T. For the year ended March 31st, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
M	10,000	3,500
S	20,000	2,500
T	15,000	3,000

Required:

- COMPUTE the costs allocated to each product from each activity.
- CALCULATE the cost of unused capacity for each activity.
- DISCUSS the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.

ANSWER

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

	Product			
	M (₹)	S (₹)	T (₹)	Total (₹)
Power (Refer to working note)	40,000 (10,000 kWh × ₹4)	80,000 (20,000 kWh × ₹4)	60,000 (15,000 kWh × ₹4)	1,80,000
Quality Inspections (Refer to working note)	1,05,000 (3,500 inspections × ₹30)	75,000 (2,500 inspections × ₹30)	90,000 (3,000 inspections × ₹30)	2,70,000



Working note

Rate per unit of cost driver:

Power	(₹ 2,00,000 / 50,000 kWh)	₹ 4/kWh
Quality Inspection	(₹ 3,00,000 / 10,000 inspections)	₹ 30 per inspection

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

	(₹)
Power (₹ 2,00,000 – ₹ 1,80,000) or 5,000 × 4	20,000
Quality Inspections (₹ 3,00,000 – ₹ 2,70,000) or 1,000 × 30	30,000
Total cost of unused capacity	50,000

(iii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing & capacity management
- Effect on pricing decisions.
- Effect on performance evaluation
- Effect on financial statements
- Regulatory requirements.
- Difficulties in forecasting.



QUESTION 3. (ILLUSTRATION 3)

ABC Ltd. Manufactures two types of machinery equipment Y and Z and applies/absorbs overheads on the basis of direct-labour hours. The budgeted overheads and direct-labour hours for the month of December are ₹ 12,42,500 and 20,000 hours respectively. The information about Company's products is as follows:

	Equipment Y	Equipment Z
Budgeted Production volume	2,500 units	3,125 units
Direct material cost	₹ 300 per unit	₹ 450 per unit
Direct labour cost		
Y : 3 hours @ ₹ 150 per hour		
Z : 4 hours @ ₹ 150 per hour	₹ 450	₹ 600

ABC Ltd.'s overheads of ₹ 12,42,500 can be identified with three major activities:

Order Processing (₹ 2,10,000), machine processing (₹ 8,75,000), and product inspection (₹ 1,57,500). These activities are driven by number of orders processed, machine hours worked, and inspection hours, respectively. The data relevant to these activities is as follows:

	Orders processed	Machine hours worked	Inspection hours
Y	350	23,000	4,000
Z	250	27,000	11,000
Total	600	50,000	15,000

Required:

(i) Assuming use of direct-labour hours to absorb/apply overheads to production, COMPUTE the unit manufacturing cost of the equipment Y and Z, if the budgeted manufacturing volume is attained.



- (ii) Assuming use of activity-based costing, COMPUTE the unit manufacturing costs of the equipment Y and Z, if the budgeted manufacturing volume is achieved.
- (iii) ABC Ltd.'s selling prices are based heavily on cost. By using direct-labour hours as an application base, CALCULATE the amount of cost distortion (under-costed or over-costed) for each equipment.

ANSWER

- (i) Overheads application base: Direct labour hours

	Equipment	Equipment
	Y (₹)	Z (₹)
Direct material cost	300	450
Direct labour cost	450	600
Overheads*	186.38	248.50
	936.38	1,298.50

$$\text{*Pre-determined rate} = \frac{\text{Budgeted overheads}}{\text{Budgeted direct labour hours}} = \frac{\text{₹12, 42,500}}{20,000 \text{ hours}} = \text{₹62.125}$$

- (ii) Estimation of Cost-Driver rate

Activity	Overhead cost	Cost-driver level	Cost driver rate
	(₹)		(₹)
Order processing	2,10,000	600	350
		Orders processed	
Machine processing	8,75,000	50,000	17.50
		Machine hours	
Inspection	1,57,500	15,000	10.50
		Inspection hours	

	Equipment	Equipment
	Y (₹)	Z (₹)
Direct material cost	300	450
Direct labour cost	450	600
Prime Cost	750	1,050
Overhead Cost		
Order processing 350 : 250 or Rs 350 per order	1,22,500	87,500
Machine processing 23,000 : 27,000 or ₹ 17.5 per hour	4,02,500	4,72,500
Inspection 4,000 : 11,000	42,000	1,15,500
Total overhead cost	5,67,000	6,75,500
Per unit cost	Y (₹)	Z (₹)
5,67,000 / 2,500	226.80	₹ 216.16
6,75,500 / 3,125		
Unit manufacturing cost (Prime Cost + Overhead per unit)	₹ 976.80	₹ 1,266.16



(iii)

	Equipment Y (₹)	Equipment Z (₹)
Unit manufacturing cost—using direct labour hours as an application base	936.38	1,298.50
Unit manufacturing cost—using activity based costing	976.80	1,266.16
Cost distortion	(-)40.42	+ 32.34

Low volume product Y is under-costed and high volume product Z is over costed using direct labour hours for overhead absorption.

**QUESTION 4. (ILLUSTRATION 4)**

‘Humara - Apna’ bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods. The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget:

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



The activity drivers and their budgeted quantifies are given below:

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

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

Required:

- CALCULATE the budgeted rate for each activity.
- PREPARE the budgeted cost statement activity wise.
- COMPUTE the budgeted product cost per account for each product using (i) and (ii) above.

ANSWER

Statement Showing "Budgeted Cost per unit of the Product"

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

Working Note

Activity	Budgeted Cost (₹)	Remark
ATM Services:		
(a) Machine Maintenance	4,00,000	- All fixed, no change.
(b) Rents	2,00,000	- Fully fixed, no change.
(c) Currency Replenishment Cost	2,00,000	- Doubled during budget period.
Total	8,00,000	
Computer Processing	2,50,000	- ₹ 2,50,000 (half of ₹ 5,00,000) is fixed and no change is expected.



			- ₹ 2,50,000 (variable portion) is expected to increase to three times the current level.
		7,50,000	
	Total	10,00,000	
Issuing Statements		18,00,000	- Existing.
		2,00,000	2 lakh statements are expected to be increased in budgeted period. For every increase of one lakh statement, one lakh rupees is the budgeted increase.
Total		20,00,000	
Computer Inquiries		3,60,000	- Estimated to increase by 80% during the budget period.
Total		3,60,000	(₹ 2,00,000 × 180%)

**QUESTION 5. (PP1)**

Woolmark Ltd. manufactures three types of products namely P, Q and R. The data relating to a period are as under:

Particulars	P	Q	R
Machine hours per unit	10	18	14
Direct Labour hours per unit	4	12	8
Direct Material per unit (₹)	90	80	120
Production (units)	3,000	5,000	20,000

Currently the company uses traditional costing method and absorbs all production overheads on the basis of machine hours. The machine hour rate of overheads is ₹ 6 per hour. Direct labour hour rate is ₹ 20 per hour.

The company proposes to use activity based costing system and the activity analysis is as under:

Particulars	P	Q	R
Batch size (units)	150	500	1,000
Number of purchase orders per batch	3	10	8
Number of inspections per batch	5	4	3

The total production overheads are analysed as under:

Machine set up costs	20%
Machine operation costs.	30%
Inspection costs	40%
Material procurement related costs..	10%

Required

- CALCULATE the cost per unit of each product using traditional method of absorbing all production overheads on the basis of machine hours.
- CALCULATE the cost per unit of each product using activity based costing principles.

**ANSWER**

(i) Statement Showing "Cost per unit - Traditional Method"

Particulars of Costs	P (₹)	Q (₹)	R (₹)
Direct Materials	90	80	120
Direct Labour [(4, 12, 8 hours) ₹ 20]	80	240	160
Production Overheads [(10, 18, 14 hours) ₹ 6]	60	108	84
Cost per unit	230	428	364

(ii) Statement Showing "Cost per unit - Activity Based Costing"

Products	P	Q	R
Production (units)	3,000	5,000	20,000
	(₹)	(₹)	(₹)
Direct Materials (90, 80, 120)	2,70,000	4,00,000	24,00,000
Direct Labour (80, 240, 160)	2,40,000	12,00,000	32,00,000
Machine Related Costs @ ₹ 1.80 per hour (30,000, 90,000, 2,80,000)	54,000	1,62,000	5,04,000
Setup Costs @ ₹ 9,600 per setup (20, 10, 20)	1,92,000	96,000	1,92,000
Inspection Costs @ ₹ 4,800 per inspection (100, 40, 60)	4,80,000	1,92,000	2,88,000
Purchase Related Costs @ ₹ 750 per purchase (60, 100, 160)	45,000	75,000	1,20,000
Total Costs	12,81,000	21,25,000	67,04,000
Cost per unit (Total Cost Units)	427.00	425.00	335.20

Workings

Number of Batches, Purchase Orders, and Inspections-

	Particulars	P	Q	R	Total
A.	Production (units)	3,000	5,000	20,000	
B.	Batch Size (units)	150	500	1,000	
C.	Number of Batches (A÷B)	20	10	20	50
D.	Number of Purchase Order per batch	3	10	8	
E.	Total Purchase Orders [C D]	60	100	160	320
F.	Number of Inspections per batch	5	4	3	
G.	Total Inspections [C F]	100	40	60	200

Total Machine Hours-

	Particulars	P	Q	R
A.	Machine Hours per unit	10	18	14
B.	Production (units)	3,000	5,000	20,000
C.	Total Machine Hours [A x B]	30,000	90,000	2,80,000

Total Machine Hours = 4,00,000

Total Production Overheads-

= 4,00,000 hrs. ₹ 6 = ₹ 24,00,000



Cost Driver Rates-

Cost Pool	%	Overheads (₹)	Cost Driver Basis	Cost Driver (Units)	Cost Driver Rate (₹)
Setup	20%	4,80,000	Number of batches	50	9,600 per Setup
Inspection	40%	9,60,000	Number of inspections	200	4,800 per Inspection
Purchases	10%	2,40,000	Number of purchases	320	750 per Purchase
Machine Operation	30%	7,20,000	Machine Hours	4,00,000	1.80 per Machine Hour

**QUESTION 6. (PP2)**

RST Limited specializes in the distribution of pharmaceutical products. It buys from the pharmaceutical companies and resells to each of the three different markets.

(i) General Supermarket Chains

(ii) Drugstore Chains

(iii) Chemist Shops

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

Particulars	General Supermarket Chains (₹)	Drugstore Chains (₹)	Chemist Shops (₹)
Average revenue per delivery	84,975	28,875	5,445
Average cost of goods sold per delivery	82,500	27,500	4,950
Number of deliveries	330	825	2,750

In the past, RST Limited has used gross margin percentage to evaluate the relative profitability of its distribution channels.

The company plans to use activity-based costing for analysing the profitability of its distribution channels.

The Activity analysis of RST Limited is as under:

Activity Area	Cost Driver
Customer purchase order processing	Purchase orders by customers
Line-item ordering	Line-items per purchase order
Store delivery	Store deliveries
Cartons dispatched to stores	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	Hours of shelf-stocking

The April month's operating costs (other than cost of goods sold) of RST Limited are ₹ 8,27,970. These operating costs are assigned to five activity areas. The cost in each area and the quantity of the cost allocation basis used in that area for the month of April are as follows:

Activity Area	Total costs (₹)	Total Units of Cost Allocation Base
Customer purchase order processing	2,20,000	5,500 orders



Line-item ordering	1,75,560	58,520 line items
Store delivery	1,95,250	3,905 store deliveries
Cartons dispatched to store	2,09,000	2,09,000 cartons
Shelf-stocking at customer store	28,160	1,760 hours

Other data for the month of April include the following:

	General Supermarket Chains	Drugstore Chains	Chemist Shops
Total number of orders	385	990	4,125
Average number of line items per order	14	12	10
Total number of store deliveries	330	825	2,750
Average number of cartons shipped per store delivery	300	80	16
Average number of hours of shelf-stocking per store delivery	3	0.6	0.1

Required:

- COMPUTE gross-margin percentage for each of its three distribution channels and compute RST Limited's operating income.
- COMPUTE the rate per unit of the cost-allocation base for each of the five activity areas.
- COMPUTE the operating income of each distribution channel using the activity-based costing information. Comment on the results. What new insights are available with the activity-based cost information?
- DESCRIBE four challenges one would face in assigning the total operating costs of ₹ 8,27,970 to five activity areas.

ANSWER

- RST Limited's

Statement of operating income and gross margin percentage for each of its three distribution channel

Particulars	General Super Market Chains	Drugstore Chains	Chemist Shops	Total
Revenues: (₹)	2,80,41,750 (330 × ₹ 84,975)	2,38,21,875 (825 × ₹ 28,875)	1,49,73,750 (2,750 × ₹ 5,445)	6,68,37,375
Less: Cost of goods sold: (₹)	2,72,25,000 (330 × ₹ 82,500)	2,26,87,500 (825 × ₹ 27,500)	1,36,12,500 (2,750 × ₹ 4,950)	635,25,000
Gross Margin: (₹)	8,16,750	11,34,375	13,61,250	33,12,375
Less: Other operating costs: (₹)				8,27,970
Operating income: (₹)				24,84,405
Gross Margin	2.91%	4.76 %	9.09%	4.96%



Operating income %				3.72

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

	(₹)
Customer purchase order processing (₹ 2,20,000/ 5,500 orders)	40 per order
Line item ordering (₹ 1,75,560/ 58,520 line items)	3 per line item order
Store delivery (₹ 1,95,250/ 3,905 store deliveries)	50 per delivery
Cartons dispatched (₹ 2,09,000/ 2,09,000 dispatches)	1 per dispatch
Shelf-stocking at customer store (₹) (₹ 28,160/ 1,760 hours)	16 Per hour

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

	General Super Market Chains	Drugstore Chains	Chemist Shops
Gross margin (₹) : (A) (Refer to (i) part of the answer)	8,16,750	11,34,375	13,61,250
Operating cost (₹): (B) (Refer to working note)	1,62,910	1,90,410	4,74,650
Operating income (₹): (A-B)	6,53,840	9,43,965	8,86,600
Operating income (in %) (Operating income/ Revenue) × 100	2.33	3.96	5.92

Comments and new insights: The activity-based cost information highlights, how the 'Chemist Shops' uses a larger amount of RST Ltd.'s resources per revenue than do the other two distribution channels. Ratio of operating costs to revenues, across these markets is:

General supermarket chains (₹ 1,62,910/ ₹ 2,80,41,750) × 100	0.58%
Drug store chains (₹ 1,90,410/ ₹ 2,38,21,875) × 100	0.80%
Chemist shops (₹ 4,74,650/ ₹ 1,49,73,750) × 100	3.17%



Working note:

Computation of operating cost of each distribution channel:

	General Super Market Chains (₹)	Drugstore Chains (₹)	Chemist Shops (₹)
Customer purchase order processing	15,400 (₹ 40 × 385 orders)	39,600 (₹ 40 × 990 orders)	1,65,000 (₹ 40 × 4125 orders)
Line item ordering	16,170 (₹ 3 × 14 × 385)	35,640 (₹ 3 × 12 × 990)	1,23,750 (₹ 3 × 10 × 4125)
Store delivery	16,500 (₹ 50 × 330 deliveries)	41,250 (₹ 50 × 825 deliveries)	1,37,500 (₹ 50 × 2750 deliveries)
Cartons dispatched	99,000 (₹ 1 × 300 cartons × 300 deliveries)	66,000 (₹ 1 × 80 cartons × 825 deliveries)	44,000 (₹ 1 × 16 cartons × 2,750 deliveries)
Shelf stocking	15,840 (₹ 16 × 330 deliveries × 3 Av. hrs.)	7,920 (₹ 16 × 825 deliveries × 0.6 Av. hrs)	4,400 (₹ 16 × 2,750 deliveries × 0.1 Av. hrs)
Operating cost	1,62,910	1,90,410	4,74,650

(iv) Challenges faced in assigning total operating cost of ₹ 8,27,970:

- Choosing an appropriate cost driver for activity area.
- Developing a reliable data base for the chosen cost driver.
- Deciding, how to handle costs that may be common across several activities.
- Choice of the time period to compute cost rates per cost driver.
- Behavioural factors



QUESTION 7. (PP3)

Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the current year for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 0
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000



Family store also provides the following information for the current year:

Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	₹ 60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	₹ 7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	₹ 12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	₹ 8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	₹ 15,36,000	15,36,000 items sold

Required:

- Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. CALCULATE the operating income and operating income as a % of revenues for each product line.
- If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using an activity-based costing system, CALCULATE the operating income and operating income as a % of revenues for each product line.

ANSWER

Working notes:

- Total support cost:

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

- Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{₹ 45,00,000}{₹ 1,50,00,000} \times 100 = 30\%$$

- Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4)=[(2)÷(3)]
Ordering	7,80,000	1,560 purchase orders	₹ 500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹ 400 per delivery
Shelf-stocking	8,64,000	8,640 hours	₹ 100 per stocking hour



Customer support	15,36,000	15,36,000 items sold	₹ 1 per item sold

- (i) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS): (B)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS): (C)	9,00,000	22,50,000	13,50,000	45,00,000
(Refer working notes)				
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: E = {(A) - (D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (E/A) × 100)	1.70%	7.17%	3.30%	4.97%

- (ii) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity- based costing system)

	Soft drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5400:2700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income C: {(A) - (B)}	4,27,500	63,000	5,29,500	10,20,000
Operating income as a % of revenues	10.78%	0.60%	8.75%	4.97%

* Refer to working note 3

**QUESTION 8. (PP4)**

Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at ₹ 90 per case and sells to retail customers at a list price of ₹ 108 per case. The data pertaining to five customers are:

	Customers				
	A	B	C	D	E
Cases sold	4,680	19,688	1,36,800	71,550	8,775
Listed Selling Price	₹ 108	₹ 108	₹ 108	₹ 108	₹ 108
Actual Selling Price	₹ 108	₹ 106.20	₹ 99	₹ 104.40	₹ 97.20
Number of Purchase orders	15	25	30	25	30
Number of Customer visits	2	3	6	2	3
Number of deliveries	10	30	60	40	20
Kilometers travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

Its five activities and their cost drivers are:

Activity	Cost Driver Rate
Order taking	₹ 750 per purchase order
Customer visits	₹ 600 per customer visit
Deliveries	₹ 5.75 per delivery Km travelled
Product handling	₹ 3.75 per case sold
Expedited deliveries	₹ 2,250 per expedited delivery

Required:

- COMPUTE the customer-level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.
- STATE what insights are gained by reporting both the list selling price and the actual selling price for each customer.

ANSWER

Working note:

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

	Customers				
	A	B	C	D	E
Cases sold: (a)	4,680	19,688	1,36,800	71,550	8,775
Revenues (at listed price) (₹) :	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
(b)					
{(a) × ₹ 108}					
Discount (₹): (c)	-	35,438	12,31,200	2,57,580	94,770
{(a) ×		(19,688	(1,36,800	(71,550	(8,775
Discount per case}		cases ×	cases ×	cases ×	cases ×
		₹ 1.80)	₹ 9)	₹ 3.60)	₹ 10.80)
Cost of goods sold (₹) : (d)	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
{(a) × ₹ 90}					
Customer level operating activities costs					



Order taking costs (₹): (No. of purchase × ₹750)	11,250	18,750	22,500	18,750	22,500
Customer visits costs (₹) (No. of customer visits × ₹ 600)	1,200	1,800	3,600	1,200	1,800
Delivery vehicles travel costs (₹) (₹ 5.75 per km) (Kms travelled by delivery vehicles × ₹ 5.75 per km.)	1,150 (5.75 × 10 × 20)	1,035 (5.75 × 30 × 6)	1,725 (5.75 × 60 × 5)	2,300 (5.75 × 40 × 10)	3,450 (5.75 × 20 × 30)
Product handling costs (₹) {(a) × ₹ 3.75}	17,550	73,830	5,13,000	2,68,313	32,906
Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 2,250}	-	-	-	-	2,250
Total cost of customer level operating activities (₹)	31,150	95,415	5,40,825	2,90,563	62,906

(i) Computation of Customer level operating income

	Customers				
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)
Revenues (At list price) (Refer to working note)	5,05,440	21,26,304	1,47,74,400	77,27,400	9,47,700
Less: Discount (Refer to working note)	-	35,438	12,31,200	2,57,580	94,770
Revenue (At actual price)	5,05,440	20,90,866	1,35,43,200	74,69,820	8,52,930
Less: Cost of goods sold (Refer to working note)	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
Gross margin	84,240	3,18,946	12,31,200	10,30,320	63,180
Less: Customer level operating activities costs (Refer to working note)	31,150	95,415	5,40,825	2,90,563	62,906
Customer level operating income	53,090	2,23,531	6,90,375	7,39,757	274

Comment on the results:

Customer D is the most profitable customer. D's profits are even higher than C (whose revenue is the highest) despite having only 52.30% of the unit volume of customer C. The main reason is that C receives a discount of ₹ 9 per case while customer D receives only a ₹ 3.60 discount per case.

Customer E is the least profitable. The profits of E is even less than A (whose revenue is least) Customer E received a discount of ₹ 10.80 per case, makes more frequent orders, requires more customer visits and requires more delivery kms. in comparison with customer A.

(ii) Insight gained by reporting both the list selling price and the actual selling price for each customer:



Separate reporting of both - the listed and actual selling prices enables Alpha Ltd. to examine which customer has received what discount per case, whether the discount received has any relationship with the sales volume. The data given below provides us with the following information;

Sales volume	Discount per case (₹)
C (1,36,800 cases)	9.00
D (71,550 cases)	3.60
B (19,688 cases)	1.80
E (8,775 cases)	10.80
A (4,680 cases)	0

The above data clearly shows that the discount given to customers per case has a direct relationship with sales volume, except in the case of customer E. The reasons for ₹ 10.80 discount per case for customer E should be explored.

**QUESTION 9. (PP5)**

BABYSOFT is a global brand created by Bio-organic Ltd. The company manufactures three ranges of beauty soaps i.e. BABYSOFT- Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond. The budgeted costs and production for the month of December are as follows:

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

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

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

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

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

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

You are requested to:

(i) PREPARE a statement showing the unit costs and total costs of each product using the



absorption costing method.

- (ii) PREPARE a statement showing the product costs of each product using the ABC approach.
 (iii) STATE what are the reasons for the different product costs under the two approaches.

ANSWER

- (i) Traditional Absorption Costing

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

Overhead rate per direct labour hour:

= Budgeted overheads / Budgeted labour hours

= ₹ 1,98,000 / 6,000 hours

= ₹ 33 per direct labour hour

Unit Costs:

	BABYSOFT-Gold (₹)	BABYSOFT-Pearl (₹)	BABYSOFT-Diamond (₹)
Direct Costs:			
- Direct Labour	5.00 $\left(\frac{10 \times 30}{60} \right)$	6.67 $\left(\frac{10 \times 40}{60} \right)$	10.00 $\left(\frac{10 \times 60}{60} \right)$
- Direct Material (Refer working note1)	167.50	215.50	248.50
Production Overhead	16.50 $\left(\frac{33 \times 30}{60} \right)$	22.00 $\left(\frac{33 \times 40}{60} \right)$	33.00 $\left(\frac{33 \times 60}{60} \right)$
Total unit costs	189.00	244.17	291.50
Number of units	4,000	3,000	2,000
Total costs	7,56,000	7,32,510	5,83,000

Working note-1

Calculation of Direct material cost

	BABYSOFT-Gold (₹)	BABYSOFT-Pearl (₹)	BABYSOFT-Diamond (₹)
Essential oils	120.00 $\left(\frac{200 \times 60}{100} \right)$	165.00 $\left(\frac{300 \times 55}{100} \right)$	195.00 $\left(\frac{300 \times 65}{100} \right)$
Cocoa Butter	40.00 $\left(\frac{200 \times 20}{100} \right)$	40.00 $\left(\frac{200 \times 20}{100} \right)$	40.00 $\left(\frac{200 \times 20}{100} \right)$



Filtered water	4.50 $\left(\frac{15 \times 30}{100}\right)$	4.50 $\left(\frac{15 \times 30}{100}\right)$	4.50 $\left(\frac{15 \times 30}{100}\right)$
Chemicals	3.00 $\left(\frac{30 \times 10}{100}\right)$	6.00 $\left(\frac{50 \times 12}{100}\right)$	9.00 $\left(\frac{60 \times 15}{100}\right)$
Total costs	167.50	215.50	248.50

(ii) Activity Based Costing

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

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

= ₹ 0.06 per gram

Supervising rate per direct = ₹ 60,000 ÷ 6,000 hours

labour hour = ₹ 10 per labour hour

Utilities rate per machine

operations = ₹ 80,000 ÷ 47,000 machine operations

= ₹ 1.70 per machine operations

Unit Costs under ABC:

	BABYSOFT-Gold (₹)	BABYSOFT-Pearl (₹)	BABYSOFT-Diamond (₹)
Direct Costs:			
- Direct Labour	5.00	6.67	10.00
- Direct material	167.50	215.50	248.50
Production Overheads:			
- Forklifting cost	6.48 (0.06 108)	6.36 (0.06 106)	7.02 (0.06 117)
- Supervising cost	5.00 $\left(\frac{10 \times 30}{60}\right)$	6.67 $\left(\frac{10 \times 40}{60}\right)$	10.00 $\left(\frac{10 \times 60}{60}\right)$
Utilities	8.50 (1.70 x 5)	8.50 (1.70 x 5)	10.20 (1.70 x 6)
Total unit costs	192.48	243.70	285.72



Number of units	4,000	3,000	2,000
Total costs	7,69,920	7,31,100	5,71,440

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

CA Rahul Panchal



REVISION TEST PAPER



RTP MAY 18

G-2020 Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Product A	Product B	Product C	
Direct Materials	50	40	40	₹/u
Direct Labour @ ₹ 10/ hour	30	40	50	₹/u
Production Overheads	30	40	50	₹/u
Total Cost	110	120	140	₹/u
Quantity Produced	10,000	20,000	30,000	Units

G-2020 Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost (₹)
Stores Receiving	Purchase Requisitions	2,96,000
Inspection	Number of Production Runs	8,94,000
Dispatch	Orders Executed	2,10,000
Machine Setup	Number of Setups	12,00,000

The following information is also supplied:

Details	Product A	Product B	Product C
No. of Setups	360	390	450
No. of Orders Executed	180	270	300
No. of Production Runs	750	1,050	1,200
No. of Purchase Requisitions	300	450	500

Required

CALCULATE activity based production cost of all the three products.

ANSWER :

The total production overheads are ₹26,00,000:

Product A: $10,000 \times ₹ 30 = ₹ 3,00,000$

Product B: $20,000 \times ₹ 40 = ₹ 8,00,000$

Product C: $30,000 \times ₹ 50 = ₹ 15,00,000$

On the basis of ABC analysis this amount will be apportioned as follows:

Statement Showing "Activity Based Production Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	A (₹)	B (₹)	C (₹)
Stores Receiving	Purchase Requisition	6:9:10	2,96,000	71,040	1,06,560	1,18,400



Inspection	Production	5:7:8	8,94,000	2,23,500	3,12,900	3,57,600
	Runs					
Dispatch	Orders	6:9:10	2,10,000	50,400	75,600	84,000
	Executed					
Machine	Setups	12:13:15	12,00,000	3,60,000	3,90,000	4,50,000
Setups						
Total Activity Cost				7,04,940	8,85,060	10,10,000
Quantity Produces				10,000	20,000	30,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				80	80	90
Total				150.49	124.25	123.67

**RTP NOV 18**

Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 20X7-X8 for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 0
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000

Family store also provides the following information for the year 20X7-X8:

Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	₹ 60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	₹ 7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	₹ 12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	₹ 8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	₹ 15,36,000	15,36,000 items sold

Required:

- Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. CALCULATE the operating income and operating income as a % of revenues for each product line.
- If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using an activity based costing system, CALCULATE the operating income and operating income as a % of revenues for each product line.

**ANSWER :**

- (i) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS): (B)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS): (C) (Refer working notes)	9,00,000	22,50,000	13,50,000	45,00,000
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: E = {(A) - (D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (E/A) × 100)	1.70%	7.17%	3.30%	4.97%

Working notes:

1. Total support cost:

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{₹45,00,000}{₹1,50,00,000} \times 100 = 30\%$$

3. Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	7,80,000	1,560 purchase orders	₹500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹400 per delivery
Shelf- stocking	8,64,000	8,640 hours	₹100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹1 per item sold

- (ii) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity -based costing system)



	Soft drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5400:2700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income C: {(A) - (B)}	4,27,500	63,000	5,29,500	10,20,000
Operating income as a % of revenues	10.78%	0.60%	8.75%	4.97%

* Refer to working note 3

**RTP MAY 19**

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

Activity	Cost Driver	Capacity	Cost (₹)
Power	Kilowatt hours	50,000 kilowatt hours	40,00,000
Quality Inspections	Number of Inspections	10,000 Inspections	60,00,000

The company makes three products M, S and T. For the year ended March 31, 20X 9, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
M	10,000	3,500
S	20,000	2,500
T	15,000	3,000

Required:

- PREPARE a statement showing cost allocation to each product from each activity.
- CALCULATE the cost of unused capacity for each activity.
- STATE the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.

ANSWER :

- Statement of cost allocation to each product from each activity

	Product			
	M (₹)	S (₹)	T (₹)	Total (₹)



Power (Refer to working note)	8,00,000 (10,000 kWh × ₹80)	16,00,000 (20,000 kWh × ₹80)	12,00,000 (15,000 kWh × ₹80)	36,00,000
Quality Inspections (Refer to working note)	21,00,000 (3,500 inspections × ₹600)	15,00,000 (2,500 inspections × ₹600)	18,00,000 (3,000 inspections × ₹600)	54,00,000

Working Note:

Rate per unit of cost driver:

Power : (₹40,00,000 ÷ 50,000 kWh) = ₹80/kWh

Quality Inspection : (₹60,00,000 ÷ 10,000 inspections) = ₹600 per inspection

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

	(₹)
Power (₹40,00,000 – ₹36,00,000)	4,00,000
Quality Inspections (₹60,00,000 – ₹54,00,000)	6,00,000
Total cost of unused capacity	10,00,000

(iii) Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing & capacity management
- Effect on pricing decisions.
- Effect on performance evaluation
- Effect on financial statements
- Regulatory requirements.
- Difficulties in forecasting for any capacity level.



RTP NOV 19

SMP Pvt. Ltd. manufactures three products using three different machines. At present the overheads are charged to products using labour hours. The following statement for the month of September 2019, using the absorption costing method has been prepared:

Particulars	Product X (using machine A)	Product Y (using machine B)	Product Z (using machine C)
Production units	45,000	52,500	30,000
Material cost per unit (₹)	350	460	410
Wages per unit @ ₹80 per hour	240	400	560
Overhead cost per unit (₹)	240	400	560
Total cost per unit (₹)	830	1,260	1,530
Selling price (₹)	1,037.50	1,575	1,912.50

The following additional information is available relating to overhead cost drivers.

Cost driver	Product X	Product Y	Product Z	Total
No. of machine set-ups	40	160	400	600



No. of purchase orders	400	800	1,200	2,400
No. of customers	1,000	2,200	4,800	8,000

Actual production and budgeted production for the month is same. Workers are paid at standard rate. Out of total overhead costs, 30% related to machine set-ups, 30% related to customer order processing and customer complaint management, while the balance proportion related to material ordering.

Required:

- COMPUTE overhead cost per unit using activity based costing method.
- DETERMINE the selling price of each product based on activity-based costing with the same profit mark-up on cost.

ANSWER :

Workings:

Total labour hours and overhead cost:

Particulars	Product X	Product Y	Product Z	Total
Production units	45,000	52,500	30,000	1,27,500
Hour per unit	3	5	7	
Total hours	1,35,000	2,62,500	2,10,000	6,07,500
Rate per hour				₹80.00
Total overhead				₹4,86,00,000

Cost per activity and driver

Activity	Machine Set-up	Customer order processing	Customer complaint management	Total
Total overhead (₹)	1,45,80,000	1,45,80,000	1,94,40,000	4,86,00,000
No. of drivers	600	2,400	8,000	
Cost per driver (₹)	24,300	6,075	2,430	

- Computation of Overhead cost per unit:

Particulars	Product X	Product Y	Product Z
No. of machine set-ups	40	160	400
Cost per driver (₹)	24,300	24,300	24,300
Total Machine set-up cost (₹) [A]	9,72,000	38,88,000	97,20,000
No. of purchase orders	400	800	1,200
Cost per driver (₹)	6,075	6,075	6,075
Total order processing cost (₹) [B]	24,30,000	48,60,000	72,90,000
No. of customers	1,000	2,200	4,800
Cost per driver (₹)	2,430	2,430	2,430
Total customer complaint management cost (₹) [C]	24,30,000	53,46,000	1,16,64,000
Total Overhead cost (₹) [A+B+C]	58,32,000	1,40,94,000	2,86,74,000
Production units	45,000	52,500	30,000
Cost per unit (₹)	129.60	268.46	955.80



(ii) Determination of Selling price per unit

Particulars	Product X (using machine A)	Product Y (using machine B)	Product Z (using machine C)
Material cost per unit (₹)	350.00	460.00	410.00
Wages per unit @ ₹80 per hour	240.00	400.00	560.00
Overhead cost per unit (₹)	129.60	268.46	955.80
Total cost per unit (₹)	719.60	1,128.46	1,925.80
Profit (25% profit mark-up) (₹)	179.90	282.11	481.45
Selling price (₹)	899.50	1,410.57	2,407.25

**RTP MAY 20**

Following are the data of three product lines of a departmental store for the year 2019 -20:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 0
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000

Additional information related with the store are as follows:

Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	₹ 60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	₹ 7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	₹ 12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	₹ 8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	₹ 15,36,000	15,36,000 items sold

Required:

CALCULATE the total cost and operating income using Activity Based Costing method.

ANSWER :

Working notes:

(i) Total support cost:

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000



Customer support	15,36,000
Total support cost	45,00,000

(ii) Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	7,80,000	1,560 purchase orders	₹500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹400 per delivery
Shelf-stocking	8,64,000	8,640 hours	₹100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹1 per item sold

Statement of Total cost and Operating income

	Soft drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5400:2700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income C: {(A) - (B)}	4,27,500	63,000	5,29,500	10,20,000

* Refer to working note (ii)



RTP NOV 20

KD Ltd. is following Activity based costing. Budgeted overheads, cost drivers and volume are as follows:

Cost pool	Budgeted overheads (₹)	Cost driver	Budgeted volume
Material procurement	18,42,000	No. or orders	1,200
Material handling	8,50,000	No. of movement	1,240
Maintenance	24,56,000	Maintenance hours	17,550
Set-up	9,12,000	No. of set-ups	1,450
Quality control	4,42,000	No. of inspection	1,820

The company has produced a batch of 7,600 units, its material cost was ₹24,62,000 and wages ₹4,68,500. Usage activities of the said batch are as follows:



Material orders	56
Material movements	84
Maintenance hours	1,420 hours
Set-ups	60
No. of inspections	18

Required:

(i) CALCULATE cost driver rates.

(ii) CALCULATE the total and unit cost for the batch.

ANSWER :

(i) Calculation of cost driver rate:

Cost pool	Budgeted overheads (₹)	Cost driver	Cost driver rate (₹)
Material procurement	18,42,000	1,200	1,535.00
Material handling	8,50,000	1,240	685.48
Maintenance	24,56,000	17,550	139.94
Set-up	9,12,000	1,450	628.97
Quality control	4,42,000	1,820	242.86

(ii) Calculation of cost for the batch:

Particulars	Amount (₹)	Amount (₹)
Material cost		24,62,000.00
Wages		4,68,500.00
Overheads:		
- Material procurement (₹1,535×56 orders)	85,960.00	
- Material handling (₹685.48×84 movements)	57,580.32	
- Maintenance (₹139.94×1,420 hours)	1,98,714.80	
- Set-up (₹628.97×60 set-ups)	37,738.20	
- Quality control (₹242.86×18 inspections)	4,371.48	3,84,364.80
Total Cost		33,14,864.80
No. of units		7,600
Cost per units		436.17



RTP MAY 21

The following budgeted information relates to N Ltd. for the year 2021:

	Products		
	X	Y	Z
Production and Sales (units)	1,00,000	80,000	60,000
	(₹)	(₹)	(₹)
Selling price per unit	90	180	140
Direct cost per unit	50	90	95
	Hours	Hours	Hours
Machine department (machine hours per unit)	3	4	5
Assembly department (direct labour hours per unit)	6	4	3



The estimated overhead expenses for the year 2021 will be as below:

Machine Department ₹ 73,60,000

Assembly Department ₹ 55,00,000

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

Machine Department On the basis of machine hours

Assembly Department On the basis of labour hours

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

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

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

	Products		
	X	Y	Z
Machine set-ups	4,500	3,000	1,500
Customer orders	2,200	2,400	2,600
Purchase orders	300	350	150

You are required to PREPARE a product-wise profit statement using:

- Absorption costing method;
- Activity-based method.

ANSWER :

(i) Profit Statement using Absorption costing method:

	Particulars	Products			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	2,40,000
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads:				
(i)	Machine department (₹) (Working note-1)	24,00,000	25,60,000	24,00,000	73,60,000
(ii)	Assembly department (₹) (Working note-1)	30,00,000	16,00,000	9,00,000	55,00,000
G.	Total Cost (₹) [E+F]	1,04,00,000	1,13,60,000	90,00,000	3,07,60,000
H.	Profit (C-G)	(14,00,000)	30,40,000	(6,00,000)	10,40,000



(ii) Profit Statement using Activity based costing (ABC) method:

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

Working Notes:

1.

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

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

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

2. Calculation of cost driver rate

Cost pool	Amount (₹)	Cost Driver	Quantity	Driver rate (₹)
Machining services	64,40,000	Machine hours	9,20,000 hours	7.00
Assembly services	44,00,000	Direct labour hours	11,00,000 hours	4.00
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups	100.00



Order processing	7,20,000	Customer orders	7,200 orders	100.00
Purchasing	4,00,000	Purchase orders	800 orders	500.00

3. Calculation of activity-wise cost

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



RTP NOV 21

Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 2020-21 for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 0
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000



Family store also provides the following information for the year 2020-21:

Activity	Description of activity	Total Cost (₹)	Cost-allocation base
Bottles returns	Returning of empty bottles	60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on- going restocking	8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	15,36,000	15,36,000 items sold

Required:

- Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. CALCULATE the operating income and operating income as a % of revenues for each product line.
- If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using an activity-based costing system, CALCULATE the operating income and operating income as a % of revenues for each product line.

ANSWER :

Working notes:

- Total support cost:

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

- Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{\text{₹ 45,00,000}}{\text{₹ 1,50,00,000}} \times 100 = 30\%$$

- Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]



Ordering	7,80,000	1,560 purchase orders	₹ 500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹ 400 per delivery
Shelf-stocking	8,64,000	8,640 hours	₹ 100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹ 1 per item sold

- (i) Statement of Operating income and Operating income as a percentage of revenues for each product line
(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS): (B)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS): (C)	9,00,000	22,50,000	13,50,000	45,00,000
(Refer working notes)				
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: (E) = {(A) - (D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (F) = {(E)/(A) × 100}	1.70%	7.17%	3.30%	4.97%

- (ii) Statement of Operating income and Operating income as a percentage of revenues for each product line
(When support costs are allocated to product lines using an activity -based costing system)

	Soft drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2,190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5,400:2,700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000



Operating income:	4,27,500	63,000	5,29,500	10,20,000
(C) = {(A) - (B)}				
Operating income as a	10.78%	0.60%	8.75%	4.97%
% of revenues:				
(D) = {(C)/(A) × 100}				

* Refer to working note 3

**RTP MAY 22**

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

- (i) Supermarket A dealing in Adults' garments (Age group 15 - 30)
- (ii) Supermarket B dealing in Kids' garments (Age group 5 - 10)

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

	Supermarket A (₹)	Supermarket B (₹)
Average revenue per delivery	1,69,950	57,750
Average cost of goods sold per delivery	1,65,000	55,000
Number of deliveries	660	1,650

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

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

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

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

Other data for the month of April include the following:

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

Required:

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



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

ANSWER :

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

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

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

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

Working note:

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

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



Computation of operating cost of each distribution channel:

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



RTP NOV 22

The profit margin of BABY Hairclips Company were over 20% of sales producing BROWN and BLACK hairclips.

During the last year, GREEN hairclips had been introduced at 10% premium in selling price after the introduction of YELLOW hairclips earlier five years back at 10/3% premium. However, the manager of the company is disheartened with the sales figure for the current financial year as follows:

Traditional Income Statement

(in ₹)

	Brown	Black	Yellow	Green	Total
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Direct Labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Overhead (3 times of direct labour)	60,00,000	48,00,000	10,80,000	1,20,000	1,20,00,000
Total Operating Income	20,00,000	16,00,000	4,14,000	60,000	40,74,000
Return on Sales (in %)	13.3%	13.3%	14.8%	18.2%	13.5%

It is a known fact that customers are ready to pay premium amount for YELLOW and GREEN hairclips for their attractiveness; and the percentage returns are also high on new products.

At present, all of the Plant's indirect expenses are allocated to the products at 3 times of the direct labour expenses. However, the manager is interested in allocating indirect expenses on the basis of activity cost to reveal real earner.

He provides support expenses category-wise as follows:

Support Expenses	(₹)
Indirect Labour	40,00,000
Labour Incentives	32,00,000
Computer Systems	20,00,000



Machinery depreciation	16,00,000
Machine maintenance	8,00,000
Energy for machinery	4,00,000
Total	1,20,00,000

He provides following additional information for accomplishment of his interest: Incentives to be allocated @ 40% of labour expenses (both direct and indirect).

Indirect labours are involved mainly in three activities. About half of indirect labour is involved in handling production runs. Another 40% is required just for the physical changeover from one color hairclip to another because YELLOW hairclips require substantial labour for preparing the machine as compared to other colour hairclips. Remaining 10% of the time is spend for maintaining records of the products in four parts.

Another amount spent on computer system of ₹ 20,00,000 is for maintenance of documents relating to production runs and record keeping of the four products. In aggregate, approx.. 80% of the amount expend is involved in the production run activity and approx.. 20% is used to keep records of the products in four parts.

Other overhead expenses i.e. machinery depreciation, machine maintenance and energy for machinery are incurred to supply machine capacity to produce all the hairclips (practical capability of 20,000 hours).

Activity Cost Drivers:

Particulars	Brown	Black	Yellow	Green	Total
Sales Volume (units)	1,00,000	80,000	18,000	2,000	2,00,000
Selling Price (₹)	150	150	155	165	
Material cost (₹)	50	50	52	55	
Machine hours per unit (Hrs)	0.10	0.10	0.10	0.10	20,000
Production runs	100	100	76	24	300
Setup time per run (Hrs)	4	1	6	4	

You are required to –

- CALCULATE operating income and operating income as per percentage of sales using activity-based costing system.
- STATE the reasons for different operating income under traditional income system and activity-based costing system.

ANSWER :

(i) Calculation of operating income using Activity Based Costing

Calculation of Cost-Driver rate

Activity	Overhead cost	Allocation	Overhead cost	Cost-driver level	Cost driver rate
Indirect labour	56,00,000	50%	28,00,000	300	9,333.33
+ 40% for incentives		40%	22,40,000	1052*	2,129.28
		10%	5,60,000	4	1,40,000
				Number of parts	



Computer Systems	20,00,000	80%	16,00,000	300	5,333.33
				Production runs	
		20%	4,00,000	4	1,00,000
				Number of parts	
Machinery depreciation	16,00,000	100%	16,00,000	20,000	80
				Machine hours	
Machine Maintenance	8,00,000	100%	8,00,000	20,000	40
				Machine hours	
Energy for Machinery	4,00,000	100%	4,00,000	20,000	20
				Machine hours	

$$* (100 \times 4) + (100 \times 1) + (76 \times 6) + (24 \times 4)$$

$$= (400 + 100 + 456 + 96)$$

$$= 1052 \text{ setup hours}$$

Activity Based Costing

	Brown	Black	Red	Green	Total
Quantity (units)	1,00,000	80,000	18,000	2,000	2,00,000
	(₹)	(₹)	(₹)	(₹)	(₹)
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Less: Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Less: Direct labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Less: 40% incentives on direct labour	8,00,000	6,40,000	1,44,000	16,000	16,00,000
(A)	72,00,000	57,60,000	13,50,000	1,64,000	1,44,74,000
Overheads					
Indirect labour + incentives					
- 50% based on Production runs	9,33,333 (9,333.33 x 100)	9,33,333 (9,333.33 x 100)	7,09,334 (9,333.33 x 76)	2,24,000 (9,333.33 x 24)	28,00,000
- 40% based on Setup hours	8,51,711 (2,129.28 x 400)	2,12,928 (2,129.28 x 100)	9,70,951 (2,129.28 x 456)	2,04,410 (2,129.28 x 96)	22,40,000
- 10% based on number of parts	1,40,000 (1,40,000 x 1)	1,40,000	1,40,000	1,40,000	5,60,000
Computer Systems					
- 80% based on Production runs	5,33,333 (5,333.33 x 100)	5,33,333 (5,333.33 x 100)	4,05,334 (5,333.33 x 76)	1,28,000 (5,333.33 x 24)	16,00,000
- 20% based on number of parts	1,00,000 (1,00,000 x 1)	1,00,000	1,00,000	1,00,000	4,00,000



Machinery depreciation	8,00,000 (80 × 0.1 × 1,00,000)	6,40,000 (80 × 0.1 × 80,000)	1,44,000 (80 × 0.1 × 18,000)	16,000 (80 × 0.1 × 2,000)	16,00,000
Machine Maintenance	4,00,000 (40 × 0.1 × 1,00,000)	3,20,000 (40 × 0.1 × 80,000)	72,000 (40 × 0.1 × 18,000)	8,000 (40 × 0.1 × 2,000)	8,00,000
Energy for Machinery	2,00,000 (20 × 0.1 × 1,00,000)	1,60,000 (20 × 0.1 × 80,000)	36,000 (20 × 0.1 × 18,000)	4,000 (20 × 0.1 × 2,000)	4,00,000
Total Overheads (B)	39,58,377	30,39,594	25,77,619	8,24,410	1,04,00,000
Operating Income (A-B)	32,41,623	27,20,406	(12,27,619)	(6,60,410)	40,74,000
Return on Sales (%)	21.61	22.67	(44.00)	(200.12)	13.53

- (ii) The difference in the operating income under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more accurate.

**RTP MAY 23**

Hygiene Care Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	Hand Wash	Detergent Powder	Dishwasher
Direct Materials (₹ / Pu)	150	120	120
Direct Labour @₹10/ hour (₹ / Pu)	45	60	75
Production Overheads (₹ / Pu)	40	50	40
Total Cost (₹ / Pu)	235	230	235
Quantity Produced (Units)	30,000	60,000	90,000

Hygiene Care Ltd. was absorbing overheads on the basis of direct labour hours. Management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost (₹)
Goods Receiving	Number of Dispatch Order	8,88,000
Inspecting and Testing costs	Number of Production Runs	26,82,000
Dispatching	Number of dispatch order	6,30,000
Storage Cost	Number of Batches of material	36,00,000

The following information is also supplied:

Details	Hand Wash	Detergent Powder	Dishwasher
Batches of material	720	780	900
Number of dispatch order	360	540	600
No. of Production Runs	1,500	2,100	2,400
Number of Dispatch Orders	600	900	1,000

Required:

CALCULATE activity-based production cost of all the three products.

**ANSWER :**

1. The Total Production Overhead are 78,00,000

Items	Labour Hour	Overheads allocation on the basis of direct Labour Hour (₹)
Labour Hour Ratio	(4.5:6:7.5)	
Hand Wash	1,35,000	9,00,000
Detergent Powder	3,60,000	24,00,000
Dishwasher	6,75,000	45,00,000
Total	11,70,000	78,00,000

2. On the basis of ABC analysis this amount will be apportioned as follows:

Statement Showing "Activity Based Production Cost"

Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	Hand Wash (₹)	Detergent Powder (₹)	Dishwasher (₹)
Goods Receiving	Dispatch order	06:09:10	8,88,000	2,13,120	3,19,680	3,55,200
Inspecting and Testing costs	Production Runs	05:07:08	26,82,000	6,70,500	9,38,700	10,72,800
Dispatching	Dispatch Order	06:09:10	6,30,000	1,51,200	2,26,800	2,52,000
Storage Cost	Batches of material	12:13:15	36,00,000	10,80,000	11,70,000	13,50,000
Total Activity Cost				21,14,820	26,55,180	30,30,000
Quantity Produces				30,000	60,000	90,000
Unit Cost (Overheads)				70.49	44.25	33.67
Add: Conversion Cost (Material + Labour)				195	180	195
Total				265.49	224.25	228.67

Note: This question can also be solved by using cost driver rate

**RTP NOV 23**

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

	₹
Machine Department expenses	18,48,000
Assembly Department expenses	6,72,000
Setup costs	90,000
Stores receiving cost	1,20,000



Order processing and dispatch	1,80,000
Inspect and Quality control cost	36,000

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

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

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

ANSWER :

Calculation of "Activity Rate"

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

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

Statement Showing "Overheads Allocation"

Particulars of Cost	Cost Driver	P	Q	R	Total
Machine Department Expenses	Machine Hours	4,20,000 (30,000 × ₹14)	6,72,000 (48,000 × ₹14)	7,56,000 (54,000 × ₹14)	18,48,000
Assembly Department Expenses	Assembly Hours	2,40,000 (15,000 × ₹16)	---	4,32,000 (27,000 × ₹16)	6,72,000



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

**RTP MAY 24**

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

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

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

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

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

ANSWER :

Working note:

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



	Customers				
	A	B	C	D	E
Units sold: (a)	4,500	6,000	9,500	7,500	12,750
Revenues (at listed price) (₹): (b)	2,91,60,000	3,88,80,000	6,15,60,000	4,86,00,000	8,26,20,000
{(a) × ₹6,480}					
Revenues (at listed price) (₹): (c)	2,91,60,000	3,82,32,000	5,64,30,000	4,69,80,000	7,43,58,000
{(a) × Actual selling price}	(4,500 × 6,480)	(6,000 × 6,372)	(9,500 × 5,940)	(7,500 × 6,264)	(12,750 × 5,832)
Discount (₹) (d)	0	6,48,000	51,30,000	16,20,000	82,62,000
{(b) – (c)}					
Cost of goods sold (₹) : (e)	2,43,00,000	3,24,00,000	5,13,00,000	4,05,00,000	6,88,50,000
{(a) × ₹5,400}					
Customer level operating activities costs					
Order taking costs (₹): (No. of purchase orders × ₹ 4,500)	67,500	1,12,500	1,35,000	1,12,500	1,35,000
Customer visits costs (₹) (No. of customer visits × ₹ 3,600)	7,200	10,800	21,600	7,200	10,800
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles × ₹ 7.50 per km.)	1,500	1,350	2,250	3,000	4,500
Product handling costs (₹) {(a) × ₹ 22.50}	1,01,250	1,35,000	2,13,750	1,68,750	2,86,875
Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 13,500}	-	-	-	-	13,500
Total cost of customer level operating activities (₹)	1,77,450	2,59,650	3,72,600	2,91,450	4,50,675



Computation of Customer level operating income

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



06

COST SHEET

**QUESTION 1. (ILLUSTRATION 1)**

The following data relates to the manufacture of a standard product during the month of April:

Particulars	(₹)
Raw materials	₹ 1,80,000
Direct wages	₹ 90,000
Machine hours worked (hours)	10,000
Machine hour rate (per hour)	₹ 8
Administration overheads (general)	₹ 35,000
Selling overheads (per unit)	₹ 5
Units produced	4,000
Units sold	3,600
Selling price per unit	₹ 125

You are required to PREPARE a cost sheet in respect of the above showing:

- Cost per unit
- Profit for the month

ANSWER :

(i) Cost Sheet

Output: 4,000 units

Particulars	Total Cost (₹)	Cost per (unit) (₹)
Raw materials	1,80,000	45.00
Direct wages	90,000	22.50
Prime cost	2,70,000	67.50
Add: Factory overheads (10,000 hrs × ₹ 8 per hour)	80,000	20.00
Cost of Production	3,50,000	87.50
Less: Closing Stock of finished goods (4,000 – 3,600 units)	(35,000)	--
Cost of Goods Sold	3,15,000	87.50
Add: Administration overheads (general)	35,000	9.72
Add: Selling Overheads (3,600 units × ₹ 5 unit)	18,000	5.00
Cost of sales (total Cost)	3,68,000	102.22

(ii) Statement of Profit

Particulars	Total Cost (₹)
Sales revenue (3,600 units @ ₹ 125)	4,50,000
Less: Cost of sales	3,68,000
Profit	82,000

**QUESTION 2. (ILLUSTRATION 2)**

The following information has been obtained from the records of ABC Corporation for the period from June 1 to June 30.

Particulars	On June 1 (₹)	On June 30 (₹)
Cost of raw materials	60,000	50,000
Cost of work-in-process	12,000	15,000
Cost of stock of finished goods	90,000	1,10,000
Purchase of raw materials during June 2020		4,80,000
Wages paid		2,40,000
Factory overheads		1,00,000
Administration overheads (related to production)		50,000
Selling & distribution overheads		25,000
Sales		10,00,000

PREPARE a statement giving the following information:

- (a) Raw materials consumed;
- (b) Prime cost;
- (c) Factory cost;
- (d) Cost of goods sold; and
- (e) Net profit.

ANSWER :

Statement of Cost & Profit
(for the month of June)

	(₹)
Opening stock of raw materials	60,000
Add: Purchase of raw materials during the month of June	4,80,000
Less: Closing stock of raw materials	(50,000)
(a) Raw materials consumed	4,90,000
Add: Direct wages	2,40,000
(b) Prime cost	7,30,000
Add: Factory overheads	1,00,000
Works cost	8,30,000
Add: Opening work-in-process	12,000
Less: Closing work-in-process	(15,000)
(c) Factory cost	8,27,000
Add: Administration overheads	50,000
Cost of production	8,77,000
Add: Opening stock of finished goods	90,000
Less: Closing stock of finished goods	(1,10,000)
(d) Cost of goods sold	8,57,000
Add: Selling & distribution overheads	25,000
Cost of sales	8,82,000
(e) Net Profit	1,18,000
Sales	10,00,000

**QUESTION 3. (ILLUSTRATION 3)**

Arnav Inspat Udyog Ltd. has the following expenditures for the year ended 31st March 2023:

Sl. No.		(₹)	(₹)
(i)	Raw materials purchased		10,00,00,000
(ii)	GST paid on the above purchases @18% (eligible for input tax credit)		1,80,00,000
(iii)	Freight inwards		11,20,600
(iv)	Wages paid to factory workers		29,20,000
(v)	Contribution made towards employees' PF & ESIS		3,60,000
(vi)	Production bonus paid to factory workers		2,90,000
(vii)	Royalty paid for production		1,72,600
(viii)	Amount paid for power & fuel		4,62,000
(ix)	Amount paid for purchase of moulds and patterns (life is equivalent to two years production)		8,96,000
(x)	Job charges paid to job workers		8,12,000
(xi)	Stores and spares consumed		1,12,000
(xii)	Depreciation on:		
	Factory building	84,000	
	Office building	56,000	
	Plant & Machinery	1,26,000	
	Delivery vehicles	86,000	3,52,000
(xiii)	Salary paid to supervisors		1,26,000
(xiv)	Repairs & Maintenance paid for: Plant & Machinery	48,000	
	Sales office building	18,000	
	Vehicles used by directors	19,600	85,600
(xv)	Insurance premium paid for:		
	Plant & Machinery	31,200	
	Factory building	18,100	
	Stock of raw materials & WIP	36,000	85,300
(xvi)	Expenses paid for quality control check activities		19,600
(xvii)	Salary paid to quality control staffs		96,200
(xviii)	Research & development cost paid for improvement in production process		18,200
(xix)	Expenses paid for pollution control and engineering & maintenance		26,600
(xx)	Expenses paid for administration of factory work		1,18,600
(xxi)	Salary paid to functional managers:		
	Production control	9,60,000	
	Finance & Accounts	9,18,000	
	Sales & Marketing	10,12,000	28,90,000
(xxii)	Salary paid to General Manager		12,56,000
(xxiii)	Packing cost paid for:		
	Primary packing necessary to maintain quality	96,000	



	For re-distribution of finished goods	1,12,000	2,08,000
(xxiv)	Interest and finance charges paid (for usage of non-equity fund)		7,20,000
(xxv)	Fee paid to auditors		1,80,000
(xxvi)	Fee paid to legal advisors		1,20,000
(xxvii)	Fee paid to independent directors		2,20,000
(xxviii)	Performance bonus paid to sales staffs		1,80,000
(xxix)	Value of stock as on 1st April, 2022:		
	Raw materials	18,00,000	
	Work-in-process	9,20,000	
	Finished goods	11,00,000	38,20,000
(xxx)	Value of stock as on 31st March, 2023:		
	Raw materials	9,60,000	
	Work-in-process	8,70,000	
	Finished goods	18,00,000	36,30,000

Amount realized by selling of scrap and waste generated during manufacturing process – ₹ 86,000/-

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

ANSWER :

Statement of Cost of Arnav Ispat Udyog Ltd. for the year ended 31st March, 2023:

Sl. No.	Particulars	(₹)	(₹)
(i)	Material Consumed:		
	Raw materials purchased	10,00,00,000	
	Freight inwards	11,20,600	
	Add: Opening stock of raw materials	18,00,000	
	Less: Closing stock of raw materials	(9,60,000)	10,19,60,600
(ii)	Direct employee (labour) cost:		
	Wages paid to factory workers	29,20,000	
	Contribution made towards employees' PF & ESIS	3,60,000	
	Production bonus paid to factory workers	2,90,000	35,70,000
(iii)	Direct expenses:		
	Royalty paid for production	1,72,600	
	Amount paid for power & fuel	4,62,000	
	Amortised cost of moulds and patterns	4,48,000	
	Job charges paid to job workers	8,12,000	18,94,600
	Prime Cost		10,74,25,200
(iv)	Works/ Factory overheads:		
	Stores and spares consumed	1,12,000	
	Depreciation on factory building	84,000	
	Depreciation on plant & machinery	1,26,000	
	Repairs & Maintenance paid for plant & machinery	48,000	



	Insurance premium paid for plant & machinery	31,200	
	Insurance premium paid for factory building	18,100	
	Insurance premium paid for stock of raw materials & WIP	36,000	
	Salary paid to supervisors	1,26,000	
	Expenses paid for pollution control and engineering & maintenance	26,600	6,07,900
	Gross factory cost		10,80,33,100
	Add: Opening value of W-I-P		9,20,000
	Less: Closing value of W-I-P		(8,70,000)
	Factory Cost		10,80,83,100
(v)	Quality control cost:		
	Expenses paid for quality control check activities	19,600	
	Salary paid to quality control staffs	96,200	1,15,800
(vi)	Research & development cost paid for improvement in production process		18,200
(vii)	Administration cost related with production:		
	- Expenses paid for administration of factory work	1,18,600	
	- Salary paid to Production control manager	9,60,000	10,78,600
(viii)	Less: Realisable value on sale of scrap and waste		(86,000)
(ix)	Add: Primary packing cost		96,000
	Cost of Production		10,93,05,700
	Add: Opening stock of finished goods		11,00,000
	Less: Closing stock of finished goods		(18,00,000)
	Cost of Goods Sold		10,86,05,700
(x)	Administrative overheads:		
	Depreciation on office building	56,000	
	Repairs & Maintenance paid for vehicles used by directors	19,600	
	Salary paid to Manager- Finance & Accounts	9,18,000	
	Salary paid to General Manager	12,56,000	
	Fee paid to auditors	1,80,000	
	Fee paid to legal advisors	1,20,000	
	Fee paid to independent directors	2,20,000	27,69,600
(xi)	Selling overheads:		
	Repairs & Maintenance paid for sales office building	18,000	
	Salary paid to Manager- Sales & Marketing	10,12,000	
	Performance bonus paid to sales staffs	1,80,000	12,10,000
(xii)	Distribution overheads:		
	Depreciation on delivery vehicles	86,000	
(xiii)	Packing cost paid for re-distribution of finished goods	1,12,000	1,98,000
(xiv)	Interest and finance charges paid		7,20,000
	Cost of Sales		11,35,03,300

Note:

GST paid on purchase of raw materials would not be part of cost of materials as it is eligible for input tax credit.

**QUESTION 4. (PP1)**

The books of Adarsh Manufacturing Company present the following data for the month of April: Direct labour cost ₹ 17,500 being 175% of works overheads. Cost of goods sold excluding administrative expenses ₹ 56,000.

Inventory accounts showed the following opening and closing balances:

	April 1 (₹)	April 30 (₹)
Raw materials	8,000	10,600
Work-in-progress	10,500	14,500
Finished goods	17,600	19,000

Other data are:

	(₹)
Selling expenses	3,500
General and administration expenses	2,500
Sales for the month	75,000

You are required to:

- FIND out the value of materials purchased.
- PREPARE a cost statement showing the various elements of cost and also the profit earned.

ANSWER :

- Computation of the value of materials purchased

To find out the value of materials purchased, reverse calculations from the given data can be presented as below:

Particulars	(₹)
Cost of goods sold	56,000
Add: Closing stock of finished goods	19,000
Less: Opening stock of finished goods	(17,600)
Cost of production	57,400
Add: Closing stock of work-in-progress	14,500
Less: Opening stock of work-in-progress	(10,500)
Works cost	61,400
Less: Factory overheads: $\left(\frac{₹17,500 \times 100}{175} \right)$	(10,000)
Prime cost	51,400
Less: Direct labour	(17,500)
Raw material consumed	33,900
Add: Closing stock of raw materials	10,600
Raw materials available	44,500
Less: Opening stock of raw materials	(8,000)
Value of materials purchased	36,500

- Cost statement

	(₹)
Raw material consumed [Refer to statement (i) above]	33,900
Add: Direct labour cost	17,500



Prime cost	51,400
Add: Factory overheads	10,000
Works cost	61,400
Add: Opening work-in-progress	10,500
Less: Closing work-in-progress	(14,500)
Cost of production	57,400
Add: Opening stock of finished goods	17,600
Less: Closing stock of finished goods	(19,000)
Cost of goods sold	56,000
Add: General and administration expenses	2,500
Add: Selling expenses	3,500
Cost of sales	62,000
Profit (Balance figure ₹ 75,000 – ₹ 62,000)	13,000
Sales	75,000

**QUESTION 5. (PP2)**

From the following particulars, you are required to PREPARE monthly cost sheet of Aditya Industries:

	(₹)
Opening Inventories:	
- Raw materials	12,00,000
- Work-in-process	18,00,000
- Finished goods (10,000 units)	9,60,000
Closing Inventories:	
- Raw materials	14,00,000
- Work-in-process	16,04,000
- Finished goods	?
Raw materials purchased	1,44,00,000
GST paid on raw materials purchased (ITC available)	7,20,000
Wages paid to production workers	36,64,000
Expenses paid for utilities	1,45,600
Office and administration expenses paid	26,52,000
Travelling allowance paid to office staffs	1,21,000
Selling expenses	6,46,000

Machine hours worked- 21,600 hours

Machine hour rate- ₹ 8.00 per hour

Units sold- 1,60,000

Units produced- 1,94,000

Desired profit- 15% on sales

**ANSWER :**

Cost sheet of Aditya Industries for month of....

Units produced- 1,94,000

Units sold- 1,60,000

Particulars	(₹)	Cost per unit (₹)
Raw materials purchased	1,44,00,000	
Add: Opening value of raw materials	12,00,000	
Less: Closing value of raw materials	(14,00,000)	
Materials consumed	1,42,00,000	73.19
Wages paid to production workers	36,64,000	18.89
Expenses paid for utilities	1,45,600	0.75
Prime Cost	1,80,09,600	92.83
Factory overheads (₹ 8 × 21,600 hours)	1,72,800	
Add: Opening value of W-I-P	18,00,000	
Less: Closing value of W-I-P	(16,04,000)	
Cost of Production	1,83,78,400	94.73
Add: Value of opening finished stock	9,60,000	
Less: Value of closing finished stock (₹ 94.73 × 44,000)	(41,68,120)	
Cost of Goods Sold	1,51,70,280	94.81
Office and administration expenses paid	26,52,000	16.58
Travelling allowance paid to office staffs	1,21,000	0.75
Selling expenses	6,46,000	4.04
Cost of Sales	1,85,89,280	116.18
Add: Profit	32,80,461	20.50
	2,18,69,741	136.68

**QUESTION 6. (PP3)**

A Ltd. Co. has capacity to produce 1,00,000 units of a product every month. Its works cost at varying levels of production is as under:

Level	Works cost per unit (₹)
10%	400
20%	390
30%	380
40%	370
50%	360
60%	350
70%	340
80%	330
90%	320
100%	310

Its fixed administration expenses amount to ₹1,50,000 and fixed marketing expenses amount to ₹2,50,000 per month respectively. The variable distribution cost amounts to ₹ 30 per unit.

It can sell 100% of its output at ₹500 per unit provided it incurs the following further expenditure:

(a) it gives gift items costing ₹ 30 per unit of sale;

(b) it has lucky draws every month giving the first prize of ₹ 50,000; 2nd prize of ₹ 25,000,



3rd prize of ₹ 10,000 and three consolation prizes of ₹ 5,000 each to customers buying the product.

(c) it spends ₹1,00,000 on refreshments served every month to its customers;

(d) it sponsors a television programme every week at a cost of ₹ 20,00,000 per month.

It can market 30% of its output at ₹550 per unit without incurring any of the expenses referred to in (a) to (d) above.

PREPARE a cost sheet for the month showing total cost and profit at 30% and 100% capacity level.

ANSWER :

Cost Sheet (For the month)

Level of Capacity	30%		100%	
	30,000 units		1,00,000 units	
	Per unit (₹)	Total (₹)	Per unit (₹)	Total (₹)
Works Cost	380.00	1,14,00,000	310.00	3,10,00,000
Add: Fixed administration expenses	5.00	1,50,000	1.50	1,50,000
Add: Fixed marketing expenses	8.33	2,50,000	2.50	2,50,000
Add: Variable distribution cost	30.00	9,00,000	30.00	30,00,000
Add: Special Costs:				
- Gift items costs	—	—	30.00	30,00,000
- Customers' prizes*	—	—	1.00	1,00,000
- Refreshments	—	—	1.00	1,00,000
- Television programme sponsorship cost	—	—	20.00	20,00,000
Cost of sales	423.33	1,27,00,000	396.00	3,96,00,000
Profit (Balancing figure)	126.67	38,00,000	104.00	1,04,00,000
Sales revenue	550.00	1,65,00,000	500.00	5,00,00,000

*Customers' prize cost:

	Amount (₹)
1st Prize	50,000
2nd Prize	25,000
3rd Prize	10,000
Consolation Prizes (3 × ₹5,000)	15,000
Total	1,00,000



QUESTION 7. (PP4)

The following figures are extracted from the Trial Balance of G.K Co. on 31st March:

	Dr. (₹)	Cr. (₹)
Inventories:		
Finished Stock	80,000	
Raw Materials	1,40,000	
Work-in-Process	2,00,000	
Office Appliances	17,400	



Plant & Machinery	4,60,500	
Building	2,00,000	
Sales		7,68,000
Sales Return and Rebates	14,000	
Materials Purchased	3,20,000	
Freight incurred on Materials	16,000	
Purchase Returns		4,800
Direct employee cost	1,60,000	
Indirect employee cost	18,000	
Factory Supervision	10,000	
Repairs and factory up-keeping expenses	14,000	
Heat, Light and Power	65,000	
Rates and Taxes	6,300	
Miscellaneous Factory Expenses	18,700	
Sales Commission	33,600	
Sales Travelling	11,000	
Sales Promotion	22,500	
Distribution Deptt.–Salaries and Expenses	18,000	
Office Salaries and Expenses	8,600	
Interest on Borrowed Funds	2,000	

Further details are available as follows:

(i) Closing Inventories:	
Finished Goods	1,15,000
Raw Materials	1,80,000
Work-in-Process	1,92,000
(ii) Outstanding expenses on:	
Direct employee cost	8,000
Indirect employee cost	1,200
Interest on Borrowed Funds	2,000
(iii) Depreciation to be provided on:	
Office Appliances	5%
Plant and Machinery	10%
Buildings	4%
(iv) Distribution of the following costs:	
Heat, Light and Power to Factory, Office and Distribution in the ratio 8 : 1 : 1.	
Rates and Taxes two-thirds to Factory and one-third to Office.	
Depreciation on Buildings to Factory, Office and Selling in the ratio 8 : 1 : 1.	

With the help of the above information, you are required to PREPARE a condensed Profit and Loss Statement of G.K Co. for the year ended 31st March along with supporting schedules of:

- Cost of Sales.
- Selling and Distribution Expenses.
- Administration Expenses

**ANSWER :**

Profit and Loss Statement of G.K Co.
for the year ended 31st March

	(₹)	(₹)
Gross Sales	7,68,000	
Less: Returns and rebates	(14,000)	7,54,000
Less: Cost of Sales (excluding interest on borrowed funds) [Refer to Schedule (i)]		(7,14,020)
Net Operating Profit		39,980
Less: Interest on borrowed funds (2,000+2,000)		(4,000)
Net Profit		35,980

(i) Schedule of Cost of Sales

	(₹)	(₹)
Raw Material (Inventory opening balance)		1,40,000
Add: Material Purchased	3,20,000	
Add: Freight on Material	16,000	
Less: Purchase Returns	(4,800)	3,31,200
		4,71,200
Less: Closing Raw Material Inventory		(1,80,000)
Materials consumed in Production		2,91,200
Direct employee cost (₹1,60,000 + ₹8,000)		1,68,000
Prime Cost		4,59,200
Factory Overheads:		
Indirect employee cost (₹18,000 + ₹1,200)	19,200	
Factory Supervision	10,000	
Repairs and factory up-keeping expenses	14,000	
Heat, Light and Power (₹65,000 × 8/10)	52,000	
Rates and Taxes (₹6,300 × 2/3rd)	4,200	
Miscellaneous Factory Expenses	18,700	
Depreciation of Plant (10% of ₹4,60,500)	46,050	
Depreciation of Buildings (4% of ₹2,00,000 × 8/10)	6,400	1,70,550
Gross Works Cost		6,29,750
Add: Opening Work-in-Process inventory		2,00,000
Less: Closing Work-in-Process inventory		(1,92,000)
Cost of production		6,37,750
Add: Opening Finished Goods inventory		80,000
Less: Closing Finished Goods inventory		(1,15,000)
Cost of Goods Sold		6,02,750
Add: Administration Expenses [See Schedule (iii)]		18,870
Add: Selling and Distribution Expenses [See Schedule (ii)]		92,400
Cost of Sales (excluding interest on borrowed funds)		7,14,020

Alternatively, Interest on borrowed funds of ₹ 4,000 (₹ 2,000 + ₹ 2,000) may be added to arrive at cost of sales.



(ii) Schedule of Selling and Distribution Expenses

	(₹)
Sales Commission	33,600
Sales Travelling	11,000
Sales Promotion	22,500
Distribution Deptt.—Salaries and Expenses	18,000
Heat, Light and Power	6,500
Depreciation of Buildings	800
	92,400

(iii) Schedule of Administration Expenses

	(₹)
Office Salaries and Expenses	8,600
Depreciation of Office Appliances	870
Depreciation of Buildings	800
Heat, Light and Power	6,500
Rates and Taxes	2,100
	18,870



REVISION TEST PAPER



RTP MAY 18

From the following figures, CALCULATE cost of production and profit for the month of March 2018.

	Amount (₹)		Amount (₹)
Stock on 1st March, 2018		Purchase of raw materials	28,57,000
- Raw materials	6,06,000	Sale of finished goods	1,34,00,000
- Finished goods	3,59,000	Direct wages	37,50,000
Stock on 31st March, 2018		Factory expenses	21,25,000
- Raw materials	7,50,000	Office and administration expenses	10,34,000
- Finished goods	3,09,000	Selling and distribution expenses	7,50,000
Work-in-process:		Sale of scrap	26,000
- On 1st March, 2018	12,56,000		
- On 31st March, 2018	14,22,000		

ANSWER :

Calculation of Cost of Production and Profit for the month ended April 2018:

Particulars	Amount (₹)	Amount (₹)
Materials consumed:		
- Opening stock	6,06,000	
- Add: Purchases	28,57,000	
	34,63,000	
- Less: Closing stock	(7,50,000)	27,13,000
Direct wages		37,50,000
Prime cost		64,63,000
Factory expenses		21,25,000
		85,88,000
Add: Opening W-I-P		12,56,000
Less: Closing W-I-P		(14,22,000)
Factory cost		84,22,000
Less: Sale of scrap		(26,000)
Cost of Production		83,96,000
Add: Opening stock of finished goods		6,06,000
Less: Closing stock of finished goods		(3,59,000)
Cost of Goods Sold		86,43,000
Office and administration expenses		10,34,000
Selling and distribution expenses		7,50,000
Cost of Sales		1,04,27,000
Profit (balancing figure)		29,73,000
Sales		1,34,00,000

**RTP NOV 18**

From the following data of Arnav Metallic Ltd., CALCULATE Cost of production:

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

ANSWER :

Calculation of Cost of Production of Arnav Metallic for the period..

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



Notes:

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

**RTP MAY 19**

Following information relate to a manufacturing concern for the year ended 31 st March, 2019:

	(₹)
Raw Material (opening)	2,28,000
Raw Material (closing)	3,05,000
Purchases of Raw Material	42,25,000
Freight Inwards	1,00,000
Direct wages paid	12,56,000
Direct wages-outstanding at the end of the year	1,50,000
Factory Overheads	20% of prime cost
Work-in-progress (opening)	1,92,500
Work-in-progress (closing)	1,40,700
Administrative Overheads (related to production)	1,73,000
Distribution Expenses	₹16 per unit
Finished Stock (opening)- 1,217 Units	6,08,500
Sale of scrap of material	8,000

The firm produced 14,000 units of output during the year. The stock of finished goods at the end of the year is valued at cost of production. The firm sold 14,153 units at a price of ₹618 per unit during the year.

PREPARE cost sheet of the firm.

ANSWER :

Cost sheet for the year ended 31st March, 2019.

Units produced - 14,000 units

Units sold - 14,153 units

Particulars	Amount (₹)
Raw materials purchased	42,25,000
Add: Freight Inward	1,00,000
Add: Opening value of raw materials	2,28,000
Less: Closing value of raw materials	(3,05,000)
	42,48,000
Less: Sale of scrap of material	(8,000)
Materials consumed	42,40,000
Direct Wages (12,56,000 + 1,50,000)	14,06,000
Prime Cost	56,46,000
Factory overheads (20% of Prime Cost)	11,29,200
Add: Opening value of W-I-P	1,92,500
Less: Closing value of W-I-P	(1,40,700)
Factory Cost	68,27,000
Add: Administrative overheads	1,73,000
Cost of Production	70,00,000
Add: Value of opening finished stock	6,08,500



Less: Value of closing finished stock	(5,32,000)
[₹ 500(70,00,000/14,000) × 1,064]	
(1,217+ 14,000 – 14,153 = 1,064 units)	
Cost of Goods Sold	70,76,500
Distribution expenses (₹16 × 14,153 units)	2,26,448
Cost of Sales	73,02,948
Profit (Balancing figure)	14,43,606
Sales (₹ 618 × 14,153 units)	87,46,554

**RTP NOV 19**

DFG Ltd. manufactures leather bags for office and school purpose. The following information is related with the production of leather bags for the month of September 2019.

- Leather sheets and cotton cloths are the main inputs, and the estimated requirement per bag is two meters of leather sheets and one meter of cotton cloth. 2,000 meter of leather sheets and 1,000 meter of cotton cloths are purchased at ₹3,20,000 and ₹15,000 respectively. Freight paid on purchases is ₹8,500.
- Stitching and finishing need 2,000 man hours at ₹80 per hour.
- Other direct cost of ₹10 per labour hour is incurred.
- DFG has 4 machines at a total cost of ₹22,00,000. Machine has a life of 10 years with a scrap value of 10% of the original cost. Depreciation is charged on straight line method.
- The monthly cost of administrative and sales office staffs are ₹45,000 and ₹72,000 respectively. DFG pays ₹1,20,000 per month as rent for a 2400 sq. feet factory premises. The administrative and sales office occupies 240 sq. feet and 200 sq. feet respectively of factory space.
- Freight paid on delivery of finished bags is ₹18,000.
- During the month 35 kg. of leather and cotton cuttings are sold at ₹150 per kg.
- There is no opening and closing stocks for input materials. There is 100 bags in stock at the end of the month.

Required:

PREPARE a cost sheet following functional classification for the month of September 2019.

ANSWER :

No. of bags manufactured = 1,000 units

Cost sheet for the month of September 2019

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	- Leather sheets	3,20,000	320.00
	- Cotton cloths	15,000	15.00
	Add: Freight paid on purchase	8,500	8.50
2.	Direct wages (₹80 × 2,000 hours)	1,60,000	160.00
3.	Direct expenses (₹10 × 2,000 hours)	20,000	20.00
4.	Prime Cost	5,23,500	523.50
5.	Factory Overheads: Depreciation on machines {(₹22,00,000×90%)÷120 months}	16,500	16.50



	Apportion cost of factory rent	98,000	98.00
6.	Works/ Factory Cost	6,38,000	638.00
7.	Less: Realisable value of cuttings (₹150×35 kg.)	(5,250)	(5.25)
8.	Cost of Production	6,32,750	632.75
9.	Add: Opening stock of bags	0	
10.	Less: Closing stock of bags (100 bags × ₹632.75)	(63,275)	
11.	Cost of Goods Sold	5,69,475	632.75
12.	Add: Administrative Overheads:		
	- Staff salary	45,000	45.00
	- Apportioned rent for administrative office	12,000	12.00
13.	Add: Selling and Distribution Overheads		
	- Staff salary	72,000	80.00
	- Apportioned rent for sales office	10,000	11.11
	- Freight paid on delivery of bags	18,000	20.00
14.	Cost of Sales (18+19+20)	7,26,475	800.86

Apportionment of Factory rent:

To factory building {(₹1,20,000 ÷ 2400 sq.feet) × 1,960 sq. feet} = ₹98,000

To administrative office {(₹1,20,000 ÷ 2400 sq.feet) × 240 sq. feet} = ₹12,000 To sale office
{(₹1,20,000 ÷ 2400 sq.feet) × 200 sq. feet} = ₹10,000



RTP MAY 20

From the following data of Arnav Metallic Ltd., CALCULATE Cost of production:

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

**ANSWER :**

Calculation of Cost of Production of Arnav Metallic Ltd. for the period..

Particulars	Amount (₹)
Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)
Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,17,100
Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,21,000
Less: Amount realised by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,22,000

Notes:

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

**RTP NOV 20**

The following details are available from the books of R Ltd. for the year ending 31st March 2020:

Particulars	Amount (₹)
Purchase of raw materials	84,00,000
Consumable materials	4,80,000
Direct wages	60,00,000
Carriage inward	1,72,600
Wages to foreman and store keeper	8,40,000
Other indirect wages to factory staffs	1,35,000
Expenditure on research and development on new production technology	9,60,000
Salary to accountants	7,20,000
Employer's contribution to EPF & ESI	7,20,000
Cost of power & fuel	28,00,000
Production planning office expenses	12,60,000
Salary to delivery staffs	14,30,000
Income tax for the assessment year 2019-20	2,80,000
Fees to statutory auditor	1,80,000
Fees to cost auditor	80,000
Fees to independent directors	9,40,000



Donation to PM-national relief fund	1,10,000
Value of sales	2,82,60,000
Position of inventories as on 01-04-2019:	
- Raw Material	6,20,000
- W-I-P	7,84,000
- Finished goods	14,40,000
Position of inventories as on 31-03-2020:	
- Raw Material	4,60,000
- W-I-P	6,64,000
- Finished goods	9,80,000

From the above information PREPARE a cost sheet for the year ended 31 st March 2020.

ANSWER :

Statement of Cost of R Ltd. for the year ended 31st March, 2020:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	- Raw materials purchased	84,00,000	
	- Carriage inward	1,72,600	
	Add: Opening stock of raw materials	6,20,000	
	Less: Closing stock of raw materials	(4,60,000)	87,32,600
(ii)	Direct employee (labour) cost:		
	- Direct wages	60,00,000	
	- Employer's Contribution towards PF & ESIS	7,20,000	67,20,000
(iii)	Direct expenses:		
	- Consumable materials	4,80,000	
	- Cost of power & fuel	28,00,000	32,80,000
	Prime Cost		1,87,32,600
(iv)	Works/ Factory overheads:		
	- Wages to foreman and store keeper	8,40,000	
	- Other indirect wages to factory staffs	1,35,000	9,75,000
	Gross factory cost		1,97,07,600
	Add: Opening value of W-I-P		7,84,000
	Less: Closing value of W-I-P		(6,64,000)
	Factory Cost		1,98,27,600
(v)	Research & development cost paid for improvement in production process		9,60,000
(vi)	Production planning office expenses		12,60,000
	Cost of Production		2,20,47,600
	Add: Opening stock of finished goods		14,40,000
	Less: Closing stock of finished goods		(9,80,000)
	Cost of Goods Sold		2,25,07,600
(vii)	Administrative overheads:		



	- Salary to accountants	7,20,000	
	- Fees to statutory auditor	1,80,000	
	- Fees to cost auditor	80,000	
	- Fee paid to independent directors	9,40,000	19,20,000
(viii)	Selling overheads & Distribution overheads:		
	- Salary to delivery staffs		14,30,000
	Cost of Sales		2,58,57,600
	Profit (balancing figure)		24,02,400
	Sales		2,82,60,000

Note: Income tax and Donation to PM National Relief Fund is avoided in the cost sheet.

**RTP MAY 21**

RTA Ltd. has the following expenditures for the year ended 31 st December, 2020:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	Freight inward		9,20,600
(iii)	Wages paid to factory workers		25,20,000
(iv)	Royalty paid for production		1,80,000
(v)	Amount paid for power & fuel		3,50,000
(vi)	Job charges paid to job workers		3,10,000
(vii)	Stores and spares consumed		1,10,000
(viii)	Depreciation on office building		50,000
(ix)	Repairs & Maintenance paid for:		
	- Plant & Machinery	40,000	
	- Sales office building	20,000	60,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	28,200	
	- Factory building	18,800	47,000
(xi)	Expenses paid for quality control check activities		18,000
(xii)	Research & development cost paid for improvement in production process		20,000
(xiii)	Expenses paid for pollution control and engineering & maintenance		36,000
(xiv)	Salary paid to Sales & Marketing managers		5,60,000
(xv)	Salary paid to General Manager		6,40,000
(xvi)	Packing cost paid for:		
	- Primary packing necessary to maintain quality	46,000	
	- For re-distribution of finished goods	80,000	1,26,000
(xvii)	Fee paid to independent directors		1,20,000
(xviii)	Performance bonus paid to sales staffs		1,20,000
(xix)	Value of stock as on 1st January, 2020:		
	- Raw materials	10,00,000	
	- Work-in-process	8,60,000	
	- Finished goods	12,00,000	30,60,000
(xx)	Value of stock as on 31st December, 2020:		



-	Raw materials	8,40,000	
-	Work-in-process	6,60,000	
-	Finished goods	10,50,000	25,50,000

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

From the above data you are requested to PREPARE Statement of Cost for RTA Ltd. for the year ended 31st December, 2020, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

ANSWER :

Statement of Cost of RTA Ltd. for the year ended 31st December, 2020:

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



	Cost of Goods Sold		5,50,59,600
(ix)	Administrative overheads:		
	- Depreciation on office building	50,000	
	- Salary paid to General Manager	6,40,000	
	- Fee paid to independent directors	1,20,000	8,10,000
(x)	Selling overheads:		
	- Repairs & Maintenance paid for sales office building	20,000	
	- Salary paid to Manager- Sales & Marketing	5,60,000	
	- Performance bonus paid to sales staffs	1,20,000	7,00,000
(xi)	Distribution overheads:		
	- Packing cost paid for re-distribution of finished goods		80,000
	Cost of Sales		5,66,49,600

**RTP NOV 21**

Impact Ltd. provides you the following details of its expenditures for the year ended 31st March, 2021:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	GST paid under Composition scheme		10,00,000
(iii)	Freight inwards		5,20,600
(iv)	Trade discounts received		10,00,000
(v)	Wages paid to factory workers		15,20,000
(vi)	Contribution made towards employees' PF & ESIS		1,90,000
(vii)	Production bonus paid to factory workers		1,50,000
(viii)	Fee for technical assistance		1,12,000
(ix)	Amount paid for power & fuel		2,62,000
(x)	Job charges paid to job workers		4,50,000
(xi)	Stores and spares consumed		1,10,000
(xii)	Depreciation on:		
	Factory building	64,000	
	Office building	46,000	
	Plant & Machinery	86,000	1,96,000
(xiii)	Salary paid to supervisors		1,20,000
(xiv)	Repairs & Maintenance paid for:		
	Plant & Machinery	58,000	
	Sales office building	50,000	
	Vehicles used by directors	20,600	1,28,600
(xv)	Insurance premium paid for:		
	Plant & Machinery	31,200	
	Factory building	28,100	59,300
(xvi)	Expenses paid for quality control check activities		25,000
(xvii)	Research & development cost paid for improvement in production process		48,200
(xviii)	Expenses paid for administration of factory work		1,38,000
(xix)	Salary paid to functional managers:		



	Finance & Accounts	9,60,000	
	Sales & Marketing	12,00,000	26,40,000
(xx)	Salary paid to General Manager		13,20,000
(xxi)	Packing cost paid for:		
	Primary packing necessary to maintain quality	1,06,000	
	For re-distribution of finished goods	1,12,000	2,18,000
(xxii)	Interest and finance charges paid (for usage of non-equity fund)		3,50,000
(xxiii)	Fee paid to auditors		1,80,000
(xxiv)	Fee paid to legal advisors		1,20,000
(xxv)	Fee paid to independent directors		2,40,000
(xxvi)	Payment for maintenance of website for online sales		1,80,000
(xxvii)	Performance bonus paid to sales staffs		2,40,000
(xxviii)	Value of stock as on 1st April, 2020:		
	Raw materials	9,00,000	
	Work-in-process	4,00,000	
	Finished goods	7,00,000	20,00,000
(xxix)	Value of stock as on 31st March, 2021:		
	Raw materials	5,60,000	
	Work-in-process	2,50,000	
	Finished goods	11,90,000	20,00,000

Amount realized by selling of waste generated during manufacturing process – ₹ 66,000/-

From the above data, you are required to PREPARE Statement of cost of Impact Ltd. for the year ended 31st March, 2021, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

ANSWER :

Statement of Cost of Impact Ltd. for the year ended 31st March, 2021:

Sl. No.	Particulars	Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	Raw materials purchased	5,00,00,000	
	GST paid under Composition scheme*	10,00,000	
	Freight inwards	5,20,600	
	Less: Trade discounts received	(10,00,000)	
	Add: Opening stock of raw materials	9,00,000	
	Less: Closing stock of raw materials	(5,60,000)	5,08,60,600
(ii)	Direct employee (labour) cost:		
	Wages paid to factory workers	15,20,000	
	Contribution made towards employees' PF & ESIS	1,90,000	
	Production bonus paid to factory workers	1,50,000	18,60,000
(iii)	Direct expenses:		
	Fee for technical assistance	1,12,000	
	Amount paid for power & fuel	2,62,000	
	Job charges paid to job workers	4,50,000	8,24,000
	Prime Cost		5,35,44,600



(iv)	Works/ Factory overheads:		
	Stores and spares consumed	1,10,000	
	Depreciation on factory building	64,000	
	Depreciation on plant & machinery	86,000	
	Repairs & Maintenance paid for plant & machinery	58,000	
	Insurance premium paid for plant & machinery	31,200	
	Insurance premium paid for factory building	28,100	
	Salary paid to supervisors	1,20,000	4,97,300
	Gross factory cost		5,40,41,900
	Add: Opening value of W-I-P		4,00,000
	Less: Closing value of W-I-P		(2,50,000)
	Factory Cost		5,41,91,900
(v)	Quality control cost:		
	Expenses paid for quality control check activities		25,000
(vi)	Research & development cost paid for improvement in production process		48,200
(vii)	Administration cost related with production:		
	-Expenses paid for administration of factory work	1,38,000	
	-Salary paid to Production control manager	4,80,000	6,18,000
(viii)	Less: Realisable value on sale of scrap and waste		(66,000)
(ix)	Add: Primary packing cost		1,06,000
	Cost of Production		5,49,23,100
	Add: Opening stock of finished goods		7,00,000
	Less: Closing stock of finished goods		(11,90,000)
	Cost of Goods Sold		5,44,33,100
(x)	Administrative overheads:		
	Depreciation on office building	46,000	
	Repairs & Maintenance paid for vehicles used by directors	20,600	
	Salary paid to Manager- Finance & Accounts	9,60,000	
	Salary paid to General Manager	13,20,000	
	Fee paid to auditors	1,80,000	
	Fee paid to legal advisors	1,20,000	
	Fee paid to independent directors	2,40,000	28,86,600
(xi)	Selling overheads:		
	Repairs & Maintenance paid for sales office building	50,000	
	Salary paid to Manager- Sales & Marketing	12,00,000	
	Payment for maintenance of website for online sales	1,80,000	
	Performance bonus paid to sales staffs	2,40,000	16,70,000
(xii)	Packing cost paid for re-distribution of finished goods		1,12,000
(xiii)	Interest and finance charges paid		3,50,000
	Cost of Sales		5,94,51,700

* GST paid under Composition scheme would be included under cost of material as it is not eligible for input tax credit.

**RTP MAY 22**

A Ltd. produces a single product X. During the month of December 2021, the company has produced 14,560 tonnes of X. The details for the month of December 2021 are as follows:

- (i) Materials consumed ₹ 15,00,000
- (ii) Power consumed 13,000 Kwh @ ₹ 7 per Kwh
- (iii) Diesels consumed 1,000 litres @ ₹ 93 per litre
- (iv) Wages & salary paid – ₹ 64,00,000
- (v) Gratuity & leave encashment paid – ₹ 44,20,000
- (vi) Hiring charges paid for HEMM- ₹ 13,00,000
- (vii) Hiring charges paid for cars used for official purpose – ₹ 80,000
- (viii) Reimbursement of diesel cost for the cars – ₹ 20,000
- (ix) The hiring of cars attracts GST under RCM @5% without credit.
- (x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of despatch) – ₹ 7,000
- (xi) AMC cost of CCTV installed at weighing bridge (used for weighing of final goods at the time of despatch) and factory premises is ₹ 6,000 and ₹ 18,000 per month respectively.
- (xii) TA/ DA and hotel bill paid for sales manager- ₹ 16,000
- (xiii) The company has 180 employees works for 26 days in a month.

Required:

- (a) PREPARE a Cost sheet for the month of December 2021.
- (b) COMPUTE Earnings per manshift (EMS) and Output per manshift (OMS) for the month of December 2021.

ANSWER :

(a) Cost Sheet of A Ltd. for the month of December 2021

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



(b) Manshift = 180 employees × 26 days = 4,680 manshifts

Computation of earnings per manshift (EMS):

$$\begin{aligned} \text{EMS} &= \frac{\text{Total employee benefits paid}}{\text{Manshift}} \\ &= \frac{\text{₹ 1,08,20,000}}{4,680} = \text{₹ 2,312} \end{aligned}$$

Computation of Output per manshift (OMS):

$$\begin{aligned} \text{OMS} &= \frac{\text{Total Output/ Production}}{\text{Manshift}} \\ &= \frac{14,560 \text{ Tonne}}{4,680} = 3.11 \text{ tonne} \end{aligned}$$



RTP NOV 22

CT Limited is engaged in producing medical equipment. It has furnished following details related to its products produced during a month:

	Units	Amount (₹)
Raw materials		
Opening stock	1,000	90,00,000
Purchases	49,000	44,10,00,000
Closing stock	1,750	1,57,50,000
Works-in-progress		
Opening	2,000	1,75,50,000
Closing	1,000	94,50,000
Direct employees' wages, allowances etc.		6,88,50,000
Primary packaging cost (per unit)		1,440
R&D expenses & Quality control expenses		2,10,60,000
Consumable stores, depreciation on plant		3,42,00,000
Administrative overheads related to production		3,15,00,000
Selling expenses		4,84,30,800
Royalty paid for production		3,64,50,000
Cost of web-site (for online sale) maintenance		60,75,000
Secondary packaging cost (per unit)		225

There was a normal scrap of 250 units of direct material which realized ₹ 5,400 per unit. The entire finished product was sold at a profit margin of 20% on sales.

You are required to PREPARE a cost sheet showing:

- (i) Prime cost
- (ii) Gross works cost
- (iii) Factory costs
- (iv) Cost of production
- (v) Profit
- (vi) Sales

**ANSWER :**

Cost Sheet

Particulars	Units	Amount (₹)
Material		
Opening stock	1,000	90,00,000
Add: Purchases	49,000	44,10,00,000
Less: Closing stock	(1,750)	(1,57,50,000)
	48,250	43,42,50,000
Less: Normal wastage of materials realized @ ₹ 5,400 per unit	(250)	(13,50,000)
Material consumed		43,29,00,000
Direct employee's wages and allowances		6,88,50,000
Direct expenses- Royalty paid for production		3,64,50,000
Prime cost	48,000	53,82,00,000
Factory overheads - Consumable stores, depreciation etc.		3,42,00,000
Gross Works Cost	48,000	57,24,00,000
Add: Opening WIP	2,000	1,75,50,000
Less: Closing WIP	(1,000)	(94,50,000)
Factory/Works Cost	49,000	58,05,00,000
Administration Overheads related to production		3,15,00,000
R&D expenses and Quality control cost		2,10,60,000
Add: Primary packaging cost @ ₹ 1,440 per unit		7,05,60,000
Cost of production	49,000	70,36,20,000
Selling expenses		4,84,30,800
Cost of maintaining website for online sale		60,75,000
Secondary packaging cost @ ₹ 225 per unit	49,000	1,10,25,000
Cost of sales		76,91,50,800
Add: Profit @ 20% on sales or 25% of cost		19,22,87,700
Sales value		96,14,38,500

**RTP MAY 23**

From the following data of Motilal Ltd., CALCULATE Cost of production:

	Particulars	Amount (₹)
(i)	Repair & maintenance paid for plant & machinery	9,80,500
(ii)	Insurance premium paid for inventories	26,000
(iii)	Insurance premium paid for plant & machinery	96,000
(iv)	Raw materials purchased	64,00,000
(v)	Opening stock of raw materials	2,88,000
(vi)	Closing stock of raw materials	4,46,000
(vii)	Wages paid	23,20,000
(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100
(x)	Quality control cost for the products in manufacturing process	86,000
(xi)	Research & development cost for improvement in production process	92,600
(xii)	Administrative cost for:	
	- Factory & production	9,00,000
	- Others	11,60,000



(xiii)	Amount realised by selling scrap generated during the manufacturing process	9,200
(xiv)	Packing cost necessary to preserve the goods for further processing	10,200
(xv)	Salary paid to Director (Technical)	8,90,000

ANSWER :

Calculation of Cost of Production of Motilal Ltd for the period..

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

Notes:

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

**RTP NOV 23**

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

- (i) Materials consumed ₹ 15,00,000
- (ii) Power consumed in operating production machinery 13,000 Kwh @ ₹ 7 per Kwh
- (iii) Diesels consumed in operating production machinery 1,000 litres @ ₹ 93 per litre
- (iv) Wages & salary paid – ₹ 64,00,000
- (v) Gratuity & leave encashment paid – ₹ 44,20,000
- (vi) Hiring charges paid for Heavy Earth Moving machines (HEMM) engaged in production – ₹ 13,00,000. Hiring charges is paid on the basis of production.
- (vii) Hiring charges paid for cars used for official purpose – ₹ 80,000
- (viii) Reimbursement of diesel cost for the cars – ₹ 20,000
- (ix) The hiring of cars attracts GST under RCM @5% without credit.
- (x) Maintenance cost paid for weighing bridge (used for weighing of final goods at the time of despatch) – ₹ 7,000



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

ANSWER :

(a) Cost Sheet of A Ltd. for the month of July 2023

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

**RTP MAY 24**

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

Sl. No.		Amount (₹)	Amount (₹)
(i)	Raw materials purchased		5,00,00,000
(ii)	Freight inward		9,20,600
(iii)	Wages paid to factory workers		25,20,000
(iv)	Royalty paid for production		1,80,000
(v)	Amount paid for power & fuel		3,50,000
(vi)	Job charges paid to job workers		3,10,000
(vii)	Stores and spares consumed		1,10,000
(viii)	Depreciation on office building		50,000
(ix)	Repairs & Maintenance paid for:		
	- Plant & Machinery	40,000	
	- Sales office building	20,000	60,000
(x)	Insurance premium paid for:		
	- Plant & Machinery	28,200	
	- Factory building	18,800	47,000



(xi)	Expenses paid for quality control check activities		18,000
(xii)	Research & development cost paid for improvement in production process		20,000
(xiii)	Expenses paid for pollution control and engineering & maintenance		36,000
(xiv)	Salary paid to Sales & Marketing managers		5,60,000
(xv)	Salary paid to General Manager		6,40,000
(xvi)	Packing cost paid for:		
	- Primary packing necessary to maintain quality	46,000	
	- For re-distribution of finished goods	80,000	1,26,000
(xvii)	Fee paid to independent directors		1,20,000
(xviii)	Performance bonus paid to sales staffs		1,20,000
(xix)	Value of stock as on 1st January, 2023:		
	- Raw materials	10,00,000	
	- Work-in-process	8,60,000	
	- Finished goods	12,00,000	30,60,000
(xx)	Value of stock as on 31st December, 2023:		
	- Raw materials	8,40,000	
	- Work-in-process	6,60,000	
	- Finished goods	10,50,000	25,50,000

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

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

ANSWER :

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

Sl. No.		Amount (₹)	Amount (₹)
(i)	Material Consumed:		
	- Raw materials purchased	5,00,00,000	
	- Freight inward	9,20,600	
	Add: Opening stock of raw materials	10,00,000	
	Less: Closing stock of raw materials	(8,40,000)	5,10,80,600
(ii)	Direct employee (labour) cost:		
	- Wages paid to factory workers		25,20,000
(iii)	Direct expenses:		
	- Royalty paid for production	1,80,000	
	- Amount paid for power & fuel	3,50,000	
	- Job charges paid to job workers	3,10,000	8,40,000
	Prime Cost		5,44,40,600
(iv)	Works/ Factory overheads:		
	- Stores and spares consumed	1,10,000	
	- Repairs & Maintenance paid for plant & machinery	40,000	
	- Insurance premium paid for plant & machinery	28,200	



	- Insurance premium paid for factory building	18,800	
	- Expenses paid for pollution control and engineering & maintenance	36,000	2,33,000
	Gross factory cost		5,46,73,600
	Add: Opening value of W-I-P		8,60,000
	Less: Closing value of W-I-P		(6,60,000)
	Factory Cost		5,48,73,600
(v)	Quality control cost:		
	- Expenses paid for quality control check activities		18,000
(vi)	Research & development cost paid for improvement in production process		20,000
(vii)	Less: Realisable value on sale of scrap and waste		(48,000)
(viii)	Add: Primary packing cost		46,000
	Cost of Production		5,49,09,600
	Add: Opening stock of finished goods		12,00,000
	Less: Closing stock of finished goods		(10,50,000)
	Cost of Goods Sold		5,50,59,600
(ix)	Administrative overheads:		
	- Depreciation on office building	50,000	
	- Salary paid to General Manager	6,40,000	
	- Fee paid to independent directors	1,20,000	8,10,000
(x)	Selling overheads:		
	- Repairs & Maintenance paid for sales office building	20,000	
	- Salary paid to Manager- Sales & Marketing	5,60,000	
	- Performance bonus paid to sales staffs	1,20,000	7,00,000
(xi)	Distribution overheads:		
	- Packing cost paid for re-distribution of finished goods		80,000
	Cost of Sales		5,66,49,600



07

COST ACCOUNTING SYSTEMS

**QUESTION 1. (ILLUSTRATION 1)**

ABC Ltd. is a multiproduct company, manufacturing three products A, B and C. The budgeted costs and production for the year ending 31st March are as follows:

	Dr.	Cr.
	(₹)	(₹)
Stores Ledger Control A/c	3,01,435	
Work-in-Process Control A/c	1,22,365	
Finished Stock Ledger Control A/c	2,51,945	
Manufacturing Overhead Control A/c		10,525
Cost Ledger Control A/c		6,65,220
	6,75,745	6,75,745

During the next three months the following items arose:

	(₹)
Finished product (at cost)	2,10,835
Manufacturing Overhead incurred	91,510
Raw Materials purchased	1,23,000
Factory Wages	50,530
Indirect Labour	21,665
Cost of Sales	1,85,890
Material issued to production	1,27,315
Sales returned at Cost	5,380
Material returned to suppliers	2,900
Manufacturing Overhead charged to production	77,200

You are required to PASS the Journal Entries; write up the accounts and schedule the balances, stating what each balance represents.

ANSWER

Journal entries are as follows:

			Dr.	Cr.
			(₹)	(₹)
1.	Finished stock ledger Control A/c	Dr.	2,10,835	
	To Work-in-Process Control A/c			2,10,835
2.	Manufacturing Overhead Control A/c	Dr.	91,510	
	To Cost Ledger Control A/c			91,510
3.	Stores Ledger Control A/c	Dr.	1,23,000	
	To Cost Ledger Control A/c			1,23,000
4.	(i) Wage Control A/c	Dr.	72,195	
	To Cost Ledger Control A/c			72,195
	(ii) Work-in-Process Control A/c	Dr.	50,530	



	To Wages Control A/c			50,530
	(iii) Manufacturing Overhead Control A/c	Dr.	21,665	
	To Wages Control A/c			21,665
5.	Cost of Sales A/c	Dr.	1,85,890	
	To Finished Stock Ledger A/c			1,85,890
6.	Work-in-Process Control A/c	Dr.	1,27,315	
	To Stores Ledger Control A/c			1,27,315
7.	Finished Stock Ledger Control A/c	Dr.	5,380	
	To Cost of Sales A/c			5,380
8.	Cost Ledger Control A/c	Dr.	2,900	
	To Stores Ledger Control A/c			2,900
9.	Work-in-Process Control A/c	Dr.	77,200	
	To Manufacturing Overhead Control A/c			77,200

COST LEDGERS

Cost Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Stores Ledger Control A/c		By Balance b/d	6,65,220
(return)	2,900		
" Balance c/d	9,49,025	" Manufacturing OH Control A/c	91,510
		" Stores Ledger Control A/c	1,23,000
		" Wages Control A/c	72,195
	9,51,925		9,51,925

Stores Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	3,01,435	By Work in Process Control A/c	1,27,315
" Cost Ledger Control A/c	1,23,000	" Cost Ledger Control A/c	2,900
		" Balance c/d	2,94,220
	4,24,435		4,24,435

Wages Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	72,195	By Work in Process Control A/c	50,530
		" Manufacturing OH Control A/c	21,665
	72,195		72,195



Manufacturing Overhead Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	91,510	By Balance b/d	10,525
" Wages Control A/c	21,665	" Work in Process Control A/c	77,200
		" Balance c/d	25,450
	1,13,175		1,13,175

Work-in-Process Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	1,22,365	By Finished Stock Ledger Control A/c	2,10,835
" Wages Control A/c	50,530	" Balance c/d	1,66,575
" Stores Ledger Control A/c	1,27,315		
" Manufacturing OH Control A/c	77,200		
	3,77,410		3,77,410

Finished Stock Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	2,51,945	By Cost of Sales Control A/c	1,85,890
" Work in Process Control A/c	2,10,835	" Balance c/d	2,82,270
" Cost of Sales Control A/c (Return at cost)	5,380		
	4,68,160		4,68,160

Cost of Sales Account

Particulars	(₹)	Particulars	(₹)
To Finished Stock Ledger Control	1,85,890	By Finished Stock Ledger Control (Return)	5,380
		" Balance c/d	1,80,510
	1,85,890		1,85,890

Trial Balance

Particulars	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	2,94,220	
Work-in-Process Control A/c	1,66,575	
Finished Stock Ledger Control A/c	2,82,270	
Manufacturing Overhead Control A/c	25,450	
Cost of Sales A/c	1,80,510	
Cost Ledger Control A/c		9,49,025
	9,49,025	9,49,025

**QUESTION 2. (ILLUSTRATION 2)**

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July as follows:

Particulars	(₹)	(₹)
Material Control A/c	1,24,000	
Work-in-Process Control A/c	62,500	
Finished Goods Control A/c	1,24,000	
Production Overhead Control A/c	8,400	
Administrative Overhead Control A/c		12,000
Selling & Distribution Overhead Control A/c	6,250	
Cost Ledger Control A/c		3,13,150
	3,25,150	3,25,150

The following are the transactions for the quarter ended 30th September:

	(₹)
Materials purchased	4,80,100
Materials issued to jobs	4,77,400
Materials to works maintenance	41,200
Materials to administrative office	3,400
Materials to sales department	7,200
Wages Direct	1,49,300
Wages Indirect	65,000
Transportation for Indirect Materials	8,400
Production Overheads incurred	2,42,250
Absorbed Production Overheads	3,59,100
Administrative Overheads incurred	74,000
Administrative Overheads allocated to production	52,900
Administrative Overheads allocated to sales department	14,800
Selling & Distribution overheads incurred	64,200
Selling & Distribution overheads absorbed	82,000
Finished goods produced	9,58,400
Finished goods sold	9,77,300
Sales	14,43,000

Make up the various accounts as you envisage in the Cost Ledger and PREPARE a Trial Balance as at 30th September.

ANSWER

Cost Ledgers
Material Control A/c*

Particulars	(₹)	Particulars	(₹)
To Balance b/d	1,24,000	By Work-in-process Control A/c	4,77,400
" Cost Ledger Control A/c (purchase)	4,80,100	" Production OH Control A/c	41,200
		" Admn. OH Control A/c	3,400
		" S&D OH Control A/c	7,200



		" Balance c/d	74,900
	6,04,100		6,04,100

*Material Control A/c may also be written as Stores Ledger Control A/c

Wages Control A/c

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	2,14,300	By Work-in-process Control A/c	1,49,300
		" Production OH Control A/c	65,000
	2,14,300		2,14,300

Production Overhead Control A/c

Particulars	(₹)	Particulars	(₹)
To Balance b/d	8,400	By Work-in-process Control A/c	3,59,100
" Cost Ledger Control A/c:			
- Transportation	8,400		
- Production OH	2,42,250		
" Wages Control A/c	65,000		
" Material Control A/c	41,200	" Balance c/d	6,150
	3,65,250		3,65,250

Administrative Overhead Control A/c

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	74,000	By Balance b/d	12,000
" Material Control A/c:	3,400	" Finished Goods Control A/c	52,900
" Balance c/d	2,300	" Cost of sales A/c	14,800
	79,700		79,700

Work-in-Process Control A/c

Particulars	(₹)	Particulars	(₹)
To Balance b/d	62,500	By Finished goods Control A/c	9,58,400
" Material Control A/c	4,77,400		
" Wages Control A/c	1,49,300		
" Production OH Control A/c	3,59,100	" Balance c/d	89,900
	10,48,300		10,48,300

Finished Goods Control A/c

Particulars	(₹)	Particulars	(₹)
To Balance b/d	1,24,000	By Cost of Sales A/c	9,77,300
" Administrative Overhead Control A/c	52,900		



"	Work-in-process Control A/c	9,58,400	"	Balance c/d	1,58,000
		11,35,300			11,35,300

Selling and Distribution Overhead Control A/c

Particulars	(₹)	Particulars	(₹)
To Balance b/d	6,250	By Cost of Sales A/c	82,000
" Cost Ledger Control A/c:	64,200		
" Material Control A/c	7,200		
" Balance c/d	4,350		
	82,000		82,000

Cost of Sales A/c

Particulars	(₹)	Particulars	(₹)
To Finished Goods Control A/c	9,77,300	By Costing P&L A/c	10,74,100
" Admn. OH Control A/c	14,800		
" S&D OH Control A/c	82,000		
	10,74,100		10,74,100

Cost Ledger Control A/c

Particulars	(₹)	Particulars	(₹)
To Costing P&L A/c (Sales)	14,43,000	By Balance b/d	3,13,150
		" Material Control A/c	4,80,100
		" Wages Control A/c	2,14,300
		(₹1,49,300+₹65,000)	
		" Production OH Control A/c (₹8,400+₹2,42,250)	2,50,650
		" Administrative OH A/c	74,000
		" S&D OH Control A/c	64,200
" Balance c/d	3,22,300	" Costing P&L A/c	3,68,900
	17,65,300		17,65,300

Costing Profit & Loss A/c

Particulars	(₹)	Particulars	(₹)
To Cost of sales A/c	10,74,100	By Cost Ledger Control A/c (sales)	14,43,000
" Cost Ledger Control A/c (profit) (balancing figure)	3,68,900		
	14,43,000		14,43,000

Trial Balance as at 30th September

	Dr. (₹)	Cr. (₹)
Material Control A/c	74,900	
Production OH Control A/c	6,150	
Administrative OH Control A/c		2,300



Selling & Distribution OH Control A/c		4,350
Work-in-process Control A/c	89,900	
Finished Goods Control A/c	1,58,000	
Cost Ledger Control A/c		3,22,300
	3,28,950	3,28,950

**QUESTION 3. (ILLUSTRATION 3)**

JOURNALISE the following transactions assuming that cost and financial transactions are integrated:

	(₹)
Raw materials purchased	2,00,000
Direct materials issued to production	1,50,000
Wages paid (30% indirect)	1,20,000
Wages charged to production	84,000
Manufacturing expenses incurred	84,000
Manufacturing overhead charged to production	92,000
Selling and Distribution costs	20,000
Finished products (at cost)	2,00,000
Sales	2,90,000
Closing stock	Nil
Receipts from debtors	69,000
Payments to creditors	1,10,000

ANSWER

Journal entries are as follows:

	DR. (₹)	CR. (₹)
Stores Ledger Control A/c..... Dr.	2,00,000	
To Payables (Creditors)/ Bank A/c		2,00,000
(Materials purchased)		
Work-in-Process Control A/c..... Dr.	1,50,000	
To Stores Ledger Control A/c		
(Materials issued to production)		1,50,000
Wages Control A/c..... Dr.	1,20,000	
To Bank A/c		1,20,000
(Wages paid)		
Factory Overhead Control A/c..... Dr.	36,000	
To Wages Control A/c		36,000
(30% of wages paid being indirect charged to overhead)		
Work-in-Process Control A/c..... Dr.	84,000	
To Wages Control A/c		84,000
(Direct wages charged to production)		
Factory Overhead Control A/c..... Dr.	84,000	
To Bank A/c		84,000
(Manufacturing overhead incurred)		



Work-in-Process Control A/c	Dr.	92,000	
To Factory Overhead Control A/c			92,000
(Manufacturing overhead charged to production)			
Selling & Distribution Overhead Control A/c.	Dr.	20,000	
To Bank A/c			20,000
(Selling and Distribution costs incurred)			
Finished Goods Control A/c.	Dr.	2,00,000	
To Work-in-Process Control A/c			2,00,000
(Cost of finished goods)			
Cost of Sales A/c	Dr.	2,20,000	
To Finished Goods Control A/c			2,00,000
To Selling and Distribution Control A/c			20,000
(Costs of sales)			
Receivables (Debtors)/ Bank A/c	Dr.	2,90,000	
To Sales A/c			2,90,000
(Finished goods sold)			
Bank A/c...	Dr.	69,000	
To Receivables (Debtors) A/c			69,000
(Receipts from receivables)			
Payables (Creditors) A/c...	Dr.	1,10,000	
To Bank A/c			1,10,000
(Payment made to payables)			

**QUESTION 4. (ILLUSTRATION 4)**

In the absence of the Chief Accountant, you have been asked to prepare a month's cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you:

	(₹)	(₹)
Balances at the beginning of the month:		
Stores Ledger Control Account		25,000
Work-in-Process Control Account		20,000
Finished Goods Control Account		35,000
Prepaid Production Overheads brought forward from previous month		3,000
Transactions during the month:		
Materials Purchased		75,000
Materials Issued:		
To production	30,000	
To factory maintenance	4,000	34,000
Materials transferred between batches		5,000
Total wages paid:		
To direct workers	25,000	
To indirect workers	5,000	30,000
Direct wages charged to batches		20,000
Recorded non-productive time of direct workers		5,000
Selling and Distribution Overheads Incurred		6,000



Other Production Overheads Incurred	12,000
Sales	1,00,000
Cost of Finished Goods Sold	80,000
Cost of Goods completed and transferred into finished goods during the month	65,000
Physical value of work-in-Process at the end of the month	40,000

The production overhead absorption rate is 150% of direct wages charged to work- in-Process.

Required:

PREPARE the following accounts for the month:

- Stores Ledger Control Account.
- Work-in-Process Control Account.
- Finished Goods Control Account.
- Production Overhead Control Account.
- Costing Profit and Loss Account.

ANSWER

- (a) Stores Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	25,000	By Work in Process Control A/c	30,000
" Creditors/ Bank A/c	75,000	" Production OH Control A/c	4,000
		" Balance c/d	66,000
	1,00,000		1,00,000

- (b) Wages Control Account

	(₹)		(₹)
To Bank A/c (Paid to direct workers)	25,000	By Work in Process Control A/c (Charged to batches)	20,000
" Bank A/c (Paid to indirect workers)	5,000	" Production OH Control A/c	5,000
		" Production OH Control A/c (Non-productive wages)	5,000
	30,000		30,000

- (c) Production Overhead Control Account

	(₹)		(₹)
To Balance b/d (Prepaid amount)	3,000	By Work-in-Process Control A/c (150% of direct wages)	30,000
" Stores Ledger Control A/c	4,000		
" Wages Control A/c (₹5,000 + ₹5,000)	10,000		
" Bank A/c	12,000		



"	Costing P&L A/c (Over-absorption, balancing figure)	1,000		
		30,000		30,000

(d) Work-in-Process Control Account

	(₹)		(₹)
To Balance b/d	20,000	By Finished Goods Control A/c	65,000
" Store Ledger Control A/c	30,000	" Balance c/d (Physical value)	40,000
" Wages Control A/c	20,000		
" Production OH Control A/c (150% of direct wages)	30,000		
" Costing P&L A/c (Stock Gains)	5,000		
	1,05,000		1,05,000

(e) Finished Goods Control Account

	(₹)		(₹)
To Balance b/d	35,000	By Cost of Goods Sold* A/c	80,000
" Work-in-Process Control A/c	65,000	" Balance c/d	20,000
	1,00,000		1,00,000

* Alternatively, Costing Profit & Loss Account

(f) Costing Profit & Loss Account

	(₹)		(₹)
To Finished Goods Control A/c or Cost of Goods Sold A/c	80,000	By Sales A/c	1,00,000
" Selling & Distribution OH A/c	6,000	" Production OH Control A/c	1,000
" Balance c/d	20,000	" Work-in-Process Control A/c (Stock gain)	5,000
	1,06,000		1,06,000

Notes:

- (1) Materials transferred between batches will not affect the Control Accounts.
- (2) Non-production time of direct workers is a production overhead and therefore will not be charged to work-in-Process Control A/c.
- (3) Production overheads absorbed in work-in-Process Control A/c equals to ₹ 30,000 (150% of ₹ 20,000).
- (4) In the work-in-Process Control A/c the excess physical value of stock is taken resulting in stock gain. Stock gain is transferred to Profit & Loss A/c.

**QUESTION 5. (ILLUSTRATION 5)**

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff for the month of January:

(i) Incomplete Ledger Entries:

Materials Control A/c

	(₹)		(₹)
To Balance b/d	35,000		

Work-in-Process Control A/c

	(₹)		(₹)
To Balance b/d	9,200	By Finished Goods Control A/c	1,51,000

Payables (Creditors) A/c

	(₹)		(₹)
To Balance c/d	19,200	By Balance b/d	16,400

Manufacturing Overheads Control A/c

	(₹)		(₹)
To Bank A/c (Amount spent)	29,600		

Finished Goods Control A/c

	(₹)		(₹)
To Balance b/d	24,000	By Balance c/d	30,000

(ii) Additional Information:

- The bank-book showed that ₹ 89,200 have been paid to creditors for raw-material.
- Ending inventory of work-in-process included materials of ₹ 5,000 on which 300 direct labour hours have been booked against wages and overheads.
- The job card showed that workers have worked for 7,000 hours. The wage rate is ₹ 10 per labour hour.
- Overhead recovery rate was ₹ 4 per direct labour hour.

You are required to COMPLETE the above accounts in the cost ledger of the company.

ANSWER**Materials Control A/c**

	(₹)		(₹)
To Balance b/d		By Work-in-process control	
Cost Ledger Control A/c	32,000	A/c	53,000
“ Payables (Creditors) A/c		“ Balance c/d	71,000
(Purchases)	92,000		
	1,24,000		1,24,000



Manufacturing Overheads A/c

	(₹)		(₹)
To Bank A/c (amount spent)	29,600	By Work-in-process control A/c (₹4 × 7,000 hours)	28,000
		“ Costing P/L A/c (Under-absorbed OH)	1,600
	29,600		29,600

Work-in-Process Control A/c

	(₹)		(₹)
To Balance b/d	9,200	By Finished Goods Control A/c	1,51,000
“ Wages Control A/c (₹10 × 7,000 hours)	70,000	“ Balance c/d:	
“ Overheads Control A/c (₹4 × 7,000 hours)	28,000	-Material 5,000	
		-Wages (₹10 × 3,000 300 hours)	
“ Materials Control A/c (Balancing figure)	53,000	- Overheads (₹4 × 300 hours) <u>1,200</u>	9,200
	1,60,200		1,60,200

Finished Goods Control A/c

	(₹)		(₹)
To Balance b/d	24,000	By Cost of sales A/c (Bal. fig.)	1,45,000
“ Work-in-process Control A/c (as above)	1,51,000	“ Balance c/d	30,000
	1,75,000		1,75,000

Payables (Creditors) A/c

	(₹)		(₹)
To Bank A/c	89,200	By Balance b/d	16,400
“ Balance c/d	19,200	“ Material Control A/c (Purchases) (Balancing fig.)	92,000
	1,08,400		1,08,400

**QUESTION 6. (ILLUSTRATION 6)**

The following figures are available from the financial records of ABC Manufacturing Co. Ltd. for the year ended 31st March.

	(₹)
Sales (20,000 units)	25,00,000
Materials	10,00,000
Wages	5,00,000
Factory Overheads	4,50,000
Administrative Overhead (production related)	2,60,000



Selling and Distribution Overheads	1,80,000
Finished goods (1,230 units)	1,50,000

	(₹)	(₹)
Work-in-Process:		
Materials	30,000	
Labour	20,000	
Factory overheads	20,000	70,000
Goodwill written off		2,00,000
Interest on loan taken		20,000

In the Costing records, factory overhead is charged at 100% of wages, administrative overhead 10% of factory cost and selling and distribution overhead at the rate of ₹ 10 per unit sold. PREPARE a statement reconciling the profit as per cost records with the profit as per financial records.

ANSWER

Profit & Loss Account of ABC Manufacturing Co. Ltd.
(for the year ended 31st March)

	(₹)		(₹)
To Opening Stock	-	By Sales (20,000 units)	25,00,000
“ Materials	10,00,000	“ Closing Stock:	
“ Wages	5,00,000	Finished goods	1,50,000
		(1,230 units)	
“ Factory Overheads	4,50,000	Work-in-Process	70,000
“ Admn. Overheads	2,60,000		
“ S&D Overheads	1,80,000		
“ Goodwill written off	2,00,000		
“ Interest on loan	20,000		
“ Net Profit	1,10,000		
	27,20,000		27,20,000

Cost Sheet

	(₹)
Materials	10,00,000
Wages	5,00,000
Direct Expenses	Nil
Prime Cost	15,00,000
Add: Factory Overhead @ 100% of wages	5,00,000
Gross Factory Cost	20,00,000
Less: Closing WIP	(70,000)
Factory Cost of (20,000 + 1,230) units	19,30,000
Add: Admn. Overhead @ 10% of Factory cost	1,93,000
	21,23,000
Less: Closing Stock of finished goods (1,230 units)	(1,23,000)*
Cost of Goods sold (20,000 units)	20,00,000



Add: Selling & Dist. Overhead @ ₹ 10 per unit	2,00,000
Cost of sales (20,000 units)	22,00,000
Sales of 20,000 units	25,00,000
Profit	3,00,000

* (₹21,23,000 × 1,230 units/ 21,230 units)

Reconciliation Statement

	(₹)	(₹)
Profit as per Cost Accounts		3,00,000
Add: Factory overheads over-absorbed (₹ 5,00,000 – ₹ 4,50,000)	50,000	
Selling & Dist. Overhead over-absorbed (₹ 2,00,000 – ₹ 1,80,000)	20,000	
Difference in the valuation of closing stock of finished goods (₹ 1,50,000 – ₹ 1,23,000)	27,000	97,000
		3,97,000
Less: Admn. overhead under-absorbed (₹ 2,60,000 – ₹ 1,93,000)	67,000	
Goodwill written off	2,00,000	
Interest on loan	20,000	2,87,000
Profit as per financial accounts		1,10,000



QUESTION 7. (ILLUSTRATION 7)

Following are the figures extracted from the Cost Ledger of a manufacturing unit.

	(₹)
Stores:	
Opening balance	15,000
Purchases	80,000
Transfer from WIP	40,000
Issue to WIP	80,000
Issue to repairs and maintenance	10,000
Sold as a special case at cost	5,000
Shortage in the year	3,000
Work-in-Process:	
Opening inventory	30,000
Direct labour cost charged	30,000
Overhead cost charged	1,20,000
Closing Balance	20,000
Finished Products:	
Entire output is sold at 10% profit on actual cost from Work-in- Process.	
Others:	
Wages for the period	35,000
Overhead Expenses	1,25,000

ASCERTAIN the profit or loss as per financial account and cost accounts and reconcile them.

**ANSWER**

Stores Ledger Control A/c

	(₹)		(₹)
To Balance b/d	15,000	By Work-in-Process Control A/c (Issued to WIP)	80,000
“ Cost Ledger Control A/c (Purchases)	80,000	“ Overhead Control A/c (Issued for repairs)	10,000
“ Work-in-Process Control A/c (Return from WIP)	40,000	“ Cost Ledger Control A/c (Sold at cost)	5,000
		“ Overheads Control A/c* (Shortages)	3,000
		“ Balance c/d	37,000
	1,35,000		1,35,000

* Assumed normal

Wages Control A/c

	(₹)		(₹)
To Cost Ledger Control A/c	35,000	By Work-in-process Control A/c	30,000
		“ Overhead Control A/c	5,000
	35,000		35,000

Overhead Control A/c

	(₹)		(₹)
To Stores Ledger Control A/c	10,000	By Work-in-Process Control A/c	1,20,000
“ Stores Ledger Control A/c	3,000		
“ Cost Ledger Control A/c	1,25,000		
“ Wages Control A/c	5,000	“ Balance c/d	23,000
	1,43,000		1,43,000

WIP Control A/c

	(₹)		(₹)
To Balance b/d	30,000	By Stores Ledger Control A/c	40,000
“ Stores Ledger Control A/c	80,000	“ Finished Goods Control A/c	2,00,000*
“ Wages Control A/c	30,000		
“ Overheads Control A/c	1,20,000	“ Balance c/d	20,000
	2,60,000		2,60,000

* Finished output at cost 2,00,000

Profit at 10% on actual cost from WIP Sales 20,000

2,20,000



Statement of Profit as per Costing Records

	(₹)
Direct Material Cost (₹80,000 – ₹40,000)	40,000
Direct wages	30,000
Prime Cost	70,000
Production Overheads	1,20,000
Works Cost	1,90,000
Add: Opening WIP	30,000
	2,20,000
Less: Closing WIP	(20,000)
Cost of finished goods	2,00,000
Profit (10% of cost)	20,000
Sales	2,20,000

Profit & Loss A/c

	(₹)		(₹)
To Material (Op. bal. + Purchases - Sale)	90,000	By Sales A/c	2,20,000
“ Opening WIP	30,000	“ Closing WIP	20,000
“ Wages for the period	35,000	“ Closing stock of Raw Material	
“ Overheads expenses	1,25,000	“ Net loss	3,000
	2,80,000		2,80,000

Reconciliation Statement

	(₹)
Profit (loss) as per Financial Accounts	(3,000)
Add: Overheads over absorbed (refer Overhead control A/c)	23,000
Net Profit as per Cost Accounts	20,000

**QUESTION 8. (ILLUSTRATION 8)**

The following figures have been extracted from the Financial Accounts of a manufacturing firm for the first year of its operation:

	(₹)
Direct Material Consumption	50,00,000
Direct Wages	30,00,000
Factory Overheads	16,00,000
General Administrative Overheads	7,00,000
Selling and Distribution Overheads	9,60,000
Bad Debts	80,000
Preliminary expenses written off	40,000
Legal Charges	10,000
Dividends Received	1,00,000
Interest received on Deposits	20,000
Sales (1,20,000 units)	1,20,00,000
Closing Stock:	



Finished Goods (4,000 units)	3,20,000
Work-in-Process	2,40,000

The cost accounts for the same period reveal that the direct material consumption was ₹ 56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at ₹ 6 per unit of goods sold. Selling and Distribution overheads are recovered at ₹ 8 per unit sold.

PREPARE the Profit and Loss Accounts both as per financial records and as per cost records.

RECONCILE the profits as per the two records.

ANSWER

Profit and Loss Account
(As per financial records)

	(₹)		(₹)
To Direct Material	50,00,000	By Sales (1,20,000 units)	1,20,00,000
“ Direct Wages	30,00,000	“ Closing Stock	
“ Factory Overheads	16,00,000	“ Work-in-process	2,40,000
“ Gross Profit c/d	29,60,000	“ Finished Goods (4,000 units)	3,20,000
	1,25,60,000		1,25,60,000
“ General Administrative Overheads	7,00,000	“ Gross Profit b/d	29,60,000
“ Selling and Dist. OH	9,60,000	“ Dividend received	1,00,000
“ Bad debts	80,000	“ Interest received	20,000
“ Preliminary Expenses written off	40,000		
“ Legal Charges	10,000		
“ Net Profit	12,90,000		
	30,80,000		30,80,000

Statement of Cost and Profit
(As per Cost Records)

	(₹)
Direct Material	56,00,000
Direct Wages	30,00,000
Prime Cost	86,00,000
Factory Overhead (20% of ₹86,00,000)	17,20,000
	1,03,20,000
Less: Closing Stock (WIP)	(2,40,000)
Works Cost or Cost of production (1,24,000 units)	1,00,80,000
Less: Finished Goods (4,000 units @ ₹81.29)	(3,25,160)
Cost of goods sold (1,20,000 units)	97,54,840
Administrative Overhead (1,20,000 units @ ₹ 6 p.u.)	7,20,000
Selling and Distribution Overhead (1,20,000 @ ₹ 8 p.u.)	9,60,000
Cost of Sales	1,14,34,840
Net profit (Balancing figure)	5,65,160



Sales Revenue	1,20,00,000

Statement of Reconciliation of profit as obtained under Cost and Financial Accounts

	(₹)	(₹)
Profit as per Cost Records		5,65,160
Add: Excess of Material Consumption	6,00,000	
Factory Overhead	1,20,000	
Administrative Overhead	20,000	
Dividend Received	1,00,000	
Interest Received	20,000	8,60,000
		14,25,160
Less: Bad debts	80,000	
Preliminary expenses written off	40,000	
Legal Charges	10,000	
Over-valuation of stock in cost book		
(₹ 3,25,160 – ₹ 3,20,000)	5,160	(1,35,160)
Profit as per Financial Records		12,90,000

**QUESTION 9. (PP1)**

The following incomplete accounts are furnished to you for the month ended 31st October, 2022.

Stores Ledger Control Account		
1.10.2022	To Balance	₹ 54,000
Work in Process Control Account		
1.10. 2022	To Balance	₹ 6,000
Finished Goods Control Account		
1.10. 2022	To Balance	₹ 75,000
Factory Overheads Control Account		
Total debits for October, 2022		₹ 45,000
Factory Overheads Applied Account		
Cost of Goods Sold Account		
Creditors for Purchases Account		
1.10. 2022	By Balance	₹ 30,000

Additional information:

- The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 2022 is ₹ 6,75,000 and the budget of direct labour hours is 4,50,000.
- The balance in the account of creditors for purchases on 31.10. 2022 is ₹ 15,000 and the payments made to creditors in October, 2022 amount to ₹ 1,05,000.
- The finished goods inventory as on 31st October, 2022 is ₹ 66,000.
- The cost of goods sold during the month was ₹ 1,95,000.
- On 31st October, 2022 there was only one unfinished job in the factory. The cost records show that ₹ 3,000 (1,200 direct labour hours) of direct labour cost and ₹ 6,000 of direct material cost had been charged.
- A total of 28,200 direct labour hours were worked in October, 2022. All factory workers



earn same rate of pay.

(vii) All actual factory overheads incurred in October, 2022 have been posted.

You are required to FIND:

- Materials purchased during October, 2022.
- Cost of goods completed in October, 2022.
- Overheads applied to production in October, 2022.
- Balance of Work-in-Process Control A/c on 31st October, 2022.
- Direct Materials consumed during October, 2022.
- Balance of Stores Ledger Control Account on 31st October, 2022.
- Over absorbed or under absorbed overheads for October, 2022.

ANSWER

Working Notes:

- (i) Overhead recovery rate per direct labour hour:

Budgeted Factory Overheads = ₹ 6,75,000

Budgeted Direct Labour hours = 4,50,000

$$\begin{aligned}\text{Overhead recovery rate} &= \frac{\text{Budgeted Factory Overheads}}{\text{Budgeted Direct Labour hours}} \\ &= \frac{\text{₹ 6,75,000}}{4,50,000 \text{ hours}} \\ &= \text{₹ 1.50 per direct labour}\end{aligned}$$

- (ii) Direct Wage rate per hour:

Direct Labour cost of WIP = ₹ 3,000

(on 31st October 2022)

Direct labour hours of WIP = 1,200 hours

$$\begin{aligned}\text{Direct wage rate per hour} &= \frac{\text{Direct labour cost on WIP}}{\text{Direct labour hours on WIP}} \\ &= \frac{\text{₹ 3,000}}{1,200 \text{ hours}} = \text{₹ 2.50}\end{aligned}$$

- (iii) Total Direct Wages charged to production:

Total direct labour hours spent on production × Direct wage rate per hour

= 28,200 hours × ₹ 2.50 = ₹ 70,500

- (a) Material purchased during October, 2022

	(₹)
Payment made to creditors	1,05,000
Add: Closing balance in the account of creditors for purchase	15,000
Less: Opening balance	(30,000)
Material Purchased	90,000

- (b) Cost of Finished Goods in October, 2022

	(₹)
Cost of goods sold during the month	1,95,000
Add: Closing finished goods inventory	66,000
Less: Opening finished goods inventory	(75,000)
Cost of goods completed during the month	1,86,000



(c) Overhead applied to production in October, 2022

$$= 28,200 \text{ hours} \times ₹ 1.50 = ₹ 42,300$$

(d) Balance of Work-in-Process on 31st October, 2022

	(₹)
Direct material cost	6,000
Direct labour cost	3,000
Overheads (₹ 1.50 × 1,200 hours)	1,800
	10,800

(e) Direct material consumed during October, 2022 = ₹ 78,000

(Refer to following Accounts)

Work in Process Control A/c

	(₹)		(₹)
To Balance b/d	6,000	By Finished goods control A/c [Refer (b) above]	1,86,000
“ Wages Control A/c [Refer working note (iii)]	70,500	“ Balance c/d [Refer (d) above]	10,800
“ Factory OH Control A/c	42,300		
“ Material consumed (Balancing fig.)	78,000		
	1,96,800		1,96,800

(f) Balance of Stores Control Account on 31st October, 2022 = ₹ 66,000

(Refer to following Account)

Stores Ledger Control Account

	(₹)		(₹)
“ Balance b/d	54,000	By Work-in-process Control A/c [Refer (e) above]	78,000
“ Payables (Creditors) A/c [Refer (a) above]	90,000	“ Balance c/d (Balancing fig.)	66,000
	1,44,000		1,44,000

(g) Over-absorbed or under-absorbed overheads for October, 2022: Balance in Factory Overhead Account below showing that ₹ 2,700 is under-absorbed.

Factory Overhead Account

	(₹)		(₹)
“ Bank A/c	45,000	By Work-in-process Control A/c (Factory OH applied)	42,300



			“	Costing P/L A/c	2,700
				(Under-absorbed)	
		45,000			45,000

**QUESTION 10. (PP2)**

A company operates on historic job cost accounting system, which is not integrated with the financial accounts. At the beginning of a month, the opening balances in cost ledger were:

	(₹ in lakhs)
Stores Ledger Control Account	80
Work-in-Process Control Account	20
Finished Goods Control Account	430
Building Construction Account	10
Cost Ledger Control Account	540

During the month, the following transactions took place:

		(₹ in lakh)
Materials	Purchased	40
	Issued to production	50
	Issued to factory maintenance	6
	Issued to building construction	4
Wages	Gross wages paid	150
	Indirect wages	40
	For building construction	10
Works Overheads	Actual amount incurred (excluding items shown above)	160
	Absorbed in building construction	20
	Under absorbed	8
Royalty paid	(related to production)	5
Selling, Distribution and Administration overheads		25
Sales		450

At the end of the month, the stock of raw material and work-in-Process was

₹ 55 lakhs and ₹ 25 lakhs respectively. The loss arising in the raw material accounts is treated as factory overheads. The building under construction was completed during the month.

Company's gross profit margin is 20% on sales.

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

ANSWER

Cost Ledger Control A/c

Amount (₹ in lakhs)

	(₹)		(₹)
To Costing P&L A/c	450	By Balance b/d	540
“ Building Construction A/c	44	“ Stores Ledger Control A/c	40
“ Balance c/d	483	“ Wages Control A/c	150



			“	Works OH Control A/c	160
			“	Royalty A/c	5
			“	Admn. OH and S&D OH A/c	25
			“	Costing P&L A/c	57
		977			977

Stores Ledger Control A/c

	(₹)		(₹)
To Balance b/d	80	By Work-in-Process A/c	50
“ Cost Ledger Control A/c	40	“ Works OH Control A/c	6
		“ Building Const. A/c	4
		“ Works OH Control A/c (Bal. fig.) (loss)	5
		“ Balance c/d	55
			120

Wages Control A/c

	(₹)		(₹)
To Cost Ledger Control A/c	150	By Works OH Control A/c	40
		“ Building Const. A/c	10
		“ Work-in-process Control A/c	100
		(Balancing figure)	
	150		150

Works Overhead Control A/c

	(₹)		(₹)
To Stores Ledger Control A/c	6	By Building Const. A/c	20
“ Wages Control A/c	40	“ Work-in-process Control A/c	183
		(Balancing figure)	
“ Cost Ledger Control A/c	160	“ Costing P&L A/c (under-absorption)	8
“ Store Ledger Control A/c (loss)	5		
	211		211

Royalty A/c

	(₹)		(₹)
To Cost Ledger Control A/c	5	By Work-in-process Control A/c	5
	5		5



Work-in-Process Control A/c

	(₹)		(₹)
To Balance b/d	20	By Finished Goods Control A/c	333
		(Balancing figure)	
“ Stores Ledger Control A/c	50		
“ Wages Control A/c	100		
“ Works OH Control A/c	183		
“ Royalty A/c	5	“ Balance c/d	25
	358		358

Finished Goods Control A/c

	(₹)		(₹)
To Balance b/d	430	By Cost of Goods Sold A/c	360
		(80% of ₹ 450)	
“ Work-in-process Control A/c	333	“ Balance c/d	403
	763		763

Cost of Goods Sold A/c

	(₹)		(₹)
To Finished Goods Control A/c	360	By Cost of sales A/c	360
	360		360

Selling, Distribution and Administration Overhead A/c

	(₹)		(₹)
To Cost Ledger Control A/c	25	By Cost of sales A/c	25
	25		25

Cost of Sales A/c

	(₹)		(₹)
To Cost of Goods Sold	360	By Costing P&L A/c	385
“ Admn. OH and S&D OH A/c	25		
	385		385

Costing P & L A/c

	(₹)		(₹)
To Cost of Sales A/c	385	By Cost Ledger Control A/c	450
		(Sales)	
“ Works Overhead Control A/c	8		
“ Cost Ledger Control A/c	57		
(Profit) (Balancing figure)			
	450		450



Building Construction A/c

	(₹)		(₹)
To Balance b/d	10	By Cost Ledger Control A/c	44
" Stores Ledger Control A/c	4		
" Wages Control A/c	10		
" Works OH Control A/c	20		
	763		763

Trial Balance

(₹ in lakhs)

	Dr. (₹)	Cr. (₹)
Stores control A/c	55	
Work-in-Process A/c	25	
Finished Goods A/c	403	
Cost Ledger Adjustment A/c		483
	483	483

**QUESTION 11. (PP3)**

Dutta Enterprises operates an Integral system of accounting. You are required to PASS the Journal Entries for the following transactions that took place for the year ended 31st March. (Narrations are not required.)

	(₹)
Raw Materials purchased (50% on Credit)	6,00,000
Materials issued to production	4,00,000
Wages paid (50% Direct)	2,00,000
Wages charged to production	1,00,000
Factory Overheads incurred	80,000
Factory Overheads charged to production	1,00,000
Selling and Distribution Overheads incurred	40,000
Finished Goods at cost	5,00,000
Sales (50% Credit)	7,50,000
Closing stock	Nil
Receipts from debtors	2,00,000
Payments to creditors	2,00,000

ANSWER

Journal entries are as follows:

	DR. (₹)	CR. (₹)
Stores Ledger Control A/c Dr.	6,00,000	
To Payables (Creditors)		3,00,000
A/c To Cash or Bank		3,00,000
Work-in-Process Control A/c Dr.	4,00,000	
To Stores Ledger Control A/c		4,00,000
Wages Control A/c. Dr.	2,00,000	
To Bank A/c		2,00,000
Factory Overhead Control A/c Dr.	1,00,000	
To Wages Control A/c		1,00,000



Work-in-Process Control A/c	Dr.	1,00,000	
To Wages Control A/c			1,00,000
Factory Overhead Control A/c	Dr.	80,000	
To Bank A/c			80,000
Work-in-Process Control A/c	Dr.	1,00,000	
To Factory Overhead Control A/c			1,00,000
Selling and Dist. Overhead Control A/c	Dr.	40,000	
To Bank A/c			40,000
Finished Goods Control A/c	Dr.	5,00,000	
To Work-in-Process Control A/c			5,00,000
Cost of Sales A/c	Dr.	5,40,000	
To Finished Goods Control A/c			5,00,000
To Selling and Distribution Control A/c			40,000
Receivables (Debtors) A/c	Dr.	3,75,000	
Bank or Cash A/c	Dr.	3,75,000	
To Sales A/c			7,50,000
Bank A/c...	Dr.	2,00,000	
To Receivables (Debtors) A/c			2,00,000
Payables (Creditors) A/c...	Dr.	2,00,000	
To Bank A/c			2,00,000

**QUESTION 12. (PP4)**

The following information is available from the financial books of a company having a normal production capacity of 60,000 units for the year ended 31st March:

- Sales ₹ 10,00,000 (50,000 units).
- There was no opening and closing stock of finished units.
- Direct Material and Direct Wages cost were ₹ 5,00,000 and ₹ 2,50,000 respectively.
- Actual factory expenses were ₹ 1,50,000 of which 60% are fixed.
- Actual Administrative expenses were ₹ 45,000 which are completely fixed.
- Actual Selling and Distribution expenses were ₹ 30,000 of which 40% are fixed.
- Interest and dividends received ₹ 15,000. You are required to:
 - FIND OUT profit as per financial books for the year ended 31st March;
 - PREPARE the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March assuming that the indirect expenses are absorbed on the basis of normal production capacity; and
 - PREPARE a statement reconciling profits shown by financial and cost books.

ANSWER

(a)

Profit & Loss Account
(for the year ended 31st March)

	(₹)		(₹)
To Direct Material	5,00,000	By Sales (50,000 units)	10,00,000
“ Direct Wages	2,50,000	“ Interest and dividends	15,000
“ Factory expenses	1,50,000		
“ Administrative expenses	45,000		



"	Selling & Dist. Expenses	30,000		
"	Net Profit	40,000		
		10,15,000		10,15,000

(b)

Cost Sheet

(for the year ended 31st March)

	(₹)	(₹)
Direct Material		5,00,000
Direct Wages		2,50,000
Prime cost		7,50,000
Factory expenses:		
Variable (40% of ₹ 1,50,000)	60,000	
Fixed (₹ 90,000 × 50,000/60,000)	75,000	1,35,000
Works cost/ Cost of production		8,85,000
Administrative expenses: (₹ 45,000 × 50,000/60,000)		37,500
Selling & Distribution expenses:		
Variable (60% of ₹ 30,000)	18,000	
Fixed* (₹ 12,000 × 50,000/60,000)	10,000	28,000
Cost of Sales		9,50,500
Profit (Balancing figure)		49,500
Sales revenue		10,00,000

*It is assumed that the company sells what it generally produces i.e. normal production.

(c)

Statement of Reconciliation

(Reconciling profit shown by Financial and Cost Accounts)

	(₹)	(₹)
Profit as per Cost Account		49,500
Add : Income from interest and dividends		15,000
		64,500
Less: Factory expenses under-charged in Cost Accounts (₹ 1,50,000 – ₹ 1,35,000)	15,000	
Administrative expenses under-charged in Cost Accounts (₹ 45,000 – ₹ 37,500)	7,500	
Selling & distribution expenses under-charged in Cost Accounts (₹ 30,000 – ₹ 28,000)	2,000	(24,500)
Profit as per Financial Accounts		40,000



QUESTION 12. (PP5)

M/s. H.K. Piano Company showed a net loss of ₹ 4,16,000 as per their financial accounts for the year ended 31st March. The cost accounts, however, disclosed a net loss of ₹ 3,28,000 for the same period. The following information were revealed as a result of scrutiny of the figures of both the sets of books:

	(₹)
(i) Factory Overheads under-recovered	6,000
(ii) Administration Overheads over-recovered	4,000



(iii)	Depreciation charged in financial accounts	1,20,000
(iv)	Depreciation recovered in costs	1,30,000
(v)	Interest on investment not included in costs	20,000
(vi)	Income-tax provided	1,20,000
(vii)	Transfer fees (credit in financial books)	2,000
(viii)	Stores adjustment (credit in financial books)	2,000

PREPARE a Memorandum reconciliation account.

ANSWER

Memorandum Reconciliation Account

		(₹)			(₹)
To	Net loss as per costing books	3,28,000	By	Administration Overhead - over-recovered in costs	4,000
"	Factory Overheads under-recovered in costs	6,000	"	Depreciation overcharged in costs	10,000
"	Income-tax not provided in costs	1,20,000	"	Interest on investments not included in costs	20,000
			"	Transfer fees in financial books	2,000
			"	Stores adjustment	2,000
			"	Net loss as per financial books	4,16,000
		4,54,000			4,54,000



REVISION TEST PAPER



RTP MAY 18

As of 31st March, 2018, the following balances existed in a firm's cost ledger, which is maintained separately on a double entry basis:

	Debit (₹)	Credit (₹)
Stores Ledger Control A/c	3,20,000	
Work-in-process Control A/c	1,52,000	
Finished Goods Control A/c	2,56,000	
Manufacturing Overhead Control A/c		28,000
Cost Ledger Control A/c		7,00,000
	7,28,000	7,28,000

During the next quarter, the following items arose:

	(₹)
Finished Product (at cost)	2,35,500
Manufacturing overhead incurred	91,000
Raw material purchased	1,36,000
Factory wages	48,000
Indirect labour	20,600
Cost of sales	1,68,000
Materials issued to production	1,26,000
Sales returned (at cost)	8,000
Materials returned to suppliers	11,000
Manufacturing overhead charged to production	86,000

Required:

PREPARE the Cost Ledger Control A/c, Stores Ledger Control A/c, Work-in-process Control A/c, Finished Stock Ledger Control A/c, Manufacturing Overhead Control A/c, Wages Control A/c, Cost of Sales A/c and the Trial Balance at the end of the quarter as per costing records.

ANSWER :

Cost Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Store Ledger Control A/c	11,000	By Opening Balance	7,00,000
To Balance c/d	9,84,600	By Store ledger control A/c	1,36,000
		By Manufacturing Overhead Control A/c	91,000
		By Wages Control A/c	68,600
	9,95,600		9,95,600

Stores Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Opening Balance	3,20,000	By WIP Control A/c	1,26,000



To Cost ledger control A/c	1,36,000	By Cost ledger control A/c (Returns)	11,000
		By Balance c/d	3,19,000
	4,56,000		4,56,000

WIP Control Account

Particulars	(₹)	Particulars	(₹)
To Opening Balance	1,52,000	By Finished Stock Ledger Control A/c	2,35,500
To Wages Control A/c	48,000	By Balance c/d	1,76,500
To Stores Ledger Control A/c	1,26,000		
To Manufacturing Overhead Control A/c	86,000		
	4,12,000		4,12,000

Finished Stock Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Opening Balance	2,56,000	By Cost of Sales	1,68,000
To WIP Control A/c	2,35,500	By Balance c/d	3,31,500
To Cost of Sales A/c (Sales Return)	8,000		
	4,99,500		4,99,500

Manufacturing Overhead Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	91,000	By Opening Balance	28,000
To Wages Control A/c	20,600	By WIP Control A/c	86,000
To Over recovery c/d	2,400		
	1,14,000		1,14,000

Wages Control Account

Particulars	(₹)	Particulars	(₹)
To Transfer to Cost Ledger Control A/c	68,600	By WIP Control A/c	48,000
		By Manufacturing Overhead Control A/c	20,600
	68,600		68,600

Cost of Sales Account

Particulars	(₹)	Particulars	(₹)
To Finished Stock Ledger Control A/c	1,68,000	By Finished Stock Ledger Control A/c (Sales return)	8,000
		By Balance c/d	1,60,000
	1,68,000		1,68,000



Trial Balance

	(₹)	(₹)
Stores Ledger Control A/c	3,19,000	
WIP Control A/c	1,76,500	
Finished Stock Ledger Control A/c	3,31,500	
Manufacturing Overhead Control A/c	--	2,400
Cost of Sales A/c	1,60,000	
Cost ledger control A/c	--	9,84,600
	9,87,000	9,87,000



RTP NOV 18

The financial books of a company reveal the following data for the year ended 31 st March, 20X8:

Opening Stock:	(₹)
Finished goods 625 units	53,125
Work-in-process	46,000
01.04.20X7 to 31.03.20X8	
Raw materials consumed	8,40,000
Direct Labour	6,10,000
Factory overheads	4,22,000
Administration overheads (Production related)	1,98,000
Dividend paid	1,22,000
Bad Debts	18,000
Selling and Distribution Overheads	72,000
Interest received	38,000
Rent received	46,000
Sales 12,615 units	22,80,000
Closing Stock: Finished goods 415 units	45,650
Work-in-process	41,200

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹ 3 per unit sold.
- Opening Stock of finished goods is valued at ₹ 120 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

- (i) PREPARE a statements for the year ended 31st March, 20X8. Show the profit as per financial records
the profit as per costing records.
- (ii) PREPARE a statement reconciling the profit as per costing records with the profit as per Financial Records.

**ANSWER :**

(i) Statement of Profit as per Financial records (for the year ended March 31, 20X8)

	(₹)		(₹)
To Opening stock of Finished Goods	53,125	By Sales	22,80,000
To Work-in-process	46,000	By Closing stock of finished Goods	45,650
To Raw materials consumed	8,40,000	By Work-in-Process	41,200
To Direct labour	6,10,000	By Rent received	46,000
To Factory overheads	4,22,000	By Interest received	38,000
To Administration overheads	1,98,000		
To Selling & distribution overheads	72,000		
To Dividend paid	1,22,000		
To Bad debts	18,000		
To Profit	69,725		
	24,50,850		24,50,850

Statement of Profit as per Costing records
(for the year ended March 31, 20X8)

	(₹)
Sales revenue (A) (12,615 units)	22,80,000
Cost of sales:	
Opening stock (625 units × ₹ 120)	75,000
Add: Cost of production of 12,405 units (Refer to working note 2)	21,63,350
Less: Closing stock (₹174.39 × 415 units)	(72,372)
Cost of goods sold (12,615 units)	21,65,978
Selling & distribution overheads (12,615 units × ₹ 3)	37,845
Cost of sales: (B)	22,03,823
Profit: {(A) – (B)}	76,177

(ii) Statement of Reconciliation

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

	(₹)	(₹)
Profit as per Cost Accounts		76,177
Add: Administration overheads over absorbed (₹ 2,81,550 – ₹ 1,98,000)	83,550	
Opening stock overvalued (₹ 75,000 – ₹ 53,125)	21,875	
Interest received	38,000	
Rent received	46,000	



Factory overheads over recovered (₹ 4,27,000 – ₹ 4,22,000)	5,000	1,94,425
		2,70,602
Less: Selling & distribution overheads under recovery (₹ 72,000 – ₹ 37,845)	34,155	
Closing stock overvalued (₹ 72,372 – ₹ 45,650)	26,722	
Dividend	1,22,000	
Bad debts	18,000	(2,00,877)
Profit as per financial accounts		69,725

Working notes:

1. Number of units produced

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

2. Cost Sheet

	(₹)
Raw materials consumed	8,40,000
Direct labour	6,10,000
Prime cost	14,50,000
Factory overheads (70% of direct wages)	4,27,000
Factory cost	18,77,000
Add: Opening work-in-process	46,000
Less: Closing work-in-process	41,200
Factory cost of goods produced	18,81,800
Administration overheads (15% of factory cost)	2,81,550
Cost of production of 12,405 units (Refer to working note 1)	21,63,350
Cost of production per unit:	
$= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹ 21,63,350}{12,405 \text{ units}} = ₹ 174.39$	



RTP MAY 19

The following is the summarised Trading and Profit and Loss Account of XYZ Ltd. for the year ended 31st March 2019:

Particulars	Amount (₹)	Particulars	Amount (₹)
Direct Material	14,16,000	Sales (30,000 units)	30,00,000
Direct wages	7,42,000	Finished stock (2,000 units)	1,67,500
Works overheads	4,26,000	Work-in-progress:	
Administration overheads	1,50,000	- Materials	34,000



Selling and distribution overheads	1,65,000	- Wages	16,000	
Net profit for the year	3,22,500	- Works overhead	4,000	54,000
	32,21,500			32,21,500

The company's cost records show that in course of manufacturing a standard unit (i) works overheads have been charged @ 20% on prime cost, (ii) administration overheads are related with production activities and are recovered at ₹5 per finished unit, and (iii) selling and distribution overheads are recovered at ₹6 per unit sold.

You are required to PREPARE:

- Costing Profit and Loss Account indicating the net profits,
- A Statement showing reconciliation between profit as disclosed by the Cost Accounts and Financial Accounts.

ANSWER :

- Costing Profit and Loss Account for the year ended 31st March 2019:

Particulars	Amount (₹)	Particulars	Amount (₹)
Material consumed	14,16,000	Sales (30,000 units)	30,00,000
Direct wages	7,42,000		
Prime Cost	21,58,000		
Works overheads (20% of Prime cost)	4,31,600		
	25,89,600		
Less: Work in progress	(54,000)		
Factory cost	25,35,600		
Administration overheads (₹5 × 32,000 units)	1,60,000		
Cost of production	26,95,600		
Less: Finished stock	(1,68,475)		
Cost of goods sold	25,27,125		
Selling and distribution overheads (₹6 × 30,000 unit)	1,80,000		
Cost of sales	27,07,125		
Profit (balancing figure)	2,92,875		
	30,00,000		30,00,000

- Statement reconciling the profit as per costing profit and loss account with the profit as per financial accounts

Particulars	Amount (₹)	Amount (₹)
Profit as per cost records		2,92,875
Add: Overheads over-absorbed:		
- Works overheads (₹ 4,31,600 – ₹ 4,26,000)	5,600	
- Administration OH (₹ 1,60,000 – ₹ 1,50,000)	10,000	
- Selling and Distribution (₹ 1,80,000 – ₹ 1,65,000)	15,000	30,600



Less: Closing stock overvalued (₹ 1,68,475 – ₹ 1,67,500)	(975)
Profit as per financial accounts	3,22,500

*It is assumed that the number of units Produced

= Number of units sold + Finished stock = 30,000 + 2,000 = 32,000 units.

**RTP NOV 19**

As of 30th September, 2019, the following balances existed in a firm's cost ledger, which is maintained separately on a double entry basis:

	Debit(₹)	Credit(₹)
Stores Ledger Control A/c	15,00,000	-
Work-in-progress Control A/c	7,50,000	-
Finished Goods Control A/c	12,50,000	-
Manufacturing Overhead Control A/c	-	75,000
Cost Ledger Control A/c	-	34,25,000
	35,00,000	35,00,000

During the next quarter, the following items arose:

	(₹)
Finished Product (at cost)	11,25,000
Manufacturing overhead incurred	4,25,000
Raw material purchased	6,25,000
Factory wages	2,00,000
Indirect labour	1,00,000
Cost of sales	8,75,000
Materials issued to production	6,75,000
Sales returned (at cost)	45,000
Materials returned to suppliers	65,000
Manufacturing overhead charged to production	4,25,000

Required:

PREPARE the Cost Ledger Control A/c, Stores Ledger Control A/c, Work-in-progress Control A/c, Finished Stock Ledger Control A/c, Manufacturing Overhead Control A/c, Wages Control A/c, Cost of Sales A/c and the Trial Balance at the end of the quarter.

ANSWER :**Cost Ledger Control Account**

Dr.

Cr.

	(₹)		(₹)
To Store Ledger Control A/c	65,000	By Opening Balance	34,25,000
To Balance c/d	47,10,000	By Store ledger control A/c	6,25,000
		By Manufacturing Overhead Control A/c	4,25,000
		By Wages Control A/c	3,00,000
	47,75,000		47,75,000



Stores Ledger Control Account

Dr.			Cr.	
	(₹)		(₹)	
To Opening Balance	15,00,000	By WIP Control A/c	6,75,000	
To Cost ledger control A/c	6,25,000	By Cost ledger control A/c	65,000	
		(Returns)		
		By Balance c/d	13,85,000	
	21,25,000		21,25,000	

WIP Control Account

Dr.			Cr.	
	(₹)		(₹)	
To Opening Balance	7,50,000	By Finished Stock Ledger Control A/c	11,25,000	
To Wages Control A/c	2,00,000	By Balance c/d	9,25,000	
To Stores Ledger Control A/c	6,75,000			
To Manufacturing Overhead Control A/c	4,25,000			
	20,50,000		20,50,000	

Finished Stock Ledger Control Account

Dr.			Cr.	
	(₹)		(₹)	
To Opening Balance	12,50,000	By Cost of Sales	8,75,000	
To WIP Control A/c	11,25,000	By Balance c/d	15,45,000	
To Cost of Sales A/c (Sales Return)	45,000			
	24,20,000		24,20,000	

Manufacturing Overhead Control Account

Dr.			Cr.	
	(₹)		(₹)	
To Cost Ledger Control A/c	4,25,000	By Opening Balance	75,000	
To Wages Control A/c	1,00,000	By WIP Control A/c	4,25,000	
		By Under recovery c/d		
	5,25,000		5,25,000	

Wages Control Account

Dr.			Cr.	
	(₹)		(₹)	
To Transfer to Cost Ledger Control A/c	3,00,000	By WIP Control A/c	2,00,000	
		By Manufacturing Overhead Control A/c	1,00,000	
	3,00,000		3,00,000	



Cost of Sales Account

Dr.

Cr.

	(₹)		(₹)
To Finished Stock Ledger	8,75,000	By Finished Stock Ledger	45,000
Control A/c		Control A/c (Sales return)	
		By Balance c/d	8,30,000
	8,75,000		8,75,000

Trial Balance

	(₹)	(₹)
Stores Ledger Control A/c	13,85,000	
WIP Control A/c	9,25,000	
Finished Stock Ledger Control A/c	15,45,000	
Manufacturing Overhead Control A/c	25,000	
Cost of Sales A/c	8,30,000	
Cost ledger control A/c	----	47,10,000
	47,10,000	47,10,000



RTP MAY 20

The following are the balances existed in the books of JPG Ltd. for the year ended, 31st March, 2019:

Particulars	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	30,00,000	
WIP Control A/c	15,00,000	
Finished Goods Control A/c	25,00,000	
Manufacturing Overheads Control A/c		1,50,000
Cost Ledger Control A/c		68,50,000

During the year 2019-20, the following transactions took place:

Particulars	Amount (₹)
Finished product (at cost)	22,50,000
Manufacturing Overhead incurred	8,50,000
Raw material purchased	12,50,000
Factory wages	4,00,000
Indirect labour	2,00,000
Cost of sales	17,50,000
Materials issued to production	13,50,000
Sales returned (at cost)	90,000
Material returned to suppliers	1,30,000
Manufacturing overhead charged to production	8,50,000

Required:

PREPARE the following control accounts and Trial balance at the end of the year:

Cost Ledger, Stores Ledger, Work-in-process, Finished Stock, Manufacturing Overhead, Wages and Cost of Sales.

**ANSWER :**

Cost Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Stores Ledger control A/c	1,30,000	By Balance b/d	68,50,000
To Costing Profit & Loss A/c	17,10,000	By Stores Ledger control A/c	12,50,000
		By Wages Control A/c	6,00,000
To Balance c/d	77,10,000	By Manufacturing overhead control A/c	8,50,000
	95,50,000		95,50,000

Store Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	30,00,000	By WIP Control A/c	13,50,000
To Cost Ledger control A/c	12,50,000	By Cost Ledger control A/c (return)	
		By Balance c/d	27,70,000
	42,50,000		42,50,000

WIP Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	15,00,000	By Finished Stock Control A/c	22,50,000
To Wages Control A/c	4,00,000		
To Stores Ledger control A/c	13,50,000		
To Manufacturing overhead control A/c	8,50,000	By Balance c/d	18,50,000
	41,00,000		41,00,000

Finished Stock Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	25,00,000	By Cost of Sales A/c	17,50,000
To WIP Control A/c	22,50,000		
To Cost of Sales A/c (sales return)	90,000	By Balance c/d	30,90,000
	48,40,000		48,40,000

Manufacturing Overhead Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	8,50,000	By Balance b/d	1,50,000
To Wages Control A/c	2,00,000	By WIP Control A/c	8,50,000
		By Costing P&L A/c (under recovery)	50,000
	10,50,000		10,50,000



Wages Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	6,00,000	By WIP Control A/c	4,00,000
		By Manufacturing overhead control A/c	2,00,000
	6,00,000		6,00,000

Cost of Sales Account

Particulars	(₹)	Particulars	(₹)
To Finished Stock Control A/c	17,50,000	By Finished Stock Control A/c	90,000
		(sales return)	
		By Costing Profit & Loss A/c	16,60,000
	17,50,000		17,50,000

Trial Balance

Particulars	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	27,70,000	
WIP Control A/c	18,50,000	
Finished Goods Control A/c	30,90,000	
Cost Ledger Control A/c		77,10,000
	77,10,000	77,10,000

Working:

Costing P&L Account

Particulars	(₹)	Particulars	(₹)
To Cost of Sales A/c	16,60,000	By Cost Ledger control A/c	17,10,000
To Manufacturing overhead control A/c	50,000		
	17,10,000		17,10,000



RTP NOV 20

A manufacturing company disclosed a net loss of ₹6,94,000 as per their cost accounts for the year ended March 31, 2020. The financial accounts however disclosed a net loss of ₹10,20,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

	(₹)
(i) Factory Overheads under-absorbed	80,000
(ii) Administration Overheads over-absorbed	1,20,000
(iii) Depreciation charged in Financial Accounts	6,50,000
(iv) Depreciation charged in Cost Accounts	5,50,000
(v) Interest on investments not included in Cost Accounts	1,92,000
(vi) Income-tax provided	1,08,000
(vii) Interest on loan funds in Financial Accounts	4,90,000
(viii) Transfer fees (credit in financial books)	48,000



(ix) Stores adjustment (credit in financial books)	28,000
(x) Dividend received	64,000

PREPARE a memorandum Reconciliation Account.

ANSWER :

Memorandum Reconciliation Accounts

Dr.		Cr.	
	(₹)		(₹)
To Net Loss as per Costing books	6,94,000	By Administration overheads over recovered in cost accounts	1,20,000
To Factory overheads under absorbed in Cost Accounts	80,000	By Interest on investment not included in Cost Accounts	1,92,000
To Depreciation under charged in Cost Accounts	1,00,000	By Transfer fees in Financial books	48,000
To Income-Tax not provided in Cost Accounts	1,08,000	By Stores adjustment (Credit in financial books)	28,000
To Interest on Loan Funds in Financial Accounts	4,90,000	By Dividend received in financial books	64,000
		By Net loss as per Financial books	10,20,000
	14,72,000		14,72,000

**RTP MAY 21**

The financial books of a company reveal the following data for the year ended 31 st March, 2020:

	(₹)
Opening Stock:	
Finished goods 625 units	1,06,250
Work-in-process	92,000
01.04.2019 to 31.03.2020	
Raw materials consumed	16,80,000
Direct Labour	12,20,000
Factory overheads	8,44,000
Administration overheads (production related)	3,96,000
Dividend paid	2,44,000
Bad Debts	36,000
Selling and Distribution Overheads	1,44,000
Interest received	76,000
Rent received	92,000
Sales 12,615 units	45,60,000
Closing Stock: Finished goods 415 units	91,300
Work-in-process	82,400



The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹ 6 per unit sold.
- Opening Stock of finished goods is valued at ₹ 240 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

- PREPARE statements for the year ended 31st March, 2020 showing:
the profit as per financial records
the profit as per costing records.
- PREPARE a statement reconciling the profit as per costing records with the profit as per financial records.

ANSWER :

- Statement of Profit as per financial records
(for the year ended March 31, 2020)

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

- Statement of Profit as per costing records
(for the year ended March 31, 2020)

	(₹)
Sales revenue (A) (12,615 units)	45,60,000
Cost of sales:	
Opening stock (625 units × ₹ 240)	1,50,000
Add: Cost of production of 12,405 units (Refer to working note 2)	43,28,140
Less: Closing stock	(1,44,795)



$\left(\frac{₹ 43,28,140 \times 415 \text{ units}}{12,405 \text{ units}} \right)$	
Production cost of goods sold (12,615 units)	43,33,345
Selling & distribution overheads (12,615 units × ₹ 6)	75,690
Cost of sales: (B)	44,09,035
Profit: {(A) – (B)}	1,50,965

(ii) Statement of Reconciliation
(Reconciling the profit as per costing records with the profit as per financial records)

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

Working notes:

1. Number of units produced

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

2. Cost Sheet

	(₹)
Raw materials consumed	16,80,000
Direct labour	12,20,000
Prime cost	29,00,000
Factory overheads (70% of direct wages)	8,54,000
Factory cost	37,54,000
Add: Opening work-in-process	92,000



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

**RTP NOV 21**

XYZ Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2020-21:

Particulars	(₹ in '000)
Opening balances:	
- Stores ledger control A/c	24,000
- Work-in-process control A/c	6,000
- Finished goods control A/c	1,29,000
- Building construction A/c	3,000
- Cost ledger control A/c	1,62,000
During the year following transactions took place:	
Materials:	
- Purchased	12,000
- Issued to production	15,000
- Issued to general maintenance	1,800
- Issued to building construction	1,200
Wages:	
- Gross wages paid	45,000
- Indirect wages paid	12,000
- For building construction	3,000
Factory overheads:	
- Actual amount incurred (excluding items shown above)	48,000
- Absorbed in building construction	6,000
- Under-absorbed	2,400
Royalty paid	1,500
Selling, distribution and administration overheads	7,500
Sales	1,35,000

At the end of the year, the stock of raw material and work-in-process was ₹ 1,65,00,000 and ₹ 75,00,000 respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales.

Required:

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

**ANSWER :**

Cost Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Costing P&L A/c	1,35,000	By Balance b/d	1,62,000
To Building Construction A/c	13,200	By Stores Ledger control A/c	12,000
To Balance c/d	1,44,900	By Wages Control A/c	45,000
		By Factory overhead control A/c	48,000
		By Royalty A/c	1,500
		By Selling, Distribution and Administration overheads	7,500
		By Costing P&L A/c	17,100
	2,93,100		2,93,100

Stores Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	24,000	By WIP control A/c	15,000
To Cost Ledger control A/c	12,000	By Factory overheads control A/c	1,800
		By Building construction A/c	1,200
		By Factory overhead control A/c (bal. fig.) (loss)	1,500
		By Balance c/d	16,500
	36,000		36,000

Wages Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	45,000	By Factory overhead control A/c	12,000
		By Building Construction A/c	3,000
		By WIP Control A/c (bal. fig.)	30,000
	45,000		45,000

Factory Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Stores Ledger control A/c	1,800	By Building Construction A/c	6,000
To Wages Control A/c	12,000	By WIP Control A/c (bal. fig.)	54,900
To Cost Ledger control A/c	48,000	By Costing P&L A/c (under-absorption)	2,400
To Stores Ledger control A/c (loss)	1,500		
	63,300		63,300

Royalty Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	1,500	By WIP Control A/c	1,500
	1,500		1,500



Work-in-process Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	6,000	By Finished goods control A/c (bal. fig.)	99,900
To Stores Ledger control A/c	15,000		
To Wages Control A/c	30,000		
To Factory overhead control A/c	54,900		
To Royalty A/c	1,500	By Balance c/d	7,500
	1,07,400		1,07,400

Finished Goods Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	1,29,000	By Cost of Goods Sold A/c (Refer working note)	1,08,000
To WIP control A/c	99,900	By Balance c/d	1,20,900
	2,28,900		2,28,900

Cost of Goods Sold Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Finished Goods control A/c	1,08,000	By Cost of sales A/c	1,08,000
	1,08,000		1,08,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	7,500	By Cost of sales A/c	7,500
	7,500		7,500

Cost of Sales Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Goods Sold A/c	1,08,000	By Costing P&L A/c	1,15,500
To Selling, Distribution and Administration A/c	7,500		
	1,15,500		1,15,500

Costing P&L Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Sales A/c	1,15,500	By Cost Ledger control A/c	1,35,000
To Factory overhead control A/c	2,400		
To Cost Ledger control A/c (bal. fig.) (Profit)	17,100		
	1,35,000		1,35,000

Building Construction Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	3,000	By Cost Ledger control A/c	13,200
To Stores Ledger control A/c	1,200		



To Wages Control A/c	3,000		
To Factory overhead control A/c	6,000		
	13,200		13,200

Trial Balance

Particulars	Dr. (₹ in '000)	Cr. (₹ in '000)
Stores Ledger Control A/c	16,500	
WIP Control A/c	7,500	
Finished Goods Control A/c	1,20,900	
Cost Ledger Control A/c		1,44,900
	1,44,900	1,44,900

Workings:

$$\text{Cost of Goods sold} = \frac{\text{₹ } 13,50,00,000 \times 80}{100} = \text{₹ } 10,80,00,000$$



RTP MAY 22

X Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2021 -22:

Particulars	Amount ('000)
Opening balances:	
- Stores ledger control A/c	48,000
- Work-in-process control A/c	12,000
- Finished goods control A/c	2,58,000
- Building construction A/c	6,000
- Cost ledger control A/c	3,24,000
During the year following transactions took place:	
Materials:	
- Purchased	24,000
- Issued to production	30,000
- Issued to general maintenance	3,600
- Issued to building construction	2,400
Wages:	
- Gross wages paid	90,000
- Indirect wages paid	24,000
- For building construction	6,000
Factory overheads:	
- Actual amount incurred (excluding items shown above)	96,000
- Absorbed in building construction	12,000
- Under-absorbed	4,800
Royalty paid	3,000
Selling distribution and administration overheads	15,000
Sales	2,70,000

At the end of the year, the stock of raw material and work-in-process was ₹3,30,00,000 and ₹15,00,000 respectively. The loss arising in the raw material account is treated as factory



overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales.

Required:

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

ANSWER :

Cost Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Costing P&L A/c	2,70,000	By Balance b/d	3,24,000
To Building Construction A/c	26,400	By Stores Ledger Control A/c	24,000
To Balance c/d	2,89,800	By Wages Control A/c	90,000
		By Factory overhead control A/c	96,000
		By Royalty A/c	3,000
		By Selling, Distribution and Administration overheads	15,000
		By Costing P&L A/c	34,200
	5,86,200		5,86,200

Stores Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	48,000	By WIP control A/c	30,000
To Cost Ledger control A/c	24,000	By Factory overheads control A/c	3,600
		By Building construction A/c	2,400
		By Factory overhead control A/c (loss) (Bal. fig)	3,000
		By Balance c/d	33,000
	72,000		72,000

Work-in-process Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	12,000	By Finished goods control A/c	1,99,800
To Stores Ledger control A/c	30,000		
To Wages Control A/c	60,000		
To Factory overhead control A/c	1,09,800		
To Royalty A/c	3,000	By Balance c/d	15,000
	2,14,800		2,14,800

Finished Goods Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	2,58,000	By Cost of Goods Sold A/c (Refer working note)	2,16,000
To WIP control A/c	1,99,800	By Balance c/d	2,41,800
	4,57,800		4,57,800



Cost of Sales Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Goods Sold A/c	2,16,000	By Costing P&L A/c	2,31,000
To Selling, Distribution and Administration A/c	15,000		
	2,31,000		2,31,000

Costing P&L Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Sales A/c	2,31,000	By Cost Ledger control A/c	2,70,000
To Factory overhead control A/c	4,800		
To Cost Ledger control A/c	34,200		
	2,70,000		2,70,000

Building Construction Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	6,000	By Cost Ledger control A/c	26,400
To Stores Ledger control A/c	2,400		
To Wages Control A/c	6,000		
To Factory overhead control A/c	12,000		
	26,400		26,400

Factory Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Stores Ledger control A/c	3,600	By Building Construction A/c	12,000
To Wages Control A/c	24,000	By WIP Control A/c	1,09,800
To Cost Ledger control A/c	96,000	By Costing P&L A/c	4,800
To Stores Ledger control A/c (loss)	3,000		
	1,26,600		1,26,600

Wages Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	90,000	By Factory overhead control A/c	24,000
		By Building Construction A/c	6,000
		By WIP Control A/c	60,000
	90,000		90,000

Royalty Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	3,000	By WIP Control A/c	3,000
	3,000		3,000



Cost of Goods Sold Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Finished Goods control A/c	2,16,000	By Cost of sales A/c	2,16,000
	2,16,000		2,16,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	15,000	By Cost of sales A/c	15,000
	15,000		15,000

Trial Balance

Particulars	Dr. (₹ in '000)	Cr. (₹ in '000)
Stores Ledger Control A/c	33,000	
WIP Control A/c	15,000	
Finished Goods Control A/c	2,41,800	
Cost Ledger Control A/c		2,89,800
	2,89,800	2,89,800

Working Note:

Cost of Goods sold = $2,70,000 \times 80/100 = ₹ 2,16,000$



RTP NOV 22

The financial books of a company reveal the following data for the financial year ending on 31st March, 2022:

	(₹)
Opening Stock:	
Finished goods 875 units	1,48,750
Work-in-process	64,000
01.04.2021 to 31.3.2022	
Raw materials consumed	
15,60,000	
Direct Labour	9,00,000
Factory overheads	6,00,000
Goodwill written off	2,00,000
Administration overheads	5,90,000
Dividend paid	1,70,000
Bad Debts	24,000
Selling and Distribution Overheads	1,22,000
Interest received	90,000
Rent received	36,000
Sales 14,500 units	41,60,000
Closing Stock: Finished goods 375 units	82,500
Work-in-process	77,334

The cost records provide as under:

- Factory overheads are absorbed at 60% of direct wages.
- Administration overheads are recovered at 20% of factory cost.



- Selling and distribution overheads are charged at ₹ 8 per unit sold.
- Opening Stock of finished goods is valued at ₹ 208 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

- PREPARE statements for the year ended 31st March, 2022 showing-
 - the profit as per financial records
 - the profit as per costing records.
- PRESENT a statement reconciling the profit as per costing records with the profit as per Financial Records.

ANSWER :

- Statement of Profit as per financial records (for the year ended March 31, 2022)

	(₹)		(₹)
To Opening stock:		By Sales	41,60,000
Finished Goods	1,48,750	By Closing stock:	
Work-in-process	64,000	Finished Goods	82,500
To Raw materials consumed	15,60,000	Work-in-Process	77,334
To Direct labour	9,00,000	By Rent received	36,000
To Factory overheads	6,00,000	By Interest received	90,000
To Goodwill written off	2,00,000		
To Administration overheads	5,90,000		
To Selling & distribution overheads	1,22,000		
To Dividend paid	1,70,000		
To Bad debts	24,000		
To Profit	67,084		
	44,45,834		44,45,834

Statement of Profit as per costing records (for the year ended March 31, 2022)

	(₹)	(₹)
Sales revenue (14,500 units) (A)		41,60,000
<u>Cost of Sales:</u>		
Opening stock (875 units x ₹ 208)	1,82,000	
Add: Cost of production of 14,000 units (Refer to Working Note 1 & 2)	35,84,000	
Less: Closing stock $\left(\frac{₹ 35,84,000 \times 375 \text{ units}}{14,000 \text{ units}} \right)$	(96,000)	
Production cost of goods sold (14,500 units)	36,70,000	
Selling & distribution overheads (14,500 units x ₹ 8)	1,16,000	
Cost of sales: (B)		37,86,000
Profit: {(A) - (B)}		3,74,000



(ii)

Statement of Reconciliation

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

	(₹)	(₹)
Profit as per Cost Accounts		3,74,000
Add: Admin. overheads over absorbed (₹ 5,97,333 – ₹ 5,90,000)	7,333	
Opening stock overvalued (₹ 1,82,000 – ₹ 1,48,750)	33,250	
Interest received	90,000	
Rent received	36,000	1,66,583
		5,40,583
Less: Factory overheads under recovery (₹ 6,00,000 – ₹ 5,40,000)	60,000	
Selling & distribution overheads under recovery (₹ 1,22,000 – ₹ 1,16,000)	6,000	
Closing stock overvalued (₹ 96,000 – ₹ 82,500)	13,500	
Goodwill written off	2,00,000	
Dividend	1,70,000	
Bad debts	24,000	4,73,500
Profit as per financial accounts		67,083

Working Notes:

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

2. Cost Sheet

	(₹)	(₹)
Raw materials consumed		15,60,000
Direct labour		9,00,000
Prime cost		24,60,000
Factory overheads (60% of direct wages)		5,40,000
Factory cost		30,00,000
Add: Opening work-in-process		64,000
Less: Closing work-in-process		77,334
Factory cost of goods produced		29,86,666
Administration overheads (20% of factory cost)		5,97,333
Cost of production of 14,000 units		35,83,999

Cost of production per unit: = $\frac{\text{Total Cost of Production}}{\text{No. of units produced}}$ = $\frac{₹ 35,83,999}{14,000 \text{ units}}$ = ₹ 256

**RTP MAY 23**

The financial records of Riva Private Limited showed a net profit of ₹1,69,500 for the year ended 31st March, 2022. The cost accounts, however, disclosed a net loss of ₹ 88,500 for the same period. The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:

		(₹)
(i)	Administrative overhead under recovered	63,750.0
(ii)	Factory overhead over recovered	3,37,500.0
(iii)	Depreciation under charged in Cost Accounts	65,000.0
(iv)	Dividend received	50,000.0
(v)	Loss due to obsolescence charged in Financial Accounts	42,000.0
(vi)	Income tax provided	1,09,000.0
(vii)	Bank interest credited in Financial Accounts	34,000.0
(viii)	Value of opening stock:	
	In Cost Accounts	4,12,500.0
	In Financial Accounts	3,62,500.0
(ix)	Value of closing stock:	
	In Cost Accounts	3,13,750.0
	In Financial Accounts	3,30,000.0
(x)	Goodwill written-off in Financial Accounts	62,500.0
(xi)	Notional rent of own premises charged in Cost Accounts	1,50,000.0
(xii)	Provision for doubtful debts in Financial Accounts	37,500.0

Prepare a reconciliation statement by taking costing net loss as base.

ANSWER :

Statement of Reconciliation

Sl. No.	Particulars	(₹)	(₹)
	Net loss as per Cost Accounts		(88,500)
	Additions		
1	Factory O/H over recovered	3,37,500	
2	Dividend Received	50,000	
3	Bank Interest received	34,000	
4	Difference in Value of Opening Stock (4,12,500 – 3,62,500)	50,000	
5	Difference in Value of Closing Stock (3,30,000 – 3,13,750)	16,250	
6	Notional Rent of own Premises	1,50,000	6,37,750
	Deductions		
1	Administration O/H under recovered	63,750	
2	Depreciation under charged	65,000	
3	Loss due to obsolescence	42,000	
4	Income tax Provided	1,09,000	
5	Goodwill written-off	62,500	
6	Provision for doubtful debts	37,500	(3,79,750)
	Net Profit as per Financial A/c.		1,69,500

**RTP NOV 23**

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

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

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹ 6 per unit sold.
- Opening Stock of finished goods is valued at ₹ 240 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

- Prepare statements for the year ended 31st March, 2023 showing:
the profit as per financial records
the profit as per costing records.
- Prepare a statement reconciling the profit as per costing records with the profit as per financial records.

ANSWER :

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

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



To Dividend paid	2,44,000		
To Bad debts	36,000		
To Profit	1,39,450		
	49,01,700		49,01,700

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

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

(ii)

Statement of Reconciliation

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

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



Working notes:

1. Number of units produced

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

2. Cost Sheet

	(₹)
Raw materials consumed	16,80,000
Direct labour	12,20,000
Prime cost	29,00,000
Factory overheads (70% of direct wages)	8,54,000
Factory cost	37,54,000
Add: Opening work-in-process	92,000
Less: Closing work-in-process	(82,400)
Factory cost of goods produced	37,63,600
Administration overheads (15% of factory cost)	5,64,540
Cost of production of 12,405 units (Refer to working note 1)	43,28,140
Cost of production per unit:	
= $\frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹43,28,140}{12,405 \text{ units}} = ₹348.90$	



RTP MAY 24

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

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



Closing Stock: Finished goods 375 units

43,250

Work-in-process

48,200

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

Factory overheads are absorbed at 60% of direct wages.

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

Selling and distribution overheads are charged at ₹ 5 per unit sold. Opening Stock of finished goods is valued at ₹105 per unit.

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

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

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

ANSWER :

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

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

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

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



Workings:

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

Cost Sheet

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

Cost of production per unit:

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

Statement of Reconciliation

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

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



8

UNIT & BATCH
COSTING**QUESTION 1. (ILLUSTRATION 1)**

The following data relate to the manufacture of a standard product during the 4- week ended 28th February:

Raw Materials Consumed	₹ 4,00,000
Direct Wages	₹ 2,40,000
Machine Hours Worked	3,200 hours
Machine Hour Rate	₹ 40
Office Overheads	10% of works cost
Selling Overheads	₹ 20 per unit
Units produced and sold	10,000 at ₹ 120 each

You are required to FIND OUT the cost per unit and profit for the 4-week ended 28th February.

ANSWER :

Statement of Cost per Unit

No. of units produced: 10,000 units

Particulars	Cost per unit (₹)	Amount (₹)
Raw Materials Consumed	40.00	4,00,000
Direct Wages	24.00	2,40,000
Prime cost	64.00	6,40,000
Add: Manufacturing Overheads (3,200 hours × ₹ 40)	12.80	1,28,000
Works cost	76.80	7,68,000
Add: Office Overheads (10% of Works Cost)	7.68	76,800
Cost of goods sold	84.48	8,44,800
Add: Selling Overheads (10,000 units × ₹ 20)	20.00	2,00,000
Cost of sales / Total cost	104.48	10,44,800
Add: Profit (Bal Figure)	15.52	1,55,200
Sales	120.00	12,00,000

**QUESTION 2. (ILLUSTRATION 2)**

Atharva Pharmacare Limited produced a uniform type of product and has a manufacturing capacity of 3,000 units per week of 48 hours. From the records of the company, the following data are available relating to output and cost of 3 consecutive weeks

Week Number	Units Manufactured	Direct Material (₹)	Direct Wages (₹)	Factory Overheads (₹)
1	1,200	9,000	3,600	31,000
2	1,600	12,000	4,800	33,000
3	1,800	13,500	5,400	34,000

Assuming that the company charges a profit of 20% on selling price, FIND OUT the selling price per unit when the weekly output is 2,000 units

**ANSWER :**

Statement of Cost and Selling price for 2,000 units of output

Particulars	Cost per unit (₹)	Total Cost (₹)
Direct Materials	7.50	15,000
Direct Labour	3.00	6,000
Prime cost	10.50	21,000
Add: Factory Overheads (Refer working note-2)	17.50	35,000
Total cost	28.00	56,000
Add: Profit (20% of Sales is equivalent to 25% of Cost)	7.00	14,000
Sales	35.00	70,000

Working Notes:

- (1) Direct Material and Direct Labour cost is varying directly in proportion to units produced and shall remain same per unit of output. Thus, direct material cost is equal to ₹ 9000 ÷ 1200 units = ₹ 7.50 per unit and labour cost is equal to ₹ 3600 ÷ 1200 units = ₹ 3 per unit.
- (2) Calculation of Factory Overheads- An observation of cost related to different output levels for factory overheads shall reveal 2 things
- Total cost increases from ₹31,000 to ₹34,000 along with increase in output from 1,200 units to 1,800 units but cost per unit is not constant. Thus it is not a variable cost. Cost per unit is reducing along with increase in output from ₹ 25.83 (₹ 31,000 ÷ 1,200 units) to ₹ 18.89 (₹34,000 ÷ 1,800 units)
 - Since the cost is varying with the output, it is also not a fixed cost.
- Hence, we can see that the cost is a semi- variable cost and has to be calculated for 2,000 units by analysing its fixed and variable components

Week Number	Units Manufactured	Factory Overheads
1	1,200	31,000
2	1,600	33,000
Difference	400	2,000

Therefore, Variable Cost per unit = Change in Factory Overheads ÷ Change in output
= ₹2,000 ÷ 400 = ₹5

Now total factory overheads for week 2 = ₹33,000

Out of this, Variable Overheads = 1,600 units × ₹5 = ₹ 8,000

Thus, fixed component = ₹ 33,000 – ₹ 8,000 = ₹ 25,000

Therefore, Variable Cost for 2,000 units = 2,000 units × ₹5 = ₹ 10,000

Fixed Cost will not change and hence will be = ₹25,000

Therefore, Total Factory Cost = Variable Overheads + Fixed Overheads

Overheads for 2,000 units = ₹10,000 + ₹25,000 = ₹ 35,000

**QUESTION 3. (ILLUSTRATION 3)**

Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake at most 50 units of any item at a time. A customer has given an order for 600 muffins. To process a batch of 50 muffins, the following cost would be incurred:

Direct materials-	₹ 500
Direct wages-	₹ 50
Oven set- up cost	₹ 150



AC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads. AC requires a profit margin of 25% of sales value. DETERMINE the selling price for 600 muffins.

ANSWER :

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

Particulars	Cost per batch (₹)	Total Cost (₹)
Direct Material Cost	500.00	6,000
Direct Wages	50.00	600
Oven set-up cost	150.00	1,800
Add: Production Overheads (20% of Direct wages)	10.00	120
Total Production cost	710.00	8,520
Add: S&D and Administration overheads (10% of Total production cost)	71.00	852
Total Cost	781.00	9,372
Add: Profit (1/3rd of total cost)	260.33	3,124
Selling price	1,041.33	12,496
Selling Price per unit = $1041.33 \div 50 = ₹ 20.83$		

**QUESTION 4. (ILLUSTRATION 4)**

A jobbing factory has undertaken to supply 200 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate equal to per labour hour. The selling price contracted for is ₹ 8 per piece. From the following data CALCULATE the cost and profit per piece of each batch order and overall position of the order for 1,200 pieces.

Month	Batch Output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	210	650	120	240
February	200	640	140	280
March	220	680	150	280
April	180	630	140	270
May	200	700	150	300
June	220	720	160	320

The other details are:

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

**ANSWER :**

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	210	200	220	180	200	220	1,230
Sale value (₹)	1,680	1,600	1,760	1,440	1,600	1,760	9,840
Material cost (₹)	650	640	680	630	700	720	4,020
Direct wages (₹)	120	140	150	140	150	160	860
Overheads* (₹)	600	672	672	621	780	800	4,145
Total cost (₹)	1,370	1,452	1,502	1,391	1,630	1,680	9,025
Profit per batch (₹)	310	148	258	49	(30)	80	815
Total cost per unit (₹)	6.52	7.26	6.83	7.73	8.15	7.64	7.34
Profit per unit (₹)	1.48	0.74	1.17	0.27	(0.15)	0.36	0.66

Overall position of the order for 1,200 units

Sales value of 1,200 units @ ₹ 8 per unit ₹ 9,600

Total cost of 1,200 units @ ₹ 7.34 per unit ₹ 8,808

Profit ₹ 792

Overheads × Direct labour hours for batch
Direct labour hour for the month

**QUESTION 5. (ILLUSTRATION 5)**

Monthly demand for a product 500 units

Setting-up cost per batch ₹ 60

Cost of manufacturing per unit ₹ 20

Rate of interest 10% p.a.

DETERMINE economic batch quantity.

ANSWER :

$$\sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 500 \times 12 \times 60}{0.1 \times 20}} = 600 \text{ units.}$$

**QUESTION 6. (ILLUSTRATION 6)**

M/s. KBC Bearings Ltd. is committed to supply 48,000 bearings per annum to M/s. KMR Fans on a steady daily basis. It is estimated that it costs ₹ 1 as inventory holding cost per bearing per month and that the set up cost per run of bearing manufacture is ₹ 3,200

(i) DETERMINE the optimum run size of bearing manufacture.

(ii) STATE what would be the interval between two consecutive optimum runs.

(iii) FIND OUT the minimum inventory holding cost.

ANSWER :

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

$$\sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48,000 \times 3,200}{12}} = 5,060 \text{ units.}$$

(ii) Number of Optimum runs = 48,000 ÷ 5,060 = 9.49 or 10 run

Interval between 2 runs (in days) = 365 days ÷ 10 = 36.5 days



(iii) Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum

Average Inventory = 5,060 units ÷ 2 = 2,530 units

Carrying Cost per unit per annum = ₹1 × 12 months = ₹ 12

Minimum Inventory Holding Costs = 2,530 units × ₹ 12 = ₹ 30,360



QUESTION 7. (ILLUSTRATION 7)

A Company has an annual demand from a single customer for 50,000 litres of a paint product. The total demand can be made up of a range of colour to be produced in a continuous production run after which a set-up of the machinery will be required to accommodate the colour change. The total output of each colour will be stored and then delivered to the customer as single load immediately before production of the next colour commences.

The Set up costs are ₹ 100 per set up. The Service is supplied by an outside company as required. The Holding costs are incurred on rented storage space which costs ₹ 50 per sq. meter per annum. Each square meter can hold 250 Litres suitably stacked.

You are required to:

- CALCULATE the total cost per year where batches may range from 4,000 to 10,000 litres in multiples of 1,000 litres and hence choose the production batch size which will minimize the cost.
- Use the economic batch size formula to CALCULATE the batch size which will minimise total cost.

ANSWER :

(i)

Production Batch Size (Lt.)	Set-upcosts per annum (₹)	Holding Costs per annum (₹)	Total Costs per annum (₹)
4,000	1,250	400	1,650
5,000	1,000	500	1,500
6,000	833	600	1,433
7,000	714	700	1,414
8,000	625	800	1,425
9,000	556	900	1,456
10,000	500	1000	1,500

As the total cost is minimum at 7,000 ltr. i.e. ₹ 1,414, thus economic production lot would be 7,000 Litres

(ii) Economic Batch Quantity (EBQ):

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

Where, D = Annual demand for the product = 50,000 Litres

S = Setting up cost per batch = ₹100 per set-up

C = Carrying cost per unit of production

= ₹ 50 / 250 litres = 0.20 per litre per annum

$$= \sqrt{\frac{2 \times 50,000 \times 100}{0.2 \times 1}} = 7,071 \text{ Litres}$$

**Working Note:**

- For Production batch size of 7,000 litres
 Number of set ups per year = $50,000 \div 7,000 = 7.14$ or 8 set-ups
 Hence, annual set up cost per year = $8 \times ₹100 = ₹800$
 Average Quantity = $7,000 \div 2 = 3,500$ litres
 Holding Costs = $3,500 \text{ ltr.} \div 250 \times 50 = ₹700$
- It can be seen that EBQ determined with mathematical formula (7,071 litres) slightly varies from the one determined by trial and error method (7,000 Litres)

**QUESTION 8. (PP1)**

Wonder Ltd. has a capacity of 120,000 units per annum as its optimum capacity. The production costs are as under:

Direct Material – ₹ 90 per unit

Direct Labour- ₹ 60 per unit

Overheads:

Fixed: ₹ 30,00,000 per annum

Variable: ₹ 100 per unit

Semi Variable: ₹ 20,00,000 per annum up to 50% capacity and an extra amount of ₹ 4,00,000 for every 25% increase in capacity or part thereof

The production is made to order and not for stocks.

If the production programme of the factory is as indicated below and the management desires a profit of ₹20,00,000 for the year DETERMINE the average selling price at which each unit should be quoted.

First 3 months: 50% capacity

Remaining 9 months: 80% capacity

Ignore Administration, Selling and Distribution overheads.

ANSWER :**Statement of Cost and Total Sales**

Amount (₹)

Particulars	First 3 months	Next 9 months	Total
Capacity Utilisation (No of units)	$120,000 \times 3/12 \times 50\% = 15,000$	$120,000 \times 9/12 \times 50\% = 72,000$	87,000
Direct Material	13,50,000	64,80,000	78,30,000
Direct Labour	9,00,000	43,20,000	52,20,000
Add:			
Overheads:			
- Fixed (1:3)	7,50,000	22,50,000	30,00,000
- Variable	15,00,000	72,00,000	87,00,000
Semi Variable	5,00,000 (For first 3 months at the rate of ₹ 20,00,000)	21,00,000 (at the rate of ₹ 28,00,000 for 9 months)	26,00,000
Total cost	50,00,000	2,23,50,000	2,73,50,000
Add: Profit			20,00,000
Sales			2,93,50,000

Average Selling Price = $₹2,93,50,000 \div 87,000 \text{ units} = ₹337.356$

**QUESTION 9. (PP2)**

Rio Limited undertakes to supply 1000 units of a component per month for the months of January, February and March. Every month a batch order is opened against which materials and labour cost are booked at actual. Overheads are levied at a rate per labour hour. The selling price is contracted at ₹ 15 per unit.

From the following data, CALCULATE the profit per unit of each batch order and the overall position of the order for the 3,000 units.

Month	Batch Output (Numbers)	Material Cost (₹)	Labour Cost (₹)
January	1,250	6,250	2,500
February	1,500	9,000	3,000
March	1,000	5,000	2,000

Labour is paid at the rate of ₹ 2 per hour. The other details are:

Month	Overheads (₹)	Total Labour Hours
January	12,000	4,000
February	9,000	4,500
March	15,000	5,000

ANSWER :

Statement of Cost and Profit per unit of each batch

	January	February	March	Total
a) Batch Output (Nos.)	1,250	1,500	1,000	3,750
b) Sales Value (@ ₹ 15 per unit)	(₹) 18,750	(₹) 22,500	(₹) 15,000	(₹) 56,250
Cost				
Material	6,250	9,000	5,000	20,250
Wages	2,500	3,000	2,000	7,500
Overheads	3,750	3,000	3,000	9,750
c) Total	12,500	15,000	10,000	37,500
d) Profit per batch (b) – (c)	6,250	7,500	5,000	18,750
e) Cost per unit (c) ÷ (a)	10	10	10	
f) Profit per unit (d) ÷ (a)	5	5	5	

Overall Position of the Order for 3,000 Units

Sales value (3,000 units × ₹ 15)	₹45,000
Less: Total cost (3,000 units × ₹ 10)	30,000
Profit	15,000

Calculation of overhead per hour:

	January	February	March
i. Labour hours:			
= $\frac{\text{Labour cost}}{\text{Labour rates per hour}}$	$\frac{₹2,500}{2} = 1,250$	$\frac{₹3,000}{2} = 1,500$	$\frac{₹2,000}{2} = 1,000$
ii. Overhead per hour:			



=	$\frac{\text{Total Overheads}}{\text{Total labour hour}}$	$\frac{\text{₹12,000}}{4,000} = \text{₹ } 3$	$\frac{\text{₹9,000}}{4,500} = \text{₹ } 2$	$\frac{\text{₹15,000}}{5,000} = \text{₹ } 2$
iii.	Overhead for batch (i) × (ii)	₹ 3,750	₹ 3,000	₹ 3,000

**QUESTION 10. (PP3)**

X Ltd. is committed to supply 24,000 bearings per annum to Y Ltd. on steady basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and that the set-up cost per run of bearing manufacture is ₹ 324.

- COMPUTE what would be the optimum run size for bearing manufacture?
- Assuming that the company has a policy of manufacturing 6,000 bearings per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?
- CALCULATE the holding cost at optimum inventory level?

ANSWER :

(a) Optimum production run size (Q) = $\sqrt{\frac{2DS}{C}}$

where,

D = No. of units to be produced within one year.

S = Set-up cost per production run

C = Carrying cost per unit per annum.

$$= \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 24,000 \times 324}{1.10 \times 12}} = 3,600 \text{ bearings.}$$

- (b) Total Cost (of maintaining the inventories) when production run size (Q) are 3,600 and 6,000 bearings respectively

Total cost = Total set-up cost + Total carrying cost.

	When run size is 3,600 bearings	When run size is 6,000 bearings
Total set up cost	$= \frac{24,000}{3,600} \times \text{₹ } 324 = \text{₹ } 2,160$	$= \frac{24,000}{6,000} \times \text{₹ } 324 = \text{₹ } 1,296$
	Or, No. of setups = 6.67 (7 setups) $= 7 \times 324 = \text{₹ } 2,268$	
Total Carrying cost	$1/2 \times 3,600 \times 0.10P \times 12$ $= \text{₹ } 2,160$	$1/2 \times 6,000 \times 0.10P \times 12$ $= \text{₹ } 3,600$
Total Cost	₹ 4,320 / ₹ 4,428	₹ 4,896

₹ 576 / ₹ 468 is the excess cost borne by the firm due to run size not being economic batch quantity.

- (c) Inventory holding cost at EBQ = $1/2 Q \times C$
(when Q = 3,600 bearings) = $1/2 \times 3,600 \text{ bearings} \times 0.10P \times 12$
= ₹ 2,160

**QUESTION 11. (PP4)**

A customer has been ordering 90,000 special design metal columns at the rate of 18,000 columns per order during the past years. The production cost per unit comprises ₹ 2,120 for material, ₹ 60 for labour and ₹ 20 for fixed overheads. It costs ₹ 1,500 to set up for one run of 18,000 column and inventory carrying cost is 5%.

- FIND the most economic production run.
- CALCULATE the extra cost that company incur due to processing of 18,000 columns in a batch.

ANSWER :

- Total Cost of production = ₹ 2,120 + 60 + 20 = ₹ 2,200

Calculation of Economic Batch Quantity (EBQ):

$$EBQ = \sqrt{\frac{2 \times 90,000 \times ₹ 1,500}{5\% \text{ of } ₹ 2,200}} = \sqrt{\frac{27,00,00,000}{₹ 110}} = 1,567 \text{ columns.}$$

- Calculation of Extra Cost due to processing of 18,000 columns in a batch

	When run size is 1,567 columns	When run size is 18,000 columns
Total set up cost	$\begin{aligned} \text{No. of setups} &= \frac{90,000}{1567} = 57.43 \text{ (58 setups)} \\ &= \frac{90,000}{1,567} \times ₹ 1,500 = ₹ 87,000 \end{aligned}$	$= \frac{90,000}{18,000} \times ₹ 1,500 = ₹ 7,500$
Total Carrying cost	$\frac{1}{2} \times 1,567 \times ₹ 110 = ₹ 86,185$	$\frac{1}{2} \times 18,000 \times ₹ 110 = ₹ 9,90,000$
Total Cost	₹ 1,73,185	₹ 9,97,500

Thus, extra cost = ₹ 9,97,500 – ₹ 1,73,185 = ₹ 8,24,315

**QUESTION 12. (PP5)**

XYZ Ltd. has obtained an order to supply 48000 bearings per year from a concern. On a steady basis, it is estimated that it costs ₹ 0.20 as inventory holding cost per bearing per month and the set-up cost per run of bearing manufacture is ₹ 384.

You are required to:

- compute the optimum run size and number of runs for bearing manufacture.
- compute the interval between two consecutive runs.
- find out the extra costs to be incurred, if company adopts a policy to manufacture 8000 bearings per run as compared to optimum run Size.
- give your opinion regarding run size of bearing manufacture. Assume 365 days in a year.

ANSWER :

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

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48,000 \times 384}{2.4}} = 3919.18 \text{ or } 3,920 \text{ units}$$

Number of Optimum runs = $48,000 \div 3,920 = 12.245$ or 13 run

- Interval between 2 runs (in days) = $365 \text{ days} \div 13 = 28 \text{ days}$

Or $365 \div 12.24 = 29.82 \text{ days}$



(iii) Statement showing Total Cost at Production Run size of 3,600 and 8,000 bearings

A.	Annual requirement	48,000	48,000
B.	Run Size	3,920	8,000
C.	No. of runs (A/B)	12.245	6
D.	Set up cost per run	₹ 384	₹ 384
E.	Total set up cost (CxD)	₹. 4,702	₹ 2,304
F.	Average inventory (B/2)	1,960	4,000
G.	Carrying cost per unit p.a.	2.40	2.40
H.	Total Carrying cost (FxG)	4,704	9,600
I.	Total cost (E+H)	9,406	11,904

Extra cost incurred, if run size is of 8,000 = ₹11,904 - 9,406 = ₹. 2,498

(iv) To save cost the company should run at optimum batch size ie 3,920 Units. It saves ₹ 2,498. Run size should match with the Economic production run of bearing manufacture. When managers of a manufacturing operation make decisions about the number of units to produce for each production run, they must consider the costs related to setting up the production process and the costs of holding inventory



REVISION TEST PAPER



RTP MAY 18

Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake at least 50 units of any item at a time. A customer has given an order for 600 cakes. To process a batch, the following cost would be incurred:

Direct materials - ₹ 5,000

Direct wages - ₹ 500 (irrespective of units) Oven set- up cost - ₹750 (irrespective of units)

AC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads.

AC requires a profit margin of 25% of sales value.

Required:

- DETERMINE the price to be charged for 600 cakes.
- CALCULATE cost and selling price per cake.
- DETERMINE what would be selling price per unit If the order is for 605 cakes.

ANSWER :

Statement of cost per batch and per order

No. of batch = $600 \text{ units} \div 50 \text{ units} = 12 \text{ batches}$

	Particulars	Cost per batch (₹)	Total Cost (₹)
	Direct Material Cost	5,000.00	60,000
	Direct Wages	500.00	6,000
	Oven set-up cost	750.00	9,000
	Add: Production Overheads (20% of Direct wages)	100.00	1,200
	Total Production cost	6,350.00	76,200
	Add: S&D and Administration overheads (10% of Total production cost)	635.00	7,620
	Total Cost	6,985.00	83,820
	Add: Profit (1/3rd of total cost)	2,328.33	27,940
(i)	Sales price	9,313.33	1,11,760
	No. of units in batch	50 units	
(ii)	Cost per unit ($₹6,985 \div 50 \text{ units}$)	139.70	
	Selling price per unit ($9,313.33 \div 50 \text{ units}$)	186.27	

- If the order is for 605 cakes, then selling price per cake would be as below:

Particulars	Total Cost (₹)
Direct Material Cost	60,500
Direct Wages ($₹500 \times 13 \text{ batches}$)	6,500
Oven set-up cost ($₹750 \times 13 \text{ batches}$)	9,750
Add: Production Overheads (20% of Direct wages)	1,300
Total Production cost	78,050



Add: S&D and Administration overheads (10% of Total production cost)	7,805
Total Cost	85,855
Add: Profit (1/3rd of total cost)	28,618
Sales price	1,14,473
No. of units	605 units
Selling price per unit (₹1,14,473 ÷ 605 units)	189.21

**RTP NOV 19**

BTL LLP. manufactures glass bottles for HDL Ltd., a pharmaceutical company, which is in ayurvedic medicines business..

BTL can produce 2,00,000 bottles in a month. Set-up cost of each production run is ₹ 5,200 and the cost of holding one bottle for a year is ₹ 1.50.

As per an estimate HDL Ltd. can order as much as 19,00,000 bottles in a year spreading evenly throughout the year.

At present the BTL manufactures 1,60,000 bottles in a batch.

Required:

- COMPUTE the Economic Batch Quantity for bottle production.
- COMPUTE the annual cost saving to BTL by adopting the EBQ of a production.

ANSWER :

$$\text{Economic Batch Quantity (EBQ)} = \sqrt{\frac{2DS}{C}}$$

Where, D = Annual demand for the product
 S = Setting up cost per batch
 C = Carrying cost per unit of production

- Computation of EBQ :

$$= \sqrt{\frac{219,00,000 \times ₹5,200}{₹1.5}}$$

- Computation of savings in cost by adopting EBQ:

Batch Size	No. of Batch	Set-up cost	Carrying cost	Total Cost
1,60,000 bottles	12	62,400 (₹5,200 × 12)	1,20,000 (₹1.5 × 1/2 × 1,60,000)	1,82,400
1,14,775 bottles	17	88,400 (₹5,200 × 17)	86,081.25 (₹1.5 × 1/2 × 1,14,775)	1,74,481.25
Saving				7,918.75

**RTP NOV 20**

A Ltd. manufactures mother boards used in smart phones. A smart phone requires one mother board. As per the study conducted by the Indian Cellular Association, there will be a demand of 180 million smart phones in the coming year. A Ltd. is expected to have a market share of 5.5% of the total market demand of the mother boards in the coming year. It is estimated that it costs ₹6.25 as inventory holding cost per board per month and that the set-up cost per run of board manufacture is ₹33,500.



- (i) COMPUTE the optimum run size for board manufacturing?
- (ii) Assuming that the company has a policy of manufacturing 80,000 boards per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

ANSWER :

- (i) Computation of optimum run size

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

Where, D = Annual demand i.e. 5.5% of 18,00,00,000 = 99,00,000 units

S = Set-up cost per run = ₹33,500

C = Inventory holding cost per unit per annum

= ₹6.25 × 12 months = ₹75

$$\text{EBQ} = \sqrt{\frac{2 \times 99,00,000 \text{ units} \times ₹33,500}{₹75}} = 94,042.5 \text{ units or } 94,043 \text{ units}$$

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

	Batch size	No. of set- ups	Set-up Cost (₹)	Inventory holding cost (₹)	Total Cost (₹)
A	80,000 units	$\frac{99,00,000}{80,000}$ 124	41,54,000 (124 × ₹33,500)	$\frac{30,00,000}{2}$ (80,000 × ₹75)	71,54,000
B	94,043 units	$\frac{99,00,000}{94,043}$ 106	35,51,000 (106 × ₹33,500)	$\frac{35,26,612.5}{2}$ (94,043 × ₹75)	70,77,612.50
			Extra Cost (A – B)		76,387.50

**RTP NOV 21**

Rollon Ltd. is committed to supply 96,800 bearings per annum to Racing Ltd. on steady basis. It is estimated that it costs 25 paise as inventory carrying cost per bearing per month and the set-up cost per run of bearing manufacture is ₹ 588.

- (a) COMPUTE what would be the optimum run size for bearing manufacture?
- (b) Assuming that the company has a policy of manufacturing 8,800 bearings per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?

ANSWER :

- (a) Optimum production run size (Q)

$$= \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 96,800 \times ₹ 588}{0.25 \times 12}} = 6,160 \text{ bearings.}$$

- (b) Calculation of Extra Cost

Total Cost (of maintaining the inventories) when production run size (Q) are 6,160 and 8,800 bearings respectively.

Total cost = Total set-up cost + Total carrying cost.



Particulars	When run size is 6,160 bearings	When run size is 8,800 bearings
Total set up cost	= $\frac{96,800}{6,160} = ₹ 588 = ₹ 9,240$	= $\frac{96,800}{8,800} = ₹ 588 = ₹ 6,468$
	Or, No. of setups = 15.71 (16 setups) = $16 \times ₹ 588 = ₹ 9,408$	
Total Carrying cost	$\frac{1}{2} \times 6,160 \times 0.25 \times 12$ = ₹ 9,240	$\frac{1}{2} \times 8,800 \times 0.25 \times 12$ = ₹ 13,200
Total Cost	₹ 18,480/ ₹ 18,648	₹ 19,668

₹ 1,188/ ₹ 1,020 is the extra cost incurred by the company due to run size not being optimum run size.

**RTP MAY 22**

Brostom Ltd. manufactures 'Stent' that is used by hospitals in angioplasty, a procedure used to open blocked coronary arteries without open-heart surgery. As per the estimates provided by Pharmaceutical Industry Bureau, there will be a demand of 1 crore 'Stents' in the coming year. Brostom Ltd. is having a market share of 10% of the total market demand of the Stents. It is estimated that it costs ₹ 3.00 as inventory holding cost per stent per month and that the set-up cost per run of stent manufacture is ₹ 450.

Required:

- WHAT would be the optimum run size for Stent manufacture?
- WHAT is the minimum inventory holding cost?

ANSWER :

- Computation of Optimum Run size of 'Stents' or Economic Batch Quantity (EBQ)

$$\text{Economic Batch Quantity (EBQ)} = \sqrt{\frac{2DS}{C}}$$

Where, D = Annual demand for the Stents
= $1,00,00,000 \times 10\% = 10,00,000$ units
S = Set- up cost per run
= ₹ 450
C = Carrying cost per unit per annum
= ₹ 3 × 12 = ₹ 36

$$\begin{aligned} \text{EBQ} &= \sqrt{\frac{2 \times 10,00,000 \times ₹ 450}{₹ 36}} \\ &= 5,000 \text{ units of Stents} \end{aligned}$$

- Minimum inventory holding cost

Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum
= $(5,000 \div 2) \times ₹ 36$
= ₹ 90,000



(iii) Calculation of the extra cost due to manufacturing policy

	When run size is 6,000 units	When run size is 5,000 units i.e. at EBQ
Total set up cost	$= \frac{10,00,000}{6,000} \times ₹ 450$ $= ₹ 75,000$	$= \frac{10,00,000}{5,000} \times ₹ 450$ $= ₹ 90,000$
Total Carrying cost	$\frac{1}{2} \times 6,000 \times ₹ 36$ $= ₹ 1,08,000$	$\frac{1}{2} \times 5,000 \times ₹ 36$ $= ₹ 90,000$
Total Cost	₹ 1,83,000	₹ 1,80,000

Extra cost = ₹ 1,83,000 - ₹ 1,80,000 = ₹ 3,000

**RTP NOV 22**

PS Ltd. manufactures articles in predetermined lots simultaneously. The following costs have been incurred for Batch No. 'PS143' in the month of March, 2022:

Units produced 1,000 units

Direct materials cost ₹ 2,00,000

Direct Labour -

Department A 800 labour hours @ ₹ 100 per hour.

Department B 1,400 labour hours @ ₹ 120 per hour.

Factory overheads are absorbed on labour hour basis and the rates are:

Department A @ ₹ 140 per hour.

Department B @ ₹ 80 per hour.

Administrative overheads are absorbed at 10% of selling price.

The firm expects 25% gross profit (sales value minus factory cost) for determining the selling price.

You are required to CALCULATE the selling price per unit of Batch No. 'PS143'.

ANSWER :

Statement showing selling price per unit of Batch number 'PS143'

Particulars	Amount (₹)	Amount (₹)
Direct Materials		2,00,000
Direct Labour		
Department A 800 labour hours @ ₹100 per hour	80,000	
Department B 1400 labour hours @ ₹120 per hour	1,68,000	2,48,000
Factory overheads		
Department A 800 labour hours @ ₹140 per hour	1,12,000	
Department B 1400 labour hours @ ₹80 per hour	1,12,000	2,24,000
Factory Cost		6,72,000
Add: Administrative overheads (10% of selling price) (6,72,000/75% × 10%)		89,600
Cost of production		7,61,600
Add: Profit (15% of selling price) (6,72,000/75% × 15%)		1,34,400
Selling price of batch no 'PS143'		8,96,000
Selling price per unit (8,96,000 / 1000 units)		896



Alternatively, selling price calculation:- Selling price assume X

$$25\% = (X - \text{factory cost}) / X$$

$$\text{or } 0.25 X = X - 6,72,000$$

$$\text{or } 0.75 X = 6,72,000$$

$$\text{hence } X = ₹ 8,96,000$$

**RTP MAY 24**

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

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

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

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

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

ANSWER :

Workings:

- Maximum number of bottles that can be processed in a batch:

$$= \frac{5,000 \text{ ltrs}}{\text{Bottle volume}}$$

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

*For simplicity of calculation small fractions has been ignored.

- Number of batches to be run:

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

*For simplicity of calculation small fractions has been ignored.



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

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

3. No. of Man-shift required:

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

4. Power consumption in Kwh

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



I	Power consumption per hour [20%×90]	18	18	18	18
J	Power consumption in Kwh [H×I]	810	1,012.5	1,080	2,902.5
K	Per batch consumption (Kwh) [J÷A]	4.5	4.5	4.5	4.5

Calculation of Profit/ loss per batch:

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

Computation of Economic Batch Quantity (EBQ):

$$EBQ = \sqrt{\frac{2 \times D \times S}{C}}$$

D = Annual Demand for the Product = Refer A below

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



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

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

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

CA Rahul Panchal



9

JOB COSTING

**QUESTION 1. (ILLUSTRATION 1)**

The manufacturing cost of a work order is ₹ 1,00,000; 8% of the production against that order spoiled and the rejection is estimated to have a realisable value of ₹ 2,000 only. The normal rate of spoilage is 2%. RECORD this in the costing journal.

ANSWER :

Actual loss due to spoilage = 8% of ₹ 1,00,000 = ₹8,000 and Normal loss = 2% of ₹ 1,00,000 = ₹2,000, therefore abnormal loss = ₹6,000.

The rejection has a realisable value of ₹ 2,000, which is to be apportioned between normal loss and abnormal loss in the ratio of 2 : 6.

The accounting entries necessary for recording the above facts would be:

	(₹)	(₹)
Material Control Account	Dr. 2,000	
Overhead Control Account	Dr. 1,500	
Costing Profit and Loss Control Account	Dr. 4,500	
To Work-in-Progress Control Account		8,000

In the case of defectives being inherent in the manufacturing process, the rectification cost may be charged to the specific jobs in which they have arisen. In case defectives cannot be identified with jobs, the cost of rectification may be treated as factory overheads. Abnormal defectives should be written off to the Costing Profit and Loss Account.

**QUESTION 2. (ILLUSTRATION 2)**

A shop floor supervisor of a small factory presented the following cost for Job No. 303, to determine the selling price.

	Per unit (₹)
Materials	70
Direct wages 18 hours @ ₹ 2.50 (Deptt. X 8 hours; Deptt. Y 6 hours; Deptt. Z 4 hours)	45
Chargeable expenses	5
	120
Add : 33-1/3 % for expenses cost	40
	160

Analysis of the Profit/Loss Account
(for the current financial year)

	(₹)	(₹)
Materials used	1,50,000	Sales less returns 2,50,000
Direct wages:		
Deptt. X	10,000	
Deptt. Y	12,000	
Deptt. Z	8,000	30,000



Special stores items	4,000		
Overheads:			
Deptt. X	5,000		
Deptt. Y	9,000		
Deptt. Z	2,000	16,000	
Works cost	2,00,000		
Gross profit c/d	50,000		
	2,50,000		2,50,000
Selling expenses	20,000	Gross profit b/d	50,000
Net profit	30,000		
	50,000		50,000

It is also noted that average hourly rates for the three Departments X, Y and Z are similar. You are required to:

- PREPARE a job cost sheet.
- CALCULATE the entire revised cost using current financial year actual figures as basis.
- Add 20% to total cost to DETERMINE selling price.

ANSWER :

Job Cost Sheet

Customer Details _____

Job No. _____

Date of commencement _____

Date of completion _____

Particulars	Amount (₹)
Direct materials	70
Direct wages:	
Deptt. X ₹ 2.50 × 8 hrs. = ₹ 20.00	
Deptt. Y ₹ 2.50 × 6 hrs. = ₹ 15.00	
Deptt. Z ₹ 2.50 × 4 hrs. = ₹ 10.00	45
Chargeable expenses	5
Prime cost	120
Overheads:	
Deptt. X = $\frac{₹5,000}{₹10,000} \times 100 = 50\% \text{ of } ₹ 20 = ₹ 10.00$	
Deptt. Y = $\frac{₹9,000}{₹12,000} \times 100 = 75\% \text{ of } ₹ 15 = ₹ 11.25$	
Deptt. Z = $\frac{₹2,000}{₹8,000} \times 100 = 25\% \text{ of } ₹ 10 = ₹ 2.50$	23.75
Works cost	143.75
Selling expenses = $\frac{₹20,000}{₹2,00,000} \times 100 = 10\% \text{ of work cost}$	14.38
Total cost	158.13
Profit (20% of total cost)	31.63
Selling price	189.76

**QUESTION 3. (PP1)**

In a factory following the Job Costing Method, an abstract from the work-in- progress as on 30th September was prepared as under.

Job No.	Materials (₹)	Direct hrs.	Labour (₹)	Factory Overheads applied (₹)
115	1325	400 hrs.	800	640
118	810	250 hrs.	500	400
120	765	300 hrs.	475	380
	2,900		1,775	1,420

Materials used in October were as follows:

Materials Requisition No.	Job No.	Cost (₹)
54	118	300
55	118	425
56	118	515
57	120	665
58	121	910
59	124	720
		3,535

A summary for labour hours deployed during October is as under:

Job No.	Number of Hours	
	Shop A	Shop B
54		
115	25	25
118	90	30
120	75	10
121	65	--
124	25	10
	275	75
Indirect Labour: Waiting of material	20	10
Machine breakdown	10	5
Idle time	5	6
Overtime premium	6	5
	316	101

A shop credit slip was issued in October, that material issued under Requisition No. 54 was returned back to stores as being not suitable. A material transfer note issued in October indicated that material issued under Requisition No. 55 for Job 118 was directed to Job 124.

The hourly rate in shop A per labour hour is ₹ 3 per hour while at shop B, it is ₹ 2 per hour. The factory overhead is applied at the same rate as in September. Job 115, 118 and 120 were completed in October.

You are asked to COMPUTE the factory cost of the completed jobs. It is the practice of the management to put a 10% on the factory cost to cover administration and selling overheads and invoice the job to the customer on a total cost plus 20% basis. DETERMINE the invoice price of these three jobs?

**ANSWER :**

Factory Cost Statement of Completed Job.

Month	Job No.	Materials	Direct labour	Factory overheads (80% of direct labour cost)	Factory cost
	(₹)	(₹)	(₹)	(₹)	(₹)
September	115	1,325	800	640	2765
October	115	--	125	100	225
Total		1,325	925	740	2,990
September	118	810	500	400	1,710
October	118	515	330	264	1,109
Total		1,325	830	664	2,819
September	120	765	475	380	1,620
October	120	665	245	196	1,106
Total		1,430	720	576	2,726

Invoice Price of Complete Job

Job No.	115 (₹)	118 (₹)	120 (₹)
Factory cost	2,990.00	2,819.00	2,726.00
Administration and selling overheads @ 10% of factory cost	299.00	281.90	272.60
Total cost	3,289.00	3,100.90	2,998.60
Profit (20% of total cost)	657.80	620.18	599.72
Invoice Price	3,946.80	3,721.08	3,598.32

Assumption: - Indirect labour costs have been included in the factory overhead which has been recovered as 80% of the labour cost.

**QUESTION 4. (PP2)**

Ares Plumbing and Fitting Ltd. (APFL) deals in plumbing materials and also provides plumbing services to its customers. On 12th August, 2022, APFL received a job order for a students' hostel to supply and fitting of plumbing materials. The work is to be done on the basis of specification provided by the hostel owner. Hostel will be inaugurated on 5th September, 2022 and the work is to be completed by 3rd September, 2022. Following are the details related with the job work:

Direct Materials

APFL uses a weighted average method for the pricing of materials issues.

Opening stock of materials as on 12th August 2022:

- 15mm GI Pipe, 12 units of (15 feet size) @ ₹ 600 each
- 20mm GI Pipe, 10 units of (15 feet size) @ ₹ 660 each
- Other fitting materials, 60 units @ ₹ 26 each
- Stainless Steel Faucet, 6 units @ ₹ 204 each
- Valve, 8 units @ ₹ 404 each

Purchases:

On 16th August 2022:

- 20mm GI Pipe, 30 units of (15 feet size) @ ₹ 610 each
- 10 units of Valve @ ₹ 402 each



On 18th August 2022:

- Other fitting materials, 150 units @ ₹ 28 each
- Stainless Steel Faucet, 15 units @ ₹ 209 each

On 27th August 2022:

- 15mm GI Pipe, 35 units of (15 feet size) @ ₹ 628 each
- 20mm GI Pipe, 20 units of (15 feet size) @ ₹ 660 each
- Valve, 14 units @ ₹ 424 each

Issues for the hostel job:

On 12th August 2022:

- 20mm GI Pipe, 2 units of (15 feet size)
- Other fitting materials, 18 units

On 17th August 2022:

- 15mm GI Pipe, 8 units of (15 feet size)
- Other fitting materials, 30 units

On 28th August 2022:

- 20mm GI Pipe, 2 units of (15 feet size)
- 15mm GI Pipe, 10 units of (15 feet size)
- Other fitting materials, 34 units
- Valve, 6 units

On 30th August 2022:

- Other fitting materials, 60 units
- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ ₹ 50 per hour (includes 12 hours overtime)

Helper: 192 hours @ ₹ 35 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ ₹ 13 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

- Calculate the total cost of the job.
- Calculate the price to be charged from the customer

ANSWER :

(a) Calculation of Total Cost for the Hostel Job:

Particulars	Amount (₹)	Amount (₹)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note-3)	3,866.07	
- Stainless steel faucet	3,113.57	
- 15 units × $\left(\frac{6 \times ₹ 204 + 15 \times ₹ 209}{21 \text{ units}} \right)$		



- Valve 6 units $\times \left(\frac{8 \times ₹ 404 + 10 \times ₹ 402 + 14 \times ₹ 424}{32 \text{ units}} \right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours $\times$ ₹ 50) + (12 hours $\times$ ₹ 25)]	9,300.00	
- Helper [(192 hours $\times$ ₹ 35) + (24 hours $\times$ ₹ 17.5)]	7,140.00	16,440.00
- Overheads [₹ 13 $\times$ (180 + 192) hours]		4,836.00
Total Cost		44,367.95

(b) Price to be charged for the job work:

Particulars	Amount (₹)
Total Cost incurred on the job	44,367.95
Add: 25% Profit on Job Price $\left(\frac{44,367.95}{75\%} \times 25\% \right)$	14,789.32
	59,157.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (₹)
17-08-2022	8 units $\times$ ₹ 600	4,800.00
28-08-2022	10 units $\times \left(\frac{4 \times ₹ 600 + 35 \times ₹ 628}{39 \text{ units}} \right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (₹)
12-08-2022	2 units $\times$ ₹ 660	1,320.00
28-08-2022	2 units $\times \left(\frac{8 \times ₹ 660 + 30 \times ₹ 610 + 20 \times ₹ 660}{58 \text{ units}} \right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (₹)
12-08-2022	18 units $\times$ ₹ 26	468.00
17-08-2022	30 units $\times$ ₹ 26	780.00
28-08-2022	34 units $\times \left(\frac{12 \times ₹ 26 + 150 \times ₹ 28}{162 \text{ units}} \right)$	946.96
30-08-2022	60 units $\times \left(\frac{12 \times ₹ 26 + 150 \times ₹ 28}{162 \text{ units}} \right)$	1,671.11
		3,866.07



REVISION TEST PAPER



RTP MAY 18

A factory uses job costing. The following data are obtained from its books for the year ended 31st March, 2018:

	Amount (₹)
Direct materials	9,00,000
Direct wages	7,50,000
Selling and distribution overheads	5,25,000
Administration overheads	4,20,000
Factory overheads	4,50,000
Profit	6,09,000

Required:

- PREPARE a Job Cost sheet indicating the Prime cost, Cost of Production, Cost of sales and the Sales value.
- In 2018-19, the factory received an order for a job. It is estimated that direct materials required will be ₹ 2,40,000 and direct labour will cost ₹ 1,50,000. DETERMINE what should be the price for the job if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%. The factory overheads is recovered as percentage of wages paid, whereas, other overheads as a percentage of cost of production, based on cost rates prevailing in the previous year.

ANSWER :

- Production Statement
For the year ended 31st March, 2018

	Amount (₹)
Direct materials	9,00,000
Direct wages	7,50,000
Prime Cost	16,50,000
Factory overheads	4,50,000
Cost of Production	21,00,000
Administration overheads	4,20,000
Selling and distribution overheads	5,25,000
Cost of Sales	30,45,000
Profit	6,09,000
Sales value	36,54,000

Calculation of Rates:

- Percentage of factory overheads to direct wages = $\frac{₹4,50,000}{₹7,50,000} \times 100 = 60\%$
- Percentage of administration overheads to Cost of production
= $\frac{₹4,20,000}{₹21,00,000} \times 100 = 20\%$



3. Selling and distribution overheads = ₹ 5,25,000 × 115% = ₹ 6,03,750 Selling and distribution overhead % to Cost of production

$$= \frac{₹6,03,750}{₹21,00,000} \times 100 = 28.75\%$$

4. Percentage of profit to sales = $\frac{₹6,09,000}{₹36,54,000} \times 100 = 16.67\%$

(ii) Calculation of price for the job received in 2018-19

	Amount (₹)
Direct materials	2,40,000
Direct wages	1,50,000
Prime Cost	3,90,000
Factory overheads (60% of ₹1,50,000)	90,000
Cost of Production	4,80,000
Administration overheads (20% of ₹4,80,000)	96,000
Selling and distribution overheads (28.75% of ₹4,80,000)	1,38,000
Cost of Sales	7,14,000
Profit (20% of ₹7,14,000)	1,42,800
Sales value	8,56,800



RTP NOV 18

A company has been asked to quote for a job. The company aims to make a net profit of 30% on sales. The estimated cost for the job is as follows:

Direct materials 10 kg @ ₹10 per kg Direct labour 20 hours @ ₹5 per hour

Variable production overheads are recovered at the rate of ₹ 2 per labour hour.

Fixed production overheads for the company are budgeted to be ₹1,00,000 each year and are recovered on the basis of labour hours.

There are 10,000 budgeted labour hours each year. Other costs in relation to selling, distribution and administration are recovered at the rate of ₹50 per job.

DETERMINE quote for the job by the Company.

ANSWER :

Determination of quotation price for the job

Cost	(₹)
Direct Material (10kg × ₹10)	100
Direct Labour (20hrs × ₹5)	100
Variable production overhead (20hrs × ₹2)	40
Fixed Overhead $\left(\frac{₹1,00,000}{10,000 \text{ budgeted hours}} \times ₹20 \text{ hours} \right)$	200
Other costs	50
Total costs	490

Net profit is 30% of sales, therefore total costs represent 70% (₹ 490 × 100) ÷ 70 = ₹ 700 price to quote for job.

To check answer is correct; profit achieved will be ₹ 210 (₹ 700 - ₹ 490)

= ₹ 210 ÷ ₹ 700 = 30%

**RTP NOV 19**

Ispat Engineers Limited (IEL) undertook a plant manufacturing work for a client. It will charge a profit mark up of 20% on the full cost of the jobs. The following are the information related to the job:

Direct materials utilised – ₹1,87,00,000

Direct labour utilised – 2,400 hours at ₹80 per hour

Budgeted production overheads are Rs. 48,00,000 for the period and are recovered on the basis of 24,000 labour hours.

Budgeted selling and administration overheads are ₹18,00,000 for the period and recovered on the basis of total budgeted total production cost of ₹36,00,00,000.

Required:

CALCULATE the price to be charged for the job.

ANSWER :

Calculation of job price

Particulars	Amount (₹)
Direct materials	1,87,00,000
Direct wages (₹80 × 2,400 hours)	1,92,000
Production overheads $\left(\frac{₹48,00,000}{24,000\text{hrs}} \times 2,400\text{hrs} \right)$	4,80,000
Production cost	1,93,72,000
Selling and administration overheads $\left(\frac{₹18,00,000}{36,00,00,000} \times ₹ 1,93,72,000 \right)$	96,860
Total cost of sales	1,94,68,860
Profit mark-up @ 20%	38,93,772
Price for the job	2,33,62,632

**RTP MAY 20**

A factory uses job costing system. The following data are obtained from its books for the year ended 31st March, 2020:

	Amount (₹)
Direct materials	18,00,000
Direct wages	15,00,000
Selling and distribution overheads	10,50,000
Administration overheads	8,40,000
Factory overheads	9,00,000
Profit	12,18,000

- PREPARE a Job Cost sheet indicating the Prime cost, Cost of Production, Cost of sales and the Sales value.
- In 2019-20, the factory received an order for a job. It is estimated that direct materials required will be ₹4,80,000 and direct labour will cost ₹3,00,000. DETERMINE what should be the price for the job if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%. The factory overheads is recovered as percentage of wages paid, whereas, other overheads as a percentage of cost of production, based on cost rates prevailing in the previous year.

**ANSWER :**

(i)

Production Statement
For the year ended 31st March, 2020

	Amount (₹)
Direct materials	18,00,000
Direct wages	15,00,000
Prime Cost	33,00,000
Factory overheads	9,00,000
Cost of Production	42,00,000
Administration overheads	8,40,000
Selling and distribution overheads	10,50,000
Cost of Sales	60,90,000
Profit	12,18,000
Sales value	73,08,000

Calculation of Rates:

- Percentage of factory overheads to direct wages = $\frac{₹9,00,000}{₹15,00,000} \times 100 = 60\%$
- Percentage of administration overheads to Cost of production
= $\frac{₹8,40,000}{₹42,00,000} \times 100 = 20\%$
- Selling and distribution overheads = $₹10,50,000 \times 115\% = ₹12,07,500$
Selling and distribution overhead % to Cost of production
= $\frac{₹12,07,500}{₹42,00,000} \times 100 = 28.75\%$
- Percentage of profit to sales = $\frac{₹12,18,000}{₹73,08,000} \times 100 = 16.67\% \text{ or, } 1/6$

(ii) Calculation of price for the job received in 2019-20

Direct materials	4,80,000
Direct wages	3,00,000
Prime Cost	7,80,000
Factory overheads (60% of ₹3,00,000)	1,80,000
Cost of Production	9,60,000
Administration overheads (20% of ₹9,60,000)	1,92,000
Selling and distribution overheads (28.75% of ₹9,60,000)	2,76,000
Cost of Sales	14,28,000
Profit (1/5 of ₹14,28,000)	2,85,600
Sales value	17,13,600

**RTP NOV 20**

AP Ltd. received a job order for supply and fitting of plumbing materials. Following are the details related with the job work:

Direct Materials

AP Ltd. uses a weighted average method for the pricing of materials issues. Opening stock of



materials as on 12th August 2020:

- 15mm GI Pipe, 12 units of (15 feet size) @ ₹600 each
- 20mm GI Pipe, 10 units of (15 feet size) @ ₹ 660 each
- Other fitting materials, 60 units @ ₹ 26 each
- Stainless Steel Faucet, 6 units @ ₹ 204 each
- Valve, 8 units @ ₹ 404 each

On 16th August 2020:

- 20mm GI Pipe, 30 units of (15 feet size) @ ₹ 610 each
- 10 units of Valve @ ₹ 402 each

On 18th August 2020:

- Other fitting materials, 150 units @ ₹ 28 each
- Stainless Steel Faucet, 15 units @ ₹ 209 each

On 27th August 2020:

- 15mm GI Pipe, 35 units of (15 feet size) @ ₹ 628 each
- 20mm GI Pipe, 20 units of (15 feet size) @ ₹ 660 each
- Valve, 14 units @ ₹ 424 each

Issues for the hostel job:

On 12th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- Other fitting materials, 18 units

On 17th August 2020:

- 15mm GI Pipe, 8 units of (15 feet size)
- Other fitting materials, 30 units

On 28th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- 15mm GI Pipe, 10 units of (15 feet size)
- Other fitting materials, 34 units

On 30th August 2020:

- Valve, 6 units
- Other fitting materials, 60 units
- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ ₹100 per hour (includes 12 hours overtime) Helper: 192 hours @ ₹70 per hour (includes 24 hours overtime) Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ ₹26 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

- (a) CALCULATE the total cost of the job.
- (b) CALCULATE the price to be charged from the customer.

ANSWER :

(a) Calculation of Total Cost for the Job:

Particulars	Amount (₹)	Amount (₹)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	



- Stainless steel faucet		
15 units × $\left(\frac{6 \times ₹204 + 15 \times ₹ 209}{21\text{units}} \right)$	3,113.57	
- Valve		
6 units × $\left(\frac{8 \times ₹ 404 + 10 \times ₹ 402 + 14 \times ₹ 424}{32\text{units}} \right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours × ₹100) + (12 hours × ₹50)]	18,600.00	
- Helper [(192 hours × ₹70) + (24 hours × ₹35)]	14,280.00	32,880.00
- Overheads[₹26 × (180 + 192) hours]		9,672.00
Total Cost		65,643.95

(b) Price to be charged for the job work:

	Amount (₹)
Total Cost incurred on the job	65,643.95
Add: 25% Profit on Job Price $\left(\frac{65,643.95}{75\%} \times 25\% \right)$	21,881.32
	87,525.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (₹)
17-08-2020	8 units × ₹ 600	4,800.00
28-08-2020	10 units × $\left(\frac{4 \times ₹600 + 35 \times ₹ 628}{39\text{units}} \right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (₹)
12-08-2020	2 units × ₹ 660	1,320.00
28-08-2020	2 units × $\left(\frac{8 \times ₹660 + 30 \times ₹610 + 20 \times ₹660}{58\text{units}} \right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (₹)
12-08-2020	18 units × ₹ 26	468.00
17-08-2020	30 units × ₹ 26	780.00
28-08-2020	34 units × $\left(\frac{12 \times ₹26 + 150 \times ₹ 28}{162\text{units}} \right)$	946.96
30-08-2020	60 units × $\left(\frac{12 \times ₹26 + 150 \times ₹ 28}{162\text{units}} \right)$	1,671.11
		3,866.07

**RTP MAY 21**

SM Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2019-20:

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

During the FY 2020-21, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 40,50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost.

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

- CALCULATE the overhead recovery rates based on actual costs for 2019-20.
- PREPARE a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

ANSWER :

- Calculation of Overhead Recovery Rate:

$$\begin{aligned} \text{Factory Overhead Recovery Rate} &= \frac{\text{Factory Overhead in 2019 - 20}}{\text{Direct Labour Costs in 2019 - 20}} \times 100 \\ &= \frac{\text{₹ } 30,80,000}{\text{₹ } 90,50,000} \times 100 = 34\% \text{ of Direct labour} \end{aligned}$$

Administrative Overhead Recovery Rate

$$\begin{aligned} &= \frac{\text{Administrative Overhead in 2019 - 20}}{\text{Factory Costs in 2019 - 20 (W.N.)}} \times 100 \\ &= \frac{\text{₹ } 20,50,400}{\text{₹ } 2,96,80,000} \times 100 = 6.91\% \text{ of Factory Cost} \end{aligned}$$

Working Note:

Calculation of Factory Cost in 2019-20

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



(ii) Job Cost Sheet for the order received in 2020-21

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

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

**RTP MAY 22**

KJ Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2020-21:

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

During the FY 2021-22, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 40,50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost.

Cost of delivery of the components at customer's premises is estimated at ₹ 9,50,000. You are required to:

- CALCULATE the overhead recovery rates based on actual costs for 2020-21.
- PREPARE a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

ANSWER :

- Calculation of Overhead Recovery Rate:

$$\begin{aligned} \text{Factory Overhead Recovery Rate} &= \frac{\text{Factory Overhead in 2020-21}}{\text{Direct labour cost in 2020-21}} \times 100 \\ &= \frac{30,80,000}{₹90,50,000} \times 100 = 34\% \text{ of Direct Labour} \end{aligned}$$

Administrative Overhead Recovery Rate

$$\begin{aligned} &= \frac{\text{Administrative Overhead in 2020-21}}{\text{Factory cost in 2020-21 (W.N)}} \times 100 \\ &= \frac{₹ 20,50,400}{₹ 2,96,80,000} \times 100 = 6.91\% \text{ of Factory Cost} \end{aligned}$$



Working Note: Calculation of Factory Cost in 2020-21

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

(ii) Job Cost Sheet for the order received in 2021-22

Particulars	Amount (₹)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of ₹ 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of ₹ 1,34,27,000)	9,27,806
Cost of delivery	9,50,000
Total Cost	1,53,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	51,01,602
Sales value (Price to be quoted for the order)	2,04,06,408

Hence the price to be quoted is ₹ 2,04,06,408.



RTP NOV 23

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

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

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

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

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

**ANSWER :**

(i) Calculation of Overhead Recovery Rate:

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

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

Working Note: Calculation of Factory Cost in 2022-23

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

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

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

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



10

PROCESS & OPERATION COSTING

**QUESTION 1. (ILLUSTRATION 1)**

From the following data, PREPARE process accounts indicating the cost of each process and the total cost. The total units that pass through each process were 240 for the period.

	Process I - (₹)	Process - II (₹)	Process - III (₹)
Materials	1,50,000	50,000	20,000
Labour	80,000	2,00,000	60,000
Other expenses	26,000	72,000	25,000

Indirect expenses amounting to ₹ 85,000 may be apportioned on the basis of wages. There was no opening or closing stock.

ANSWER :

Process- I Account					
Dr.			Cr.		
Particulars	Per unit (₹)	Total (₹)	Particulars	Per unit (₹)	Total (₹)
To Material	625	1,50,000	By Process -II A/c	1,150	2,76,000
Labour	334	80,000	(Transfer to Process-II)		
Other expenses	108	26,000			
Indirect expenses*	83	20,000			
	1,150	2,76,000		1,150	2,76,000

Process- II Account					
Dr.			Cr.		
Particulars	Per unit (₹)	Total (₹)	Particulars	Per unit (₹)	Total (₹)
To Process-I A/c	1,150	2,76,000	By Process-III A/c	2,700	6,48,000
Material	208	50,000	(Transfer to Process-III)		
Labour	834	2,00,000			
Other expenses	300	72,000			
Indirect expenses*	208	50,000			
	2,700	6,48,000		2,700	6,48,000

Process- III Account					
Dr.			Cr.		
Particulars	Per unit (₹)	Total (₹)	Particulars	Per unit (₹)	Total (₹)
To Process-II A/c	2,700	6,48,000	By Finished Stock A/c	3,200	7,68,000
Material	83	20,000	(Transferred)		
Labour	250	60,000			
Other expenses	104	25,000			
Indirect expenses*	63	15,000			
	3,200	7,68,000		3,200	7,68,000



* Apportionment of Indirect expenses among Process-I, Process-II and Process-III Total Wages to processes (I + II + III) = ₹ 80,000 + ₹ 2,00,000 + ₹ 60,000 = ₹ 3,40,000

Apportionment to:

$$\text{Process-I} = \frac{\text{₹}85,000}{\text{₹}3,40,000} \times \text{₹}80,000 = \text{₹}20,000$$

$$\text{Process-II} = \frac{\text{₹}85,000}{\text{₹}3,40,000} \times \text{₹}2,00,000 = \text{₹}50,000 \text{ and}$$

$$\text{Process-III} = \frac{\text{₹}85,000}{\text{₹}3,40,000} \times \text{₹}60,000 = \text{₹}15,000$$



QUESTION 2. (ILLUSTRATION 2)

A product passes through three processes. The output of each process is treated as the raw material of the next process to which it is transferred and output of the third process is transferred to finished stock.

	Process I - (₹)	Process - II (₹)	Process - III (₹)
Materials issued	40,000	20,000	10,000
Labour	6,000	4,000	1,000
Manufacturing overhead	10,000	10,000	15,000

10,000 units have been issued to the Process-I and after processing, the output of each process is as under:

Process	Output	Normal Loss
Process-I	9,750 units	2%
Process-II	9,400 units	5%
Process-III	8,000 units	10%

No stock of materials or of work-in-process was left at the end. CALCULATE the cost of the finished articles.

ANSWER :

Dr. Process-I Account			Cr.		
Particulars	Units	Total (₹)	Particulars	Units	Total (₹)
To Material	10,000	40,000	By Normal Loss A/c (2% of 10,000 units)	200	--
Labour	--	6,000	Abnormal Loss A/c (₹ 5.7142 × 50 units)	50	286
Manufacturing OH	--	10,000	Process-II A/c (₹ 5.7142 × 9,750 units)	9,750	55,714
	10,000	56,000		10,000	56,000

Cost per unit of completed units and abnormal loss:

$$\frac{\text{Total Cost}}{\text{Inputs-Normal loss}} = \frac{\text{₹}56,000}{10,000\text{units}-200\text{units}} = \text{₹}5.7142$$



Dr.		Process-II Account				Cr.	
Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
To	Process-I A/c	9,750	55,714	By	Normal Loss A/c (5% of 9,750 units)	488	--
	Material	--	20,000		Process-III A/c (₹ 9.6862 × 9,400 units)	9,400	91,051
	Labour	--	4,000				
	Manufacturing OH	--	10,000				
	Abnormal Gain A/c (₹ 9.6862 × 138 units)	138	1,337				
		9,888	91,051			9,888	91,051

Cost per unit of completed units and abnormal gain:

$$\frac{\text{Total Cost}}{\text{Inputs - Normal loss}} = \frac{₹89,714}{9,750\text{units}-488\text{units}} = ₹ 9.6862$$

Dr.		Process-III Account					Cr.
Particulars		Units	Total (₹)	Particulars		Units	Total (₹)
To	Process-II A/c	9,400	91,051	By	Normal Loss A/c (10% of 9,400 units)	940	--
	Material	--	10,000		Abnormal Loss A/c (₹13.8358 × 460 units)	460	6,364
	Labour	--	1,000		Finished Stock A/c (₹13.8358 × 8,000 units)	8,000	1,10,687
	Manufacturing OH	--	15,000				
		9,400	1,17,051			9,400	1,17,051

Cost per unit of completed units and abnormal loss:

$$\frac{\text{Total Cost}}{\text{Inputs - Normal loss}} = \frac{₹1,17,051}{9,400\text{units}-940\text{units}} = ₹13.8358$$



QUESTION 3. (ILLUSTRATION 3)

RST Limited processes Product Z through two distinct processes – Process- I and Process- II. On completion, it is transferred to finished stock. From the following information for the current year, PREPARE Process- I, Process- II and Finished Stock A/c:

Particulars	Process- I	Process- II
Raw materials used	7,500 units	--
Raw materials cost per unit	₹ 60	--



Transfer to next process/finished stock	7,050 units	6,525 units
Normal loss (on inputs)	5%	10%
Direct wages	₹ 1,35,750	₹ 1,29,250
Direct Expenses	60% of Direct wages	65% of Direct wages
Manufacturing overheads	20% of Direct wages	15% of Direct wages
Realisable value of scrap per unit	₹ 12.50	₹ 37.50

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-process.

ANSWER :

Process- I A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Raw material used (₹60 × 7,500 units)	7,500	4,50,000	By Normal loss (5% of 7,500 units) × ₹12.5	375	4,688
To Direct wages	--	1,35,750	By Process- II A/c	7,050	6,82,403
To Direct expenses	--	81,450	(₹96.7947 × 7,050 units)	75	7,259
To Manufacturing overhead		27,150	By Abnormal loss (₹96.7947 × 75 units)		
	7,500	6,94,350		7,500	6,94,350

Cost per unit of completed units and abnormal loss:

Total Cost - Realisable value from normal loss

Inputs units - Normal loss units

$$= \frac{₹6,94,350 - ₹4,688}{7,500 \text{ units} - 375 \text{ units}} = \frac{₹6,89,662}{7,125 \text{ units}} = ₹96.7947$$

Process- II A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process- I A/c	7,050	6,82,403	By Normal loss (10% of 7,050 units) × ₹37.5	705	26,438
To Direct wages	--	1,29,250	By Finished Stock A/c (₹140.0496 × 6,525 units)	6,525	9,13,824
To Direct expenses	--	84,013			
To Manufacturing overhead	--	19,387			
To Abnormal gain (₹140.0496 × 180 units)	180	25,209			
	7,230	9,40,262		7,230	9,40,262

Cost per unit of completed units and abnormal loss:

Total Cost - Realisable value from normal loss

Inputs units - Normal loss units

$$= \frac{₹9,15,053 - ₹26,438}{7,050 \text{ units} - 705 \text{ units}} = \frac{₹8,88,615}{6,345 \text{ units}} = ₹140.0496$$



Finished Goods Stock A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process II A/c	6,525	9,13,824	By Cost of Sales	6,000	8,40,298
			(₹140.0496 × 6,000 units)		
			By Balance c/d	525	73,526
	6,525	9,13,824		6,525	9,13,824

Income Statement

Particulars	(₹)	Particulars	(₹)
To Cost of sales	8,40,298	By Abnormal gain	18,459
		{180 units × (₹140.0496 – ₹37.50)}	
To Abnormal loss	6,322	By Sales (₹8,40,298 × 115%)	9,66,343
{75 units × (₹96.7947 – ₹12.50)}			
To Net Profit	1,38,182		
	9,84,802		9,84,802

**QUESTION 4. (ILLUSTRATION 4)**

Opening work-in-process 1,000 units (60% complete); Cost ₹ 1,10,000. Units introduced during the period 10,000 units; Cost ₹ 19,30,000. Transferred to next process - 9,000 units.

Closing work-in-process - 800 units (75% complete). Normal loss is estimated at 10% of total input including units in process at the beginning. Scraps realise ₹ 10 per unit. Scraps are 100% complete.

Using FIFO method, COMPUTE equivalent production and cost per equivalent unit. Also evaluate the output.

ANSWER :

Particulars	Input units	Particulars	Output units	Equivalent Production	
				(%)	Equivalent units
Opening W-I-P	1,000	From opening W-I-P	1,000	40	400
Units introduced	10,000	From fresh inputs	8,000	100	8,000
		Units completed (Transferred to next process)	9,000		
		Normal Loss {10% (1,000 + 10,000 units)}	1,100	--	--
		Closing W-I-P	800	75	600
		Abnormal loss (Balancing figure)	100	100	100
	11,000		11,000		9,100



Computation of cost per equivalent production unit:

Cost of the Process (for the period)	₹19,30,000
Less: Scrap value of normal loss (₹ 10 × 1,100 units)	(₹11,000)
Total process cost	₹ 19,19,000
Cost per equivalent unit = $\frac{₹19,19,000}{9,100\text{units}}$	= ₹ 210.88

Statement of Evaluation

Particulars	Equivalent Units (EU)	Cost per EU (₹)	Amount (₹)
(i) Opening W-I-P completed during the period	400	210.88	84,352
Add: Cost of W-I-P at beginning	--	--	1,10,000
Complete cost of 1,000 units of opening W-I-P	1,000	194.35	1,94,352
(ii) Completely processed units	8,000	210.88	16,87,040
(iii) Abnormal Loss	100	210.88	21,088
(iv) Closing W-I-P	600	210.88	1,26,528

(The difference in total amount may arise due to rounding off error)

Process Explained:

- Total Units completed and Transferred is 9,000 units. Out of these 9,000 units, 1,000 units has been taken from opening WIP and the rest is from the fresh units introduced.
- The opening WIP is 60% complete in respect of costs, hence, 40% more work is to be done during the period.
- Total cost for cost elements for the period (current period only) is accumulated.
- The realisable value of scrap (i.e. normal loss) is deducted from the total cost as accumulated above.
- Total cost less realisable value is divided by equivalent units to get cost per equivalent unit.
- The equivalent cost as calculated above is multiplied by the equivalent units of completely processed goods, abnormal loss and closing WIP to get the value.
- Cost of units completed and transferred is calculated separately for Opening WIP and fresh inputs.



QUESTION 5. (ILLUSTRATION 5)

Refer to information provided in Illustration 4 above and solve this by Weighted Average Method:

ANSWER :

Statement of Equivalent Units (Under Weighted Average Method)

Particulars	Input units	Particulars	Output units	Equivalent Production	
				(%)	Equivalent units
Opening W-I-P	1,000	Units completed (Transferred to next process)	9,000	100	9,000



Units introduced	10,000	Normal Loss {10% (1,000 + 10,000 units)}	1,100	--	--
		Closing W-I-P	800	75	600
		Abnormal loss (Balancing figure)	100	100	100
	11,000		11,000		9,700

Computation of cost per equivalent production unit :

Cost of Opening W-I-P	₹ 1,10,000
Cost of the Process (for the period)	₹19,30,000
Less: Scrap value of normal loss (₹ 10 × 1,100 units)	(₹11,000)
Total process cost	<u>₹20,29,000</u>

Cost per equivalent unit = $\frac{₹20,29,000}{9,700\text{units}}$ = ₹ 209.18

Statement of Evaluation

Particulars	Equivalent Units (EU)	Cost per EU (₹)	Amount (₹)
(i) Units Completed and transferred to next process	9,000	209.18	18,82,620
(ii) Abnormal Loss	100	209.18	20,918
(iii) Closing W-I-P	600	209.18	1,25,508

(The difference in total amount may arise due to rounding off error)

Process Explained:

- Total Units completed and Transferred is 9,000 units. All the 9,000 units has been considered as equally complete in respected of cost.
- Total cost for cost elements for the period and opening WIP is accumulated.
- The realisable value of scrap (i.e. normal loss) is deducted from the total cost as accumulated above.
- Total cost less realisable value is divided by equivalent units to get cost per equivalent unit.
- The equivalent cost as calculated above is multiplied by the equivalent units of completely processed goods, abnormal loss and closing WIP to get the value.



QUESTION 6. (ILLUSTRATION 6)

A Ltd. produces product 'AXE' which passes through two processes before it is completed and transferred to finished stock. The following data relate for the month of October:

Particulars	Process- I (₹)	Process- II (₹)	Finished Stock (₹)
Opening stock	7,500	9,000	22,500
Direct materials	15,000	15,750	--
Direct wages	11,200	11,250	--
Factory overheads	10,500	4,500	--
Closing stock	3,700	4,500	11,250
Inter-process profit included in opening stock	--	1,500	8,250



Output of Process- I is transferred to Process- II at 25% profit on the transfer price.

Output of Process- II is transferred to finished stock at 20% profit on the transfer price. Stock in processes is valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales during the period are ₹ 1,40,000.

PREPARE Process cost accounts and finished goods account showing the profit element at each stage.

ANSWER :

Process- I Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	7,500	7,500	--	Process- II A/c*	54,000	40,500	13,500
Direct materials	15,000	15,000	--	Closing Stock	3,700	3,700	--
Direct wages	11,200	11,200	--				
Prime Cost	33,700	33,700					
Overheads	10,500	10,500	--				
Total Cost	44,200	44,200					
Profit**	13,500	--	13,500				
	57,700	44,200	13,500		57,700	44,200	13,500

$$\text{*Transfer price} = \frac{\text{Total cost} - \text{Closing stock}}{75\%} = \frac{44,200 - 3,700}{75\%} = ₹54,000$$

$$\text{**Profit on transfer} = 54,000 \times 25\% = ₹13,500$$

Process- II Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	9,000	7,500	1,500	Finished Stock A/c**	1,12,500	75,750	36,750
Transferred from Process- I	54,000	40,500	13,500	Closing stock*	4,500	3,750	750
Direct materials	15,750	15,750	--				
Direct wages	11,250	11,250	--				
Prime cost	90,000	75,000	15,000				
Overheads	4,500	4,500	--				
Total cost	94,500	79,500	15,000				
Profit***	22,500	--	22,500				
	1,17,000	79,500	37,500		1,17,000	79,500	37,500

$$\text{* Cost of Closing Stock} = \frac{₹75,000}{₹90,000} \times ₹4,500 = ₹3,750$$

$$\text{**Transfer price} = \frac{\text{Total cost} - \text{Closing stock}}{80\%} = \frac{94,500 - 4,500}{80\%} = ₹1,12,500$$

$$\text{***Profit on transfer} = 1,12,500 \times 20\% = ₹22,500$$



Finished Stock Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	22,500	14,250	8,250	Costing P&L A/c	1,40,000	82,425	57,575
Process- II	1,12,500	75,750	36,750	Closing stock*	11,250	7,575	3,675
Profit	16,250	--	16,250				
	1,51,250	90,000	61,250		1,51,250	90,000	61,250

* Cost of Closing Stock = $\frac{\text{Cost of transfer from Process -II}}{\text{Transfer price from Process -II}} \times \text{Value of closing stock}$

(As per instruction given in the question)

$$= \frac{₹ 75,750}{₹ 1,12,500} \times ₹ 11,250 = ₹ 7,575$$

**QUESTION 7. (PP1)**

An English willow company who manufactures cricket bat buys wood as its direct material. The Forming department processes the cricket bats and the cricket bats are then transferred to the Finishing department where stickers are applied. The Forming department began manufacturing 10,000 initial bats during the month of December for the first time and their cost is as follows:

Direct material:	₹ 33,000
Conversion costs:	₹ 17,000
Total	₹ 50,000

A total of 8,000 cricket bats were completed and transferred to the Finishing department, the rest 2,000 were still in the Forming process at the end of the month. All of the forming departments direct material were placed, but, on average, only 25% of the conversion costs was applied to the ending work in progress inventory.

CALCULATE:

- Equivalent units of production for each cost.
- The Conversion cost per Equivalent units.
- Cost of closing work in process (WIP) and finished products.

ANSWER :

- Calculation of equivalent units of production:

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Unit Introduced	10,000	Finished output	8,000	100	8,000	100	8,000
		Closing W-I-P	2,000	100	2,000	25	500
Total	10,000	Total	10,000		10,000		8,500

- Calculation of cost per equivalent unit

	Direct Material	Conversion costs
Total cost (₹)	33,000	17,000
Equivalent units	10,000	8,500
Cost per equivalent unit (₹)	3.30	2.00



(iii) The cost of closing work in process (WIP):

COSTS	EQUIVALENT UNITS	RATE (₹)	TOTAL COST (₹)
Direct Material	2,000	3.30	6,600
Conversion Costs	500	2.00	1,000
Total			7,600

The cost of finished products:

COSTS	EQUIVALENT UNITS	RATE (₹)	TOTAL COST (₹)
Direct Material	8,000	3.30	26,400
Conversion Costs	8,000	2.00	16,000
Total			42,400



QUESTION 8. (PP2)

Hill manufacturing Ltd uses process costing to manufacture Water density sensors for hydro sector. The following information pertains to operations for the month of May.

Particulars	Units
Beginning WIP, May 1	16,000
Started in production during May	1,00,000
Completed production during May	92,000
Ending work in progress, May 31	24,000

The beginning work in progress was 60% complete for materials and 20% complete for conversion costs. The ending inventory was 90% complete for material and 40% complete for conversion costs.

Costs pertaining to the month of May are as follows:

Beginning inventory costs are material ₹27,670, direct labour ₹30,120 and factory overhead ₹12,720.

Cost incurred during May are material used, ₹ 4,79,000, direct labour ₹1,82,880, factory overheads ₹ 3,91,160.

CALCULATE:

- Using the FIFO method, the equivalent units of production for material.
- Cost per equivalent unit for conversion cost.

ANSWER :

(i) Calculation of equivalent units of production:

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Beginning WIP	16,000	Completed Output: From beginning WIP	16,000	40	6,400	80	12,800
Unit Introduced	1,00,000	Completed output: From unit introduced	76,000	100	76,000	100	76,000
		Closing W-I-P	24,000	90	21,600	40	9,600
Total	1,16,000	Total	1,16,000		1,04,000		98,400



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

Particulars	Amount (₹)
Direct Labour	1,82,880
Factory Overheads	3,91,160
	5,74,040
Equivalent Units	98,400
Cost Per Equivalent Unit (₹)	5.83

**QUESTION 9. (PP3)**

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

Presuming that average method of inventory is used, PREPARE:

- Statement of equivalent production.
- Statement showing cost for each element.
- Statement of apportionment of cost.
- Process cost account for Process-I.

ANSWER :

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

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



(ii) Statement showing cost for each element

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

(iii) Statement of apportionment of cost

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

(iv) Process-I Cost Account

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

**QUESTION 10. (PP4)**

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

Production Record:	(₹)
Opening work-in process (2,000 units)	4,000
Materials	80,000
Labour	15,000
Overheads	45,000
Materials introduced in Process-I (38,000 units)	14,80,000
Direct Labour	3,59,000
Overheads	10,77,000

Units scrapped: 3,000 units

Degree of completion:

Materials 100%

Labour and overheads 80%

Closing work-in process: 2,000 units

Degree of completion:

Materials 100%

Labour and overheads 80%



Units finished and transferred to Process-II: 35,000 units

Normal Loss:

5% of total input including opening work-in-process. Scrapped units fetch ₹ 20 per piece.

You are required to PREPARE using average method:

- Statement of equivalent production
- Statement of cost
- Statement of distribution cost, and
- Process-I Account, Normal Loss Account and Abnormal Loss Account.

ANSWER :

- Statement of Equivalent Production

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

- Statement showing cost for each element

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

- Statement of Distribution of cost

	Amount (₹)	Amount (₹)
1. Value of units completed and transferred (35,000 units × ₹ 80)		28,00,000
2. Value of Abnormal Loss:		
- Materials (1,000 units × ₹ 40)	40,000	
- Labour (800 units × ₹ 10)	8,000	
- Overheads (800 units × ₹ 30)	24,000	72,000



3. Value of Closing W-I-P:		
- Materials (2,000 units × ₹ 40)	80,000	
- Labour (1,600 units × ₹ 10)	16,000	
- Overheads (1,600 units × ₹ 30)	48,000	1,44,000

(iv)

Process-I A/c

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

Normal Loss A/c

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

Abnormal Loss A/c

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

**QUESTION 11. (PP5)**

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

Direct material	₹15,000
Direct wages	₹18,000
Factory overheads	₹12,000

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

No further process material costs occur after introduction at the first process until the end of the



second process, when protective packing is applied to the completed components. The process and packing costs incurred at the end of the Process II were:

Packing materials	₹4,000
Direct wages	₹3,500
Factory overheads	₹4,500

Required:

- PREPARE Statement of Equivalent Production, Cost per unit and Process I A/c.
- PREPARE Statement of Equivalent Production, Cost per unit and Process II A/c.

ANSWER :

(i) Process I – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Closing stock of WIP
		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	30,000	10,000	100%	10,000	40,000
Wages	30,000	10,000	50%	5,000	35,000
Overhead	30,000	10,000	50%	5,000	35,000

Process I

Particulars	Process Cost (₹)	Equivalent Production (units)	Process Cost p.u. (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (₹) (4) x (5)	Transfer to Process II (2)–(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	15,000	40,000	0.375	10,000	3,750	11,250
Wages	18,000	35,000	0.514	5,000	2,570	15,430
Overhead	12,000	35,000	0.343	5,000	1,715	10,285
	45,000				8,035	36,965

Process I A/c

	Particulars	Unit	(₹)		Particulars	Units	(₹)
To	Direct material	40,000	15,000	By	Process II A/c	30,000	36,965
To	Direct wages	--	18,000	By	Closing W-I-P	10,000	8,035
To	Factory overhead	--	12,000			--	--
		40,000	45,000			40,000	45,000

(ii) Process II – Statement of Equivalent Production

Particulars	Completed Units	Closing stock of WIP			Equivalent Production units
		Units	% of Completion	Equivalent Units	
	(1)			(2)	(1) + (2)
Material	28,000	1,800	100%	1,800	29,800
Wages	28,000	1,800	25%	450	28,450
Overhead	28,000	1,800	25%	450	28,450



Process II

Particulars	Process Cost (₹)	Equivalent Production (units)	Process Cost p.u. (2)/(3)	WIP stock Equivalent units	Cost of WIP Stock (₹) (4) x (5)	Transfer to Finished Stock (2)-(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Material	36,965	29,800	1.240	1,800	2,232	34,733
Wages	3,500	28,450	0.123	450	55	3,445
Overhead	4,500	28,450	0.158	450	71	4,429
	44,965				2,358	42,607
Add: Packing Material Cost						4,000
Cost of Finished Stock						46,607

Process II A/c

	Particulars	Units	(₹)		Particulars	Units	(₹)
To	Process I	30,000	36,965	By	Finished Stock	28,000	46,607
To	Direct wages	--	3,500	By	Normal loss	200	--
To	Factory overhead	--	4,500	By	WIP stock	1,800	2,358
To	Packing charges	--	4,000				
		30,000	48,965			30,000	48,965



QUESTION 12. (PP6)

'Healthy Sweets' is engaged in the manufacturing of jaggery. Its process involve sugarcane crushing for juice extraction, then filtration and boiling of juice along with some chemicals and then letting it cool to cut solidified jaggery blocks.

The main process of juice extraction (Process – I) is done in conventional crusher, which is then filtered and boiled (Process – II) in iron pots. The solidified jaggery blocks are then cut, packed and dispatched. For manufacturing 10 kg of jaggery, 100 kg of sugarcane is required, which extracts only 45 litre of juice.

Following information regarding Process – I has been obtained from the manufacturing department of Healthy Sweets for the month of January:

	(₹)
Opening work-in process (4,500 litre)	
Sugarcane	50,000
Labour	15,000
Overheads	45,000
Sugarcane introduced for juice extraction (1,00,000 kg)	5,00,000
Direct Labour	2,00,000
Overheads	6,00,000
Abnormal Loss: 1,000 kg	
Degree of completion:	
Sugarcane	100%
Labour and overheads	80%
Closing work-in process: 9,000 litre	
Degree of completion:	
Sugarcane	100%
Labour and overheads	80%



Extracted juice transferred for filtering and boiling: 39,500 litre (Consider mass of 1 litre of juice equivalent to 1 kg)

You are required to PREPARE using average method:

- (i) Statement of equivalent production,
- (ii) Statement of cost,
- (iii) Statement of distribution cost, and
- (iv) Process-I Account.

ANSWER :

- (i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Sugarcane		Labour & O.H.	
				%	Units	%	Units
Opening WIP	4,500	Completed and transferred to Process - II	39,500	100	39,500	100	39,500
Units introduced	1,00,000	Normal Loss (55%* of 1,00,000)	55,000	--	--	--	--
		Abnormal loss	1,000	100	1,000	80	800
		Closing WIP	9,000	100	9,000	80	7,200
	1,04,500		1,04,500		49,500		47,500

* 100 kg of sugarcane extracts only 45 litre of juice. Thus, normal loss = $100 - 45 = 55\%$

- (ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in- process	50,000	15,000	45,000	1,10,000
Cost incurred during the month	5,00,000	2,00,000	6,00,000	13,00,000
Total cost: (A)	5,50,000	2,15,000	6,45,000	14,10,000
Equivalent units: (B)	49,500	47,500	47,500	
Cost per equivalent unit: (C) = (A ÷ B)	11.111	4.526	13.579	29.216

- (iii) Statement of Distribution of cost

		Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (39,500 units × ₹ 29.216)		11,54,032
2.	Value of Abnormal Loss:		
	- Sugarcane (1,000 units × ₹ 11.111)	11,111	
	- Labour (800 units × ₹ 4.526)	3,621	
	- Overheads (800 units × ₹ 13.579)	10,863	25,595
3.	Value of Closing W-I-P:		



-	Sugarcane (9,000 units × ₹ 11.111)	99,999	
-	Labour (7,200 units × ₹ 4.526)	32,587	
-	Overheads (7,200 units × ₹ 13.579)	97,769	2,30,355

(iv)

Process-I A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W.I.P:			By Normal Loss	55,000	--
- Sugarcane	4,500	50,000	By Abnormal loss	1,000	25,613
			[₹ 25,595 + ₹ 18		
			(difference due		
			to approxi-		
			mation)]		
- Labour	--	15,000	By Process-II A/c	39,500	11,54,032
- Overheads	--	45,000	By Closing WIP	9,000	2,30,355
To Sugarcane introduced	100,000	5,00,000			
To Direct Labour		2,00,000			
To Overheads		6,00,000			
	104,500	14,10,000		104,500	14,10,000



REVISION TEST PAPER



RTP MAY 18

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

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

- Opening work-in-process at the beginning of the month was 800 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 26,640.
- Closing work-in-process at the end of the month was 160 litres, 30% complete for labour and 20% complete for overheads.
- Normal loss is 10% of input and total losses during the month were 1,800 litres partly due to the fire damage.
- Output sent to finished goods warehouse was 4,200 litres.
- Losses have a scrap value of ₹15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹39 for the month made up as follows:

	(₹)
Raw Material	23
Labour	7
Overheads	9
	39

Required:

- CALCULATE the quantity (in litres) of raw material inputs during the month.
- CALCULATE the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.
- CALCULATE the values of raw material, labour and overheads added to the process during the month.
- PREPARE the process account for the month.

ANSWER :

- Calculation of Raw Material inputs during the month:

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	800	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,360	Process Losses	1,800
		Closing WIP	160
	6,160		6,160



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

	Litres
Total process losses for month	1,800
Normal Loss (10% input)	536
Abnormal Loss (balancing figure)	1,264

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

	Material	Labour	Overheads
Cost per equivalent unit	₹23.00	₹7.00	₹9.00
Equivalent units (litre) (refer the working note)	4,824	4,952	5,016
Cost of equivalent units	₹1,10,952	₹34,664	₹45,144
Add: Scrap value of normal loss (536 units × ₹ 15)	₹8,040	--	--
Total value added	₹1,18,992	₹34,664	₹45,144

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	800	Units completed:							
Units introduced	5,360	- Opening WIP	800	--	--	240	30	320	40
		- Fresh inputs	3,400	3,400	100	3,400	100	3,400	100
		Normal loss	536	--	--	--	--	--	--
		Abnormal loss	1,264	1,264	100	1,264	100	1,264	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,824		4,952		5,016	

(iv) Process Account for Month

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	800	26,640	By Finished goods	4,200	1,63,800
To Raw Materials	5,360	1,18,992	By Normal loss	536	8,040
To Wages	--	34,664	By Abnormal loss	1,264	49,296
To Overheads	--	45,144	By Closing WIP	160	4,304
	6,160	2,25,440		6,160	2,25,440



RTP NOV 18

From the following information for the month of January, 20X9, PREPARE Process-III cost accounts.

Opening WIP in Process-III	1,600 units at ₹ 24,000
Transfer from Process-II	55,400 units at ₹ 6,23,250
Transferred to warehouse	52,200 units
Closing WIP of Process-III	4,200 units
Units Scrapped	600 units



Direct material added in Process-III	₹ 2,12,400
Direct wages	₹ 96,420
Production overheads	₹ 56,400

Degree of completion:

	Opening Stock	Closing Stock	Scrap
Material	80%	70%	100%
Labour	60%	50%	70%
Overheads	60%	50%	70%

The normal loss in the process was 5% of the production and scrap was sold @ ₹ 5 per unit.

(Students may treat material transferred from Process – II as Material – A and fresh material used in Process – III as Material B)

ANSWER :

Statement of Equivalent Production Process III

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material-A		Material-B		Labour & Overhead	
				%	Units	%	Units	%	Units
Opening WIP	1,600	Work on Op. WIP	1,600	-	-	20	320	40	640
Process-II Transfer	55,400	Introduced & completed during the month	50,600	100	50,600	100	50,600	100	50,600
		Normal loss (5% of 52,800 units)	2,640	-	-	-	-	-	-
		Closing WIP	4,200	100	4,200	70	2,940	50	2,100
		Abnormal Gain	(2,040)	100	(2,040)	100	(2,040)	100	(2,040)
	57,000		57,000		52,760		51,820		51,300

Working note:

$$\begin{aligned}
 \text{Production units} &= \text{Opening units} + \text{Units transferred from Process-II} - \text{Closing Units} \\
 &= 1,600 \text{ units} + 55,400 \text{ units} - 4,200 \text{ units} \\
 &= 52,800 \text{ units}
 \end{aligned}$$

Statement of Cost

	Cost (₹)	Equivalent units	Cost per equivalent units (₹)
Material A (Transferred from previous process)	6,23,250		
Less: Scrap value of normal loss (2,640 units × ₹ 5)	(13,200)		
	6,10,050	52,760	11.5627
Material B	2,12,400	51,820	4.0988
Labour	96,420	51,300	1.8795
Overheads	56,400	51,300	1.0994
	9,75,270		18.6404



Statement of apportionment of Process Cost

		Amount (₹)	Amount (₹)
Opening WIP	Material A		24,000
Completed opening WIP units- 1600	Material B (320 units × ₹ 4.0988)	1311.62	
	Wages (640 units × ₹ 1.8795)	1202.88	
	Overheads (640 units × ₹ 1.0994)	703.62	3,218.12
Introduced & Completed- 50,600 units	50,600 units × ₹ 18.6404		9,43,204.24
Total cost of 52,200 finished goods units			9,70,422.36
Closing WIP units- 4,200	Material A (4,200 units × ₹ 11.5627)		48,563.34
	Material B (2,940 units × ₹ 4.0988)		12,050.47
	Wages (2,100 units × ₹ 1.8795)		3,946.95
	Overheads (2,100 units × ₹ 1.0994)		2,308.74
			66,869.50
Abnormal gain units - 2,040	(2,040 units × ₹ 18.6404)		38,026.42

Process III A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Balance b/d	1,600	24,000	By Normal loss	2,640	13,200
To Process II A/c	55,400	6,23,250	By Finished goods	52,200	9,70,422.36
To Direct material		2,12,400	By Closing WIP	4,200	66,874.06*
To Direct wages		96,420			
To Production overheads		56,400			
To Abnormal gain	2,040	38,026.42			
	59,040	10,50,496.42		59,040	10,50,496.42

* Difference in figure due to rounding off has been adjusted with closing WIP



RTP NOV 19

A product is manufactured in two sequential processes, namely Process-1 and Process-2. The following information relates to Process-1. At the beginning of June 2019, there were 1,000 WIP goods (60% completed in terms of conversion cost) in the inventory, which are valued at ₹2,86,020 (Material cost: ₹2,55,000 and Conversion cost: ₹31,020). Other information relating to Process-1 for the month of June 2019 is as follows;

Cost of materials introduced- 40,000 units (₹)	96,80,000
Conversion cost added (₹)	18,42,000
Transferred to Process-2 (Units)	35,000
Closing WIP (Units) (60% completed in terms of conversion cost)	1,500



100% of materials are introduced to Process-1 at the beginning. Normal loss is estimated at 10% of input materials (excluding opening WIP).

Required:

- (i) PREPARE a statement of equivalent units using the weighted average cost method and thereby calculate the following:
- (ii) CALCULATE the value of output transferred to Process-2 and closing WIP.

ANSWER :

- (i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Conversion cost	
				%	Units	%	Units
Opening WIP	1,000	Completed and transferred to Process-2	35,000	100	35,000	100	35,000
Units introduced	40,000	Normal Loss (10% of 40,000)	4,000	--	--	--	--
		Abnormal loss (Balancing figure)	500	100	500	60	300
		Closing WIP	1,500	100	1,500	60	900
	41,000		41,000		37,000		36,200

- (ii) Calculation of value of output transferred to Process-2 & Closing WIP

	Amount (₹)	Amount (₹)
1. Value of units completed and transferred (35,000 units × ₹ 320.25) (Refer working note)		1,12,08,750
3. Value of Closing W-I-P:		
- Materials (1,500 units × ₹ 268.51)	4,02,765	
- Conversion cost (900 units × ₹ 51.74)	46,566	4,49,331

Workings:

Cost for each element

Particulars	Materials (₹)	Conversion (₹)	Total (₹)
Cost of opening work-in-process	2,55,000	31,020	2,86,020
Cost incurred during the month	96,80,000	18,42,000	1,15,22,000
Total cost: (A)	99,35,000	18,73,020	1,18,08,020
Equivalent units: (B)	37,000	36,200	
Cost per equivalent unit: (C) = (A ÷ B)	268.51	51.74	320.25



RTP MAY 20

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

Star Ltd. needs your help to prepare the process accounts for the month during which the fire occurred. You have been able to gather some information about the month's operating activities



but some of the information could not be retrieved due to the damage. The following information was salvaged:

- Opening work-in-process at the beginning of the month was 1,600 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 1,06,560.
- Closing work-in-process at the end of the month was 320 litres, 30% complete for labour and 20% complete for overheads.
- Normal loss is 10% of input and total losses during the month were 1,200 litres partly due to the fire damage.
- Output sent to finished goods warehouse was 8,400 litres.
- Losses have a scrap value of ₹15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹78 for the month made up as follows:

	(₹)
Raw Material	46
Labour	14
Overheads	18
	78

Required:

- CALCULATE the quantity (in litres) of raw material inputs during the month.
- CALCULATE the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.
- CALCULATE the values of raw material, labour and overheads added to the process during the month.
- PREPARE the process account for the month.

ANSWER :

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

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	1,600	Transfer to Finished Goods	8,400
Raw material input (balancing figure)	8,320	Process Losses	1,200
		Closing WIP	320
	9,920		9,920

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

	Litres
Total process losses for month	1,200
Normal Loss (10% input)	832
Abnormal Loss (balancing figure)	368

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

	Material	Labour	Overheads
Cost per equivalent unit	₹46.00	₹14.00	₹18.00
Equivalent units (litre) (refer the working note)	7,488	7,744	7,872
Cost of equivalent units	₹3,44,448	₹1,08,416	₹1,41,696



Add: Scrap value of normal loss (832 units × ₹15)	₹12,480	--	--
Total value added	₹3,56,928	₹1,08,416	₹1,41,696

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	1,600	Units completed:							
Units introduced	8,320	- Opening WIP	1,600	--	--	480	30	640	40
		- Fresh inputs	6,800	6,800	100	6,800	100	6,800	100
		Normal loss	832	--	--	--	--	--	--
		Abnormal loss	368	368	100	368	100	368	100
		Closing WIP	320	320	100	96	30	64	20
	9,920		9,920	7,488		7,744		7,872	

(iv)

Process Account for the month

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	1,600	1,06,560	By Finished goods	8,400	6,55,200
			[8400 × ₹ 78]		
To Raw Materials	8,320	3,56,928	By Normal loss	832	12,480
			[832 × ₹ 15]		
To Wages	--	1,08,416	By Abnormal loss		
			[368 × ₹ 78]	368	28,704
To Overheads	--	1,41,696	By Closing WIP	320	17,216
			[(320 × ₹ 46) +		
			(320		
			× .30 × ₹ 14) +		
			(320		
			× .20 × ₹ 18)]		
	9,920	7,13,600		9,920	7,13,600



RTP NOV 20

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

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

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



The scrapes are sold at ₹10 per unit

Product-Z can be sold at ₹135 per unit with a selling cost of ₹15 per unit No. of units produced: Process-I- 6,600; Process-II- 5,200, Process-III- 4,800 and Product-Z- 600 There is not stock at the beginning and end of the month.

You are required to PREPARE accounts for:

- (i) Process-I, II and III
- (ii) By-product process.

ANSWER :

(i)

Process-I A/c

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

$$* \frac{₹(3,42,000 - 3,500)}{(7,000 - 350)\text{units}} = ₹50.9022$$

Process-II A/c

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

$$** \frac{₹(6,49,955 - 6,600)}{(6,600 - 660)\text{units}} = ₹50.9022$$

Process-III A/c

Particulars	Units	Amt.(₹)	Particulars	Units	Amt.(₹)
To Process-I A/c	5,200	5,63,206	By Normal loss (5% of 5,200)	260	2,600
To Other materials	-	84,200	By Product-X***	4,800	8,64,670
To Direct wages	-	48,000			
To Direct expenses	-	14,000	By Product-Z# (₹35×600)	600	21,000



To Production OH (200% of ₹48,000)	-	96,000			
To Abnormal gain***	460	82,864			
	5,660	8,88,270		5,660	8,88,270

** $\frac{₹(8,05,406 - 2,600 - 21,000)}{(5,200 - 260 - 600)\text{units}} = ₹180.1396$

Realisable value = ₹135 - (85+15) = ₹35

(ii) By-Product Process A/c

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



RTP MAY 21

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

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

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

Costs incurred in Process-II are as follows:

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

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

Required:

- PREPARE Statement of Equivalent Production, Cost per unit and Process I A/c.
- PREPARE statement of Equivalent Production, Cost per unit and Process II A/c.

ANSWER :

Process I

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
40,000	Completed	30,000	100	30,000	100	30,000	100	30,000



	Closing WIP	10,000	100	10,000	50	5,000	50	5,000
40,000		40,000		40,000		35,000		35,000

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

Process-I Account

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

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

Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--
	Closing WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

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

Process-II Account

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

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

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

**RTP NOV 21**

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

Production Record:

Units in process as on 1st February

(All materials used, 1/4th complete for labour and overhead) 8,000

New units introduced 32,000

Units completed 28,000

Units in process as on 28th February

(All materials used, 1/3rd complete for labour and overhead) 12,000

Cost Records: (₹)

Work-in-process as on 1st February

Materials 1,20,000

Labour 20,000

Overhead 20,000

1,60,000

Cost during the month:

Materials 5,12,000

Labour 3,00,000

Overhead 3,00,000

11,12,000

Presuming that average method of inventory is used, PREPARE the following:

- Statement of equivalent production.
- Statement showing cost for each element.
- Statement of apportionment of cost.
- Process cost account for Process-I.

ANSWER :

- Statement of equivalent production (Average cost method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	8,000	Completed and transferred	28,000	100	28,000	100	28,000
Units introduced	32,000	Closing WIP	12,000	100	12,000	1/3rd	4,000
	40,000		40,000		40,000		32,000

- Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in- process	1,20,000	20,000	20,000	1,60,000
Cost incurred during the month	5,12,000	3,00,000	3,00,000	11,12,000
Total cost: (A)	6,32,000	3,20,000	3,20,000	12,72,000
Equivalent units: (B)	40,000	32,000	32,000	
Cost per equivalent unit: (C) = (A ÷ B)	15.8	10	10	35.8



(iii) Statement of apportionment of cost

Particulars	Amount (₹)	Amount (₹)
1. Value of units completed and transferred (28,000 units × ₹ 35.8)		10,02,400
2. Value of Closing W-I-P:		
- Materials (12,000 units × ₹ 15.8)	1,89,600	
- Labour (4,000 units × ₹ 10)	40,000	
- Overheads (4,000 units × ₹ 10)	40,000	2,69,600

(iv) Process-I Cost Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W-I-P	8,000	1,60,000	By Completed units	28,000	10,02,400
To Materials	32,000	5,12,000	By Closing W-I-P	12,000	2,69,600
To Labour	--	3,00,000			
To Overhead	--	3,00,000			
	40,000	12,72,000		40,000	12,72,000



RTP MAY 22

A company produces a component, which passes through two processes. During the month of December, 2021, materials for 40,000 components were put into Process-I of which 30,000 were completed and transferred to Process-II. Those not transferred to Process-II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process-I costs incurred were as follows:

Direct Materials	₹ 6,00,000
Direct Wages	₹ 7,00,000
Factory Overheads	₹ 4,90,000

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

Costs incurred in Process-II are as follows:

Packing Materials	₹ 1,60,000
Direct Wages	₹ 1,42,250
Factory Overheads	₹ 1,70,700

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

Required:

- PREPARE Statement of Equivalent Production, Cost per unit and Process I A/c.
- PREPARE statement of Equivalent Production, Cost per unit and Process II A/c.

**ANSWER :**

(i)

Process I

Statement of Equivalent Production and Cost

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

Particulars	Materials	Labour	Overhead	Total
Cost incurred (₹)	6,00,000	7,00,000	4,90,000	17,90,000
Equivalent units	40,000	35,000	35,000	
Cost per equivalent unit (₹)	15	20	14	49

Particulars	Units	(₹)	Particulars	Units	(₹)
To Materials	40,000	6,00,000	By Process-II A/c (30,000 units × ₹49)	30,000	14,70,000
To Labour		7,00,000	By Closing WIP*	10,000	3,20,000
To Overhead		4,90,000			
	40,000	17,90,000		40,000	17,90,000

* (Material 10,000 units × ₹ 15) + (Labour 5,000 units × ₹ 20) + (Overheads 5,000 units × ₹ 14)

= ₹ 1,50,000 + ₹ 1,00,000 + ₹ 70,000 = ₹ 3,20,000

(ii)

Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--
	Closing WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

Particulars	Materials	Labour	Overhead	Total
Process-I Cost	14,70,000	--	--	14,70,000
Cost incurred (₹)	--	1,42,250	1,70,700	3,12,950
Equivalent units	29,800	28,450	28,450	--
Cost per equivalent unit (₹)	49.3289	5.00	6.00	60.3289

Process-II Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	30,000	14,70,000	By Normal loss A/c	200	--
To Packing Material	--	1,60,000	By Finished Goods Stock A/c	28,000*	18,49,209



To Direct Wages	--	1,42,250	By Closing WIP	1,800**	93,741
To Factory Overhead	--	1,70,700			
	30,000	19,42,950		30,000	19,42,950

* $28,000 \times ₹ 60.3289 = ₹ 16,89,209 + ₹ 1,60,000$ (Packing Material Cost)
 $= ₹ 18,49,209$

** $1,800 \text{ units} \times ₹ 49.3289 + 450 \text{ units} \times (₹ 5 + ₹ 6) = ₹ 93,741$

**RTP NOV 22**

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

	Process A	Process B	Process C
Transferred to next Process	60%	50%	
Transferred to warehouse for sale	40%	50%	100%

In each process, there is a weight loss of 2% and scrap of 8% of input of each process. The realizable value of scrap of each process is as below:

Process A @ ₹ 2 per ton

Process B @ ₹ 4 per ton

Process C @ ₹ 6 per ton.

The following particulars relate to April, 2022:

	Process A	Process B	Process C
Materials used (in Tons)	1,000	260	140
Rate per ton	₹ 20	₹ 15	₹ 10
Direct Wages	₹ 4,000	₹ 3,000	₹ 2,000
Direct Expenses	₹ 3,160	₹ 2,356	₹ 1,340

PREPARE Process Accounts- A, B and C & calculate cost per ton at each process.

ANSWER :**Process A Account**

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Materials	1,000	20,000	By Weight Loss	20	---
To Wages		4,000	By Scrap	80	160
To Direct Expenses		3,160	By Process B	540	16,200
			By Warehouse	360	10,800
Total	1,000	27,160	Total	1,000	27,160

Cost per Tonne = $\frac{27,160 - 160}{1,000 - 20 - 80}$
 $= \frac{27,000}{900}$
 $= ₹ 30 \text{ per ton}$



Process B Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process A	540	16,200	By Weight Loss	16	---
To Materials	260	3,900	By Scrap	64	256
To Wages		3,000	By Process C	360	12,600
To Direct Expenses		2,356	By Warehouse	360	12,600
Total	800	25,456	Total	800	25,456

$$\begin{aligned}
 \text{Cost per Tonne} &= \frac{25,456 - 256}{800 - 16 - 64} \\
 &= \frac{25,200}{720} \\
 &= ₹35 \text{ per ton}
 \end{aligned}$$

Process C Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process B	360	12,600	By Weight Loss	10	---
To Materials	140	1,400	By Scrap	40	240
To Wages		2,000	By Warehouse	450	17,100
To Direct Expenses		1,340			
Total	500	17,340	Total	500	17,340

$$\begin{aligned}
 \text{Cost per Tonne} &= \frac{17,340 - 240}{500 - 10 - 40} \\
 &= \frac{17,100}{450} \\
 &= ₹ 38 \text{ per ton}
 \end{aligned}$$



RTP MAY 23

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

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

Items	(₹)
Opening work-in process (13,500 litre)	
Milk	1,50,000
Labour	45,000
Overheads	1,35,000
Milk introduced for filtration and boiling (3,00,000 litre)	15,00,000
Direct Labour	6,00,000
Overheads	18,00,000
Abnormal Loss: 3,000 litres	
Degree of completion:	
Milk	100%



Labour and overheads	80%
Closing work-in process: 27,000 litres	
Degree of completion:	
Milk	100%
Labour and overheads	80%
Milk transferred for Packing: 1,18,500 litres	
You are required to PREPARE using average method:	
(i) Statement of equivalent production,	
(ii) Statement of cost,	
(iii) Statement of distribution cost, and	
(iv) Process-I Account.	

ANSWER :

(i) Statement of Equivalent Production

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	13,500	Completed and transferred to Process-II	1,18,500	100	1,18,500	100	1,18,500
Units introduced	3,00,000	Normal Loss (55%* of 3,00,000)	1,65,000	--	--	--	--
		Abnormal loss	3,000	100	3,000	80	2400
		Closing WIP	27,000	100	27,000	80	21,600
	3,13,500		3,13,500		1,48,500		1,42,500

* 100 litre of milk extracts only 45 litre of standardized milk. Thus, normal loss = $100 - 45 = 55\%$

(ii) Statement showing cost for each element

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

(iii) Statement of Distribution of cost

	(₹)	(₹)
1. Value of units completed and transferred (1,18,500 units × ₹ 29.216)		34,62,096
2. Value of Abnormal Loss: -		
Milk (3,000 units × ₹ 11.111)	33,333	
Labour (2400 units × ₹ 4.526)	10,863	



Overheads (2400 units × ₹ 13.579)	32,590	76,786
3. Value of Closing W-I-P:		
Milk (27,000 units × ₹ 11.111)	299,997	
Labour (21,600 units × ₹ 4.526)	97,762	
Overheads (21,600 units × ₹ 13.579)	2,93,306	6,91,065

(iv) Process-I A/c

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



RTP NOV 23

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

- (i) Opening Work-in-Progress - Nil
- (ii) Units transferred from Process I - 55,000 units at ₹ 3,27,800
- (iii) Expenditure debited to Process - II:
 - Consumables ₹ 1,57,200
 - Labour ₹ 1,04,000
 - Overhead ₹ 52,000
- (iv) Units transferred to Process III - 51,000 units
- (v) Closing WIP - 2,000 units (Degree of completion):
 - Consumables 80%
 - Labour 60%
 - Overhead 60%
- (vi) Units scrapped - 2,000 units, scrapped units were sold at ₹ 5 per unit
- (vii) Normal loss - 4% of units introduced

You are required to:

- (i) Prepare a Statement of Equivalent Production.
- (ii) Determine the cost per unit
- (iii) Determine the value of Work-in-Process and units transferred to Process - III

**ANSWER :**

(i) Statement of Equivalent Production

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

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

(ii) Determination of Cost per Unit

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

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

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

**RTP MAY 24**

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

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

Material	100%
Labour	60%
Overheads	60%
- (3) Input of materials at a total cost of ₹ 55,200 for 9,200 units.
- (4) Direct wages incurred ₹ 18,600
- (5) Overheads ₹ 8,630.
- (6) Units scrapped 200 units. The stage of completion of these units was:

Materials	100%
Labour	80%
Overheads	80%
- (7) Closing work in process; 700 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overheads	70%
- (8) 8,900 units were completed and transferred to the next process.
- (9) Normal loss is 4% of the total input (opening stock plus units put in)
- (10) Scrap value is ₹ 6 per unit.

You are required to:

- (i) PREPARE using FIFO method, Statement of equivalent production,
- (ii) PREPARE Statement of cost,
- (iii) CALCULATE cost of closing WIP,
- (iv) CALCULATE the cost of the units to be transferred to the next process.

ANSWER :

- (i) Statement of Equivalent Production (FIFO Method)

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



(ii) Statement of Cost per equivalent units

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

Cost of Abnormal Gain – 192 Units

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

(iii) Cost of closing WIP – 700 Units

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

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

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



11

JOINT PRODUCTS
AND BY PRODUCTS**QUESTION 1. (ILLUSTRATION 1)**

A coke manufacturing company produces the following products by using 5,000 tonnes of coal @ ₹1,100 per tonne into a common process.

Coke 3,500 tonnes

Tar 1,200 tonnes

Sulphate of ammonia 52 tonnes

Benzol 48 tonnes

PREPARE a statement apportioning the joint cost amongst the products on the basis of the physical unit method.

ANSWER :

	Products					
	Coke	Tar	Sulphate of ammonia	Benzole	Wastage	Total
Output (in tonne)	3,500	1,200	52	48	200	5,000
Wastage (in tonne) (Refer Note-1)	146	50	2	2	(200)	
Input (in tonne)	3,646	1,250	54	50	-	5,000
Share of Joint Cost @ ₹1,100 per tonne (in ₹)	40,10,600	13,75,000	59,400	55,000	-	55,00,000

Note-1: Apportionment of wastage of 200 tonnes over the four products on the basis of physical weights (3,500:1,200:52:48) is as follows:

Coke: $\frac{200}{4,800} \times 3,500 \text{ tonnes} = 146 \text{ tonnes}$

Tar : $\frac{200}{4,800} \times 1,200 \text{ tonnes} = 50 \text{ tonnes}$

Sulphate of ammonia: $\frac{200}{4,800} \times 52 \text{ tonnes} = 2 \text{ tonnes}$

Benzole : $\frac{200}{4,800} \times 48 \text{ tonnes} = 2 \text{ tonnes}$

**QUESTION 2. (ILLUSTRATION 2)**

FIND OUT the cost of joint products A, B and C using average unit cost method from the following data:

(a) Pre-separation Joint Cost ₹ 60,000

(b) Production data:

Products	Units produced
A	500
B	200
C	300

**ANSWER :**

$$\text{Average cost per unit} = \frac{\text{Total joint costs}}{\text{Units produced}} = \frac{\text{₹ 60,000}}{1,000 \text{ units}} = \text{₹ 60}$$

The joint costs apportioned @ ₹ 60 are as follows:

Products	Units	Cost per unit (₹)	Value (₹)
A	500	60	30,000
B	200	60	12,000
C	300	60	18,000
			60,000

**QUESTION 3. (ILLUSTRATION 3)**

FIND OUT the cost of joint products A and B using contribution margin method from the following data :

Sales

A : 100 kg @ ₹ 60 per kg.

B : 120 kg @ ₹ 30 per kg.

Joint costs

Marginal cost ₹ 4,400

Fixed cost ₹ 3,900

ANSWER :

The marginal cost (variable cost) of ₹ 4,400 is apportioned over the joint products A and B in the ratio of their physical quantity i.e 100 : 120

$$\text{Marginal cost for Product A : ₹ 4,400} \times \frac{100}{220} = \text{₹ 2,000}$$

$$\text{Marginal cost for Product B : ₹ 4,400} \times \frac{120}{220} = \text{₹ 2,400}$$

The fixed cost of ₹ 3,900 is apportioned over the joint products A and B in the ratio of their contribution margin i.e. 40 : 12

(Refer to working note)

$$\text{Product A : ₹ 3,900} \times \frac{40}{52} = \text{₹ 3,000}$$

$$\text{Product B : ₹ 3,900} \times \frac{12}{52} = \text{₹ 900}$$

Working Note:

Computation of contribution margin ratio

Products	Sales revenue	Marginal cost	Contribution
	(₹)	(₹)	(₹)
A	6,000	2,000	4,000
B	3,600	2,400	1,200
		(Refer to above)	

Contribution ratio is 40 : 12

**QUESTION 4. (ILLUSTRATION 4)**

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC. In the month of July, Inorganic Chemicals purchased Salt for ₹ 40,000. Conversion cost of ₹ 60,000 were incurred upto the split off point, at which time two sealable products were produced. Chlorine can be further processed into PVC.

The July production and sales information is as follows:

	Production (in tonne)	Sales Quantity (in tonne)	Selling price per tonne (₹)
Caustic Soda	1,200	1,200	50
Chlorine	800	—	—
PVC	500	500	200

All 800 tonnes of Chlorine were further processed, at an incremental cost of ₹ 20,000 to yield 500 tonnes of PVC. There was no beginning or ending inventories of Caustic Soda, Chlorine or PVC in July.

There is active market for Chlorine. Inorganic Chemicals could have sold all its July production of Chlorine at ₹ 75 per tonne.

Required :

- SHOW how joint cost of ₹1,00,000 would be apportioned between Caustic Soda and Chlorine under each of following methods:
 - sales value at split- off point ;
 - physical unit method, and
 - estimated net realisable value.
- Lifetime Swimming Pool Products offers to purchase 800 tonnes of Chlorine in August at ₹ 75 per tonne. This sale of Chlorine would mean that no PVC would be produced in August. EXPLAIN how the acceptance of this offer for the month of August would affect operating income?

ANSWER :

- (a) Sales value at split- off point method

Products	Sales (in Tonne)	Selling Price per Tonne (₹)	Sales Revenue (₹)	Joint Cost Apportioned (₹)
Caustic Soda	1,200	50	60,000	50,000
Chlorine	800	75	60,000	50,000
			1,20,000	1,00,000

Apportionment of joint cost

$$= \frac{\text{Total joint costs}}{\text{Units produced}} \times \text{Sale revenue of each product}$$

$$\text{Joint cost apportioned to Caustic Soda} = \frac{\text{₹ 1,00,000}}{\text{₹ 1,20,000}} \times \text{₹ 60,000}$$

$$= \text{₹ 50,000}$$

$$\text{Joint cost apportioned to Chlorine} = \frac{\text{₹ 1,00,000}}{\text{₹ 1,20,000}} \times \text{₹ 60,000}$$

$$= \text{₹ 50,000}$$



(b) Physical measure method

Products	Sales (in Tonne)	Joint Cost Apportioned (₹)
Caustic Soda	1,200	60,000
Chlorine	800	40,000
		1,00,000

Apportioned joint cost

$$= \frac{\text{Total joint cost}}{\text{Total physical value}} \times \text{Physical units of each product}$$

Joint cost apportioned to Caustic Soda

$$= \frac{₹ 1,00,000}{2,000 \text{ tonnes}} \times 1,200 \text{ tonnes}$$

$$= ₹60,000$$

Joint cost apportioned to chlorine

$$= \frac{₹ 1,00,000}{2,000 \text{ tonnes}} \times 800 \text{ tonnes}$$

$$= ₹40,000$$

(c) Estimated net realisable value method:

Products	Caustic Soda Amount (₹)	Chlorine Amount (₹)
Sales Value	60,000 (₹50 × 1,200 tonnes)	1,00,000 (₹200 × 500 tonnes)
Less: Post split-off cost (Further processing cost)	-	(20,000)
Net Realisable Value	60,000	80,000
Apportionment of Joint Cost of 1,00,000 in ratio of 3:4	42,857	57,143

2. Incremental revenue from further processing of Chlorine into PVC

(500 tonnes × ₹200 – 800 tonnes × ₹75)

₹40,000

Less : Incremental cost of further processing

of Chlorine into PVC

₹20,000

Incremental operating income from further processing

₹20,000

The operating income of Inorganic Chemicals will be reduced by ₹20,000 in August if it sells 800 tonnes of Chlorine to Lifetime Swimming Pool Products, instead of further processing of Chlorine into PVC for sale.

**QUESTION 5. (PP1)**

Smile company produces two main products and a by-product out of a joint process. The ratio of output quantities to input quantities of direct material used in the joint process remains consistent on yearly basis. Company has employed the physical volume method to allocate joint production costs to the main products. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main products. Details of company's operation are given in the table below. During the month, company incurred joint production costs of ₹ 10,00,000/- The main products are not marketable at the split off point and thus have to be processed further.



Particulars	Product-A	Product-B	By product
Monthly output in kg.	60,000	1,20,000	50,000
Selling price per kg.	₹ 50	₹ 30	₹ 5
Process costs	₹ 2,00,000	₹ 3,00,000	

FIND OUT the amount of joint product cost that Smile company would allocate to the product-B by using the physical volume method to allocate joint production costs?

ANSWER :

Calculation of Net joint costs to be allocated:

Particulars	Amount (₹)
Joint Costs	10,00,000
Less: Net Realizable value of by-product (50,000×5)	2,50,000
Net joint costs to be allocated	7,50,000

Therefore, amount of joint product cost that Smile company would allocate to the product-B by using the physical volume method to allocate joint production costs:

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

$$= \frac{1,20,000 \text{ units}}{1,80,000 \text{ units}} \times ₹ 7,50,000 = ₹ 5,00,000$$

**QUESTION 6. (PP2)**

Sun-moon Ltd. produces and sells the following products:

Products	Units	Selling price at split-off point (₹)	Selling price after further processing (₹)
A	2,00,000	17	25
B	30,000	13	17
C	25,000	8	12
D	20,000	10	-
E	75,000	14	20

Raw material costs ₹35,90,000 and other manufacturing expenses cost ₹ 5,47,000 in the manufacturing process which are absorbed on the products on the basis of their 'Net realisable value'. The further processing costs of A, B, C and E are ₹ 12,50,000; ₹ 1,50,000; ₹ 50,000 and ₹ 1,50,000 respectively. Fixed costs are ₹ 4,73,000.

You are required to PREPARE the following in respect of the coming year:

- Statement showing income forecast of the company assuming that none of its products are to be further processed.
- Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

Can you suggest any other production plan whereby the company can maximise its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

**ANSWER :**

Working Note:

Apportionment of joint costs on the basis of Net Realisable Value method

Products	Sales Value (₹)	Post separation Cost (₹)	Net Realisable Value (₹)	Apportioned Cost (₹)
A	50,00,000 (2,00,000 units × ₹ 25)	12,50,000	37,50,000	26,25,000
B	5,10,000 (30,000 units × ₹ 17)	1,50,000	3,60,000	2,52,000
C	3,00,000 (25,000 units × ₹ 12)	50,000	2,50,000	1,75,000
D	2,00,000 (20,000 units × ₹ 10)	—	2,00,000	1,40,000
E	15,00,000 (75,000 units × ₹ 20)	1,50,000	13,50,000	9,45,000
			59,10,000	41,37,000

Total joint cost = Raw material costs + Manufacturing expenses
 = ₹ 35,90,000 + ₹ 5,47,000 = ₹ 41,37,000

Apportioned joint cost

= $\frac{\text{Total joint cost}}{\text{Total net realisable value}} \times \text{Net realisable value of each product}$

Apportioned joint cost for Product A

= $\frac{₹ 41,37,000}{₹ 59,10,000} \times ₹ 37,50,000 = ₹ 26,25,000$

Similarly, the apportioned joint cost for products B, C, D and E are
 ₹ 2,52,000, ₹ 1,75,000, ₹ 1,40,000 and ₹ 9,45,000 respectively.

(a) Statement showing income forecast of the company assuming that none of its products are further processed

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
Sales revenue	34,00,000	3,90,000	2,00,000	2,00,000	10,50,000	52,40,000
	(₹17 × 2,00,000)	(₹13 × 30,000)	(₹8 × 25,000)	(₹10 × 20,000)	(₹14 × 75,000)	
Less:						
Apportioned Costs (Refer Working note)	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
	7,75,000	1,38,000	25,000	60,000	1,05,000	11,03,000
Less: Fixed Cost						4,73,000
Profit						6,30,000



- (b) Statement showing income forecast of the company: assuming that products A, B, C and E are further processed (Refer to working note)

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
A. Sales revenue	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000	75,10,000
B. Appor- tioned Costs	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
C. Further processing cost	12,50,000	1,50,000	50,000	-	1,50,000	16,00,000
D. Total processing cost (B+ C)	38,75,000	4,02,000	2,25,000	1,40,000	10,95,000	57,37,000
E. Excess of sales revenue (A-D)	11,25,000	1,08,000	75,000	60,000	4,05,000	17,73,000
F. Fixed Cost						4,73,000
G. Profit (E - F)						13,00,000

Suggested production plan for maximising profits:

On comparing the figures of excess of revenue over cost of manufacturing in the above statements one observes that the concern is earning more after further processing of A, C and E products but is loosing a sum of ₹ 30,000 in the case of product B (if it is processed further). Hence the best production plan will be to sell A, C and E after further processing and B and D at the point of split off. The profit statement based on this suggested production plan is as below :

Profit statement based on suggested production plan

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
A. Sales revenue	50,00,000	3,90,000	3,00,000	2,00,000	15,00,000	73,90,000
B. Apportioned Costs	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
C. Further processing cost	12,50,000	-	50,000	-	1,50,000	14,50,000
D. Total processing cost (B+ C)	38,75,000	2,52,000	2,25,000	1,40,000	10,95,000	55,87,000
E. Excess of sales revenue (A-D)	11,25,000	1,38,000	75,000	60,000	4,05,000	18,03,000
F. Fixed Cost						4,73,000
G. Profit (E - F)						13,30,000

Hence the profit of the company has increased by ₹ 30,000.

**QUESTION 7. (PP3)**

'Buttery Butter' is engaged in the production of Buttermilk, Butter and Ghee. It purchases processed cream and let it through the process of churning until it separates into buttermilk and butter. For the month of January, 'Buttery Butter' purchased 50 Kilolitre processed cream @ ₹ 100 per 1000 ml. Conversion cost of ₹ 1,00,000 were incurred up-to the split off point, where two saleable products were produced i.e. buttermilk and butter. Butter can be further processed into Ghee.

The January production and sales information is as follows:

Products	Production (in Kilolitre/tonne)	Sales Quantity (in Kilolitre/tonne)	Selling price per Litre/Kg (₹)
Buttermilk	28	28	30
Butter	20	—	—
Ghee	16	16	480

All 20 tonne of butter were further processed at an incremental cost of ₹ 1,20,000 to yield 16 Kilolitre of Ghee. There was no opening or closing inventories of buttermilk, butter or ghee in the month of January.

Required:

- SHOW how joint cost would be apportioned between Buttermilk and Butter under Estimated Net Realisable Value method.
- 'Healthy Bones' offers to purchase 20 tonne of butter in February at ₹ 360 per kg. In case 'Buttery Butter' accepts this offer, no Ghee would be produced in February. SUGGEST whether 'Buttery Butter' shall accept the offer affecting its operating income or further process butter to make Ghee itself?

ANSWER :

- Estimated Net Realisable Value Method:

	Buttermilk Amount (₹)	Butter Amount (₹)
Sales Value	8,40,000 (₹ 30 × 28 × 1000)	76,80,000 (₹ 480 × 16 × 1000)
Less: Post split-off cost (Further processing cost)	—	(1,20,000)
Net Realisable Value	8,40,000	75,60,000
Apportionment of Joint Cost of ₹ 51,00,000* in ratio of 1:9	5,10,000	45,90,000

$$* [(\text{₹ } 100 \times 50 \times 1000) + \text{₹ } 1,00,000] = \text{₹ } 51,00,000$$

- Incremental revenue from further processing of Butter into Ghee
(₹ 480 × 16 × 1000 - ₹ 360 × 20 × 1000) ₹ 4,80,000
Less: Incremental cost of further processing of Butter into Ghee ₹ 1,20,000
Incremental operating income from further processing ₹ 3,60,000
The operating income of 'Buttery Butter' will be reduced by ₹ 3,60,000 in February if it sells 20 tonne of Butter to 'Healthy Bones', instead of further processing of Butter into Ghee for sale. Thus, 'Buttery Butter' is advised not to accept the offer and further process butter to make Ghee itself.

**QUESTION 8. (PP4)**

NN Manufacturing company uses joint production process that produces three products at the split off point. Joint productions costs during September were ₹ 8,40,000. Product information for September was as follows:

Particulars	Product A	Product B	Product C
Units produced	1,500	3,000	4,500
Units sold	2,000	6,000	7,500
Sales prices:			
At the split-off	₹ 100		
After further processing	₹ 150	₹ 175	₹ 50
Costs to process after split-off	₹ 1,50,000	₹ 1,50,000	₹ 1,50,000

Assume that product C is treated as a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Assume also that Product B&C must be processed further before they can be sold. FIND OUT the total cost of Product A in September if joint cost allocation is based on net realizable values?

ANSWER :

Product A can be sold at the split-off point, because the question says that "Products B and C must be processed further before they can be sold." Since product A is not included in that, we know that Product A can be sold at the split-off point. Furthermore, the cost to process Product A after the split-off point is ₹ 150,000, whereas the additional revenue to be earned by processing it further is only ₹75,000 (₹50 increase in selling price per unit multiplied by the 1,500 units produced during September). Therefore, Product A will not be processed further, and we use the sales value at split-off for A for allocating the joint costs. The sales value at the split-off for A is ₹ 100 × 1,500 units, or ₹1,50,000.

Since Product B must be processed further, we use its net realizable value for the joint cost allocation. The net realizable value of Product B is ₹3,75,000 [(₹175 selling price after further processing × 3,000 units produced) – ₹1,50,000 in further processing costs].

Product C, the by-product, must also be processed further to be sold. The net realizable value of Product C is ₹ 75,000 [(₹ 50 sales price after further processing × 4,500 units produced) – ₹ 1,50,000 in further processing costs].

Joint production costs total ₹ 8,40,000. Since the by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated are ₹ 7,65,000 (₹ 8,40,000 minus the ₹ 75,000 NRV of Product C), to be allocated between Product A (sales value ₹ 1,50,000) and Product B (net realizable value ₹ 3,75,000). So, the total on which the allocation of the joint costs is based is ₹ 1,50,000 + 3,75,000 = ₹ 5,25,000. Product A represents 28.571% of the total (₹ 1,50,000 ÷ ₹ 5,25,000).

Since Product A has no further processing costs, the total cost of Product A is equal to its allocated joint costs, which are 28.571% of the net joint costs of ₹ 7,65,000, or ₹ 2,18,568.

**QUESTION 9. (PP5)**

RST Limited produces three joint products X, Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for a particular month:

Cost incurred up to separation point: ₹ 10,000



Output (in Litre)	Product X 100 ₹	Product Y 70 ₹	Product Z 80 ₹
Cost incurred after separation point	2,000	1,200	800
Selling Price per Litre:			
After further processing	50	80	60
At pre-separation point (estimated)	25	70	45

You are required to:

- Prepare a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.
- Advise the management whether, on purely financial consideration, the three products are to be processed further or not.

ANSWER :

- Statement showing profit/loss by each product after further processing products

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)
Sales value after further processing	5,000	5,600	4,800
Less: Further processing cost	2,000	1,200	800
Less: Joint Cost* (as apportioned)	4,000	2,800	3,200
Profit/(loss)	(1,000)	1,600	800

* Statement showing apportionment of joint cost on the basis of physical units

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)	Total (₹)
Output (in litre)	100	70	80	250
Weight	0.4	0.28	0.32	
	(100/250)	(70/250)	(80/250)	
Joint cost apportioned	4,000	2,800	3,200	

- Decision whether to process further or not

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)
Incremental Revenue	2,500	700	1,200
	[(50-25) × 100]	[(80-70) × 70]	[(60-45) × 80]
Less: Further processing cost	2,000	1,200	800
Incremental profit/(loss)	500	(500)	400

	Product X (in ₹)	Product Y (in ₹)	Product Z (in ₹)	Total
Sales	2500	4900	3600	11000
Pre separation costs	4000	2800	3200	10000
Profit/(Loss)	(1500)	2100	400	1000

It is advisable to further process only product X and Z and to sale product Y at the point of separation.

**QUESTION 10. (PP6)**

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

Product	Further processing costs (₹)	Sales at split-off point (₹)	Sales after further processing (₹)
S	80,000	20,000	1,20,000
P	32,000	12,000	40,000
N	36,000	28,000	48,000
A	-	20,000	-

You are required to identify the products which can be further processed for maximizing profits and make suitable suggestions.

ANSWER :

Statement of Comparison of Profits before and after further processing

	S (₹)	P (₹)	N (₹)	A (₹)	Total (₹)
A. Sales at split off point	20,000	12,000	28,000	20,000	80,000
B. Apportioned Joint Costs (Refer Working Note)	10,000	6,000	14,000	10,000	40,000
C. Profit at split-off point	10,000	6,000	14,000	10,000	40,000
D. Sales after further processing	1,20,000	40,000	48,000	-	2,08,000
E. Further processing cost	80,000	32,000	36,000	-	1,48,000
F. Apportioned Joint Costs (Refer Working Note)	10,000	6,000	14,000	-	-
G. Profit if further processing (D - E + F)	30,000	2,000	(-) 2,000	-	-
H. Increase/ decrease in profit after further processing (G-C)	20,000	- 4,000	-16,000	-	-

Suggested Product to be further processed for maximising profits:

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



Working Note:

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

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

Where,

Total Joint cost = ₹ 40,000

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

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

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

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

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



REVISION TEST PAPER



RTP MAY 18

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

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

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

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

Required:

- PREPARE a statement showing the apportionment of joint costs to A, B and X.
- PREPARE a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.
- PREPARE a statement showing the product wise and total profit for the period.
- DECIDE with supporting calculations as to whether any or all the products should be further processed or not

ANSWER :

- Statement showing the apportionment of joint costs to A, B and X

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

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

Products	A	B	X
Joint costs apportioned (₹) : (I)	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000



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

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

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

Working Notes

1.

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

2. Valuation of closing stock:

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

Products	A	B	X	Total
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (₹)	45	43	9	
Closing stock value (₹)	45,000	2,15,000	90,000	3,50,00
	(₹ 45 x 1,000 kg)	(₹ 43 x 5,000 kg)	(₹9x10,000 kg)	

(iv) Calculations for processing decision

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

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

**RTP NOV 18**

In an Oil Mill four products emerge from a refining process. The total cost of input during the quarter ending March 20X8 is ₹1,48,000. The output, sales and additional processing costs are as under:

Products	Output in Litres	Additional processing cost after split off (₹)	Sales value (₹)
ACH	8,000	43,000	1,72,500
BCH	4,000	9,000	15,000
CSH	2,000	-	6,000
DSH	4,000	1,500	45,000

PRODUCE a statement of profitability based on:

- If the products are sold after further processing is carried out in the mill.
- If they are sold at the split off point.

ANSWER :

- Statement of profitability of the Oil Mill (after carrying out further processing) for the quarter ending 31st March 20X8.

Products	Sales Value after further processing	Share of Joint cost	Additional processing cost	Total cost after processing	Profit (loss)
ACH	1,72,500	98,667	43,000	1,41,667	30,833
BCH	15,000	19,733	9,000	28,733	(13,733)
CSH	6,000	4,933	--	4,933	1,067
DSH	45,000	24,667	1,500	26,167	18,833
	2,38,500	1,48,000	53,500	2,01,500	37,000

- Statement of profitability at the split off point

Products	Selling price of split off	Output in units	Sales value at split off point	share of joint cost	profit at split off point
ACH	15.00	8,000	1,20,000	98,667	21,333
BCH	6.00	4,000	24,000	19,733	4,267
CSH	3.00	2,000	6,000	4,933	1,067
DSH	7.50	4,000	30,000	24,667	5,333
			1,80,000	1,48,000	32,000

Note: Share of Joint Cost has been arrived at by considering the sales value at split off point.

**RTP MAY 19**

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

X was further processed in Department 3 at a cost of ₹1,08,000. There is no waste in further



processing. The details of sales affected during the period were as under:

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

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

Required:

- PREPARE a statement showing the apportionment of joint costs to A, B and X.
- PRESENT a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.
- PREPARE a statement showing the product wise and total profit for the period.
- STATE with supporting calculations as to whether any or all the products should be further processed or not

ANSWER :

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

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

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

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



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

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

Working Notes

1.

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

2. Valuation of closing stock:

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

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

(iv) Calculations for processing decision

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

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

**RTP NOV 20**

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

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

The selling prices quoted here are expected to remain the same in the coming year. During 2019-20, the selling prices of the items and the total amounts sold were:

X – 186 tons sold for ₹3,000 per ton

Y – 527 tons sold for ₹2,250 per ton

Z – 736 tons sold for ₹1,500 per ton

The total joint manufacturing costs for the year were ₹12,50,000. An additional ₹ 6,20,000 was spent to finish product Z.

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

X 180 tons

Y 60 Tons

Z 25 tons

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

Required:

COMPUTE the cost of inventories of X, Y and Z and cost of goods sold for year ended March 31, 2020, using Net realizable value (NRV) method of joint cost allocation.

ANSWER :

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

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



Cost of goods sold as on March 31, 2020
(By using Net Realisable Value Method)

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

Working Notes

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

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

2. Joint cost apportioned to each product:

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

$$\text{Total cost of Product X} = \frac{₹12,50,000}{₹29,40,250} \times ₹10,98,000 = ₹4,66,797$$

$$\text{Total cost of Product Y} = \frac{₹12,50,000}{₹29,40,250} \times ₹13,20,750 = ₹5,61,496$$

$$\text{Total cost of Product Z} = \frac{₹12,50,000}{₹29,40,250} \times ₹13,20,750 = ₹5,61,496$$



RTP NOV 21

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

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



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

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

The details of sales during the said period are:

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

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

Required:

- PREPARE a statement showing the apportionment of joint cost to A and B in proportion of sales value at split off point.
- PREPARE a statement showing the cost per kg of each product indicating joint cost, processing cost and total cost separately.
- PREPARE a statement showing the product wise profit for the year.
- On the basis of profits before and after further processing of product A and B, give your COMMENT that products should be further processed or not.

ANSWER :

Calculation of quantity produced

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

- Statement of apportionment of joint cost of dept I

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

- Statement of cost per kg

Further processing cost (₹)	2,60,000	3,00,000
Output (kg)	1,60,000	3,20,000
Share in joint cost (₹)	12,50,000	5,00,000
Joint Cost per kg (₹) (A)	7.8125	1.5625



Further processing cost (₹)	2,60,000	3,00,000
Further processing cost per kg (₹) (B)	1.625	0.9375
Total cost per kg (₹) {(A)+(B)}	9.4375	2.5000

(iii) Statement of profit

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

(iv) Profitability statement before and after processing

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

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

**RTP NOV 22**

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

Product information for the month of July is as follows:

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

Other information is as follows:

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

**ANSWER :****Product A**

As the question says that "Products B and C must be processed further before they can be sold", it means Product A can be sold at the split-off point.

Cost to process Product A after the split-off point = ₹ 6,00,000

Additional revenue to be earned by processing further = ₹ 3,00,000

(₹ 100 increase in selling price
per unit × 3,000 units)

Therefore, Product A will not be processed further, and the sales value at split-off for A will be used for allocating the joint costs.

Sales value at the split-off for A = ₹ 6,00,000

(₹ 200 × 3,000 units)

Product B

Since Product B must be processed further, we use its net realizable value for the joint cost allocation.

Net realizable value of Product B = ₹ 15,00,000

[(₹ 350 × 6,000 units) – ₹ 6,00,000
further processing costs]

Product C

Product C, the by-product, must also be processed further to be sold.

Net realizable value of Product C = ₹ 3,00,000

[(₹ 100 × 9,000 units) – ₹ 6,00,000
in further processing costs]

Joint Cost Allocation

Joint production cost = ₹ 33,60,000

Since, by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated

= ₹ 30,60,000

(₹ 33,60,000 – ₹ 3,00,000 NRV of Product C)

Allocation of joint costs between Product A and B will be on the basis of ₹ 6,00,000: ₹ 15,00,000

Joint Cost allocated to Product A = ₹ 30,60,000 × $\frac{₹ 6,00,000}{₹ 21,00,000}$ = ₹ 8,74,286

**RTP MAY 23**

Key Pee Limited produces and sells the following products:

Products	Units	Selling price at split-off point (₹)	Selling price after further processing (₹)
A	500000	42.5	62.5
B	75000	32.5	42.5
C	62500	20	30
D	50000	25	-
E	187500	35	50

Cost of raw material ₹ 89,75,000 and other manufacturing expenses cost ₹13,67,500 in the manufacturing process which are absorbed on the products on the basis of their 'Net realisable



value'. The further processing costs of A, B, C and E are ₹31,25,000; ₹ 3,75,000; ₹1,25,000 and ₹3,75,000 respectively. Fixed costs are ₹11,82,500.

You are required to PREPARE the following in respect of the coming year:

- Statement showing income forecast of the company assuming that none of its products are to be further processed.
- Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

ANSWER :

Working Note:

Apportionment of joint costs on the basis of Net Realisable Value method

Products	Sales Value (₹)	Post separation Cost (₹)	Net Realisable Value (₹)	Apportioned Cost (₹)
A	3,12,50,000 (5,00,000 units x ₹ 62.50)	31,25,000	2,81,25,000	67,74,563
B	31,87,500 (75,000 units x ₹ 42.5)	3,75,000	28,12,500	6,77,456
C	18,75,000 (62,500 units x ₹ 30)	1,25,000	17,50,000	4,21,528
D	12,50,000 (50,000 units x ₹ 25)	---	12,50,000	3,01,092
E	93,75,000 (1,87,500 units x ₹ 50)	3,75,000	90,00,000	21,67,860
			4,29,37,500	1,03,42,500

Total joint cost = Raw material costs + Manufacturing expenses = ₹89,75,000 + ₹13,67,500 = ₹1,03,42,500

Apportioned joint cost = (Total Joint Cost / Total Net Realisable value of each X Net Realisable value of each product)

Apportioned joint cost for Product A = (1,03,42,500 / 4,29,37,500 X 2,81,25,000) = ₹67,74,563.32

Similarly, the apportioned joint cost for products B, C, D and E are ₹6,77,456, ₹4,21,528, ₹3,01,092 and ₹21,67,860 respectively.

- Statement showing income forecast of the company assuming that none of its products are further processed.

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
Sales revenue	2,12,50,000	24,37,500	12,50,000	12,50,000	65,62,500	3,27,50,000
	(₹42.5 × 5,00,000)	(₹ 32.5 × 75,000)	(₹ 20 × 62,500)	(₹ 25 × 50,000)	(₹ 35 × 1,87,500)	



Less:	67,74,563	6,77,456	4,21,528	3,01,092	21,67,860	1,03,42,500
Apportioned Costs (Refer Working note)						
	1,44,75,437	17,60,044	8,28,472	9,48,908	43,94,640	2,24,07,500
Less: Fixed Cost						11,82,500
Profit						2,12,25,000

(b) Statement showing income forecast of the company: assuming that products A, B, C and E are further processed (Refer to working note)

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
A. Sales revenue	3,12,50,000	31,87,500	18,75,000	12,50,000	93,75,000	4,69,37,500
B. Apportioned Costs	67,74,563	6,77,456	4,21,528	3,01,092	21,67,860	1,03,42,500
C. Further processing cost	31,25,000	3,75,000	1,25,000	-	3,75,000	40,00,000
D. Total processing cost (B+ C)	98,99,563	10,52,456	5,46,528	3,01,092	25,42,860	1,43,42,500
E. Excess of sales revenue (A- D)	2,13,50,437	21,35,044	13,28,472	9,48,908	68,32,140	3,25,95,000
F. Fixed Cost						11,82,500
G. Profit (E - F)						3,14,12,500

**RTP NOV 23**

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

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

Subsequent cost in ₹ are given below:

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



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

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

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

ANSWER :

Apportionment of Joint Costs

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

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

Statement showing Cost of Production of A and B

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

Working Note:

Calculation of Selling and Distribution Expenses

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



12

SERVICE COSTING

**QUESTION 1. (ILLUSTRATION 1)**

A lorry starts with a load of 20 MT of goods from Station 'A'. It unloads 8 MT in Station 'B' and balance goods in Station 'C'. On return trip, it reaches Station 'A' with a load of 16 MT, loaded at Station 'C'. The distance between A to B, B to C and C to A are 80 Kms, 120 Kms and 160 Kms, respectively. COMPUTE "Absolute MT-Kilometer" and "Commercial MT – Kilometer".

(MT = Metric Ton or Ton).

ANSWER :

Weighted Average or Absolute basis – MT – Kilometer:

$$= (20 \text{ MT} \times 80 \text{ Kms}) + (12 \text{ MT} \times 120 \text{ Kms}) + (16 \text{ MT} \times 160 \text{ Kms}) \\ = 1,600 + 1,440 + 2,560 = 5,600 \text{ MT - Kilometer}$$

Simple Average or Commercial basis – MT – Kilometer:

$$= \left\{ \frac{(20+12+16)}{3} \right\} \text{ MT} \times \{(80+120+160) \text{ Kms}\} \\ = 16 \text{ MT} \times 360 \text{ Kms} = 5,760 \text{ MT - Kilometer}$$

**QUESTION 2. (ILLUSTRATION 2)**

AXA Passenger Transport Company is running 5 buses between two towns, which are 40 kms apart. Seating capacity of each bus is 40 passengers. Following details are available from their books, for the month of April:

Particulars	Amount (₹)
Salary of Drivers, Cleaners and Conductors	24,000
Salary to Supervisor	10,000
Diesel and other Oil	40,000
Repairs and Maintenance	8,000
Tax and Insurance	16,000
Depreciation	26,000
Interest	20,000
	1,44,000

Actual passengers carried were 75% of the seating capacity. All the five buses run on all days for the month. Each bus made one round trip per day. CALCULATE cost per passenger – Kilometer.

ANSWER :

Working Note:

Total Passenger Kilometres =

Number of Buses × Distance × Seating Capacity × Used Capacity × Number of days
in the month × Number of trips

$$= 5 \text{ Buses} \times 40 \text{ kms.} \times 40 \text{ Seats} \times 75\% \times 30 \text{ Days} \times 2 \text{ Single trips (1 Round Trip)}$$

$$= 3,60,000 \text{ Passenger-Kms.}$$

$$\text{Cost per Passenger-Km} = \text{Total costs} \div \text{Total Passenger Kilometers}$$



Statement of Cost per Passenger – Km

Particulars	Cost Per Month	Cost per Passenger – Km
A. Standing Charges:		
Wages of Drivers, Cleaners and Conductors	24,000	
Salary to Supervisor	10,000	
Tax and Insurance	16,000	
Depreciation	26,000	
Interest	20,000	
Total Standing Charges	96,000	0.267
B. Running Charges		
Diesel and other Oil	40,000	0.111
C. Maintenance Charges		
Repairs and Maintenance	8,000	0.022
Total	1,44,000	0.400

Cost per Passenger-Km = ₹ 0.40

**QUESTION 3. (ILLUSTRATION 3)**

ABC Transport Company has given a route 40 kilometers long to run bus.

- The bus costs the company a sum of ₹ 10,00,000
- It has been insured at 3% p.a. and
- The annual tax will amount to ₹ 20,000
- Garage rent is ₹ 20,000 per month.
- Annual repairs will be ₹ 2,04,000
- The bus is likely to last for 2.5 years
- The driver's salary will be ₹ 30,000 per month and the conductor's salary will be ₹ 25,000 per month in addition to 10% of takings as commission [To be shared by the driver and conductor equally].
- Cost of stationery will be ₹ 1,000 per month.
- Manager-cum-accountant's salary is ₹ 17,000 per month.
- Petrol and oil will be ₹ 500 per 100 kilometers.
- The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.
- The bus will run on an average 25 days in a month.

Assuming 15% profit on takings, CALCULATE the bus fare to be charged per passenger-kilometer.

ANSWER :

Working Note:

- Total Kilometers run per annum:

$$= \text{Number of Buses} \times \text{Distance} \times \text{Number of days in the Month} \times \text{Number of trips} \times 12 \text{ months}$$

$$= 1 \text{ Bus} \times 40 \text{ kms} \times 25 \text{ Days} \times 6 \text{ Single trips (3 Round Trips)} \times 12 \text{ months} = 72,000 \text{ kms.}$$
- Total Passenger Kilometers per annum:

$$\text{Total Kilometers run per annum} \times \text{Seating Capacity}$$

$$= 72,000 \text{ Kms} \times 40 \text{ Seats} = 28,80,000 \text{ Passenger-Kms.}$$



(3) Petrol & oil Consumption per annum:

Total Kilometers run per annum × Petrol Consumption per KM

= 72,000 Kms × (₹500 / 100 Kms) = ₹ 3,60,000

Statement of Cost per Passenger – Km

Particulars	Per Annum	Per Passenger - Kilometer
A. Standing Charges:		
Insurance @ 3% on ₹10,00,000	30,000	
Annual Tax	20,000	
Garage rent (₹20,000 × 12)	2,40,000	
Depreciation	4,00,000	
Salary of Driver (fixed part)	3,60,000	
Salary of Conductor (fixed part)	3,00,000	
Stationary	12,000	
Manager-cum-accountant's salary	2,04,000	
Total Standing Charges	15,66,000	0.5438
B. Running Charges:		
Diesel and other Oil (WN-3)	3,60,000	
Commission to Driver* (10% × ₹28,40,000 × 1/2)	1,42,000	
Commission to Conductor* (10% × ₹28,40,000 × 1/2)	1,42,000	
Total Running Charges	6,44,000	0.2236
C. Maintenance Charges:		
Repairs	2,04,000	0.0708
Grand Total (A+B+C)	24,14,000	0.8382
Profit (15% × ₹28,40,000)	4,26,000	0.1479
Fare per Passenger Kilometer		0.9861

*Total takings = Standing Charges + (Running cost + Commission on takings)
+ Maintenance cost + Profit

Let Takings = X

Or, X = 15,66,000 + (3,60,000 + 0.1X) + 2,04,000 + 0.15X

Or, X - 0.25X = 21,30,000

Or, X = 28,40,000

**QUESTION 4. (ILLUSTRATION 4)**

SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a larger number of students availing of the bus service the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The work-load of the students has been so arranged that in the morning the first trip picks up senior students and the second trip plying an hour later picks up the junior students. Similarly, in the afternoon the first trip takes the junior students and an hour later the second trip takes the senior students' home.

The distance travelled by each bus one way is 8 km. The school works 25 days in a month and



remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all 12 months in a year.

The details of expenses for a year are as under:

Driver's salary ₹ 4,500 per month per driver

Cleaner's salary ₹ 3,500 per month

(Salary payable for all 12 months)

(One cleaner employed for all the five buses)

License fee, taxes, etc. ₹ 8,600 per bus per annum

Insurance ₹ 10,000 per bus per annum

Repairs & maintenance ₹ 35,000 per bus per annum

Purchase price of the bus ₹ 15,00,000 each

Life of each bus 12 years

Scrap value of buses at the end of life ₹ 3,00,000

Diesel cost ₹ 45.00 per litre

Each bus gives an average mileage of 4 km. per litre of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range up to 4 km. of distance from the school are charged half fare and fifty per cent of the students travelling in each trip are in this category.

Ignore interest. Since the charges are to be based on average cost you are required to:

- (i) PREPARE a statement showing the expenses of operating a single bus and the fleet of five buses for a year.
- (ii) WORK OUT the average cost per student per month in respect of –
 - (A) students coming from a distance of upto 4 km. from the school and
 - (B) students coming from a distance beyond 4 km. from the school.

ANSWER :

- (i) Statement of Expenses of operating bus/ buses for a year

Particulars	Rate (₹)	Per Bus per annum (₹)	Fleet of 5 buses p.a. (₹)
(i) Standing Charges:			
Driver's salary	4,500 p.m	54,000	2,70,000
Cleaner's salary	3,500 p.m	8,400	42,000
Licence fee, taxes etc.	8,600 p.a.	8,600	43,000
Insurance	10,000 p.a.	10,000	50,000
Depreciation (15,00,000 – 3,00,000) ÷ 12 yrs	1,00,000 p.a.	1,00,000	5,00,000
(ii) Maintenance Charges:			
Repairs & maintenance	35,000 p.a.	35,000	1,75,000
(iii) Operating Charges:			
Diesel (Working Note 1)		1,62,000	8,10,000
Total Cost [(i) + (ii) + (iii)]		3,78,000	18,90,000
Cost per month		31,500	1,57,500
Total no. of equivalent students		150	750



Total Cost per half fare equivalent student		₹ 210	₹ 210

(ii) Average cost per student per month:

A. Students coming from distance of upto 4 km. from school

$$= \frac{\text{Total cost per month}}{\text{Total no. of equivalent students}} = \frac{₹ 31,500}{150 \text{ students}} = ₹ 210$$

B. Students coming from a distance beyond 4 km. from school

$$= \text{Cost of per half fare student} \times 2 = ₹ 210 \times 2 = ₹ 420$$

Working Notes:

1. Calculation of Diesel cost per bus :

Distance travelled in a year:

(8 round trip × 8 km. × 25 days × 9 months)

Distance travelled p.a.: 14,400 km.

$$\text{Cost of diesel (per bus p.a.): } \frac{14,400 \text{ km.}}{4 \text{ kmpl}} \times ₹ 45 = ₹ 1,62,000$$

2. Calculation of equivalent number of students per bus :

Seating capacity of a bus 50 students

Half fare students (50% of 50 students) 25 students

Full fare students (50% of 50 students) 25 students

Total number of students equivalent to half fare students

Full fare students (25 students × 2) 50 students

Add: Half fare students 25 students

Total Equivalent number of students in a trip 75 students

Total number of equivalent students in two trips 150 students

(Senior + Junior)

**QUESTION 5. (ILLUSTRATION 5)**

GTC has a lorry of 6-tonne carrying capacity. It operates lorry service from city A to city B for a particular vendor. It charges ₹ 2,400 per tonne from city 'A' to city 'B' and ₹ 2,200 per tonne for the return journey from city 'B' to city 'A'. Goods are also delivered to an intermediate city 'C' but no extra charges are billed for unloading goods in-between destination city and no concession in rates is given for reduced load after unloading at intermediate city. Distance between the city 'A' to 'B' is 300 km and distance from city 'A' to 'C' is 140 km.

In the month of January, the truck made 12 journeys between city 'A' and city 'B'. The details of journeys are as follows:

Outward journey	No. of journeys	Load (in tonne)
'A' to 'B'	10	6
'A' to 'C'	2	6
'C' to 'B'	2	4
Return journey	No. of journeys	Load (in tonne)
'B' to 'A'	5	8
'B' to 'A'	6	6



'B' to 'C'	1	6
'C' to 'A'	1	0

Annual fixed costs and maintenance charges are ₹ 6,00,000 and ₹ 1,20,000 respectively. Running charges spent during the month of January are ₹ 2,94,400 (includes ₹ 12,400 paid as penalty for overloading).

You are required to:

- CALCULATE the cost as per (a) Commercial tonne-kilometer. (b) Absolute tonne- kilometer.
- CALCULATE Net Profit/ loss for the month of January.

ANSWER :

- Calculation of total monthly cost for running truck:

	Particulars	Amount per annum (₹)	Amount per month (₹)
(i)	Standing Charges:		
	Annual fixed costs	6,00,000	50,000
(ii)	Maintenance Charges:	1,20,000	10,000
(iii)	Running Cost:		
	Running charges	2,94,400	
Less:	Penalty paid for overloading (12,400)		2,82,000
	Total monthly cost		3,42,000

$$(a) \text{ Cost per commercial tonne-km.} = \frac{\text{₹3, 42,000}}{44,856 \text{ ton-km.}} = \text{₹ 7.62}$$

(Refer to working note-1)

$$(b) \text{ Cost per commercial tonne-km.} = \frac{\text{₹3, 42,000}}{44,720 \text{ ton-km.}} = \text{₹ 7.65}$$

(Refer to working note-2)

- Calculation of Net Profit/Loss for the month of January:

Particulars	(₹)	(₹)
Truck hire charges received during the month:		
From Outward journey [(10 + 2) trips × 6 tonne × ₹ 2,400]	1,72,800	
From return journey	1,80,400	3,53,200
{(5 trips × 8 tonne × ₹ 2,200) + [(6 + 1) trips × 6 tonne × ₹ 2,200]}		
Less: Monthly running cost (as per (i) above)		(3,42,000)
Operating profit		11,200
Less: Penalty paid for overloading		(12,400)
Net Loss for the month		(1,200)

Working Notes:

- Calculation of Commercial Tonne-km:

Particulars	Tonne-km.
A. Total Distance travelled	



To and fro (300 km × 2 × 12 trips) (in km)		7,200
B. Average weight carried:		
Outward (12 journeys × 6 tonne + 2 journeys × 4 tonne)	80	
Return (5 journeys × 8 tonne + 6 journeys × 6 tonne + 1 journey × 6 tonne)	82	
Total weight	162	
No. of journeys	26	
Average weight (in tonne) (162 ÷ 26)	6.23	
Total Commercial Tonne-km (A × B)		44,856

2. Calculation of Absolute Tonne-km:

Particulars	Tonne-km.	Tonne-km.
Outward journeys:		
From city A to city B (10 journey × 300 km. × 6 tonne)	18,000	
From city A to city C (2 journeys × 140 km. × 6 tonne)	1,680	
From city C to city B (2 journeys × 160 km. × 4 tonne)	1,280	20,960
Return journeys:		
From city B to city A (5 journeys × 300 km. × 8 tonne) + (6 journeys × 300 km. × 6 tonne)	22,800	
From city B to city C (1 journey × 160 km. × 6 tonne)	960	23,760
Total Absolute Tonne-km		44,720

Note: (i) While calculating absolute/commercial tonne-km., actual load carried are considered irrespective of the fact it attracts fines or penalty. (ii) Penalty paid for overloading is an abnormal expenditure and is not included in the operating cost of the lorry. This amount will be debited to Costing Profit and Loss A/c and hence deducted from operating profit to arrive at net profit/loss.



QUESTION 6. (ILLUSTRATION 6)

A company runs a holiday home. For this purpose, it has hired a building at a rent of ₹ 10,000 per month along with 5% of total taking. It has three types of suites for its customers, viz., single room, double rooms and triple rooms.

Following information is given:

Type of suite	Number	Occupancy percentage
Single room	100	100%
Double rooms	50	80%
Triple rooms	30	60%

The rent of double rooms suite is to be fixed at 2.5 times of the single room suite and that of triple rooms suite as twice of the double room's suite.

The other expenses for the year 2022-23 are as follows:

	(₹)
Staff salaries	14,25,000
Room attendants' wages	4,50,000
Lighting, heating and power	2,15,000



Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000

Provide profit @ 20% on total taking and assume 360 days in a year.

You are required to CALCULATE the rent to be charged for each type of suite.

ANSWER :

Working Notes:

(i) Total equivalent single room suites

Nature of suite	Occupancy (Room-days)	Equivalent single room suites (Room-days)
Single room suites	36,000 (100 rooms x 360 days x 100%)	36,000 (36,000 x 1)
Double rooms suites	14,400 (50 rooms x 360 days x 80%)	36,000 (14,400 x 2.5)
Triple rooms suites	6,480 (30 rooms x 360 days x 60%)	32,400 (6,480 x 5)

(ii) Statement of total cost:

	(₹)
Staff salaries	14,25,000
Room attendant's wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000
	25,21,000
Building rent {(₹10,000 12 months) + 5% on total taking}	1,20,000 + 5% on total takings
Total cost	26,41,000 + 5% on total takings

Profit is 20% of total takings

∴ Total takings = ₹ 26,41,000 + 25% (5% + 20%) of total takings

Let R be rent for single room suite

Then 1,04,400 R = 26,41,000 + (0.25 × 1,04,400 R)

Or, 1,04,400 R = 26,41,000 + 26,100 R

Or, 78,300 R = 26,41,000

Or, R = ₹33.73

Alternatively

Let total takings be x

∴ X = 26,41,000 + .25X (5% + 20%)

∴ X = 35,21,333



Let the rent of single room be R

Then 1,04,400 R = 35,21,333

Or, R = ₹33.73

Rent to be charged:

Rent to be charged for single room suite = ₹33.73

Rent for double rooms suites ₹ 33.73 2.5 = ₹84.33

Rent for triple rooms suites ₹33.73 5 = ₹168.65



QUESTION 7. (ILLUSTRATION 7)

A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off- season months in a year when numbers of visitor are limited. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March. [Assume a month to be of 30 days].

- (i) Occupancy during the season is 80% while in the off- season it is 40% only.
- (ii) Total investment in the home is ₹ 200 lakhs of which 80% relate to buildings and balance for furniture and equipment.
- (iii) Expenses:
 - Staff salary [Excluding room attendants] : ₹ 5,50,000
 - Repairs to building : ₹ 2,61,000
 - Laundry charges : ₹ 80, 000
 - Interior : ₹ 1,75,000
 - Miscellaneous expenses : ₹ 1,90,800
- (iv) Annual depreciation is to be provided for buildings @ 5% and on furniture and equipment @ 15% on straight-line basis.
- (v) Room attendants are paid ₹ 10 per room day on the basis of occupancy of the rooms in a month.
- (vi) Monthly lighting charges are ₹ 120 per room, except in four months in winter when it is ₹ 30 per room.

You are required to WORK OUT the room rent chargeable per day both during the season and the off-season months on the basis of the foregoing information.

ANSWER :

Working Notes:

- (i) Total Room days in a year

Season	Occupancy (Room-days)	Equivalent Full Room charge days
Season – 80% Occupancy	100 Rooms × 80% × 6 months × 30 days in a month = 14,400 Room Days	14,400 Room Days × 100% = 14,400
Off-season – 40% Occupancy	100 Rooms × 40% × 6 months × 30 days in a month = 7,200 Room Days	7,200 Room Days × 50% = 3,600
Total Room Days	14,400 + 7,200 = 21,600 Room Days	18,000 Full Room days



(ii) Lighting Charges:

It is given in the question that lighting charges for 8 months is ₹120 per month and during winter season of 4 months it is ₹30 per month. Further it is also given that peak season is 6 months and off season is 6 months.

It should be noted that – being Hill station, winter season is to be considered as part of Off season. Hence, the non-winter season of 8 months include – Peak season of 6 months and Off season of 2 months.

Accordingly, the lighting charges are calculated as follows:

Season	Occupancy (Room-days)
Season & Non-winter – 80% Occupancy	100 Rooms × 80% × 6 months × ₹120 per month = ₹ 57,600
Off- season & non-winter – 40% Occupancy (8 – 6 months)	100 Rooms × 40% × 2 months × ₹120 per month = ₹ 9,600
Off- season & -winter – 40% Occupancy months)	100 Rooms × 40% × 4 months × ₹ 30 per month = ₹ 4,800
Total Lighting charges	₹ 57,600 + 9,600 + 4,800 = ₹ 72,000

Statement of total cost:

	(₹)
Staff salary	5,50,000
Repairs to building	2,61,000
Laundry & Linen	80,000
Interior	1,75,000
Sundries Expenses	1,90,800
Depreciation on Building (₹ 200 Lakhs × 80% × 5%)	8,00,000
Depreciation on Furniture & Equipment (₹ 200 Lakhs × 20% × 15%)	6,00,000
Room attendant's wages (₹ 10 per Room Day for 21,600 Room Days)	2,16,000
Lighting charges	72,000
Total cost	29,44,800
Add: Profit Margin (20% on Room rent or 25% on Cost)	7,36,200
Total Rent to be charged	36,81,000

Calculation of Room Rent per day:

Total Cost / Equivalent Full Room days = ₹ 36,81,000 / 18,000 = ₹204.50

Room Rent during Season – ₹204.50

Room Rent during Off season = ₹204.50 × 50% = ₹ 102.25

**QUESTION 8. (ILLUSTRATION 8)**

ABC Hospital runs a Critical Care Unit (CCU) in a hired building. CCU consists of 35 beds and 5 more beds can be added, if required.

Rent per month – ₹ 75,000

Supervisors – 2 persons – ₹ 25,000 Per month – each

Nurses – 4 persons – ₹ 20,000 per month – each

Ward Boys – 4 persons – ₹ 5,000 per month – each

Doctors paid ₹ 2,50,000 per month – paid on the basis of number of patients attended and the time spent by them



Other expenses for the year are as follows:

Repairs (Fixed) – ₹ 81,000

Food to Patients (Variable) – ₹ 8,80,000

Other services to patients (Variable) – ₹ 3,00,000

Laundry charges (Variable) – ₹ 6,00,000

Medicines (Variable) – ₹ 7,50,000

Other fixed expenses – ₹ 10,80,000

Administration expenses allocated – ₹ 10,00,000

It was estimated that for 150 days in a year 35 beds are occupied and for 80 days only 25 beds are occupied.

The hospital hired 750 beds at a charge of ₹ 100 per bed per day, to accommodate the flow of patients. However, this does not exceed more than 5 extra beds over and above the normal capacity of 35 beds on any day.

You are required to –

- CALCULATE profit per Patient day, if the hospital recovers on an average ₹ 2,000 per day from each patient
- FIND OUT Breakeven point for the hospital.

ANSWER :

Working Notes:

- Calculation of number of patient days

35 Beds × 150 days = 5,250

25 Beds × 80 days = 2,000

Extra beds = 750

Total = 8,000

Statement of Profitability

Particulars	Amount	Amount
Income for the year (₹ 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (₹ 2,50,000 per month × 12)	30,00,000	
Food to Patients (Variable)	8,80,000	
Other services to patients (Variable)	3,00,000	
Laundry charges (Variable) – (₹)	6,00,000	
Medicines (Variable) – (₹)	7,50,000	
Bed Hire Charges (₹100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (₹ 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × ₹25,000 × 12)	6,00,000	
Nurses (4 persons × ₹ 20,000 × 12)	9,60,000	
Ward Boys (4 persons × ₹ 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses – (₹)	10,80,000	



Administration expenses allocated – (₹)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

(1) Calculation of Contribution per Patient day

Total Contribution – ₹ 1,03,95,000

Total Patient days – 8,000

Contribution per Patient day – ₹ 1,03,95,000 / 8,000 = ₹ 1,299.375

- (2) Breakeven Point = Fixed Cost / Contribution per Patient day
 = ₹ 48,61,000 / ₹1,299.375
 = 3,741 patient days

**QUESTION 9. (ILLUSTRATION 9)**

Following are the data pertaining to Infotech Pvt. Ltd, for the year 2022-23:

	Amount (₹)
Salary to Software Engineers (5 persons)	15,00,000
Salary to Project Leaders (2 persons)	9,00,000
Salary to Project Manager	6,00,000
Repairs & maintenance	3,00,000
Administration overheads	12,00,000

The company executes a Project XYZ, the details of the same as are as follows:

Project duration – 6 months

One Project Leader and three Software Engineers were involved for the entire duration of the project, whereas Project Manager spends 2 months' efforts, during the execution of the project.

Travel expenses incurred for the project – ₹ 1,87,500

Two Laptops were purchased at a cost of ₹ 50,000 each, for use in the project and the life of the same is estimated to be 2 years

PREPARE Project cost sheet.

ANSWER :

Working Notes:

(1) Calculation of Cost per month and Overhead absorption rate

Particulars	Total Per Annum	Per Person Per Annum	Per Person Per Month
Salary to Software Engineer (5 Persons)	₹15,00,000	₹ 3,00,000	₹25,000
Salary to Project Leaders (2 persons)	₹ 9,00,000	₹ 4,50,000	₹ 37,500
Salary to Project Manager	₹ 6,00,000	₹ 6,00,000	₹ 50,000
Total	₹ 30,00,000		₹ 1,12,500

- (2) Total Overhead = Repairs & maintenance + Administration overheads
 = ₹ 3,00,000 + ₹12,00,000 = ₹15,00,000

- (3) Calculation of Overhead absorption rate
 = Total Overhead / Total Salary = ₹15,00,000 / ₹30,00,000 = 50%



Project Cost Sheet

		(₹)
Salary Cost:		
Salary of Software Engineers	$(3 \times ₹ 25,000 \times 6 \text{ months})$	4,50,000
Salary of Project Leader	$(₹ 37,500 \times 6 \text{ months})$	2,25,000
Salary of Project Manager	$(₹ 50,000 \times 2 \text{ months})$	1,00,000
Total Salary		7,75,000
Overheads	(50% of Salary)	3,87,500
Travel Expenses		1,87,500
Depreciation on Laptops	$(₹ 1,00,000 / 2 \text{ years} \times 6 \text{ months})$	25,000
Total Project Cost		13,75,000

**QUESTION 10. (ILLUSTRATION 10)**

BHG Toll Plaza Ltd built a 60 km. long highway and now operates a toll plaza to collect tolls from passing vehicles using the highway. The company has estimated that a total of 12 crore vehicles (only single type of vehicle) will be using the highway during the 10 years toll collection tenure.

Toll Operating and Maintenance cost for the month of April are as follows:

(i) Salary to –

- Collection Personnel (3 Shifts and 4 persons per shift) – ₹ 550 per day per person
- Supervisor (2 Shifts and 1 person per shift) – ₹ 750 per day per person
- Security Personnel (3 Shifts and 6 persons per shift) – ₹ 450 per day per person
- Toll Booth Manager (2 Shifts and 1 person per shift) – ₹ 900 per day per person

(ii) Electricity – ₹ 8,00,000

(iii) Telephone – ₹ 1,40,000

(iv) Maintenance cost – ₹ 30 Lakh

Monthly depreciation and amortisation expenses will be ₹ 1.50 crore. Further, the company needs 25% profit over total cost to cover interest and other costs.

Required:

(i) CALCULATE cost per kilometer per month.

(ii) CALCULATE the toll rate per vehicle.

ANSWER :

Calculation of cost for the month of April

Particulars		(₹)
Salary to Collection Personnel	$(3 \text{ Shifts} \times 4 \text{ persons per shift} \times 30 \text{ days} \times ₹ 550 \text{ per day})$	1,98,000
Salary to Supervisor	$(2 \text{ Shifts} \times 1 \text{ persons per shift} \times 30 \text{ days} \times ₹ 750 \text{ per day})$	45,000
Salary to Security Personnel	$(3 \text{ Shifts} \times 6 \text{ persons per shift} \times 30 \text{ days} \times ₹ 450 \text{ per day})$	2,43,000
Salary to Toll Booth Manager	$(2 \text{ Shifts} \times 1 \text{ persons per shift} \times 30 \text{ days} \times ₹ 900 \text{ per day})$	54,000
Electricity		8,00,000
Telephone		1,40,000
Maintenance cost		30,00,000



Total operating cost (A)	44,80,000
Depreciation and amortisation expenses (B)	1,50,00,000
Total Cost (A + B)	1,94,80,000

(i) Calculation of cost per kilometer per month:

$$= \frac{\text{Total Cost}}{\text{Total km.}} = \frac{\text{₹ 1,94,80,000}}{60 \text{ km.}} = \text{₹ 3,24,666.67}$$

(ii) Calculation of toll rate per vehicle:

$$= \frac{\text{Total Cost} + 25\% \text{ profit}}{\text{Vehicles per month}} = \frac{\text{₹ 1,94,80,000} + \text{₹ 48,70,000}}{10,00,000 \text{ vehicles}} = \text{₹ 24.35}$$

Working:

No. of vehicles using the highway per month

$$= \frac{\text{Total estimated vehicles}}{10 \text{ years}} \times \frac{1 \text{ month}}{12 \text{ months}} = \frac{12 \text{ crore}}{10 \text{ years}} \times \frac{1 \text{ month}}{12 \text{ months}} = 10 \text{ lakhs}$$



QUESTION 11. (ILLUSTRATION 11)

AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes, but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

	Amount (₹)
Teachers' salary (25 teachers × ₹ 35,000 × 12 months)	1,05,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × ₹ 15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × ₹ 10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

Other information:

(i)

	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840
Lab classes in a year	0	0	144	156
No. of examinations in a year	2	2	2	2
Time spent at library by students per year	180 hours	120 hours	240 hours	60 hours



Time spent by principal for administration	208 hours	312 hours	480 hours	1,400 hours
Teachers for 11 & 12 standard	4	5	6	10

- (ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.
- (iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.
- (iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section.
- (v) All school students irrespective of section and age participates in annual functions and sports activities.

Required:

- (a) CALCULATE cost per student per annum for all three streams.
- (b) If the management decides to take uniform fee of ₹ 1,000 per month from all higher secondary students, CALCULATE stream wise profitability.
- (c) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively.

ANSWER :

Calculation of Cost per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
Re-apportionment of Economics & Mathematics teachers' salary (W.N- 2)	(84,000)	1,45,091	(61,091)	-
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600
Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200
Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administration expenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000
Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

- (i) Calculation of cost per student per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student per annum	17,397	9,533	19,238	13,610



(ii) Calculation of profitability

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Total Fees per annum	12,000	12,000	12,000	
Cost per student per annum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

(iii) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts (₹)	Commerce (₹)	Science (₹)
Cost per student per annum	17,397	9,533	19,238
Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764

Working Notes:

(1) Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (₹) (₹ 35,000 × 12)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

(2) Re-apportionment of Economics and Mathematics teachers' salary

Particulars	Economics		Mathematics	
	Arts	Commerce	Science	Commerce
No. of classes	832	208	940	160
Salary re-	(84,000)	84,000	(61,091)	61,091
apportionment (₹)	$\left(\frac{₹4,20,000 \times 208}{1,040} \right)$		$\left(\frac{₹4,20,000 \times 160}{1,100} \right)$	

- (3) Principal's salary has been apportioned on the basis of time spent by him for administration of classes.
- (4) Lab attendants' salary has been apportioned on the basis of lab classes attended by the students.
- (5) Salary of library staffs are apportioned on the basis of time spent by the students in library.
- (6) Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

	Amount (₹)
Peon dedicated for higher secondary (1 peon × ₹10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × ₹10,000 × 12 months)}	54,000
	1,74,000



- (7) Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.
- (8) Examination expenses has been apportioned taking number of students into account (It may also be apportioned on the basis of number of examinations).

**QUESTION 12. (ILLUSTRATION 12)**

Sanziet Lifecare Ltd. operates in life insurance business. Last year it launched a new term insurance policy for practicing professionals 'Professionals Protection Plus'. The company has incurred the following expenditures during the last year for the policy:

	₹
Policy development cost	11,25,000
Cost of marketing of the policy	45,20,000
Sales support expenses	11,45,000
Policy issuance cost	10,05,900
Policy servicing cost	35,20,700
Claims management cost	1,25,600
IT cost	74,32,000
Postage and logistics	10,25,000
Facilities cost	15,24,000
Employees cost	5,60,000
Office administration cost	16,20,400

Number of policies sold- 528

Total insured value of policies- ₹ 1,320 crore

Required:

- (i) CALCULATE total cost for Professionals Protection Plus policy segregating the costs into four main activities namely (a) Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.
- (ii) CALCULATE cost per policy.
- (iii) CALCULATE cost per rupee of insured value.

ANSWER :

- (i) Calculation of total cost for 'Professionals Protection Plus policy

Particulars	Amount (₹)	Amount (₹)
1. Marketing and Sales support:		
- Policy development cost	11,25,000	
- Cost of marketing	45,20,000	
- Sales support expenses	11,45,000	67,90,000
2. Operations:		
- Policy issuance cost	10,05,900	
- Policy servicing cost	35,20,700	
- Claims management cost	1,25,600	46,52,200
3. IT Cost		74,32,000



4.	Support functions		
	- Postage and logistics	10,25,000	
	- Facilities cost	15,24,000	
	- Employees cost	5,60,000	
	- Office administration cost	16,20,400	47,29,400
	Total Cost		2,36,03,600

(ii) Calculation of cost per policy = $\frac{\text{Total cost}}{\text{No. of policies}} = \frac{\text{₹2,36,03,600}}{528} = \text{₹ } 44,703.79$

(iii) Cost per rupee of insured value = $\frac{\text{Total cost}}{\text{Total insured value}} = \frac{\text{₹ 2.36 crore}}{\text{₹ 1,320 crore}} = \text{₹ } 0.0018$

**QUESTION 13. (ILLUSTRATION 13)**

The loan department of a bank performs several functions in addition to home loan application processing task. It is estimated that 25% of the overhead costs of loan department are applicable to the processing of home-loan application. The following information is given concerning the processing of a loan application:

Direct professional labor:

	(₹)
Loan processor monthly salary: (4 employees @ ₹ 60,000 each)	2,40,000
Loan department overhead costs (monthly)	
Chief loan officer's salary	75,000
Telephone expenses	7,500
Depreciation Building	28,000
Legal advice	24,000
Advertising	40,000
Miscellaneous	6,500
Total overhead costs	1,81,000

You are required to COMPUTE the cost of processing home loan application on the assumption that five hundred home loan applications are processed each month.

ANSWER :

Statement showing computation of the cost of processing a typical home loan application

	(₹)
Direct professional labour cost (4 employees @ ₹ 60,000 each)	2,40,000
Service overhead cost (25% of ₹ 1,81,000)	45,250
Total processing cost per month	2,85,250
No. of applications processed per month	500
Total processing cost per home loan application	570.5

**QUESTION 14. (ILLUSTRATION 14)**

PREPARE the cost statement of Ignus Thermal Power Station showing the cost of electricity generated per kWh, from the data provided below pertaining to the year 2022-23.

Total units generated 20,00,000 kWh

	Amount (₹)
Operating labour	30,00,000
Repairs & maintenance	10,00,000
Lubricants, spares and stores	8,00,000
Plant supervision	6,00,000
Administration overheads	40,00,000

5 kWh. of electricity generated per kg of coal consumed @ ₹ 4.25 per kg. Depreciation charges @ 5% on capital cost of ₹ 5,00,00,000.

ANSWER :

Cost Statement of Ignus Thermal Power Station

Total units generated 20,00,000 kwh.

	Per annum (₹)	Per kWh (₹)
Fixed costs:		
Plant supervision	6,00,000	
Administration overheads	40,00,000	
Depreciation (5% of ₹ 5,00,00,000 p.a.)	25,00,000	
Total fixed cost: (A)	71,00,000	3.55
Variable costs:		
Operating labour	30,00,000	
Lubricants, spares and stores	8,00,000	
Repairs & maintenance	10,00,000	
Coal cost (Refer to working note)	17,00,000	
Total variable cost: (B)	65,00,000	3.25
Total cost [(A) + (B)]	1,36,00,000	6.80

Working Note:

Coal cost (20,00,000 kwh. ÷ 5 kwh) × ₹ 4.25 per kg. = ₹ 17,00,000

**QUESTION 15. (ILLUSTRATION 15)**

Solar Power Ltd. has a power generation capacity of 1000 Megawatt per day. On an average it operates at 85% of its installed capacity. The cost structure of the plant is as under:

	Cost particulars	Amount (₹ in Lakh)
1.	Employee cost per year	2500
2.	Solar panel maintenance cost per year	250
3.	Site maintenance cost per year	150
4.	Depreciation per year	5940

CALCULATE cost of generating 1kW of power.

[1 Megawatt = 1,000 kW]

**ANSWER :**

Working:

- Estimated power generated in a year
 $= 1000 \text{ Megawatt} \times 85\% \times 365 \text{ days}$
 $= 3,10,250 \text{ Megawatt}$

Calculation of 1 kW power generation cost:

	Cost particulars	Amount (₹ in Lakh)
A.	Employee cost per year	2500
B.	Solar panel maintenance cost per year	250
C.	Site maintenance cost per year	150
D.	Depreciation per year	5940
E.	Total Cost [A+B+C+D]	8840
F.	Estimated power generated (in Megawatt) (Refer working note-1)	3,10,250
G.	Cost of generating 1 Megawatt (₹) [(E÷F)×1,00,000]	2,849.31
H.	Cost of 1 kW (₹) [G÷1,000]	2.849

**QUESTION 16. (PP1)**

SLS Infrastructure built and operates 110 k.m. highway on the basis of Built- Operate-Transfer (BOT) for a period of 25 years. A traffic assessment carried out to estimate the traffic flow per day shows the following figures:

Sl. No.	Type of vehicle	Daily traffic volume
1.	Two wheelers	44,500
2.	Car and SUVs	3,450
3.	Bus and LCV	1,800
4.	Heavy commercial vehicles	816

The following is the estimated cost of the project:

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

An estimated cost of ₹1,120 lakh has to be incurred on administration and toll plaza operation. On the basis of the vehicle specifications (i.e. weight, size, time saving etc.), the following weights has been assigned to the passing vehicles:



Sl. No.	Type of vehicle	
1.	Two wheelers	5%
2.	Car and SUVs	20%
3.	Bus and LCV	30%
4.	Heavy commercial vehicles	45%

Required:

- (i) CALCULATE the total project cost per day of concession period.
(ii) COMPUTE toll fee to be charged for per vehicle of each type, if the company wants to earn a profit of 15% on total cost.

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

ANSWER :

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

Activities	Amount (₹ in lakh)
Site clearance	170.70
Land development and filling work	9,080.35
Sub base and base courses	10,260.70
Bituminous work	35,070.80
Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc	29,055.60
Drainage and protection work	9,040.50
Traffic sign, marking and road appurtenance	8,405.00
Maintenance, repairing and rehabilitation	12,429.60
Environmental management	982.00
Total Project cost	114,495.25
Administration and toll plaza operation cost	1,120.00
Total Cost	115,615.25
Concession period in days (25 years × 365 days)	9,125
Cost per day of concession period (₹ in lakh)	12.67

- (ii) Computation of toll fee:

Cost to be recovered per day = Cost per day of concession period + 15% profit on cost

$$= ₹12,67,000 + ₹1,90,050$$

$$= ₹14,57,050$$

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

$$= ₹19.06 \text{ per equivalent vehicle}$$

Vehicle type-wise toll fee:

Sl. No.	Type of vehicle	Equivalent cost [A]	Weight [B]	Toll fee per vehicle [A×B]
1.	Two wheelers	₹ 19.06	1	19.06
2.	Car and SUVs	₹ 19.06	4	76.24



3.	Bus and LCV	₹ 19.06	6	114.36
4.	Heavy commercial vehicles	₹ 19.06	9	171.54

Working Note:

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

Sl. No.	Type of vehicle	Daily traffic volume [A]	Weight	Ratio [B]	Equivalent Two-wheeler [A×B]
1.	Two wheelers	44,500	0.05	1	44,500
2.	Car and SUVs	3,450	0.20	4	13,800
3.	Bus and LCV	1,800	0.30	6	10,800
4.	Heavy commercial vehicles	816	0.45	9	7,344
	Total				76,444

**QUESTION 17. (PP2)**

Mr. X owns a bus which runs according to the following schedule:

(i)	Delhi to Chandigarh and back, the same day.	
	Distance covered:	250 km. one way.
	Number of days run each month:	8
	Seating capacity occupied	90%.
(ii)	Delhi to Agra and back, the same day.	
	Distance covered:	210 km. one way
	Number of days run each month:	10
	Seating capacity occupied	85%
(iii)	Delhi to Jaipur and back, the same day.	
	Distance covered:	270 km. one way
	Number of days run each month:	6
	Seating capacity occupied	100%
(iv)	Following are the other details:	
	Cost of the bus	₹ 12,00,000
	Salary of the Driver	₹ 24,000 p.m.
	Salary of the Conductor	₹ 21,000 p.m.
	Salary of the part-time Accountant	₹ 5,000 p.m.
	Insurance of the bus	₹ 4,800 p.a.
	Diesel consumption 4 km. per litre at	₹ 56 per litre
	Road tax	₹ 15,915 p.a.
	Lubricant oil	₹ 10 per 100 km.
	Permit fee	₹ 315 p.m.
	Repairs and maintenance	₹ 1,000 p.m.
	Depreciation of the bus	@ 20% p.a.
	Seating capacity of the bus	50 persons.

Passenger tax is 20% of the total takings.

CALCULATE the bus fare to be charged from each passenger to earn a profit of 30% on total



takings. The fares are to be indicated per passenger for the journeys:

(i) Delhi to Chandigarh (ii) Delhi to Agra and (iii) Delhi to Jaipur.

ANSWER :

Working Notes:

Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Chandigarh	250	2	8	4,000
Delhi to Agra	210	2	10	4,200
Delhi to Jaipur	270	2	6	3,240
				11,440

Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger- Km. per month
		(%)	Seats		
Delhi to Chandigarh & Back	800 (50 seats 2 trips 8 days)	90	720	250	1,80,000 (720 seats × 250 km.)
Delhi to Agra & Back	1,000 (50 seats 2 trips 10 days)	85	850	210	1,78,500 (850 seats × 210 km.)
Delhi to Jaipur & Back	600 (50 seats 2 trips 6 days)	100	600	270	1,62,000 (600 seats × 270 km.)
					5,20,500

Monthly Operating Cost Statement

	Per annum (₹)	Per kWh (₹)
(i) Running Costs		
Diesel {(11,440 km ÷ 4 km) × ₹ 56}	1,60,160	
Lubricant oil {(11,440 km ÷ 100) × ₹ 10}	1,144	1,61,304
(ii) Maintenance Costs		
Repairs & Maintenance		1,000
(iii) Standing charges		
Salary to driver	24,000	
Salary to conductor	21,000	
Salary of part-time accountant	5,000	
Insurance (₹ 4,800 ÷ 12)	400	
Road tax (₹ 15,915 ÷ 12)	1,326.25	
Permit fee	315	
Depreciation {(₹ 12,00,000 × 20%) ÷ 12}	20,000	72,041.25
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,34,345.25
Passenger Tax*		93,738.10
Total Cost		3,28,083.35



Add: Profit*		1,40,607.15
Total takings per month		4,68,690.50

*Let, total takings be X then

$X = \text{Total costs per month before passenger tax} + 0.2 X (\text{passenger tax}) + 0.3 X (\text{profit})$

$X = ₹ 2,34,345.25 + 0.2 X + 0.3 X$

$0.5 X = ₹ 2,34,345.25$ or, $X = ₹ 4,68,690.50$

Passenger Tax = 20% of ₹ 4,68,690.50 = ₹ 93,738.10

Profit = 30% of ₹ 4,68,690.50 = ₹ 1,40,607.15

Calculation of Rate per passenger km. and fares to be charged for different routes

$$\begin{aligned} \text{Rate per Passenger-Km.} &= \frac{\text{Total takings per month}}{\text{Total Passenger -Km. per month}} \\ &= \frac{₹ 4,68,690.50}{5,20,500 \text{ Passenger -Km.}} = ₹ 0.90 \end{aligned}$$

Bus fare to be charged per passenger.

Delhi to Chandigarh	=	₹ 0.90	250 km	=	₹ 225.00
Delhi to Agra	=	₹ 0.90	210 km	=	₹ 189.00
Delhi to Jaipur	=	₹ 0.90	270 km	=	₹ 243.00



QUESTION 18. (PP3)

A company is considering three alternative proposals for conveyance facilities for its sales personnel who has to do considerable traveling, approximately 20,000 kilometers every year. The proposals are as follows:

- Purchase and maintain its own fleet of cars. The average cost of a car is ₹ 6,00,000.
- Allow the Executive use his own car and reimburse expenses at the rate of ₹ 10 per kilometre and also bear insurance costs.
- Hire cars from an agency at ₹ 1,80,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol ₹ 6 per km.	Repairs and maintenance ₹ 0.20 per km.
Tyre ₹ 0.12 per km.	Insurance ₹ 1,200 per car per annum
Taxes ₹ 800 per car per annum	Life of the car: 5 years with annual mileage of 20,000 km.

Resale value: ₹ 80,000 at the end of the fifth year.

WORK OUT the relative costs of three proposals and rank them.

ANSWER :

Calculation of relative costs of three proposals and their ranking

	per annum (₹)	I Use of company's car per km. (₹)	II Use of own car per km. (₹)	III Use of hired car per km. (₹)
Reimbursement		--	10.00	9.00*



Fixed cost:				
Insurance	1,200	0.06	0.06	--
Taxes	800	0.04	--	0.04
Depreciation	1,04,000	5.20	--	--
(₹ 6,00,000 - ₹80,000) ÷ 5 year				
Running and Maintenance Cost:				
Petrol	--	6.00	--	6.00
Repairs and Maintenance	--	0.20	--	--
Tyre	--	0.12	--	0.12
Total cost per km.	--	11.62	10.06	15.16
Cost for 20,000 km.		2,32,400	2,01,200	3,03,200
Ranking of proposals		II	I	III

* (₹ 1,80,000 ÷ 20,000 km.)

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



QUESTION 19. (PP4)

From the following data pertaining to the year 2022-23 PREPARE a cost statement showing the cost of electricity generated per kwh by Chambal Thermal Power Station.

Total units generated	10,00,000 kWh (₹)
Operating labour	15,00,000
Repairs & maintenance	5,00,000
Lubricants, spares and stores	4,00,000
Plant supervision	3,00,000
Administration overheads	20,00,000
5 kWh. of electricity generated per kg. of coal consumed @ ₹ 4.25 per kg. Depreciation charges @ 5% on capital cost of ₹ 2,00,00,000.	

ANSWER :

Cost Statement of Chambal Thermal Power Station

Total units generated		10,00,000 kWh.	
		Per annum (₹)	Per kWh. (₹)
Fixed costs:			
Plant supervision		3,00,000	
Administration overheads		20,00,000	
Depreciation (5% of ₹ 2,00,00,000 p.a.)		10,00,000	
Total fixed cost: (A)		33,00,000	3.30
Variable costs:			
Operating labour		15,00,000	
Lubricants, spares and stores		4,00,000	
Repairs & maintenance		5,00,000	
Coal cost (Refer to working note)		8,50,000	
Total variable cost: (B)		32,50,000	3.25
Total cost [(A) + (B)]		65,50,000	6.55

Working Note:

Coal cost (10,00,000 kWh. ÷ 5 kWh) × ₹ 4.25 per kg. = ₹ 8,50,000



REVISION TEST PAPER



RTP MAY 18

AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

	Amount (₹)
Teachers' salary (15 teachers × ₹35,000 × 12 months)	63,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × ₹15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × ₹10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

Other information:

(i)

	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840
Lab classes in a year	0	0	144	156
No. of examinations in a year	2	2	2	2
Time spent at library per student per year	180 hours	120 hours	240 hours	60 hours
Time spent by principal for administration	208 hours	312 hours	480 hours	1,400 hours
Teachers for 11 & 12 standard	4	5	6	-

(ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.

(iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.

(iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section.

(v) All school students irrespective of section and age participates in annual functions and sports activities.

Required:

(i) CALCULATE cost per student per annum for all three streams.



- (ii) If the management decides to take uniform fee of ₹ 1,000 per month from all higher secondary students, CALCULATE stream wise profitability.
- (iii) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively.

ANSWER :

Calculation of Cost per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
R-apportionment of Economics & Mathematics teachers' salary (W.N- 2)	(84,000)	1,45,091	(61,091)	-
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600
Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200
Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administration expenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000
Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

- (i) Calculation of cost per student per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student per annum	17,397	9,533	19,238	13,610

- (ii) Calculation of profitability

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Total Fees per annum	12,000	12,000	12,000	
Cost per student per annum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

- (iii) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts (₹)	Commerce (₹)	Science (₹)
Cost per student per annum	17,397	9,533	19,238



Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764

Working Notes:

(1) Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (₹)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

(2) Re-apportionment of Economics and Mathematics teachers' salary

	Economics		Mathematics	
Particulars	Arts	Commerce	Science	Commerce
No. of classes	832	208	940	160
Salary re-apportionment (₹)	(84,000)	84,000	(61,091)	61,091
	$\left(\frac{₹4,20,000}{1,040} \times ₹208 \right)$		$\left(\frac{₹4,20,000}{1,100} \times 160 \right)$	

(3) Principal's salary has been apportioned on the basis of time spent by him for administration of classes.

(4) Lab attendants' salary has been apportioned on the basis of lab classes attended by the students.

(5) Salary of library staffs are apportioned on the basis of time spent by the students in library.

(6) Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

	Amount (₹)
Peon dedicated for higher secondary (1 peon × ₹10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × ₹10,000 × 12 months)}	54,000
	1,74,000

(7) Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.

(8) Examination Expenses has been apportion taking number of students and number examinations into account.



RTP NOV 18

Sanziet Lifecare Ltd. operates in life insurance business. Last year it has launched a new term insurance policy for practicing professionals 'Professionals Protection Plus'. The company has incurred the following expenditures during the last year for the policy:

Policy development cost	₹11,25,000
Cost of marketing of the policy	₹45,20,000
Sales support expenses	₹11,45,000
Policy issuance cost	₹10,05,900
Policy servicing cost	₹35,20,700



Claims management cost	₹1,25,600
IT cost	₹74,32,000
Postage and logistics	₹10,25,000
Facilities cost	₹15,24,000
Employees cost	₹ 5,60,000
Office administration cost	₹16,20,400

Number of policy sold - 528

Total insured value of policies - ₹1,320 crore

Required:

- CALCULATE total cost for Professionals Protection Plus' policy segregating the costs into four main activities namely (a) Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.
- CALCULATE cost per policy.
- CALCULATE cost per rupee of insured value.

ANSWER :

- Calculation of total cost for 'Professionals Protect Plus' policy

	Particulars	Amount (₹)	Amount (₹)
1.	Marketing and Sales support:		
	- Policy development cost	11,25,000	
	- Cost of marketing	45,20,000	
	- Sales support expenses	11,45,000	67,90,000
2.	Operations:		
	- Policy issuance cost	10,05,900	
	- Policy servicing cost	35,20,700	
	- Claims management cost	1,25,600	46,52,200
3.	IT Cost		74,32,000
4.	Support functions		
	- Postage and logistics	10,25,000	
	- Facilities cost	15,24,000	
	- Employees cost	5,60,000	
	- Office administration cost	16,20,400	47,29,400
	Total Cost		2,36,03,600

- Calculation of cost per policy = $\frac{\text{Total cost}}{\text{No. of policies}} = \frac{₹2,36,03,600}{528} = ₹44,703.79$

- Cost per rupee of insured value = $\frac{\text{Total cost}}{\text{Total insured value}} = \frac{₹2.36 \text{ crore}}{₹1,320 \text{ crore}} = ₹0.0018$



RTP MAY 19

A company runs a holiday home. For this purpose, it has hired a building at a rent of ₹10,00,000 per month alongwith 5% of total taking. It has three types of suites for its customers, viz., single room, double rooms and triple rooms.

Following information is given:



Type of suite	Number	Occupancy percentage
Single room	100	100%
Double rooms	50	80%
Triple rooms	30	60%

The rent of double rooms suite is to be fixed at 2.5 times of the single room suite and that of triple rooms suite as twice of the double rooms suite.

The other expenses for the year 20X9 are as follows:

	(₹)
Staff salaries	14,25,00,000
Room attendants' wages	4,50,00,000
Lighting, heating and power	2,15,00,000
Repairs and renovation	1,23,50,000
Laundry charges	80,50,000
Interior decoration	74,00,000
Sundries	1,53,00,000

Provide profit @ 20% on total taking and assume 360 days in a year.

You are required to CALCULATE the rent to be charged for each type of suite.

ANSWER :

(i) Total equivalent single room suites

Nature of suite	Occupancy (Room-days)	Equivalent single room suites (Room-days)
Single room suites	36,000 (100 rooms 360 days 100%)	36,000 (36,000 1)
Double rooms suites	14,400 (50 rooms 360 days 80%)	36,000 (14,400 2.5)
Triple rooms suites	6,480 (30 rooms 360 days 60%)	32,400 (6,480 x 5)
		1,04,400

(ii) Statement of total cost:

	(₹)
Staff salaries	14,25,00,000
Room attendant's wages	4,50,00,000
Lighting, heating and power	2,15,00,000
Repairs and renovation	1,23,50,000
Laundry charges	80,50,000
Interior decoration	74,00,000
Sundries	1,53,00,000
	25,21,00,000
Building rent {(₹10,00,000 12 months) + 5% on total taking}	1,20,00,000 + 5% on total takings
Total cost	26,41,00,000 + 5% on total takings

Profit is 20% of total takings

Total takings = ₹ 26,41,00,000 + 25% (5% + 20%) of total takings

Let x be rent for single room suite



$$\begin{aligned} \text{Then } 1,04,400 \times &= 26,41,00,000 + 0.25 \times 1,04,400 \times \\ \text{Or, } 1,04,400 \times &= 26,41,00,000 + 26,100 \times \\ \text{Or, } 78,300 \times &= 26,41,00,000 \\ \text{Or, } x &= 3,373 \end{aligned}$$

(iii) Rent to be charged for single room suite = ₹ 3,373

Rent for double rooms suites ₹ 3,373 2.5 = ₹ 8,432.5

Rent for triple rooms suites ₹ 3,373 5 = ₹ 16,865

**RTP NOV 19**

A transport company has a fleet of four trucks of 10 tonne capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	One way Distance Km	No. of trips per day	Load carried per trip / day tonnes
1	48	4	6
2	120	1	9
3	90	2	8
4	60	4	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under

Year	Total distance travelled	Maintenance Cost ₹
1	1,60,200	1,38,150
2	1,56,700	1,35,525

The following are the details of expenses for the year under review:

Diesel	₹ 60 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	₹ 22,000 per truck per month
Licence and taxes	₹ 15,000 per annum per truck
Insurance	₹ 80,000 per annum for all the four trucks
Purchase Price per truck	₹30,00,000, Life 10 years. Scrap value at the end of life is ₹1,00,000.
Oil and sundries	₹ 525 per 100 km run.
General Overhead	₹ 1,10,840 per annum

The trucks operate 24 days per month on an average.

Required

- PREPARE an Annual Cost Statement covering the fleet of four trucks.
- CALCULATE the cost per km. run.
- DETERMINE the freight rate per tonne km. to yield a profit of 30% on freight.

ANSWER :

(i) Annual Cost Statement of four vehicles

	(₹)
Diesel {(4,21,632 km. ÷ 4 km) × ₹ 60} (Refer to Working Note 1)	63,24,480
Oil & sundries {(4,21,632 km. ÷ 100 km.) × ₹ 525}	22,13,568
Maintenance {(4,21,632 km. × ₹ 0.75) + ₹ 18,000} (Refer to Working Note 2)	3,34,224



Drivers' salary {(₹22,000 × 12 months) × 4 trucks}	10,56,000
Licence and taxes (₹ 15,000 × 4 trucks)	60,000
Insurance	80,000
Depreciation {(₹29,00,000 ÷ 10 years) × 4 trucks}	11,60,000
General overhead	1,10,840
Total annual cost	1,13,39,112

(ii) Cost per km. run

$$\begin{aligned} \text{Cost per kilometer run} &= \frac{\text{Total annual cost of vehicles}}{\text{Total kilometre travelled annually}} \quad (\text{Refer to Working Note 1}) \\ &= \frac{₹1,13,39,112}{4,21,632 \text{ Kms}} = ₹ 26.89 \end{aligned}$$

(iii) Freight rate per tonne km (to yield a profit of 30% on freight)

$$\begin{aligned} \text{Cost per tonne km.} &= \frac{\text{Total annual cost of three vehicles}}{\text{Total effective tonnes kms. per annum}} \quad (\text{Refer to Working Note 1}) \\ &= \frac{₹1,13,39,112}{16,10,496 \text{ kms}} = ₹ 7.04 \end{aligned}$$

$$\text{Freight rate per tonne km.} \left(\frac{₹7.04}{0.7} \right) \times 1 = ₹ 10.06$$

Working Notes:

1. Total kilometre travelled and tonnes kilometre (load carried) by four trucks in one year

Truck number	One way distance in kms	No. of trips	Total distance covered in km per day	Load carried per trip / day in tonnes	Total effective tonnes km
1	48	4	384	6	1,152
2	120	1	240	9	1,080
3	90	2	360	8	1,440
4	60	4	480	8	1,920
Total			1,464		5,592

Total kilometre travelled by four trucks in one year

$$(1,464 \text{ km.} \times 24 \text{ days} \times 12 \text{ months}) = 4,21,632$$

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

$$(5,592 \text{ tonnes km.} \times 24 \text{ days} \times 12 \text{ months}) = 16,10,496$$

2. Fixed and variable component of maintenance cost:

$$\begin{aligned} \text{Variable maintenance cost per km} &= \frac{\text{Difference in maintenance cost}}{\text{Difference in distance travelled}} \\ &= \frac{₹ 1,38,150 - ₹ 1,35,525}{1,60,200 \text{ kms} - 1,56,700 \text{ kms}} \\ &= ₹ 0.75 \end{aligned}$$

$$\begin{aligned} \text{Fixed maintenance cost} &= \text{Total maintenance cost} - \text{Variable maintenance cost} \\ &= ₹1,38,150 - 1,60,200 \text{ kms} \times ₹ 0.75 = ₹ 18,000 \end{aligned}$$

**RTP MAY 20**

AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

	Amount (₹)
Teachers' salary (15 teachers × ₹35,000 × 12 months)	63,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × ₹15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × ₹10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

Other information:

(i)

	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840
Lab classes in a year	0	0	144	156
No. of examinations in a year	2	2	2	2
Time spent at library per student per year	180 hours	120 hours	240 hours	60 hours
Time spent by principal for administration	208 hours	312 hours	480 hours	1,400 hours
Teachers for 11 & 12 standard	4	5	6	-

- (ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.
- (iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.
- (iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section.
- (v) All school students irrespective of section and age participate in annual functions and sports activities.

Requirement:

- (a) CALCULATE cost per student per annum for all three streams.
- (b) If the management decides to take uniform fee of ₹ 1,000 per month from all higher secondary students, CALCULATE stream wise profitability.
- (c) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively.

**ANSWER :**

Calculation of Cost per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
Re-apportionment of Economics & Mathematics teachers' salary (W.N- 2)	(84,000)	1,45,091	(61,091)	-
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600
Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200
Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administration expenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000
Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

(a) Calculation of cost per student per annum

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student per annum	17,397	9,533	19,238	13,610

(b) Calculation of profitability

Particulars	Arts (₹)	Commerce (₹)	Science (₹)	Total (₹)
Total Fees per annum	12,000	12,000	12,000	
Cost per student per annum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

(c) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts (₹)	Commerce (₹)	Science (₹)
Cost per student per annum	17,397	9,533	19,238
Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764



Working Notes:

(1) Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (₹)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

(2) Re-apportionment of Economics and Mathematics teachers' salary

Particulars	Economics		Mathematics	
	Arts	Commerce	Science	Commerce
No. of classes	832	208	940	160
Salary re-apportionment (₹)	(84,000)	84,000	(61,091)	61,091
	$\left(\frac{₹4,20,000}{1,040} \times ₹208 \right)$		$\left(\frac{₹4,20,000}{1,100} \times 160 \right)$	

Total addition to Commerce stream = ₹ 84,000 + ₹ 61,091 = ₹ 1,45,091

- (3) Principal's salary has been apportioned on the basis of time spent by him for administration of classes.
- (4) Lab attendants' salary has been apportioned on the basis of lab classes attended by the students.
- (5) Salary of library staffs are apportioned on the basis of time spent by the students in library.
- (6) Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

	Amount (₹)
Peon dedicated for higher secondary (1 peon × ₹10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × ₹10,000 × 12 months)}	54,000
	1,74,000

- (7) Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.
- (8) Examination Expenses has been apportioned taking number of students and number of examinations into account.



RTP NOV 20

A transport company has 20 vehicles, the capacities are as follows:

No. of Vehicles	Capacity per vehicle
5	9 MT
6	12 MT
7	15 MT
2	20 MT

The company provides the goods transport service between stations 'A' to station 'B'. Distance between these stations is 100 kilometers. Each vehicle makes one round trip per day on an average. Vehicles are loaded with an average of 90 per cent of capacity at the time of departure from station 'A' to station 'B' and at the time of return back loaded with 70 per cent of capacity.



10 per cent of vehicles are laid up for repairs every day. The following information is related to the month of August, 2020:

Salary of Transport Manager	₹ 60,000
Salary of 30 drivers	₹ 20,000 each driver
Wages of 25 Helpers	₹ 12,000 each helper
Loading and unloading charges	₹ 850 each trip
Consumable stores (depends on running of vehicles)	₹ 1,35,000
Insurance (Annual)	₹ 8,40,000
Road Licence (Annual)	₹ 6,00,000
Cost of Diesel per litre	₹ 78
Kilometres run per litre each vehicle	5 Km.
Lubricant, Oil etc.	₹ 1,15,000
Cost of replacement of Tyres, Tubes, other parts etc. (on running basis)	₹ 4,25,000
Garage rent (Annual)	₹ 9,00,000
Routine mechanical services	₹ 3,00,000
Electricity charges (for office, garage and washing station)	₹ 55,000
Depreciation of vehicles (on time basis)	₹ 6,00,000

There is a workshop attached to transport department which repairs these vehicles and other vehicles also. 40 per cent of transport manager's salary is debited to the workshop. The transport department has been apportioned ₹88,000 by the workshop during the month. During the month operation was for 25 days.

You are required:

- CALCULATE per ton-km operating cost.
- DETERMINE the freight to be charged per ton-km, if the company earned a profit of 25 per cent on freight.

ANSWER :

- Operating Cost Sheet for the month of August, 2020

	Particulars	Amount (₹)
A.	Fixed Charges:	
	Manager's salary (₹60,000 × 60%)	36,000
	Drivers' Salary (₹20,000 30 drivers)	6,00,000
	Helpers' wages (₹12,000 25 helpers)	3,00,000
	Insurance (₹8,40,000 ÷ 12 months)	70,000
	Road licence (₹6,00,000 ÷ 12 months)	50,000
	Garage rent (₹9,00,000 ÷ 12 months)	75,000
	Routine mechanical services	3,00,000
	Electricity charges (for office, garage and washing station)	55,000
	Depreciation of vehicles	6,00,000
	Apportioned workshop expenses	88,000
	Total (A)	21,74,000
B.	Variable Charges:	
	Loading and unloading charges (Working Note 1)	7,65,000
	Consumable Stores	1,35,000



		Cost of diesel (Working Note 2)	14,04,000
		Lubricant, Oil etc.	1,15,000
		Replacement of Tyres, Tubes & other parts	4,25,000
		Total (B)	28,44,000
	C.	Total Cost (A + B)	50,18,000
	D.	Total Ton-Kms. (Working Note 3)	9,43,200
	E.	Cost per ton-km. (C ÷ D)	5.32

(ii) Calculation of Chargeable Freight

Cost per ton-km.	₹ 5.32
Add: Profit @ 25% on freight or 33% on cost	₹ 1.77
Chargeable freight per ton-km.	₹ 7.09

Working Notes:

1. Wages paid to loading and unloading labours

Numbers of vehicles available per day × No. of days × trips × wages per trip
 $(20 \text{ vehicles} \times 90\%) \times 25 \text{ days} \times 2 \text{ trips} \times ₹850$
 $18 \times 25 \times 2 \times 850 = ₹7,65,000$

2. Cost of Diesel:

Distance covered by each vehicle during August, 2020
 $= 100 \text{ k.m.} \times 2 \times 25 \text{ days} \times 90\% = 4,500 \text{ km.}$

Consumption of diesel = $\frac{4,500 \text{ k.m.} \times 20 \text{ vehicles}}{5 \text{ k.m.}}$ = 18,000 litres.

Cost of diesel = 18,000 litres ₹ 78 = ₹14,04,000

3. Calculation of total ton-km:

Total Ton-Km. = Total Capacity Distance covered by each vehicle × Average Capacity Utilisation ratio.

$= [(5 \times 9 \text{ MT}) + (6 \times 12 \text{ MT}) + (7 \times 15 \text{ MT}) + (2 \times 20 \text{ MT})] \times 4,500 \text{ k.m.} \times \frac{(90\% + 70\%)}{2}$

$= (45 + 72 + 105 + 40) \times 4,500 \text{ k.m} \times 80\%$

$= 262 \times 4,500 \times 80\%$

$= 9,43,200 \text{ ton-km.}$



RTP MAY 21

VPS is a public school having 25 buses each plying in different directions for the transport of its school students. In view of large number of students availing of the bus service, the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The workload of the students has been so arranged that in the morning, the first trip picks up senior students and the second trip plying an hour later picks up junior students. Similarly, in the afternoon, the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus, one way is 8 km. The school works 22 days in a month and remains closed for vacation in May and June. The bus fee, however, is payable by the students for all the 12 months in a year.



The details of expenses for a year are as under:

Driver's salary – payable for all the 12 in months	₹ 12,000 per month per driver
Cleaner's salary payable for all the 12 months	₹ 8,000 per month per cleaner
License fees, taxes etc.	₹ 8,400 per bus per annum
Insurance Premium	₹ 15,600 per bus per annum
Repairs and Maintenance	₹ 20,500 per bus per annum
Purchase price of the bus	₹ 20,00,000 each
Life of the bus	16 years
Scrap value	₹ 1,60,000
Diesel Cost	₹ 78.50 per litre

Each bus gives an average of 5 km. per litre of diesel. The seating capacity of each bus is 40 students.

The school follows differential transportation fees based on distance travelled as under:

Students picked up and dropped within the range of distance from the school	Transportation fee	Percentage of students availing this facility
2 km.	25% of Full	15%
4 km.	50% of Full	30%
8 km.	Full	55%

Due to a pandemic, lockdown imposed on schools and the school remained closed from April 2020 to December 2020. Drivers and cleaners were paid 75% of their salary during the lockdown period. Repairing cost reduced to 75% for the year 2020.

Ignore the interest cost. Required:

- PREPARE a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.
- FIND OUT transportation fee per student per month in respect of:
 - Students coming from a distance of upto 2 km. from the school.
 - Students coming from a distance of upto 4 km. from the school; and
 - Students coming from a distance of upto 8 km. from the school.
- CALCULATE the minimum bus fare that has to be recovered from the students for the year 2020.

ANSWER :

- Statement showing the expenses of operating a single bus and the fleet of 25 buses for a year

Particulars	Per bus per annum (₹)	Fleet of 25 buses per annum (₹)
Running costs : (A)		
Diesel (Refer to working note 1)		
Repairs & maintenance costs: (B)	2,21,056	55,26,400
Fixed charges:	20,500	5,12,500
Fixed charges:		
Driver's salary		
(₹ 12,000 × 12 months)	1,44,000	36,00,000
Cleaners salary	96,000	24,00,000
(₹ 8,000 × 12 months)		



Licence fee, taxes etc.	8,400	2,10,000
Insurance	15,600	3,90,000
Depreciation $\left(\frac{\text{₹ } 20,00,000 - \text{₹ } 1,60,000}{16 \text{ years}} \right)$	1,15,000	28,75,000
Total fixed charges: (C)	3,79,000	94,75,000
Total expenses: (A+B+C)	6,20,556	1,55,13,900

(ii) Average cost per student per month in respect of students coming from a distance of:

Particulars	Amount (₹)
(a) 2 km. from the school {₹ 6,20,556 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 219.12
(b) 4 km. from the school (₹ 219.12 × 2)	₹ 438.24
(c) 8 km. from the school (₹ 219.12 × 4)	₹ 876.48

(iii) Calculation of minimum bus fare to be recovered from the students during the year 2020:
Statement showing the expenses of operating a single bus in year 2020

Particulars	Per bus per annum (₹)
Running costs : (A)	
Diesel (Refer to working note 3)	66,316.80
Repairs & maintenance costs: (B) (₹ 20,500 × 0.75)	15,375
Fixed charges:	
Driver's salary {₹ 12,000 × 3 months + (75% of ₹ 12,000 × 9 months)}	1,17,000
Cleaners salary {₹ 8,000 × 3 months + (75% of ₹ 8,000 × 9 months)}	78,000
Licence fee, taxes etc.	8,400
Insurance	15,600
Depreciation $\left(\frac{\text{₹ } 20,00,000 - \text{₹ } 1,60,000}{16 \text{ years}} \right)$	
Total fixed charges: (C)	3,34,000
Total expenses: (A+B+C)	4,15,691.80

Minimum bus fare to be recovered:

(a) 2 km. from the school {₹ 4,15,691.8 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 146.78
(b) 4 km. from the school (₹ 146.78 × 2)	₹ 293.56
(c) 8 km. from the school (₹ 146.78 × 4)	₹ 587.12

Working Notes:

1. Calculation of diesel cost per bus:

No. of trips made by a bus each day	4
Distance travelled in one trip both ways (8 km. × 2 trips)	16 km.
Distance travelled per day by a bus (16 km. × 4 shifts)	64 km.



Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled per year (1,408 × 10 months)	14,080 km.
No. of litres of diesel required per bus per year (14,080 km. ÷ 5 km.)	2,816 litres
Cost of diesel per bus per year (2,816 litres × ₹ 78.50)	₹ 2,21,056

2. Calculation of equivalent number of students per bus:

Bus capacity of 2 trips (40 students × 2 trips)	80 students
1/4th fare students (15% × 80 students)	12 students
½ fare students (30% × 80 students × 2) (equivalent to 1/4th fare students)	48 students
Full fare students (55% × 80 students × 4) (equivalent to 1/4th fare students)	176 students
Total students equivalent to 1/4th fare students	236 students

3. Calculation of diesel cost per bus in Year 2020:

Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled during the year 2020 (1,408 × 3 months)	4,224 km.
No. of litres of diesel required per bus per year (4,224 km. ÷ 5 km.)	844.8 litres
Cost of diesel per bus per year (844.8 litres × ₹ 78.50)	₹ 66,316.80

**RTP NOV 21**

Mr. PS owns a bus which runs according to the following schedule:

(i)	Delhi to Hisar and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	9
	Seating capacity occupied	90%.
(ii)	Delhi to Aligarh and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	12
	Seating capacity occupied	95%
(iii)	Delhi to Alwar and back, the same day	
	Distance covered:	170 km. one way
	Number of days run each month:	6
	Seating capacity occupied	100%
(iv)	Following are the other details:	
	Cost of the bus	₹ 15,00,000
	Salary of the Driver	₹ 30,000 p.m.
	Salary of the Conductor	₹ 26,000 p.m.
	Salary of the part-time Accountant	₹ 7,000 p.m.
	Insurance of the bus	₹ 6,000 p.a.
	Diesel consumption 5 km. per litre at	₹ 90 per litre
	Road tax	₹ 21,912 p.a.
	Lubricant oil	₹ 30 per 100 km.
	Permit fee	₹ 500 p.m.



Repairs and maintenance

₹ 5,000 p.m.

Depreciation of the bus

@ 30% p.a.

Seating capacity of the bus

50 persons

Passenger tax is 20% of the total takings.

CALCULATE the bus fare to be charged from each passenger to earn a profit of 30% on total takings.

The fares are to be indicated per passenger for the journeys: (i) Delhi to Hisar (ii) Delhi to Aligarh and (iii) Delhi to Alwar.

ANSWER :

Working Notes:

1. Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Hisar	160	2	9	2,880
Delhi to Aligarh	160	2	12	3,840
Delhi to Alwar	170	2	6	2,040
Total				8,760

2. Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger- Km. per month
		(%)	Seats		
Delhi to Hisar & Back	900 (50 seats 2 trips 9 days)	90	810	160	1,29,600 (810 seats × 160 km.)
Delhi to Aligarh & Back	1,200 (50 seats 2 trips 12 days)	95	1,140	160	1,82,400 (1,140 seats × 160 km.)
Delhi to Alwar & Back	600 (50 seats 2 trips 6 days)	100	600	170	1,02,000 (600 seats × 170 km.)
Total					4,14,000

Monthly Operating Cost Statement

Particulars	(₹)	(₹)
(i) Running Costs		
Diesel {(8,760 km ÷ 5 km) ₹ 90}	1,57,680.00	
Lubricant oil {(8,760 km ÷ 100) ₹ 30}	2,628.00	1,60,308.00
(ii) Maintenance Costs		
Repairs & Maintenance		
(iii) Standing charges		
Salary to driver	30,000.00	
Salary to conductor	26,000.00	
Salary of part-time accountant	7,000.00	



Insurance (₹ 6,000 ÷ 12)	500.00	
Road tax (₹ 21,912 ÷ 12)	1,826.00	
Permit fee	500.00	
Depreciation {(₹ 15,00,000 30%) 12}	37,500.00	1,03,326.00
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,68,634.00
Passenger Tax*		1,07,453.60
Total Cost		3,76,087.60
Add: Profit*		1,61,180.40
Total takings per month		5,37,268.00

*Let total takings be X then,

X = Total costs per month before passenger tax + 0.2 X (passenger tax) + 0.3 X (profit)

X = ₹ 2,68,634 + 0.2 X + 0.3 X

0.5 X = ₹ 2,68,634 or, X = ₹ 5,37,268

Passenger Tax = 20% of ₹ 5,37,268 = ₹ 1,07,453.60

Profit = 30% of ₹ 5,37,268 = ₹ 1,61,180.40

Calculation of Rate per passenger km. and fares to be charged for different routes

Rate per Passenger-Km. = $\frac{\text{Total takings per month}}{\text{Total Passenger - Km. per month}}$
 = $\frac{\text{₹ 5,37,268}}{4,14,000 \text{ Passenger-Km.}}$ = ₹ 1.30 (approx.)

Bus fare to be charged per passenger:

Delhi to Hisar	=	₹ 1.30 160 km	=	₹ 208.00
Delhi to Aligarh	=	₹ 1.30 160 km	=	₹ 208.00
Delhi to Alwar	=	₹ 1.30 170 km	=	₹ 221.00



RTP MAY 22

Navya LMV Pvt. Ltd, operates cab/ car rental service in Delhi/NCR. It provides its service to the offices of Noida, Gurugram and Faridabad. At present it operates CNG fuelled cars but it is also considering to upgrade these into Electric vehicle (EV). The details related with the owning of CNG & EV propelled cars are as tabulated below:

Particulars	CNG Car	EV Car
Car purchase price (₹)	9,20,000	15,20,000
Govt. subsidy on purchase of car (₹)	--	1,50,000
Life of the car	15 years	10 years
Residual value (₹)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (₹)	60	--
Power cost per Kwh (₹)	--	7.60
Annual Maintenance cost (₹)	8,000	5,200
Annual insurance cost (₹)	7,600	14,600
Tyre replacement cost in every 5 -year (₹)	16,000	16,000
Battery replacement cost in every 8- year (₹)	12,000	5,40,000



Apart from the above, the following are the additional information:

Particulars	
Average distance covered by a car in a month	1,500 km
Driver's salary (₹)	20,000 p.m
Garage rent per car (₹)	4,500 p.m
Share of Office & Administration cost per car (₹)	1,500 p.m

Required:

CALCULATE the operating cost of vehicle per month per car for both CNG & EV options.

ANSWER :

Working Notes:

1. Calculation of Depreciation per month:

	Particulars	CNG Car	EV Car
A	Car purchase price (₹)	9,20,000	15,20,000
B	Less: Govt. subsidy (₹)	--	(1,50,000)
C	Less: Residual value (₹)	(95,000)	(1,70,000)
D	Depreciable value of car (₹) [A-B-C]	8,25,000	12,00,000
E	Life of the car	15 years	10 years
F	Annual depreciation (₹) [D÷E]	55,000	1,20,000
G	Depreciation per month (₹) [F÷12]	4,583.33	10,000

2. Fuel/ Electricity consumption cost per month:

	Particulars	CNG Car	EV Car
A	Average distance covered in a month (KM)	1,500	1,500
B	Mileage (KM)	20	240
C	Qty. of CNG/ Full charge required [A÷B]	75 kg.	6.25
D	Electricity Consumption [C×30kwh]	-	187.5
E	Cost of CNG per kg (₹)	60	-
F	Power cost per Kwh (₹)	-	7.60
G	CNG Cost per month (₹) [C×E]	4,500	-
H	Power cost per month (₹) [D×F]	-	1,425

3. Amortised cost of Tyre replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	5 years	5 years
C	No. of time replacement required	2 times	1 time
D	Cost of tyres for each replacement (₹)	16,000	16,000
E	Total replacement cost (₹) [C×D]	32,000	16,000
F	Amortised cost per year (₹) [E÷A]	2,133.33	1,600
E	Cost per month (₹) [F÷12]	177.78	133.33



4. Amortised cost of Battery replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	8 years	8 years
C	No. of time replacement required	1 time	1 time
D	Cost of battery for each replacement (₹)	12,000	5,40,000
E	Total replacement cost (₹) [C×D]	12,000	5,40,000
F	Amortised cost per year (₹) [E÷A]	800	54,000
E	Cost per month (₹) [F÷12]	66.67	4,500

Calculation of Operating cost per month:

	Particulars	CNG Car (₹)	EV Car (₹)
A	Running cost:		
	Fuel cost/ Power consumption cost [Refer WN-2]	4,500	1,425
B	Maintenance cost:		
	Annual Maintenance cost [Annual cost ÷ 12]	666.67	433.33
	Annual Insurance cost [Annual cost ÷ 12]	633.33	1,216.67
	Amortised cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortised cost of Battery replacement [Refer WN-4]	66.67	4,500
		1,544.45	6,283.33
C	Fixed cost:		
	Depreciation [Refer WN-1]	4,583.33	10,000
	Driver's salary	20,000	20,000
	Garage rent	4,500	4,500
	Share of Office & Administration cost	1,500	1,500
		30,583.33	36,000
D	Operating cost per month [A+B+C]	36,627.78	43,708.33



RTP NOV 22

Royal Transport Services runs fleet of buses within the limits of Jaipur city. The following are the details which were incurred by the company during October, 2021:

	(₹)
Cost of each Bus	24,00,000
Garage Rent	1,00,000
Insurance	25,000
Road tax	20,000
Manager's Salary	60,000
Assistant's Salary (Two)	32,000 each
Supervisor's Salary (Three)	24,000 each
Driver's Salary (Twenty-Five)	20,000 each
Cleaner's Salary (Twenty)	5,000 each
Office Staff's Salary	1,00,000
Consumables	1,20,000
Repairs & Maintenance	90,000



Other Fixed Expenses	72,000
Diesel (10 Kms per Litre)	80 per litre
Oils & Lubricants	1,45,000
Tyres and tubes	35,000

Depreciation 10% p.a. on Cost Other details are as below:

	Capacity
12 Buses	60 Passengers
13 Buses	50 Passengers

Each bus makes 4 round trips a day covering a distance of 10 Kilometers in each trip (One Way) on an average. During the trips 80% of the seats are occupied. The annual records show that 5 buses are generally required to be kept away from roads each day for repairs.

You are required to CALCULATE cost per passenger-km. Cost sheet to be prepared on the basis of 25 buses.

ANSWER :

Operating Cost Sheet

Particulars	Amount (₹)	Amount (₹)
Standing Charges:		
Depreciation (₹ 24,00,000 X 10% X 1/12 X 25)	5,00,000	
Garage Rent	1,00,000	
Insurance	25,000	
Road Tax	20,000	
Manager's Salary	60,000	
Assistant's Salary (₹ 32,000 X 2)	64,000	
Supervisor's Salary (₹ 24,000 X 3)	72,000	
Driver's Salary (₹ 20,000 X 25)	5,00,000	
Cleaner's Salary (₹ 5,000 X 20)	1,00,000	
Office Staff's Salary	1,00,000	
Consumables	1,20,000	
Repairs & Maintenance	90,000	
Other Fixed Expenses	72,000	18,23,000
Running Charges		
Diesel (49,600 Kms / 10 Kms X ₹ 80 per unit)	3,96,800	
Oils & Lubricants	1,45,000	
Tyres and tubes	35,000	5,76,800
Total Operating Cost		23,99,800

$$\begin{aligned}
 \text{Cost per passenger-km} &= \frac{\text{Total Operating Cost}}{\text{Passenger -kms}} \\
 &= \frac{23,99,800}{27,18,080} \\
 &= 0.883
 \end{aligned}$$



Working Note:

Calculation of Total Kilometers and Passenger Kilometers

Specification	Total Km.	Passenger-Km.
12 Buses (60 Passengers)	29,760 Kms (10 Kms × 4 X 2 trips × 31 days × 12 Buses)	14,28,480 (29760 Kms × 60 Pass. × 80%)
13 Buses (50 Passengers)	32,240 Kms (10 Kms × 4 X 2 trips × 31 days × 13 Buses)	12,89,600 (32240 Kms × 50 Pass. × 80%)
Total	62,000	27,18,080

Since 5 buses out of 25 buses are kept for repairs every day

Actual total Km. $62,000 \times 20/25 = 49,600$



RTP MAY 23

PREPARE cost statement of Panipat Thermal Power Station showing the cost of electricity generated per kwh, from the following data.

Total units generated	16,50,000 kWh
	(₹)
Operating labour	21,75,000
Repairs & maintenance	7,25,000
Lubricants, spares and stores	5,80,000
Plant supervision	4,35,000
Administration overheads	29,00,000
Insurance Charges	15,00,000
Fuel Charges	8,00,000

7 kWh. of electricity generated per kg. of coal consumed @ ₹4.75 per kg. Depreciation charges @ 5% on capital cost of ₹3,10,00,000.

ANSWER :

Total units generated 16,50,000 kWh.

Cost Statement of Panipat Thermal Power Station

	Per annum (₹)	Per kWh. (₹)
Fixed costs:		
Plant supervision	4,35,000	
Administration overheads	29,00,000	
Insurance Charges	15,00,000	
Depreciation (5% of ₹ 3,10,00,000 p.a.)	15,50,000	
Total fixed cost: (A)	63,85,000	3.87
Variable costs:		
Operating labour	21,75,000	
Fuel Charges	8,00,000	
Lubricants, spares and stores	5,80,000	
Repairs & maintenance	7,25,000	
Coal cost (Refer to working note)	11,19,643	
Total variable cost: (B)	53,99,643	3.27
Total cost [(A) + (B)]	1,17,84,643	7.14



Working Note:

Coal cost (16,50,000 kWh. ÷ 7 kWh) × ₹4.75 per kg. = ₹11,19,643



RTP NOV 23

P Holiday Resorts offers three types of rooms to its guests, viz deluxe room, super deluxe room and luxury suite. You are required to ascertain the tariff to be charged to the customers for different types of rooms on the basis of following information:

Types of Room	Number of Rooms	Occupancy
Deluxe Room	100	90%
Super Deluxe Room	60	75%
Luxury Suite	40	60%

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and that of 'luxury suite' is 3 times of 'deluxe room'. Annual expenses are as follows:

Particulars	Amount (₹ lakhs)
Staff salaries	680.00
Lighting, Heating and Power	300.00
Repairs, Maintenance and Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior decoration	75.00
Sundries	30.28

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

ANSWER :

Operating cost statement of P Holiday Resorts

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

**Computation of profit:**

Let ₹ x be the rent for deluxe from.

Equivalent deluxe room days are 90,720 (Refer WN-2)

Total takings = ₹ 90,720x

Profit is 25% of total takings.

Profit = 25% of ₹ 90,720x = ₹ 22,680x

Total takings = Total Cost + Profit

₹ 90,720x = ₹ 16,66,98,000 + ₹ 22,680x

₹ 90,720x - ₹ 22,680x = ₹ 16,66,98,000

₹ 68,040x = ₹ 16,66,98,000

X = $\frac{₹ 16,66,98,000}{₹ 68,040} = ₹ 2,450$

Rent to be charged for deluxe room	₹ 2,450
Rent to be charged for super deluxe room =	₹ 4,900
Rent of deluxe room x 2 = ₹ 2,450 x 2	
Rent to be charged for luxury suite =	₹ 7,350
Rent of Deluxe room x 3 = ₹ 2,450 x 3	

Working Notes:**1. Computation of Room Occupancy**

Type of Room	No. of rooms x no. of days x occupancy %	Room days
Deluxe Room	100 rooms x 360 days x 90% occupancy	32,400
Super Deluxe Room	60 rooms x 360 days x 75% occupancy	16,200
Luxury Suite	40 x 360 days x 60% occupancy	8,640
	Total	57,240

2. Computation of equivalent deluxe room days

Rent of 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and luxury suite is 3 times of 'deluxe room'. Therefore, equivalent room days would be:

Type of Room	Room days	Equivalent deluxe room days
Deluxe Room	32,400 x 1	32,400
Super Deluxe Room	16,200 x 2	32,400
Luxury Suite	8,640 x 3	25,920
	Total	90,720

3. Computation of room attendant's wages:

Room occupancy days @ ₹ 500 per day

= 57,240 days x ₹ 500 per day = ₹ 2,86,20,000

4. Computation of Depreciation per annum:

Particulars	Cost (₹)	Rate of Depreciation	Depreciation (₹)
Building	900,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

**RTP MAY 24**

A LMV Pvt. Ltd, operates cab/ car rental service in Delhi/NCR. It provides its service to the offices of Noida, Gurugram and Faridabad. At present it operates CNG fuelled cars but it is also considering to upgrade these into Electric vehicle (EV). The following details related with the owning of CNG & EV propelled cars are as tabulated below:

Particulars	CNG Car	EV Car
Car purchase price (₹)	9,20,000	15,20,000
Govt. subsidy on purchase of car (₹)	--	1,50,000
Life of the car	15 years	10 years
Residual value (₹)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (₹)	60	--
Power cost per Kwh (₹)	--	7.60
Annual Maintenance cost (₹)	8,000	5,200
Annual insurance cost (₹)	7,600	14,600
Tyre replacement cost in every 5 - year (₹)	16,000	16,000
Battery replacement cost in every 8- year (₹)	12,000	5,40,000

Apart from the above, the following are the additional information:

Particulars	
Average distance covered by a car in a month	1,500 km
Driver's salary (₹)	20,000 p.m
Garage rent per car (₹)	4,500 p.m
Share of Office & Administration cost per car (₹)	1,500 p.m

You have been approached by the management of A LMV Pvt. Ltd. for consultation on the two options of operating the cab service.

CALCULATE the operating cost of vehicle per month per car for both CNG & EV options.

ANSWER :

Workings:

1. Calculation of Depreciation per month:

	Particulars	CNG Car	EV Car
A	Car purchase price (₹)	9,20,000	15,20,000
B	Less: Govt. subsidy (₹)	--	(1,50,000)
C	Less: Residual value (₹)	(95,000)	(1,70,000)
D	Depreciable value of car (₹) [A-B-C]	8,25,000	12,00,000
E	Life of the car	15 years	10 years
F	Annual depreciation (₹) [D÷E]	55,000	1,20,000
G	Depreciation per month (₹) [F÷12]	4,583.33	10,000

2. Fuel/ Electricity consumption cost per month:

	Particulars	CNG Car	EV Car
A	Average distance covered in a month (KM)	1,500	1,500
B	Mileage (KM)	20	240
C	Qty. of CNG/ Full charge required [A÷B]	75 kg.	6.25



D	Electricity Consumption [C×30kwh]	-	187.5
E	Cost of CNG per kg (₹)	60	-
F	Power cost per Kwh (₹)	-	7.60
G	CNG Cost per month (₹) [C×E]	4,500	-
H	Power cost per month (₹) [D×F]	-	1,425

3. Amortised cost of Tyre replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	5 years	5 years
C	No. of time replacement required	2 times	1 time
D	Cost of tyres for each replacement (₹)	16,000	16,000
E	Total replacement cost (₹) [C×D]	32,000	16,000
F	Amortised cost per year (₹) [E÷A]	2,133.33	1,600
E	Cost per month (₹) [F÷12]	177.78	133.33

4. Amortised cost of Battery replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	8 years	8 years
C	No. of time replacement required	1 time	1 time
D	Cost of battery for each replacement (₹)	12,000	5,40,000
E	Total replacement cost (₹) [C×D]	12,000	5,40,000
F	Amortised cost per year (₹) [E÷A]	800	54,000
E	Cost per month (₹) [F÷12]	66.67	4,500

Calculation of Operating cost per month

	Particulars	CNG Car (₹)	EV Car (₹)
A	Running cost:		
	Fuel cost/ Power consumption cost [Refer WN-2]	4,500	1,425
B	Maintenance cost:		
	Annual Maintenance cost [Annual cost ÷ 12]	666.67	433.33
	Annual Insurance cost [Annual cost ÷ 12]	633.33	1,216.67
	Amortised cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortised cost of Battery replacement [Refer WN-4]	66.67	4,500
		1,544.45	6,283.33
C	Fixed cost:		
	Depreciation [Refer WN-1]	4,583.33	10,000
	Driver's salary	20,000	20,000
	Garage rent	4,500	4,500
	Share of Office & Administration cost	1,500	1,500
		30,583.33	36,000
D	Operating cost per month [A+B+C]	36,627.78	43,708.33



13

STANDARD COSTING

**QUESTION 1. (ILLUSTRATION 1)**

The standard and actual figures of product 'Z' are as under:

	Standard	Actual
Material quantity	50 units	45 units
Material price per unit	₹ 1.00	₹ 0.80

CALCULATE material cost variances.

ANSWER :

The variances may be calculated as under:

(a) Standard cost	=	Std. Qty × Std. price = 50 units × ₹1.00 = ₹50
(b) Actual cost	=	Actual qty. × Actual price = 45 units × ₹0.80 = ₹ 36

Variances:

(i) Price variance	=	Actual qty (Std. price – Actual price)
	=	45 units (₹1.00 – ₹0.80) = ₹ 9 (F)
(ii) Usage variance	=	Std. price (Std. qty – Actual qty.)
	=	₹1 (50 units – 45 units) = ₹ 5 (F)
(iii) Material cost variance	=	Standard cost – Actual cost
(Total variance)	=	₹ 50 – ₹ 36 = ₹ 14 (F)

**QUESTION 2. (ILLUSTRATION 2)**

NXE Manufacturing Concern furnishes the following information:

Standard:	Material for 70 kg finished products	100 kg
	Price of material	₹ 1 per kg
Actual:	Output	2,10,000 kg
	Material used	2,80,000 kg
	Cost of Materials	₹ 2,52,000

CALCULATE: (a) Material usage variance, (b) Material price variance, (c) Material cost variance.

ANSWER :

$$\text{Standard Quantity of input for actual output (SQ)} = 2,10,000 \text{ kg} \times \frac{100 \text{ kg}}{70 \text{ kg}}$$

$$= 3,00,000 \text{ kg.}$$

$$\text{Actual Price (AP)} = (\text{₹}2,52,000 \div 2,80,000 \text{ kg}) = \text{₹ } 0.90 \text{ per kg.}$$

$$\begin{aligned} \text{(a) Material Usage Variance} &= (\text{SQ} - \text{AQ}) \times \text{SP} \\ &= (3,00,000 - 2,80,000) \times 1 = \text{₹ } 20,000 \text{ (F)} \end{aligned}$$

$$\begin{aligned} \text{(b) Material Price Variance} &= (\text{SP} - \text{AP}) \times \text{AQ} \\ &= (1 - 0.90) \times 2,80,000 = \text{₹ } 28,000 \text{ (F)} \end{aligned}$$

$$\begin{aligned} \text{(c) Material Cost Variance} &= (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP}) \\ &= (3,00,000 \times 1) - (2,80,000 \times 0.90) \\ &= \text{₹ } 48,000 \text{ (F)} \end{aligned}$$



Check MCV = MPV + MUV
 ₹ 48, 000 (F) = ₹ 28,000 (F) + ₹20, 000 (F)

**QUESTION 3. (ILLUSTRATION 3)**

The standard cost of a chemical mixture is as follows:

40% material A at ₹ 20 per kg

60% material B at ₹ 30 per kg

A standard loss of 10% of input is expected in production. The cost records for a period showed the following usage:

90 kg material A at a cost of ₹ 18 per kg

110 kg material B at a cost of ₹ 34 per kg

The quantity produced was 182 kg of good product.

CALCULATE (a) Material cost variance, (b) Material price variance, (c) Material usage variance.

ANSWER :

Basic Calculation

Material	Standard for 180 kg. output			Actual for 182 kg. output		
	Qty. Kg.	Rate (₹)	Amount (₹)	Qty Kg.	Rate (₹)	Amount (₹)
A	80	20	1,600	90	18	1,620
B	120	30	3,600	110	34	3,740
Total	200		5,200	200		5,360
Less: Loss	20			18		
	180		5,200	182		5,360

Std. cost of actual output = $\frac{₹5,200 \times 182}{180} = ₹ 5, 257.78$

Calculation of Variances

1. Material Cost Variance = (Std. cost of actual output – Actual cost)
 = (5,257.78 – 5,360) = ₹ 102.22 (A)

2. Material Price Variance = (SP – AP) × AQ

Material A = (20 – 18) × 90 = ₹ 180.00 (F)

Material B = (30 – 34) × 110 = ₹ 440.00 (A)

MPV = ₹ 260.00 (A)

3. Material Usage Variance = (Std. Quantity for actual output – Actual Quantity) × Std. Price

Material A = $\left(\frac{80 \times 182}{180} - 90 \right) \times 20 = ₹ 182.22 (A)$

Material B = $\left(\frac{120 \times 182}{180} - 110 \right) \times 30 = ₹ 340.00 (F)$

MUV = ₹ 157.78 (F)

Check MCV ₹ 102.22 (A)

MPV ₹ 260 (A)

MUV ₹ 157.78 (F)

**QUESTION 4. (ILLUSTRATION 4)**

ABC Ltd. produces an article by lending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials:

Material	Standard mix	Standard price (₹ per kg)
A	40%	4
B	60%	3

The standard loss in processing is 15%. During April, the company produced 1,700 kgs. of finished output.

The position of stock and purchases for the month of April are as under:

Material	Stock on 01.04.2021	Stock on 30.04.2021	Purchased during April 2021	
	(Kg.)	(Kg.)	(Kg.)	(₹)
A	35	5	800	3,400
B	40	50	1,200	3,000

Opening stock of material is valued at standard price. CALCULATE the following variances:

- (i) Material price variance
 - (ii) Material usage variance
 - (iii) Material yield variance Material mix variance
- Total Material cost variance

ANSWER :

Types of material	Standard			Actual		
	Qty. (Kg.)	Rate (₹)	Amount (₹)	Qty. (Kg.)	Rate (₹)	Amount (₹)
A	800	4	3,200	35	4	140.00
				795	4.25	3,378.75
B	1200	3	3,600	40	3	120.00
				1,150	2.50	2,875.00
Total	2,000		6,800	2,020		6,513.75

- (i) Material price variance

= Actual qty. (Std. price – Actual price)

Material A: Since the actual price and standard price in respect of 35 kg. of raw materials A are same i.e. ₹ 4, there will be no price variance in respect of this quantity. Price variance will be in respect of only 795 kg. as given below:

= 795 kg. (₹ 4 – ₹ 4.25) = ₹ 198.75 (A)

Material B: For Material B also, price variance will only be in respect of 1,150 kg. as given below:

= 1,150 kg. (₹ 3 – ₹ 2.50) = ₹ 575 (F)

Total = ₹ 198.75 (A) + 575 (F) = ₹ 376.25(F)

- (ii) Material usage variance

= (Std. qty. for actual output – Actual qty.) × Std. price



Material A	$= (800 - 830) \times 4$	$= 120 \text{ (A)}$
Material B	$= (1,200 - 1,190) \times 3$	$= 30 \text{ (F)}$
		$\text{₹ } 90 \text{ (A)}$

(iii) Material yield variance

$$= (\text{Std. qty.} - \text{Revised Std. qty.}) \times \text{Std. Price}$$

$$\text{Material A} = (800 - 808) \times 4 = 32 \text{ (A)}$$

$$\text{Material B} = (1,200 - 1,212) \times 3 = 36 \text{ (A)}$$

$$\text{₹ } 68 \text{ (A)}$$

(iv) Material mix variance

$$= (\text{Revised std. qty.} - \text{Actual qty.}) \times \text{Std. Price}$$

$$\text{Material A} = (808 - 830) \times 4 = 88 \text{ (A)}$$

$$\text{Material B} = (1,212 - 1,190) \times 3 = 66 \text{ (F)}$$

$$\text{₹ } 22 \text{ (A)}$$

Check

$$\text{MUV} = \text{MMV} + \text{MYV}$$

$$90 \text{ (A)} = 22 \text{ (A)} + 68 \text{ (A)}$$

(v) Total material cost variance

$$= \text{Std. cost for actual output} - \text{Actual cost} = 6,800 - 6,513.75 = 286.25 \text{ (F)}$$

Check

$$\text{MCV} = \text{MPV} + \text{MUV}$$

$$286.25 \text{ (F)} = 376.25 \text{ (F)} + 90 \text{ (A)}$$

Working Notes:

1. Standard quantity for actual output

The standard loss being 15%. It means to produce, 1,700 kg. of the article, standard quantity of material required is:

$$= \frac{100}{85} \times 1,700 \text{ kgs.} = 2,000 \text{ kg.}$$

Out of 2,000 kg. of material used, 40% is of type A and 60% is of type B, i.e.,

Standard quantity for actual output for:

$$\text{Material A} = 2,000 \times \frac{40}{100} = 800 \text{ kg.}$$

$$\text{Material B} = 2,000 \times \frac{60}{100} = 1,200 \text{ kg.}$$

2. Actual quantity of material

$$= \text{Opening stock} + \text{Purchases} - \text{Closing stock}$$

$$\text{Material A} = 35 + 800 - 5 = 830 \text{ kg.}$$

$$\text{Material B} = 40 + 1,200 - 50 = 1,190 \text{ kg.}$$

3. Standard cost per unit

$$= \frac{\text{Total standard cost}}{\text{Total standard output of std. mix}}$$

$$= \frac{\text{₹ } 6,800}{1,700 \text{ kg.}} = \text{₹ } 4 \text{ per kg}$$



4. Revised Standard Quantity

$$\text{Material A} = \frac{2,020}{2,000} \times 800 = 808 \text{ kg.}$$

$$\text{Material B} = \frac{2,020}{2,000} \times 1,200 = 1,212 \text{ kg.}$$

**QUESTION 5. (ILLUSTRATION 5)**

The standard and actual figures of a firm are as under

Standard time for the job	1,000 hours
Standard rate per hour	₹ 50
Actual time taken	900 hours
Actual wages paid	₹ 36,000

CALCULATE variances.

ANSWER :

(a) Std. labour cost	(₹)
(1,000 hours × ₹50)	50,000
(b) Actual wages paid	36,000
(c) Actual rate per hour:	₹ 36,000/900 hours = ₹40

Variances

(i) Labour Rate variance	= Actual time (Std. rate – Actual rate)
	= 900 hours (₹50 – ₹40) = ₹9,000 (F)
(ii) Efficiency variance	= Std. rate per hr. (Std. time – Actual time)
	= ₹50 (1,000 hrs. – 900 hrs.) = ₹5,000 (F)
(iii) Total labour cost variance	= Std. labour cost – Actual labour cost
	= {(₹50 × 1,000 hours) – ₹36,000}
	= (₹50,000 – ₹36,000) = ₹14,000 (F)

**QUESTION 6. (ILLUSTRATION 6)**

The standard output of product 'EXE' is 25 units per hour in manufacturing department of a company employing 100 workers. The standard wage rate per labour hour is ₹ 6.

In a 42 hours week, the department produced 1,040 units of 'EXE' despite 5% of the time paid being lost due to an abnormal reason. The hourly wages actually paid were ₹ 6.20, ₹ 6 and ₹ 5.70 respectively to 10, 30 and 60 of the workers. CALCULATE relevant labour variances.

ANSWER :

Working Notes:

- Calculation of standard man hours
When 100 worker works for 1 hr., then the std. output is 25 units.
Std. man hour per unit = $\frac{100 \text{ hrs.}}{25 \text{ units}} = 4 \text{ hrs.}$
- Calculation of std. man hours for actual output
Total std. man hours = 1,040 units × 4 hrs. = 4,160 hrs.



Standard for actual			Actual					
Hours	Rate (₹)	Amount (₹)	No. of workers	Actual hours paid	Idle time hrs.	Production hours	Rate (₹)	Amount paid (₹)
4,160	6	24,960	10	420	21	399	6.20	2,604
			30	1,260	63	1,197	6.00	7,560
			60	2,520	126	2,394	5.70	14,364
4,160	6	24,960	100	4,200	210	3,990		24,528

1. Labour cost variance
= Std. labour cost – Actual labour cost
= 24,960 – 24,528 = ₹ 432 (F)
2. Labour rate variance
= (SR – AR) × AHPaid
= (6 – 6.20) × 420 = 84 (A)
= (6 – 6) × 1260 = NIL
= (6 – 5.70) × 2,520 = 756 (F)
= 672 (F)
3. Labour efficiency variance
= (SH – AH) × SR
= (4,160 – 3,990) × 6 = 1,020 (F)
4. Labour Idle time variance
= Idle Hours × SR
= 210 × 6 = 1,260 (A)

**QUESTION 7. (ILLUSTRATION 7)**

NPX Ltd. uses standard costing system for manufacturing of its product X. Following is the budget data given in relation to labour hours for manufacture of 1 unit of Product X :

Labour	Hours	Rate (₹)
Skilled	2	6
Semi-Skilled	3	4
Un-Skilled	5	3
Total	10	

In the month of January, total 10,000 units were produced following are the details:

Labour	Hours	Rate (₹)	Amount (₹)
Skilled	18,000	7	1,26,000
Semi-Skilled	33,000	3.5	1,15,500
Un-Skilled	58,000	4	2,32,000
Total	1,09,000		4,73,500

Actual Idle hours (abnormal) during the month:

Skilled:	500
Semi-Skilled:	700
Unskilled:	800
Total	2,000

**CALCULATE:**

- (a) Labour Variances.
- (b) Also show the effect on Labour Rate Variance if 5,000 hours of Skilled Labour are paid @ ₹ 5.5 per hour and balance were paid @ ₹ 7 per hour.

ANSWER :**Working Notes:**

	Budget			Standard for actual			Actual		
	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
Skilled	2	6	12	20,000	6	1,20,000	18,000	7	1,26,000
Semi- skilled	3	4	12	30,000	4	1,20,000	33,000	3.5	1,15,500
Unskilled	5	3	15	50,000	3	1,50,000	58,000	4	2,32,000
	10		39	1,00,000		3,90,000	1,09,000		4,73,500

	Idle Hours	Hours worked
Skilled	500	17,500
Semi-skilled	700	32,300
Unskilled	800	57,200
	2,000	1,07,000

(a)

(i) Labour Cost Variance = $(SH \times SR - AH \times AR)$

Skilled	$20,000 \times 6 - 18,000 \times 7$	=	₹ 6,000 (A)
Semi-Skilled	$30,000 \times 4 - 33,000 \times 3.5$	=	₹ 4,500 (F)
Unskilled	$50,000 \times 3 - 58,000 \times 4$	=	₹ 82,000 (A)
Total			₹ 83,500 (A)

(ii) Labour Rate Variance = $(SR - AR) \times AHPaid$

Skilled	$(6 - 7) \times 18,000$	=	₹ 18,000 (A)
Semi-Skilled	$(4 - 3.5) \times 33,000$	=	₹ 16,500 (F)
Unskilled	$(3 - 4) \times 58,000$	=	₹ 58,000 (A)
Total			₹ 59,500 (A)

(iii) Labour Efficiency Variance = $(SH - AH) \times SR$

Skilled	$(20,000 - 17,500) \times 6$	=	₹ 15,000 (F)
Semi- Skilled	$(30,000 - 32,300) \times 4$	=	₹ 9,200 (A)
Unskilled	$(50,000 - 57,200) \times 3$	=	₹ 21,600 (A)
Total			₹ 15,800 (A)

(iv) Labour Idle Time Variance = $(Idle\ Hours \times SR)$

Skilled	500×6	=	₹ 3,000 (A)
Semi- Skilled	700×4	=	₹ 2,800 (A)
Unskilled	800×3	=	₹ 2,400 (A)
Total			₹ 8,200 (A)



(v)	Labour Mix Variance = $(RSH - AH_{\text{Worked}}) \times SR$		
	Revised Std. hours (RSH) = $\frac{\text{Std.Hours}}{\text{Total Std. hours}} \times \text{Total Actual Hours}$		
Skilled	$(\frac{20,000}{1,00,000} \times 1,07,000 - 17,500) \times 6 = ₹ 23,400 \text{ (F)}$		
Semi- Skilled	$(\frac{30,000}{1,00,000} \times 1,07,000 - 32,300) \times 4 = ₹ 800 \text{ (A)}$		
Unskilled	$(\frac{50,000}{1,00,000} \times 1,07,000 - 57,200) \times 3 = ₹ 11,100 \text{ (A)}$		
Total	₹ 11,500 (F)		

(vi)	Labour Yield Variance = $(SH - RSH) \times SR$		
Skilled	$(20,000 - \frac{20,000}{1,00,000} \times 1,07,000) \times 6 = ₹ 8,400 \text{ (A)}$		
Semi- Skilled	$(30,000 - \frac{30,000}{1,00,000} \times 1,07,000) \times 4 = ₹ 8,400 \text{ (A)}$		
Unskilled	$(50,000 - \frac{50,000}{1,00,000} \times 1,07,000) \times 3 = ₹ 10,500 \text{ (A)}$		
Total	₹ 27,300 (A)		

(b)	Labour Rate Variance = $(SR - AR) \times AH_{\text{Paid}}$		
Skilled	$(6 - 5.5) \times 5,000$		
	$(6 - 7) \times 13,000$	=	₹ 10,500 (A)
Semi- Skilled	$(4 - 3.5) \times 33,000$		
	$(4 - 3.5) \times 33,000$	=	₹ 16,500 (F)
Unskilled	$(3 - 4) \times 58,000$		
	$(3 - 4) \times 58,000$	=	₹ 58,000 (A)
Total	₹ 52,000 (A)		

**QUESTION 8. (ILLUSTRATION 8)**

The standard labour employment and the actual labour engaged in a week for a job are as under:

	Skilled workers	Semi-skilled workers	Unskilled workers
Standard no. of workers in the gang	32	12	6
Actual no. of workers employed	28	18	4
Standard wage rate per hour	3	2	1
Actual wage rate per hour	4	3	2

During the 40 hours working week, the gang produced 1,800 standard labour hours of work.

CALCULATE:

(a) Labour Cost Variance	(b) Labour Rate Variance
(c) Labour Efficiency Variance	(d) Labour Mix Variance
(e) Labour Yield Variance	

**ANSWER :**

Workings:

1. Standard hours (SH) for actual hours produced are calculated as below:

$$\text{Skilled} = \frac{1,800}{2,000} \times 1,280 = 1,152 \text{ hrs.}$$

$$\text{Semi-skilled} = \frac{1,800}{2,000} \times 480 = 432 \text{ hrs.}$$

$$\text{Unskilled} = \frac{1,800}{2,000} \times 240 = 216 \text{ hrs.}$$

2. Actual hours (AH) paid are calculated as below:

Category	No. of Worker	Hours in a week	Total Hours
Skilled	32	40	1,280
Semi-skilled	12	40	480
Unskilled	6	40	240
			2,000

Calculations

Category of workers	SH × SR	AH × SR	AH × AR	RSH × SR
Skilled	1,152 × 3 = 3,456	1,120 × 3 = 3,360	1,120 × 4 = 4,480	1,280 × 3 = 3,840
Semi-skilled	432 × 2 = 864	720 × 2 = 1,440	720 × 3 = 2,160	480 × 2 = 960
Unskilled	216 × 1 = 216	160 × 1 = 160	160 × 2 = 320	240 × 1 = 240
Total	₹ 4,536	₹ 4,960	₹ 6,960	₹ 5,040

(i) Labour Cost Variance = Std. Cost for hours worked – Actual cost paid

$$= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{AR})$$

$$= ₹4,536 - 6,960 = ₹2,424 \text{ (A)}$$

(ii) Labour Rate Variance = AH (SR – AR) or (AH × SR) – (AH × AR)

$$\text{Skilled} = 3,360 - 4,480 = ₹1,120 \text{ (A)}$$

$$\text{Semi-skilled} = 1,440 - 2,160 = ₹720 \text{ (A)}$$

$$\text{Unskilled} = 160 - 320 = ₹160 \text{ (A)} \quad 2,000 \text{ (A)}$$

(iii) Labour Efficiency Variance = SR (SH – AH) or (SR × SH) – (SR × AH)

$$\text{Skilled} = 3,456 - 3,360 = ₹96 \text{ (F)}$$

$$\text{Semi-skilled} = 864 - 1,440 = ₹576 \text{ (A)}$$

$$\text{Unskilled} = 216 - 160 = ₹56 \text{ (F)} \quad ₹424 \text{ (A)}$$

(iv) Labour Mix Variance = SR (RSH – AH) or (SR × RSH) – (SR × AH)

$$\text{Skilled} = 3,840 - 3,360 = ₹480 \text{ (F)}$$

$$\text{Semi-skilled} = 960 - 1,440 = ₹480 \text{ (A)}$$

$$\text{Unskilled} = 240 - 160 = ₹80 \text{ (F)} \quad ₹80 \text{ (F)}$$

(v) Labour Yield Variance = SR (SH – RSH) or (SR × SH – SR × RSH)

$$\text{Skilled} = 3,456 - 3,840 = ₹384 \text{ (A)}$$

$$\text{Semi-skilled} = 864 - 960 = ₹96 \text{ (A)}$$

$$\text{Unskilled} = 216 - 240 = ₹24 \text{ (A)} \quad ₹504 \text{ (A)}$$



Check

- (i) LCV = LRV + LEV
 $\text{₹2,424 (A)} = \text{₹2,000 (A)} + \text{₹424 (A)}$
- (ii) LEV = LMV + LYV
 $\text{₹424 (A)} = \text{₹80 (F)} + \text{₹504 (A)}$

**QUESTION 9. (ILLUSTRATION 9)**

From the following information of G Ltd., calculate (i) Variable Overhead Cost Variance; (ii) Variable Overhead Expenditure Variance and (iii) Variable Overhead Efficiency Variance:

Budgeted Production	6,000 units
Budgeted Variable Overhead	₹ 1,20,000
Standard time for one Unit of output	2 hours
Actual Production	5,900 units
Actual Overhead Incurred	₹ 1,22,000
Actual Hours Worked	11,600 hours

ANSWER :

Workings:

1. Standard cost per unit = $\frac{\text{₹1,20,000}}{6,000\text{units}} = \text{₹20}$
2. Standard cost per hour = $\frac{\text{₹1,20,000}}{6,000\text{units} \times 2\text{hours}} = \text{₹10}$

- (i) Variable Overhead Cost Variance:
 = Std. Overhead for actual production – Actual overhead incurred
 = $\text{₹20} \times 5,900 \text{ units} - \text{₹1,22,000} = \text{₹4,000 (A)}$
- (ii) Variable Overhead Expenditure Variance:
 = Std. overhead for Actual hours – Actual Overhead
 = $\text{₹10} \times 11,600 \text{ hours} - \text{₹1,22,000} = \text{₹6,000 (A)}$
- (iii) Variable Overhead Efficiency Variance:
 = Std.rate per hour $\times$ (Std. hours for actual production – Actual hours)
 = $\text{₹10} (2 \text{ hours} \times 5,900 \text{ units} - 11,600 \text{ hours}) = \text{₹2,000 (F)}$

**QUESTION 10. (ILLUSTRATION 10)**

The cost detail of J&G Ltd. for the month of September is as follows:

	Budgeted	Actual
Fixed overhead	₹ 15,00,000	₹ 15,60,000
Units of production	7,500	7,800
Standard time for one unit	2 hours	-
Actual hours worked	-	16,000 hours

Required:

CALCULATE (i) Fixed Overhead Cost Variance (ii) Fixed Overhead Expenditure Variance (iii) Fixed Overhead Volume Variance (iv) Fixed Overhead Efficiency Variance and (v) Fixed Overhead Capacity Variance.

**ANSWER :**

- (i) Fixed Overhead Cost Variance:
= Overhead absorbed for actual production – Actual overhead incurred
$$= \left(\frac{₹15,00,000}{7,500} \times 7,800 \right) - ₹15,60,000 = 0$$
- (ii) Fixed Overhead Expenditure Variance:
= Budgeted overhead – Actual overhead
$$= ₹15,00,000 - ₹15,60,000 = ₹60,000 \text{ (A)}$$
- (iii) Fixed Overhead Volume Variance:
= Absorbed overhead – Budgeted overhead
$$= \left(\frac{₹15,00,000}{7,500} \times 7,800 \right) - ₹15,00,000 = ₹60,000 \text{ (F)}$$
- (iv) Fixed Overhead Efficiency Variance:
= Std. Rate (Std. hours for actual production – Actual hours)
$$= \frac{₹15,00,000}{7,500 \times 2} \times \{(2 \text{ hours} \times 7,800 \text{ hours}) - 16,000 \text{ hours}\}$$
$$= ₹100 (15,600 - 16,000) = ₹40,000 \text{ (A)}$$
- (v) Fixed Overhead Capacity Variance:
= Std. Rate (Actual hours – Budgeted hours)
$$= \frac{₹15,00,000}{7,500 \times 2} \times (16,000 \text{ hours} - 15,000 \text{ hours})$$
$$= ₹100 (16,000 - 15,000) = ₹1,00,000 \text{ (F)}$$

**QUESTION 11. (ILLUSTRATION 11)**

A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at ₹ 1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.

In April 2021, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output. The actual fixed overheads were ₹ 1,42,000.

COMPUTE the following Fixed Overhead variance:

1. Efficiency variance
2. Capacity variance
3. Calendar variance
4. Expenditure variance
5. Volume variance
6. Total Fixed overhead variance

**ANSWER :**

Working Notes:

		Budget	Actual
(1)	Fixed overheads for the month	1,44,000	1,42,000
(2)	Working days per month	25	24
(3)	Working hours per month	(120 machines × 8 hrs. × 25 days) = 24,000	(840 machines hours × 24 days) = 20,160
(4)	Production units per month	$\frac{24,000 \text{ hrs.}}{4 \text{ hrs.}} = 6,000$	5,305

(5) Standard hours for actual production

= Actual production units × Std. hours per unit

= 5,305 × 4 = 21,220 hrs.

(6) Standard fixed overhead rate per unit

= $\frac{₹1,44,000}{6000 \text{ units}}$ = ₹ 24

(7) Standard fixed overhead rate per hour

= $\frac{₹1,44,000}{24,000 \text{ hrs.}}$ = ₹ 6

(8) Standard fixed overhead per day

= $\frac{₹1,44,000}{25 \text{ days}}$ = ₹ 5,760

1. Efficiency variance

= Std. rate per hr. (Std. hrs. for actual production – Actual hrs.)

= 6 × (21,220 – 20,160) = ₹ 6,360 (F)

2. Capacity variance

= Std. Rate (Actual hours – Budgeted hours)

= 6 × {20,160 – (24 days × 120 machine × 8 hrs.)} = ₹ 17,280 (A)

3. Calendar variance

= (Actual No. of days – Budgeted No. of days) × Std. rate per day

= (24 – 25) × 5,760 = ₹ 5,760 (A)

4. Expenditure variance

= Budgeted overhead – Actual overhead

= 1,44,000 – 1,42,000 = ₹ 2,000 (F)

5. Volume variance

= Absorbed overhead – Budgeted overhead

= (5,305 × 24) – 1,44,000 = ₹ 16,680 (A)

6. Total fixed overhead Variance

= Absorbed overhead – Actual overhead incurred

= (5,305 × 24) – 1,42,000 = ₹ 14,680 (A)

**QUESTION 12. (ILLUSTRATION 12)**

The overhead expense budget for a factory producing to a capacity of 200 units per month is as follows:

Description of overhead	Fixed cost per unit in ₹	Variable cost per unit in ₹	Total cost per unit in ₹
Power and fuel	1,000	500	1,500
Repair and maintenance	500	250	750
Printing and stationary	500	250	750
Other overheads	1,000	500	1,500
	₹ 3,000	₹ 1,500	4,500

The factory has actually produced only 100 units in a particular month. Details of overheads actually incurred have been provided by the accounts department and are as follows:

Description of overhead	Actual cost
Power and fuel	₹ 4,00,000
Repair and maintenance	₹ 2,00,000
Printing and stationary	₹ 1,75,000
Other overheads	₹ 3,75,000

You are required to CALCULATE the Overhead volume variance and the overhead expense variances.

ANSWER :

Overheads volume variance (in case of fixed overhead):

Standard fixed overheads per unit (SR): ₹3,000 (Given)

Actual production : 100 units

Standard production (capacity) : 200 units

Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted Overhead

= (₹3,000 × 100 units) – (₹3,000 × 200 units)

= ₹3,00,000 – ₹6,00,000 = ₹3,00,000 (Adverse)

Overhead expense variances

= Budgeted Overhead – Actual Overhead

= (₹3,000 × 200 units) – (Total overhead – Variable overhead)

= (₹3,000 × 200 units) – (₹11,50,000 – ₹1,50,000 × 100 units)

= ₹6,00,000 – (₹11,50,000 – ₹1,50,000)

= ₹6,00,000 – ₹10,00,000 = ₹4,00,000 (Adverse)

**QUESTION 13. (ILLUSTRATION 13)**

The following information was obtained from the records of a manufacturing unit using standard costing system.

	Standard	Actual
Production	4,000 units	3,800 units
Working days	20	21
Machine hours	8,000 hours	7,800 hours
Fixed Overhead	₹ 4,00,000	₹ 3,90,000
Variable Overhead	₹1,20,000	₹1,20,000



You are required to CALCULATE the following overhead variance:

- (a) Variable overhead variances
- (b) Fixed overhead variances

ANSWER :

- (a) Variable Overhead Variances

- (i) Variable Overhead Variance:

= Std. overhead for actual production – Actual overhead

$$= \left(\frac{\text{₹}1,20,000}{4,000 \text{ units}} \times 3,800 \text{ units} \right) - \text{₹}1,20,000$$

$$= \text{₹}1,14,000 - \text{₹}1,20,000 = \text{₹}6,000 \text{ (A)}$$

- (ii) Variable Overhead Expenditure Variance:

= Std. overhead for actual hours – Actual overhead

$$= \left(\frac{\text{₹}1,20,000}{8,000 \text{ hours}} \times 7,800 \text{ hours} \right) - \text{₹}1,20,000$$

$$= \text{₹}15 \times 7,800 \text{ hours} - \text{₹}1,20,000 = \text{₹}3,000 \text{ (A)}$$

- (iii) Variable Overhead Efficiency Variance:

= Std. Rate per hour (Std. hours for actual production – Actual hours)

$$= \frac{\text{₹}1,20,000}{8,000 \text{ hours}} \times \left[\left(\frac{8,000 \text{ hours}}{4,000 \text{ hours}} \times 3,800 \text{ units} \right) - 7,800 \text{ hours} \right]$$

$$= \text{₹}15 \times (7,600 \text{ hours} - 7,800 \text{ hours}) = \text{₹}3,000 \text{ (A)}$$

- (b) Fixed Overhead Variance:

- (i) Fixed Overhead Variance:

= Absorbed overhead – Actual overhead

$$= \left(\frac{\text{₹}4,00,000}{4,000 \text{ units}} \times 3,800 \text{ units} \right) - \text{₹}3,90,000$$

$$= \text{₹}3,80,000 - \text{₹}3,90,000 = \text{₹}10,000 \text{ (A)}$$

- (ii) Fixed Overhead Expenditure Variance:

= Budgeted Overhead – Actual Overhead

$$= \text{₹}4,00,000 - \text{₹}3,90,000 = \text{₹}10,000 \text{ (F)}$$

- (iii) Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted Overhead

$$= \left(\frac{\text{₹}4,00,000}{4,000 \text{ units}} \times 3,800 \text{ units} \right) - \text{₹}4,00,000$$

$$= \text{₹}3,80,000 - \text{₹}4,00,000 = \text{₹}20,000 \text{ (A)}$$

- (iv) Fixed Overhead Efficiency Variance:

= SR × (Std. hours for actual production – Actual hours)

$$= \text{₹}50 \times \{ (2 \text{ hours} \times 3,800 \text{ units}) - 7,800 \text{ hours} \}$$

$$= \text{₹}3,80,000 - \text{₹}3,90,000 = \text{₹}10,000 \text{ (A)}$$



(v) Fixed Overhead Capacity Variance:

$$= SR \times (\text{Actual hours} - \text{Revised budgeted hours})$$

$$= ₹50 \times \left[7,800 \text{ hours} - \frac{8,000}{20 \text{ days}} \times 21 \text{ days} \right]$$

$$= ₹50 \times (7,800 \text{ hours} - 8,400 \text{ hours}) = ₹30,000 \text{ (A)}$$

(vi) Fixed Overhead Calendar Variance:

$$= \text{Rate per day} (\text{Budgeted days} - \text{Actual days})$$

$$= \frac{₹4,00,000}{20 \text{ days}} \times (20 \text{ days} - 21 \text{ days}) = 20,000 \text{ (F)}$$

**QUESTION 14. (PP1)**

For making 10 kg. of CEMCO, the standard material requirements is:

Material	Quantity	Rate per kg. (₹)
A	8 kg	6.00
B	4 kg	4.00

During April, 1,000 kg of CEMCO were produced. The actual consumption of materials is as under:

Material	Quantity (Kg.)	Rate per kg. (₹)
A	750	7.00
B	500	5.00

CALCULATE (A) Material Cost Variance; (b) Material Price Variance; (c) Material usage Variance.

ANSWER :

Basic Calculations

	Standard for 1,000 kg.			Actual for 1,000 kg.		
	Qty.	Rate	Amount	Qty.	Rate	Amount
	Kg.	(₹)	(₹)	Kg.	(₹)	(₹)
A	800*	6	4,800	750	7	5,250
B	400*	4	1,600	500	5	2,500
Total	1,200		6,400	1,250		7,750

(* A- $8 \div 10 \times 1000 = 800$

B- $4 \div 10 \times 1000 = 400$)

Calculation of Variances:

(a) Material Cost Variance = Std. cost for actual output – Actual cost

$$\text{MCV} = 6,400 - 7,750 = ₹1,350 \text{ (A)}$$

(b) Material Price Variance = $(SP - AP) \times AQ$

$$\text{A} = (6 - 7) \times 750 = ₹750 \text{ (A)}$$

$$\text{B} = (4 - 5) \times 500 = ₹500 \text{ (A)}$$

$$\text{MPV} = ₹1,250 \text{ (A)}$$

(c) Material Usages Variance = $(SQ - AQ) \times SP$

$$\text{A} = (800 - 750) \times 6 = ₹300 \text{ (F)}$$

$$\text{B} = (400 - 500) \times 4 = ₹400 \text{ (A)}$$

$$\text{MUV} = ₹100 \text{ (A)}$$



Check

MCV = MPV + MUV

1,350 (A) = 1,250 (A) + 100 (A)

**QUESTION 15. (PP2)**

The standard mix to produce one unit of a product is as follows:

Material X	60 units @ ₹ 15 per unit	=	900
Material Y	80 units @ ₹ 20 per unit	=	1,600
Material Z	100 units @ ₹ 25 per unit	=	2,500
	<u>240 units</u>		<u>5,000</u>

During the month of April, 10 units were actually produced and consumption was as follows:

Material X	640 units @ ₹ 17.50 per unit	=	11,200
Material Y	950 units @ ₹ 18.00 per unit	=	17,100
Material Z	870 units @ ₹ 27.50 per unit	=	23,925
	<u>2,460 units</u>		<u>52,225</u>

CALCULATE all material variances.

ANSWER :

Material	Standard for 10 units			Actual for 10 units		
	Qty. Units	Rate (₹)	Amount (₹)	Qty. units	Rate (₹)	Amount (₹)
X	600	15	9,000	640	17.50	11,200
Y	800	20	16,000	950	18.00	17,100
Z	1,000	25	25,000	870	27.50	23,925
Total	2,400		50,000	2,460		52,225

1. Material Cost Variance = Standard cost – Actual cost

= ₹ 50,000 – ₹ 52,225

MCV = ₹ 2,225 (A)

2. Material Price Variance = (Std. Price – Actual Price) × Actual Qty.

Material X = (15 – 17.50) × 640 = ₹ 1,600 (A)

Material Y = (20 – 18) × 950 = ₹ 1,900 (F)

Material Z = (25 – 27.50) × 870 = ₹ 2,175 (A)

MPV = ₹ 1,875 (A)

3. Material Usage Variance = (Std. Qty. – Actual Qty.) × Std. Price

Material X = (600 – 640) × 15 = ₹ 600 (A)

Material Y = (800 – 950) × 20 = ₹ 3,000 (A)

Material Z = (1,000 – 870) × 25 = ₹ 3,250 (F)

MUV = ₹ 350 (A)

Check MCV = MPV + MUV

₹ 2,225 (A) = ₹ 1,875 (A) + ₹ 350 (A)



4. Material Mix Variance = (Revised Std. Qty. – Actual Qty.) × Std. Price

Material X = $(615^* - 640) \times 15$ = ₹ 375 (A)

Material Y = $(820^* - 950) \times 20$ = ₹2,600 (A)

Material Z = $(1,025 - 870) \times 25$ = ₹3,875 (F)

MMV = ₹ 900 (F)

*Revised Standard Quantity (RSQ) is calculated as follows:

Material X = $\frac{2460}{2400} \times 600 = 615$ units

Material Y = $\frac{2460}{2400} \times 800 = 820$ units

Material Z = $\frac{2460}{2400} \times 1,000 = 1,025$ units

5. Material Yield Variance = (Std. Qty - Revised Std. Qty.) × Std. Price

Material X = $(600 - 615) \times 15$ = ₹225 (A)

Material Y = $(800 - 820) \times 20$ = ₹400 (A)

Material Z = $(1,000 - 1,025) \times 25$ = ₹625 (A)

MYV = ₹1,250 (A)

Check

MUV = MMV + MYV (Or MRUV)

₹350 (A) = ₹900 (F) + ₹1,250 (A)

or

MCV = MPV + MMV + MYV (Or MRUV)

₹ 2,225 (A) = ₹ 1,875 (A) + ₹900 (F) + ₹ 1,250 (A)



QUESTION 16. (PP3)

GAP Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. Following are the details.

Budgeted data:

Material	Qty	Price (₹)	Amount (₹)
A	60	20	1200
B	40	30	1200

Inputs	100	2400
Normal loss	20	
Output	80	2400

Actual data:

Actual output 80 units.

Material	Qty	Price (₹)	Amount (₹)
A	70	?	?
B	?	30	?

Material Price Variance (A) ₹ 105A

Material cost variance ₹ 275A



You are required to CALCULATE:

- (i) Actual Price of material A
- (ii) Actual Quantity of material B
- (iii) Material Price Variance
- (iv) Material Usage Variance
- (v) Material Mix Variance
- (vi) Material Sub Usage Variance

ANSWER :

- (i) Actual Price of Material A

Let Actual Price of Material A be 'X'

Material Price Variance (A) = ₹ 105 (A)

Material Price Variance = (SP – AP) × AQ

$(20 - X) \times 70 = 105$ (A)

$1,400 - 70X = -105$

$X = 1,505 \div 70 = 21.5$

Therefore X (Actual Price) = ₹ 21.5

- (ii) Actual Quantity of Material B

Let Actual Quantity of Material B be 'X'

Material Cost Variance = (SQ × SP) – (AQ × AP)

Material Cost Variance = 275 (A)

$\{(60 \times 20) - (70 \times 21.5)\} + \{(40 \times 30) - (X \times 30)\} = 275$ (A)

$\{(1,200 - 1,505) + (1,200 - 30X)\} = -275$

$(895 - 30X) = -275$

$X = 1,170 \div 30 = 39$ units

- (iii) Material Price Variance = (SP – AP) × AQ

Material A = $(20 - 21.5) \times 70 = ₹ 105$ (A)

Material B = $(30 - 30) \times 39 = ₹ 0$

Total = ₹ 105 (A)

- (iv) Material Usage Variance = (SQ – AQ) × SP

Material A = $(60 - 70) \times 20 = ₹ 200$ (A)

Material B = $(40 - 39) \times 30 = ₹ 30$ (F)

Total = ₹ 170 (A)

- (v) Material Mix Variance = (RSQ – AQ) × SP

Material A = $\left(\frac{109}{100} \times 60 - 70 \right) \times 20 = ₹ 92$ (A)

Material B = $\left(\frac{109}{100} \times 40 - 39 \right) \times 30 = ₹ 138$ (F)

Total = ₹ 46 (F)



(vi)	Material Yield Variance = $(SQ - RSQ) \times SP$	
	Material A = $(60 - \frac{109}{100} \times 60) \times 20$	= ₹ 108 (A)
	Material B = $(40 - \frac{109}{100} \times 40) \times 30$	= ₹ 108 (A)
	Total	= ₹ 216 (A)

**QUESTION 17. (PP4)**

One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June 2023:

- (a) Standard mix for chemical A is 50% and chemical B is 50%.
- (b) Standard price kilogram of chemical A is ₹ 12 and chemical B is ₹ 15.
- (c) Actual input of chemical B is 70 kilograms.
- (d) Actual price per kilogram of chemical A is ₹ 15
- (c) Standard normal loss is 10% of total input
- (d) Total Material cost variance is ₹ 650 adverse.
- (e) Total Material yield variance is ₹ 135 adverse.

You are required to CALCULATE:

- (i) Total Material mix variance
- (ii) Total Material usage variance
- (iii) Total Material price variance
- (iv) Actual loss of actual input
- (v) Actual input of chemical A
- (vi) Actual price per kg. of chemical B

ANSWER :

Working Notes:

- (1) Calculation of standard mix of input (assuming Standard input as 100 kg)

	Qty. (Kg)	Price (₹)	Amount (₹)
Chemical A	50	12	600
Chemical B	50	15	750
	100	13.50	1,350
Normal Loss (10%)	(10)		
	90		1,350

- (2) Let the actual input of chemical A be X kg. and the actual price of chemical B be ₹ Y.

Given,

Material yield variance = (Total standard input – Total Actual input) ×

Standard cost per unit of input

$$= [100 - (70 + X)] \times 13.5 = 135 \text{ (A)}$$

Therefore, X = 40 kg.

Also, Material cost variance = (Standard quantity × Standard price) –

(Actual quantity × Actual price)

$$= 1,350 - \{(40 \times 15) + (70 \times Y)\} = 650 \text{ (A)}$$

$$= 1,350 - 600 - 70Y = 650A$$

Therefore, Y = ₹ 20



- (i) Material mix variance
 $= (\text{Revised Std. Quantity}^* - \text{Actual quantity}) \times \text{Standard Price}$
 Chemical A $= (55 - 40) \times 12 = 180 \text{ (F)}$
 Chemical B $= (55 - 70) \times 15 = 225 \text{ (A)}$
 $= ₹ 45 \text{ (A)}$
 *Revised Std. Quantity:
 Chemical A $= (70 + 40) \times 50\% = 55$
 Chemical B $= (70 + 40) \times 50\% = 55$
- (ii) Material usage variance
 $= (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$
 Chemical A $= (50 - 40) \times 12 = 120 \text{ (F)}$
 Chemical B $= (50 - 70) \times 15 = 300 \text{ (A)}$
 $= ₹ 180 \text{ (A)}$
- (iii) Material price variance
 $= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.}$
 Chemical A $= (12 - 15) \times 40 = 120 \text{ (A)}$
 Chemical B $= (15 - 20) \times 70 = 350 \text{ (A)}$
 $= ₹ 470 \text{ (A)}$
- (iv) Actual loss of actual input
 Actual total input $= 110 \text{ kg.}$
 Less: Actual output $= 90 \text{ kg.}$
 Actual loss $= 20 \text{ kg.}$
- (v) Actual input of chemical A = 40 kg. [As calculated in Working note (2)].
 (vi) Actual price per kg. of chemical B = ₹ 20 [As calculated in Working note (2)].

**QUESTION 18. (PP5)**

The following standards have been set to manufacture a product:

Direct Material:	(₹)
2 units of A @ ₹ 4 per unit	8.00
3 units of B @ ₹ 3 per unit	9.00
15 units of C @ ₹ 1 per unit	15.00
	32.00
Direct Labour: 3 hours @ ₹ 8 per hour	24.00
Total standard prime cost	56.00

The company manufactured and sold 6,000 units of the product during the year. Direct material costs were as follows:

12,500 units of A at ₹ 4.40 per unit 18,000 units of B at ₹ 2.80 per unit 88,500 units of C at ₹ 1.20 per unit

The company worked 17,500 direct labour hours during the year. For 2,500 of these hours, the company paid at ₹ 12 per hour while for the remaining, the wages were paid at standard rate.

CALCULATE

- (i) Materials price variance & Usage variance
 (ii) Labour rate & Efficiency variances.

**ANSWER :**

For Material Cost Variances

	SQ × SP	AQ × AP	AQ × SP
A	12,000 × 4 = 48,000	12,500 × 4.40 = 55,000	12,500 × 4 = 50,000
B	18,000 × 3 = 54,000	18,000 × 2.80 = 50,400	18,000 × 3 = 54,000
C	90,000 × 1 = 90,000	88,500 × 1.20 = 1,06,200	88,500 × 1 = 88,500
Total	₹ 1,92,000	₹ 2,11,600	₹ 1,92,500

Variances:

Material Price Variance = Actual quantity (Std. price – Actual price)

Or, = (AQ × SP) – (AQ × AP)

Or, = ₹ 1,92,500 – ₹ 2,11,600

= ₹ 19,100 (A)

Material Usage Variance = Standard Price (Std. Quantity – Actual Quantity)

Or, = (SP × SQ) – (SP × AQ)

Or, = ₹ 1,92,000 – ₹ 1,92,500 = ₹ 500 (A)

For Labour Cost Variance :

	SH × SR	AH × AR	AH × SR
Labour	(6,000 × 3) × ₹ 8 = 1,44,000	2,500 × 12 = 30,000 15,000 × 8 = 1,20,000	17,500 × 8 = 1,40,000
Total	₹ 1,44,000	₹ 1,50,000	₹ 1,40,000

Variances:

Labour Rate Variance: Actual Hours (Std. Rate – Actual Rate)

Or, = (AH × SR) – (AH × AR)

Or, = ₹ 1,40,000 – ₹ 1,50,000

= ₹ 10,000 (A)

Labour Efficiency Variance: Standard Rate (Std. Hours – Actual Hours)

Or, = (SR × SH) – (SR × AH)

Or, = ₹ 1,44,000 – ₹ 1,40,000

= ₹ 4,000 (F)

**QUESTION 19. (PP6)**

The following information is available from the cost records of Novell & Co. for the month of March 2021:

Materials purchased	20,000 units @ ₹ 88,000
Materials consumed	19,000 units
Actual wages paid for 4,950 hrs.	₹ 24,750
Units produced	1,800 units
Standard rates and pieces are:	
Direct material	₹ 4 per unit
Standard output	10 number for one unit



Direct labour rate	₹ 4.00 per hour
Standard requirement	2.5 hours per unit

You are required to CALCULATE relevant material and labour variance for the month.

ANSWER :**Material variances**

1. Material cost variance

$$= (\text{Std. qty for actual output} \times \text{Std. price}) - (\text{Actual qty.} \times \text{Actual price})$$

$$= (18,000 \times 4) - (19,000 \times 4.40)$$

$$= 72,000 - 83,600 = ₹ 11,600 \text{ (A)}$$

$$* \text{ Std. qty. for actual output} = 1,800 \times 10 = 18,000 \text{ units}$$

2. Material price variance

$$= (\text{Std. price} - \text{Actual price}) \times \text{Actual qty.}$$

$$= (4 - 4.40) \times 19,000 = 0.40 \times 19,000 = ₹ 7,600 \text{ (A)}$$

3. Material usage variance

$$= (\text{Std. qty.} - \text{Actual qty.}) \times \text{Std. price}$$

$$= (18,000 - 19,000) \times 4 = 1,000 \times 4 = ₹ 4,000 \text{ (A)}$$

Labour variances

1. Labour cost variance

$$= (\text{Std. hours for actual output} \times \text{Std. price}) - \text{Actual cost}$$

$$= (4,500 \times 4) - 24,750$$

$$= 18,000 - 24,750 = ₹ 6,750 \text{ (A)}$$

$$* \text{ Std. hours for actual output} = 1,800 \times 2.5 = 4,500 \text{ hrs.}$$

2. Labour rate variance

$$= (\text{Std. rate} - \text{Actual rate}) \times \text{Actual hrs.}$$

$$= (4 - 5) \times 4,950 = ₹ 4,950 \text{ (A)}$$

3. Labour efficiency variance

$$= (\text{Std. hrs. for actual output} - \text{Actual hrs.}) \times \text{Std. rate}$$

$$= (4,500 - 4,950) \times 4 = ₹ 1,800 \text{ (A)}$$

**QUESTION 20. (PP7)**

XYZ Company has established the following standards for factory overheads.

Variable overhead per unit: ₹ 10/-

Fixed overheads per month ₹ 1,00,000

Capacity of the plant 20,000 units per month.

The actual data for the month are as follows:

Actual overheads incurred ₹ 3,00,000

Actual output (units) 15,000 units

Required:

CALCULATE overhead variances viz:

(i) Production volume variance

(ii) Overhead expense variance

**ANSWER :**

Production/ Overhead volume variance (only for fixed overhead)

Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted Overhead

= (₹5 × 15,000 units) – (₹5 × 20,000 units)

= ₹75,000 – ₹1,00,000 = ₹25,000 (Adverse)

Overhead expense variances

= Budgeted Overhead – Actual Overhead

= (₹5 × 20,000 units) – (Total overhead – Variable overhead)

= (₹5 × 20,000 units) – (₹3,00,000 – ₹10 × 15,000 units)

= ₹1,00,000 – (₹3,00,000 – ₹1,50,000)

= ₹1,00,000 – ₹1,50,000 = ₹ 50,000 (Adverse)

**QUESTION 21. (PP8)**

Following information is available from the records of a factory:

	Budget	Actual
Fixed overhead for the month of June	₹ 10,000	₹ 12,000
Production in June (units)	2,000	2,100
Standard time per unit (hours)	10	–
Actual hours worked in June	–	21,000

CALCULATE:

(i) Fixed overhead cost variance,

(ii) Expenditure variance,

(iii) Volume variance.

ANSWER :

For fixed overhead variances:

Actual F.O. incurred (given) ₹12,000

Budgeted F.O. for the period ₹10,000

Standard F.O. for production

2,100 units × {₹10,000 ÷ 2,000 units} ₹10,500

(i) Fixed Overhead Variance = Standard F.O. – Actual F.O.

= ₹ 10,500 – ₹12,000

= ₹1,500 (A)

(ii) F.O. Expenditure Variance = Budgeted F.O – Actual F.O.

= ₹10,000 – ₹12,000

= ₹2,000 (A)

(iii) F.O. Volume Variance = Standard F.O – Budgeted F.O.

= ₹10,500 – ₹ 10,000 = ₹ 500 (F)

**QUESTION 21. (PP9)**

XYZ Ltd. has furnished you the following information for the month of August:

	Budget	Actual
Output (units)	30,000	32,500
Hours	30,000	33,000
Fixed overhead	₹ 45,000	50,000
Variable overhead	₹ 60,000	68,000
Working days	25	26

CALCULATE overhead variances.

ANSWER :

Basic Calculations:

$$\text{Standard hours per unit} = \frac{\text{Budgeted hours}}{\text{Budgeted units}} = \frac{30,000}{30,000} = 1 \text{ hour}$$

$$\text{Std. hrs. for actual output} = 32,500 \text{ units} \times 1 \text{ hr} = 32,500$$

$$\text{Standard hours per unit} = \frac{\text{Budgeted overhead}}{\text{Budgeted hours}}$$

$$\text{For fixed overhead} = \frac{45,000}{30,000} = ₹1.50 \text{ per hour}$$

$$\text{For variable overhead} = \frac{60,000}{30,000} = ₹2 \text{ per hour}$$

$$\text{Std. F.O. rate per day} = ₹45,000 \div 25 \text{ days} = ₹1,800$$

$$\text{Recovered overhead} = \text{Std. hrs. for actual output} \times \text{Std. rate}$$

$$\text{For fixed overhead} = 32,500 \text{ hrs.} \times ₹1.50 = ₹48,750$$

$$\text{For variable overhead} = 32,500 \text{ hrs.} \times ₹2 = ₹65,000$$

$$\text{Standard overhead} = \text{Actual hours} \times \text{Std. rate}$$

$$\text{For fixed overhead} = 33,000 \times 1.50 = ₹49,500$$

$$\text{For variable overhead} = 33,000 \times 2 = ₹66,000$$

$$\begin{aligned} \text{Revised budget hours} &= \frac{\text{Budgeted hours}}{\text{Budgeted days}} \times \text{Actual days} \\ &= \frac{30,000}{25} \times 26 = 31,200 \text{ hours} \end{aligned}$$

$$\text{Revised budgeted overhead (for fixed overhead)} = 31,200 \times 1.50 = ₹46,800$$

Calculation of variances

Fixed Overhead Variances:

$$\begin{aligned} \text{(i) F.O. cost Variance} &= \text{Recovered Overhead} - \text{Actual Overhead} \\ &= 48,750 - 50,000 \\ &= ₹1,250 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{(ii) F.O. Expenditure Variance} &= \text{Budgeted Overhead} - \text{Actual Overhead} \\ &= 45,000 - 50,000 \\ &= ₹5,000 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{(iii) F.O. Volume Variance} &= \text{Recovered Overhead} - \text{Budgeted Overhead} \\ &= 48,750 - 45,000 \\ &= ₹3,750 \text{ (F)} \end{aligned}$$



- (iv) F.O. Efficiency Variance = Recovered Overhead – Standard Overhead
= 48,750 – 49,500 = ₹750 (A)
- (v) F.O. Capacity Variance = Standard Overhead – Revised Budgeted Overhead
= 49,500 – 46,800 = ₹2,700 (F)
- (v) Calendar Variance = (Actual Days – Budget Days) × St. rate per day.
= (26 – 25) × 1,800 = ₹1,800 (F)

Variable Overhead Variances

- (i) V.O. Cost variance = Recovered Overhead – Actual Overhead
= 65,000 – 68,000 = ₹3,000 (A)
- (ii) V.O. Expenditure Variance = Standard Overhead – Actual Overhead
= 66,000 – 68,000 = ₹2,000 (A)
- (iii) V.O. Efficiency Variance = Recovered Overhead – Standard Overhead
= 65,000 – 66,000 = ₹1,000 (A)

Check

- (i) F.O. Cost Variance = Expenditure variance + Volume variance
1,250 (A) = 5,000 (A) + 3,750 (F)
- (ii) F.O. Volume Variance = Efficiency + Capacity + Calendar
Variance Variance Variance
3,750 (F) = 750 (A) + 2,700 (F) + 1,800 (F)
- (iii) V.O. Cost Variance = Expenditure Variance + Efficiency Variance
3,000 (A) = 2,000 (A) + 1,000 (A).

**QUESTION 22. (PP10)**

S.V. Ltd. has furnished the following data:

	Budget	Actual (for the month of July)
No. of working days	25	27
Production in units	20,000	22,000
Fixed overheads	₹ 30,000	₹ 31,000

Budgeted fixed overhead rate is ₹ 1.00 per hour. In July, the actual hours worked were 31,500.

CALCULATE the following variances:

- (i) Expenditure variance.
(ii) Volume variance.
(iii) Total overhead variance.

ANSWER :

For Fixed Overhead Variances

Actual fixed overhead incurred	₹ 31,000
Budgeted fixed overhead for the period	₹30,000
Standard fixed overhead for production (₹ 30,000 ÷ 20,000 units) × 22,000	₹33,000

Computation of Variances:

- (i) Fixed overhead expenditure variance:
= Budgeted fixed overhead – Actual fixed overhead
= ₹ 30,000 – ₹ 31,000 = ₹ 1,000 (A)



- (ii) Fixed overhead volume variance:
 $= \text{Standard fixed overhead} - \text{Budgeted fixed overhead}$
 $= ₹ 33,000 - ₹ 30,000 = ₹ 3,000 (F)$
- (iii) Fixed overhead variance:
 $= \text{Standard fixed overhead} - \text{Actual fixed overhead}$
 $= ₹ 33,000 - ₹ 31,000 = ₹ 2,000 (F)$

**QUESTION 23. (PP11)**

The following data for Pijee Ltd. is given:

	Budget	Actual
Production (in units)	400	360
Man hours to produce above	8,000	7,000
Variable overheads (in ₹)	10,000	9,150

CALCULATE relevant Variable overhead variances.

ANSWER :

Working Notes:

- Calculation of standard variable overhead per unit
 $= \frac{\text{Budgeted variable overhead}}{\text{Budgeted production}} = \frac{10,000}{400} = ₹ 25 \text{ per unit}$
 - Calculation of standard variable overhead per hour
 $= \frac{\text{Budgeted variable overhead}}{\text{Budgeted production}} = \frac{10,000}{8,000} = ₹ 1.25 \text{ per hour}$
 - Calculation of Std. variable overhead for actual output
 $= \text{Actual output} \times \text{Std. variable overhead per unit}$
 $= 360 \text{ units} \times ₹ 25 = ₹ 9,000$
 - Calculation of Budgeted variable overhead based on actual hours worked
 $= \text{Actual hours worked} \times \text{Std. variable overhead per hour}$
 $= 7,000 \times 1.25 = ₹ 8,750$
 - Calculation of standard hours for actual output
 $= \text{Actual output} \times \text{Std. hours per unit}$
 $= 360 \text{ units} \times 20 \text{ hours} = 7,200 \text{ hours}$
- (i) Variable overhead cost variance
 $= \text{Std. variable overhead for actual output} - \text{Actual Variable Overheads}$
 $= 9,000 - 9,150 = ₹ 150 (A)$
- (ii) Variable overhead expenditure variance
 $= \text{Std. overhead for Actual hours} - \text{Actual Overhead}$
 $= 8,750 - 9,150 = ₹ 400 (A)$



- (iii) Variable overhead efficiency variance
 $= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Std. rate per hour}$
 $= (7,200 - 7,000) \times 1.25 = ₹ 250 (F)$

**QUESTION 24. (PP12)**

The following data has been collected from the cost records of a unit for computing the various fixed overhead variances for a period:

Number of budgeted working days	25
Budgeted man-hours per day	6,000
Output (budgeted) per man-hour (in units)	1
Fixed overhead cost as budgeted	₹ 1,50,000
Actual number of working days	27
Actual man-hours per day	6,300
Actual output per man-hour (in-units)	0.9
Actual fixed overhead incurred	₹ 1,56,000

CALCULATE fixed overhead variances:

- (i) Expenditure Variance
(ii) Volume Variance,
(iii) Fixed Cost Variance.

ANSWER :

For Fixed overheads Variances:

Actual fixed overhead incurred = ₹ 1,56,000

Budgeted fixed overhead for the period = 1,50,000

Standard fixed overhead for production (Standard output for actual time × Standard Fixed Overhead per unit)

$(6,300 \text{ hrs} \times 27 \text{ days} \times 0.9) \times (\text{₹ } 1,50,000 \div 1,50,000 \text{ units}) = ₹ 1,53,090$

(a) Fixed Overhead Expenditure Variance = Budgeted fixed overhead - Actual fixed overhead
 $= ₹ 1,50,000 - ₹ 1,56,000 = ₹ 6,000 (A)$

(b) Fixed Overhead Volume Variance = Standard fixed overhead - Budgeted fixed overhead
 $= ₹ 1,53,090 - ₹ 1,50,000 = ₹ 3,090 (F)$

(c) Fixed Overhead Variance = Standard fixed overhead - Actual fixed overhead
 $= ₹ 1,53,090 - ₹ 1,56,000 = ₹ 2,910 (A)$

**QUESTION 25. (PP13)**

J.K. Ltd. manufactures NXE by mixing three raw materials. For every batch of 100 kg. of NXE, 125 kg. of raw materials are used. In the month of April, 60 batches were prepared to produce an output of 5,600 kg. of NXE. The standard and actual particulars for the month of April, are as follows:



Raw Materials	Standard		Actual		Quantity of Raw Materials Purchased (Kg.)
	Mix	Price per kg.	Mix	Price per Kg.	
	(%)	(₹)	(%)	(₹)	
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

You are required to CALCULATE:

- Material Price variance
- Material Usage Variance

ANSWER :

Actual material used = 125 kg × 60 = 7,500 kg.

Actual cost of actual material used (AQ × AR) (₹)

A	(60%) 4,500 kg × ₹21	=	94,500
B	(20%) 1,500 kg × ₹ 8	=	12,000
C	(20%) <u>1,500</u> kg × ₹ 6	=	<u>9,000</u>
	<u>7,500</u>		<u>1,15,500</u>

Standard cost of actual material used (AQ × SR) (₹)

A	4,500 kg × ₹20	=	90,000
B	1,500 kg × ₹10	=	15,000
C	<u>1,500</u> kg × ₹ 5	=	<u>7,500</u>
	<u>7,500</u>		<u>1,12,500</u>

Standard cost of material, if it had been used in standard proportion

(Standard Proportion Standard Rate)		(₹)
A	(50%) 3,750 kg × ₹20	= 75,000
B	(30%) 2,250 kg × ₹10	= 22,500
C	(20%) <u>1,500</u> kg × ₹ 5	= <u>7,500</u>
	<u>7,500</u>	<u>1,05,000</u>

Standard cost of production (SQ for actual production × SR)

Standard cost of output for 100 kg:		(₹)
A	62.50 kg × ₹20	= 1,250
B	37.50 kg × ₹10	= 375
C	25.00 kg × ₹ 5	= <u>125</u>
	<u>125.00</u>	<u>1,750</u>

Standard cost for output of 5,600 kg.

$$= \frac{1,750}{100} \text{ kg} \times 5,600 \text{ kg.} = ₹ 98,000$$

Material Price Variance = Standard cost of actual material used – Actual cost of actual material used = ₹ 1,12,500 – ₹ 1,15,500 = ₹ 3,000 (A)

Material Usage Variance = Standard cost of production – Standard cost of actual material used = ₹ 98,000 – ₹ 1,12,500 = ₹ 14,500 (A)

Note: Material Price Variance can be calculated at the time of purchase as well. In that case, material variance will be as follows:



Actual cost of material purchased

A 5,000 kg × ₹ 21 = ₹ 1,05,000

B 2,000 kg × ₹ 8 = ₹ 16,000

C 1,200 kg × ₹ 6 = ₹ 7,200
₹ 1,28,200

Standard cost of material purchased

A 5,000 kg × ₹ 20 = ₹ 1,00,000

B 2,000 kg × ₹ 10 = ₹ 20,000

C 1,200 kg × ₹ 5 = ₹ 6,000
₹ 1,26,000

Material Price variance (if calculated at the time of purchase)

= Standard cost of actual material used – Actual cost of actual material used

= ₹ 1,26,000 – ₹ 1,28,200 = ₹ 2,200 (A)



QUESTION 26. (PP14)

Following data is extracted from the books of XYZ Ltd. for the month of January:

(i) Estimation-

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
Material-A	800	?	--
Material-B	600	30.00	18,000
			--

Normal loss was expected to be 10% of total input materials.

(ii) Actuals-

1480 kg of output produced.

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
Material-A	900	?	--
Material-B	?	32.50	--
			59,825

(iii) Other Information-

Material Cost Variance = ₹ 3,625 (F)

Material Price Variance = ₹ 175 (F)

You are required to CALCULATE:

(i) Standard Price of Material-A;

(ii) Actual Quantity of Material-B;

(iii) Actual Price of Material-A;

(iv) Revised standard quantity of Material-A and Material-B; and

(v) Material Mix Variance.

ANSWER :

(i) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
₹ 3,625 = (SQ × SP) – ₹ 59,825
(SQ × SP) = ₹ 63,450
(SQ_A × SP_A) + (SQ_B × SP_B) = ₹ 63,450



$$\begin{aligned}
 (940 \text{ kg} \times SP_A) + (705 \text{ kg} \times ₹30) &= ₹ 63,450 \\
 (940 \text{ kg} \times SP_A) + ₹21,150 &= ₹ 63,450 \\
 (940 \text{ kg} \times SP_A) &= ₹ 42,300 \\
 SP_A &= ₹ \frac{42,300}{940\text{kg}}
 \end{aligned}$$

Standard Price of Material-A = ₹ 45

Working Note:

SQ i.e. quantity of inputs to be used to produce actual output

$$= \frac{1,480\text{kg}}{90\%} = 1,645 \text{ kg}$$

$$SQ_A = \frac{800\text{kg}}{(800+600)} \times 1,645\text{kg} = 940 \text{ kg}$$

$$SQ_B = \frac{600\text{kg}}{(800+600)} \times 1,645\text{kg} = 705 \text{ kg}$$

$$\begin{aligned}
 \text{(ii) Material Price Variance (A + B)} &= \{(AQ \times SP) - (AQ \times AP)\} \\
 ₹ 175 &= (AQ \times SP) - ₹ 59,825 \\
 (AQ \times SP) &= ₹ 60,000 \\
 (AQ_A \times SP_A) + (AQ_B \times SP_B) &= ₹ 60,000 \\
 [900 \text{ kg} \times ₹ 45 \text{ (from (i) above)}] &+ (AQ_B \times ₹ 30) = ₹ 60,000 \\
 ₹ 40,500 + (AQ_B \times ₹ 30) &= ₹ 60,000 \\
 (AQ_B \times ₹ 30) &= ₹ 19,500 \\
 AQ_B &= \frac{19,500}{30} = 650 \text{ kg}
 \end{aligned}$$

Actual Quantity of Material B = 650 kg.

$$\begin{aligned}
 \text{(iii) } (AQ \times AP) &= ₹ 59,825 \\
 (AQ_A \times AP_A) + (AQ_B \times AP_B) &= ₹ 59,825 \\
 (900 \text{ kg} \times AP_A) + (650 \text{ kg (from (ii) above)} \times ₹ 32.5) &= ₹ 59,825 \\
 (900 \text{ kg} \times AP_A) + ₹ 21,125 &= ₹ 59,825 \\
 (900 \text{ kg} \times AP_A) &= ₹ 38,700 \\
 AP_A &= \frac{38,700}{900} = ₹ 43
 \end{aligned}$$

Actual Price of Material-A = ₹ 43

$$\begin{aligned}
 \text{(iv) Total Actual Quantity of Material-A and Material-B} &= AQA + AQB \\
 &= 900 \text{ kg} + 650 \text{ kg (from (ii) above)} \\
 &= 1,550 \text{ kg}
 \end{aligned}$$

Now,

$$\text{Revised } SQ_A = \frac{800\text{kg}}{(800+600)} \times 1,550\text{kg} = 886 \text{ kg}$$

$$\text{Revised } SQ_B = \frac{600\text{kg}}{(800+600)} \times 1,550\text{kg} = 664 \text{ kg}$$



$$\begin{aligned}
 \text{(v) Material Mix Variance (A + B)} &= \{(RSQ \times SP) - (AQ \times SP)\} \\
 &= \{(RSQ_A \times SP_A) + (RSQ_B \times SP_B) - 60,000\} \\
 &= (886 \text{ kg (from (iv) above)} \times ₹ 45 \text{ (from (i) above)}) + (664 \text{ kg (from (iv) above)} \\
 &\quad \times ₹ 30) - ₹ 60,000 \\
 &= (39,870 + 19,920) - 60,000 = ₹ 210 \text{ (A)}
 \end{aligned}$$

**QUESTION 27. (PP15)**

Paras Synthetics uses Standard costing system in manufacturing of its product 'Star 95 Mask'. The details are as follows;

Direct Material 0.50 Meter @ ₹ 60 per meter	₹ 30
Direct Labour 1 hour @ ₹ 20 per hour	₹ 20
Variable overhead 1 hour @ ₹ 10 per hour	₹ 10
Total	₹ 60

During the month of August, 10,000 units of 'Star 95 Mask' were manufactured.

Details are as follows:

Direct material consumed 5700 meters @ ₹ 58 per meter	
Direct labour Hours ? @ ?	₹ 2,24,400
Variable overhead incurred	₹ 1,12,200

Variable overhead efficiency variance is ₹ 2,000 A. Variable overheads are based on Direct Labour Hours.

You are required to calculate the missing data and all the relevant Variances.

ANSWER :**(i) Material Variances**

	Budget			Std. for actual			Actual		
	Quantity	Price (₹)	Amount (₹)	Quantity	Price (₹)	Amount (₹)	Quantity	Price (₹)	Amount (₹)
Material	0.5	60	30	5,000	60	3,00,000	5,700	58	3,30,600

$$\text{Material Cost Variance} = (SQ \times SP - AQ \times AP)$$

$$3,00,000 - 3,30,600 = ₹ 30,600 \text{ (A)}$$

$$\text{Material Price Variance} = (SP - AP) AQ$$

$$(60 - 58) 5,700 = ₹ 11,400 \text{ (F)}$$

$$\text{Material Usage Variance} = (SQ - AQ) SP$$

$$(5,000 - 5,700) 60 = ₹ 42,000 \text{ (A)}$$

(ii) Variable Overheads variances

$$\text{Variable overhead cost Variance} = (\text{Standard variable overhead} - \text{Actual Variable Overhead})$$

$$\text{Standard Variable Overheads: } 10,000 \text{ units} \times 10 = 1,00,000$$

$$(1,00,000 - 1,12,200) = ₹ 12,200 \text{ (A)}$$

$$\text{Variable overhead Efficiency Variance} = (\text{Standard Hours} - \text{Actual Hours}) \times$$

$$\text{Standard Rate per Hour}$$

$$\text{Let Actual Hours be 'X'}$$



$$(10,000 - X) \times 10 = 2,000 \text{ (A)}$$

$$1,00,000 - 10X = -2,000$$

$$X = 1,02,000 \div 10$$

$$\text{Therefore, Actual Hours (X)} = 10,200$$

Variable overhead Expenditure Variance = (Variable Overhead at Actual Hours - Actual Variable Overheads)

$$10,200 \times 10 - 1,12,200 = ₹ 10,200 \text{ (A)}$$

(iii) Labour variances

	Budget			Std. for actual			Actual		
	Hours	Price (₹)	Amount (₹)	Hours	Price (₹)	Amount (₹)	Hours	Price (₹)	Amount (₹)
Labour	1	20	20	10,000	20	2,00,000	10,200	22	2,24,400

$$\text{Actual Rate} = ₹ 2,24,400 \div 10,200 \text{ hours} = ₹ 22$$

$$\text{Labour Cost Variance} = (SH \times SR) - (AH \times AR)$$

$$10,000 \times 20 - 10,200 \times 22 = ₹ 24,400 \text{ (A)}$$

$$\text{Labour Rate Variance} = (SR - AR) \times AH$$

$$(20 - 22) \times 10,200 = ₹ 20,400 \text{ (A)}$$

$$\text{Labour Efficiency Variance} = (SH - AH) \times SR$$

$$(10,000 - 10,200) \times 20 = ₹ 4,000 \text{ (A)}$$



REVISION TEST PAPER



RTP MAY 18

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

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	45.00	36,000
Material-B	600 kg.	30.00	18,000
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 1,480 kg. finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	43.00	38,700
Material-B	650 kg.	32.50	21,125
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

Required:

CALCULATE:

- Material Cost Variance;
- Material Price Variance;
- Material Mix Variance;
- Material Yield Variance;
- Labour Cost Variance;
- Labour Efficiency Variance and
- Labour Yield Variance.

ANSWER :

Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	45.00	42,300	886 kg.	39,870	900 kg.	40,500	43.00	38,700
B	705 kg.	30.00	21,150	664 kg.	19,920	650 kg.	19,500	32.50	21,125
	1645 kg		63,450	1550 kg	59,790	1550 kg	60,000		59,825

WN-1: Standard Quantity (SQ):

$$\text{Material A-} \left(\frac{800\text{kg}}{0.9 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 939.68 \text{ or } 940 \text{ kg.}$$

$$\text{Material B-} \left(\frac{600\text{kg.}}{0.9 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 704.76 \text{ or } 705 \text{ kg.}$$

**WN- 2: Revised Standard Quantity (RSQ):**

$$\text{Material A-} \left(\frac{800\text{kg}}{1,400\text{kg.}} \times 1,550 \text{ kg.} \right) = 885.71 \text{ or } 886 \text{ kg.}$$

$$\text{Material B-} \left(\frac{600\text{kg}}{1,400 \text{ kg.}} \times 1,550 \text{ kg.} \right) = 664.28 \text{ or } 664 \text{ kg.}$$

- (i) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
= {63,450 – 59,825} = 3,625 (F)
- (ii) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)}
= {60,000 – 59,825} = 175 (F)
- (iii) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
= {59,790 – 60,000} = 210 (A)
- (iv) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
= {63,450 – 59,790} = 3,660 (F)

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):

$$\text{Skilled labour-} \left(\frac{0.95 \times 1,000\text{hr}}{0.90 \times 1,400\text{kg.}} \times 1,480 \text{ kg.} \right) = 1,115.87 \text{ or } 1,116 \text{ hrs.}$$

$$\text{Unskilled labour-} \left(\frac{0.95 \times 800\text{hr.}}{0.90 \times 1,400\text{kg.}} \times 1,480 \text{ kg.} \right) = 892.69 \text{ or } 893 \text{ hrs.}$$

WN-4: Revised Standard Hours (RSH):

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

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

- (v) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
= {61,496 – 62,380} = 884 (A)
- (vi) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
= {61,496 – 63,920} = 2,424 (A)
- (vii) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}
= {61,496 – 63,052} = 1,556 (A)

**RTP NOV 18**

Aaradhya Ltd. manufactures a commercial product for which the standard cost per unit is as follows:

	(₹)
Material:	
5 kg. @ ₹ 4 per kg.	20.00
Labour:	
3 hours @ ₹10 per hour	30.00
Overhead	
Variable: 3 hours @ ₹1	3.00
Fixed: 3 hours @ ₹0.50	1.50
Total	54.50

During Jan. 20X8, 600 units of the product were manufactured at the cost shown below:

	(₹)
Materials purchased:	
5,000 kg. @ ₹4.10 per kg.	20,500
Materials used:	
3,500 kg.	
Direct Labour:	
1,700 hours @ ₹ 9	15,300
Variable overhead	1,900
Fixed overhead	900
Total	38,600

The flexible budget required 1,800 direct labour hours for operation at the monthly activity level used to set the fixed overhead rate.

COMPUTE:

(a) Material price variance; (b) Material Usage variance; (c) Labour rate variance; (d) Labour efficiency variance; (e) Variable overhead expenditure variance; (f) Variable overhead efficiency variance; (g) Fixed overhead expenditure variance; (h) Fixed overhead volume variance; (i) Fixed overhead capacity variance; and (j) Fixed overhead efficiency variance.

Also RECONCILE the standard and actual cost of production.

ANSWER :

(a) Material price variance:

$$= (\text{Standard price} - \text{Actual Price}) \times \text{Actual quantity}$$

$$= (\text{₹ } 4 - \text{₹ } 4.10) \times 5,000 = \text{₹ } 500 \text{ Adv.}$$

(b) Material usage variance:

$$= (\text{Std. quantity for actual output} - \text{Actual qty.}) \times \text{Std. price}$$

$$= (600 \times 5 - 3,500) \times 4 = \text{₹ } 2,000 \text{ Adv.}$$

(c) Labour Rate Variance:

$$= (\text{Standard rate} - \text{Actual rate}) \times \text{Actual hours}$$

$$= (\text{₹ } 10 - \text{₹ } 9) \times 1,700 = \text{₹ } 1,700 \text{ Fav.}$$

(d) Labour Efficiency Variance:

$$= (\text{Standard hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$$



$$= (600 \times 3 - 1,700) \times ₹10$$

$$= ₹ 1,000 \text{ Fav.}$$

(e) Variable Overhead Expenditure Variance

$$= (\text{Actual Hours} \times \text{Standard Rate}) - \text{Actual Overhead}$$

$$= (1,700 \times ₹ 1) - ₹ 1,900$$

$$= ₹ 200 \text{ Adv.}$$

(f) Variable Overhead Efficiency Variance:

$$= \text{Std. hours for actual output} - \text{Actual hours} \times \text{Std. rate}$$

$$= (600 \times 3 - 1,700) \times ₹1 = ₹100 \text{ Fav.}$$

(g) Fixed Overhead Expenditure Variance:

$$= (\text{Budgeted overhead} - \text{Actual overhead})$$

$$= (1,800 \times 0.50 - 900) = \text{Nil}$$

(h) Fixed Overhead Volume Variance:

$$= (\text{Std. hours for actual output} - \text{Budgeted hours}) \times \text{Std. rate}$$

$$= (600 \times 3 - 1,800) \times ₹ 0.50 = \text{Nil}$$

(i) Fixed Overhead Capacity Variance:

$$= (\text{Budgeted hours} - \text{Actual Hours}) \times \text{Standard rate}$$

$$= (1,800 - 1,700) \times ₹ 0.50 = ₹ 50 \text{ Adv.}$$

(j) Fixed Overhead Efficiency Variance:

$$= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$$

$$= (600 \times 3 - 1,700) \times ₹ 0.50 = ₹ 50 \text{ Fav.}$$

Verification:	(₹)	(₹)
Overhead recovered: 600 units @ ₹4.50		2,700
Actual Overhead:		
Variable	1,900	
Fixed	900	2,800
		100 Adv.
Variable expenditure variance		200 Adv
Variable Efficiency variance		100 Fav.
Fixed expenditure variance		Nil
Fixed overhead volume variance		Nil
		100 Adv.

Reconciliation Statement

Standard Cost: 600 units @ ₹54.50		32,700	
Actual Cost:	38,600		
Less: Material Stock at standard cost: (1,500 × ₹4)	6,000	(32,600)	100 Fav.
Variances:	Adv. (₹)	Fav. (₹)	
Material price	500		
Material usage	2,000		
Labour rate		1,700	
Labour efficiency		1,000	
Variable expenditure	200		
Variable efficiency		100	
Total	2,700	2,800	100 Fav.

**RTP MAY 19**

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

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	45.00	36,000
Material-B	600 kg.	30.00	18,000
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 1,480 kg. finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	43.00	38,700
Material-B	650 kg.	32.50	21,125
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

You are required to CALCULATE:

- Material Cost Variance;
- Material Price Variance;
- Material Mix Variance;
- Material Yield Variance;
- Labour Cost Variance;
- Labour Efficiency Variance and
- Labour Yield Variance.

ANSWER :

Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	45.00	42,300	886 kg.	39,870	900 kg.	40,500	43.00	38,700
B	705 kg.	30.00	21,150	664 kg.	19,920	650 kg.	19,500	32.50	21,125
	1645 kg		63,450	1550 kg	59,790	1550 kg	60,000		59,825

WN-1: Standard Quantity (SQ):

$$\text{Material A-} \left(\frac{800\text{kg}}{0.9 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 939.68 \text{ or } 940 \text{ kg.}$$

$$\text{Material B-} \left(\frac{600\text{kg.}}{0.9 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 704.76 \text{ or } 705 \text{ kg.}$$

WN-2: Revised Standard Quantity (RSQ):

$$\text{Material A-} \left(\frac{800\text{kg}}{1,400\text{kg.}} \times 1,550 \text{ kg.} \right) = 885.71 \text{ or } 886 \text{ kg.}$$



$$\text{Material B-} \left(\frac{600\text{kg}}{1,400\text{ kg.}} \times 1,550\text{ kg.} \right) = 664.28 \text{ or } 664\text{ kg.}$$

- (a) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
= {63,450 – 59,825} = 3,625 (F)
- (b) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)}
= {60,000 – 59,825} = 175 (F)
- (c) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
= {59,790 – 60,000} = 210 (A)
- (d) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
= {63,450 – 59,790} = 3,660 (F)

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):

$$\text{Skilled labour-} \left(\frac{0.95 \times 1,000\text{hr}}{0.90 \times 1,400\text{kg.}} \times 1,480\text{ kg.} \right) = 1,115.87 \text{ or } 1,116\text{ hrs.}$$

$$\text{Unskilled labour-} \left(\frac{0.95 \times 800\text{hr.}}{0.90 \times 1,400\text{kg.}} \times 1,480\text{ kg.} \right) = 892.69 \text{ or } 893\text{ hrs.}$$

WN-4: Revised Standard Hours (RSH):

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

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

- (e) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
= {61,496 – 62,380} = 884 (A)
- (f) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
= {61,496 – 63,920} = 2,424 (A)
- (g) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}

**RTP NOV 19**

JVG Ltd. produces a product and operates a standard costing system and value material and finished goods inventories at standard cost. The information related with the product is as follows:

Particulars	Cost per unit (₹)
Direct materials (30 kg at ₹350 per kg)	10,500
Direct labour (5 hours at ₹80 per hour)	400

The actual information for the month just ended is as follows:

- The budgeted and actual production for the month of September 2019 is 1,000 units.
- Direct materials – 5,000 kg at the beginning of the month. The closing balance of direct materials for the month was 10,000 kg. Purchases during the month were made at ₹ 365 per kg. The actual utilization of direct materials was 7,200 kg more than the budgeted quantity.
- Direct labour – 5,300 hours were utilised at a cost of ₹ 4,34,600.

Required:

CALCULATE (i) Direct material price and usage variances (ii) Direct labour rate and efficiency variances.

ANSWER :

Working:

Quantity of material purchased and used.

No. of units produced	1,000 units
Std. input per unit	30kg.
Std. quantity (Kg.)	30,000 kg.
Add: Excess usage	7,200 kg.
Actual Quantity	37,200 kg.
Add: Closing Stock	10,000 kg.
Less: Opening stock	5,000 kg.
Quantity of Material purchased	42,200 kg.

(i) Direct Material Price Variance:

$$= \text{Actual Quantity purchased (Std. Price – Actual Price)}$$

$$= 42,200 \text{ kg.} (\text{₹}350 - \text{₹}365) = 6,33,000 \text{ (Adverse)}$$

Direct Material Usage Variance:

$$= \text{Std. Price (Std. Quantity – Actual Quantity)}$$

$$= \text{₹}350 (30,000 \text{ kg.} - 37,200 \text{ kg.}) = \text{₹}25,20,000 \text{ (Adverse)}$$

(ii) Direct Labour Rate Variance:

$$= \text{Actual hours (Std. Rate – Actual Rate)}$$

$$= 5,300 \text{ hours } (\text{₹}80 - \text{₹}82) = \text{₹}10,600 \text{ (Adverse)}$$

Direct Labour Efficiency Variance:

$$= \text{Std. Rate (Std. hours – Actual hours)}$$

$$= \text{₹}80 (1,000 \text{ units} \times 5 \text{ hours} - 5,300 \text{ hours}) = \text{₹}24,000 \text{ (Adverse)}$$

**RTP MAY 20**

ABC Ltd. had prepared the following estimation for the month of January:

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	90.00	72,000
Material-B	600 kg.	60.00	36,000
Skilled labour	1,000 hours	75.00	75,000
Unskilled labour	800 hours	44.00	35,200

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 1,480 kg. finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	86.00	77,400
Material-B	650 kg.	65.00	42,250
Skilled labour	1,200 hours	71.00	85,200
Unskilled labour	860 hours	46.00	39,560

You are required to CALCULATE:

- Material Cost Variance;
- Material Price Variance;
- Material Mix Variance;
- Material Yield Variance;
- Labour Cost Variance;
- Labour Efficiency Variance and
- Labour Yield Variance.

ANSWER :

Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	90.00	84,600	886 kg.	79,740	900 kg.	81,000	86.00	77,400
B	705 kg.	60.00	42,300	664 kg.	39,840	650 kg.	39,000	65.00	42,250
	1645 kg		1,26,900	1550 kg	1,19,580	1550 kg	1,20,000		1,19,650

WN-1: Standard Quantity (SQ):

$$\text{Material A-} \left(\frac{800\text{kg}}{0.9 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 939.68 \text{ or } 940 \text{ kg.}$$

$$\text{Material B-} \left(\frac{600\text{kg.}}{0.9 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 704.76 \text{ or } 705 \text{ kg.}$$

WN- 2: Revised Standard Quantity (RSQ):

$$\text{Material A-} \left(\frac{800\text{kg}}{1,400 \text{ kg.}} \times 1,550\text{kg.} \right) = 885.71 \text{ or } 886 \text{ kg.}$$



$$\text{Material B} - \left(\frac{600\text{kg.}}{1,400\text{ kg.}} \times 1,550\text{ kg.} \right) = 664.28 \text{ or } 664\text{ kg.}$$

- (a) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
= {1,26,900 – 1,19,650} = 7,250 (F)
- (b) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)}
= {1,20,000 – 1,19,650} = 350 (F)
- (c) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
= {1,19,580 – 1,20,000} = 420 (A)
- (d) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
= {1,26,900 – 1,19,580} = 7,320 (F)

Labour Variances:

Labour	SH (WN-3)	SR (₹)	SH × SR (₹)	RSH (WN-4)	RSH × SR (₹)	AH	AH × SR (₹)	AR (₹)	AH × AR (₹)
Skilled	1,116 hrs	75.00	83,700	1144	85,800	1,200	90,000	71.00	85,200
Unskilled	893 hrs	44.00	39,292	916	40,304	860	37,840	46.00	39,560
	2,009 hrs		1,22,992	2,060	1,26,104	2,060	1,27,840		1,24,760

WN- 3: Standard Hours (SH):

$$\text{Skilled labour} - \left(\frac{0.95 \times 1,000\text{hr}}{0.90 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 1,115.87 \text{ or } 1,116\text{ hrs.}$$

$$\text{Unskilled labour} - \left(\frac{0.95 \times 800\text{hr.}}{0.90 \times 1,400\text{kg.}} \times 1,480\text{kg.} \right) = 892.69 \text{ or } 893\text{ hrs.}$$

WN- 4: Revised Standard Hours (RSH):

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

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

- (e) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
= {1,22,992 – 1,24,760} = 1,768 (A)
- (f) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
= {1,22,992 – 1,27,840} = 4,848 (A)
- (g) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}
= {1,22,992 – 1,26,104} = 3,112 (A)



RTP NOV 20

Following are the standard cost for a product-X:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹100 per hour	800



Variable Overhead 8 hours @ ₹15 per hour	120
Fixed Overhead	400
	<u>2,220</u>
Budgeted output for the year was 2,000 units. Actual output is 1,800 units. Actual cost for year is as follows:	
	(₹)
Direct Materials 17,800 Kg @ ₹ 92 per Kg.	16,37,600
Direct Labour 14,000 hours @ ₹ 104 per hour	14,56,000
Variable Overhead incurred	2,17,500
Fixed Overhead incurred	7,68,000

You are required to CALCULATE:

- (i) Material Usage Variance
- (ii) Material Price Variance
- (iii) Material Cost Variance
- (iv) Labour Efficiency Variance
- (v) Labour Rate Variance
- (vi) Labour Cost Variance
- (vii) Variable Overhead Cost Variance
- (viii) Fixed Overhead Cost Variance.

ANSWER :

- (i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
= ₹ 90 (18,000 kg. – 17,800 kg.)
= ₹ 18,000 (Favourable)
- (ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 17,800 kg. (₹ 90 – ₹ 92) = ₹ 35,600 (Adverse)
- (iii) Material Cost Variance = Std. Material Cost – Actual Material Cost
= (SQ × SP) – (AQ × AP)
= (18,000 kg. × ₹ 90) – (17,800 kg. × ₹ 92)
= ₹ 16,20,000 – ₹ 16,37,600
= ₹ 17,600 (Adverse)
- (iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
= ₹ 100 (1,800 units × 8 – 14,000 hrs.)
= ₹ 100 (14,400 hrs. – 14,000 hrs.)
= ₹ 40,000 (Favourable)
- (v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 14,000 hrs. (₹ 100 – ₹ 104)
= ₹ 56,000 (Adverse)
- (vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost
= (SH × SR) – (AH × AR)
= (14,400 hrs. × ₹ 100) – (14,000 hrs. × ₹ 104)
= ₹ 14,40,000 – ₹ 14,56,000
= ₹ 16,000 (Adverse)
- (vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost



$$= (14,400 \text{ hrs.} \times ₹ 15) - ₹ 2,17,500$$

$$= ₹ 1,500 \text{ (Adverse)}$$

(viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead – Actual Fixed Overhead

$$= (1,800 \text{ units} \times ₹ 400) - ₹ 7,68,000$$

$$= ₹ 7,20,000 - ₹ 7,68,000 = ₹ 48,000 \text{ (Adverse)}$$

**RTP MAY 21**

LM Limited produces a product 'SX4' which is sold in a 10 Kg. packet. The standard cost card per packet of 'SX4' is as follows:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹ 80 per hour	640
Variable Overhead 8 hours @ ₹ 20 per hour	160
Fixed Overhead	250
	<u>1,950</u>

Budgeted output for a quarter of a year was 10,000 Kg. Actual output is 9,000 Kg. Actual costs for this quarter are as follows:

	(₹)
Direct Materials 8,900 Kg @ ₹ 92 per Kg.	8,18,800
Direct Labour 7,000 hours @ ₹ 84 per hour	5,88,000
Variable Overhead incurred	1,40,000
Fixed Overhead incurred	2,60,000

You are required to CALCULATE:

- Material Usage Variance
- Material Price Variance
- Material Cost Variance
- Labour Efficiency Variance
- Labour Rate Variance
- Labour Cost Variance
- Variable Overhead Cost Variance
- Fixed Overhead Cost Variance

ANSWER :

- Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
 $= ₹ 90 (9,000 \text{ kg.} - 8,900 \text{ kg.})$
 $= ₹ 9,000 \text{ (Favourable)}$
- Material Price Variance = Actual Quantity (Std. Price – Actual Price)
 $= 8,900 \text{ kg.} (₹ 90 - ₹ 92) = ₹ 17,800 \text{ (Adverse)}$
- Material Cost Variance = Std. Material Cost – Actual Material Cost
 $= (SQ \times SP) - (AQ \times AP)$
 $= (9,000 \text{ kg.} \times ₹ 90) - (8,900 \text{ kg.} \times ₹ 92)$
 $= ₹ 8,10,000 - ₹ 8,18,800$
 $= ₹ 8,800 \text{ (Adverse)}$
- Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)



$$= ₹ 80 \left(\frac{9,000}{10} \text{ 8hours} - 7,000 \text{ hrs.} \right)$$

$$= ₹ 80 (7,200 \text{ hrs.} - 7,000 \text{ hrs.})$$

$$= ₹ 16,000 \text{ (Favourable)}$$

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
 = 7,000 hrs. (₹ 80 – ₹ 84)
 = ₹ 28,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost
 = (SH × SR) – (AH × AR)
 = (7,200 hrs. × ₹ 80) – (7,000 hrs. × ₹ 84)
 = ₹ 5,76,000 – ₹ 5,88,000
 = ₹ 12,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost
 = (7,200 hrs. × ₹ 20) – ₹ 1,40,000
 = ₹ 4,000 (Adverse)

(viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead – Actual Fixed Overhead
 = $\frac{₹ 250}{10 \text{ kgs.}} \times 9,000 \text{ kgs.}$ ₹ 2,60,000
 = ₹ 2,25,000 – ₹ 2,60,000 = ₹ 35,000 (Adverse)

**RTP NOV 21**

BabyMoon Ltd. uses standard costing system in manufacturing one of its product 'Baby Cap'. The details are as follows:

Direct Material 1 Meter @ ₹ 60 per meter	₹ 60
Direct Labour 2 hour @ ₹ 20 per hour	₹ 40
Variable overhead 2 hour @ ₹ 10 per hour	₹ 20
Total	₹ 120

During the month of August, 10,000 units of 'Baby Cap' were manufactured. Details are as follows:

Direct material consumed	11,400 meters	@	₹ 58 per meter	
Direct labour Hours	?	@	?	₹ 4,48,800
Variable overhead incurred				₹ 2,24,400

Variable overhead efficiency variance is ₹ 4,000 A. Variable overheads are based on Direct Labour Hours.

You are required to CALCULATE the following Variances:

- Material Variances- Material Cost Variance, Material Price Variance and Material Usage Variance.
- Variable Overheads variances- Variable overhead Cost Variance, Variable overhead Efficiency Variance and Variable overhead Expenditure Variance.
- Labour variances- Labour Cost Variance, Labour Rate Variance and Labour Efficiency Variance.

**ANSWER :**

(i) Material Variances

Budget			Std. for actual			Actual		
Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)
1	60	60	10,000	60	6,00,000	11,400	58	6,61,200

Material Cost Variance = (SQ × SP – AQ × AP)

= 6,00,000 – 6,61,200 = ₹ 61,200 (A)

Material Price Variance = (SP – AP) AQ

= (60 – 58) 11,400 = ₹ 22,800 (F)

Material Usage Variance = (SQ – AQ) SP

= (10,000 – 11,400) 60 = ₹ 84,000 (A)

(ii) Variable Overheads variances

Variable overhead cost Variance

= Standard variable overhead – Actual Variable Overhead

= (10,000 units × 2 hours × ₹ 10) – 2,24,400 = ₹ 24,400 (A)

Variable overhead Efficiency Variance

= (Standard Hours – Actual Hours) × Standard Rate per Hour

Let Actual Hours be 'X', then:

(20,000 – X) × 10 = 4,000 (A)

2,00,000 – 10X = - 4,000

X = 2,04,000 ÷ 10

Therefore, Actual Hours (X) = 20,400

Variable overhead Expenditure Variance

= Variable Overhead at Actual Hours – Actual Variable Overheads

= 20,400 × ₹ 10 – 2,24,400 = ₹ 20,400 (A)

(iii) Labour variances

Budget			Std. for actual			Actual		
Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
2	20	40	20,000	20	4,00,000	20,400	22*	4,48,800

*Actual Rate = ₹ 4,48,800 ÷ 20,400 hours = ₹ 22

Labour Cost Variance = (SH × SR) – (AH × AR)

= 4,00,000 – 4,48,800 = ₹ 48,800 (A)

Labour Rate Variance = (SR – AR) × AH

= (20 – 22) × 20,400 = ₹ 40,800 (A)

Labour Efficiency Variance = (SH – AH) × SR

= (20,000 – 20,400) × 20 = ₹ 8,000 (A)

**RTP MAY 22**

The standard output of a Product 'D' is 50 units per hour in manufacturing department of a Company employing 100 workers. In a 40 hours week, the department produced 1,920 units of product 'D' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹ 12.40, ₹ 12.00 and ₹ 11.40 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹ 480 (F).

You are required to COMPUTE:

- (i) Total Labour Cost Variance.
- (ii) Total Labour Rate Variance.
- (iii) Total Labour Gang Variance.
- (iv) Total Labour Yield Variance, and
- (v) Total Labour Idle Time Variance.

ANSWER :

Working Notes:

1. Calculation of Standard Man hours

When 100 workers work for 1 hour, the standard output is 50 units.

Standard man hours per unit = $\frac{100 \text{ hours}}{50 \text{ units}} = 2 \text{ hours per unit}$

2. Calculation of standard man hours for actual output:

= 1,920 units × 2 hours = 3,840 hours.

3. Calculation of actual cost

Type of Workers	No of Workers	Actual Hours Paid	Rate (₹)	Amount (₹)	Idle Hours (5% of hours paid)	Actual hours Worked
Group 'A'	10	400	12.40	4,960	20	380
Group 'B'	30	1,200	12	14,400	60	1,140
Group 'C'	60	2,400	11.40	27,360	120	2,280
	100	4,000		46,720	200	3,800

4. Calculation of Standard wage Rate:

Labour Efficiency Variance

= 480F

(Standard hours for Actual production – Actual Hours) × SR

= 480F

(3,840 – 3,800) × SR

= 480

Standard Rate (SR)

= ₹ 12 per hour

- (i) Total Labour Cost Variance

= (Standard hours × Standard Rate) – (Actual Hours × Actual rate)

= (3,840 × 12) – 46,720

= 640A

- (ii) Total Labour Rate Variance

= (Standard Rate – Actual Rate) × Actual Hours

Group 'A' = (12 – 12.40) 400

= 160A

Group 'B' = (12 – 12) 1,200

= 0

Group 'C' = (12 – 11.40) 2,400

= 1,440F

1,280F



- (iii) Total Labour Gang Variance
 = Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang
 - Average Standard Rate per hour of Actual Gang@}
 @ on the basis of hours worked
 = $3,800 \times \left(12 - \frac{3,840 \times 12}{3,800} \right)$
 = 0
 [Note: As the number of workers in standard and actual is the same, there is no difference in mix ratio, so labour gang variance will be NIL]
- (iv) Total Labour Yield Variance
 = Average Standard Rate per hour of Standard Gang × {Total Standard Time (hours) - Total Actual Time worked (hours)}
 = $12 \times (3,840 - 3,800)$
 = 480F
- (v) Total Labour idle time variance
 = Total Idle hours × standard rate per hour
 = 200 hours × 12
 = 2,400A

**RTP NOV 22**

Ahaan Limited operates a system of standard costing in respect of one of its products 'AH1' which is manufactured within a single cost centre. Details of standard per unit are as follows:

- The standard material input is 20 kilograms at a standard price of ₹ 24 per kilogram.
- The standard wage rate is ₹ 72 per hour and 5 hours are allowed to produce one unit.
- Fixed production overhead is absorbed at the rate of 100% of wages cost.

During the month of April 2022, the following was incurred:

- Actual price paid for material purchased @ ₹ 22 per kilogram.
- Total direct wages cost was ₹ 43,92,000
- Fixed production overhead cost incurred was ₹ 45,00,000

Analysis of variances was as follows:

Variances	Favourable	Adverse
Direct material price	₹ 4,80,000	-
Direct material usage	₹ 48,000	
Direct labour rate	-	₹ 69,120
Direct labour efficiency	₹ 33,120	-
Fixed production overhead expenditure		₹ 1,80,000

You are required to CALCULATE the following for the month of April, 2022

- Material cost variance
- Budgeted output (in units)
- Quantity of raw materials purchased (in kilograms)
- Actual output (in units)
- Actual hours worked



- (vi) Actual wage rate per labour hour
 (vii) Labour cost variance
 (viii) Production overhead cost variance

ANSWER :

- (i) Direct Material Cost Variance = Direct Material Price Variance + Direct Material Usage Variance

$$= ₹ 4,80,000 \text{ F} + ₹ 48,000 \text{ F} = ₹ 5,28,000 \text{ F}$$

- (ii) Budgeted Output (units)

Fixed Production Overhead Expenditure Variance

$$= \text{Budgeted Fixed Overhead} - \text{Actual Fixed Overheads}$$

$$= \text{Budgeted Output} \times \text{Standard Overhead Rate} - \text{Actual Fixed Overheads}$$

$$₹ 1,80,000 \text{ A} = \text{Budgeted Output} \times ₹ 360 (5 \text{ hrs @ ₹ 72}) - ₹ 45,00,000$$

$$\text{Budgeted Output} = \frac{₹ 45,00,000 - ₹ 1,80,000}{₹ 360} = 12,000 \text{ units}$$

- (iii) Quantity of Materials purchased (in kilograms)

Material Price Variance = Actual Usage (Standard Price per kg - Actual price per kg)

$$₹ 4,80,000 \text{ F} = \text{Actual Usage} (₹ 24 - ₹ 22)$$

$$\text{Actual usage in kgs} = \frac{₹ 4,80,000 - ₹ 1,80,000}{₹ 2} = 2,40,000 \text{ kgs}$$

- (iv) Actual Output (units)

Actual Direct Wages	₹ 43,92,000
Direct labour rate variance	₹ 69,120 A
Direct labour efficiency variance	₹ 33,120 F
Standard labour cost for actual output	₹ 43,56,000

$$\text{Actual Output} = \frac{\text{Standard labour cost for actual output}}{\text{Standard wage rate per unit}} = 12,000 \text{ units}$$

$$= \frac{₹ 43,56,000}{₹ 360 (72 \times 5)} = 12,100 \text{ units}$$

Alternatively, let X be the actual quantity of output

Then, Standard Quantity of input for actual output 'X'

$$20X = \text{SQ}$$

$$\text{Material cost variance} = (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP})$$

$$₹ 5,28,000 = (20X \times ₹ 24) - (2,40,000 \text{ kgs} \times ₹ 22)$$

$$480X = ₹ 52,80,000 + ₹ 5,28,000$$

$$480X = ₹ 58,08,000$$

$$X = \frac{₹ 58,08,000}{480} = 12,100 \text{ units}$$

- (v) Actual hours worked

Labour Efficiency Variance = Standard Labour Rate (Standard time for actual output - Actual time)

$$₹ 33,120 \text{ F} = ₹ 72 (5 \text{ hours} \times 12100 \text{ units} - \text{Actual time})$$



460 hours = 60,500 hours - Actual time

Actual time = 60,500 - 460 = 60,040 hours

(vi) Actual wage rate per hour

Actual Wages paid = ₹ 43,92,000

Actual hours worked = 60,040 hours

Actual Wage rate per hour = $\frac{\text{₹ 43,92,000}}{60,040 \text{ hours}}$ = ₹ 73.15 per hour

(vii) Labour cost variance

= Labour rate variance + Labour efficiency variance

= ₹ 69,120 A + ₹ 33,120 F

= ₹ 36,000 A

(viii) Production Overhead Cost Variance

= Actual Output x Standard overhead rate - Actual Overheads Incurred

= 12,100 units x ₹ 360 - ₹ 45,00,000

= ₹ 43,56,000 - ₹ 45,00,000

= ₹ 1,44,000 A



RTP MAY 23

XYZ Manufacturing Ltd. had prepared the following estimation for the month of January:

	Quantity	Rate (₹)	(₹)
Raw Material - DF	1,600 kg.	50	80,000
Raw Material - CE	1,200 kg.	35	42,000
Skilled labour	2,000 hours	40	80,000
Semiskilled labour	1,600 hours	25	40,000

Standard loss in the process 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 2,960 kg. finished product by using the followings:

	Quantity	Rate (₹)	(₹)
Raw Material - DF	1,800 kg.	40	72,000
Raw Material - CE	1,300 kg.	30	39,000
Skilled labour	2,400 hours	35	84,000
Semiskilled labour	1,720 hours	20	34,400

You are required to CALCULATE:

(a)	Material Cost Variance;
(b)	Material Price Variance;
(c)	Material Mix Variance;
(d)	Material Yield Variance;
(e)	Labour Cost Variance;
(f)	Labour Efficiency Variance and
(g)	Labour Yield Variance

**ANSWER :****Material Variance**

Raw Material	SQ (kg.)	SP	SQ × SP	RSQ (WN-2) (kg.)	RSQ × SP	AQ	AQ × SP	AP	AQ × AP
	(WN-1)	(₹)	(₹)		(₹)		(₹)	(₹)	(₹)
DF	1879	50	93,950	1771	88,550	1800	90,000	40	72,000
CE	1410	35	49,350	1329	46,515	1300	45,500	30	39,000
	3289		1,43,300	3,100	1,35,065	3100	1,35,500		1,11,000

WN-1: Standard Quantity (SQ):

$$1879.365 \text{ or } 1879 \text{ kg.} = \left(\frac{1,600 \text{ kg.}}{0.9 \times 2,800 \text{ kg.}} \times 2,960 \text{ kg.} \right)$$

$$\text{Raw Material DF} = \left(\frac{1,200 \text{ kg.}}{0.9 \times 2,800 \text{ kg.}} \times 2,960 \text{ kg.} \right)$$

$$\text{Raw Material CE} = 1409.52 \text{ or } 1410 \text{ kg.} \left(\frac{1,200 \text{ kg.}}{2,800 \text{ kg.}} \times 3,100 \text{ kg.} \right)$$

WN- 2: Revised Standard Quantity (RSQ):

$$\text{Raw Material DF} = 1,771.43 \text{ or } 1,771 \text{ kg.} \left(\frac{1,200 \text{ kg.}}{2,800 \text{ kg.}} \times 3,100 \text{ kg.} \right)$$

$$\text{Raw Material CE} = 1,328.57 \text{ or } 1,329 \text{ kg.}$$

$$(a) \text{ Material Cost Variance (A + B)} = \{(SQ \times SP) - (AQ \times AP)\}$$

$$\{1,43,300 - 1,11,000\} = 32,300(F) (F)$$

$$(b) \text{ Material Price Variance (A + B)} = \{(AQ \times SP) - (AQ \times AP)\}$$

$$\{1,35,500 - 1,11,000\} = 24,500(F)$$

$$(c) \text{ Material Mix Variance (A + B)} = \{(RSQ \times SP) - (AQ \times SP)\}$$

$$\{1,35,065 - 1,35,500\} = 435 (A)$$

$$(d) \text{ Material Yield Variance (A + B)} = \{(SQ \times SP) - (RSQ \times SP)\}$$

$$\{1,43,300 - 1,35,065\} = 8,235 (F)$$

Labour Variances:

Labour	SH	SR	SH × SR	RSH (WN-4)	RSH × SR	AH	AH × SR	AR	AH × AR
	(WN-3)	(₹)	(₹)		(₹)		(₹)	(₹)	(₹)
Skilled	2232	40	89,280	2289	91,560	2,400	96,000	35	84,000
Semiskilled	1785	25	44,625	1831	45,775	1720	43,000	20	34,400
	4,017 hrs		1,33,905	4,120	1,37,335	4,120	1,39,000		1,18,400

WN- 3: Standard Hours (SH):

$$\text{Skilled labour} = 2,231.746 \text{ or } 2,232 \text{ hrs} \left(\frac{0.95 \times 2,000 \text{ hr}}{0.90 \times 2800 \text{ kg.}} \times 2,960 \text{ kg.} \right)$$

WN- 4: Revised Standard Hours (RSH):

$$\text{Skilled labour} = 2,288.889 \text{ or } 2,289 \text{ hrs.} = \left(\frac{2,000 \text{ hrs}}{3,600 \text{ kg}} \times 4,120 \text{ hrs} \right)$$



$$\text{Semiskilled labour} = 1831.11 \text{ or } 1831 \text{ hrs.} = \left(\frac{1,600 \text{ hrs}}{3,600 \text{ kg}} \times 4,120 \text{ hrs} \right)$$

$$(e) \text{ Labour Cost Variance (Skilled + Semiskilled)} = \{(SH \times SR) - (AH \times AR)\}$$

$$\{1,33,905 - 1,18,400\} = 15,505 \text{ (F)}$$

$$(f) \text{ Labour Efficiency Variance (Skilled + Semiskilled)} = \{(SH \times SR) - (AH \times SR)\}$$

$$\{1,33,905 - 1,39,000\} = 5,095 \text{ (A)}$$

$$(g) \text{ Labour Yield Variance (Skilled + Semiskilled)} = \{(SH \times SR) - (RSH \times SR)\}$$

$$= \{1,33,905 - 1,37,335\} = 3,430 \text{ (A)}$$

**RTP NOV 23**

The following information has been provided by a company:

Number of units produced and sold	6,000
Standard labour rate per hour	₹ 8
Standard hours required for 6,000 units	-
Actual hours required	17094 hours
Labour efficiency	105.3%
Labour rate variance	

You are required to calculate: ₹ 68,376 (A)

- Actual labour rate per hour
- Standard hours required for 6,000 units
- Labour Efficiency variance
- Standard labour cost per unit
- Actual labour cost per unit.

ANSWER :

SR – Standard labour Rate per Hour

AR – Actual labour rate per hour

SH – Standard Hours

AH – Actual hours

$$(i) \text{ Labour rate Variance} = AH (SR - AR)$$

$$\text{Or } 17,094 (8 - AR) = 68,376(A)$$

$$\text{Or } 17,094 (8 - AR) = - 68,376$$

$$\text{Or } 8 - AR = -4$$

$$\text{Or } AR = ₹12$$

$$(ii) \text{ Labour Efficiency} = \frac{SH}{AH} \times 100 = 105.3$$

$$= SH = \frac{AH \times 105.3}{100} = \frac{17,094 \times 105.3}{100}$$

$$= 17,999.982$$

$$= SH = 18,000 \text{ hours}$$

$$(iii) \text{ Labour Efficiency Variance} = SR (SH - AH)$$

$$= 8(18,000 - 17,094)$$

$$= 8 \times 906$$

$$= ₹ 7,248(F)$$



$$(iv) \text{ Standard Labour Cost per Unit} = \frac{18,000 \times 8}{6,000} = ₹ 24$$

$$(v) \text{ Actual Labour Cost Per Unit} = \frac{17,094 \times 12}{6,000} = ₹ 34.19$$

**RTP MAY 24**

EML operates in coal mining through open cast mining method. Explosives and detonators are used for excavation of coal from the mines. The following are the details of standard quantity of explosives materials used for mining:

Particulars	Rate (₹)	Standard Qty. for Iron ore	Standard Qty. for Overburden (OB)
SME	40.00 per kg.	2.4 kg per tonne	1.9 kg per cubic- meter
Detonators	20.00 per piece	2 pcs per tonne	2 pcs per cubic- meter

The standard stripping ratio is 3:1 (means 3 cubic- meter of overburden soil to be removed to get one tonne of coal).

During the month of December 2023, the company produces 20,000 tonnes of coal and 58,000 cubic- meter of OB. The quantity of explosive materials used and paid for the month is as below:

Material	Quantity	Amount (₹)
SME	1,67,200 kg.	63,53,600
Detonators	1,18,400 pcs	24,27,200

Explosive suppliers are paid for the explosive materials on the basis of performance of the explosives which is termed as powder factor. One of the suppliers has presented their bill for explosive supplied for the month of December 2023. You being a bill passing officer of EML is required to COMPUTE the material price variance, material quantity variance and material cost variance.

ANSWER :

Workings:

1. Calculation of Standard Qty. of Explosives and Detonators for actual output:

	Particulars	Coal	Overburden (OB)	Total
SME:				
A	Actual Output	20,000 tonne	58,000 M ³	
B	Standard Qty per unit	2.4 kg./ tonne	1.9 kg./M ³	
C	Standard Qty. for actual production [A×B]	48,000 kg.	1,10,200 kg.	1,58,200 kg.
Detonators:				
D	Standard Qty per unit	2 pcs/ tonne	2 pcs/ M ³	
E	Standard Qty. for actual production [A × D]	40,000 pcs.	1,16,000 pcs	1,56,000 pcs



2. Calculation of Actual Price per unit of materials:

Material	Quantity [A]	Amount (₹) [B]	Rate (₹) [C = B÷A]
SME	1,67,200 kg.	63,53,600	38.00
Detonators	1,18,400 pcs	24,27,200	20.50

Computation of material price variance:

Material Price Variance = Actual Qty. × (Std. Price - Actual Price)

SME = 1,67,200 kg. × (₹40 - ₹38) = ₹3,34,400 (F)

Detonators = 1,18,400 pcs × (₹20 - ₹20.5) = ₹59,200 (A)

Total = ₹2,75,200 (F)

Computation of material quantity variance:

Material Qty. Variance = Std. Price × (Std. Qty for actual output - Actual Qty.)

SME = ₹40 × (1,58,200 kg. - 1,67,200 kg.) = ₹3,60,000 (A)

Detonators = ₹20 × (1,56,000 pcs - 1,18,400 pcs) = ₹7,52,000 (F)

Total = ₹3,92,000 (F)

Computation of material cost variance:

Material cost variance = Std. cost - Actual Cost

Or, (Std. Price × Std. Qty) - (Actual Price × Actual Qty.)

SME = (₹40 × 1,58,200 kg.) - (₹38 × 1,67,200 kg.)

= ₹63,28,000 - ₹63,53,600 = ₹25,600 (A)

Detonators = (₹20 × 1,56,000 pcs) - (₹20.50 × 1,18,400 pcs)

= ₹31,20,000 - ₹24,27,200 = ₹6,92,800 (F)

Total = ₹6,67,200 (F)



14

MARGINAL COSTING

**QUESTION 1. (ILLUSTRATION 1)**

MNP Ltd sold 2,75,000 units of its product at ₹ 37.50 per unit. Variable costs are ₹ 17.50 per unit (manufacturing costs of ₹ 14 and selling cost ₹ 3.50 per unit). Fixed costs are incurred uniformly throughout the year and amounting to ₹ 35,00,000 (including depreciation of ₹ 15,00,000). There is no beginning or ending inventories.

Required:

COMPUTE breakeven sales level quantity and cash breakeven sales level quantity.

ANSWER :

$$\text{Break even Sales Quantity} = \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{\text{₹ 35,00,000}}{\text{₹ 20}} = 1,75,000 \text{ units}$$

$$\text{Cash Break-even Sales Quantity} = \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{\text{₹ 20,00,000}}{\text{₹ 20}} = 1,00,000 \text{ units.}$$

**QUESTION 2. (ILLUSTRATION 2)**

You are given the following particulars

- Fixed cost ₹ 1,50,000
- Variable cost ₹ 15 per unit
- Selling price is ₹ 30 per unit CALCULATE:
 - Break-even point
 - Sales to earn a profit of ₹ 20,000

ANSWER :

$$(a) \text{ Break-even point (BEP)} = \frac{\text{Fixed cost}}{\text{Contribution per unit} *} = \frac{\text{₹ 1,50,000}}{\text{₹ 15}} = 10,000 \text{ Units}$$

* (Contribution per unit = Sales per unit – Variable cost per unit = ₹ 30 – ₹ 15)

(b) Sales to earn a Profit of ₹ 20,000:

$$= \frac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution per unit}} \times \text{Selling price per unit}$$

$$= \frac{1,50,000 + \text{₹ 20,000}}{\text{₹ 15}} \times \text{₹ 30} = \text{₹ 3,40,000}$$

Or

$$= \frac{\text{Fixed cost} + \text{Desired profit}}{\text{P / V Ratio}} = \frac{\text{₹ 1,70,000}}{\text{P / V Ratio}} = \frac{\text{₹ 1,70,000}}{50\%} = \text{₹ 3,40,000}$$

$$\text{PV Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

**QUESTION 3. (ILLUSTRATION 3)**

A company has a P/V ratio of 40%. COMPUTE by what percentage must sales be increased to offset: 20% reduction in selling price?

ANSWER :

$$\text{Revised Sales Value} = \frac{\text{Desired Contribution}}{\text{Revised P / V Ratio} * } = \frac{0.40}{0.25} = 1.6$$

This means sales value to be increased by 60% of the existing sales.

$$* \text{Revised P/V Ratio} = \frac{\text{Revised Contribution}}{\text{Revised Selling Price}} = \frac{0.80 - 0.60}{0.80} = 0.25$$

$$\text{Required Sales Quantity} = \frac{\text{Desired Contribution}}{\text{Revised P / V Ratio} * \text{Revised Selling Price}} = \frac{0.40}{0.25 \times 0.80} = 2$$

Therefore, Sales value to be increased by 60% and sales quantity to be doubled to offset the reduction in selling price.

Proof:

Let selling price per unit is ₹10 and sales quantity is 100 units.

Data before change in selling price:

	(₹)
Sales (₹10 × 100 units)	1,000
Contribution (40% of 1,000)	400
Variable cost (balancing figure)	600

Data after the change in selling price:

Selling price is reduced by 20% that means it became ₹8 per unit. Since, we have to maintain the earlier contribution margin i.e. ₹400 by increasing the sales quantity only. Therefore, the target contribution will be ₹400.

The new P/V Ratio will be

	(₹)
Sales	8.00
Variable cost	6.00
Contribution per unit	2.00
P/V Ratio	25%

$$\text{Sales Value} = \frac{\text{Desired Contribution}}{\text{Revised P / V Ratio}} = \frac{₹400}{0.25} = ₹1,600$$

$$\text{Sales quantity} = \frac{\text{Sales value}}{\text{Selling price per unit}} = \frac{₹1,600}{₹8} = 200 \text{ units}$$

**QUESTION 4. (ILLUSTRATION 4)**

PQR Ltd. has furnished the following data for the two years:

	2021-22	2022-23
Sales	₹ 8,00,000	?
Profit/Volume Ratio (P/V ratio)	50%	37.5%
Margin of Safety sales as a % of total sales	40%	21.875%

There has been substantial savings in the fixed cost in the year 2022-23 due to the restructuring process. The company could maintain its sales quantity level of 2021-22 in 2022-23 by reducing selling price.

You are required to CALCULATE the following:

- Sales for 2022-23 in Value,
- Fixed cost for 2022-23 in Value,
- Break-even sales for 2022-23 in Value.

ANSWER :

In 2021-22, PV ratio = 50%

Variable cost ratio = 100% - 50% = 50%

Variable cost in 2021-22 = ₹ 8,00,000 50% = ₹ 4,00,000

In 2022-23, sales quantity has not changed. Thus, variable cost in 2022-23 is ₹ 4,00,000.

In 2022-23, P/V ratio = 37.50%

Thus, Variable cost ratio = 100% 37.5% = 62.5%

(i) Thus, sales in 2022-23 = $\frac{4,00,000}{62.5\%} = ₹ 6,40,000$

In 2022-23, Break-even sales = 100% 21.875% (Margin of safety) = 78.125%

(ii) Break-even sales = 6,40,000 78.125% = ₹ 5,00,000

(iii) Fixed cost = B.E. sales P/V ratio
= 5,00,000 37.50% = ₹ 1,87,500.

**QUESTION 5. (ILLUSTRATION 5)**

You are given the following data for the current financial year of Rio Co. Ltd:

Variable cost	60,000	60%
Fixed cost	30,000	30%
Net profit	10,000	10%
Sales	1,00,000	100%

FIND OUT (a) Break-even point, (b) P/V ratio, and (c) Margin of safety. Also DRAW a break-even chart showing contribution and profit.

ANSWER :

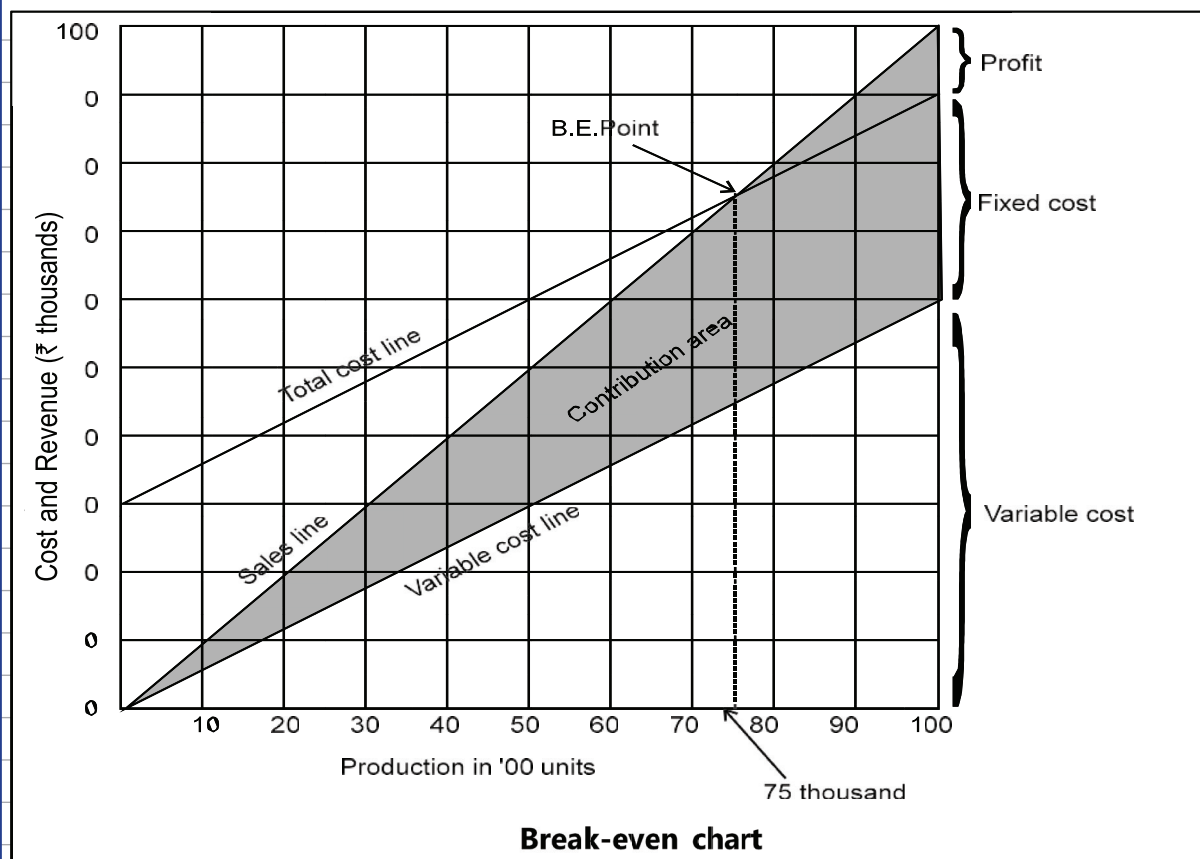
P / V ratio = $\frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} = \frac{1,00,000 - 60,000}{1,00,000} = 40\%$

Break Even Point = $\frac{\text{Fixed Cost}}{\text{P / V ratio}} = \frac{30,000}{40\%} = ₹ 75,000$

Margin of safety = Actual Sales - BE point = 1,00,000 - 75,000 = ₹ 25,000



Break even chart showing contribution is shown below:



QUESTION 6. (ILLUSTRATION 6)

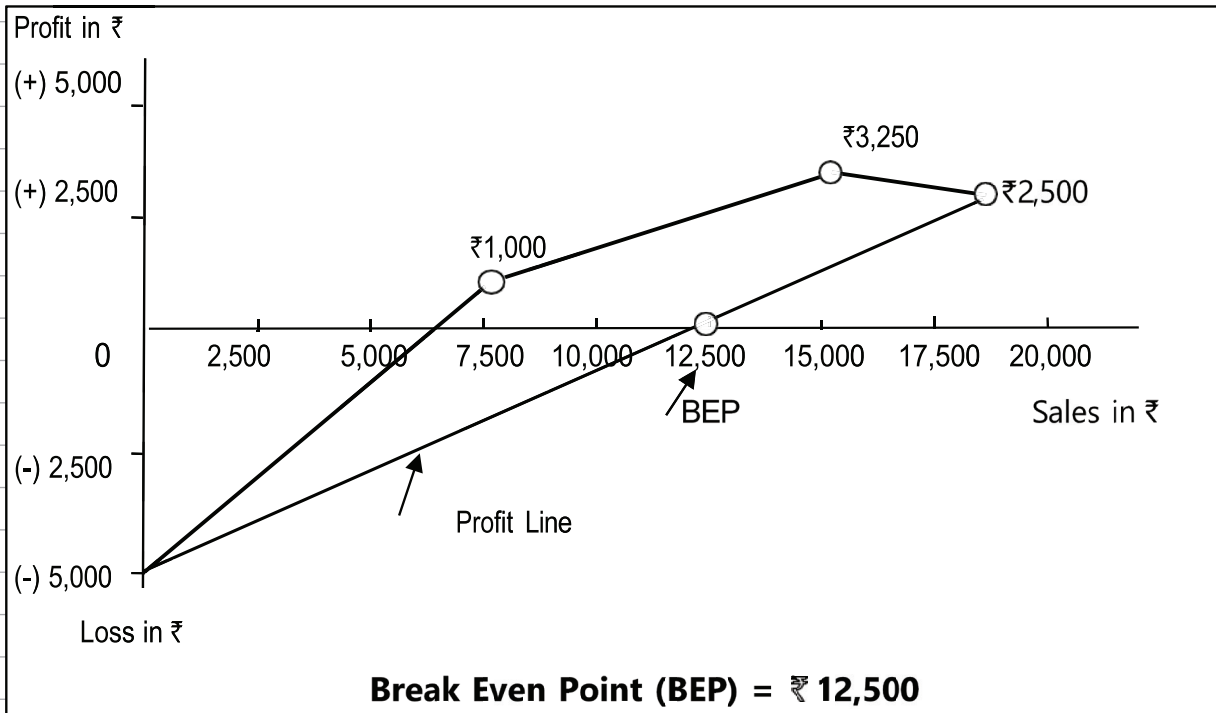
PREPARE a profit graph for products A, B and C and find break-even point from the following data:

Products	A	B	C	Total
Sales (₹)	7,500	7,500	3,750	18,750
Variable cost (₹)	1,500	5,250	4,500	11,250
Fixed cost (₹)	---	---	---	5,000

ANSWER :

Statement Showing Cumulative Sales & Profit

Sales	Cumulative Sales		Variable Cost	Contribution	Cumulative Contribution	Cumulative Profit
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
A	7,500	7,500	1,500	6,000	6,000	1,000
B	7,500	15,000	5,250	2,250	8,250	3,250
C	3,750	18,750	4,500	(750)	7,500	2,500

**QUESTION 7. (ILLUSTRATION 7)**

A company earned a profit of ₹ 30,000 during the year. If the marginal cost and selling price of the product are ₹ 8 and ₹ 10 per unit respectively, FIND OUT the amount of margin of safety.

ANSWER :

$$P / V \text{ ratio} = \frac{\text{Selling price} - \text{Variable cost per unit}}{\text{Selling price}} = \frac{₹10 - ₹8}{₹10} = 20\%$$

$$\text{Margin of safety} = \frac{\text{Profit}}{P/V \text{ ratio}} = \frac{30,000}{20\%} = ₹ 1,50,000$$

**QUESTION 8. (ILLUSTRATION 8)**

A Ltd. Maintains margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to ₹ 5 lakhs.

CALCULATE the following:

- Break-even sales
- Total sales
- Total variable cost
- Current profit
- New 'margin of safety' if the sales volume is increased by 7 ½ %.

ANSWER :

(i) We know that: Break- even Sales (BES) × P/V Ratio = Fixed Cost

$$\text{Break-even Sales (BES)} \times 40\% = ₹ 5,00,000$$

$$\text{Break- even Sales (BES)} = ₹ 12,50,000$$

(ii) Total Sales (S) = Break Even Sales + Margin of Safety

$$S = ₹ 12,50,000 + 0.375S$$

$$\text{Or, } S - 0.375S = ₹ 12,50,000$$

$$\text{Or, } S = ₹ 20,00,000$$



- (iii) Contribution to Sales Ratio = 40%
 Therefore, Variable cost to Sales Ratio = 60%
 Variable cost = 60% of sales = 60% of 20,00,000
 Variable cost = 12,00,000
- (iv) Current Profit = Sales – (Variable Cost + Fixed Cost)
 = ₹ 20,00,000 – (12,00,000 + 5,00,000) = ₹ 3,00,000
- (v) If sales value is increased by 7½ %
 New Sales value = ₹ 20,00,000 × 1.075 = ₹ 21,50,000
 New Margin of Safety = New Sales value – BES
 = ₹ 21,50,000 – ₹ 12,50,000 = ₹ 9,00,000

**QUESTION 9. (ILLUSTRATION 9)**

By noting “P/V will increase or P/V will decrease or P/V will not change”, as the case may be, STATE how the following independent situations will affect the P/V ratio:

- An increase in the physical sales volume;
- An increase in the fixed cost;
- A decrease in the variable cost per unit;
- A decrease in the contribution margin;
- An increase in selling price per unit;
- A decrease in the fixed cost;
- A 10% increase in both selling price and variable cost per unit;
- A 10% increase in the selling price per unit and 10% decrease in the physical sales volume;
- A 50% increase in the variable cost per unit and 50% decrease in the fixed cost.
- An increase in the angle of incidence.

ANSWER :

Item no.	P/V Ratio	Reason
(i)	Will not change	The ratio of sales value and variable cost will remain same irrespective of change in sales volume.
(ii)	Will not change	Fixed cost is not considered in calculation of P/V ratio.
(iii)	Will increase	Decrease in variable cost increases contribution margin so does the P/V ratio.
(iv)	Will decrease	Decrease in contribution margin decreases the P/V ratio.
(v)	Will increase	Increase in selling price per unit increases the contribution margin per unit and the P/V ratio.
(vi)	Will not change	Fixed cost is not considered in calculation of P/V ratio.
(vii)	Will not change	The increase in selling price and variable cost by the same ratio will not change the P/V ratio. Please refer the example note- 1 below.
(viii)	Will increase	The increase in selling price will increase the contribution margin but the change in sales volume in any direction will not affect P/V ratio. Thus, increase in selling price with decrease in sales volume will increase the P/V ratio.



(ix)	Will decrease	The increase in variable cost reduces the contribution margin thus decreases the PV ratio. Increase or decrease in fixed cost will not affect the P/V ratio.
(x)	Will increase	Angle of incidence represents the rate of profit earning, after reaching the break-even point. Increase in angle of incidence means increase in rate of profit earning which is nothing but the P/V ratio that contributes towards the profitability after recovering the fixed cost. (Please also refer para 14.12)

A 10% increase in both selling price and variable cost per unit. Example note-1:

Assumptions:

- a) Variable cost is less than selling price.
- b) Selling price ₹100 variable cost ₹ 90 per unit.

c) $P/V \text{ ratio} = \frac{100-90}{100} = 10\%$

10% increase in S.P. = ₹110

10% increase in variable cost = ₹99

$P/V \text{ ratio} = \frac{110-99}{10} = 10\%$ i.e. P/V ratio will not change



QUESTION 10. (ILLUSTRATION 10)

A company can make any one of the 3 products X, Y or Z in a year. It can exercise its option only at the beginning of each year.

Relevant information about the products for the next year is given below.

	X	Y	Z
Selling Price (₹ / unit)	10	12	12
Variable Costs (₹ / unit)	6	9	7
Market Demand (unit)	3,000	2,000	1,000
Production Capacity (unit)	2,000	3,000	900
Fixed Costs (₹)	30,000		

Required

COMPUTE the opportunity costs for each of the products.

ANSWER :

	X	Y	Z
I. Contribution per unit (₹)	4	3	5
II. Units (Lower of Production / Market Demand)	2,000	2,000	900
III. Possible Contribution (₹) [I × II]	8,000	6,000	4,500
IV. Opportunity Cost* (₹)	6,000	8,000	8,000

(*) Opportunity cost is the maximum possible contribution forgone by not producing alternative product i.e. if Product X is produced then opportunity cost will be maximum of (₹ 6,000 from Y, ₹ 4,500 from Z).

**QUESTION 11. (ILLUSTRATION 11)**

M.K. Ltd. manufactures and sells a single product X whose selling price is ₹ 40 per unit and the variable cost is ₹ 16 per unit.

- (i) If the Fixed Costs for this year are ₹ 4,80,000 and the annual sales are at 60% margin of safety, CALCULATE the rate of net return on sales, assuming an income tax level of 40%
- (ii) For the next year, it is proposed to add another product line Y whose selling price would be ₹ 50 per unit and the variable cost ₹ 10 per unit. The total fixed costs are estimated at ₹ 6,66,600. The sales mix values of X : Y would be 7 : 3. DETERMINE at what level of sales next year, would M.K. Ltd. break even? Give separately for both X and Y the break-even sales in rupee and quantities.

ANSWER :

- (i) Contribution per unit = Selling price – Variable cost
 $= ₹40 - ₹16 = ₹24$
- Break-even Point = $\frac{₹4,80,000}{₹24} = 20,000 \text{ units}$
- Percentage Margin of Safety = $\frac{\text{Actual Sales} - \text{Break - even Sales}}{\text{Actual Sales}}$
- Or, 60% = $\frac{\text{Actual Sales} - 20,000 \text{ units}}{\text{Actual Sales}}$
- ∴ Actual Sales = 50,000 units

	(₹)
Sales Value (50,000 units × ₹40)	20,00,000
Less: Variable Cost (50,000 units × ₹16)	8,00,000
Contribution	12,00,000
Less: Fixed Cost	4,80,000
Profit	7,20,000
Less: Income Tax @ 40%	2,88,000
Net Return	4,32,000

$$\text{Rate of Net Return on Sales} = 21.6\% \left(\frac{4,32,000}{20,00,000} \times 100 \right)$$

- (ii) Products

	X	Y
	(₹)	(₹)
Selling Price	40	50
Less: Variable Cost	16	10
Contribution per unit	24	40
Sales Ratio	7	3
Contribution in sales Ratio	168	120

Based on Weighted Contribution

$$\text{Weighted Contribution} = \frac{24 \times 7 + 40 \times 3}{10} = ₹ 28.8 \text{ per unit}$$



$$\text{Total Break-even Point} = \frac{\text{Total Fixed Cost}}{\text{Weighted Contribution}} = \frac{6,66,600}{28.80} = 23,145.80 \text{ units}$$

Break-even Point

$$X = \frac{7}{10} \times 23,145.80 = 16,202 \text{ units}$$

$$\text{or } 16,202 \times ₹ 40 = ₹ 6,48,080$$

$$Y = \frac{3}{10} \times 23,145.80 = 6,944 \text{ units or } 6,944 \times ₹ 50 = ₹ 3,47,200$$

Based on distributing fixed cost in the weighted Contribution Ratio

Fixed Cost

$$X = \frac{168}{288} \times 6,66,600 = ₹ 3,88,850$$

$$Y = \frac{120}{288} \times 6,66,600 = ₹ 2,77,750$$

Break-even Point

$$X = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{3,88,850}{24} = 16,202 \text{ units or } ₹ 6,48,000$$

$$Y = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{2,77,750}{40} = 6,944 \text{ units or } ₹ 3,47,200$$

**QUESTION 12. (ILLUSTRATION 12)**

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

	Part A	Part B
Per unit		
Alloy usage	1.6 kgs.	1.6 kgs.
Machine Time: Machine P	0.6 hrs	0.25 hrs.
Machine Time: Machine Q	0.5 hrs.	0.55 hrs.
Target Price (₹)	145	115
Total hours available	Machine P 4,000 hours	
	Machine Q 4,500 hours	
Alloy available is 13,000 kgs. @ ₹ 12.50 per kg.		
Variable overheads per machine hours	Machine P: ₹ 80	
	Machine Q: ₹ 100	

Required

- IDENTIFY the spare part which will optimize contribution at the offered price.
- If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machine hour, CALCULATE the total contribution from the spare part identified above?

**ANSWER :**

(i)

	Part A	Part B
Machine "P" (4,000 hrs)	6,666	16,000
Machine "Q" (4,500 hrs)	9,000	8,181
Alloy Available (13,000 kg.)	8,125	8,125
Maximum Number of Parts to be manufactured (Minimum of the above three)	6,666	8,125

	₹	₹
Material ($₹12.5 \times 1.6$ kg.)	20.00	20.00
Variable Overhead: Machine "P"	48.00	20.00
Variable Overhead: Machine "Q"	50.00	55.00
Total Variable Cost per unit	118.00	95.00
Price Offered	145.00	115.00
Contribution per unit	27.00	20.00
Total Contribution for units produced (I)	1,79,982	1,62,500

Spare Part A will optimize the contribution.

(ii)

	Part A
Parts to be manufactured numbers	6,666
Machine P : to be used	4,000
Machine Q : to be used	3,333
Underutilized Machine Hours (4,500 hrs. – 3,333 hrs.)	1,167
Compensation for unutilized machine hours (1,167hrs. $\times$ ₹60) (II)	70,020
Reduction in Price by 10%, Causing fall in Contribution of ₹14.50 per unit (6,666 units $\times$ ₹14.5) (III)	96,657
Total Contribution (I + II – III)	1,53,345

**QUESTION 13. (ILLUSTRATION 13)**

The profit for the year of R.J. Ltd. works out to 12.5% of the capital employed and the relevant figures are as under:

Sales	₹ 5,00,000
Direct Materials	₹ 2,50,000
Direct Labour	₹ 1,00,000
Variable Overheads ₹ 40,000 Capital Employed	₹ 4,00,000

The new Sales Manager who has joined the company recently estimates for next year a profit of about 23% on capital employed, provided the volume of sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

Required

FIND OUT by computing in detail the cost and profit for next year, whether the proposal of Sales Manager can be adopted.

**ANSWER :**

Statement Showing "Cost and Profit for the Next Year"

Particulars	Existing Volume, etc.	Volume, Costs, etc. after 10% Increase	Estimated Sale, Cost, Profit, etc.*
	(₹)	(₹)	(₹)
Sales	5,00,000	5,50,000	5,72,000
Less: Direct Materials	2,50,000	2,75,000	2,69,500
Direct Labour	1,00,000	1,10,000	1,07,800
Variable Overheads	40,000	44,000	43,120
Contribution	1,10,000	1,21,000	1,51,580
Less: Fixed Cost#	60,000	60,000	58,800
Profit	50,000	61,000	92,780

(*) for the next year after increase in selling price @ 4% and overall cost reduction by 2%. (#)

Fixed Cost = Existing Sales – Existing Marginal Cost – 12.5% on ₹4,00,000

= ₹5,00,000 – ₹3,90,000 – ₹50,000 = ₹60,000

Percentage Profit on Capital Employed equals to 23.19% $\left(\frac{₹92,780}{4,00,000} \times 100 \right)$

Since the Profit of ₹92,780 is more than 23% of capital employed, the proposal of the Sales Manager can be adopted.

**QUESTION 14. (ILLUSTRATION 14)**

Wonder Ltd. manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

Activity Level	50%	100%
Sales and production (units)	400	800
	(₹)	(₹)
Sales	8,00,000	16,00,000
Production costs:		
- Variable	3,20,000	6,40,000
- Fixed	1,60,000	1,60,000
Selling and distribution costs:		
- Variable	1,60,000	3,20,000
- Fixed	2,40,000	2,40,000

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter, 220 units were produced and 160 units were sold. Required:

- COMPUTE the fixed production costs absorbed by ZEST if absorption costing is used?
- CALCULATE the under/over-recovery of overheads during the period?
- CALCULATE the profit using absorption costing?
- CALCULATE the profit using marginal costing?

**ANSWER :**

(a)	Fixed production costs absorbed:	(₹)
	Budgeted fixed production costs	1,60,000
	Budgeted output (normal level of activity 800 units)	
	Therefore, the absorption rate: $1,60,000/800 = ₹ 200$ per unit	
	During the first quarter, the fixed production cost absorbed by ZEST would be (220 units × ₹ 200)	44,000
(b)	Under /over-recovery of overheads during the period:	(₹)
	Actual fixed production overhead	40,000
	(1/4 of ₹ 1,60,000)	
	Absorbed fixed production overhead	44,000
	Over-recovery of overheads	4,000
(c)	Profit for the Quarter (Absorption Costing)	

	(₹)	(₹)
Sales revenue (160 units × ₹ 2,000): (A)		3,20,000
Less: Production costs:		
- Variable cost (220 units × ₹ 800)	1,76,000	
- Fixed overheads absorbed (220 units × ₹ 200)	44,000	2,20,000
Add: Opening stock		--
Less: Closing Stock $\left(\frac{₹2,20,000}{220\text{units}} \times 60 \text{ units} \right)$		(60,000)
Cost of Goods sold		1,60,000
Less: Adjustment for over-absorption of fixed production overheads		(4,000)
Add: Selling & Distribution Overheads:		
- Variable (160 units × ₹400)	64,000	
- Fixed (1/4th of ₹ 2,40,000)	60,000	1,24,000
Cost of Sales (B)		2,80,000
Profit {(A) – (B)}		40,000

(d) Profit for the Quarter (Marginal Costing)

	(₹)	(₹)
Sales revenue (160 units × ₹ 2,000): (A)		3,20,000
Less: Production costs:		
- Variable cost (220 units × ₹ 800)		1,76,000
Add: Opening stock		--
Less: Closing Stock $\left(\frac{₹1,76,000}{220\text{units}} \times 60 \text{ units} \right)$		(48,000)
Variable cost of goods sold		1,28,000
Add: Selling & Distribution Overheads:		
- Variable (160 units × ₹400)		64,000
Cost of Sales (B)		1,92,000
Contribution {(C) = (A) – (B)}		1,28,000
Less: Fixed Costs:		
- Production cost	(40,000)	
- Selling & distribution cost	(60,000)	(1,00,000)
Profit		28,000

**QUESTION 15. (PP1)**

If P/V ratio is 60% and the Marginal cost of the product is ₹ 20. CALCULATE the selling price?

ANSWER :

$$\begin{aligned}\text{Variable Cost} &= 100 - \text{P/V Ratio} \\ &= 100 - 60 = 40\end{aligned}$$

If Variable cost is 40, then selling price = 100

If Variable cost is 20, then selling price = $(100/40) \times 20 = ₹ 50$

**QUESTION 16. (PP2)**

The ratio of variable cost to sales is 70%. The break-even point occurs at 60% of the capacity sales. Find the capacity sales when fixed costs are ₹ 90,000. Also COMPUTE profit at 75% of the capacity sales.

ANSWER :

Variable cost to sales = 70%, Contribution to sales = 30%,
Or P/V Ratio 30%

We know that: $\text{BES} \times \text{P/V Ratio} = \text{Fixed Cost}$

$$\text{BES} \times 0.30 = ₹ 90,000$$

$$\text{Or BES} = ₹ 3,00,000$$

It is given that break-even occurs at 60% capacity.

$$\text{Capacity sales} = ₹ 3,00,000 \div 0.60 = ₹ 5,00,000$$

Computation of profit of 75% Capacity

$$75\% \text{ of capacity sales (i.e. } ₹ 5,00,000 \times 0.75) = ₹ 3,75,000$$

$$\text{Less: Variable cost (i.e. } ₹ 3,75,000 \times 0.70) = ₹ 2,62,500$$

$$= ₹ 1,12,500$$

$$\text{Less: Fixed Cost} = ₹ 90,000$$

$$\text{Profit} = ₹ 22,500$$

**QUESTION 17. (PP3)**

You are required to-

(₹)

(i)	DETERMINE profit, when sales	=	2,00,000
	Fixed Cost	=	40,000
	BEP	=	1,60,000
(ii)	DETERMINE sales, when fixed cost	=	20,000
	Profit	=	10,000
	BEP	=	40,000

ANSWER :

(i) We know that: $\text{B.E. Sales} \times \text{P/V Ratio} = \text{Fixed Cost}$

$$\text{or } ₹ 1,60,000 \times \text{P/V ratio} = ₹ 40,000$$

$$\text{P/V ratio} = 25\%$$

We also know that $\text{Sales} \times \text{P/V Ratio} = \text{Fixed Cost} + \text{Profit}$

$$\text{or } ₹ 2,00,000 \times 0.25 = ₹ 40,000 + \text{Profit}$$

$$\text{or Profit} = ₹ 10,000$$



(ii) Again B.E. Sales $\times$ P/V ratio = Fixed Cost
 or ₹ 40,000 $\times$ P/V Ratio = ₹ 20,000
 or P/V ratio = 50%
 We also know that: Sales $\times$ P/V ratio = Fixed Cost + Profit
 or Sales $\times$ 0.50 = ₹ 20,000 + ₹ 10,000
 or Sales = ₹ 60,000.

**QUESTION 18. (PP4)**

A company has made a profit of ₹ 50,000 during the year. If the selling price and marginal cost of the product are ₹ 15 and ₹ 12 per unit respectively, FIND OUT the amount of margin of safety.

ANSWER :

$$\begin{aligned}\text{P/V Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 \\ &= [(15 - 12)/15] \times 100 \\ &= (3/15) \times 100 = 20\%\end{aligned}$$

$$\begin{aligned}\text{Marginal of Safety} &= \text{Profit} \div \text{P/V Ratio} \\ &= 50,000 \div 20\% = ₹ 2,50,000\end{aligned}$$

**QUESTION 19. (PP5)**

- (a) If margin of safety is ₹ 2,40,000 (40% of sales) and P/V ratio is 30% of AB Ltd, CALCULATE its (1) Break even sales, and (2) Amount of profit on sales of ₹ 9,00,000.
 (b) X Ltd. has earned a contribution of ₹ 2,00,000 and net profit of ₹ 1,50,000 of sales of ₹ 8,00,000. What is its margin of safety?

ANSWER :

$$(a) \text{ Total Sales} = 2,40,000 \times \frac{100}{40} = ₹ 6,00,000$$

$$\text{Contribution} = 6,00,000 \times 30\% = ₹ 1,80,000$$

$$\text{Profit} = \text{M/S} \times \text{P/V ratio} = 2,40,000 \times 30\% = ₹ 72,000$$

$$\begin{aligned}\text{Fixed cost} &= \text{Contribution} - \text{Profit} \\ &= 1,80,000 - 72,000 = ₹ 1,08,000\end{aligned}$$

$$(1) \text{ Break-even Sales} = \frac{\text{Fixed Cost}}{\text{P / V ratio}} = \frac{1,08,000}{30\%} = ₹ 3,60,000$$

$$\begin{aligned}(2) \text{ Profit} &= (\text{Sales} \times \text{P/V ratio}) - \text{Fixed cost} \\ &= (9,00,000 \times 30\%) - 1,08,000 = ₹ 1,62,000\end{aligned}$$

$$(b) \text{ P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{2,00,000}{8,00,000} = 25\%$$

$$\text{Margin of safety} = \frac{\text{Profit}}{\text{P / V ratio}} = \frac{1,50,000}{25\%} = ₹ 6,00,000$$

Alternatively:

$$\begin{aligned}\text{Fixed cost} &= \text{Contribution} - \text{Profit} \\ &= ₹ 2,00,000 - ₹ 1,50,000 = ₹ 50,000\end{aligned}$$

$$\text{B.E. Point} = ₹ 50,000 \div 25\% = ₹ 2,00,000-$$



Margin of Safety = Actual sales – B.E. sales
 = 8,00,000 – 2,00,000 = 6,00,000

**QUESTION 20. (PP6)**

A company sells its product at ₹ 15 per unit. In a period, if it produces and sells 8,000 units, it incurs a loss of ₹ 5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹ 4 per unit. CALCULATE break-even point both in terms of Value as well as in units.

ANSWER :

∴ Suppose variable cost = x, Fixed Cost = y

In first situation:

$$15 \times 8,000 - 8,000x = y - 40,000 \quad (1)$$

In second situation:

$$15 \times 20,000 - 20,000x = y + 80,000 \quad (2)$$

$$\text{or, } 1,20,000 - 8,000x = y - 40,000 \quad (3)$$

$$3,00,000 - 20,000x = y + 80,000 \quad (4)$$

From (3) & (4) we get $x = ₹ 5$, Variable cost per unit = ₹ 5

Putting this value in 3rd equation:

$$1,20,000 - (8,000 \times 5) = y - 40,000$$

$$\text{or, } y = ₹ 1,20,000$$

Fixed Cost = ₹ 1,20,000

$$\text{P/V ratio} = \frac{S - V}{S} = \frac{15 - 5}{15} \times 100 = \frac{200}{3} = 66 \frac{2}{3} \%$$

Suppose break-even sales = x

$$15x - 5x = 1,20,000 \quad (\text{at BEP, contribution will be equal to fixed cost})$$

$$x = 12,000 \text{ units.}$$

$$\text{or, Break-even sales in units} = 12,000, \text{ Break-even sales in Value} \\ = 12,000 \times 15 = ₹ 1,80,000.$$

**QUESTION 21. (PP7)**

You are given the following data:

	Sales	Profit
Year 2021-22	₹ 1,20,000	8,000
Year 2022-23	₹ 1,40,000	13,000

FIND OUT –

- P/V ratio,
- B.E. Point,
- Profit when sales are ₹ 1,80,000,
- Sales required earn a profit of ₹ 12,000,
- Margin of safety in year 2022-23.

ANSWER :

	Sales	Profit
Year 2021-22	₹ 1,20,000	8,000
Year 2022-23	₹ 1,40,000	13,000
Difference	₹ 20,000	5,000



- (i)
$$\text{P/V Ratio} = \frac{\text{Difference in profit}}{\text{Difference in Sales}} \times 100 = \frac{5,000}{20,000} \times 100 = 25\%$$
- (₹)
- | | |
|--|-------------------------|
| Contribution in 2021-22 (1,20,000 × 25%) | 30,000 |
| Less: Profit | 8,000 |
| Fixed Cost* | 22,000 |
| *Contribution | = Fixed cost + Profit |
| ∴ Fixed cost | = Contribution - Profit |
- (ii)
$$\text{Break-even point} = \frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{22,000}{25\%} = ₹ 88,000$$
- (iii) Profit when sales are ₹1,80,000 (₹)
- | | |
|--------------------------------|--------|
| Contribution (₹1,80,000 × 25%) | 45,000 |
| Less: Fixed cost | 22,000 |
| Profit | 23,000 |
- (iv) Sales to earn a profit of ₹12,000
- $$\frac{\text{Fixed cost} + \text{Desired profit}}{\text{P/V ratio}} = \frac{22,000 + 12,000}{25\%} = ₹1,36,000$$
- (v) Margin of safety in 2022-23 –
- | | | |
|------------------|---|---------------------------------|
| Margin of safety | = | Actual sales – Break-even sales |
| | = | 1,40,000 – 88,000 = ₹ 52,000. |

**QUESTION 22. (PP8)**

The product mix of a Gama Ltd. is as under:

	Products	
	M	N
Units	54,000	18,000
Selling price	₹ 7.50	₹ 15.00
Variable cost	₹ 6.00	₹ 4.50

FIND the break-even points in units, if the company discontinues product 'M' and replace with product 'O'. The quantity of product 'O' is 9,000 units and its selling price and variable costs respectively are ₹ 18 and ₹ 9. Fixed Cost is ₹ 15,000.

ANSWER :

N	= 18,000 units
O	= 9,000 units
Ratio (N : O)	= 2:1
Let	
t	= No. of units of 'O' for BEP
2t	= No. of units of 'N' for BEP
Contribution of 'N'	= ₹ 10.5 per unit
Contribution of 'O'	= ₹ 9 per unit



At Break Even Point:

$$\begin{aligned} \Rightarrow 10.5 \times (2t) + 9 \times t - 15,000 &= 0 \\ \Rightarrow 30t &= 15,000 \\ \Rightarrow t &= 500 \text{ units} \\ \text{BEP of 'N'} &= 2t \\ &= 1,000 \text{ units} \\ \text{BEP of 'O'} &= t = 500 \text{ units} \end{aligned}$$

**QUESTION 23. (PP9)**

Mr. X has ₹ 2,00,000 investments in his business firm. He wants a 15 per cent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 per cent of sales, his fixed costs are ₹ 80,000 per year. Show COMPUTATIONS to answer the following questions:

- What sales volume must be obtained to break even?
- What sales volume must be obtained to get 15 per cent return on investment?
- Mr. X estimates that even if he closed the doors of his business, he would incur ₹ 25,000 as expenses per year. At what sales would he be better off by locking his business up?

ANSWER :

Particulars	(₹)
Suppose sales	100
Variable cost	60
Contribution	40
P/V ratio	40%
Fixed cost	= ₹ 80,000
(i) Break-even point = Fixed Cost ÷ P/V ratio = 80,000 ÷ 40% or ₹ 2,00,000	
(ii) 15% return on ₹ 2,00,000	30,000
Fixed Cost	80,000
Contribution required	1,10,000
Sales volume required = ₹ 1,10,000 ÷ 40% or ₹ 2,75,000	
(iii) Avoidable fixed cost if business is locked up = ₹ 80,000 - ₹ 25,000 = ₹ 55,000	
Minimum sales required to meet this cost: ₹ 55,000 ÷ 40% or ₹ 1,37,500	

Mr. X will be better off by locking his business up, if the sale is less than ₹ 1,37,500

**QUESTION 24. (PP10)**

A company had incurred fixed expenses of ₹ 4,50,000, with sales of ₹ 15,00,000 and earned a profit of ₹ 3,00,000 during the first half year. In the second half, it suffered a loss of ₹ 1,50,000.

CALCULATE:

- The profit-volume ratio, break-even point and margin of safety for the first half year.
- Expected sales volume for the second half year assuming that selling price and fixed expenses remained unchanged during the second half year.
- The break-even point and margin of safety for the whole year.

**ANSWER :**

(i) In the First half year:

$$\begin{aligned} \text{Contribution} &= \text{Fixed cost} + \text{Profit} \\ &= 4,50,000 + 3,00,000 = ₹ 7,50,000 \\ \text{P/V ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{7,50,000}{15,00,000} \times 100 = 50\% \\ \text{Break-even point} &= \frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{4,50,000}{50\%} \times 100 = ₹ 9,00,000 \\ \text{Margin of safety} &= \text{Actual sales} - \text{Break-even point} \\ &= 15,00,000 - 9,00,000 = ₹ 6,00,000 \end{aligned}$$

(ii) In the second half year:

$$\begin{aligned} \text{Contribution} &= \text{Fixed cost} - \text{Loss} \\ &= 4,50,000 - 1,50,000 = ₹ 3,00,000 \\ \text{Expected sales volume} &= \frac{\text{Fixed cost} - \text{Loss}}{\text{P / V ratio}} = \frac{3,00,000}{50\%} = ₹ 6,00,000 \end{aligned}$$

(iii) For the whole year:

$$\begin{aligned} \text{B.E. point} &= \frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{4,50,000 \times 2}{50\%} = ₹ 18,00,000 \\ \text{Margin of safety} &= \frac{\text{Profit}}{\text{P/V ratio}} = \frac{3,00,000 - 1,50,000}{50\%} = ₹ 3,00,000. \end{aligned}$$

**QUESTION 25. (PP11)**

The following information is given by Star Ltd.:

Margin of Safety	₹ 1,87,500
Total Cost	₹ 1,93,750
Margin of Safety	3,750 units
Break-even Sales	1,250 units

Required:

CALCULATE Profit, P/V Ratio, BEP Sales (in ₹) and Fixed Cost.

ANSWER :

$$\begin{aligned} \text{Margin of Safety (\%)} &= \frac{3,750 \text{ units}}{3,750 \text{ units} + 1,250 \text{ units}} \\ &= 75\% \\ \text{Total Sales} &= \frac{₹ 1,87,500}{0.75} = ₹ 2,50,000 \\ \text{Profit} &= \text{Total Sales} - \text{Total Cost} \\ &= ₹ 2,50,000 - ₹ 1,93,750 \\ &= ₹ 56,250 \\ \text{P/V Ratio} &= \frac{\text{Profit}}{\text{Margin of Safety (₹)}} \times 100 \\ &= \frac{₹ 56,250}{₹ 1,87,500} \times 100 = 30\% \\ \text{Break-even Sales} &= \text{Total Sales} \times [100 - \text{Margin of Safety \%}] \\ &= ₹ 2,50,000 \times 0.25 = ₹ 62,500 \end{aligned}$$



$$\begin{aligned}\text{Fixed Cost} &= \text{Sales} \times \text{P/V Ratio} - \text{Profit} \\ &= ₹ 2,50,000 \times 0.30 - ₹ 56,250 = ₹ 18,750\end{aligned}$$

**QUESTION 26. (PP12)**

A single product company sells its product at ₹ 60 per unit. In 2021-22, the company operated at a margin of safety of 40%. The fixed costs amounted to ₹ 3,60,000 and the variable cost ratio to sales was 80%.

In 2022-23, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

- FIND the selling price required to be fixed in 2022-23 to earn the same P/V ratio as in 2021-22.
- Assuming the same selling price of ₹ 60 per unit in 2022-23, FIND the number of units required to be produced and sold to earn the same profit as in 2021-22.

ANSWER :

- Profit earned in 2021-22:

Particulars	(₹)
	6,666
Total contribution (50,000 × ₹ 12)	6,00,000
Less: Fixed cost	3,60,000
Profit	2,40,000
Selling price to be fixed in 2022-23:	
Revised variable cost (₹ 48 × 1.10)	52.80
Revised fixed cost (3,60,000 × 1.05)	3,78,000
P/V Ratio (Same as of 2021-22)	20%
Variable cost ratio to selling price	80%

Therefore, revised selling price per unit = ₹ 52.80 ÷ 80% = ₹ 66

- No. of units to be produced and sold in 2022-23 to earn the same profit:

We know that Fixed Cost plus profit	=	Contribution
		(₹)
Profit in 2021-22		2,40,000
Fixed cost in 2022-23		3,78,000
Desired contribution in 2022-23		6,18,000
Contribution per unit = Selling price per unit – Variable cost per unit.		
= ₹ 60 – ₹ 52.80 = ₹ 7.20.		

No. of units to be produced in 2022-23 = ₹ 6,18,000 ÷ ₹ 7.20 = 85,834 units.

Workings:

- PV Ratio in 2021-22

	(₹)
Selling price per unit	60
Variable cost (80% of Selling Price)	48
Contribution	12
P/V Ratio	20%



2. No. of units sold in 2021-22

$$\begin{aligned}\text{Break-even point} &= \text{Fixed cost} \div \text{Contribution per unit} \\ &= ₹ 3,60,000 \div ₹ 12 = 30,000 \text{ units.}\end{aligned}$$

Margin of safety is 40%. Therefore, break-even sales will be 60% of units sold.

$$\begin{aligned}\text{No. of units sold} &= \text{Break-even point in units} \div 60\% \\ &= 30,000 \div 60\% = 50,000 \text{ units.}\end{aligned}$$

**QUESTION 27. (PP13)**

(a) You are given the following data for the coming year for a factory.

Budgeted output 8,00,000 units

Fixed expenses ₹ 40,00,000

Variable expenses per unit ₹ 100

Selling price per unit ₹ 200

DRAW a break-even chart showing the break-even point.

(b) If price is reduced to ₹ 180, what will be the new break-even point?

ANSWER :

(a) Contribution = S - V = ₹ 200 - ₹ 100 = ₹ 100 per unit.

$$\text{B.E. Point} = \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{40,00,000}{₹ 100} = 40,000 \text{ unit}$$

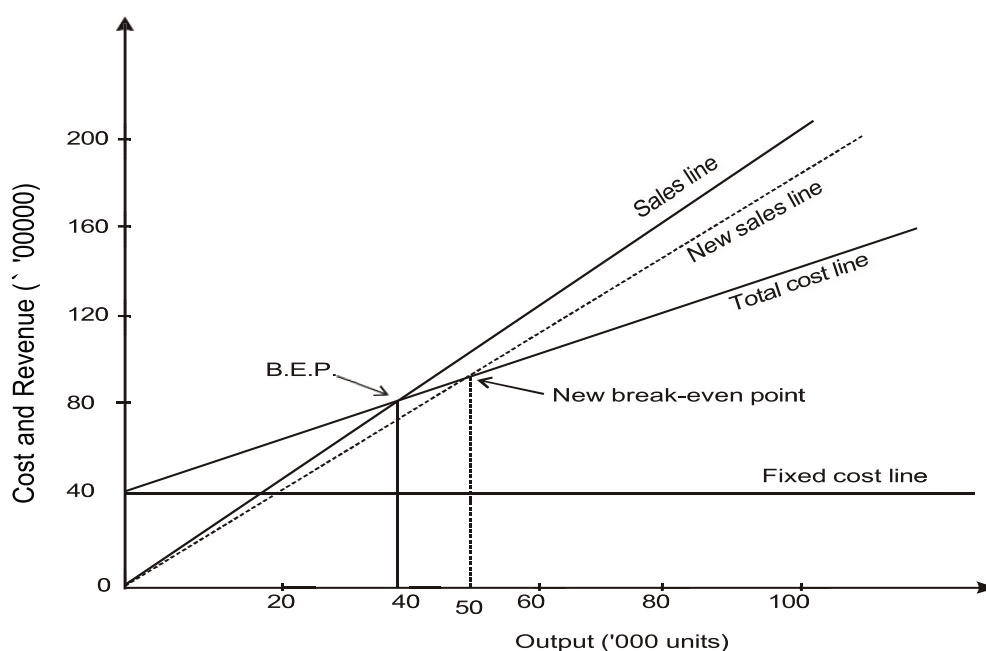
(b) When selling price is reduced

New selling price = ₹ 180

New Contribution = ₹ 180 - ₹ 100 = ₹ 80 per unit.

$$\text{New B.E. Point} = \frac{₹ 40,00,000}{₹ 80} = 50,000 \text{ units.}$$

The break-even chart is shown below:



**QUESTION 28. (PP14)**

A company has three factories situated in north, east and south with its Head Office in Mumbai. The management has received the following summary report on the operations of each factory for a period:

(₹ in '000)

	Sales		Profit	
	Actual	Over/(Under) Budget	Actual	Over/(Under) Budget
North	1,100	(400)	135	(180)
East	1,450	150	210	90
South	1,200	(200)	330	(110)

CALCULATE for each factory and for the company as a whole for the period:

- (i) the fixed costs. (ii) break-even sales.

ANSWER :

Calculation of P/V Ratio

(₹ '000)

	Sales	Profit
North : Actual	1,100	135
Add : Under budgeted	400	180
Budgeted	1,500	315

$$\text{P/V ratio} = \frac{\text{Difference in Profit}}{\text{Difference in Sales}} = \frac{315 - 135}{1,500 - 1,100} = \frac{180}{400} \times 100 = 45\%$$

(₹ '000)

	Sales	Profit
East : Actual	1,450	210
Less : Over budgeted	(150)	(90)
Budgeted	1,300	120

$$\text{P/V ratio} = \frac{90}{150} \times 100 = 60\%$$

(₹ '000)

	Sales	Profit
South : Actual	1,200	330
Add: Under budgeted	200	110
Budgeted	1,400	440

$$\text{P/V ratio} = \frac{110}{200} \times 100 = 55\%$$

- (i) Calculation of fixed cost

$$\text{Fixed Cost} = (\text{Actual sales} \times \text{P/V ratio}) - \text{Profit}$$

$$\text{North} = (1,100 \times 45\%) - 135 = 360$$

$$\text{East} = (1,450 \times 60\%) - 210 = 660$$

$$\text{South} = (1,200 \times 55\%) - 330 = 330$$

$$\text{Total Fixed Cost} = 1,350$$



(ii) Calculation of break-even sales (in ₹ 000)

B.E. Sales	=	$\frac{\text{Fixed Cost}}{\text{P/V ratio}}$	
North	=	$\frac{360}{45\%}$	= 800
East	=	$\frac{660}{60\%}$	= 1,100
South	=	$\frac{330}{55\%}$	= 600
Total			2,500

**QUESTION 29. (PP15)**

An automobile manufacturing company produces different models of Cars. The budget in respect of model 007 for the month of March is as under:

Budgeted Output			40,000 Units
		₹ In lakhs	₹ In lakhs
Net Realisation			2,10,000
Variable Costs:			
Materials		79,200	
Labour		15,600	
Direct expenses		37,200	1,32,000
Specific Fixed Costs		27,000	
Allocated Fixed Costs		33,750	60,750
	Total Costs		1,92,750
	Profit		17,250
	Sales		2,10,000

CALCULATE:

- Profit with 10 percent increase in selling price with a 10 percent reduction in sales volume.
- Volume to be achieved to maintain the original profit after a 10 percent rise in material costs, at the originally budgeted selling price per unit.

ANSWER :

- Budgeted selling price = 2,10,000 lakhs / 40,000 units = ₹5,25,000 per unit.

Budgeted variable cost = 1,32,000 lakhs / 40,000 units = ₹ 3,30,000 per unit.

Increased selling price = ₹5,25,000 + 10% = ₹ 5,77,500 per unit

New volume 40,000 – 10% = 36,000 units

Statement of Calculation of Profit:

	(₹ In lakhs)
Sales 36,000 units at ₹ 5,77,500 =	2,07,900
Less: Variable cost: 36,000 × ₹3,30,000 =	1,18,800
Contribution	89,100
Less: fixed costs	60,750
Profit	28,350



(ii) Budgeted Material Cost = 79,200 Lakhs/ 40,000 Units = ₹1,98,000 per Unit

Increased material cost = ₹1,98,000 × 110% =	2,17,800
Labour cost 15,600 lakhs/ 40,000 units =	39,000
Direct expenses, 37,200 lakhs/ 40,000 units =	93,000
Variable cost per unit	3,49,800
Budgeted selling price per unit	5,25,000
Contribution per unit (5,25,000 – 3,49,800)	1,75,200

Sales volume = $\frac{\text{Fixed costs} + \text{Profit}}{\text{Contribution Per Unit}} = \frac{60,750 \text{ lakhs} + 17,250 \text{ lakhs}}{\text{₹1.752 lakhs}}$
 = 44,521 units are to be sold to maintain the original profit of ₹ 17,250 lakhs.



QUESTION 30. (PP16)

An Indian soft drink company is planning to establish a subsidiary company in Bhutan to produce mineral water. Based on the estimated annual sales of 40,000 bottles of the mineral water, cost studies produced the following estimates for the Bhutanese subsidiary:

	Total annual costs	Percent of Total Annual Cost which is variable
Material	2,10,000	100%
Labour	1,50,000	80%
Factory Overheads	92,000	60%
Administration Expenses	40,000	35%

The Bhutanese production will be sold by manufacturer's representatives who will receive a commission of 8% of the sale price. No portion of the Indian office expenses is to be allocated to the Bhutanese subsidiary. You are required to

- COMPUTE the sale price per bottle to enable the management to realize an estimated 10% profit on sale proceeds in Bhutan.
- CALCULATE the break-even point in rupees sales as also in number of bottles for the Bhutanese subsidiary on the assumption that the sale price is ₹ 14 per bottle.

ANSWER :

- Computation of Sale Price Per Bottle

Output: 40,000 Bottles

Particulars	(₹)
Variable Cost:	
Material	2,10,000
Labour (₹1,50,000 × 80%)	1,20,000
Factory Overheads (₹92,000 × 60%)	55,200
Administrative Overheads (₹40,000 × 35%)	14,000
Commission (8% on ₹6,00,000) (W.N.-1)	48,000
Fixed Cost:	
Labour (₹1,50,000 × 20%)	30,000
Factory Overheads (₹92,000 × 40%)	36,800
Administrative Overheads (₹40,000 × 65%)	26,000



Total Cost	5,40,000
Profit (W.N. - 1)	60,000
Sales Proceeds (W.N. - 1)	6,00,000
Sales Price per bottle $\left(\frac{₹6,00,000}{40,000 \text{ Bottles}} \right)$	15

(ii) Calculation of Break-even Point

Sales Price per Bottle = ₹14

Variable Cost per Bottle = $\frac{₹4,44,000 \text{ (W.N. - 2)}}{40,000 \text{ Bottles}}$ = ₹11.10

Contribution per Bottle = ₹14 - ₹11.10 = ₹2.90

Break -even Point:

(in number of Bottles) = $\frac{\text{Fixed Costs}}{\text{Contribution per Bottle}}$
 = $\frac{₹92,800}{₹2.90}$ = 32,000 Bottles

(in Sales Value) = 32,000 Bottles × ₹14
 = ₹4,48,000

Working Note

W.N. - 1

Let the Sales Price be 'x'

Commission = $\frac{8x}{100}$ Profit = $\frac{10x}{100}$

$$x = 4,92,000 + \frac{8x}{100} + \frac{10x}{100}$$

$$100x - 8x - 10x = 4,92,00,000$$

$$82x = 4,92,00,000$$

$$x = 4,92,00,000 / 82 = ₹6,00,000$$

W.N. - 2

Total Variable Cost	(₹)
Material	2,10,000
Labour	1,20,000
Factory Overheads	55,200
Administrative Overheads	14,000
Commission [(40,000 Bottles × ₹14) × 8%]	44,800
	4,44,000

**QUESTION 31. (PP17)**

XYZ Ltd. has a production capacity of 2,00,000 units per year. Normal capacity utilisation is reckoned as 90%. Standard variable production costs are ₹ 11 per unit. The fixed costs are ₹3,60,000 per year. Variable selling costs are ₹ 3 per unit and fixed selling costs are ₹2,70,000 per year. The unit selling price is ₹ 20.



In the year just ended on 31st March, the production was 1,60,000 units and sales were 1,50,000 units. The closing inventory on 31st March was 20,000 units. The actual variable production costs for the year were ₹ 35,000 higher than the standard.

- (i) CALCULATE the profit for the year
 - (a) by absorption costing method and
 - (b) by marginal costing method.
- (ii) EXPLAIN the difference in the profits.

ANSWER :

Income Statement (Absorption Costing) for the year ending 31st March

	(₹)	(₹)
Sales (1,50,000 units @ ₹20)		30,00,000
Production Costs:		
Variable (1,60,000 units @ ₹11)	17,60,000	
Add: Increase	35,000	17,95,000
Fixed (1,60,000 units @ ₹2*)		3,20,000
Cost of Goods Produced		21,15,000
Add: Opening stock (10,000 units @ ₹13)*		1,30,000
		22,45,000
Less: Closing stock $\left(\frac{₹ 21,15,000}{1,60,000 \text{ units}} \times 20,000 \text{ units} \right)$		2,64,375
Cost of Goods Sold		19,80,625
Add: Under absorbed fixed production overhead (3,60,000 – 3,20,000)		40,000
		20,20,625
Add: Non-production costs:		
Variable selling costs (1,50,000 units @ ₹3)		4,50,000
Fixed selling costs		2,70,000
Total cost		27,40,625
Profit (Sales – Total Cost)		2,59,375

* Working Notes:

1. Fixed production overhead is absorbed at a pre-determined rate based on normal capacity, i.e. ₹3,60,000 ÷ 1,80,000 units = ₹ 2.
2. Opening stock is 10,000 units, i.e., 1,50,000 units + 20,000 units – 1,60,000 units. It is valued at ₹13 per unit, i.e., ₹11 + ₹2 (Variable + fixed).

Income Statement (Marginal Costing) for the year ended 31st March

	(₹)	(₹)
Sales (1,50,000 units @ ₹20)		30,00,000
Variable production cost (1,60,000 units @ ₹11 + ₹35,000)		17,95,000
Variable selling cost (1,50,000 units @ ₹3)		4,50,000
		22,45,000
Add: Opening Stock (10,000 units @ ₹11)		1,10,000
		23,55,000
Less: Closing stock $\left(\frac{₹17,95,000}{1,60,000 \text{ units}} \times 20,000 \text{ units} \right)$		2,24,375



Variable cost of goods sold		21,30,625
Contribution (Sales – Variable cost of goods sold)		8,69,375
Less: Fixed cost – Production	3,60,000	
– Selling	2,70,000	6,30,000
Profit		2,39,375

Reasons for Difference in Profit:	(₹)
Profit as per absorption costing	2,59,375
Add: Op. stock under –valued in marginal costing (₹1,30,000 – 1,10,000)	20,000
	2,79,375
Less: Cl. Stock under –valued in marginal closing (₹2,64,375 – 2,24,375)	40,000
Profit as per marginal costing	2,39,375

**QUESTION 32. (PP18)**

The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

	A Manual (₹)	B Semi- Automatic (₹)	C Fully- Automatic (₹)
Monthly fixed costs:			
Occupancy	15,000	15,000	15,000
Maintenance contract	---	5,000	10,000
Equipment lease	---	25,000	1,00,000
Unit variable costs (per report):			
Supplies	40	80	20
Labour	₹200 (5 hrs × ₹40)	₹60 (1 hr × ₹60)	₹20 (0.25 hr × ₹80)

Required:

- CALCULATE cost indifference points. Interpret your results.
- If the present case load is 600 cases and it is expected to go up to 850 cases in near future, SELECT most appropriate on cost considerations?

ANSWER :

- Cost Indifference Point

	A and B (₹)	A and C (₹)	B and C (₹)
Monthly fixed costs:			
Differential Fixed Cost (I)	₹30,000 (₹45,000 – ₹15,000)	₹1,10,000 (₹1,25,000 – ₹15,000)	₹80,000 (₹1,25,000 – ₹45,000)
Differential Variable Costs (II)	₹100 (₹240 – ₹140)	₹200 (₹240 – ₹40)	₹100 (₹140 – ₹40)
Cost Indifference Point (I/II)	300	550	800
(Differential Fixed Cost / Differential Variable Costs per case)	Cases	Cases	Cases

**Interpretation of Results**

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

No. of Cases	Alternative to be Chosen
Cases ≤ 300	Alternative 'A'
$300 \geq \text{Cases} \leq 800$	Alternative 'B'
Cases ≥ 800	Alternative 'C'

- (ii) Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go upto 850 cases, alternative C is most appropriate.

**QUESTION 33. (PP19)**

XY Ltd. makes two products X and Y, whose respective fixed costs are F₁ and F₂. You are given that the unit contribution of Y is one-fifth less than the unit contribution of X, that the total of F₁ and F₂ is ₹ 1,50,000, that the BEP of X is 1,800 units (for BEP of X, F₂ is not considered) and that 3,000 units is the indifference point between X and Y (i.e. X and Y make equal profits at 3,000 unit volume, considering their respective fixed costs). There is no inventory buildup as whatever is produced is sold.

Required

FIND OUT the values F₁ and F₂ and units contributions of X and Y.

ANSWER :

Let C_x be the Contribution per unit of Product X.

Therefore, Contribution per unit of Product Y = C_y = $\frac{4}{5}C_x = 0.8C_x$

Given F₁ + F₂ = 1,50,000,

F₁ = 1,800C_x (Break even Volume × Contribution per unit)

Therefore, F₂ = 1,50,000 – 1,800C_x.

$3,000C_x - F_1 = 3,000 \times 0.8C_x - F_2$ or $3,000C_x - F_1 = 2,400C_x - F_2$ (Indifference Point)

i.e., $3,000C_x - 1,800C_x = 2,400C_x - 1,50,000 + 1,800C_x$

i.e., $3,000C_x = 1,50,000$, Therefore, C_x = ₹ 50/- (1,50,000 / 3,000)

Therefore, Contribution per unit of X = ₹ 50

Fixed Cost of X = F₁ = ₹ 90,000 (1,800 × 50)

Therefore, Contribution per unit of Y is ₹ 50 × 0.8 = ₹ 40 and

Fixed Cost of Y = F₂ = ₹ 60,000 (1,50,000 – 90,000)

The Value of F₁ = ₹ 90,000, F₂ = ₹ 60,000 and X = ₹ 50 and Y = ₹ 40

**QUESTION 34. (PP20)**

Prisha Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	A	B	C
Sales Mix	40%	35%	25%
Selling Price	₹ 300	₹ 400	₹ 200
Variable Cost	₹ 150	₹ 200	₹ 120
Total Fixed Costs	₹ 18,00,000		
Total Sales	₹ 60,00,000		

The company has currently under discussion, a proposal to discontinue the manufacture of Product C and replace it with Product E, when the following results are anticipated:

	Products		
	A	B	E
Sales Mix	45%	30%	25%
Selling Price	₹ 300	₹ 400	₹ 300
Variable Cost	₹ 150	₹ 200	₹ 150
Total Fixed Costs	₹ 18,00,000		
Total Sales	₹ 64,00,000		

Required:

- CALCULATE the total contribution to sales ratio and present break-even sales at existing sales mix.
- CALCULATE the total contribution to sales ratio and present break-even sales at proposed sales mix.
- STATE whether the proposed sales mix is accepted or not?

ANSWER :

- Calculation of Contribution to sales ratio at existing sales mix:

	Products			Total
	A	B	C	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	
Contribution per unit (₹)	150	200	80	
P/V Ratio	50%	50%	40%	
Sales Mix	40%	35%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	20%	17.5%	10%	47.5%
Present Total Contribution (₹ 60,00,000 × 47.5%)				₹ 28,50,000
Less: Fixed Costs				₹ 18,00,000
Present Profit				₹ 10,50,000
Present Break-Even Sales (₹ 18,00,000/0.475)				₹ 37,89,473.68



(ii) Calculation of Contribution to sales ratio at proposed sales mix:

	Products			Total
	A	B	C	
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	150	
P/V Ratio	50%	50%	50%	
Sales Mix	45%	30%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	22.5%	15%	12.5%	50%
Proposed Total Contribution (₹ 64,00,000 × 50%)				₹ 32,00,000
Less: Fixed Costs				₹ 18,00,000
Proposed Profit				₹ 14,00,000
Proposed Break-Even Sales (₹ 18,00,000/0.50)				₹ 36,00,000

(iii) The proposed sales mix increases the total contribution to sales ratio from 47.5% to 50% and the total profit from ₹ 10,50,000 to ₹ 14,00,000. Thus, the proposed sales mix should be accepted.



REVISION TEST PAPER



RTP MAY 18

A company manufactures two types of herbal product, A and B. Its budget shows profit figures after apportioning the fixed joint cost of ₹15 lacs in the proportion of the numbers of units sold. The budget for 2018, indicates:

	A	B
Profit (₹)	1,50,000	30,000
Selling Price / unit (₹)	200	120
P/V Ratio (%)	40	50

Required:

COMPUTE the best option among the following, if the company expects that the number of units to be sold would be equal.

- Due to exchange in a manufacturing process, the joint fixed cost would be reduced by 15% and the variables would be increased by $7\frac{1}{2}\%$.
- Price of A could be increased by 20% as it is expected that the price elasticity of demand would be unity over the range of price.
- Simultaneous introduction of both the option, viz, (i) and (ii) above.

ANSWER :

Option (i)

Increase in profit when due to change in a manufacturing process there is reduction in joint fixed cost and increase in variable costs.

	(₹)
Revised Contribution from 12,000 units of A due to 7.5% increase in Variable Cost {12,000 units × (₹200 – ₹129)}	8,52,000
Revised Contribution from 12,000 units of B due to 7.5% increase in Variable Cost {12,000 units × (₹120 – ₹64.50)}	6,66,000
Total Revised Contribution	15,18,000
Less: Fixed Cost (₹15,00,000 – 15% × ₹15,00,000)	12,75,000
Revised Profit	2,43,000
Less: Existing Profit	1,80,000
Increase in Profit	63,000

Option (ii)

Increase in profit when the price of product A increased by 20% and the price elasticity of its demand would be unity over the range of price.

	(₹)
Budgeted Revenue from Product A (12,000 units × ₹200)	24,00,000
Revised Demand (in units) (₹24,00,000 / ₹240)	10,000
Revised Contribution (in ₹) [10,000 units × (₹240 – ₹120)]	12,00,000
Less: Existing Contribution (12,000 units × ₹80)	9,60,000
Increase in Profit (Contribution)	2,40,000



*Note: Since Price Elasticity of Demand is 1, therefore the Revenue in respect of Products will remain same.

Option (iii)

Increase in profit on the simultaneous introduction of above two options.

	(₹)
Revised Contribution from Product A [10,000 units × (₹240 – ₹129)]	11,10,000
Revised Contribution from Product B [12,000 units × (₹120 – ₹64.50)]	6,66,000
Total Revised Contribution	17,76,000
Less: Revised Fixed Cost	12,75,000
Revised Profit	5,01,000
Less: Existing Profit	1,80,000
Increase in Profit	3,21,000

A comparison of increase in profit figures under above three options clearly indicates that the option (iii) is the best as it increases the profit of the concern by ₹3,21,000.

Note: The budgeted profit / (loss) for 2018 in respect of products A and B should be ₹ 2,10,000 and (₹30,000) respectively instead of ₹ 1,50,000 and ₹ 30,000.

Workings

1. Contribution per unit of each product:

	Product	
	A (₹)	B (₹)
Contribution per unit	80	60
(Sales × P/V Ratio)	(₹200 × 40%)	(₹120 × 50%)

2. Number of units to be sold:

Total Contribution – Fixed Cost = Profit

Let x be the number of units of each product sold, therefore:

$$(80x + 60x) - ₹15,00,000 = ₹1,50,000 + ₹30,000$$

$$\text{Or } x = 12,000 \text{ units}$$



RTP NOV 18

A company sells its product at ₹ 15 per unit. In a period, if it produces and sells 8,000 units, it incurs a loss of ₹ 5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹ 4 per unit. CALCULATE break-even point both in terms of rupees as well as in units.

ANSWER :

We know that $S - V = F + P$ (S - Sales, V - Variable cost, F - Fixed cost and P - Profit/loss)

∴ Suppose variable cost = x per unit

Fixed Cost = y

When sales is 8,000 units, then

$$15 \times 8,000 - 8,000x = y - 40,000 \dots \dots \dots (1)$$

When sales volume raised to 20,000 units, then

$$15 \times 20,000 - 20,000x = y + 80,000 \dots \dots \dots (2)$$

$$\text{Or, } 1,20,000 - 8,000x = y - 40,000 \dots \dots \dots (3)$$

$$\text{And } 3,00,000 - 20,000x = y + 80,000 \dots \dots \dots (4)$$



From (3) & (4) we get $x = ₹ 5$.

Variable cost per unit = ₹ 5

Putting this value in 3rd equation:

$$1,20,000 - (8,000 \times 5) = y \quad 40,000$$

$$\text{or } y = ₹ 1,20,000$$

Fixed Cost = ₹ 1,20,000

$$\text{P/V ratio} = \frac{S - V}{S} = \frac{15 - 5}{15} \times 100 = \frac{200}{3} = 66 \frac{2}{3} \%$$

Suppose break-even sales = x

$$15x - 5x = 1,20,000 \quad (\text{at BEP, contribution will be equal to fixed cost})$$

$$x = 12,000 \text{ units.}$$

Or Break-even sales in units = 12,000

$$\text{Break-even sales in rupees} = 12,000 \times ₹ 15 = ₹ 1,80,000$$



RTP MAY 19

MNP Ltd sold 2,75,000 units of its product at ₹ 375 per unit. Variable costs are ₹ 175 per unit (manufacturing costs of ₹140 and selling cost ₹35 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹3,50,00,000 (including depreciation of ₹ 1,50,00,000). there are no beginning or ending inventories.

Required:

- COMPUTE breakeven sales level quantity and cash breakeven sales level quantity.
- COMPUTE the P/V ratio.
- COMPUTE the number of units that must be sold to earn an income (EBIT) of ₹ 25,00,000.
- COMPUTE the sales level achieve an after-tax income (PAT) of ₹ 25,00,000. Assume 40% corporate Income Tax rate.

ANSWER :

- (i) Contribution = ₹375 - ₹175 = ₹200 per unit.

$$\text{Break even Sales Quantity} = \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{₹ 3,50,00,000}{₹ 200} = 1,75,000 \text{ units}$$

$$\text{Cash Break even Sales Qty} = \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{₹ 2,00,00,000}{₹ 200} = 1,00,000 \text{ units.}$$

- (ii) $\text{P/V ratio} = \frac{\text{Contribution/ unit}}{\text{Selling Price / unit}} \times 100 = \frac{₹ 200}{₹ 375} \times 100 = 53.33\%$

- (iii) No. of units that must be sold to earn an Income (EBIT) of ₹ 25,00,000

$$\frac{\text{Fixed cost} + \text{Desired EBIT level}}{\text{Contribution margin per unit}} = \frac{3,50,00,000 + 25,00,000}{₹ 200} = 1,87,500 \text{ units}$$

- (iv) After Tax Income (PAT) = ₹25,00,000

Tax rate = 40%



$$\text{Desired level of Profit before tax} = \frac{\text{₹25,00,000}}{60} \times 100 = \text{₹41,66,667}$$

$$\text{Estimate Sales Level} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V ratio}}$$

$$\text{Or, } \left(\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution per unit}} \times \text{Selling Price per unit} \right)$$

$$= \frac{\text{₹3,50,00,000} + \text{₹41,66,667}}{53.33\%} = \text{₹7,34,42,091}$$

**RTP NOV 19**

PVC Ltd sold 55,000 units of its product at ₹375 per unit. Variable costs are ₹175 per unit (manufacturing costs of ₹140 and selling cost ₹35 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹65,00,000 (including depreciation of ₹15,00,000). There is no beginning or ending inventories.

Required:

- COMPUTE breakeven sales level quantity and cash breakeven sales level quantity.
- COMPUTE the P/V ratio.
- COMPUTE the number of units that must be sold to earn an income (EBIT) of ₹5,00,000.
- COMPUTE the sales level achieve an after-tax income (PAT) of ₹5,00,000, assume 40% corporate tax rate..

ANSWER :

- (i) Contribution = ₹375 - ₹175 = ₹200 per unit.

$$\text{Break even Sales Quantity} = \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{\text{₹ 65,00,000}}{\text{₹ 200}} = 32,500 \text{ units}$$

$$\text{Cash Break even Sales Qty} = \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{\text{₹50,00,000}}{\text{₹200}} = 25,000 \text{ units.}$$

(ii) $\text{P/V ratio} = \frac{\text{Contribution / unit}}{\text{Selling Price / unit}} \times 100 = \frac{\text{₹200}}{\text{₹375}} \times 100 = 53.33\%$

- (iii) No. of units that must be sold to earn an Income (EBIT) of ₹5,00,000

$$\frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{\text{Desired EBIT level}}{200} = \frac{65,00,000}{200} = 35,000 \text{ units}$$

- (iv) After Tax Income (PAT) = ₹5,00,000

Tax rate = 40%

$$\text{Desired level of Profit before tax} = \frac{\text{₹5,00,000}}{60} \times 100 = \text{₹8,33,333.}$$

$$\text{Estimate Sales Level} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P / V ratio}}$$



$$\text{Or, } \left(\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution per unit}} \times \text{Selling Price per unit} \right)$$

$$= \frac{₹65,00,000 + ₹8,33,333}{53.33\%} = ₹1,37,50,859$$

**RTP MAY 20**

A Ltd. manufacture and sales its product R-9. The following figures have been collected from cost records of last year for the product R-9:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of Cost of Goods Sold	--
Direct Labour	15% of Cost of Goods Sold	--
Factory Overhead	10% of Cost of Goods Sold	₹ 2,30,000
Administration Overhead	2% of Cost of Goods Sold	₹ 71,000
Selling & Distribution Overhead	4% of Cost of Sales	₹ 68,000

Last Year 5,000 units were sold at ₹185 per unit. From the given DETERMINE the followings:

- Break-even Sales (in rupees)
 - Profit earned during last year
 - Margin of safety (in %)
 - Profit if the sales were 10% less than the actual sales.
- (Assume that Administration Overhead is related with production activity)

ANSWER :

Working Notes:

- (1) Calculation of Cost of Goods Sold (COGS):

$$\text{COGS} = \text{DM} + \text{DL} + \text{FOH} + \text{AOH}$$

$$\text{COGS} = \{0.3 \text{ COGS} + 0.15 \text{ COGS} + (0.10 \text{ COGS} + ₹ 2,30,000) + (0.02 \text{ COGS} + ₹ 71,000)\}$$

$$\text{Or, COGS} = 0.57 \text{ COGS} + ₹ 3,01,000$$

$$\text{Or, COGS} = \frac{₹ 3,01,000}{0.43} = ₹ 7,00,000$$

- (2) Calculation of Cost of Sales (COS):

$$\text{COS} = \text{COGS} + \text{S\&DOH}$$

$$\text{COS} = \text{COGS} + (0.04 \text{ COS} + ₹ 68,000)$$

$$\text{Or, COS} = ₹ 7,00,000 + (0.04 \text{ COS} + ₹ 68,000)$$

$$\text{Or, COS} = \frac{₹ 7,68,000}{0.96} = ₹ 8,00,000$$

- (3) Calculation of Variable Costs:

Direct Material-	(0.30 × ₹ 7,00,000)	₹ 2,10,000

Direct Labour-	(0.15 × ₹ 7,00,000)	₹ 1,05,000

Factory Overhead-	(0.10 × ₹ 7,00,000)	₹ 70,000

Administration OH-	(0.02 × ₹ 7,00,000)	₹ 14,000



Selling & Distribution OH	(0.04 × ₹ 8,00,000)	₹ 32,000
		<u>₹ 4,31,000</u>

(4) Calculation of total Fixed Costs:

Factory Overhead-	₹ 2,30,000
Administration OH-	₹ 71,000
Selling & Distribution OH	<u>₹ 68,000</u>
	<u>₹ 3,69,000</u>

(5) Calculation of P/V Ratio:

$$\begin{aligned} \text{P/V Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}} \times 100 \\ &= \frac{(\text{₹}185 \times 5,000\text{units}) - \text{₹}4,31,000}{\text{₹}185 \times 5,000\text{units}} \times 100 = 53.41\% \end{aligned}$$

(i) Break-Even Sales

$$= \frac{\text{Fixed Costs}}{\text{P / V Ratio}} = \frac{\text{₹}3,69,000}{53.41\%} = \text{₹}6,90,882$$

(ii) Profit earned during the last year

$$\begin{aligned} &= (\text{Sales} - \text{Total Variable Costs}) - \text{Total Fixed Costs} \\ &= (\text{₹}9,25,000 - \text{₹}4,31,000) - \text{₹}3,69,000 \\ &= \text{₹}1,25,000 \end{aligned}$$

(iii) Margin of Safety (%)

$$\begin{aligned} &= \frac{\text{Sales} - \text{Breakeven sales}}{\text{Sales}} \times 100 \\ &= \frac{\text{₹}9,25,000 - \text{₹}6,90,882}{\text{₹}9,25,000} \times 100 = 25.31\% \end{aligned}$$

(iv) Profit if the sales were 10% less than the actual sales:

$$\begin{aligned} \text{Profit} &= 90\% (\text{₹}9,25,000 - \text{₹}4,31,000) - \text{₹}3,69,000 \\ &= \text{₹}4,44,600 - \text{₹}3,69,000 = \text{₹}75,600 \end{aligned}$$

**RTP NOV 20**

J Ltd. manufactures a Product-Y. Analysis of income statement indicated a profit of ₹ 250 lakhs on a sales volume of 5,00,000 units. Fixed costs are ₹1,000 lakhs which appears to be high. Existing selling price is ₹680 per unit. The company is considering revising the profit target to ₹ 700 lakhs. You are required to COMPUTE –

- Break- even point at existing levels in units and in rupees.
- The number of units required to be sold to earn the target profit.
- Profit with 10% increase in selling price and drop in sales volume by 10%.
- Volume to be achieved to earn target profit at the revised selling price as calculated in (ii) above, if a reduction of 10% in the variable costs and ₹ 170 lakhs in the fixed cost is envisaged.

**ANSWER :**

Sales Volume 5,00,000 Units

Computation of existing contribution

Particulars	Per unit (₹)	Total (₹ In Lakhs)
Sales	680	3,400
Fixed Cost	200	1,000
Profit	50	250
Contribution	250	1,250
Variable Cost (Sales – Contribution)	430	2,150

$$(i) \text{ Break even sales in units} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{₹10,00,00,000}{₹250} = 4,00,000 \text{ units}$$

$$\text{Break even sales in rupees} = 4,00,000 \text{ units} \times ₹ 680 = ₹ 2,720 \text{ lakhs}$$

OR

$$\text{P/V Ratio} = \frac{250}{680} \times 100 = 36.76\%$$

$$\text{B.E.P (Rupees)} = \frac{\text{Fixed Cost}}{\text{P / V Ratio}} = \frac{10,00,00,000}{36.76\%} = ₹ 2,720 \text{ lakhs (approx.)}$$

(ii) Number of units sold to achieve a target profit of ₹700 lakhs:

$$\begin{aligned} \text{Desired Contribution} &= \text{Fixed Cost} + \text{Target Profit} \\ &= 1,000 \text{ L} + 700 \text{ L} = 1,700 \text{ L} \end{aligned}$$

$$\text{Number of units to be sold} = \frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{17,00,00,000}{250} = 6,80,000 \text{ units}$$

(iii) Profit if selling price is increased by 10% and sales volume drops by 10%:

$$\text{Existing Selling Price per unit} = ₹ 680$$

$$\text{Revised selling price per unit} = ₹ 680 \times 110\% = ₹ 748$$

$$\text{Existing Sales Volume} = 5,00,000 \text{ units}$$

$$\text{Revised sales volume} = 5,00,000 \text{ units} - 10\% \text{ of } 5,00,000 = 4,50,000 \text{ units.}$$

Statement of profit at sales volume of 4,50,000 units @ ₹ 748 per unit

Particulars	Per unit (₹)	Total (₹ In lakhs)
Sales	748	3,366
Less: Variable Costs	430	1,935
Contribution	318	1,431
Less: Fixed Cost		1,000
Profit		431

(iv) Volume to be achieved to earn target profit of ₹700 lakhs with revised selling price and reduction of 10% in variable costs and ₹170 lakhs in fixed cost:

$$\text{Revised selling price per unit} = ₹ 748$$

$$\text{Variable costs per unit existing} = ₹ 430$$

Revised Variable Costs

Reduction of 10% in variable costs = ₹ 430 – 10% of 430

= ₹ 430 – ₹43

= ₹387

Total Fixed Cost (existing) = ₹ 1,000 lakhs

Reduction in fixed cost = ₹ 170 lakhs

Revised fixed cost = ₹ 1,000 lakhs – ₹ 170 lakhs = ₹830 lakhs

Revised Contribution (unit) = Revised selling price per unit – Revised
Variable Costs per units

Revised Contribution per unit = ₹ 748 – ₹ 387 = ₹ 361

Desired Contribution = Revised Fixed Cost + Target Profit

= ₹ 830 lakhs + ₹700 lakhs = ₹1,530 lakhs

No. of units to be sold = $\frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{₹15,30,00,000}{₹361} = 4,23,823 \text{ units}$ **RTP MAY 21**

Aditya Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	S	T	U
Sales Mix	35%	35%	30%
Selling Price	₹ 300	₹ 400	₹ 200
Variable Cost	₹ 150	₹ 200	₹ 120
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 60,00,000

The company has currently under discussion, a proposal to discontinue the manufacture of Product U and replace it with Product M, when the following results are anticipated:

	Products		
	S	T	M
Sales Mix	50%	25%	25%
Selling Price	₹ 300	₹ 400	₹ 300
Variable Cost	₹ 150	₹ 200	₹ 150
Total Fixed Costs			₹ 18,00,000
Total Sales			₹ 64,00,000

Required

- COMPUTE the PV ratio, total contribution, profit and Break-even sales for the existing product mix.
- COMPUTE the PV ratio, total contribution, profit and Break-even sales for the proposed product mix.

**ANSWER :**

(i) Computation of PV ratio, contribution and break-even sales for existing product mix

	Products			Total
	S	T	U	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	
Contribution per unit (₹)	150	200	80	
P/V Ratio (Contribution/Selling price)	50%	50%	40%	
Sales Mix	35%	35%	30%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	17.5%	17.5%	12%	47%
Present Total Contribution (₹60,00,000 × 47%)				₹ 28,20,000
Less: Fixed Costs				₹ 18,00,000
Present Profit				₹ 10,20,000
Present Break Even Sales (₹18,00,000/0.47)				₹ 38,29,787

(ii) Computation of PV ratio, contribution and break-even sale for proposed product mix

	Products			Total
	S	T	M	
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	150	
P/V Ratio (Contribution/Selling price)	50%	50%	50%	
Sales Mix	50%	25%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	25%	12.5%	12.5%	50%
Proposed Total Contribution (₹64,00,000 × 50%)				₹ 32,00,000
Less: Fixed Costs				₹ 18,00,000
Proposed Profit				₹ 14,00,000
Proposed Break Even Sales (₹18,00,000/0.50)				₹ 36,00,000

**RTP NOV 21**

A company has three factories situated in North, East and South with its Head Office in Mumbai. The Management has received the following summary report on the operations of each factory for a period:

(₹ in '000)

Factory	Sales		Profit	
	Actual	Over / (Under) Budget	Actual	Over / (Under) Budget
North	1,100	(400)	135	(180)
East	1,450	150	210	90
South	1,200	(200)	330	(110)

CALCULATE the following for each factory and for the company as a whole for the period:

- (i) Fixed Cost
(ii) Break-even Sales

**ANSWER :**

Computation of Profit Volume Ratio

Factory	Sales			Profit			P/V Ratio ($\frac{\text{Change in Profit}}{\text{Change in Sales}}$)
	Actual	Over / (Under) Budget	Budgeted Sales	Actual	Over / (Under) Budget	Budget Profit	
North	1,100	(400)	1,500	135	(180)	315	45%
East	1,450	150	1,300	210	90	120	60%
South	1,200	(200)	1,400	330	(110)	440	55%

(i) Computation of Fixed Costs

(₹ in '000)

Factory	Actual Sales	P/V Ratio	Contribution	Actual Profit	Fixed Cost
	(1)	(2)	(3) = (1) × (2)	(4)	(5) = (3) - (4)
North	1,100	45%	495	135	360
East	1,450	60%	870	210	660
South	1,200	55%	660	330	330
Total	3,750		2,025	675	1,350

(ii) Computation of Break-Even Sales

Factory	Fixed Cost (a)	P/V Ratio (b)	Break-even Sales (a) / (b)
North	360	45%	800
East	660	60%	1,100
South	330	55%	600
			2,500

$$\begin{aligned}
 \text{Break-even Sales (Company as Whole)} &= \frac{\text{Fixed Cost}}{\text{Composite P / V Ratio} *} \\
 &= \frac{₹ 13,50,000}{54\%} \\
 &= ₹ 25,00,000
 \end{aligned}$$

$$\text{*Composite P/V Ratio} = \frac{\text{Total Contribution}}{\text{Total Actual sales}} = \frac{2,025}{3,750} = 54\%$$

**RTP MAY 22**

A Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	S	T	U
Sales Mix	25%	35%	40%
Selling Price	₹ 600	₹ 800	₹ 400
Variable Cost	₹ 300	₹ 400	₹ 240
Total Fixed Costs			₹ 36,00,000
Total Sales			₹ 1,20,00,000



The company has currently under discussion, a proposal to discontinue the manufacture of Product U and replace it with Product M, when the following results are anticipated:

	Products		
	S	T	M
Sales Mix	40%	35%	25%
Selling Price	₹ 600	₹ 800	₹ 600
Variable Cost	₹ 300	₹ 400	₹ 300
Total Fixed Costs	₹ 36,00,000		
Total Sales	₹ 1,28,00,000		

Required:

- COMPUTE the PV ratio, total contribution, profit and Break-even sales for the existing product mix.
- COMPUTE the PV ratio, total contribution, profit and Break-even sales for the proposed product mix

ANSWER :

- Computation of PV ratio, contribution, profit and break-even sales for existing product mix

	Products			Total
	S	T	U	
Selling Price (₹)	600	800	400	
Less: Variable Cost (₹)	300	400	240	
Contribution per unit (₹)	300	400	160	
P/V Ratio (Contribution/Selling price)	50%	50%	40%	
Sales Mix	25%	35%	40%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	12.5%	17.5%	16%	46%
Present Total Contribution (₹1,20,00,000 × 46%)				₹ 55,20,000
Less: Fixed Costs				₹ 36,00,000
Present Profit				₹ 19,20,000
Present Break Even Sales (₹ 36,00,000/0.46)				₹ 78,26,087

- Computation of PV ratio, contribution, profit and break-even sale for proposed product mix

	Products			Total
	S	T	M	
Selling Price (₹)	600	800	600	
Less: Variable Cost (₹)	300	400	300	
Contribution per unit (₹)	300	400	300	
P/V Ratio (Contribution/Selling price)	50%	50%	50%	
Sales Mix	40%	35%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	20%	17.5%	12.5%	50%
Proposed Total Contribution (₹ 1,28,00,000 × 50%)				₹ 64,00,000
Less: Fixed Costs				₹ 36,00,000
Proposed Profit				₹ 28,00,000
Proposed Break- Even Sales (₹ 36,00,000/0.50)				₹ 72,00,000

**RTP NOV 22**

- (a) RPP Manufacturers is approached by an international customer for one-time special order similar to one offered to its domestic customers. Per unit data for sales to regular customers is provided below:

Direct material@	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Fixed manufacturing support	₹ 1092
Total manufacturing costs	₹ 2604
Markup (50%)	₹ 1302
Targeted selling price	₹ 3906

It is provided that RPP Manufacturers has excess capacity.

Required:

- WHAT is the full cost of the product per unit?
- WHAT is the contribution margin per unit?
- WHICH costs are relevant for making the decision regarding this one-time special order? WHY?
- For RPP Manufacturers, WHAT is the minimum acceptable price of this one-time special order only?
- For this one-time-only special order, SHOULD RPP Manufacturers consider a price of ₹ 2100 per unit? WHY or why not?

- (b) The lab corner of Newlife Hospital Trust operates two types of specialist MRI scanning machine- MR10 and MR59. Following details are estimated for the next period:

Machine	MR10	MR59
Running hours	1,100	2,000
	(₹)	(₹)
Variable running costs excluding special technology	68,750	1,60,000
Fixed Costs	50,000	2,43,750

A brain scan is normally carried out on machine type MR10. This task uses special technology costing ₹ 100 each and takes four hours of machine time. Because of the nature of the process, around 10% of the scans produce blurred and therefore useless results.

Required:

- CALCULATE the total cost of a satisfactory brain scan on machine type MR10.
- Brain scans can also be done on machine type MR59 and would take only 1.8 hours per scan with a reduced reject rate of 6%. However, the cost of the special technology would be ₹ 137.50 per scan. ADVISE which type should be used, assuming sufficient capacity is available on both types of machines. Consider fixed costs will remain unchanged.

ANSWER :

- (a) (i) Full cost of the product per unit
- | | |
|-----------------|-------|
| Direct material | ₹ 693 |
| Direct labour | ₹ 315 |



	Variable manufacturing support	₹ 504
	Fixed manufacturing support	₹ 1092
	Total manufacturing costs	₹ 2604
(ii)	Contribution margin per unit	
	Selling price	₹ 3906
	Less: Variable costs	
	Direct material	₹ 693
	Direct labour	₹ 315
	Variable manufacturing support	₹ 504
	Contribution margin per unit	₹ 2394
(iii)	Costs for decision making are those costs that differ between alternatives, which in this situation are the incremental costs.	
	Direct material	₹ 693
	Direct labour	₹ 315
	Variable manufacturing support	₹ 504
	Total incremental costs	₹ 1512
(iv)	Minimum acceptable price would be the incremental costs in the short term i.e. ₹ 1512	
(v)	Yes, RPP Manufacturers may consider a price of ₹ 2100 per unit because this price is greater than the minimum acceptable price.	

(b) (i)

Particulars	(₹)
Variable cost per running hour of Machine MR10 ($\text{₹ } 68,750 / 1100 \text{ hours}$)	62.50
Fixed cost ($\text{₹ } 50,000 / 1100 \text{ hours}$)	45.46
Cost of brain scan on Machine MR10:	(₹)
Variable machine cost ($4 \text{ hours} \times \text{₹ } 62.50$)	250.00
Special technology	100.00
Total variable cost	350.00
Fixed machine cost ($4 \text{ hours} \times \text{₹ } 45.46$)	181.84
Total cost of a scan	531.84
Total cost of a satisfactory scan ($\text{₹ } 531.84 / 0.9$)	590.93

(ii) It is given that fixed cost will remain unchanged and thus they are not relevant for the decision. The relevant costs would be the incremental costs of an additional scan:

Machine MR10:	(₹)
Variable cost per scan	350.00
Variable cost per satisfactory scan ($\text{₹ } 350 / 0.9$)	388.89
Machine MR59:	(₹)
Variable machine cost per scan ($\text{₹ } 1,60,000 / 2000 \text{ hours} \times 1.8 \text{ hours}$)	144.00
Special technology	137.50
Variable cost per scan	281.50
Variable cost per satisfactory scan ($\text{₹ } 281.50 / 0.94$)	299.47

The relevant costs per satisfactory scan are cheaper on Machine MR59 and therefore brain scans should be undertaken on said machine.

**RTP MAY 23**

The following data are available from the budget records of Finesign Women's Handbag Company for the forthcoming budget period.

	₹
Selling Price per unit	1000
Variable cost per unit:	
Cost of Material used	750.00
Sales commission	50.00
Total Variable Cost	800.00
Annual fixed expenses:	
Rent	7,00,000
Salaries	11,00,000
Other fixed expenses	5,00,000
Total Fixed Cost	23,00,000

Although the firm manufactures Bags with different styles, they have identical purchase costs and selling price.

Requirement:

- What is the annual break-even point both in terms of units and value?
 - If the store manager is paid 1 per cent commission on sales, what would be the annual break-even point both in terms of units and value?
 - If the firm decides to pay a fixed salary of ₹ 9,00,000 in lieu of sales commission, what would be the annual break-even point in terms of units and value.
- Considering break-even point in requirement (a), If the stores manager is paid 2 per cent commission on each bag sold in excess of the break-even point, what would be the profit if 20000 bags were sold.

ANSWER :

(a) P/V ratio: $\frac{\text{Sales per unit} - \text{Variable Cost per unit}}{\text{Selling price per unit}} \times 1000$

$$= \frac{1000 - 800}{1000} \times 100$$

$$= \frac{200}{1000} \times 100 = 20\%$$

Annual BEP in units: $\frac{\text{Annual fixed cost}}{\text{Contribution per unit}}$

$$= \frac{\text{₹ } 23,00,000}{\text{₹ } 200} = 11,500 \text{ units}$$

Annual BEP in value: $\frac{\text{Annual fixed cost}}{\text{P / V ratio}}$

$$\frac{\text{₹ } 23,00,000}{\text{₹ } 20\%} = \text{₹ } 1,15,00,000$$



(b) Revised P/V ratio and BEP :

commission on sales per unit = 1% of 1,000 = ₹10

So, P/V ratio : $\frac{1000 - (750 + 50 + 10)}{1000}$

= $\frac{190}{1000} \times 100 = 19\%$

BEP in terms of units: $\frac{\text{Annual fixed cost}}{\text{Contribution per unit}}$

= $\frac{23,00,000}{190} = 12,106 \text{ units}$

BEP in terms of value: $\frac{\text{Annual fixed cost}}{P / V}$

= $\frac{23,00,000}{19\%} = ₹1,21,05,263$

(c) Break-even point under fixed salary plan:

P/V ratio = $\frac{\text{Contribution per unit}}{\text{Selling price per unit}} = \frac{1000 - 750}{1000} \times 100 = \frac{250}{1000} \times 100 = 25\%$

Revised fixed cost :

Original fixed cost ₹ 23,00,000

Proposed fixed salary ₹ 9,00,000

Total ₹ 32,00,000

BEP in terms of units: $\frac{\text{Annual fixed cost}}{\text{Contribution per unit}} = \frac{32,00,000}{250} = 12,800 \text{ units}$

BEP in terms of value: $\frac{\text{Annual fixed cost}}{P / v \text{ ratio}} = \frac{32,00,000}{25\%} = 1,28,00,000$

(d) Annual break-even point under requirement (a) is 11,500 units.

Margin of safety at sales volume of 20,000 unit of bags (20,000 – 11,500) = 8500 units

Contribution on sales beyond break-even sales: Revised contribution per unit: 200 – (2% of 1000) = 180 Profit = Margin of safety (in units) × Contribution per unit

= 8500 × 180 = ₹ 15,30,000



RTP NOV 23

(a) A dairy product company manufacturing baby food with a shelf life of one year furnishes the following information:

(i) On 1st April, 2023, the company has an opening stock of 20,000 packets whose variable cost is ₹ 180 per packet.

(ii) In 2022-23, production was 1,20,000 packets and the expected production in 2023-24 is 1,50,000 packets. Expected sales for 2023-24 is 1,60,000 packets.



(iii) In 2022-23, fixed cost per unit was ₹ 60 and it is expected to increase by 10% in 2023-24. The variable cost is expected to increase by 25%. Selling price for 2023-24 has been fixed at ₹ 300 per packet.

You are required to calculate the Break-even volume in units for 2023-24.

(b) The M-Tech Manufacturing Company is presently evaluating two possible processes for the manufacture of a toy. The following information is available:

Particulars	Process A (₹)	Process B (₹)
Variable cost per unit	12	14
Sales price per unit	20	20
Total fixed costs per year	30,00,000	21,00,000
Capacity (in units)	4,30,000	5,00,000
Anticipated sales (Next year, in units)	4,00,000	4,00,000

Suggest:

1. Identify the process which gives more profit.
2. Would you change your answer as given above, if you were informed that the capacities of the two processes are as follows:
A - 6,00,000 units; B - 5,00,000 units?

ANSWER :

(a) Working Notes:

Particulars	2022-23 (₹)	2023-24 (₹)
Fixed Cost	72,00,000	79,20,000
	(₹ 60 × 1,20,000 units)	(110% of ₹ 72,00,000)
Variable Cost	180	225
		(125% of ₹ 180)

Calculation of Break-even Point (in units):

Since, shelf life of the product is one year only, hence, opening stock is to be sold first.

	(₹)
Total Contribution required to recover total fixed cost in 2023-24 and to reach break-even volume.	79,20,000
Less: Contribution from opening stock {20,000 units × (₹ 300 - ₹ 180)}	24,00,000
Balance Contribution to be recovered	55,20,000

Units to be produced to get balance contribution

$$= \frac{\text{₹ } 55,20,000}{\text{₹ } 300 - \text{₹ } 225} = 73,600 \text{ packets.}$$

Break-even volume in units for 2023-24

	Packets
From 2023-24 production	73,600
Add: Opening stock from 2022-23	20,000
	93,600



(b) (1) Comparative Profitability Statements

Particulars	Process- A (₹)	Process- B (₹)
Selling Price per unit	20.00	20.00
Less: Variable Cost per unit	12.00	14.00
Contribution per unit	8.00	6.00
Total Contribution	32,00,000 (₹ 8 × 4,00,000)	24,00,000 (₹ 6 × 4,00,000)
Less: Total fixed costs	30,00,000	21,00,000
Profit	2,00,000	3,00,000
Capacity (units)	4,30,000	5,00,000
Total Contribution at full capacity	34,40,000 (₹ 8 × 4,30,000)	30,00,000 (₹ 6 × 5,00,000)
Fixed Cost	30,00,000	21,00,000
Profit	4,40,000	9,00,000

Process - B gives more profit.

(2)

Particulars	Process- A (₹)	Process- B (₹)
*Capacity (units)	6,00,000	5,00,000
Total contribution	48,00,000 (₹ 8 × 6,00,000)	30,00,000 (₹ 6 × 5,00,000)
Fixed Cost	30,00,000	21,00,000
Profit	18,00,000	9,00,000

Process-A be chosen.

*Note: It is assumed that capacity produced equals sales.

**RTP MAY 24**

The analysis of cost sheet of A Ltd. for the last financial year has revealed the following information for its product R:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of cost of goods sold	--
Direct Labour	15% of cost of goods sold	--
Factory Overhead	10% of cost of goods sold	₹ 2,30,000
General & Administration Overhead	2% of cost of goods sold	₹ 71,000
Selling & Distribution Overhead	4% of cost of sales	₹ 68,000

Last year 5,000 units were sold at ₹185 per unit.

You being an associate to cost controller of the A Ltd., CALCULATE :

- Break-even Sales (in rupees),
- Profit earned during last year,
- Margin of safety (in %) and
- the profit if the sales were 10% less than the actual sales.

**ANSWER :**

Workings:

Calculation of Cost of Goods Sold (COGS):

$$\text{COGS} = \{(DM - 0.3 \text{ COGS}) + (DL - 0.15 \text{ COGS}) + (FOH - 0.10 \text{ COGS} + ₹ 2,30,000) + (G\&AOH - 0.02 \text{ COGS} + ₹ 71,000)\}$$

$$\text{Or COGS} = 0.57 \text{ COGS} + ₹ 3,01,000$$

$$\text{Or COGS} = \frac{₹ 3,01,000}{0.43} = ₹ 7,00,000$$

Calculation of Cost of Sales (COS):

$$\text{COS} = \text{COGS} + (S\&DOH - 0.04 \text{ COS} + ₹ 68,000)$$

$$\text{Or COS} = ₹ 7,00,000 + (0.04 \text{ COS} + ₹ 68,000)$$

$$\text{Or COS} = \frac{₹ 7,68,000}{0.96} = ₹ 8,00,000$$

Calculation of total Fixed Costs:

Factory Overhead	₹ 2,30,000
General & Administration OH	₹ 71,000
Selling & Distribution OH	₹ 68,000
	₹ 3,69,000

Calculation of Variable Costs:

Direct Material	(0.3 × ₹ 7,00,000)	₹ 2,10,000
Direct Labour	(0.15 × ₹ 7,00,000)	₹ 1,05,000
Factory Overhead	(0.10 × ₹ 7,00,000)	₹ 70,000
General & Administration OH	(0.02 × ₹ 7,00,000)	₹ 14,000
Selling & Distribution OH	(0.04 × ₹ 8,00,000)	₹ 32,000
		₹ 4,31,000

Calculation of P/V Ratio:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}} \times 100$$

$$= \frac{(₹ 185 \times 5,000 \text{ units}) - ₹ 4,31,000}{₹ 185 \times 5,000 \text{ units}} \times 100 = 53.41\%$$

$$(i) \text{ Break-Even Sales} = \frac{\text{Fixed Costs}}{\text{P / V Ratio}} = \frac{₹ 3,69,000}{53.41\%} = ₹ 6,90,882$$

(ii) Profit earned during the last year

$$= (\text{Sales} - \text{Total Variable Costs}) - \text{Total Fixed Costs}$$

$$= (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000$$

$$= ₹ 1,25,000$$

$$(iii) \text{ Margin of Safety (\%)} = \frac{\text{Sales} - \text{Breakeven sales}}{\text{Sales}} \times 100$$

$$= \frac{₹ 9,25,000 - ₹ 6,90,882}{₹ 9,25,000} \times 100 = 25.31\%$$



(iv) Profit if the sales were 10% less than the actual sales:

Profit = 90% (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 4,44,600 - ₹ 3,69,000 = ₹ 75,600

CA Rahul Panchal



15

BUDGETS &
BUDGETARY
CONTROL**QUESTION 1. (ILLUSTRATION 1)**

A factory which expects to operate 7,000 hours, i.e., at 70% level of activity, furnishes details of expenses as under:

Variable expenses ₹1,260

Semi-variable expenses ₹1,200

Fixed expenses ₹1,800

The semi-variable expenses go up by 10% between 85% and 95% activity and by 20% above 95% activity. PREPARE a flexible budget for 80, 90 and 100 per cent activities.

ANSWER :

Head of Account	Control basis	70%	80%	90%	100%
Budgeted hours		7,000	8,000	9,000	10,000
		(₹)	(₹)	(₹)	(₹)
Variable expenses	Variable	1,260	1,440	1,620	1,800
Semi-variable expenses	Semi-variable	1,200	1,200	1,320	1,440
Fixed expenses	Fixed	1,800	1,800	1,800	1,800
Total expenses		4,260	4,440	4,740	5,040
Recovery rate per hour:					
Total expenses/Bud hours		0.61	0.55	0.53	0.50

Conclusion:

We notice that the recovery rate at 70% activity is ₹ 0.61 per hour. If in a particular month the factory works 8,000 hours, it will be incorrect to estimate the allowance as ₹4,880 @ ₹0.61. The correct allowance will be ₹4,440 as shown in the table. If the actual expenses are ₹4,500 for this level of activity, the company has not saved any money but has over-spent by ₹60 (₹4,500 – ₹4,440).

**QUESTION 2. (ILLUSTRATION 2)**

A department of Company X attains sale of ₹ 6,00,000 at 80 per cent of its normal capacity and its expenses are given below:

Administration costs:	(₹)
Office salaries	90,000
General expenses	2 per cent of sales
Depreciation	7,500
Rates and taxes	8,750
Selling costs:	
Salaries	8 per cent of sales
Travelling expenses	2 per cent of sales
Sales office expenses	1 per cent of sales
General expenses	1 per cent of sales



Distribution costs:

Wages 15,000

Rent 1 per cent of sales

Other expenses 4 per cent of sales

PREPARE flexible administration, selling and distribution costs budget, operating at 90 per cent, 100 per cent and 110 per cent of normal capacity.

ANSWER :

Flexible Budget of Department of Company 'X'

	80% (₹)	90% (₹)	100%(₹)	110%(₹)
Sales	6,00,000	6,75,000	7,50,000	8,25,000
Administration Costs:				
Office Salaries (fixed)	90,000	90,000	90,000	90,000
General expenses (2% of Sales)	12,000	13,500	15,000	16,500
Depreciation (fixed)	7,500	7,500	7,500	7,500
Rent and rates (fixed)	8,750	8,750	8,750	8,750
(A) Total Adm. Costs	1,18,250	1,19,750	1,21,250	1,22,750
Selling Costs:				
Salaries (8% of sales)	48,000	54,000	60,000	66,000
Travelling expenses (2% of sales)	12,000	13,500	15,000	16,500
Sales office (1% of sales)	6,000	6,750	7,500	8,250
General expenses (1% of sales)	6,000	6,750	7,500	8,250
(B) Total Selling Costs	72,000	81,000	90,000	99,000
Distribution Costs:				
Wages (fixed)	15,000	15,000	15,000	15,000
Rent (1% of sales)	6,000	6,750	7,500	8,250
Other expenses (4% of sales)	24,000	27,000	30,000	33,000
(C) Total Distribution Costs	45,000	48,750	52,500	56,250
Total Costs (A + B + C)	2,35,250	2,49,500	2,63,750	2,78,000

Note: In the absence of information, it has been assumed that office salaries, depreciation, rates and taxes and wages remain the same at 110% level of activity also. However, in practice some of these costs may change if present capacity is exceeded.



QUESTION 3. (ILLUSTRATION 3)

Action Plan Manufacturers normally produce 8,000 units of their product in a month, in their Machine Shop. For the month of January, they had planned for a production of 10,000 units. Owing to a sudden cancellation of a contract in the middle of January, they could only produce 6,000 units in January.

Indirect manufacturing costs are carefully planned and monitored in the Machine Shop and the Foreman of the shop is paid a 10% of the savings as bonus when in any month the indirect manufacturing cost incurred is less than the budgeted provision.

The Foreman has put in a claim that he should be paid a bonus of ₹ 88.50 for the month of January. The Works Manager wonders how anyone can claim a bonus when the Company has lost a sizeable contract. The relevant figures are as under:



Indirect manufacturing	Expenses for a normal month (₹)	Planned for January (₹)	Actual in costs January (₹)
Salary of foreman	1,000	1,000	1,000
Indirect labour	720	900	600
Indirect material	800	1,000	700
Repairs and maintenance	600	650	600
Power	800	875	740
Tools consumed	320	400	300
Rates and taxes	150	150	150
Depreciation	800	800	800
Insurance	100	100	100
	5,290	5,875	4,990

Do you agree with the Works Manager? Is the Foreman entitled to any bonus for the performance in January? Substantiate your answer with facts and figures. EXPLAIN.

ANSWER :

Flexible Budget of "Action Plan Manufacturers" (for the month of January)

Indirect manufacturing cost	Nature of cost	Expenses for a normal month (₹)	Planned expenses (₹)	Expenses as per flexible budget (₹)	Actual expenses (₹)	Difference (₹) (6)=(5)-(4)
	(1)	(2)	(3)	(4)	(5)	
Salary of foreman	Fixed	1,000	1,000	1,000	1,000	Nil
Indirect labour (WN 1)	Variable	720	900	540	600	60
Indirect material (WN 2)	Variable	800	1,000	600	700	100
Repair and maintenance (WN 3)	Semi-variable	600	650	550	600	50
Power (WN 4)	Semi-variable	800	875	725	740	15
Tools consumed (WN 5)	Variable	320	400	240	300	60
Rates and taxes	Fixed	150	150	150	150	Nil
Depreciation	Fixed	800	800	800	800	Nil
Insurance	Fixed	100	100	100	100	Nil
		5,290	5,875	4,705	4,990	285

Conclusion: The above statement of flexible budget shows that the concern's expenses in the month of January have increased by ₹285 as compared to flexible budget. Under such circumstances, assuming the expenses are controllable and based on the financial perspective the Foreman of the company should not be entitled for any performance bonus for the month of January.



Working notes:

$$1. \text{ Indirect labour cost per unit } = \frac{\text{₹ } 720}{8,000} = \text{₹ } 0.09$$

$$\text{Indirect labour for 6,000 units} = 6,000 \times \text{₹ } 0.09 = \text{₹ } 540.$$

$$2. \text{ Indirect material cost per unit } = \frac{\text{₹ } 800}{8,000} = \text{₹ } 0.10$$

$$\text{Indirect material for 6,000 units} = 6,000 \times \text{₹ } 0.10 = \text{₹ } 600$$

3. According to high and low point method of segregating semi-variable cost into fixed and variable components, following formulae may be used.

$$\begin{aligned} \text{Variable cost of repair and maintenance per unit} &= \frac{\text{Change in expense level}}{\text{Change in output level}} \\ &= \frac{\text{₹ } 650 - \text{₹ } 600}{2,000} = \text{₹ } 0.025 \end{aligned}$$

For 8,000 units

$$\text{Total Variable cost of repair and maintenance} = \text{₹ } 200$$

$$\text{Fixed repair \& maintenance cost} = \text{₹ } 400$$

$$\begin{aligned} \text{Hence at 6,000 units output level, total cost of repair and maintenance should be} \\ = \text{₹ } 400 + \text{₹ } 0.025 \times 6,000 \text{ units} = \text{₹ } 400 + \text{₹ } 150 = \text{₹ } 550 \end{aligned}$$

$$4. \text{ Variable cost of power per unit} = \frac{\text{₹ } 875 - \text{₹ } 800}{2,000 \text{ units}} = 0.0375$$

For 8,000 units

$$\text{Total variable cost of power} = \text{₹ } 300$$

$$\text{Fixed cost} = \text{₹ } 500$$

$$\begin{aligned} \text{Hence, at 6,000 units output level, total cost of power should be} \\ = \text{₹ } 500 + \text{₹ } 0.0375 \times 6,000 \text{ units} = \text{₹ } 500 + \text{₹ } 225 = \text{₹ } 725 \end{aligned}$$

$$5. \text{ Tools consumed cost for 8,000 units} = \text{₹ } 320$$

$$\text{Hence, tools consumed cost for 6,000 units} = (\text{₹ } 320 / 8,000 \text{ units}) \times 6,000 \text{ units} = \text{₹ } 240$$



QUESTION 4. (ILLUSTRATION 4)

A single product company estimated its quarter-wise sales for the next year as under:

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 6,000 units and the company expects to maintain the closing stock of finished goods at 12,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter. The company maintains this 20% of sales of next quarter as closing stock of current quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg. and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg. of raw materials.



The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below:

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per kg. (₹)
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of raw materials in the beginning of the year is ₹ 20,000. You are required to PREPARE the following for the next year, quarter wise:

- Production budget (in units).
- Raw material consumption budget (in quantity).
- Raw material purchase budget (in quantity and value).
- Priced stores ledger card of the raw material using First in First out method.

ANSWER :

Working Note:

Calculation of total annual production

	(Units)
Sales in 4 quarters	1,53,750
Add: Closing balance	12,250
	1,66,000
Less: Opening balance	(6,000)
Total number of units to be produced in the next year	1,60,000

(i) Production Budget (in units)

Quarters	I Units	II Units	III Units	IV Units	Total Units
Sales	30,000	37,500	41,250	45,000	1,53,750
Production in current quarter (80% of the sale of current quarter)	24,000	30,000	33,000	36,000	
Production for next quarter (20% of the sale of next quarter)	7,500	8,250	9,000	12,250	
Total production	31,500	38,250	42,000	48,250	1,60,000

(ii) Raw material consumption budget in quantity

Quarters	I	II	III	IV	Total
Units to be produced in each quarter: (A)	31,500	38,250	42,000	48,250	1,60,000
Raw material consumption p.u. (kg.): (B)	2	2	2	2	
Total raw material consumption (Kg.) : (A × B)	63,000	76,500	84,000	96,500	3,20,000



(iii) Raw material purchase budget (in quantity)

	Qty. (kg.)
Raw material required for production	3,20,000
Add : Closing balance of raw material	5,000
	3,25,000
Less : Opening balance	(10,000)
Material to be purchased	3,15,000

Raw material purchase budget (in value)

Quarters	% of annual requirement	Qty. of material	Rate per kg. (₹)	Amount (₹)
(1)	(2)	(3)	(4)	(5)=(3×4)
I	30	94,500 (3,15,000 kg. × 30%)	2	1,89,000
II	50	1,57,500 (3,15,000 kg. × 50%)	3	4,72,500
III	20	63,000 (3,15,000 kg. × 20%)	4	2,52,000
Total		3,15,000		9,13,500



	Quarters											
	I			II			III			IV		
	Kg.	Rate (₹)	Value (₹)	Kg.	Rate (₹)	Value (₹)	Kg.	Rate (₹)	Value (₹)	Kg.	Rate (₹)	Value (₹)
Opening balance	10,000	2	20,000	41,500	2	83,000	1,22,500	3	3,67,500	38,500	3	1,15,500
(A)										63,000	4	2,52,000
Purchases: (B)	94,500	2	1,89,000	1,57,500	3	4,72,500	63,000	4	2,52,000	–	–	–
Consumption: (C)	63,000	2	1,26,000	41,500	2	83,000	84,000	3	2,52,000	38,500	3	1,15,500
				35,000	3	1,05,000				58,000	4	2,32,000
Balance: (D)	41,500	2	83,000	1,22,500	3	3,67,500	38,500	3	1,15,500	5,000	4	20,000
(D) = (A) + (B) – (C)							63,000	4	2,52,000			

**QUESTION 5. (ILLUSTRATION 5)**

A company is engaged in the manufacture of specialised sub-assemblies required for certain electronic equipment. The company envisages that in the forthcoming month, December, the sales will be in the ratio of 3 : 4 : 2 respectively of sub-assemblies, ACB, MCB and DP.

The following is the schedule of components required for manufacture:

Component requirements					
Sub-assembly	Selling Price	Base board	IC08	IC12	IC26
ACB	520	1	8	4	2
MCB	500	1	2	10	6
DP	350	1	2	4	8
Purchase price (₹)		60	20	12	8

The direct labour time and variable overheads required for each of the sub- assemblies are:

	Labour hours		Variable overheads (₹)
	Grade A	Grade B	
ACB	8	16	36
MCB	6	12	24
DP	4	8	24
Direct wage rate per hour (₹)	5	4	—

The labourers work 8 hours a day for 25 days a month.

The opening stocks of sub-assemblies and components for December are as under:

Sub-assemblies		Components	
ACB	800	Base Board	1,600
MCB	1,200	IC08	1,200
DP	2,800	IC12	6,000
		IC26	4,000

Fixed overheads amount to ₹ 7,57,200 for the month and a monthly profit target of ₹ 12 lacs has been set.

The company is eager for a reduction of closing inventories for the month of December of sub-assemblies and components by 10% of quantity as compared to the opening stock. PREPARE the following budgets for the month of December:

- Sales budget in quantity and value.
- Production budget in quantity
- Component usage budget in quantity.
- Component purchase budget in quantity and value.
- Manpower budget showing the number of workers and the amount of wages payable.

ANSWER :

Working Note:

- Statement showing contribution:

Sub- assemblies	ABC	MCB	DP	Total
	(₹)	(₹)	(₹)	(₹)
Selling price per unit (p.u.) : (A)	520	500	350	
Marginal Cost per unit.				
Components				



- Base board	60	60	60	
- IC08	160	40	40	
- IC12	48	120	48	
- IC26	16	48	64	
Labour				
- Grade A	40	30	20	
- Grade B	64	48	32	
Variable production overhead	36	24	24	
Total marginal cost per unit. : (B)	424	370	288	
Contribution per unit. : (C) = (A) – (B)	96	130	62	
Sales ratio : (D)	3	4	2	
Contribution × Sales ratio: [(E) = (C) × (D)]	288	520	124	932

2. Desired Contribution for the forthcoming month December

	(₹)
Fixed overheads	7,57,200
Desired profit	12,00,000
Desired contribution	19,57,200

3. Sales mix required i.e. number of batches for the forthcoming month December

Sales mix required = Desired contribution/contribution × Sales ratio

= ₹19,57,200/932 (Refer to Working notes 1 and 2)

= 2,100 batches

Budgets for the month of December

(a) Sales budget in quantity and value

Sub-assemblies	ACB	MCB	DP	Total
Sales (Qty.)	6,300	8,400	4,200	
	(2,100×3)	(2,100×4)	(2,100×2)	
Selling price p.u. (₹)	520	500	350	
Sales value (₹)	32,76,000	42,00,000	14,70,000	89,46,000

(b) Production budget in quantity

Sub-assemblies	ACB	MCB	DP
Sales	6,300	8,400	4,200
Add : Closing stock	720	1,080	2,520
(Opening stock less 10%)			
Total quantity required	7,020	9,480	6,720
Less : Opening stock	(800)	(1,200)	(2,800)
Production	6,220	8,280	3,920

(c) Component usage budget in quantity

Sub-assemblies	ACB	MCB	DP	Total
Production	6,220	8,280	3,920	—
Base board (1 each)	6,220	8,280	3,920	18,420



Component IC08 (8:2:2)	49,760 (6,220 × 8)	16,560 (8,280 × 2)	7,840 (3,920 × 2)	74,160
Component IC12 (4:10:4)	24,880 (6,220 × 4)	82,800 (8,280 × 10)	15,680 (3,920 × 4)	1,23,360
Component IC26 (2:6:8)	12,440 (6,220 × 2)	49,680 (8,280 × 6)	31,360 (3,920 × 8)	93,480

(d) Component Purchase budget in quantity and value

Sub-assemblies	Base board	IC08	IC12	IC26	Total
Usage in production	18,420	74,160	1,23,360	93,480	
Add: Closing stock (Opening stock less 10%)	1,440	1,080	5,400	3,600	
	19,860	75,240	1,28,760	97,080	
Less: Opening stock	(1,600)	(1,200)	(6,000)	(4,000)	
Purchase (Qty.)	18,260	74,040	1,22,760	93,080	
Purchase price (₹)	60	20	12	8	
Purchase value (₹)	10,95,600	14,80,800	14,73,120	7,44,640	47,94,160



QUESTION 6. (ILLUSTRATION 6)

Float glass Manufacturing Company requires you to PREPARE the Master budget for the next year from the following information:

Sales:

Toughened Glass	₹ 6,00,000
Bent Glass	₹ 2,00,000

Direct material cost 60% of sales

Direct wages 20 workers @ ₹ 150 per month

Factory overheads:

Indirect labour – Works manager	₹ 500 per month
Foreman	₹ 400 per month

Stores and spares 2.5% on sales

Depreciation on machinery ₹ 12,600

Light and power ₹ 3,000

Repairs and maintenance ₹ 8,000

Others sundries 10% on direct wages

Administration, selling and distribution expenses ₹ 36,000 per year

ANSWER :

Master Budget for the year ending _____

Sales:			(₹)
Toughened Glass			6,00,000
Bent Glass			2,00,000
Total Sales			8,00,000
Less: Cost of production:			
Direct materials (60% of ₹8,00,000)		4,80,000	



Direct wages (20 workers × ₹150 × 12months)		36,000	
Prime Cost		5,16,000	
Fixed Factory Overhead:			
Works manager's salary (500 × 12)	6,000		
Foreman's salary (400 × 12)	4,800		
Depreciation	12,600		
Light and power (assumed fixed)	3,000	26,400	
Variable Factory Overhead:			
Stores and spares	20,000		
Repairs and maintenance	8,000		
Sundry expenses	3,600	31,600	
Works Cost			5,74,000
Gross Profit (Sales – Works cost)			2,26,000
Less: Adm., selling and distribution expenses			36,000
Net Profit			1,90,000

**QUESTION 7. (ILLUSTRATION 7)**

Following data is available for DKG and Co:

Standard working hours	8 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	6,400 hours
Std. hours expected to be earned per four weeks	8,000 hours
Actual hours worked in the four- week period	6,000 hours
Standard hours earned in the four- week period	7,000 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event. CALCULATE the following ratios:

(1) Efficiency Ratio, (2) Activity Ratio, (3) Calendar Ratio, (4) Standard Capacity Usage Ratio, (5) Actual Capacity Usage Ratio. (6) Actual Usage of Budgeted Capacity Ratio.

ANSWER :

Maximum Capacity in a budget period

= 50 Employees × 8 Hrs. × 5 Days × 4 Weeks = 8,000 Hrs.

Budgeted Hours

40 Employees × 8 Hrs. × 5 Days × 4 Weeks = 6,400 Hrs.

Actual Hrs. = 6,000 Hrs. (given)

Standard Hrs. for Actual Output = 7,000 Hrs.

Budget No. of Days = 20 Days = 20 Days (4 Weeks × 5 Days)

Actual No. of Days = 20 – 1 = 19 Days

1. Efficiency Ratio = $\frac{\text{Standard Hrs}}{\text{Actual Hrs}} \times 100 = \frac{7,000 \text{ hours}}{6,000 \text{ hours}} \times 100 = 116.67\%$

2. Activity Ratio = $\frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100 = \frac{7,000 \text{ hours}}{6,400 \text{ hours}} \times 100 = 109.375\%$



3. Calendar Ratio = $\frac{\text{Available working days}}{\text{Budgeted working days}} \times 100 = \frac{19\text{days}}{20\text{days}} \times 100 = 95\%$
4. Standard Capacity Usage Ratio = $\frac{\text{Budgeted Hours}}{\text{Max. possible hours in the budgeted period}} \times 100 = \frac{6,400 \text{ hours}}{8,000 \text{ hours}} \times 100 = 80\%$
5. Actual Capacity Usage Ratio = $\frac{\text{Actual Hours worked}}{\text{Max. possible working hours in a period}} \times 100$
 $= \frac{6,000 \text{ hours}}{8,000 \text{ hours}} \times 100 = 75\%$
6. Actual Usage of Budgeted Capacity Ratio = $\frac{\text{Actual working Hours}}{\text{Budgeted Hours}} \times 100$
 $= \frac{6,000 \text{ hours}}{6,400 \text{ hours}} \times 100 = 93.75\%$

**QUESTION 8. (PP1)**

B Ltd manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2022-23:

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	800 units at ₹18	1,200 units at ₹18	1,000 units at ₹18	1,400 units at ₹18
Y	600 units at ₹42	1,000 units at ₹42	400 units at ₹42	800 units at ₹42

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by ₹ 2, it will, find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹ 2 it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

Percentage increase in sales over budgeted sales

Product	East Division	West Division
X	+ 12.5%	+ 7.5%
Y	+ 22.5%	+ 12.5%

With the help of intensive advertisement campaign, following additional sales (over and above the above-mentioned estimated sales by Divisional Managers) are possible:

Product	East Division	West Division
X	120 units	140 units
Y	80 units	100 units

You are required to PREPARE Sales Budget for 2022-23 after incorporating above estimates and also SHOW the Budgeted Sales and Actual Sales of 2021-22.

**ANSWER :**

Statement Showing Sales Budget for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	1,020 ¹	20	20,400	815 ³	40	32,600	53,000
West	1,430 ²	20	28,600	1,225 ⁴	40	49,000	77,600
Total	1,200		49,000	1,000		81,600	1,30,600

Workings

- $800 \times 112.5\% + 120 = 1,020$ units
- $1,200 \times 107.5\% + 140 = 1,430$ units
- $600 \times 122.5\% + 80 = 815$ units
- $1,000 \times 112.5\% + 100 = 1,225$ units

Statement Showing Sales Budget for 2021-22

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	800	18	14,400	600	42	25,200	39,600
West	1,200	18	21,600	1,000	42	42,000	63,600
Total	2,000		36,000	1,600		67,200	1,03,200

Statement Showing Actual Sales for 2021-22

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	1,000	18	18,000	400	42	16,800	34,800
West	1,400	18	25,200	800	42	33,600	58,800
Total	2,400		43,200	1,200		50,400	93,600

**QUESTION 9. (PP2)**

During the FY 2021-22, P Limited has produced 60,000 units operating at 50% capacity level. The cost structure at the 50% level of activity is as under:

	(₹)
Direct Material	300 per unit
Direct Wages	100 per unit
Variable Overheads	100 per unit
Direct Expenses	60 per unit
Factory Expenses (25% fixed)	80 per unit
Selling and Distribution Exp. (80% variable)	40 per unit
Office and Administrative Exp. (100% fixed)	20 per unit

The company anticipates that in FY 2022-23, the variable costs will go up by 20% and fixed costs will go up by 15%.

The selling price per unit will increase by 10% to ₹ 880



Required:

- (i) CALCULATE the budgeted profit/ loss for the FY 2021-22.
- (ii) PREPARE an Expense budget on marginal cost basis for the FY 2022-23 for the company at 50% and 60% level of activity and FIND OUT the profits at respective levels.

ANSWER :

- (i) Calculation of Budgeted profit for the FY 2021-22

	60,000 units	
	Per unit (₹)	Amount (₹)
Sales (A)	800.00	4,80,00,000
Variable Costs:		
- Direct Material	300.00	1,80,00,000
- Direct Wages	100.00	60,00,000
- Variable Overheads	100.00	60,00,000
- Direct Expenses	60.00	36,00,000
- Variable factory expenses (75% of ₹80 p.u.)	60.00	36,00,000
- Variable Selling & Dist. exp. (80% of ₹40 p.u.)	32.00	19,20,000
Total Variable Cost (B)	652.00	3,91,20,000
Contribution (C) = (A - B)	148.00	88,80,000
Fixed Costs:		
- Office and Admin. exp. (100%)	--	12,00,000
- Fixed factory exp. (25%)	--	12,00,000
- Fixed Selling & Dist. exp. (20%)	--	4,80,000
Total Fixed Costs (D)	--	28,80,000
Profit (C - D)	--	60,00,000

- (ii) Expense Budget of P Ltd. for the FY 2022-23 at 50% & 60% level

	60,000 units		72,000 units	
	Per unit (₹)	Amount (₹)	Per unit (₹)	Amount (₹)
Sales (A)	880.00	5,28,00,000	880.00	6,33,60,000
Variable Costs:				
- Direct Material	360.00	2,16,00,000	360.00	2,59,20,000
- Direct Wages	120.00	72,00,000	120.00	86,40,000
- Variable Overheads	120.00	72,00,000	120.00	86,40,000
- Direct Expenses	72.00	43,20,000	72.00	51,84,000
- Variable factory expenses	72.00	43,20,000	72.00	51,84,000
- Variable Selling & Dist. exp.	38.40	23,04,000	38.40	27,64,800
Total Variable Cost (B)	782.40	4,69,44,000	782.40	5,63,32,800
Contribution (C) = (A - B)	97.60	58,56,000	97.60	70,27,200
Fixed Costs:				



- Office and Admin. exp. (100%)	--	13,80,000	--	13,80,000
- Fixed factory exp. (25%)	--	13,80,000	--	13,80,000
- Fixed Selling & Dist. exp. (20%)	--	5,52,000	--	5,52,000
Total Fixed Costs (D)	--	33,12,000	--	33,12,000
Profit (C – D)	--	25,44,000	--	37,15,200

**QUESTION 10. (PP3)**

K Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2022-23.

The following information are made available for this purpose:

- It expects to sell 1,50,000 bags of 'X' during the second quarter of 2022-23 at the selling price of ₹ 1,200 per bag.
- Each bag of 'X' requires 2.5 mtr. of raw – material 'Y' and 7.5 mtr. of raw – material 'Z'.
- Stock levels are planned as follows:

Particulars	Beginning of Quarter	End of Quarter
Finished Bags of 'X' (Nos.)	45,000	33,000
Raw – Material 'Y' (mtr)	96,000	78,000
Raw – Material 'Z' (mtr)	1,71,000	1,41,000
Empty Bag (Nos.)	1,11,000	84,000

- 'Y' cost ₹160 per mtr., 'Z' costs ₹30 per mtr. and 'Empty Bag' costs ₹110 each.
- It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is ₹ 70 per hour.
- Variable manufacturing costs are ₹ 60 per bag. Fixed manufacturing costs ₹ 40,00,000 per quarter.
- Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are ₹ 3,75,000 per quarter.

Required

- PREPARE a production budget for the said quarter in quantity.
- PREPARE a raw – material purchase budget for 'Y', 'Z' and 'Empty Bags' for the said quarter in quantity as well as in rupees.
- COMPUTE the budgeted variable cost to produce one bag of 'X'.

ANSWER :

- Production Budget of 'X' for the Second Quarter

Particulars	Bags (Nos.)
Budgeted Sales	1,50,000
Add: Desired Closing stock	33,000
Total Requirements	1,83,000
Less: Opening stock	(45,000)
Required Production	1,38,000



(ii) Raw-Materials Purchase Budget in Quantity as well as in ₹ for 1,38,000 Bags of 'X'

Particulars	'Y' Mtr.	'Z' Mtr.	Empty Bags Nos.
Production Requirements Per bag of 'X'	2.5	7.5	1.0
Requirement for Production	3,45,000	10,35,000	1,38,000
	(1,38,000 × 2.5)	(1,38,000 × 7.5)	(1,38,000 × 1)
Add: Desired Closing Stock	78,000	1,41,000	84,000
Total Requirements	4,23,000	11,76,000	2,22,000
Less: Opening Stock	(96,000)	(1,71,000)	(1,11,000)
Quantity to be purchased	3,27,000	10,05,000	1,11,000
Cost per mtr./Bag	₹160	₹30	₹110
Cost of Purchase (₹)	5,23,20,000	3,01,50,000	1,22,10,000

(iii) Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'

Particulars	(₹)
Raw – Material	
Y 2.5 mtr @160	400.00
Z 7.5 mtr @30	225.00
Empty Bag	110.00
Direct Labour (₹70× 9 minutes / 60 minutes)	10.50
Variable Manufacturing Overheads	60.00
Variable Cost of Production per bag	805.50

**QUESTION 11. (PP4)**

ABC Ltd. is currently operating at 75% of its capacity. In the past two years, the levels of operations were 55% and 65% respectively. Presently, the production is 75,000 units. The company is planning for 85% capacity level during 2022- 23. The cost details are as follows:

Particulars	55% (₹)	65% (₹)	75% (₹)
Direct Materials	11,00,000	13,00,000	15,00,000
Direct Labour	5,50,000	6,50,000	7,50,000
Factory Overheads	3,10,000	3,30,000	3,50,000
Selling Overheads	3,20,000	3,60,000	4,00,000
Administrative Overheads	1,60,000	1,60,000	1,60,000
	24,40,000	28,00,000	31,60,000

Profit is estimated @ 20% on sales.



The following increases in costs are expected during the year:

In percentage

Direct Materials	8
Direct Labour	5
Variable Factory Overheads	5
Variable Selling Overheads	8
Fixed Factory Overheads	10
Fixed Selling Overheads	15
Administrative Overheads	10

PREPARE flexible budget for the period 2022-23 at 85% level of capacity. Also ascertain profit and contribution.

ANSWER :

ABC Ltd.

Budget for 85% capacity level for the period 2022-23

Budgeted production (units)	85,000	
	Per Unit (₹)	Amount (₹)
Direct Material (note 1)	21.60	18,36,000
Direct Labour (note 2)	10.50	8,92,500
Variable factory overhead (note 3)	2.10	1,78,500
Variable selling overhead (note 4)	4.32	3,67,200
Variable cost	38.52	32,74,200
Fixed factory overhead (note 3)		2,20,000
Fixed selling overhead (note 4)		1,15,000
Administrative overhead		1,76,000
Fixed cost		5,11,000
Total cost		37,85,200
Add: Profit 20% on sales or 25% on total cost		9,46,300
Sales		47,31,500
Contribution (Sales – Variable cost)		14,57,300

Working Notes:

1. Direct Materials:

	(₹)		(₹)
75% Capacity	15,00,000	65% Capacity	13,00,000
65% Capacity	13,00,000	55% Capacity	11,00,000
10% change in capacity	2,00,000	10% change in capacity	2,00,000

For 10% increase in capacity, i.e., for increase by 10,000 units, the total direct material cost regularly changes by ₹ 2,00,000

Direct material cost (variable) = ₹ 2,00,000 ÷ 10,000 = ₹ 20

After 8% increase in price, direct material cost per unit = ₹ 20 × 1.08 = ₹ 21.60

Direct material cost for 85,000 budgeted units = 85,000 × ₹ 21.60 = ₹ 18,36,000



2. Direct Labour:

	(₹)		(₹)
75% Capacity	7,50,000	65% Capacity	6,50,000
65% Capacity	6,50,000	55% Capacity	5,50,000
10% change in capacity	1,00,000	10% change in capacity	1,00,000

For 10% increase in capacity, direct labour cost regularly changes by ₹ 1,00,000.

Direct labour cost per unit = ₹ 1,00,000 ÷ 10,000 = ₹ 10

After 5% increase in price, direct labour cost per unit = ₹ 10 × 1.05 = ₹ 10.50

Direct labour for 85,000 units = 85,000 units × ₹ 10.50 = ₹ 8,92,500.

3. Factory overheads are semi-variable overheads:

	(₹)		(₹)
75% Capacity	3,50,000	65% Capacity	3,30,000
65% Capacity	3,30,000	55% Capacity	3,10,000
10% change in capacity	20,000	10% change in capacity	20,000

Variable factory overhead = ₹ 20,000 ÷ 10,000 = ₹ 2

Variable factory overhead for 75,000 units = 75,000 × ₹ 2 = ₹ 1,50,000

Fixed factory overhead = ₹ 3,50,000 – ₹ 1,50,000 = ₹ 2,00,000.

Variable factory overhead after 5% increase = ₹ 2 × 1.05 = ₹ 2.10

Fixed factory overhead after 10% increase = ₹ 2,00,000 × 1.10 = ₹ 2,20,000.

4. Selling overhead is semi-variable overhead:

	(₹)		(₹)
75% Capacity	4,00,000	65% Capacity	3,60,000
65% Capacity	3,60,000	55% Capacity	3,20,000
10% change in capacity	40,000	10% change in capacity	40,000

Variable selling overhead = ₹ 40,000 ÷ 10,000 units = ₹ 4

Variable selling overhead for 75,000 units = 75,000 × ₹ 4 = ₹ 3,00,000.

Fixed selling overhead = ₹ 4,00,000 – ₹ 3,00,000 = ₹ 1,00,000

Variable selling overhead after 8% increase = ₹ 4 × 1.08 = ₹ 4.32

Fixed selling overhead after 15% increase = ₹ 1,00,000 × 1.15
= ₹ 1,15,000

5. Administrative overhead is fixed:

After 10% increase = ₹ 1,60,000 × 1.10 = ₹ 1,76,000

**QUESTION 12. (PP5)**

The accountant of manufacturing company provides you the following details for year 2021-22:

	(₹)		(₹)
Direct materials	1,75,000	Other variable costs	80,000
Direct Wages	1,00,000	Other fixed costs	80,000
Fixed factory overheads	1,00,000	Profit	1,15,000
Variable factory overheads	1,00,000	Sales	7,50,000



During the year, the company manufactured two products A and B and the output and costs were:

	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹ 2.00	₹ 3.50
Direct materials per unit	₹ 0.50	₹ 0.75
Direct wages per unit	₹ 0.25	₹ 0.50

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹ 0.25 per unit; and B ₹ 0.30 per unit.

During 2022-23, it is expected that the demand for product A will fall by 25 % and for B by 50%. It is decided to manufacture a further product C, the cost for which is estimated as follows:

	Product C
Output (units)	2,00,000
Selling price per unit	₹ 1.75
Direct materials per unit	₹ 0.40
Direct wages per unit	₹ 0.25

It is anticipated that the other variable costs per unit will be the same as for product A.

PREPARE a budget to present to the management, showing the current position and the position for 2022-23. Comment on the comparative results.

ANSWER :

Budget Showing Current Position and Position for 2022-23

	Position for 2021-22			Position for 2022-23			
	A	B	Total (A+B)	A	B	C	Total (A+B+C)
Sales (units)	2,00,000	1,00,000	–	1,50,000	50,000	2,00,000	–
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
(A) Sales	4,00,000	3,50,000	7,50,000	3,00,000	1,75,000	3,50,000	8,25,000
Direct Material	1,00,000	75,000	1,75,000	75,000	37,500	80,000	1,92,500
Direct wages	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Factory overhead (variable)	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Other variable costs	50,000	30,000	80,000	37,500	15,000	50,000	1,02,500
(B) Marginal Cost	2,50,000	2,05,000	4,55,000	1,87,500	1,02,500	2,30,000	5,20,000
(C) Contribution (A-B)	1,50,000	1,45,000	2,95,000	1,12,500	72,500	1,20,000	3,05,000
Fixed costs –							
Factory			1,00,000				1,00,000
– Others			80,000				80,000
(D) Total fixed cost			1,80,000				1,80,000
Profit (C – D)			1,15,000				1,25,000



Comments: Introduction of Product C is likely to increase profit by ₹ 10,000 (i.e. from ₹ 1,15,000 to ₹ 1,25,000) in 2022-23 as compared to 2021-22. Therefore, introduction of product C is recommended.

**QUESTION 13. (PP6)**

TQM Ltd. has furnished the following information for the month ending 30th June:

	Master Budget	Actual	Variance
Units produced and sold	80,000	72,000	
Sales (₹)	3,20,000	2,80,000	40,000 (A)
Direct material (₹)	80,000	73,600	6,400 (F)
Direct wages (₹)	1,20,000	1,04,800	15,200 (F)
Variable overheads (₹)	40,000	37,600	2,400 (F)
Fixed overhead (₹)	40,000	39,200	800 (F)
Total Cost	2,80,000	2,55,200	

The Standard costs of the products are as follows:

	Per unit (₹)
Direct materials (1 kg. at the rate of ₹1 per kg.)	1.00
Direct wages (1 hour at the rate of ₹ 1.50)	1.50
Variable overheads (1 hour at the rate of ₹ 0.50)	0.50

Actual results for the month showed that 78,400 kg. of material were used and 70,400 labour hours were recorded.

Required:

- PREPARE Flexible budget for the month and compare with actual results.
- CALCULATE Material, Labour, Sales Price, Variable Overhead and Fixed Overhead Expenditure variances and Sales Volume (Profit) variance.

ANSWER :

- Statement showing Flexible Budget and its comparison with actual

		Master Budget 80,000 units	Flexible Budget (at standard cost)		Actual for 72,000 units	Variance
			Per unit	72,000 units		
A.	Sales	3,20,000	4.00	2,88,000	2,80,000	8,000 (A)
B.	Direct material	80,000	1.00	72,000	73,600	1,600 (A)
C.	Direct wages	1,20,000	1.50	1,08,000	1,04,800	3,200 (F)
D.	Variable overhead	40,000	0.50	36,000	37,600	1,600 (A)
E.	Total variable cost	2,40,000	3.00	2,16,000	2,16,000	-
F.	Contribution	80,000	1.00	72,000	64,000	
G.	Fixed overhead	40,000	0.50	40,000	39,200	800 (F)
H.	Net profit	40,000	0.50	32,000	24,800	7,200 (A)



(ii) Variances:

Sales Price Variance	= Actual Quantity (Standard Rate – Actual Rate)
	= 72,000 units (₹ 4.00 – ₹ 3.89)
	= ₹ 8,000 (A)
Direct Material Cost Variance	= Standard Cost for Actual output–Actual cost
	= ₹ 72,000 – ₹ 73,600 = ₹ 1,600 (A)
Direct Material Price Variance	= Actual Quantity (Standard rate – Actual Rate)
	= 78,400 units $\left(₹1.00 - \frac{₹ 73,600}{78,400 \text{ units}} \right)$
	= ₹ 4,800 (F)
Direct Material Usage Variance	= Standard Rate (Std. Qty. – Actual Quantity)
	= ₹ 1 (72,000 units – 78,400 units)
	= ₹ 6,400 (A)
Direct Labour Cost Variance	= Standard Cost for actual output – Actual cost
	= ₹ 1,08,000 – ₹1,04,800 = ₹3,200 (F)
Direct Labour Rate Variance	= Actual Hour (Std Rate – Actual Rate)
	= 70,400 hours $\left(₹1.5 - \frac{₹ 1,04,800}{70,400 \text{ units}} \right)$
	= ₹ 800 (F)
Direct Labour Efficiency	= Standard Rate (Standard Hour – Actual Hour)
	= ₹ 1.5 (72,000 – 70,400) = ₹ 2,400 (F)
Variable Overhead	= Recovered variable overhead –
	Actual variable overhead
	= (72,000 units x ₹ 0.50) – ₹ 37,600
	= ₹ 1,600(A)
Fixed Overhead Expenditure	= Budgeted fixed overhead –
	Actual fixed overhead
	= ₹ 40,000 – ₹ 39,200 = ₹ 800 (F)
Sales Volume (Profit) Variance	= Std. Profit (Budgeted Quantity – Actual Quantity)
	= ₹ 0.50 (80,000 – 72,000) = ₹4,000(A)

**QUESTION 14. (PP7)**

Jigyasa Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 2022-23. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

	Minimax (MM)	Heavyhigh (HH)
Budgeted Production units	1,80,000	1,20,000
	(₹)	(₹)
Direct material cost per unit	220	280
Direct labour cost per unit	130	120
Manufacturing overhead	4,00,000	5,00,000



The estimated units to be sold in the first four months of the year 2022-23 are as under

	April	May	June	July
Minimax	8,000	10,000	12,000	16,000
Heavyhigh	6,000	8,000	9,000	14,000

PREPARE production budget for the first quarter in month-wise.

ANSWER :

Production Budget of Product Minimax and Heavyhigh (in units)

	April		May		June		Total	
	MM	HH	MM	HH	MM	HH	MM	HH
Sales	8,000	6,000	10,000	8,000	12,000	9,000	30,000	23,000
Add: Closing Stock (25% of next month's sale)	2,500	2,000	3,000	2,250	4,000	3,500	9,500	7,750
Less: Opening Stock	2,000*	1,500*	2,500	2,000	3,000	2,250	7,500	5,750
Production units	8,500	6,500	10,500	8,250	13,000	10,250	32,000	25,000

* Opening stock of April is the closing stock of March, which is as per company's policy 25% of next month's sale.

Production Cost Budget

Element of cost	Rate (₹)		Amount (₹)	
	MM (32,000 units)	HH (25,000 units)	MM	HH
Direct Material	220	280	70,40,000	70,00,000
Direct Labour	130	120	41,60,000	30,00,000
Manufacturing Overhead (4,00,000 ÷ 1,80,000 × 32,000) (5,00,000 ÷ 1,20,000 × 25,000)			71,111	1,04,167
			1,12,71,111	1,01,04,167



QUESTION 15. (PP8)

Concorde Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

	Product- A	Product- B
Budgeted sales (in units)	2,400	3,600
Budgeted material consumption per unit (in kg):		
Material-X	5	3
Material-Y	4	6
Standard labour hours allowed per unit of product	3	5

Material-X and Material-Y cost ₹ 4 and ₹ 6 per kg and labours are paid ₹ 25 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 180 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%. In addition the non-productive down-



time is budgeted at 20% of the productive hours worked.

There are four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A 400 units

Product-B 200 units

Material-X 1,000 kg.

Material-Y 500 kg.

The anticipated closing stocks for budget period are as below:

Product-A 4 days sales

Product-B 5 days sales

Material-X 10 days consumption

Material-Y 6 days consumption

Required:

CALCULATE the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month.

ANSWER :

Number of days in budget period = 4 weeks × 5 days = 20 days

Number of units to be produced

	Product-A (units)	Product-B (units)
Budgeted Sales	2,400	3,600
Add: Closing stock		
$\left(\frac{2,400 \text{ units}}{20 \text{ days}} \times 4 \text{ days} \right)$ $\left(\frac{3,600 \text{ units}}{20 \text{ days}} \times 5 \text{ days} \right)$	480	900
Less: Opening stock	400	200
	2,480	4,300

(i) Material Purchase Budget

	Material-X (Kg.)	Material-Y (Kg.)
Material required:		
Product-A	12,400	9,920
	(2,480 units × 5 kg.)	(2,480 units × 4 kg.)
Product-B	12,900	25,800
	(4,300 units × 3 kg.)	(4,300 units × 6 kg.)
	25,300	35,720
Add: Closing stock		
$\left(\frac{25,300 \text{ kgs.}}{20 \text{ days}} \times 10 \text{ days} \right)$	12,650	10,716
$\left(\frac{35,720 \text{ kgs.}}{20 \text{ days}} \times 6 \text{ days} \right)$		
Less: Opening stock	1,000	500
Quantity to be purchased	36,950	45,936
Rate per kg. of Material	₹ 4	₹ 6
Total Cost	₹ 1,47,800	₹ 2,75,616



(ii) Wages Budget

	Product-A (Hours)	Product-B (Hours)
Units to be produced	2,480 units	4,300 units
Standard hours allowed per unit	3	5
Total Standard Hours allowed	7,440	21,500
Productive hours required for production	$\frac{7,440 \text{ hours}}{80\%} = 9,300$	$\frac{21,500 \text{ hours}}{80\%} = 26,875$
Add: Non-Productive down time	1,860 hours. (20% of 9,300 hours)	5,375 hours. (20% of 26,875 hours)
Hours to be paid	11,160	32,250

Total Hours to be paid = 43,410 hours (11,160 + 32,250)

Hours to be paid at normal rate = 4 weeks × 40 hours × 180 workers
= 28,800 hours

Hours to be paid at premium rate = 43,410 hours – 28,800 hours = 14,610 hours

Total wages to be paid = 28,800 hours × ₹ 25 + 14,610 hours × ₹ 37.5
= ₹ 7,20,000 + ₹ 5,47,875
= ₹ 12,67,875



REVISION TEST PAPER



RTP MAY 18

G Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 36 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following information has been extracted from departmental estimates for the year ended 31st March 2018 (the budget period):

	Product M	Product N
Sales (units)	28,000	13,000
Finished goods stock increase by year-end	320	160
Post-production rejection rate (%)	4	6
Material Z usage (per completed unit, net of wastage)	5 kg	6 kg
Material Z wastage (%)	10	5

Additional information:

- Usage of raw material Z is expected to be at a constant rate over the period.
- Annual cost of holding one unit of raw material in stock is 11% of the material cost.
- The cost of placing an orders is ₹ 320 per order.
- The management of G Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

Required:

- PREPARE functional budgets for the year ended 31st March 2018 under the following headings:
 - Production budget for Products M and N (in units).
 - Purchases budget for Material Z (in kgs and value).
- CALCULATE the Economic Order Quantity for Material Z (in kgs).
- If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration, CALCULATE the maximum number of units of Product M and N that could be produced.

ANSWER

(i)

- Production Budget (in units) for the year ended 31st March 2016

	Product M	Product N
Budgeted sales (units)	28,000	13,000
Add: Increase in closing stock	320	160
No. good units to be produced	28,320	13,160
Post production rejection rate	4%	6%



No. of units to be produced	29,500	14,000
	$\left(\frac{28,320}{0.96} \right)$	$\left(\frac{13,160}{0.94} \right)$

(b) Purchase budget (in kgs and value) for Material Z

	Product M	Product N
No. of units to be produced	29,500	14,000
Usage of Material Z per unit of production	5 kg.	6 kg.
Material needed for production	1,47,500 kg.	84,000 kg.
Materials to be purchased	1,63,889 kg.	88,421 kg.
	$\left(\frac{1,47,500}{0.90} \right)$	$\left(\frac{84,000}{0.95} \right)$
Total quantity to be purchased	2,52,310 kg.	
Rate per kg. of Material Z	₹36	
Total purchase price	₹90,83,160	

(ii) Calculation of Economic Order Quantity for Material Z

$$EOQ = \sqrt{\frac{2 \times 2,52,310 \text{ kg.} \times ₹320}{₹36 \times 11\%}} = \sqrt{\frac{16,14,78,400}{₹3.96}} = 6,385.72 \text{ kg.}$$

(iii) Since, the maximum number of order per year can not be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of Material Z that can be available for production:

$$= 4,000 \text{ kg.} \times 40 \text{ orders} = 1,60,000 \text{ kg.}$$

	Product M	Product N
Material needed for production to maintain the same production mix	1,03,929 kg.	56,071 kg.
	$\left(1,60,000 \times \frac{1,63,889}{2,52,310} \right)$	$\left(1,60,000 \times \frac{88,421}{2,52,310} \right)$
Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for production	93,536 kg.	53,267 kg.
Units to be produced	18,707 units	8,878 units
	$\left(\frac{93,536 \text{ kg.}}{5 \text{ kg.}} \right)$	$\left(\frac{53,267 \text{ kg.}}{6 \text{ kg.}} \right)$



RTP NOV 18

Gaurav Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 20X8-X9. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

	Minimax (MM)	Heavyhigh (HH)
Budgeted Production units	1,80,000	1,20,000
	(₹)	(₹)
Direct material cost per unit	220	280
Direct labour cost per unit	130	120
Manufacturing overhead	4,00,000	5,00,000



The estimated units to be sold in the first four months of the year 20X8-X9 are as under

	April	May	June	July
Minimax	8,000	10,000	12,000	16,000
Heavyhigh	6,000	8,000	9,000	14,000

PREPARE production budget for the first quarter in month-wise

ANSWER

Production budget of Product Minimax and Heavyhigh (in units)

	April		May		June		Total	
	MM	HH	MM	HH	MM	HH	MM	HH
Sales	8,000	6,000	10,000	8,000	12,000	9,000	30,000	23,000
Add: Closing Stock (25% of next month's sale)	2,500	2,000	3,000	2,250	4,000	3,500	9,500	7,750
Less: Opening Stock	2,000*	1,500*	2,500	2,000	3,000	2,250	7,500	5,750
Production units	8,500	6,500	10,500	8,250	13,000	10,250	32,000	25,000

*Opening stock of April is the closing stock of March, which is as per company's policy 25% of next months sale.

Production Cost Budget

Element of cost	Rate (₹)		Amount (₹)	
	MM (32,000 units)	HH (25,000 units)	MM	HH
Direct Material	220	280	70,40,000	70,00,000
Direct Labour	130	120	41,60,000	30,00,000
Manufacturing Overhead (4,00,000/ 1,80,000 × 32,000)			71,111	
(5,00,000/ 1,20,000 × 25,000)				1,04,167
			1,12,71,111	1,01,04,167



RTP MAY 19

S Ltd. has prepared budget for the coming year for its two products A and B.

	Product A (₹)	Product B (₹)
Production & Sales unit	6,000 units	9,000 units
Raw material cost per unit	60.00	42.00
Direct labour cost per unit	30.00	18.00
Variable overhead per unit	12.00	6.00
Fixed overhead per unit	8.00	4.00
Selling price per unit	120.00	78.00

After some marketing efforts, the sales quantity of the Product A & B can be increased by 1,500 units and 500 units respectively but for this purpose the variable overhead and fixed overhead will be increased by 10% and 5% respectively for the both products.



You are required to PREPARE flexible budget for both the products:

- Before marketing efforts
- After marketing efforts.

ANSWER

(a) Flexible Budget before marketing efforts:

	Product A (₹) 6,000 units		Product B (₹) 9,000 units	
	Per unit	Total	Per unit	Total
Sales	120.00	7,20,000	78.00	7,02,000
Raw material cost	60.00	3,60,000	42.00	3,78,000
Direct labour cost per unit	30.00	1,80,000	18.00	1,62,000
Variable overhead per unit	12.00	72,000	6.00	54,000
Fixed overhead per unit	8.00	48,000	4.00	36,000
Total cost	110.00	6,60,000	70.00	6,30,000
Profit	10.00	60,000	8.00	72,000

(b) Flexible Budget after marketing efforts:

	Product A (₹) 7,500 units		Product B (₹) 9,500 units	
	Per unit	Total	Per unit	Total
Sales	120.00	9,00,000	78.00	7,41,000
Raw material cost	60.00	4,50,000	42.00	3,99,000
Direct labour cost per unit	30.00	2,25,000	18.00	1,71,000
Variable overhead per unit	13.20	99,000	6.60	62,700
Fixed overhead per unit	6.72	50,400	3.98	37,800
Total cost	109.92	8,24,400	70.58	6,70,500
Profit	10.08	75,600	7.42	70,500



RTP NOV 19

KLM Limited has prepared its expense budget for 50,000 units in its factory for the year 2019-20 as detailed below:

	(₹ per unit)
Direct Materials	125
Direct Labour	50
Variable Overhead	40
Direct Expenses	15
Selling Expenses (20% fixed)	25
Factory Expenses (100% fixed)	15
Administration expenses (100% fixed)	8
Distribution expenses (85% variable)	20
Total	298

PREPARE an expense budget for the production of 35,000 units and 70,000 units.

**ANSWER**

Expense Budget of KLM Ltd.

Particulars	50,000 Units (₹)	35,000 Units (₹)	70,000 Units (₹)
Direct Material	62,50,000 (50,000 × 125)	43,75,000 (35,000 × 125)	87,50,000 (70,000 × 125)
Direct Labour	25,00,000 (50,000 × 50)	17,50,000 (35,000 × 50)	35,00,000 (70,000 × 50)
Variable Overhead	20,00,000 (50,000 × 40)	14,00,000 (35,000 × 40)	28,00,000 (70,000 × 40)
Direct Expenses	7,50,000 (50,000 × 15)	5,25,000 (35,000 × 15)	10,50,000 (70,000 × 15)
Selling Expenses (Variable)*	10,00,000 (50,000 × 20)	7,00,000 (35,000 × 20)	14,00,000 (70,000 × 20)
Selling Expenses (Fixed)* (5 × 50,000)	2,50,000	2,50,000	2,50,000
Factory Expenses (Fixed) (15 × 50,000)	7,50,000	7,50,000	7,50,000
Administration Expenses (Fixed) (8 × 50,000)	4,00,000	4,00,000	4,00,000
Distribution Expenses (Variable)** (17 × 50,000)	8,50,000	5,95,000 (17 × 35,000)	11,90,000 (17 × 70,000)
Distribution Expenses (Fixed)** (3 × 50,000)	1,50,000	1,50,000	1,50,000
	1,49,00,000	1,08,95,000	2,02,40,000

*Selling Expenses: Fixed cost per unit = ₹25 × 20% = ₹5

Fixed Cost = ₹5 × 50,000 units = ₹2,50,000

Variable Cost Per unit = ₹25 – ₹5 = ₹20

**Distribution Expenses: Fixed cost per unit = ₹20 × 15% = ₹3

Fixed Cost = ₹3 × 50,000 units = ₹1,50,000

Variable cost per unit = ₹20 – ₹3 = ₹17

**RTP MAY 20**

A Vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

Month	No. of vehicles
October	40,000
November	35,000
December	45,000
January	60,000
February	65,000

To manufacture a vehicle a standard cost of ₹11,42,800 is incurred and sold through dealers at a uniform selling price of ₹17,14,200 to customers. Dealers are paid 15% commission on selling price on sale of a vehicle.

Apart from other materials, four units of Part - X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part-X at the end of each month to cover 40% of next



month's production. 48,000 units of Part-X are in stock as on 1st October.

There are 9,500 nos. of completed vehicles in stock as on 1st October and it is policy to have stocks at the end of each month to cover 20% of the next month's sales.

You are required to -

- PREPARE Production budget (in nos.) for the month of October, November, December and January.
- PREPARE a Purchase budget for Part-X (in units) for the months of October, November and December.
- CALCULATE the budgeted gross profit for the quarter October to December.

ANSWER

- Preparation of Production Budget (in units)

	October	November	December	January
Demand for the month (Nos.)	40,000	35,000	45,000	60,000
Add: 20% of next month's demand	7,000	9,000	12,000	13,000
Less: Opening Stock	(9,500)	(7,000)	(9,000)	(12,000)
Vehicles to be produced	37,500	37,000	48,000	61,000

- Preparation of Purchase budget for Part-X

	October	November	December
Production for the month (Nos.)	37,500	37,000	48,000
Add: 40% of next month's production	14,800 (40% of 37,000)	19,200 (40% of 48,000)	24,400 (40% of 61,000)
	52,300	56,200	72,400
No. of units required for production	2,09,200 (52,300 × 4 units)	2,24,800 (56,200 × 4 units)	2,89,600 (72,400 × 4 units)
Less: Opening Stock	(48,000)	(59,200) (14,800 × 4 units)	(76,800) (19,200 × 4 units)
No. of units to be purchased	1,61,200	1,65,600	2,12,800

- Budgeted Gross Profit for the Quarter October to December

	October	November	December	Total
Sales in nos.	40,000	35,000	45,000	1,20,000
Net Selling Price per unit* (₹)	14,57,070	14,57,070	14,57,070	
Sales Revenue (₹ in lakh)	5,82,828	5,09,974.50	6,55,681.50	17,48,484
Less: Cost of Sales (₹ in lakh)	4,57,120	3,99,980	5,14,260	13,71,360
(Sales unit × Cost per unit)				
Gross Profit (₹ in lakh)	1,25,708	1,09,994.50	1,41,421.50	3,77,124

* Net Selling price unit = ₹17,14,200 – 15% commission on ₹17,14,200
= ₹14,57,070.

**RTP NOV 20**

The information of Z Ltd. for the year ended 31st March 2020 is as below:

	Amount (₹)
Direct materials	17,50,000
Direct wages	12,50,000
Variable factory overhead	9,50,000
Fixed factory overhead	12,00,000
Other variable costs	6,00,000
Other fixed costs	4,00,000
Profit	8,50,000
Sales	70,00,000

During the year, the company manufactured two products, X and Y, and the output and cost were:

	X	Y
Output (units)	8,000	4,000
Selling price per unit (₹)	600	550
Direct material per unit (₹)	140	157.50
Direct wages per unit (₹)	90	132.50

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as:

Product X – ₹40 per unit and Product Y- ₹70 per unit.

For the FY 2020-21, due to a pandemic, it is expected that demand for product X and Y will fall by 20% & 10% respectively. It is also expected that direct wages cost will raise by 20% and other fixed costs by 10%. Products will be required to be sold at a discount of 20%.

You are required to:

- PREPARE product- wise profitability statement on marginal costing method for the FY 2019-20 and
- PREPARE a budget for the FY 2020-21.

ANSWER

- Product-wise Profitability Statement for the FY 2019-20:

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
Output (units)	8,000	4,000	
Selling price per unit	600	550	
Sales value	48,00,000	22,00,000	70,00,000
Direct material	11,20,000 (₹140×8,000)	6,30,000 (₹157.50×4,000)	17,50,000
Direct wages	7,20,000 (₹90×8,000)	5,30,000 (₹132.5×4,000)	12,50,000
Variable factory overheads	5,47,200 (76% of 7,20,000)	4,02,800 (76% of 5,30,000)	9,50,000
Other variable costs	3,20,000 (₹40×8,000)	2,80,000 (₹70×4,000)	6,00,000
Contribution	20,92,800	3,57,200	24,50,000
Fixed factory overheads	-	-	12,00,000



Other fixed costs	-	-	4,00,000
Profit			8,50,000

(ii) Preparation of Budget for the FY 2020-21:

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
Output (units)	6,400 (8,000×80%)	3,600 (4,000×90%)	
Selling price per unit	480 (600×80%)	440 (550×80%)	
Sales value	30,72,000	15,84,000	46,56,000
Direct material	8,96,000 (₹140×6,400)	5,67,000 (₹157.50×3,600)	14,63,000
Direct wages per unit	6,91,200 (₹108×6,400)	5,72,400 (₹159×3,600)	12,63,600
Variable factory overheads	5,25,312 (76% of 6,91,200)	4,35,024 (76% of 5,72,400)	9,60,336
Other variable costs	2,56,000 (₹40×6,400)	2,52,000 (₹70×3,600)	5,08,000
Contribution	7,03,488	(2,42,424)	4,61,064
Fixed factory overheads	-	-	12,00,000
Other fixed costs (110% of ₹4,00,000)	-	-	4,40,000
Profit/ (Loss)			(11,78,936)



RTP MAY 21

RS Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 302.4 lakh during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹ 60 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 69,12,000.

The other relevant details are as under:

Purchase Price:	Material A	₹ 160 per kg
	Materials B	₹ 100 per kg
Labour Rate:	Machine Shop	₹ 140 per hour
	Assembly Shop	₹ 70 per hour

	Finished Stock	Material A	Material B
Opening Stock	2,500 units	7,500 kg	4,000 kg
Closing Stock	3,000 units	8,000 kg	5,500 kg

Required:

- CALCULATE number of units of product proposed to be sold and selling price per unit,
- PREPARE Production Budget in units, and
- PREPARE Material Purchase Budget in units.

**ANSWER**

Workings:

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs. @ ₹ 140 per hour	560
Assembly Shop: 2 hrs. @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold	=	Total Variable Cost / Variable Cost per unit
	=	₹ 1,72,80,000 / ₹ 2,160
	=	8,000 units
Selling Price per unit	=	Total Sales Value / Number of Units Sold
	=	₹ 3,02,40,000 / 8,000 units
	=	₹ 3,780

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000
Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	51,000	25,500
	(8,500 units × 6 Kg.)	(8,500 units × 3 Kg.)
Add: Desired Closing Stock	8,000	5,500



Total Requirements	59,000	31,000
Less: Opening Stock	(7,500)	(4,000)
Quantity to be purchased	51,500	27,000

**RTP NOV 21**

The accountant of manufacturing company provides you the following details for year 2019- 20:

Particulars	(₹)
Direct materials	28,00,000
Direct Wages	16,00,000
Fixed factory overheads	16,00,000
Variable factory overheads	16,00,000
Other variable costs	12,80,000
Other fixed costs	12,80,000
Profit	18,40,000
Sales	1,20,00,000

During the year, the company manufactured two products A and B and the output and costs were:

Particulars	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹ 32.00	₹ 56.00
Direct materials per unit	₹ 8.00	₹ 12.00
Direct wages per unit	₹ 4.00	₹ 8.00

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹ 4.00 per unit; and B ₹ 4.80 per unit.

During 2020-21, it is expected that the demand for product A will fall by 25% and for B by 50%.

It is decided to manufacture a new product C, the cost for which is estimated as follows:

Particulars	Product C
Output (units)	2,00,000
Selling price per unit	₹ 28.00
Direct materials per unit	₹ 6.40
Direct wages per unit	₹ 4.00

It is anticipated that the other variable costs per unit of Product C will be same as for product A. PREPARE a budget to present to the management, showing the current position and the position for 2020-21. COMMENT on the comparative results.

ANSWER

Budget Showing Current Position and Position for 2020-21

	Position for 2019-20			Position for 2020-21			
	A	B	Total (A+B)	A	B	C	Total (A+B+C)
Sales (units)	2,00,000	1,00,000	–	1,50,000	50,000	2,00,000	–
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
(A) Sales	64,00,000	56,00,000	1,20,00,000	48,00,000	28,00,000	56,00,000	1,32,00,000
Direct Material	16,00,000	12,00,000	28,00,000	12,00,000	6,00,000	12,80,000	30,80,000
Direct wages	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000



Factory overhead (variable)	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Other variable costs	800,000	4,80,000	12,80,000	6,00,000	240,000	8,00,000	16,40,000
(B) Marginal Cost	40,00,000	32,80,000	72,80,000	30,00,000	16,40,000	36,80,000	83,20,000
(C) Contribution (A - B)	24,00,000	23,20,000	47,20,000	18,00,000	11,60,000	19,20,000	48,80,000
Fixed costs							
– Factory			16,00,000				16,00,000
– Others			12,80,000				12,80,000
(D) Total fixed cost			28,80,000				28,80,000
Profit (C - D)			18,40,000				20,00,000

Comments: Introduction of Product C is likely to increase profit by ₹ 1,60,000 (i.e. from ₹ 18,40,000 to ₹ 20,00,000) in 2020-21 as compared to 2019-20 even if the demand for Product A & B falls. Therefore, introduction of product C is recommended.

**RTP MAY 22**

Maharatna Ltd., a public sector undertaking (PSU), produces product A. The company is in process of preparing its revenue budget for the year 2022. The company has the following information which can be useful in preparing the budget:

- It has anticipated 12% growth in sales volume from the year 2021 of 4,20,000 tonnes.
- The sales price of ₹23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.
- To produce one tonne of product A, 2.3 tonnes of raw material are required. The raw material cost is ₹4,500 per tonne. The price of raw material will also increase by 10% if WPI increase by 5%.
- The projected increase in WPI for 2022 is 4%
- A total of 6,000 employees works for the company. The company works 26 days in a month.
- 85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is ₹ 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2022 and it is expected that a 15% increase in pay will be given.
- The casual employees are getting a daily wage of ₹ 850. The wages are linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2022.
- Power cost for the year 2021 is ₹ 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.
- During the year 2021, the company has paid ₹ 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.
- During the year 2021, the company has paid ₹ 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2022.



- (xi) During the year 2021, the company has paid ₹ 6,00,000 for car hire charges (excluding fuel cost). In year 2022, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.
- (xii) Depreciation on fixed assets for the year 2021 is ₹ 80,40,00,000 and it will be 15% lower in 2022.

Required:

From the above information PREPARE Revenue (Flexible) budget for the year 2022 and also show the budgeted profit/ loss for the year.

ANSWER

Revenue Budget (Flexible Budget) of Maharatna Ltd. for the Year 2022

	Particulars	PY 2021	CY 2022
A	Sales Volume (Tonnes)	4,20,000	4,70,400 [112%×4,20,000]
B	Selling Price per tonne (₹)	23,000 (₹ in lakh)	23,000 (₹ in lakh)
C	Sales value [A×B]	96,600	1,08,192
D	Raw material Cost:		
(i)	Qty. of Material [2.3 tonnes × A] (tonnes)	9,66,000	10,81,920
(ii)	Price per tonne (₹)	4,500	4,500
(iii)	Total raw material cost (₹ in lakh) [(i)×(ii)]	43,470	48,686.40
E	Wages & Salary Cost:		
(i)	Wages to casual employees (15% × 6,000 = 900 employees)	2,386.80 [900 × 26 × 12 × ₹ 850]	2,508.47 [900 × 26 × 12 × ₹ 893.33]
(ii)	Salary to permanent employees (85% × 6,000 = 5,100 employees)	47,736 [5100 × 26 × 12 × ₹ 3,000]	51,316.20 [(5100 × 26 × 6 × ₹ 3,000) + (5100 × 26 × 6 × ₹ 3,450)]
(iii)	Total wages & salary [(i)+(ii)]	50,122.80	53,824.67
F	Power cost:		
(i)	For production (units)	4,20,000 [60% × 7,00,000]	4,70,400 [112% × 4,20,000]
(ii)	For employees & offices (units) [40% × 7,00,000]	2,80,000	2,80,000
(iii)	Total Power consumption (units) [(i)+(ii)]	7,00,000	7,50,400
(iv)	Power rate per unit (₹) [₹42,00,000 ÷ 7,00,000]	6.00	6.00
(v)	Total power cost [(iii)×(iv)]	42	45.024
G	Safety and maintenance Cost	60	67.20 [112% × 60,00,000]
H	Diesel cost	1.2	-
I	Car Hire charge:		



(i)	Car hire charge	6	6
(ii)	Fuel reimbursement cost	-	1.38
			[115% × 1.2]
(iii)	GST@5% on RCM basis [5%×(i+ii)]	-	0.369
(iv)	Total Car hire charge cost [(i)+(ii)+(iii)]	6	7.749
J	Depreciation	8,040	6,834
			[85% × 8040]
K	Total Cost [Sum of D to J]	1,01,742	1,09,465.043
L	Profit/ (Loss) [C-L]	(5,142)	(1273.043)

**RTP NOV 22**

Following information is available for DK and Co.:

Standard working hours	9 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	7,200 hours
Std. hours expected to be earned per four weeks	9,000 hours
Actual hours worked in the four- week period	6,750 hours
Standard hours earned in the four- week period	7,875 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

You are required to CALCULATE the following ratios:

- Efficiency Ratio
- Activity Ratio
- Calendar Ratio
- Standard Capacity Usage Ratio
- Actual Capacity Usage Ratio
- Actual Usage of Budgeted Capacity Ratio

ANSWER

Maximum Capacity in a budget period

= 50 Employees × 9 Hrs. × 5 Days × 4 Weeks = 9,000 Hrs.

Budgeted Hours

= 40 Employees × 9 Hrs. × 5 Days × 4 Weeks = 7,200 Hrs.

Actual Hrs.

= 6,750 Hrs.

Standard Hrs. for Actual Output

= 7,875 Hrs.

Budget No. of Days

= 20 Days (4 Weeks × 5 Days)

Actual No. of Days

= 20 – 1 = 19 Days

(i) Efficiency Ratio = $\frac{\text{Standard Hrs}}{\text{Actual Hrs}} \times 100 = \frac{7,875 \text{ hours}}{6,750 \text{ hours}} \times 100 = 116.67\%$



(ii)	Activity Ratio	=	$\frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100 = \frac{7,875 \text{ hours}}{7,200 \text{ hours}} \times 100 = 109.375\%$
(iii)	Calendar Ratio	=	$\frac{\text{Available working days}}{\text{Budgeted working days}} \times 100 = \frac{19 \text{ days}}{20 \text{ days}} \times 100 = 95\%$
(iv)	Standard Capacity Usage Ratio	=	$\frac{\text{Budgeted Hours}}{\text{Max. possible hours in the budgeted period}} \times 100$ $= \frac{7,200 \text{ hours}}{9,000 \text{ hours}} \times 100 = 80\%$
(v)	Actual Capacity Usage Ratio	=	$\frac{\text{Actual Hours worked}}{\text{Max. possible working hours in a period}} \times 100$ $= \frac{6,750 \text{ hours}}{9,000 \text{ hours}} \times 100 = 75\%$
(vi)	Actual Usage of Budgeted Capacity Ratio	=	$\frac{\text{Actual working Hours}}{\text{Budgeted Hours}} \times 100$ $= \frac{6,750 \text{ hours}}{7,200 \text{ hours}} \times 100 = 93.75\%$

**RTP MAY 23**

EDF Ltd. produces two products using Skilled labour and two types of materials. Shown below the information for the next month's budget:

	Product- A	Product-B
Budgeted sales (in units)	4,080	6,120
Budgeted material consumption per unit (in kg):		
Material-X	8.5	5.1
Material-Y	6.8	10.2
Standard labour hours allowed per unit of product	5.1	8.5

Material-X and Material-Y cost ₹8 and ₹10 per kg and labours are paid ₹30 per hour. Overtime premium is 75% and is payable, if a worker works for more than 45 hours a week. There are 400 direct workers.

The target efficiency ratio for the productive hours worked by the direct workers in actually manufacturing the products is 85%. In addition the non-productive down-time is budgeted at 15% of the productive hours worked.

There are four 6-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A	550 units
Product-B	350 units
Material-X	1,200 kgs.
Material-Y	600 kgs.



The anticipated closing stocks for budget period are as below:

Product-A	5 days sales
Product-B	5 days sales
Material-X	10 days consumption
Material-Y	5 days consumption

Required:

CALCULATE the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month.

ANSWER

Number of days in budget period = 4 weeks × 6 days = 24 days

Number of units to be produced

	Product-A (units)	Product-B (units)
Budgeted Sales	4,080	6,120
Add: Closing stock	850	1275
	$\left(\frac{4,080 \text{ units} \times 5 \text{ days}}{24 \text{ days}} \right)$	$\left(\frac{6,120 \text{ units} \times 5 \text{ days}}{24 \text{ days}} \right)$
Less: Opening stock	550	350
	4,380	7,045
(i) Material Purchase Budget		
	Material-X (Kg.)	Material-Y (Kg.)
Material required:		
Product-A	37,230	29,784
	(4,380 units × 8.5 kg.)	(4,380 units × 6.8 kg.)
Product-B	35,930	71,859
	(7,045 units × 5.1 kg.)	(7,045 units × 10.2 kg.)
	73,160	1,01,643
Add: Closing stock	30,483	21,176
	$\left(\frac{73,160 \text{ kgs.} \times 10 \text{ days}}{24 \text{ days}} \right)$	$\left(\frac{1,01,643 \text{ kgs.} \times 5 \text{ days}}{24 \text{ days}} \right)$
Less: Opening stock	1,200	600
Quantity to be purchased	1,02,443	1,22,219
Rate per kg. of Material	8	10
Total Cost	8,19,541	12,22,186
(ii) Wages Budget		
	Product-A (Hours)	Product-B (Hours)
Units to be produced	4,380	7,045
Standard hours allowed per unit	5.1	8.5
Total Standard Hours allowed	22,338	59,883
Productive hours required for production	$\frac{22,338 \text{ hours} \times 26,280}{85\%}$	$\frac{59,883 \text{ hours} \times 70,450}{85\%}$
Add: Non-Productive down time hours	3942	10568
	(15% of 26,280 hours)	(15% of 70,450 hours)
Hours to be paid	30,222	81,018
Total Hours to be paid =	1,11,240	



Hours to be paid at normal rate (4 weeks × 45 hours × 400 workers) =	72000
Hours to be paid at premium rate	39,240
Total wages to be paid	
= (72,000 hours × ₹30 + 39,240 hours × ₹52.5)	= ₹ 21,60,000 + ₹ 20,60,100 = ₹ 42,20,100

**RTP NOV 23**

XY Co. Ltd manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2022-23:

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	400 units at ₹ 9	600 units at ₹ 9	500 units at ₹ 9	700 units at ₹ 9
Y	300 units at ₹ 21	500 units at ₹ 21	200 units at ₹ 21	400 units at ₹ 21

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by ₹ 1, it will, find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹ 1 it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

Percentage increase in sales over budgeted sales

Product	East Division	West Division
X	+ 10%	+ 5%
Y	+ 20%	+ 10%

With the help of intensive advertisement campaign, following additional sales (over and above the above-mentioned estimated sales by Divisional Managers) are possible:

Product	East Division	West Division
X	60 units	70 units
Y	40 units	50 units

You are required to prepare Sales Budget for 2023-24 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2022-23.

ANSWER

Statement Showing Sales Budget for 2023-24

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	500 ¹	10	5,000	400 ³	20	8,000	13,000
West	700 ²	10	7,000	600 ⁴	20	12,000	19,000
Total	1,200		12,000	1,000		20,000	32,000

Workings

1. $400 \times 110\% + 60 = 500$ units
2. $600 \times 105\% + 70 = 700$ units
3. $300 \times 120\% + 40 = 400$ units
4. $500 \times 110\% + 50 = 600$ units



Statement Showing Sales Budget for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	400	9	3,600	300	21	6,300	9,900
West	600	9	5,400	500	21	10,500	15,900
Total	1,000		9,000	800		16,800	25,800

Statement Showing Actual Sales for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	500	9	4,500	200	21	4,200	8,700
West	700	9	6,300	400	21	8,400	14,700
Total	1,200		10,800	600		12,600	23,400



RTP MAY 24

M Ltd. is a public sector undertaking (PSU), produces a product A. The company is in process of preparing its revenue budget for the year 2024. The company has the following information which can be useful in preparing the budget:

- It has anticipated 12% growth in sales volume from the year 2023 of 4,20,000 tonnes.
- The sales price of ₹ 23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.
- To produce one tonne of product A, 2.3 tonnes of raw material are required. The raw material cost is ₹ 4,500 per tonne. The price of raw material will also increase by 10% if WPI increase by 5%.
- The projected increase in WPI for 2024 is 4%
- A total of 6,000 employees works for the company. The company works 26 days in a month.
- 85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is ₹ 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2024 and it is expected that a 15% increase in pay will be given.
- The casual employees are getting a daily wage of ₹ 850. The wages are linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2024.
- Power cost for the year 2023 is ₹ 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.
- During the year 2023, the company has paid ₹ 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.
- During the year 2023, the company has paid ₹ 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2024.
- During the year 2023, the company has paid ₹ 6,00,000 for car hire charges (excluding fuel cost). In year 2024, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.



(xii) Depreciation on fixed assets for the year 2023 is ₹ 80,40,00,000 and it will be 15% lower in 2024.

You being an associate to the budget controller of the company, PREPARE Revenue (Flexible) budget for the year 2024 and also show the budgeted profit/ loss for the year.

ANSWER

Revenue Budget (Flexible Budget) of M Ltd. for the Year 2024

	Particulars	PY 2023	CY 2024
A	Sales Volume (Tonnes)	4,20,000	4,70,400 [112%×4,20,000]
B	Selling Price per tonne (₹)	23,000 (₹ in lakh)	23,000 (₹ in lakh)
C	Sales value [A×B]	96,600	1,08,192
D	Raw material Cost:		
(i)	Qty. of Material [2.3 tonnes × A] (tonnes)	9,66,000	10,81,920
(ii)	Price per tonne (₹)	4,500	4,500
(iii)	Total raw material cost [(i)×(ii)]	43,470	48,686.40
E	Wages & Salary Cost:		
(i)	Wages to casual employees (15%×6,000 = 900 employees)	2,386.80 [900×26×12×₹850]	2,508.47 [900×26×12×₹893.33]
(ii)	Salary to permanent employees (85%×6,000 = 5,100 employees)	47,736 [5100×26×12×₹3,000]	51,316.20 [(5100×26×6×₹3,000) + (5100×26×6×₹3,450)]
(iii)	Total wages & salary [(i)+(ii)+(iii)]	50,122.80	53,824.67
F	Power cost:		
(i)	For production (units)	4,20,000 [60%×7,00,000]	4,70,400 [112%×4,20,000]
(ii)	For employees & offices (units) [40%×7,00,000]	2,80,000	2,80,000
(iii)	Total Power consumption (units) [(i)+(ii)]	7,00,000	7,50,400
(iv)	Power rate per unit (₹) [₹42,00,000÷7,00,000]	6.00	6.00
(v)	Total power cost [(iii)×(iv)]	42	45.024
G	Safety and maintenance Cost	60	67.20 [112%×4,20,000]
H	Diesel cost	1.2	-
I	Car Hire charge:		
(i)	Car hire charge	6	6
(ii)	Fuel reimbursement cost	-	1.38 [115%×1.2]



(iii)	GST@5% on RCM basis [5%×(i+ii)]	-	0.369
(iv)	Total Car hire charge cost [(i)+(ii)+(iii)]	6	7.749
J	Depreciation	8,040	6,834 [85%×8040]
K	Total Cost [Sum of D to J]	1,01,742	1,09,465.043
L	Profit/ (Loss) [C-L]	(5,142)	(1273.043)

CA Rahul Panchal