Standard Costing

Solution 1- RTP Jan 2025

(i)

Material	SQ* × SP (₹)	AQ** × SP (₹)	AQ** × AP (₹)	RSQ*** × SP(₹)
A	27,50,000	33,00,000	34,50,000	26,24,600
	(25,000 kg.× ₹ 110)	(30,000 kg.× ₹ 110)	(30,000 kg.× ₹ 115)	(23,860 kg.× ₹ 110)
B	48,00,000	40,00,000	41,25,000	45,82,400
	(15,000 kg.× ₹ 320)	(12,500 kg.× ₹ 320)	(12,500 kg.× ₹ 320)	(14,320 kg.× ₹ 320)
C	69,00,000	46,00,000	40,50,000	65,87,200
	(15,000 kg. × ₹460)	(10,000 kg.× ₹460)	(10,000 kg.× ₹405)	(14,320 kg.× ₹ 460)
Total	**1,44,50,000**	**1,19,00,000**	**1,16,25,000**	**1,37,94,200**

*** Standard Quantity of materials for actual output :**

A	$= \frac{50\ kgs}{100\ kgs} \times 50{,}000$ kgs.=25,000 kgs.
B	$= \frac{30\ kgs}{100\ kgs} \times$ 50,000 kgs. = 15,000 kgs.
C	$= \frac{30\ kgs}{100\ kgs} \times$ 50,000 kgs. = 15,000 kgs.

**** Actual Quantity of Material used for actual output:**

A	$= \frac{60\ kgs}{100\ kgs} \times 50{,}000$ kgs.=30,000 kgs.
B	$= \frac{25\ kgs}{100\ kgs} \times 50{,}000$ kgs.=12,500 kgs.
C	$= \frac{20\ kgs.}{100\ kgs} \times 50{,}000$ kgs.=10,000 kgs.

*****Revised Standard Quantity (RSQ):**

A	$= \frac{50\ kgs.}{110\ kgs.} \times 52{,}500$ kgs.=23,860 kgs.
B	$= \frac{30\ kgs.}{110\ kgs} \times 52{,}500$ kgs.=14,320 kgs.
C	$= \frac{30\ kgs.}{110\ kgs.} \times 52{,}500$ kgs.=14,320 kgs.

(i) Material Cost Variance = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)
Or = (SQ × SP) – (AQ × AP)

A	= ₹ 27,50,000 - ₹ 34,50,000	= ₹ 7,00,000 (A)
B	= ₹ 48,00,000 - ₹ 41,25,000	= ₹ 6,75,000 (F)
C	= ₹ 69,00,000 - ₹ 40,50,000	= ₹ 28,50,000 (F)
		= ₹ 28,25,000 (F)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price) = (AQ × SP) – (AQ × AP)

A	= ₹ 33,00,000 - ₹ 34,50,000	= ₹ 1,50,000 (A)
B	= ₹ 40,00,000 - ₹ 41,25,000	= ₹ 1,25,000 (A)
C	= ₹ 46,00,000 - ₹ 40,50,000	= ₹ 5,50,000 (F)
		= ₹ 2,75,000 (F)

(iii) Material Usage Variance = Std. Price (Std. Qty. – Actual Qty.)
Or = (SQ × SP) – (AQ × SP)

A	= ₹ 27,50,000 - ₹ 33,00,000	= ₹ 5,50,000 (A)
B	= ₹ 48,00,000 - ₹ 40,00,000	= ₹ 8,00,000 (F)
C	= ₹ 69,00,000 - ₹ 46,00,000	= ₹ 23,00,000 (F)
		= ₹ 25,50,000 (F)

(iv) Material Mix Variance = Std. Price (Revised Std. Qty. – Actual Qty.)
Or = (RSQ × SP) – (AQ × SP)

A	= ₹ 26,24,600 - ₹ 33,00,000	= ₹ 6,75,400 (A)
B	= ₹ 45,82,400 - ₹ 40,00,000	= ₹ 5,82,400 (F)

C = ₹ 65,87,200 - ₹ 46,00,000 = ₹ 19,87,200 (F)
= ₹ 18,94,200 (F)

(v) Material Yield Variance = Std. Price (Std. Qty. – Revised Std. Qty.)
Or = (SQ × SP) – (RSQ × SP)

A = ₹ 27,50,000 - ₹ 26,24,600 = ₹ 1,25,400 (F)
B = ₹ 48,00,000 - ₹ 45,82,400 = ₹ 2,17,600 (F)
C = ₹ 69,00,000 - ₹ 65,87,200 = ₹ 3,12,800 (F)
= ₹ 6,55,800 (F)

Solution 2-

Source Table

Materials	Standard for Actual			Actual			Revised Standard Quantity Standard Qty × $\frac{Total\ Actual\ Qty\ Mix}{Total\ Standard\ Qty\ Mix}$
	Qty (Kgs.)	Rate (Rs.)	Amount (Rs.)	Qty (Kgs.)	Rate (Rs.)	Amount (Rs.)	
A	3,500	20	70,000	4,500	21	94,500	$3,500 \times \frac{7,500}{7,000}$ = 3,750
B	2,100	10	21,000	1,500	8	12,000	$2,100 \times \frac{7,500}{7,000}$ = 2,250
C	1,400	5	7,000	1,500	6	9,000	$1,400 \times \frac{7,500}{7,000}$ = 1,500
	7,000		98,000	7,500		1,15,500	

1. Material Cost Variance = Standard Cost – Actual Cost
= 98,000 – 1,15,000 = Rs. 17,500 (A)

2. Material Price Variance = (Standard Price – Actual Price) × Actual Quantity
A = (20 – 21) × 4,500 = Rs. 4,500 (A)
B = (10 – 8) × 1,500 = Rs. 3,000 (F)
C = (5 – 6) × 1,500 = Rs. 1,500 (A)
Rs. 3,000 (A)

3. Material Usage Variance = (Standard Quantity for Actual Output – Actual Quantity) × Standard Price
A =(3,500 – 4,500) × Rs. 20 =Rs. 20,000 (A)
B = (2,100 – 1,500) × Rs. 10 =Rs. 6,000 (A)
C = (1,400 – 1,500) × Rs. 5 =Rs. 500 (A)
Rs. 14,500 (A)

4. Material Mix Variance = (Revised Standard Quantity – Actual Quantity) × Standard Price
A = (3,750 – 4,500) × Rs. 20 = Rs. 15,000 (A)
B = (2,250 – 1,500) × Rs. 10 = Rs. 7,500 (F)
C = (1,500 – 1,500) × Rs. 5 = Nil
Rs. 7,500 (A)

5. Material Yield Variance = (Standard Yield for Actual Mix – Actual Yield) × Standard Rate
= (6,000 – 5,600) × Rs. 17.5 = Rs. 7,000 (A)

Working Notes:

(i) Total Standard input of raw materials required to produce 5,600 Kgs. of 'BXE' are 7,000 Kgs. In 7,000 Kgs. of raw material A, B and C are in proportion of 5 : 3 : 2 or

A = $\frac{7,000}{10}$ × 5 = 3,500 Kgs.
B = $\frac{7,000}{10}$ × 3 = 2,100 Kgs.
C = $\frac{7,000}{10}$ × 2 = 1,400 Kgs.

(ii) Standard Rate = $\frac{Standard\ Cost\ of\ Standard\ Mix}{Standard\ Output}$ = $\frac{Rs.98,000}{5,600\ Kg}$ = Rs. 17.50

(iii) For 7,000 Kgs. of standard input the standard output is 5,600 kg. of 'NXE'
For 7,500 Kgs. of standard input the standard output is = $\frac{5,600}{7,000}$ × 7,500 = 6,000 Kgs. of 'NXE'

Solution 3- RTP May 2025

(i) Standard input (kgs.) of Material- B:

Material usage variance = Std. Rate (Std. Quantity – Actual Quantity)

₹ 300 Adverse = ₹ 15 (SQ – 70)

Or, -300 = 15 SQ – 1,050

Or, SQ = 50 kgs.

(ii) Actual Input (kgs) of Material- A:

Let the actual input in for Material-A is X kgs.

Material Mix Variance = Std. Price (Actual Quantity in Std. mix – Actual Quantity)

Or, Material Mix Variance (A+B) = Material Mix Variance for Material - A + Material Mix Variance for Material -B

Or, - 45= [₹ 12 {($\frac{X+70}{2}$ X}] + ₹ 15 {($\frac{X+70}{2}$ 70}]

Or, - 45= [₹ 12 {($\frac{X+70-2X}{2}$-}] + ₹ 15 {($\frac{X+70-140}{2}$-

Or, - 45= [₹ 12 {($\frac{70-X}{2}$-}] + ₹ 15 {($\frac{X-70}{2}$-}]

Or, - 45= [-6X +420] + [{($\frac{15X-1050}{2}$}]

Or, - 90 = 3X-210–

Or, X = $\frac{120}{3}$ = 40kgs.

(iii) (a) Material Price Variance of A = Actual Quantity (Std. Rate – Actual Rate)

= 40 kg. (12–15) = ₹ 120 Adverse

(b) Material Price Variance of B = 70 kg. (15 – 20) = ₹ 350 Adverse

(iv) Material usage variance of A = Std. Rate (Std. Quantity – Actual Quantity)

= 12 (50 – 40) = ₹ 120 Favourable

(v) (a) Material Cost variance of A = Std. Cost – Actual Cost = (50 kgs. @ ₹ 12) – (40 kgs. @ ₹ 15)

= 600 – 600 = Nil

(b) Material Cost variance of B = (50 kgs. @ ₹ 15) – (70 kgs. @ ₹ 20) = 750 – 1,400 = ₹ 650 Adverse

Solution 4-

Source Table

Category	Standard for Actual Output				Actual					Revised Std Quantity
	Total Std	Hours	Rate (Rs.)	Amount (Rs.)	Hours	Idle hours	Effective hours	Rate (Rs.)	Amount (Rs.)	$\frac{Total\ Actual\ hrs\ Mix}{Total\ Std.\ hrs\ Mix}$ × Std. hrs for Actual Output
Men	400	400 × $\frac{960}{1,000}$ =384	1.25	480	520	13 ×2= 26	49	1.20	624	$\frac{760}{800}$ × 480 = 380 hrs
Women	200	200 × $\frac{960}{1,000}$ =192	0.80	153.6	160	4 × 2 = 8	152	0.85	136	$\frac{760}{800}$ × 200 = 190 hrs
Boys	200	200 × $\frac{960}{1,000}$ =192	0.70	134.4	120	3 × 2 = 6	114	0.65	78	$\frac{760}{800}$ × 200 = 190 hrs
	800	768		768	800		760		838	

Direct Labour Cost Variance = Standard Cost for Actual Output – Actual Cost

= Rs. 768 – Rs. 838 = Rs. 70 (A)

Direct Labour Rate Variance = (Standard Rate – Actual Rate) × Actual Hours Paid for

Men = (Rs. 1.25 – Rs. 1.20) × 520 = Rs. 26 (F)

Women = (Re. 0.80 – Rs. 0.85) × 160 = Rs. 8 (A)

Boys = (Re. 0.70 – Rs. 0.65) × 120 = Rs. 6 (F)

Rs. 24 (F)

Direct Labour Efficiency Variance = (Standard Time for Actual Output – Actual Time Worked) × Standard Rate

Men = (384 – 494) × Rs.1.25 = Rs. 137.50(A)

Women	=	(192 – 152) × Re. 0.80	= Rs. 32.00 (F)
Boys	=	(192 – 114) × Re. 0.70	= Rs. 54.60(F)
			Rs. 50.90 (A)

Idle Time Variance = Idle hours × Standard Rate

Men	=	Rs. 26× 1.25	= Rs. 32.50 (A)
Women	=	Re. 8 × 0.80	= Rs. 6.40 (A)
Boys	=	Re. 6 × 0.70	= Rs. 4.20 (A)
			Rs. 43.10 (A)

Direct Labour Material Variance = (Revised Standard Time – Actual Time Taken) × Standard Rate

Men	=	(380 – 494) × Rs. 1.25	= Rs. 142.50 (A)
Women	=	(190 – 152) × Re. 0.80	= Rs. 30.40 (F)
Boys	=	(190 – 114) × Re. 0.70	= Rs. 53.20 (F)
			Rs. 58.90 (A)

Direct Labour Yield Variance = (Standard Output for Actual Time – Actual Output) × Standard Cost per Unit
= (950 – 960) × Re. 0.80 = Rs. 8 (F)

Verification:

Direct Labour Cost Variance = Direct Labour Rate Variance + Idle Time Variance
Rs. 70 (A) = Rs. 24 (F) + Rs. 50.90 (A) + Rs. 43.10 (A)

Direct Labour Efficiency Variance = Direct Labour Material Variance + Direct Labour Yield Variance
Rs. 50.90 (A) = Rs. 58.90 (A) + Rs. 8 (F)

Solution 5-

SR – Standard labour Rate per Hour
AR – Actual labour rate per hour
SH – Standard Hours AH – Actual hours

(i) Labour rate Variance = AH (SR – AR)
Or 17,094 (8 – AR) = 68,376(A)
Or 17,094 (8 – AR) = - 68,376
Or 8 – AR = -4 Or AR = ₹12

(ii) Labour Efficiency = $\frac{SH}{AH}$ x 100 = 105.3
= SH = $\frac{AH\ X\ 105.3}{100}$ = $\frac{17{,}094\ X\ 105.3}{100}$ = 17,999.982
= SH = 18,000 hours

(iii) Labour Efficiency Variance = SR (SH – AH)
= 8(18,000 – 17,094)
= 8 X 906
= ₹ 7,248(F)

(iv)Standard Labour Cost per Unit = $\frac{18{,}000\ X\ 8}{6{,}000}$ = ₹ 24

(v)Actual Labour Cost Per Unit = $\frac{17{,}094\ X\ 12}{6{,}000}$ = ₹ 34.19

Answer 6- Jan 2025

(a) (i) Actual Hours Worked 17,820
Standard Rate Per hour 9
Labour Rate Variance 71280 (A)
Labour Rate Variance = (Standard Rate – Actual Rate) Actual Hours
(9 – Actual Rate) 17,820 = -71,280
(9 – Actual Rate) = - 4
Actual Rate = 13

(ii) Labour Efficiency = $\frac{Standard\ Hours}{Actual\ Hours}$ x 100

106.8% = $\frac{Standard\ Hours}{17,820}$

Standard Hours = 19,031.76

(iii) Labour Efficiency Variance = (Standard Hours – Actual Hours) x Standard Rate
= (19,031.76 – 17,820) x 9
= 10,905.84 (F)

(iv) Standard Labour Cost per unit= $\frac{19,031.76}{7,000}$ x 9 = 24.47

(v) Actual Labour cost per unit = $\frac{17,820\ x\ 13}{7,000}$ = 33.09

Solution 7-

Calculation of actual hours

Standard rate per hour = $\frac{Variable\ factory\ overhead\ per\ unit}{Standard\ time\ for\ one\ unit\ of\ output}$ = $\frac{16}{0.8}$ = ₹ 20

Variable Overhead Efficiency Variance:

(Standard hours for actual production – Actual hours) × Standard rate per hour

Let actual hours be x

[(87,600 × 0.8) – x] ×20 = -67,200

(70,080 – x) × 20 = -67,200

x = 73,440

(i) Variable Factory Overhead Expenditure Variance:

(Variable overhead at actual hours – Actual variable overheads)

$\left[\left(\frac{13,44,000}{67,200} \times 73,440\right) - 14,37,000\right]$ = 31,800 F

(ii) Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead – Actual fixed overhead.

(6,72,000 – 7,05,000) = 33,000 A

(iii)Fixed Factory Overhead Efficiency Variance:

(Standard hours for actual production – Actual hours) × Standard rate per hour

(70,080 – 73,440) × 10 = 33,600 A

(iv)Fixed Overhead Capacity Variance:

(Actual hours - Budgeted hours) × Standard rate per hour

(73,440 - 67,200) ×10 = 62,400 F

The solution can also be presented in following way based on Quantity (units)

Calculation of standard quantity for actual hours:

Variable standard rate per unit (SR) = ₹ 16

Variable Overhead Efficiency Variance:

(SR x AQ) – (SR x standard quantity for Actual hours worked)

-67,200 = (16 x 87,600) – 16 x

-67200 = 14,01,600- 16 x

x = 14,68,800 / 16 = 91,800 (SQ for actual hours worked)

(i) Variable Factory Overhead Expenditure Variance:

(SR x SQ for actual hour worked – Actual variable overheads)

16 x 91,800 – 14,37,000 or 14,68,800 – 14,37,000 = 31,800 F

(ii)Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead – Actual fixed overhead.

(6,72,000 – 7,05,000) = 33,000 A

(iii)Fixed Factory Overhead Efficiency Variance:

Standard rate per unit (SR) = 6,72,000 / 84,000 = ₹ 8 per unit

(SR x AQ) – (SR x standard quantity for Actual hours)

(8 x 87,600) – (8 x 91,800)

(7,00,800 – 7,34,400) = 33,600 A

(iv)Fixed Overhead Capacity Variance:
(SR x standard quantity for Actual hours - Budgeted fixed overheads)
(8 x 91800) – (6,72,000)
(7,34,400 – 6,72,000) = 62,400 F

Solution 9-

1. Fixed Overhead Cost Variance = (Standard Hours for Actual Output × Standard Rate) – Actual Overheads
= (33,000 hours × Rs 1) – 31,000 = Rs 2,000 (F)

2. Fixed Overhead Expenditure Variance = (Budgeted Overheads – Actual Overheads)
= (Rs 30,000 – Rs 31,000) = Rs 1,000 (A)

3. Fixed Overhead Volume Variance = (Standard hours for Actual output × Standard Rate) – Budgeted Overheads
= (33,000 × Rs 1) – 30,000 = Rs 3,000 (F)

4. Fixed Overhead Efficiency Variance = (Standard hours for Actual output – Actual Hours) × Standard Rate
= (33,000 – 31,500) × Rs 1 = Rs 1,500 (F)

5. Fixed Overhead Capacity Variance = (Actual hours – Budgeted hours) × Standard Rate
= (31,500 – 30,000) × Rs 1 = Rs 1,500 (F)

6. Fixed Overhead Calendar Variance = (Possible Hours – Budgeted Hours) × Standard Rate
= (32,400 – 30,000) × Rs 1 = Rs 2,400 (F)

7. Fixed Overhead Revised Capacity Variance = (Actual hours – Possible hours) × Standard Rate
= (31,500 – 32,400) × Rs 1 = Rs 900 (A)

Verification:
Fixed Overheads Cost Variance = Fixed Overheads Expenditure Variance + Fixed Overheads Volume Variance
Rs 2,000 (F) = Rs 1,000 (A) + Rs 3,000 (F)
Fixed Overheads Volume Variance = Fixed Overheads Efficiency Variance+Fixed Overheads Capacity Variance
Rs 3,000 (F) = Rs 1,500 (F) + Rs 1,500 (F)

Working Notes:

- Budgeted Hours = $\frac{Rs.30,000}{Rs.1}$ = 30,000 hours
- Budgeted Hours per day = $\frac{30,000\ Hours}{25}$ = 1,200 hours
- Standard Hours for Actual Output = $\frac{30,000\ Hours}{20,000\ Units} \times 22,000$ = 33,000 hours
- Standard Rate per hour = Rs 1
- Budgeted Overheads = Rs 30,000
- Actual Overheads = Rs 31,000
- Actual Hours = 31,500 hours

Possible hours = 1,200 Hours × 27 Days = 32,400 hours

Answer 10- May 2025

(i) Variable Overhead Variance:
= Standard Overhead for Actual Production - Actual Variable Overhead
= $\left(\frac{₹\ 14,400}{4,800\ units} \times 4,560\ units\right)$ - ₹ 14, 400
= ₹ 13,680 – ₹ 14,400 = ₹ 720 (A)

(ii) Fixed Overhead Variance:
= Absorbed Fixed Overhead – Actual Fixed Overhead
= $\left(\frac{₹\ 48,000}{4,800\ units} \times 4,560\ units\right)$ - ₹46,800
= ₹ 45,600 - ₹ 46,800 = ₹ 1,200 (A)

(iii) Fixed Overhead Expenditure Variance:
= Budgeted Fixed Overhead – Actual Fixed Overhead
= ₹ 48,000 - ₹ 46,800 = ₹ 1,200 (F)

(iv) Fixed Overhead Volume Variance:
= Absorbed Fixed Overhead – Budgeted Fixed Overhead
= $\left(\frac{₹\ 48,000}{4,800\ units} \times 4,560\ units\right)$ - ₹48,000
= ₹ 45,600 - ₹ 48,000 = ₹ 2,400 (A)

(v) Fixed Overhead Calendar Variance:
= (Actual Days - Budgeted Days) x Standard rate per day
= (27 days – 25 days) x $\frac{48,000}{25 days}$ = ₹ 3,840 (F)

Solution 11-
(i) Material Usage Variance = Std.Price (Std.Quantity – Actual Quantity)
= ₹ 45 (9,000 kgs. – 8,900 kgs.) = ₹ 4,500 (Favourable)
(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 8,900 kgs. (₹ 45 – ₹ 46) = ₹ 8,900 (Adverse)
(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost = (SQ × SP) – (AQ × AP)
= (9,000 kgs. × ₹ 45) – (8,900 kgs. × ₹ 46) = ₹ 4,05,000 – ₹ 4,09,400 = ₹ 4,400(Adverse)
(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
= ₹ 50 ($\frac{9,000}{10}$ ×8hours – 7,000 hrs.) = ₹ 50 (7,200 hrs. – 7,000 hrs.) = ₹ 10,000 (Favourable)
(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 7,000 hrs. (₹ 50 – ₹ 52) = ₹ 14,000 (Adverse)
(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost = (SH × SR) – (AH × AR)
= (7,200 hrs. × ₹ 50) – (7,000 hrs. × ₹ 52) = ₹ 3,60,000 – ₹ 3,64,000 = ₹ 4,000 (Adverse)
(vii) Variable Overhead Cost Variance = Std.Overhead for Actual Production – Actual Variable Overhead Cost
= (7,200 hrs. × ₹ 10) – ₹ 72,500 = ₹ 500 (Adverse)
(viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead – Actual Fixed Overhead
= $\frac{₹200}{10\ kgs}$ ×9,000kgs.- ₹1,92,000 = ₹ 1,80,000 – ₹ 1,92,000 = ₹ 12,000 (Adverse)

Solution 12-
Budgeted Production 30,000 hours ÷ 6 hours per unit = 5,000 units
Budgeted Fixed Overhead Rate = ₹ 4,50,000 ÷ 5,000 units = ₹ 90 per unit Or
= ₹ 4,50,000 ÷ 30,000 hours = ₹ 15 per hour.
(i) Material Cost Variance = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)
= (4,800 units × 15 kg. × ₹15) - ₹ 9,85,000 = ₹ 10,80,000 – ₹ 9,85,000 = ₹ 95,000 (F)
(ii) Labour Cost Variance = (Std. Hours × Std. Rate) – (Actual Hours × Actual rate)
= (4,800 units × 6 hours × ₹ 5) – ₹1,40,000 = ₹ 1,44,000 – ₹ 1,40,000 = ₹ 4,000 (F)
(iii)Fixed Overhead Cost Variance = (Budgeted Rate × Actual Qty) – Actual Overhead
= (₹ 90 x 4,800 units) – ₹ 4,70,000 = ₹ 38,000 (A)
OR
= (Budgeted Rate × Std. Hours) – Actual Overhead
= (₹ 15 x 4,800 units × 6 hours) – ₹ 4,70,000 = ₹ 38,000 (A)
(iv)Variable Overhead Cost Variance = (Std. Rate × Std. Hours) – Actual Overhead
= (4,800 units × 6 hours × ₹ 12) - ₹ 3,60,200 = ₹ 3,45,600 - ₹ 3,60,200 = ₹ 14,600 (A)

Solution 13-

	Budget			Actual		
	Qty. (Kg.) [SQ]	Price (₹) [SP]	Amount (₹) [SQ x SP]	Qty. (Kg.) [AQ]	Price (₹) [AP]	Amount (₹) [AQ x AP]
A	6,400	50	3,20,000	7,000	40	2,80,000
B	12,800	40	5,12,000	12,500	45	5,62,500
	19,200		**8,32,000**	**19,500**		**8,42,500**

Material Cost Variance = (SQ X SP – AQ X AP)
= ₹ 8,32,000 – ₹ 8,42,500 = ₹ 10,500 (A)

Material Price Variance = (SP – AP) x AQ
A (₹ 50 – ₹ 40) × 7,000 Kg = **₹ 70,000 (F)**
B (₹ 40 – ₹ 45) × 12,500 Kg = **₹ 62,500 (A)**
₹ 7,500 (F)

Material Usage Variance = SP x (SQ – AQ)
A ₹ 50 × (6,400 Kg – 7000 Kg) = **₹ 30,000 (A)**
B ₹ 40 × (12,800 Kg – 12,500 Kg) = **₹ 12,000 (F)**
₹ 18,000 (A)

Material Mix Variance = (RSQ - AQ) X SP
A = (6,500 Kg – 7,000 Kg) x ₹ 50 = **₹ 25,000 (A)**
B = (13,000 Kg – 12,500 Kg) x ₹ 40 = **₹ 20,000 (F)**
₹ 5,000 (A)

Material Yield Variance = (SQ – RSQ) X SP
A = (6,400 Kg – 6,500 Kg) x ₹ 50 = **₹ 5,000 (A)**
B = (12,800 Kg – 13,000 Kg) x ₹ 40 = **₹ 8,000 (A)**
₹ 13,000 (A)

Labour

Standard Hours for actual Production = 6 Hours X 1,600 Units = 9,600 Hours

Labour Cost Variance = (SH X SR – AH X AR)
= 9,600 hrs x ₹ 20 – {(6,000 hrs x ₹ 25) + (4,000 hrs x ₹ 20)}
= ₹ 1,92,000 – ₹ 2,30,000 = **₹ 38,000 (A)**

Labour Rate Variance = (SR – AR) X AH
= (₹ 20 -₹ 25) x 6,000 hrs = **₹ 30,000 (A)**

Efficiency Variance = (SH – AH worked) x SR
= (9,600 hrs – 9,500 hrs) x ₹ 20 = **₹ 2,000 (F)**

Idle time Variance = Idle Hours X SR
= (AH – AH$^{\#}$) × SR
= (10,000 hours – 9,500 hours) x ₹ 20 = **₹ 10,000 (A)**

AH$^{\#}$ refers to Actual Hours Worked.

Marginal Costing

Solution 1-

(i) Break-even sales = $\frac{Fixed\ Cost}{P/V\ Ratio}$

P/V Ratio = $\frac{Change\ in\ Profit}{Change\ in\ Sales} \times 100$ or, $\frac{₹37,50,000}{₹7,80,60,000-₹5,93,10,000} \times 100$

Or, $\frac{₹37,50,000}{₹1,87,50,000} \times 100$ or 20%

Break-even sales = $\frac{₹98,50,000}{20\%}$ = ₹4,92,50,000

(ii) Profit/ loss = Contribution – Fixed Cost
= ₹8,20,00,000 × 20% - ₹98,50,000
= ₹1,64,00,000 – ₹98,50,000 = ₹65,50,000

(iii) To earn the same amount of profit in 2022-23 as was in 2021-22, it has to earn the same amount of contribution as in 2021-22.

Sales – Variable cost = Contribution equal to 2021-22 contribution

Contribution in 2021-22 = Sales in 2021-22 × P/V Ratio in 2021-22
= ₹5,93,10,000 × 20% = ₹1,18,62,000

Let the number of units to be sold in 2022-23 = X

Sales in 2022-23 – Variable cost in 2022-23 = Desired Contribution

90 X – 80 X = ₹1,18,62,000

Or, 10 X = 1,18,62,000

Or, X = 11,86,200 units

Therefore, **Sales amount** required to earn a profit equal to 2021-22 profit

= ₹ 90 × 11,86,200 units = ₹ 10,67,58,000

Solution 2-

(i) Break-even sales = $\frac{Fixed\ Cost}{P/v\ Ratio}$

P/V Ratio = $\frac{Change\ in\ Profit}{Change\ in\ Sales} \times 100$ or, $\frac{15,00,000}{2,40,00,000-1,80,00,000} \times 100$

Or, $\frac{15,00,000}{60,00,000} \times 100$ or, 25%

Fixed Cost = Contribution – Profit
= ₹ 2,40,00,000 × 25% - ₹ 11,20,000
= ₹ 60,00,000 – ₹ 11,20,000 = ₹ 48,80,000

Break-even sales = $\frac{48,80,000}{25\%}$ = ₹ 1,95,20,000

(ii) Desired Contribution in 2024-25 = Revised Fixed Cost + Target Profit
= (₹ 48,80,000- ₹ 4,80,000) + ₹ 15,00,000
= ₹ 59,00,000

Earlier P/V ratio = 25%. So Variable Cost ratio =75%.
The selling price remains the same.
Variable cost increased by 5% i.e. Variable Cost ratio will be 78.75% (75+5%of 75).
Now revised P/V ratio=21.25%
Sales Volume in 2024-25= $\frac{59,00,000}{21.25\%}$ = ₹ 2,77,64,706(approx.)

If it is assumed that variable cost will go up by 5% on total. So, it will be increased from 75% to 80% and solution can be done in following way:

(i) Desired Contribution in 2024-25 = Revised Fixed Cost + Target Profit
= (₹ 48,80,000-₹ 4,80,000) + ₹ 15,00,000
= ₹ 59,00,000

Earlier P/V ratio = 25%. So Variable Cost ratio =75%.
The selling price remains the same.
Variable cost increased by 5% i.e. Variable Cost ratio will be 80% (75%+5%).
Now revised P/V ratio=20%

Sales Volume in 2024-25= $\frac{59,00,000}{20\%}$ = ₹ 2,95,00,000

Solution 3-

(i)

	Machine M			Machine N		
	Quantity	**Price**	**Amount (₹)**	**Quantity**	**Price**	**Amount (₹)**
Sales	50,000	100	50,00,000	50,000	100	50,00,000
Variable cost	50,000	92.5	46,25,000	50,000	95	47,50,000
Contribution		7.5	3,75,000		5	2,50,000
Fixed Cost			1,50,000			90,000
Profit			2,25,000			1,60,000
P/V Ratio						
$\frac{Contribution}{Sales}$ x 100			$\frac{3,75,000}{50,00,000}$ x100			$\frac{2,50,000}{50,00,000}$x100
			7.5%			5%
Break even Sales						
$\frac{Fixed\ Cost}{P/V\ ratio}$			20,00,000			18,00,000

(ii) Let the units be x

7.5x – 1,50,000 = 5x – 90,000

2.5x = 60,000

X = 24,000 Units

Solution 4-

(a) (i) Statement Showing "Calculation of Contribution/ unit"

	P (₹)	Q (₹)	R (₹)	S (₹)
Selling Price ...(A)	23.88	28.68	55.08	47.88
Variable Cost				
Direct Material	10.08	13.20	30.48	24.96
Direct Labour	4.08	4.08	6.72	6.36
Variable Overheads	1.44	1.44	2.40	2.16
Total Variable Cost ...(B)	15.60	18.72	39.60	33.48
Contribution per unit ...(A) - (B)	8.28	9.96	15.48	14.40

(ii) Calculation of Machine Hours/ unit

Machine Hours per unit	1.20	1.20	2.00	1.80

(iii) Machine Hours Required

Machine Hours per unit	1,44,000*	2,23,200%	3,42,000@	1,78,200#
Total				8,87,400

* - (1,20,000 × 1.2); % - (1,86,000 × 1.2); @ - (1,71,000 × 2); # - (99,000 × 1.8)

(iv) Total Machine Hours Available 8,15,000. Hence, it is a key factor. Product 'S' is to be manufactured, since it is not available with the sub-contractor/ market.

(v) Statement Showing "Make or Buy for Products P, Q, R"

	P (₹)	Q (₹)	R (₹)
Sub-Contractor/ Buy Price	21.36	24.00	48.00
Less: Variable Manufacturing Cost	15.60	18.72	39.60
Saving in Cost	5.76	5.28	8.40
Saving in Cost per machine hour	4.8	4.4	4.20
Ranking	I	II	III

(vi) Statement Showing "Best Product Mix"

Product	Units	Machine Hour/ Unit	Total Machine Hours
S	99,000	1.8	1,78,200
P	1,20,000	1.2	1,44,000
Q	1,86,000	1.2	2,23,200

R (Balance)	1,34,800	2.0	2,69,600
Total			8,15,000

Balance quantity of R to be purchased 36,200 units (1,71,000 – 1,34,800).

(vii) Profitability Statement

Product	No of Units	Contribution/unit (₹)	Total Cont. (₹)
P (Mfg)	1,20,000	8.28	9,93,600
Q (Mfg)	1,86,000	9.96	18,52,560
R (Mfg)	1,34,800	15.48	20,86,704
R (Buy)	36,200	7.08 (₹55.08 - ₹48.00)	2,56,296
S (Mfg)	99,000	14.40	14,25,600
Total Contribution			66,14,760
Less: Fixed Overheads			46,84,000
Net Profit			19,30,760

Solution 5-

Total Fixed Cost = ₹ 6,00,000 + ₹20,00,000 + ₹8,00,000 + ₹ 2,00,000 = ₹ 36,00,000

Contribution per unit = ₹600 - ₹470 = ₹130

P/V Ratio $= \frac{Contribution\ Per\ Unit}{Selling Price} \times 100 = \frac{₹130}{₹600} \times 100 = 21.67\%$

Break-even Point $= \frac{Total\ Fixed\ Cost}{Contribution\ Per\ Unit} = \frac{₹36,00,000}{₹130} =$ 27,692.31 or 27,693 units

Break-even Sales $= \frac{Total\ Fixed\ Cost}{P/V\ Ratio} = \frac{₹36,00,000}{21.67\ \%} =$ ₹1,66,12,829

Calculation of Profit/ (loss):

Total Contribution (₹130 × 35,000 units) = ₹45,50,000

Less: Fixed Cost = ₹36,00,000

Profit = ₹ 9,50,000

Solution 6-

Working Notes:

Particulars	2022-23 (₹)	2023-24 (₹)
Fixed Cost	72,00,000 (₹ 60 × 1,20,000 units)	79,20,000 (110% of ₹ 72,00,000)
Variable Cost	180	225 (125% of ₹ 180)

Calculation of Break-even Point (in units):

Since, shelf life of the product is one year only, hence, opening stock is to be sold first.

Particulars	(₹)
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

$= \frac{₹\ 55,20,000}{₹300 - ₹\ 225}$ = 73,600 packets.

Break-even volume in units for 2023-24

	Packets
From 2023-24 production	73,600
Add: Opening stock from 2022-23	20,000
	93,600

Solution 7-

(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.

Solution 8-

Statement of profit

Particulars	₹
Selling Price	15 per unit
Less : Variable cost	12 per unit
Contribution	3 per unit
Capacity	60,000 units
Total contribution (60,000 units × ₹ 3)	1,80,000
Less: Fixed Cost	4,20,000
Loss	(2,40,000)

Shut down cost

Particulars	₹
Fixed cost	1,70,000
Additional cost	25,000
Shut down cost	**1,95,000**

(i) Since the loss of the Noida plant exceeds the shut down cost it is better to shut down the plant.

(ii) Shut down point: $\frac{Total\ fixed\ cost - Shut\ down\ cost}{Contribution\ per\ unit}$

$\frac{4,20,000 - 1,95,000}{3}$ = 75,000 units

The solution can also be presented in following way

Statement of profit

Particulars	If plant is continued ₹	If plant is shut down ₹
Selling Price	15 per unit	-
Less : Variable cost	12 per unit	-
Contribution	3 per unit	-
Capacity	60,000 units	-
Total contribution (60,000 units ×₹ 3)	1,80,000	
Less : Fixed Cost	4,20,000	1,70,000
Additional Fixed Cost	-	25,000
Loss	2,40,000	1,95,000

(i) Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

(ii) Shut down point: $\frac{Total\ fixed\ cost - Shut\ down\ cost}{Contribution\ per\ unit}$

$\frac{4,20,000-1,95,000}{3}$ = 75,000 units

Solution 9-

(i) **Computation of Sale Price Per Bottle**

Output: 40,000 Bottles

	(₹)
Variable Cost:	
Material	3,15,000
Labour (₹ 1,40,000 × 75%)	1,05,000
Factory Overheads (₹ 1,35,000 × 50%)	67,500
Administrative Overheads (₹ 50,000 × 35%)	17,500
Commission (10% on ₹ 8,00,000) (W.N.-1)	80,000
Fixed Cost:	
Labour (₹ 1,40,000 × 25%)	35,000
Factory Overheads (₹ 1,35,000 × 50%)	67,500
Administrative Overheads (₹ 50,000 × 65%)	32,500
Total Cost	7,20,000
Profit (W.N.-1)	80,000
Sales Proceeds (W.N.-1)	8,00,000
Sales Price per bottle ($\frac{₹\ 8,00,000}{40,000\ Bottles}$)	20

(ii) **Calculation of Break-even Point**

Sales Price per Bottle = ₹19

Variable Cost per Bottle = $\frac{₹\ 5,85,000\ (W.N.-2)}{40,000\ Bottles}$

= ₹ 14.625

Contribution per Bottle = ₹ 19 – ₹14.625

= ₹ 4.375

Break -even Point (in number of Bottles) = $\frac{Fixed\ Costs}{Contribution\ per\ bottle}$

= $\frac{₹1,35,000}{₹\ 4.375}$ = = 30,857 Bottles

Break- even Point (in Sales Value) = 30,857 Bottles × ₹ 19

= ₹ 5,86,285/-

Working Note W.N.-1

Let the Sales Price be 'x'

Commission = $\frac{10x}{100}$

Profit = $\frac{10x}{100}$

X = 640,000 + $\frac{10x}{100}$ + $\frac{10x}{100}$

100x - 10x - 10x = 6,40,00,000

80x = 6,40,00,000

x = 6,40,00,000 / 80

= ₹ 8,00,000

W.N.-2

Total Variable Cost

	(₹)
Material	3,15,000
Labour	1,05,000

Factory Overheads	67,500
Administrative Overheads	17,500
Commission [(40,000 Bottles x ₹20) x 10%]	80,000
Total	**5,85,000**

	Product-A (units)	Product-B (units)
Budgeted Sales	2,400	3,600
Add: Closing stock	480 $\left(\frac{2,400\ units}{20\ Days} \times 4\ Days\right)$	900 $\left(\frac{3,600\ units}{5\ Days} \times 5\ Days\right)$
Less: Opening stock	(400)	(200)
	2,480	4,300

Solution 10-

Workings:

Calculation of Cost of Goods Sold (COGS):

COGS = {(DM- 0.3 COGS) + (DL- 0.15 COGS) + (FOH- 0.10 COGS + ₹ 2,30,000) + (G&AOH- 0.02 COGS + ₹ 71,000)} Or COGS = 0.57 COGS + ₹ 3,01,000

Or COGS = $\frac{₹3,01,000}{0.43}$ = ₹ 7,00,000

Calculation of Cost of Sales (COS):

COS = COGS + (S&DOH- 0.04 COS + ₹ 68,000)

Or COS = ₹ 7,00,000 + (0.04 COS + ₹ 68,000)

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:

P/V Ratio = $\frac{Contribution}{Sales}$ × 100 = $\frac{Sales - Variable\ Costs}{Sales}$ × 100

= $\frac{(₹185 \times 5,000\ units) - ₹4,31,000}{₹185 \times 5,000\ units}$ ×100 = 53.41%

(i) Break-Even Sales = $\frac{Fixed\ Costs}{P/V\ Ratio}$ = $\frac{₹3,69,000}{53.41\%}$ = ₹ 6,90,882

(ii) Profit earned during the last year
= (Sales – Total Variable Costs) – Total Fixed Costs
= (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000
= ₹ 1,25,000

(iii) Margin of Safety (%) = $\frac{Sales - Break\ Even\ Sales}{Sales}$ ×100

= $\frac{₹9,25,000 - ₹6,90,882}{₹9,25,000}$ ×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

Solution 11-

(i) Contribution per unit = Selling price – Variable cost
= ₹ 100 – ₹ 60
= ₹ 40

Break-even Point = $\frac{₹24,00,000}{₹40}$
= 60,000 units

Percentage Margin of Safety = $\frac{Actual\ Sales - Breakeven\ sales}{Actual\ sales}$

Or, 60% = $\frac{Actual\ Sales - 60,000\ units}{Actual\ Sales}$

Actual Sales = 1,50,000 units

	(₹)
Sales Value (1,50,000 units × ₹ 100)	1,50,00,000
Less: Variable Cost (1,50,000 units × ₹ 60)	(90,00,000)
Contribution	60,00,000
Less: Fixed Cost	(24,00,000)
Profit	36,00,000
Less: Income Tax @ 40%	(14,40,000)
Net Return	21,60,000

Rate of Net Return on Sales = 14.40% $\left(\frac{₹21,60,000}{₹1,50,00,000} \times 100\right)$

(ii) **Products**

	X (₹)	Y (₹)
Selling Price per unit	100	150
Variable Cost per unit	60	100
Contribution per unit	40	50

Composite contribution will be as follows:

Contribution per unit = $\left(\frac{40}{8} \times 5\right) + \left(\frac{50}{8} \times 3\right)$
= 25 + 18.75 = ₹ 43.75

Break-even Sale = 64,000 units $\left(\frac{₹28,00,000}{₹43.75}\right)$

Break-even Sales Mix:
X (64,000 units × 5/8) = 40,000 units
Y (64,000 units × 3/8) = 24,000 units

Answer 12- Jan 2025

(b) Calculation of Profit under each Alternative

Particulars	Present Situation (₹)	Alternative 1 (₹)	Alternative 2 (₹)	Alternative 3 (₹)
Selling Price per unit	800	720	700	680
Less: Variable Cost per unit				
Manufacturing Cost	200	200	200	200
Selling and Distribution Cost	100	100	100	100
Contribution per unit	**500**	**420**	**400**	**380**
No. of units sold	4,800	5,520	5,760	6,000
Total Contribution	24,00,000	23,18,400	23,04,000	22,80,000
Less: Fixed Cost	16,00,000	16,00,000	16,00,000	16,00,000
Profit	**8,00,000**	**7,18,400**	**7,04,000**	**6,80,000**
Change in profit		(81,600)	(96,000)	(1,20,000)
Percentage change in profit		-10.2%	-12%	-15%

Among the various alternatives, alternative 1 is giving maximum profit. However, in each of the alternatives (alternative 1,2,3) maximum profit is reduced. Accordingly, SW limited should continue to sell at current selling price to get the maximum profit.

Answer 13- May 2025

(i) **Calculation of Variable Overhead Per Unit & Fixed Cost (F.Y. 2024-25)**

Variable cost per unit = $\frac{Difference\ in\ Total\ Cost}{Difference\ in\ Units}$

$$= \frac{₹\ 28{,}500\ crores - ₹\ 25{,}000\ crores}{50{,}000\ units - 40{,}000\ units} = ₹\ 0.35 \text{ crore per unit}$$

Therefore, Fixed cost = ₹ 25,000 crores - (40,000 x 0.35) = ₹ 11,000 crores
Revised Fixed cost (FY 2025-26) = 10,500 Crores
Desired Profit per unit (₹ 10,000 crores/40,000 units) = ₹ 0.25 crores per unit

Calculation of Contribution per unit

Particulars		Per Unit (₹ in crores)
Selling price per unit		2.50
Variable Cost:		
Material	1.25	
Labour (0.375 x 120%)	0.45	
Variable Overheads	0.35	2.05
Contribution per Unit		0.45

Let the units sold be X
Contribution = 0.45X
Profit = 0.25X
Profit = Contribution – Fixed Cost
0.25X = 0.45X – 10,500 Crores
Minimum no. of units to be sold to sustain the same per unit profit, X = 52,500 Units

Alternatively, solution can be done in following way:

Calculation of Variable Overhead Per Unit & Fixed Cost (F.Y. 2024-25)

Variable cost per unit = $\frac{Difference\ in\ Total\ Cost}{Difference\ in\ Units}$

$$= \frac{₹\ 29{,}000\ crores - ₹\ 25{,}000\ crores}{50{,}000\ units - 40{,}000\ units} = ₹\ 0.40 \text{ crore per unit}$$

Therefore, Fixed cost = ₹ 25,000 crores - (40,000 x 0.40) = ₹ 9,000 crores
Revised Fixed cost (FY 2025-26) = 8,500 Crores
Desired Profit per unit (₹ 10,000 crores/40,000 units) = ₹ 0.25 crores per unit

Calculation of Contribution per unit (2025-26)

Particulars		Per Unit (₹ in crores)
Selling price per unit		2.50
Variable Cost:		
Material	1.25	
Labour (0.375 x 120%)	0.45	
Variable Overheads	0.40	2.10
Contribution per Unit		**0.40**

Let the units sold be X
Contribution = 0.40X
Profit = 0.25X
Profit = Contribution – Fixed Cost
0.25X = 0.40X – 8,500 Crores
Minimum no. of units to be sold to sustain the same per unit profit, X = 56,667 Units.

Solution 15- RTP Jan 2025

Statement of Minimum Price Which the Company Can Afford to Quote for the New Customer

	(₹)	(₹)
Cost to be incurred to bring the machine in its original condition		3,70,000
Direct Material (Replacement Value)		1,50,000
Direct Wages		
Dept. X: (35 men days × ₹ 1,000)	35,000	
Dept. Y: (55 men days × ₹ 1,200)	66,000	
Opportunity Cost of Contribution Lost by Dept. Y (₹66,000 ×₹3)	1,98,000	2,99,000
Variable Overheads [30%×(₹35,000+₹ 66,000)]		30,300
Delivery Costs		15,500
Additional Supervisory required for modification		80,000
Saving Due to Alternative Use of AI Device		
Bought Out Price	1,05,000	
Less: Dismantling & Removal Cost (5 men day × ₹1,000)	5,000	
Less: Variable Cost (30% × ₹ 5,000)	1,500	(98,500)
Net Loss on Material Cost Savings (W.N.)		1,93,500
Opportunity Cost ofRemaining Materials which can be sold as scrap		1,50,000
Opportunity Cost of Sale of Drawings		45,000
Total Minimum Price which may be quoted		**12,34,800**

Working Note

	(₹)
Loss on Material Cost Saving of Machine	2,00,000
Less: Conversion Cost (5 men days × ₹1,000)	5,000
Less: Variable Cost (30% × ₹5,000)	1,500
Net Loss on Material Cost Saving of Machine	**1,93,500**

Solution 16- RTP May 2025

(a) Estimation of the Fixed and Variable Costs.

Variable Manufacturing Cost per carton: $\frac{Changing\ Costs}{ChangeinActivity} = \frac{8,80,000 - 7,00,000}{70,000 - 50,000} = \frac{1,80,000}{20,000}$ = ₹ 9 per carton

Fixed Manufacturing Costs:

Costs of Goods Sold = Fixed Manufacturing Cost + Variable Manufacturing Cost
₹ 7,00,000 = Fixed Manufacturing Cost + (50,000 Cartons × ₹9)
Fixed Manufacturing Cost = ₹7,00,000 – ₹4,50,000 = ₹2,50,000

Variable Selling and Administration Cost per unit: $\frac{6,90,000 - 6,50,000}{70,000 - 50,000} = \frac{40,000}{20,000}$ = ₹ 2 per unit

Fixed Selling & Administration Costs:

Total Selling & Admn. Costs = Fixed Selling & Admn. Cost + Variable Selling & Admn. Costs
₹6,50,000 = Fixed Selling & Admn. Costs + (50,000 Cartons × ₹ 2)
Fixed Selling & Admn. Cost = ₹6,50,000 – ₹1,00,000 = ₹5,50,000

So the Total Variable Costs per unit are ₹ 11 per unit (₹ 9 + ₹ 2).
Total Fixed Costs are ₹8,00,000 per quarter (₹ 2,50,000 + ₹ 5,50,000).
Given Sale Price of ₹24 per carton and Variable Costs of ₹ 11 per carton, the Contribution per carton is ₹ 13 (₹ 24 – ₹ 11).

Breakeven Point (in terms of carton units) = $\frac{Fixed\ Cost\ (per\ quarter)}{Contribution\ per\ Carton} = \frac{8,00,000}{13}$ = 61,539 Cartons

(b) To earn an After Tax Return of 20% on ₹30,00,000, the Desired Annual After Tax Net Income is ₹6,00,000 (₹30,00,000 × 20%). The Quarterly After Tax Net Income will be ₹1,50,000. Given the Tax

Rate of 40%, the Pre-tax Return will be ₹ 2,50,000 (₹ 1,50,000 × 100/60).
Quarterly Sales (units) = $\frac{FixedCost + DesiredReturn}{Contribution\ per\ unit} = \frac{₹(8,00,000\ 2,50,000)}{₹\ 13}$ = 80,769 Cartons
Quarterly Sales Revenue = ₹19,38,456 (80,769 Cartons × ₹ 24)

(c) The proposal involves reducing Selling Price from ₹24 per carton to ₹ 22.50 per carton. Hence the Contribution per carton will be ₹ 11.50 (₹22.50 – ₹11.00).
The increase in Advertising Costs will push Fixed Costs up by ₹1,50,000 to ₹9,50,000.

A 20% increase over second quarter's Sales would increase Sales from 70,000 cartons to 84,000 cartons.
The Expected Earnings Before Taxes will be ₹ 16,000 [(84,000 Cartons × ₹ 11.50) – ₹ 9,50,000].
After deducting Tax at 40%, the Net Income will be ₹9,600 (₹ 16,000 – ₹ 6,400).
Earning has reduced from ₹ 66,000 to ₹ 9,600, accordingly this plan should not be implemented.

Solution 17.

Workings

(1)	All Overheads for one carton or 24cans	₹ 27
	Therefore, per can Overheads (₹27/24)	1.125
	Fixed Overheads Allocated for 1,50,000 cans:	₹1,12,500 Per can
	Fixed Overheads (₹1,12,500 / 1,50,000cans)	₹ 0.75
	Variable Overheads per can (₹1.125 – ₹0.75)	₹ 0.375
(2)	Direct Wage per carton	₹ 36 Per can
	(₹36/24)	₹ 1.50
(3)	Direct Materials per carton	₹ 54 Per can
	(₹54/24)	₹ 2.25

(4) **Cost of making one empty can:**

	Cost per can of 'EXE' (₹)	Cost % empty can	Cost empty can (₹)	Cost of per can of 'EXE' without empty can (₹)
Direct Material	2.250	20	0.4500	1.8000
Direct Wages	1.500	10	0.1500	1.3500
Variable Overheads	0.375	10	0.0375	0.3375
Total	4.125		0.6375	3.4875

(5) **Cost of manufacturing/buying of 1,50,000 empty cans of 'EXE':**

	Empty can Cost (₹)	If empty can made(₹)	If empty can purchased (₹)
Direct Material	0.4500	67,500.00	-----
Direct Wages	0.1500	22,500.00	-----
Variable Overheads	0.0375	5,625.00	-----
Purchase Price	0.6750	-----	1,01,250.00
Total		95,625.00	1,01,250.00

The company should manufacture the empty cans for a production volume of 1,50,000 'EXE' cans as capacity is available and cost of manufacture is lower.

(6) After the level of 1,50,000 empty cans, the company has to install a new machine involving a total additional Fixed Overheads of ₹7,500. The cost of making and buying the additional cans of 25,000 and 75,000 will be as follows:

	Cost per can (₹)	Make (₹)	Buy (₹)	Make (₹)	Buy (₹)
		25,000 cans		75,000 cans	
Direct Material	0.4500	11,250.00	-	33,750.00	-
Direct Wages	0.1500	3,750.00	-	11,250.00	-
Variable Overheads	0.0375	937.50	-	2,812.50	-
Additional Overheads		7,500.00	-	7,500.00	-
Purchase Price	0.6750	-	16,875.00	-	50,625.00
Total		23,437.50	16,875.00	55,312.50	50,625.00

The cost of buying additional empty containers at both the levels is lower than the cost of their manufacture.

A. If the company increases production to 1,75,000 cans of 'EXE', 1,50,000 empty cans should be manufactured and additional 25,000 cans should be purchased at ₹16,875 [Refer W.N. 5&6]
If the company increases production to 2,25,000 cans of 'EXE', 1,50,000 empty cans should be manufactured and additional 75,000 cans should be purchased at a cost of ₹ 50,625. [Refer W.N. 5&6]

B. Additional fixed overheads to be incurred on a new machine: ₹7,500 Savings per unit if empty cans are made instead of buying:
₹ 0.675 – ₹ 0.6375 = ₹ 0.0375
Minimum additional quantity of empty containers to be made to recover the additional fixed costs:
₹ 7,500/ ₹0.0375 = 2,00,000 empty cans
Installation of the new machine for the manufacture of empty cans will be economical at production level of 3,50,000 cans per month.

C. Evaluation of the profitability on sale of "EXE" at the three levels.

	Per can (₹)	**1,50,000 can (₹)**	**1,75,000 can (₹)**	**2,25,000 can (₹)**
Sales	5.0000	7,50,000.00	8,75,000.00	11,25,000.00
Less: Direct Material	1.8000	2,70,000.00	3,15,000.00	4,05,000.00
Direct Wages	1.3500	2,02,500.00	2,36,250.00	3,03,750.00
Variable Overheads	0.3375	50,625.00	59,062.50	75,937.50
Empty can made	0.6375	95,625.00	95,625.00	95,625.00
Empty can purchases	0.6750		16,875.00	50,625.00
Net Gain		**1,31,250.00**	**1,52,187.50**	**1,94,062.50**

Budgetary Control

Solution 1-

Workings

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs @ ₹ 140 per hour	560
Assembly Shop: 2 hrs @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold = Total Variable Cost/Variable Cost per unit
= ₹ 1,72,80,000 / ₹ 2,160 = 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold
= ₹ 3,02,40,000 / 8,000 units = ₹ 3,780

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000
Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	51,000 (8,500 units × 6 Kg.)	25,500 (8,500 units × 3Kg.)
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

Solution 2-

(a) (i) Production Budget (in units) for the year ended 31st March 2023

Particulars	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 $\left(\frac{28,320}{0.96}\right)$	14,000 $\left(\frac{13,160}{0.94}\right)$

(ii) **Purchase budget (in kgs and value) for Material Z**

Particulars	Product M	Product N
No. of units to be produced	29,500	14,000
Usage of Material Z per unit of production	5 kg.	6 kg.
Material needed for production	1,47,500 kg.	84,000 kg.
Materials to be purchased	1,63,889 kg. $\left(\frac{1,47,500}{0.90}\right)$	88,421 kg. $\left(\frac{84,000}{0.95}\right)$
Total quantity to be purchased	2,52,310 kg.	
Rate per kg. of Material Z	₹36	
Total purchase price	₹90,83,160	

(b) Calculation of Economic Order Quantity for Material Z

EOQ $=\sqrt{\frac{2\times 2,52,310\ kg\times ₹320}{36\times 11\%}}=\sqrt{\frac{16,14,78,400}{₹3.96}}$ = 6,385.72 kg.

Solution 3-

(a) (i) Production Budget (in units) for the year ended 31st March 2025

Particulars	Product X	Product Y
Budgeted sales (units)	28,000	13,000
Add: Increase in closing stock	320	160
No. good units to be produced	28,320	13,160
Post production rejection rate	4%	6%
No. of units to be produced	29,500 $\left(\frac{28,320}{0.96}\right)$	14,000 $\left(\frac{13,160}{0.94}\right)$

(ii) Calculation of Economic Order Quantity for Material Z

EOQ = $\sqrt{\frac{2\times 2,52,310\times 15,600}{72\times 11\%}}=\sqrt{\frac{5,04,620\times 15,600}{72\times 11\%}}$ = 31,526.95 kg.

(b) Purchase budget (in kgs and value) for Material Z

Particulars	Product X	Product Y
No. of units to be produced	29,500	14,000
Usage of Material Z per unit of production	5 kg.	6 kg.
Material needed for production	1,47,500 kg.	84,000 kg.
Materials to be purchased	1,63,889 kg. $\left(\frac{1,47,500}{0.90}\right)$	88,421 kg. $\left(\frac{84,000}{0.95}\right)$
Total quantity to be purchased	2,52,310 kg.	
Rate per kg. of Material Z	₹72	
Total purchase price	₹1,81,66,320	

(c)

Since, the maximum number of orders per year cannot be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of Material Z that can be available for production: = 4,000 kg. × 40 orders =1,60,000 kg.

Particulars	Product X	Product Y
Material needed for production to maintain the same production mix	1,03,929 kg. $\left(1,60,000\ \times \frac{1,63,889}{2,52,310}\right)$	56,071 kg. $\left(1,60,000\ \times \frac{88,421}{2,52,310}\right)$
Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for production	93,536 kg.	53,267 kg.
Units to be produced	18,707 units $\left(\frac{93,536kg}{5\ Kg}\right)$	8,878 units $\left(\frac{53,267kg}{6\ Kg}\right)$

Solution 5-

Number of days in budget period = 4 weeks × 5 days = 20 days

Number of units to be produced

Particulars	Product-A (units)	Product-B (units)
Budgeted Sales	2,400	3,600
Add: Closing stock $\left(\frac{2,400\ units}{20\ days} \times 4\ days\right)\left(\frac{3,600\ units}{20\ days} \times 5\ days\right)$	480	900
Less: Opening stock	400	200
Production (units)	2,480	4,300

(i) Material Purchase Budget

Particulars	Material-X (Kg.)	Material-Y (Kg.)
Material required:		
Product-A	12,400 (2,480 units × 5 kg.)	9,920 (2,480 units × 4 kg.)
Product-B	12,900 (4,300 units × 3 kg.)	25,800 (4,300 units × 6 kg.)
	25,300	35,720
Add: Closing stock $\left(\frac{25,300\ kgs}{20\ days} \times 10\ days\right)$ $\left(\frac{35,720\ kgs}{20\ days} \times 6\ days\right)$	12,650	10,716
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

Particulars	Product-A (Hours)	Product-B (Hours)
Units to be produced	2,480 units	4,300 units
Standard hours allowed per unit	3	5
Total Standard Hours allowed	7,440	21,500
Productive hours required for production	$\frac{7,440\ hours}{80\%}$=9,300	$\frac{21,500\ hours}{80\%}$=26,875
Add: Non-Productive down time	1,860 hours. (20% of 9,300 hours)	5,375 hours. (20% of 26,875 hours)
Hours to be paid	11,160	32,250

Total Hours to be paid = 43,410 hours (11,160 + 32,250)
Hours to be paid at normal rate = 4 weeks × 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

Solution 6-

(i) Preparation of Production Budget (in units)

Particulars	October	November	December	January
Demand for the month (Nos.)	40,000	35,000	45,000	60,000
Add: 20% of next month's demand	7,000	9,000	12,000	13,000
Less: Opening Stock	(9,500)	(7,000)	(9,000)	(12,000)
Vehicles to be produced	37,500	37,000	48,000	61,000

(ii) Preparation of Purchase budget for Part-X

Particulars	October	November	December
Production for the month (Nos.)	37,500	37,000	48,000

Add: 40% of next month's production	14,800 (40% of 37,000)	19,200 (40% of 48,000)	24,400 (40% of 61,000)
	52,300	56,200	72,400
No. of units required for production	2,09,200 (52300 × 4 units)	2,24,800 (56200 × 4 units)	2,89,600 (72,400 × 4 units)
Less: Opening Stock	(48,000)	(59,200) (14800 × 4 units)	(76,800) (19200 × 4 units)
No. of units to be purchased	1,61,200	1,65,600	2,12,800

(iii) Budgeted Gross Profit for the Quarter October to December

Particulars	October	November	December	Total
Sales in nos.	40,000	35,000	45,000	1,20,000
Net Selling Price per unit*	7,28,535	7,28,535	7,28,535	
Sales Revenue (₹ in lakh)	2,91,414	2,54,987.25	3,27,840.75	8,74,242
Less: Cost of Sales (₹ in lakh) (Sales unit × Cost per unit)	2,28,560	1,99,990.00	2,57,130.00	6,85,680
Gross Profit (₹ in lakh)	62,854	54,997.25	70,710.75	1,88,562

* Net Selling price unit = ₹ 8,57,100 – 15% commission on ₹ 8,57,100 = ₹7,28,535.

Solution 7-

Production Budget (in units)

Particulars	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
October 2023				
Sales*	2,10,000	2,38,000	3,36,000	60,000
Add: Closing stock	15,000	14,000	12,000	5,500
Total Quantity Required	2,25,000	2,52,000	3,48,000	65,500
Less: Opening stock	12,000	13,000	11,000	7,500
Production	**2,13,000**	**2,39,000**	**3,37,000**	**58,000**
November 2023				
Sales*	3,15,000	1,66,600	3,36,000	50,000
Add: Closing stock	13,000	15,000	10,000	6,000
Total Quantity Required	3,28,000	1,81,600	3,46,000	56,000
Less: Opening stock	15,000	14,000	12,000	5,500
Production	**3,13,000**	**1,67,600**	**3,34,000**	**50,500**
December 2023				
Sales*	4,72,500	1,16,620	3,36,000	30,000
Add: Closing stock	11,000	16,000	13,000	7,000
Total Quantity Required	4,83,500	1,32,620	3,49,000	37,000
Less: Opening stock	13,000	15,000	10,000	6,000
Production	**4,70,500**	**1,17,620**	**3,39,000**	**31,000**

*sales units are taken from sales budget

Sales Budget (in Units and sales value)

Particulars	Hot Coffee	Cold Coffee	Fruit Juice	Carbonated Soft Drink
October 2023 (in units)	2,10,000 [1,40,000+ (1,40,000 x50%)]	2,38,000 [3,40,000- (3,40,000 x 30%)]	3,36,000 [420000- (4,20,000x20%)]	60,000
October 2023 (Sales Value in ₹)	42,00,000 (2,10,000 x ₹ 20)	95,20,000 (2,38,000 x ₹ 40)	67,20,000 (3,36,000 x ₹20)	12,00,000 (60,000 x ₹ 20)
November 2023 (in units)	3,15,000 [2,10,000+ (2,10,000 x 50%)]	1,66,600 [2,38,000- (2,38,000 x 30%)]	3,36,000	50,000
November 2023 (Sales Value in ₹)	63,00,000 (3,15,000 x ₹ 20)	66,64,000 (1,66,600 x ₹ 40)	67,20,000 (3,36,000 x ₹ 20)	10,00,000 (50,000 x ₹ 20)
December 2023 (in units)	4,72,500	1,16,620 [1,66,600-	3,36,000	30,000

	[3,15,000+ (3,15,000 x 50%)]	(1,66,600 x 30%)]		
December 2023 (Sales Value in ₹)	94,50,000 (4,72,500x ₹ 20)	46,64,800 (1,16,620x ₹ 40)	67,20,000 (3,36,000 x ₹ 20)	6,00,000 (30,000 x ₹ 20)

Sales Budget can also be presented in following way:

Particulars	Oct 2023		Nov 2023		Dec 2023	
	Quantity (units)	Amount (₹)	Quantity (units)	Amount (₹)	Quantity (units)	Amount (₹)
Hot Coffee @ ₹ 20 per unit	2, 10,000	42,00,000	3,15,000	63,00,000	4,72,500	94,50,000
Cold Coffee @ ₹ 40 per unit	2,38,000	95,20,000	1,66,600	66,64,000	1,16,620	46,64,800
Fruit Juice @ ₹ 20 per unit	3,36,000	67,20,000	3,36,000	67,20,000	3,36,000	67,20,000
Carbonated Soft Drink @ ₹ 20 per unit	60,000	12,00,000	50,000	10,00,000	30,000	6,00,000
		2,16,40,000		**2,06,84,000**		**2,14,34,800**

Solution 8-

(i) Actual Hours worked

Actual Usage of Budgeted Capacity Ratio = $\frac{Actual\ working\ hours}{Budgeted\ hours} \times 100$

86% = (Actual working hours÷ Budgeted hours) × 100

Budgeted hours=125 workers × 8 hours× 6 days × 4 weeks = 24,000 hours

Actual hours= 24,000 × 86% = 20,640 hours

(ii) Standard hours for actual output

Efficiency ratio = $\frac{Standard\ Hrs}{Actual\ Hrs} \times 100$

110% = Standard hours÷ Actual hours

Standard hours= 20,640 × 110% = 22,704 hours

(iii) Activity ratio = $\frac{Standard\ Hrs}{budgeted\ Hrs} \times 100$

= (22,704 ÷ 24,000) × 100 = 94.6%

(iv) Standard capacity usage ratio

= $\frac{Budgeted\ Hours}{Max.\ possible\ hours\ in\ the\ budgeted\ period} \times 100$

= {24,000 hours÷ (150 workers × 8 hours× 6 days × 4 weeks)} × 100

= (24,000 ÷ 28,800) × 100 = 83.33%

Solution 9-

(i) Expense Budget at 60%, 70% & 90% level

Particulars	60% (12,000 units)		70% (14,000 units)		90% (18,000 units)	
	Per unit (₹)	Amount (₹)	Per unit (₹)	Amount (₹)	Per unit (₹)	Amount (₹)
Sales **(A)**	400	48,00,000	388	54,32,000	384	69,12,000
Variable Costs:						
Direct Material	200	24,00,000	208	29,12,000	210	37,80,000
Direct Wages	60	7,20,000	60	8,40,000	60	10,80,000
Variable Factory Overheads	30	3,60,000	30	4,20,000	30	5,40,000
Variable Administrative & Selling Overheads	16	1,92,000	16	2,24,000	16	2,88,000
Total Variable Cost **(B)**	306	36,72,000	314	43,96,000	316	56,88,000
Contribution **(C)=(A–B)**	94	11,28,000	74	10,36,000	68	12,24,000
Fixed Costs:						
Fixed Factory Overheads (50%)	--	3,60,000	--	3,60,000	--	3,60,000
Fixed Administrative & Selling Overheads (60%)	--	2,88,000	--	2,88,000	--	2,88,000

Advertising Cost	--	--	--	--	--	20,000
Total Fixed Costs **(D)**	--	6,48,000	--	6,48,000	--	6,68,000
Profit **(C – D)**	--	4,80,000	--	3,88,000	--	5,56,000

(ii) Comment: Increase of production capacity to 90% is likely to increase the profit to maximum of ₹ 5,56,000 due to increase in contribution while fixed cost is slightly increased due to advertising cost. At 70% capacity, profit is reduced to minimum of ₹ 3,88,00 due to decrease in selling price by 3% along with increase in raw material cost by 4% resulting in decrease of contribution. Therefore, it is recommended that the factory should operate at 90% capacity.

Solution 10-

Flexible Budget of Savi Ltd

Particulars	60% (72,000 units) (₹)	80% (96,000 units) (₹)	100% (1,20,000 units) (₹)
Sales **(A)**	120.00	120.00	120.00
Variable Costs:			
- Direct Variable Cost	20.00	20.00	20.00
- Variable Factory Overheads (WN1)	7.00	7.00	7.00
- Sales Commission (2%)	2.40	2.40	2.40
- Transportation Expenses	1.00	1.00	1.00
Total Variable Cost **(B)**	30.40	30.40	30.40
Contribution Per Unit **(C) = (A – B)**	89.60	89.60	89.60
Total Contribution **(D)**	64,51,200.00	86,01,600.00	1,07,52,000.00
Fixed Costs:			
- Administrative Overheads(100%)	20,60,000.00	20,60,000.00	20,60,000.00
- Factory Overheads (20%)	1,68,000.00	1,68,000.00	1,68,000.00
Total Fixed Costs **(E)**	22,28,000.00	22,28,000.00	22,28,000.00
Profit **(D-E)**	42,23,200.00	63,73,600.00	85,24,000.00
Total Cost	**44,16,800.00**	**51,46,400.00**	**58,76,000.00**

WN1:

Variable factory Overheads = ₹ 8,40,000 x 80% = ₹ 6,72,000

Variable factory Overheads per unit = ₹ 6,72,000/96,000 units = ₹ 7

Answer 11- May 2025

(c) (i) Flexible Budget showing the total cost for a trip:

Particulars	No. of Students			
	300	600	900	1200
	(₹)	(₹)	(₹)	(₹)
Variable Cost				
Breakfast @ ₹ 55 per student	16,500	33,000	49,500	66,000
Lunch @ ₹ 120 per student	36,000	72,000	1,08,000	1,44,000
Evening Tea with snacks @ ₹ 40 per student	12,000	24,000	36,000	48,000
Entrance Fee at amusement park (Free entry)	-	-	-	-
Entrance Fee at the zoo @ ₹ 25 per student	7,500	15,000	22,500	30,000
Total Variable Costs (A)	72,000	1,44,000	2,16,000	2,88,000
Semi-Variable Cost				
Hire Charges @ ₹ 6,000 per bus	36,000	72,000	1,08,000	1,44,000
Special Permit Fees @ ₹ 500 per bus	3,000	6,000	9,000	12,000
DA to Teachers @ ₹ 500 x 4 teachers per bus = ₹ 2,000 per bus	12,000	24,000	36,000	48,000

Block Entrance Fees at the Technological Museum	2,000	3,000	3,000	3,500
Prizes to students	2,200	2,400	2,400	2,500
Total Semi-Variable Costs (B)	55,200	1,07,400	1,58,400	2,10,000
Total Cost for a Trip (A+B)	1,27,200	2,51,400	3,74,400	4,98,000

Working Note:

No. of Students	**300**	**600**	**900**	**1200**
No. of Buses required (50 students per bus)	300/50 = 6 buses	600/50 = 12 buses	900/50 = 18 buses	1200/50 = 24 buses

(ii) Average cost per student at each level:

No. of Students	**300**	**600**	**900**	**1200**
Total Cost (₹)	1,27,200	2,51,400	3,74,400	4,98,000
Average cost per student (₹)	424	419	416	415

Solution 12- RTP Jan 2025

Flexible Budget of BT Ltd.

Particulars	**75% (₹)**	**85% (₹)**	**100% (₹)**	**115% (₹)**
Sales	73,12,500	82,87,500	97,50,000	1,12,12,500
COGS (40% of Sales)	29,25,000	33,15,000	39,00,000	44,85,000
Administration Costs:				
Office Salaries (fixed)	11,70,000	11,70,000	11,70,000	11,70,000
General expenses (5% of COGS)	1,46,250	1,65,750	1,95,000	2,24,250
Depreciation (fixed)	97,500	97,500	97,500	97,500
Rent and rates (fixed)	1,13,750	1,13,750	1,13,750	1,13,750
(A) Total Adm. Costs	**15,27,500**	**15,47,000**	**15,76,250**	**16,05,500**
Selling Costs:				
Salaries (8% of sales)	5,85,000	6,63,000	7,80,000	8,97,000
Travelling expenses (5% of COGS)	1,46,250	1,65,750	1,95,000	2,24,250
Sales office (2.5% of COGS)	73,125	82,875	97,500	1,12,125
General expenses (2.5% of COGS)	73,125	82,875	97,500	1,12,125
(B) Total Selling Costs	**8,77,500**	**9,94,500**	**11,70,000**	**13,45,500**
Distribution Costs:				
Wages (fixed)	195,000	195,000	195,000	195,000
Rent (1% of sales)	73,125	82,875	97,500	1,12,125
Other expenses (10% of COGS)	2,92,500	3,31,500	3,90,000	4,48,500
(C) Total Distribution Costs	**5,60,625**	**6,09,375**	**6,82,500**	**7,55,625**
Total Costs (A + B + C)	**29,65,625**	**31,50,875**	**34,28,750**	**37,06,625**

Solution 13-

Statement Showing Sales Budget for 2023-24

	Product X			**Product Y**			**Total**
Division	**Qty.**	**Rate (₹)**	**Amt. (₹)**	**Qty.**	**Rate (₹)**	**Amt. (₹)**	**Amt. (₹)**
East	5001	10	5,000	4003	20	8,000	13,000
West	7002	10	7,000	6004	20	12,000	19,000
Total	1,200		12,000	1,000		20,000	32,000

Workings

1. 400 × 110% + 60 = 500 units
2. 600 × 105% + 70 = 700 units
3. 300 × 120% + 40 = 400 units
4. 500 × 110% + 50 = 600 units

Statement Showing Sales Budget for 2022-23:

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	400	9	3,600	300	21	6,300	9,900
West	600	9	5,400	500	21	10,500	15,900
Total	1,000		9,000	800		16,800	25,800

Statement Showing Actual Sales for 2022-23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amt. (₹)	Qty.	Rate (₹)	Amt. (₹)	Amt. (₹)
East	500	9	4,500	200	21	4,200	8,700
West	700	9	6,300	400	21	8,400	14,700
Total	1,200		10,800	600		12,600	23,400

Solution 14- RTP May 2025

(i) Statement of Variable Cost per unit and Fixed Costs under Given Cost Classification Effective for Quarter IV

Particulars	Total Fixed Cost (₹)	Variable Cost p.u. (₹)
Direct Materials (W.N.1)		
A	-----	6
B	-----	5
Production Labour (W.N.2)	90,000	9
Manufacturing Overhead Ex. Depreciation (W.N.3)	72,000	3
Depreciation of Production Machinery	20,000	-----
Administration Expenses	25,000	-----
Selling & Distribution Expenses (W.N.4)	24,000	2

(ii) Flexible Budget of Production Costs for the Quarter IV

Particulars	15,000 units (₹)	18,000 units (₹)	21,000 units (₹)
Direct Material			
A	90,000 (15,000 units × ₹ 6)	1,08,000 (18,000 units × ₹ 6)	1,26,000 (21,000 × ₹ 6)
B	75,000 (15,000 units × ₹ 5)	90,000 (18,000 × ₹ 5)	1,05,000 (21,000 units × ₹ 5)
Production Labour	2,25,000 (15,000 units × ₹ 9 + ₹ 90,000)	2,52,000 (18,000 units × ₹ 9 + ₹ 90,000	2,88,000*
Manufacturing Overhead	1,17,000 (15,000 units × ₹ 3 + ₹ 72,000)	1,26,000 (18,000 units × ₹ 3 ₹ 72,000)	1,35,000 (21,000 units × ₹ 3 + ₹ 72,000)
Depreciation	20,000	20,000	20,000
Total Production Cost	5,27,000	5,96,000	6,74,000

* Production Labour (21,000 units level)

	₹
Variable Cost (21,000 units × ₹ 9)	1,89,000
Fixed Cost	90,000
Overtime (2,000 units × ₹ 9 × 0.50) 9,000	2,88,000

Working Notes :

1. Direct Material Cost:

A: $\frac{60,000}{10,000\ units}$ = ₹ 6

B: $\frac{50,000}{10,000\ units}$ = ₹ 5

Direct material cost (variable cost) for material A and B for all the quarters on computation comes to ₹ 6 /- and ₹ 5 /- for materials A and B respectively.

2. Fixed and Variable Cost Component of production labour cost:

Particulars	Quarter I	Quarter III	Change
Production (units)	10,000	15,000	5,000
Production labour (₹)	1,80,000	2,30,000	50,000

Variable Cost (per unit) $= \frac{Change\ in\ Production\ Labour\ Cost}{Change\ in\ Production\ Units}$

Change in Production units $= \frac{16,000}{8,000} =$ $= ₹ 10$

Fixed Cost = ₹ 1,80,000 – ₹ 1,00,000 = ₹ 80,000

For Quarter II (20,000 units):	₹
Variable Cost of 20,000 units @ ₹ 10 p.u.	2,00,000
Fixed Cost	80,000
Overtime Premium on 1,000 @ ₹ 5 p.u.	5,000
Total Production Labour Cost	2,85,000

For Quarter IV (18,000 units):	
Variable Cost of 18,000 units @ ₹ 9 p.u. (₹ 10 × 1.125 × 0.80 = ₹ 9)	1,62,000
Fixed Cost (₹ 80,000 × 1.125)	90,000
Total Production Labour Cost	2,52,000

3. Fixed and Variable Cost Component of manufacturing overhead:

	Quarter I	Quarter II	Change
Production (units)	10,000	20,000	10,000
Manufacturing Overhead (₹) (Excluding Depreciation)	90,000	1,20,000	30,000

Variable Cost Component of manufacturing overhead: $\frac{Change\ in\ Manufacturing\ Overhead\ Costs}{Change\ in\ Production\ Units} =$

$\frac{Change\ in\ Manufacturing\ Overhead\ Costs}{Change\ in\ Production\ Units} = \frac{₹30,000}{10000\ UNITS} = ₹ 3$ p.u

Fixed Cost Component of manufacturing overhead:

= ₹ 1,20,000 – 20,000 units × ₹ 3 = ₹ 60,000

For Quarter IV:

	₹
Fixed Cost =	60,000
Add: 20% Increase =	12,000
Total Fixed Cost =	72,000

4. Fixed and Variable Cost Component of selling and distribution expenses

	Quarter I	Quarter II	Change
Sales (units)	9,000	17,000	8,000
Selling & Distribution Expenses	38,000 5	4,000	16,000

Variable Cost Component of selling & distribution expenses:

$= \frac{Change\ in\ selling\ \&\ Distribution\ expenses}{Change\ in\ sales\ units} = \frac{₹\ 16,000}{8000} = ₹ 2$ per unit

Fixed Cost Component of selling & distribution expenses:

= ₹ 54,000 – 17,000 units × ₹ 2 = ₹ 20,000

Fixed Cost Component for IV Quarter:

= ₹ 20,000 × 1.20 = ₹ 24,000

Solution 15-

Material Purchase Budget (in quantities and value)

Particulars	Total
Material Consumption (Kg.)	
A (1,740 units x 5 Kg. = 8,700)	
B (2,000 units x 3 Kg. = 6,000)	14,700

Add: Closing Balance of Material (Kg.) (W.N. 3)	2,450
Less: Anticipated Opening Balance of Material (Kg.)	2,150
Total Quantity of Material (kg.) to be purchased	15,000
Total Value of Material to be purchased (₹) (15,000 Kg. x ₹12)	₹ 1,80,000

Direct Workers Wages Budget
(showing hours required and wages paid)

Particulars	Total
Standard Hours for Budgeted Production A (1,740 units x 5 hrs.= 8,700) B (2,000 units x 4 hrs.= 8,000)	16,700
Standard Hours for Budgeted Production at Targeted Efficiency Ratio (W.N. 4)	20,875
Add: Non Productive Downtime (20% x 20,875 hours)	4,175
Total Labour Hours Required	25,050
Less: Normal Labour Hours (45 workers x 12 weeks x 5 days x 8 hours)	21,600
Difference (Overtime hours)	3,450
Wages for normal hours (21,600 hours x ₹ 8)	₹1,72,800
Overtime Wages (3,450 x ₹12)	₹41,400
Total Wages	**₹2,14,200**

Working Notes:

1. Computation of Closing Stock Balance of Products A and B

Budgeted Period of Sales (In days) = 12 weeks x 5 days = 60 days

Closing Stock of Product A (Units) (15 days sales)

$= \frac{1{,}800\ units \times 15\ days}{60\ days}$ = 450 units

Closing stock of Product B (units) (20 days sales)

$= \frac{12{,}400\ units \times 20\ days}{60\ days}$ =800

2. Production Budget (Units)

	Products	
	A	B
Sales in units (60 days)	1,800	2,400
Add: Closing Stock (W.N. 1)	450	800
	2,250	3,200
Less: Anticipated Opening Balance	510	1,200
Total Number of Units to be produced	1,740	2,000

3. Closing Balance of Material (Kg.)

Closing Balance of Material (10 days consumption) $= \frac{14{,}700\ kg}{60\ Days}$ × 10 days 60 days = 2,450 Kg.

4. Standard Hours for Budgeted Production at targeted 80% efficiency ratio = $\frac{16{,}700\ Hrs}{80}$.×100=20,875 Hrs.

Service Sector Costing

Solution 1-

(a) Statement of Cost per Passenger – Km

Particulars	Cost per annum (₹)	Per month (₹)
Standing Charges (A):		
Taxes	2,000	
Insurance (5,00,000 × 0.02)	10,000	
Garage Rent (500 × 12)	6,000	
Salary of Driver (15,000× 12)	1,80,000	
Salary of Conductor (12,000× 12)	1,44,000	
Stationery (800 × 12)	9,600	
Salary of Manager cum Accountant (35,000 × 12)	4,20,000	
Total	7,71,600	
Monthly Standing Charges: (7,71,600/12)		**64,300.00**
Running Charges (B):		
Depreciation [(5,00,000/5/12]		8,333.33
Diesel and oil [(4 × 2 × 25 × 25) × 10]		50,000.00
Monthly Running Charges		**58,333.33**
Maintenance Charges (C):		
Repairs	8,000	666.67
Total cost before commission		1,23,300.00
Commission: (D)		**16,440.00**
Total cost (A+B+C+D)		1,39,740.00
Profit		**24,660.00**
Total takings (Total Cost + Profit)		**1,64,400.00**

Total passenger-km = 4 × 2 × 25 × 25 × 30 = 1,50,000 passenger km
Hence, Fare per passenger-km = 1,64,400.00/ 1,50,000 = ₹ 1.09

Working Note:
Calculation of Commission and Profit:

Let total takings	= ₹ x
Commission	= 0.10 x
Profit	= 0.15 x
Takings	= Cost before commission and profit + Commission + Profit
Therefore, x	= 1,23,300 + 0.10 x + 0.15 x
0.75x	= 1,23,300
x	= ₹ 1,64,400
Commission	= 0.10 × ₹ 1,64,400 = ₹ 16,440
Profit	= 0.15 × ₹ 1,64,400 = ₹ 24,660

(b) (i) **Calculation of Overhead Recovery Rate:**
Production Overhead recovery rate based on Direct Labour Costs

$$= \frac{Production\ Overhead}{Direct\ Labour\ Cost} \times 100$$

$$= \frac{2,50,000}{5,00,000} \times 100 = 50\% \text{ of Direct Labour}$$

Marketing & Distribution Overhead recovery rate based on Total Production Costs

$$= \frac{Marketing\ \&\ Distribution\ Overhead}{Total\ Production\ Cost} \times 100$$

$$= \frac{1,52,000}{19,00,000} \times 100 = 8\% \text{ of Total Production Costs}$$

Working Note:

Statement showing Total Cost for 2023

Particulars	Amount (₹)
Opening stock of raw material	2,00,000
Add: Purchases	12,00,000
Less: Closing stock of raw material	(2,50,000)
Direct Material Consumed	11,50,000

Direct Labour Cost	5,00,000
Prime Cost	16,50,000
Add: Production Overhead	2,50,000
Production cost	19,00,000
Add: Marketing & Distribution Cost	1,52,000
Total Cost	20,52,000

Answer 2-

(a) Statement of Cost per Passenger – Km

Particulars	Cost per annum (₹)	Per month (₹)
Standing Charges (A):		
Taxes	2,000	
Insurance (5,00,000 × 0.02)	10,000	
Garage Rent (500 × 12)	6,000	
Salary of Driver (15,000× 12)	1,80,000	
Salary of Conductor (12,000× 12)	1,44,000	
Stationery (800 × 12)	9,600	
Salary of Manager cum Accountant (35,000 × 12)	4,20,000	
Total	7,71,600	
Monthly Standing Charges: (7,71,600/12)		**64,300.00**
Running Charges (B):		
Depreciation [(5,00,000/5/12]		8,333.33
Diesel and oil [(4 × 2 × 25 × 25) × 10]		50,000.00
Monthly Running Charges		**58,333.33**
Maintenance Charges (C):		
Repairs	8,000	666.67
Total cost before commission		1,23,300.00
Commission: (D)		**16,440.00**
Total cost (A+B+C+D)		1,39,740.00
Profit		**24,660.00**
Total takings (Total Cost + Profit)		**1,64,400.00**

Total passenger-km = 4 × 2 × 25 × 25 × 30 = 1,50,000 passenger km

Hence, Fare per passenger-km = 1,64,400.00/ 1,50,000 = ₹ 1.09

Working Note:

Calculation of Commission and Profit:

Let total takings = ₹ x

Commission = 0.10 x

Profit = 0.15 x

Takings = Cost before commission and profit + Commission + Profit

Therefore, x = 1,23,300 + 0.10 x + 0.15 x

0.75x = 1,23,300

x = ₹ 1,64,400

Commission = 0.10 × ₹ 1,64,400 = ₹ 16,440

Profit = 0.15 × ₹ 1,64,400 = ₹ 24,660

Solution 3- RTP Jan 2025

(i) Statement of Expenses of operating a single bus for a year

Particulars	Rate (₹)	Per Bus per annum (₹)
(A) Standing Charges:		
Driver and attendant salary	60,000 p.m	7,20,000
Average Cleaner's salary (50%)	30,000 p.m	1,80,000
Insurance charge	60,000 p.a.	60,000
License fee, taxes etc.	10,160 p.m.	121,920

Average parking charges	36,000 p.a.	3,00,000
Depreciation {(30,00,000-6,00,000)/8}	3,00,000 p.a.	3,00,000
(B) Maintenance Charges:		
Repairs & maintenance including engine oil and lubricants (Working Note 1)	57,120 p.a.	57,120
(C) Operating Charges:		
Diesel (Working Note 2)		11,52,000
Total Cost (A+B+C)		**26,63,040**
Cost per month		**2,21,920**

(ii) **Average cost per students per month:**

A. Student coming from distance of up-to 10 km

$= \frac{Total\ cost\ per\ month}{Total\ no.\ of\ equivalent\ student} = \frac{₹2,21,920}{72^*} =$ ₹ 3,082.22

B. Student coming from a distance beyond 10 km

= ₹ 3,082.22 × 2 = ₹ 6,164.44

*** Considering half fare students as a base**

Full fare students (12 × 2)	24 students
Add: Half fare students (Working Note 3)	12 students
Total Equivalent number of students per month	36 students
Total Equivalent number of students per month (morning + afternoon shift)	72 students

Working Notes:

1. Calculation of Repairs and maintenance cost of a bus:

Distance travelled in a year:
(4 trips × 2 × 20 km. × 30 days × 12 months)
Distance travelled p.a.: 57,600 km.
Repairs and maintenance cost per Bus per annum:

$= \frac{57,600\ km}{5,760\ km}$ × ₹ 5,712 per bus = ₹ 57,120 per annum

2. Calculation of diesel cost per bus per annum:

Distance travelled in a year = 57,600 km
Diesel cost per Bus per annum:

$= \frac{57,600\ km.}{8\ km}$ × ₹ 160 = ₹ 11,52,000

3. Calculation of equivalent number of students per bus:

Seating capacity of a bus	30 students
Occupancy (80% of capacity)	24 students
Half fare students (50% of 24 students)	12 students
Full fare students (50% of 24 students)	12 students

Solution 4-

(i) **Annual Cost Statement of three vehicles**

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

(ii) Cost per km. run

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

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

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

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

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

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

Working Notes:

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

Truck	One way distance in kms	No. of trips	Total distance covered in km per day(with load)	Total distance covered in km per day (up & down)	Load carried per trip / day in tonnes	Total effective tonnes km
	a	b	c = a × b	d = c × 2	e	f = 27/3 × c
1	16	4	64	128	6	576
2	40	2	80	160	9	720
3	30	3	90	180	12	810
Total			234	468	27	2,106

Total kilometre travelled by three trucks in one year
(468 km. × 24 days × 12 months) = 1,34,784
Total effective tonnes kilometre of load carried by three trucks during one year
(2,106 tonnes km. × 24 days × 12 months) = 6,06,528 tonne-km

2. Fixed and variable component of maintenance cost:

Variable maintenance cost per km. = $\frac{Difference\ in\ maintenance\ cost}{Difference\ in\ distance\ travelled}$

=$\frac{₹46,050-₹45,175}{1,60,200\ kms-1,56,700\ kms}$ = ₹ 0.25

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

Solution 5-

(i) Calculation of Absolute Ton-km for the next month:

Journey	Distance in km	Weight- Up (in MT)	Ton-km	Weight- Down (in MT)	Ton-km	Total
	(a)	(b)	(c)=(a)×(b)	(d)	(e)= (a)×(d)	(c)+(e)
Delhi to Kochi	2,700	14	37,800	6	16,200	54,000
Delhi to Guwahati	1,890	12	22,680	0	0	22,680
Delhi to Vijayawada	1,840	15	27,600	0	0	27,600
Delhi to Varanasi	815	10	8,150	0	0	8,150
Delhi to Asansol	1,280	12	15,360	4	5,120	20,480
Delhi to Chennai	2,185	10	21,850	8	17,480	39,330
Total	10,710	73	1,33,440	18	38,800	1,72,240

Total Ton-Km = 1,72,240 ton-km

(ii) Calculation of cost per ton-km:

Particulars		Amount (₹)	Amount (₹)
A.	**Running cost:**		
-	Diesel Cost {₹19.20 × (10,710 × 2)}	4,11,264.00	
-	Engine oil cost $\left(\frac{₹4,200}{13,000\ Km} \times 21,420\ km\right)$	6,920.31	
-	Cost of loading of goods {₹180 × (73+18)}	16,380.00	

- Depreciation {(30,00,000/720,000×21,420km)×4}	3,57,000.00	7,91,564.31
B. Repairs & Maintenance Cost (36,000/10,000×21,420)		77,112.00
C. Standing Charges		
- Drivers' salary (₹24,000 × 4 trucks)	96,000.00	
- Cleaners' salary (₹15,000 × 4 trucks)	60,000.00	
- Supervision and other general exp.	14,000.00	1,70,000.00
Total Cost (A + B + C)		10,38,676.31
Total ton-km		1,72,240
Cost per ton-km		6.03

Solution 6-

	Particulars	Amount in ₹
A	**Operating costs:**	
	Petrol	400
	Oil	170
	Grease	90
	Wages to Driver	550
	Wages to Worker	350
	(A)	1,560
B	**Maintenance Costs:**	
	Repairs	170
	Overhead	60
	Tyres	150
	Garage Charges	100
	(B)	480
C	**Fixed Cost:**	
	Insurance	50
	License, Tax etc	80
	Interest	40
	Other Overheads	190
	Depreciation $\frac{(54,000-36,000)}{5\times12}$	300
	(C)	660
	Total Cost (A + B + C)	2,700

(i) Cost per days maintained = ₹ 2700/30 days = ₹ 90
(ii) Cost per days operated = ₹ 2700/25 days = ₹ 108
(iii) Cost per hours operated = ₹ 2700/300 hours = ₹ 9
(iv) Cost per kilometres covered = ₹ 2700/2500 kms = ₹ 1.08
(v) Cost per commercial tonne kms= ₹ 2700/5000 tonne kms = ₹ 0.54
*Commercial tonne kms = Total distance travelled x Average load
= $\frac{(4\ tonnes + 0\ tonnes)}{2}$ x 2500 kms = 5000 tonne kms

Solution 7-

(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

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

Vehicle type-wise toll fee:

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

Working Note:

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

Sl. No.	Type of vehicle	Daily traffic volume [A]	Weight	Ratio [B]	Equivalent Two-wheeler [A×B]
1.	**Two wheelers**	44,500	0.05	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

Solution 9-

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

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

(ii)

Fare collection (144 passengers x ₹11,670)		16,80,480
Variable costs:		
Fuel	2,28,000	
Food (144 passengers x ₹270)	38,880	
Commission (7.5% of ₹16,80,480)	1,26,036	3,92,916
Contribution		12,87,564
Fixed Costs:		
Lease and Landing Charges	9,12,000	
Salaries of Flight Crew	90,000	10,02,000
Net income per flight		2,85,564

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

Solution 10-

Working Notes:

(1) Calculation of number of patient days

35 Beds × 150 days	=	5,250
25 Beds × 80 days	=	2,000
Extra beds	=	750
Total	=	8,000

Statement of Profitability

Particulars	Amount	Amount
Income for the year (₹ 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (₹ 2,50,000 per month × 12)	30,00,000	
Food to Patients (Variable)	8,80,000	
Other services to patients (Variable)	3,00,000	
Laundry charges (Variable) – (₹)	6,00,000	
Medicines (Variable) – (₹)	7,50,000	
Bed Hire Charges (₹100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (₹ 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × ₹25,000 × 12)	6,00,000	
Nurses (4 persons × ₹ 20,000 × 12)	9,60,000	
Ward Boys (4 persons × ₹ 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses – (₹)	10,80,000	
Administration expenses allocated – (₹)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

(i) Calculation of Contribution per Patient- day

Total Contribution – ₹ 1,03,95,000

Total Patient days – 8,000

Contribution per Patient -day – ₹ 1,03,95,000 / 8,000 = ₹ 1,299.375

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

= ₹ 48,61,000 / ₹1,299.375

= 3,741 patient days

Solution 11-

Workings:

Total occupancy = Occupancy in normal season + Occupancy in off- season

= (20 rooms × 80% × 8 months × 30 days) + (20 rooms × 50% × 4 months × 30 days)

= 3,840 + 1,200 = 5,040 room-days

Total Cost = Variable cost + Fixed cost

= (₹ 500 × 5,040 room-days) + ₹ 53,25,000

= ₹ 25,20,000 + ₹ 53,25,000 = 78,45,000

(a) Calculation of tariff rate per room

Tariff per room per day = (Total cost + 25% Margin on total cost) ÷ Total occupancy

= (₹ 78,45,000 + 19,61,250) ÷ 5,040 = ₹ 1,945.68

(b) Calculation of break-even occupancy

Contribution per day = Tariff – Variable cost = = ₹ 1,945.68 – 500 = ₹ 1445.68

Break-even occupancy = ₹ 53,25,000 ÷ 1445.68 = 3683

Occupancy in normal season = Break-even occupancy – Occupancy in off-season

= 3683 – (20 rooms × 50% × 4 months × 30 days)
= 3683 – 1200 = 2483 room-days
In Percentage = 2483 ÷ 4800 = 51.73%

Solution 12-

Operating cost statement of P Holiday Resorts

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

Computation of profit:
Let ₹ x be the rent for deluxe from.
Equivalent deluxe room days are 90,720 (Refer WN-2)
Total takings = ₹ 90,720x
Profit is 25% of total takings.
Profit = 25% of ₹ 90,720x = ₹ 22,680x

Total takings = Total Cost + Profit
₹ 90,720x = ₹ 16,66,98,000 + ₹ 22,680x
₹ 90,720x - ₹ 22,680x = ₹ 16,66,98,000
₹ 68,040x = ₹ 16,66,98,000
$X = \frac{₹\ 16,66,98,000}{₹\ 68,040}$ =₹ 2,450

Rent to be charged for deluxe room	₹ 2,450
Rent to be charged for super deluxe room = Rent of deluxe room x 2 = ₹ 2,450 x 2	₹ 4,900
Rent to be charged for luxury suite = Rent of Deluxe room x 3 = ₹ 2,450 x 3	₹ 7,350

Working Notes:

1.**Computation of Room Occupancy**

Type of Room	No. of rooms x no. of days x occupancy %	Room days
Deluxe Room	100 rooms x 360 days x 90% occupancy	32,400
Super Deluxe Room	60 rooms x 360 days x 75% occupancy	16,200
Luxury Suite	40 x 360 days x 60% occupancy	8,640
	Total	57,240

2.**Computation of equivalent deluxe room days**

Rent of a 'super deluxe' room is to be fixed at 2 times of 'deluxe room' and 'luxury suite' is 3 times of 'deluxe room'. Therefore, equivalent room days would be:

Type of Room	Room days	Equivalent deluxe room days
Deluxe Room	32,400 x 1	32,400
Super Deluxe Room	16,200 x 2	32,400
Luxury Suite	8,640 x 3	25,920
	Total	90,720

3.**Computation of room attendant's wages:**

Room occupancy days @ ₹ 500 per day = 57,240 days × ₹ 500 per day = ₹ 2,86,20,000

4.**Computation of Depreciation per annum:**

Particulars	Cost (₹)	Rate of Depreciation	Depreciation (₹)
Building	900,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000

Solution 13-

Calculation of room days:

Nature of Room	Occupancy (Room-days)
Deluxe room	5760 (20 x 80% x 360)
Executive room	2160 (10 x 60% x 360)
Suite room	1080 (4 x 75% x 360)

Statement showing Total Profit for each room type

Elements	Deluxe room (₹)	Executive room (₹)	Suite room (₹)	Total (₹)
Room Days	**5760**	**2160**	**1080**	
Revenue	86,40,000	51,84,000	41,04,000	1,79,28,000
Cost				
Housekeeping @ ₹ 280 per room day	16,12,800	6,91,200	4,59,000	27,63,000
Breakfast @ ₹ 150 per person	-	6,48,000	3,24,000	9,72,000
Swimming pool @ ₹ 200 per person	-	-	4,32,000	4,32,000
Salaries to staff (25:35:40)	14,40,000	20,16,000	23,04,000	57,60,000
Electricity expenses (occupancy)	15,36,000	5,76,000	2,88,000	24,00,000
Total cost	45,88,800	39,31,200	38,07,000	1,23,27,000
Profit	**40,51,200**	**12,52,800**	**2,97,000**	**56,01,000**

The solution can also be presented in following way:

Calculation of room days

Particulars	Occupancy during the year		
	Deluxe Room	Executive Room	Suite Room
(i) No. of Rooms	20	10	4
(ii) Occupancy in %	80%	60%	75%
No. of rooms occupied per day	16	6	3
No. of rooms occupied per year	5,760	2,160	1,080

Statement showing Total Profit for each room type

Annual Room Rent	Deluxe Room	Executive Room	Suite Room
Room Rent per day per room	₹ 1,500	₹ 2,400	₹ 3,800
Annual Room Rent (A)	₹ 86,40,000	₹ 51,84,000	₹ 41,04,000
Annual Fixed Expenses			
Staff Salary (25:35:40)	₹ 14,40,000	₹ 20,16,000	₹ 23,04,000
Electricity Expenses (Occupancy)	₹ 15,36,000	₹ 5,76,000	₹ 2,88,000
Total (B)	₹ 29,76,000	₹ 25,92,000	₹ 25,92,000
Housekeeping Expenses	₹ 16,12,800	₹ 6,91,200	₹ 4,59,000
Breakfast Charges		₹ 6,48,000 (2,160 x 2 x 150)	₹ 3,24,000 (1,080 x 2 x 150)
Swimming Pool Charges			₹ 4,32,000 (1,080 x 2 x 200)
Total (C)	₹ 16,12,800	₹ 13,39,200	₹12,15,000
Total Cost (B+C)	₹ 45,88,800	₹ 39,31,200	₹ 38,07,000
Profit	**₹ 40,51,200**	**₹ 12,52,800**	**₹ 2,97,000**

Solution 14- RTP May 2025

Statement of total cost

Particulars	(₹)
Staff salaries	30,20,000
Room attendant's wages (₹ 125 per Room Day for 10,080 Room Days)	12,60,000
Food and beverage costs	20,16,000
Lighting and power	8,60,000
Repairs and renovation	4,94,000
Laundry charges	3,22,000
Building rent	14,40,000
Miscellaneous expenses	6,12,000
Total cost	**1,00,24,000**

Profit is 25% on total taking

∴ Total taking = ₹ 1,00,24,000 + 25% of total taking

Let R be rent for single room

Then 11,520 R = 1,00,24,000 + (0.25 × 11,520 R)

Or, 8,640 R = 1,00,24,000

Or, R = ₹ 1,160 (approx.)

Rent to be charged for single room = ₹ 1,160

Rent for double room ₹ 1,160 · 1.5 = ₹ 1,740

Rent to be charged from Mr. Matrix

Double room rent	₹ 1,740
Add: Power backup charges	₹ 200
	₹ 1,940

Solution 15-

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

Answer 16- May 2025

(i) **Total Equivalent Classic seats per day:**

Type of Seats	Occupied seats per day	Equivalent Classic seats per day
Classic	648 (216 seats x 75% x 4 shows)	648 (648 x 1)
Prime	144 (72 seats x 50% x 4 shows)	288 (144 x 2)
Recliner	36 (18 seats x 50% x 4 shows)	216 (36 x 6)
		1,152

(ii) **Calculation of Ticket Prices for all types of seats:**

Total cost per day = ₹ 77,760

Profit is 25% on total revenue

$$\therefore \text{Total Revenue} = \frac{₹\ 77,760}{75} \times 100 = ₹\ 1,03,680$$

Calculation of Ticket Price for Classic seat per show:

Total Revenue / Equivalent Classic Seats per day = $\frac{1,03,680}{1152}$ = ₹ 90

Ticket Prices for all three types of seats:

Ticket price per show for Classic Seat = ₹ 90

Ticket price per show for Prime Seat = ₹ 90 x 2 = ₹ 180

Ticket price per show for Recliner Seat= ₹ 90 x 6 = ₹ 540

Answer 17-

Service industry	Cost Unit
Oil	Cost per barrel, Cost per gallon/litre
Professional Services	Per service/project, per hour
Education	Per course, per student, per batch, per lecture etc.

Brick-making	Per brick, per thousand bricks
Engineering	Per project, per hour, per job, per contract
Electricity	Per kilowatt-hour (kWh)
Hotel/Catering	Guest Days or Room Days, Per item, per meal etc.
Coal Mining	Per ton, per quintal
Brewing	per gallon/litre, per barrel
Hospital	Patient per day, room per day or per bed, per operation etc.

Solution 1-

Cost Sheet for the product BXE

Sl. No.	Particulars	(₹)	(₹)
(i)	Material Consumed:		
	Raw materials purchased	2,48,00,000	
	Freight inwards	7,50,000	
	Insurance on material procured	15,000	
	Less: Trade discount	(4,50,000)	
	Add: Opening stock of raw materials	27,00,000	
	Less: Closing stock of raw materials	(32,60,000)	2,45,55,000
(ii)	Direct wages		42,00,000
(iii)	Direct expenses:		
	Power & fuel	18,75,000	
	Cost of special drawings	3,60,000	22,35,000
	Prime Cost		**3,09,90,000**
(iv)	Works/ Factory overheads:		
	Rent of factory building (4/5th of 7,00,000)	5,60,000	
	Depreciation on machinery	6,25,000	
	Defective rectification cost	33,600	
	Consumable stores & indirect wages	15,20,000	27,38,600
	Gross works cost		3,37,28,600
	Add: Opening work in process		10,60,000
	Less: Closing work in process		(11,80,000)
	Factory cost		**3,36,08,600**
(v)	Quality control cost		9,00,000
(vi)	Primary packing cost		12,90,000
(vii)	Less: Amount realised from scrap sale		(1,20,600)
	Cost of production		**3,56,78,000**
	Add: Opening stock of finished goods		25,00,000
	Less: Closing stock of finished goods		(28,38,000)
	Cost of Goods Sold		**3,53,40,000**
	Administrative overheads:		
(viii)	Rent of factory building (1/5th of 7,00,000)		1,40,000
	General administrative overheads		17,50,000
	Selling and Distribution overheads:		
(x)	Salary paid to marketing staff		9,60,000
(xi)	Packing cost for transportation		1,84,000
(xii)	Depreciation on delivery vans		1,20,000
	Cost of Sales		**3,84,94,000**

Alternatively, Power and fuel expenses of ₹ 18,75,000 can be taken as a part of factory overhead. Accordingly, prime cost will be 2,91,15,000. However, there will be no change in factory cost, cost of production, cost of goods sold and cost of sales.

Solution 2-

Since 10% units are scrapped.
Units produced (total) is 14,000 (12,600/90%)

Calculation of cost of sales and profit

Particulars	₹
Raw Material (28,000 × ₹ 72)	20,16,000
Wages	8,82,000
Prime Cost	**28,98,000**
Factory overheads	7,05,600
Factory Cost	**36,03,600**
Sale of Scrap (1,400 × ₹ 45)	(63,000)
Cost of Production	**35,40,600**

Less: Closing Stock of finished goods	2,24,800
Cost of goods sold	33,15,800
Add: Administration overheads	4,72,000
Add: Selling & Distribution overheads (₹ 54 x 11,800)	6,37,200
Cost of Sales	**44,25,000**
Sales (11,800 × ₹ 416)	49,08,800
Profit	**4,83,800**

Solution 3-

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**

Solution 4-

Cost Sheet

Particulars	January 2024	February 2024
	33,600 Units	**84,000 Units**
Opening Stock of Raw Material	50,400	1,51,200
Add: Purchases	8,40,000	16,46,400
Less: Closing stock of Raw Material	(1,51,200)	(4,53,600)
Direct materials consumed:	7,39,200	13,44,000
Direct Wages	4,92,800	8,96,000
Direct expenses	2,46,400	4,48,000
Prime Cost	14,78,400	26,88,000
Factory overheads (60% of direct wages)	2,95,680	5,37,600
Factory / Works Cost	17,74,080	32,25,600
Add: Administration overhead (Production)	2,01,600	2,01,600
Cost of Production / Cost of goods sold	19,75,680	34,27,200
Add: Fixed selling and distribution Overhead	1,68,000	1,68,000
Variable distribution overheads (₹ 1.5 per unit)	50,400	1,26,000
- Sponsorship cost	-	1,05,000
- Hi tea programme	-	1,05,000
- Special gifts (84,000 x 1/12 x 105)	-	7,35,000
- Lucky draw prize *	-	2,52,000
Cost of sales / Total Cost	21,94,080	49,18,200
Profit (Balancing figure)	1,17,600	2,05,800
Sales revenue	23,11,680	51,24,000

***Lucky draw prize:**

	Amount (₹)
1st Prize	1,00,000

2nd Prize	80,000
3rd Prize	40,000
Consolation Prizes (4 × ₹ 8,000)	32,000
Total	2,52,000

Working note :
Calculation of opening and costing stock of Raw Material
January

Units Manufactured = 84,000 x 40% = 33,600 units
Prime Cost = 33,600 x 44 = ₹ 14,78,400
Raw Material consumed = ₹ 14,78,400 X 3/6 = ₹ 7,39,200
Raw Material purchase (given) = ₹ 8,40,000
Let closing stock of Raw Material be x
Opening stock of Raw Material be 1/3x
Opening Stock + Purchase – closing stock = Raw Material consumed
1/3x + ₹ 8,40,000 – x = ₹ 7,39,200
1/3x – x = ₹ 7,39,200 – ₹ 8,40,000
2/3x = ₹ 1,00,800
x = ₹ 1,51,200 (closing stock)
Opening stock = ₹ 1,51,200 x 1/3 = ₹ 50,400

February

Prime Cost = 84,000 x 32 = ₹ 26,88,000
Raw Material consumed = ₹ 26,88,000 x 3/6 = ₹ 13,44,000
Raw Material purchased (given) = ₹ 16,46,400
Opening Stock + Purchase – closing stock = Raw Material consumed
₹ 1,51,200 + ₹ 16,46,400 – closing stock = ₹ 13,44,000
Closing stock = ₹ 4,53,600

Answer 5- Jan 2025

(a) **Cost Sheet**

Particulars	(₹)	(₹)
Material Consumed:		
Raw materials purchased	8,00,000	
Freight inwards (2% of Raw materials purchased)	16,000	
Add: Opening stock of raw materials	3,40,000	
Less: Closing stock of raw materials	(1,80,000)	9,76,000
Direct employee (labour) cost:		
Wages paid to factory workers	6,30,000	
Production bonus paid to factory workers (10%)	63,000	6,93,000
Direct expenses:		
Job charges paid to job workers	41,000	41,000
Prime Cost		**17,10,000**
Works/ Factory overheads:		
Depreciation on factory building (21,87,000 x 10%)	2,18,700	
Depreciation on plant & machinery (11,56,000 x 15%)	1,73,400	
Insurance premium paid for plant & machinery (15,00,000 x 2%)	30,000	
Insurance premium paid for factory building (25,00,000 x 2%)	50,000	
Salary paid to supervisors	6,17,900	10,90,000
Gross factory cost		**28,00,000**
Add: Opening value of W-I-P		5,50,000
Less: Closing value of W-I-P		(3,50,000)
Factory Cost		**30,00,000**
Quality control cost:		
Expenses paid for quality control check activities	4,30,000	4,30,000
Administration cost related with production:		
Salary paid to Production control manager	7,20,000	7,20,000

Less: Realisable value on sale of scrap and waste		(50,000)
Add: Primary packing cost		3,00,000
Cost of Production		**44,00,000**
Add: Opening stock of finished goods (80,000 units)		8,00,000
Less: Closing stock of finished goods (70,000 units)		(7,00,000)
Cost of Goods Sold		**45,00,000**
Administrative overheads:		
Depreciation on office building (36,00,000 x 10%)	3,60,000	
Salary paid to General Manager	12,40,000	
Fee paid to independent directors	5,00,000	
Selling Overheads (4,50,000 units x ₹2):	9,00,000	30,00,000
Cost of Sales		**75,00,000**
Profit (25% on cost)		18,75,000
Sales		**93,75,000**

Working Note: Calculation of value of closing finished goods.

Number of units produced = units sold + closing stock – opening stock
= 4,50,000 + 70,000 – 80,000
= 4,40,000 units

Per unit cost $= \frac{Cost\ of\ production}{Number\ of\ units\ produced}$

$= \frac{₹\ 44,00,000}{4,40,000\ units}$ = ₹ 10 per unit

Value of Closing stock = ₹ 10 x 70,000 units = ₹ 7,00,000

Answer 6-

(a) **Preparation of Cost Sheet for FY 2024-25**

Particulars	Max (₹)	Pro (₹)	Total (₹)
Direct materials	42,000	63,000	1,05,000
Direct wages (Working note- (i))	55,000	66,000	1,21,000
Prime cost	**97,000**	**1,29,000**	**2,26,000**
Work overhead (50% of labour cost)	27,500	33,000	60,500
Factory Cost/Work Cost	**1,24,500**	**1,62,000**	**2,86,500**
Administration/Office Overhead (20 % of work cost)	24,900	32,400	57,300
Cost of production	**1,49,400**	**1,94,400**	**3,43,800**
Less: Closing stock (Working note- (ii))	(59,760)	(38,880)	(98,640)
Cost of goods sold	**89,640**	**1,55,520**	**2,45,160**
Selling and distribution overhead	27,000 (₹ 30 x 900)	57,600 (₹ 20 x 2,880)	84,600
Cost of sales/ Total cost	1,16,640	2,13,120	3,29,760
Profit (20% on sales or 25% of cost)	29,160	53,280	82,440
Sales value	1,45,800	2,66,400	4,12,200
Selling price per unit	**162**	**92.5**	

Working Notes:

(i) Direct labour cost per unit of Pro = M
Direct labour cost per unit of Max = 2M
Total Direct labour cost = M x 3,600 units + 2M × 1,500 units
₹1,21,000 = 3,600 M + 3,000 M
M = ₹ 18.333
Therefore, Direct labour Cost per unit of Max
= 2 x ₹ 18.33 = ₹ 36.667
Total labour cost of Pro = ₹ 18.333 x 3,600 units
= ₹ 66,000
Total labour cost of Max = ₹ 36.667 x 1,500 units
= ₹ 55,000

(ii) Value of closing stock

Particulars	Max (units)	Pro (units)

No. of units produced	1,500	3,600
No. of units sold	60% of 1,500 = 900	80% of 3,600 = 2,880
Closing Stock	600	720

Max = (1,49,400/1,500) x 600 = ₹ 59,760
Pro = (1,94,400/3,600) x 720 = ₹ 38,880
Note: If a student assumes Office overheads as general overheads, then it will be part of cost of sales.

Solution 7-

(a) **Statement of total cost and Sales**

Particulars	**Amount (₹)**
Direct Material ($\frac{15,00,000}{3,000}$ x 4,000) x 110%	22,00,000
Direct Labour ($\frac{6,00,000}{3,000}$ x 4,000) x 115%	9,20,000
Factory Overheads:	
Variable (4,000 x 100)	4,00,000
Fixed (50,000 x 80%)	40,000
Total Cost	35,60,000
Profit (Bal. Fig)	4,40,000
Sales (35,60,000/89%)	40,00,000
No of units	4,000
Selling Price per unit	1,000

Calculation of fixed and variable factory overhead

Variable Factory overhead (per unit) = $\frac{4,30,000 - 3,50,000}{3,800 - 3,000}$ = ₹ 100

Fixed factory overheads {3,50,000 - (3,000 x 100)} = ₹ 50,000

Solution 8-

Preparation of Cost Sheet for 'silicon' phone covers

No. of units produced = 1,00,000 units
No. of units sold = 90,000 units

Particulars	**Per unit (₹)**	**Total (₹)**
Direct Materials (Working note- (i))	40.00	40,00,000
Direct Wages (Working note - (ii))	20.00	20,00,000
Prime Cost	60.00	60,00,000
Production Overhead (Working note - (iii))	8.00	8,00,000
Factory Cost	68.00	68,00,000
Administration Overhead (50% of Production Overhead)	4.00	4,00,000
Cost of Production	72.00	72,00,000
Less: Closing stock (1,00,000 units - 90,000 units)	-	(7,20,000)
Cost of Goods Sold i.e. 90,000 units	72.00	64,80,000
Selling cost	8.00	7,20,000
Cost of Sales / Total Cost	**80.00**	**72,00,000**
Profit	**60.00**	**54,00,000**
Sales Value (₹140 x 90,000 units)	140.00	1,26,00,000

Working Notes:

(i) Direct material cost per unit of 'plastic' phone cover = M
Direct material cost per unit of 'silicon' phone cover = 2M
Total Direct Material Cost = 2M × 1,00,000 units + M × 3,00,000 units
Or, ₹ 1,00,00,000 = 2,00,000 M + 3,00,000 M
Or, M = $\frac{₹1,00,00,000}{5,00,000}$ = ₹ 20
Therefore, Direct material Cost per unit of 'silicon' phone cover = 2 × ₹ 20 = ₹ 40

(ii) Direct wages per unit for 'silicon' phone cover = W
Direct wages per unit for 'plastic' phone cover = 0.6W
So, (W x 100,000) + (0.6W x 3,00,000) = ₹ 56,00,000
Or, 1,00,000 W + 1,80,000 W = ₹ 56,00,000

Or, W = $\frac{₹56,00,000}{2,80,000}$ = ₹ 20 per unit

Therefore, Direct wages per unit of 'silicon' phone cover = ₹ 20

(iii) Production overhead per unit = $\frac{₹32,00,000}{(1,00,000+3,00,000)}$ = ₹ 8

Production overhead for 'silicon' phone cover = ₹ 8 × 1,00,000 units = ₹ 8,00,000

Solution 9-

Profit and Loss Statement of EVS & Co. for the year ended 31st March

Particulars	(₹)	(₹)
Gross Sales	1,35,21,600	
Less: Returns and rebates	(1,91,800)	1,33,29,800
Less: Cost of Sales [See Schedule (i)]		**(1,20,21,887)**
Net Operating Profit		13,07,913
Less: Cash discount allowed on sales		(1,17,820)
Net Profit		**11,90,093**

(i) Schedule of Cost of Sales

Particulars	(₹)	(₹)
Raw Material (Inventory opening balance)		19,18,000
Add: Material Purchased	43,84,000	
Add: Freight on Material	2,19,200	
Less: Purchase Returns	(65,760)	45,37,440
		64,55,440
Less: Closing Raw Material Inventory		(24,66,000)
Materials consumed in Production		39,89,440
Direct employee cost (₹ 21,92,000 + ₹ 1,09,600)		23,01,600
Prime Cost		**62,91,040**
Factory Overheads:		
Indirect employee cost	2,46,600	
Drawing and Designing cost	1,37,000	
Repairs and maintenance of factory	1,91,800	
Heat, Light and Power (₹ 8,90,500 × 70%)	6,23,350	
Pollution Control Expenses	2,56,190	
Depreciation of Plant (40% of ₹ 63,08,850)	25,23,540	
Depreciation of Building (10% of ₹ 27,40,000 × 70%)	1,91,800	41,70,280
Gross Works Cost		**1,04,61,320**
Add: Opening Work-in-Process inventory		27,40,000
Less: Closing Work-in-Process inventory		(26,30,400)
Cost of production		**1,05,70,920**
Add: Opening Finished Goods inventory		10,96,000
Less: Closing Finished Goods inventory		(15,75,500)
Cost of Goods Sold		**1,00,91,420**
Add: Administration Expenses [See Schedule (iii)]		4,25,522
Add: Selling and Distribution Expenses [See Schedule (ii)]		15,04,945
Cost of Sales		**1,20,21,887**

Note: Cash discount allowed on sales will not form part of Cost Sheet.

(ii) **Schedule of Selling and Distribution Expenses**

Particulars	(₹)
Sales Commission	4,60,320
Sales Promotion	3,08,250
Distribution Deptt. - Salaries and Expenses	2,46,600
Heat, Light and Power (₹ 8,90,500 x 15%)	1,33,575
Depreciation of Building (10% of ₹ 27,40,000 × 15%)	41,100

Packing Cost to make the product marketable	3,15,100
	15,04,945

(iii) **Schedule of Administration Expenses**

Particulars	(₹)
Office Salaries and Expenses	1,17,820
Depreciation of Office Appliances (₹ 2,38,380 x 15%)	35,757
Depreciation of Building (10% of ₹ 27,40,000 × 15%)	41,100
Heat, Light and Power (₹ 8,90,500 x 15%)	1,33,575
Printing and Stationery expenses	89,050
Bank Charges paid	8,220
	4,25,522

Answer 10-

(i) Calculation of Contribution per unit of good units

	Total Amount (₹)	Per Unit (₹)
Selling Price	48,50,000	250.00
Direct Material Cost	24,00,000	
Direct Labour Cost	16,50,000	
Variable Overhead (₹120 x 3,000 hours)	3,60,000	
Total Variable Cost	44,10,000	220.50
Less: Scrap Value of Rejected Units (₹ 75 x 20,000 x 3%)	45,000	
Net Variable Cost	43,65,000	225.00
Contribution per good units	4,85,000	25.00

Working Note:

Number of units manufactured in a month = Number of batches x number of units in a batch
= 10 x 2,000 = 20,000 units

Number of good units sold = 20,000 units x 97% = 19,400 units

(ii) Calculation of Company's total monthly profit

	Total Amount (₹)
Contribution	4,85,000
Less: Fixed Cost	1,25,000
Total Monthly Profit	**3,60,000**

Solution 11-

Statement of Cost and Profit per unit of each batch order

		October	November	December	Total
a)	Batch Output (Nos.)	2,500	3,000	2,000	7,500
b)	Sales Value (@ ₹15 per unit)	(₹) 37,500	(₹) 45,000	(₹) 30,000	(₹) 1,12,500
Cost					
Material		12,500	18,000	10,000	40,500
Wages		5,000	6,000	4,000	15,000
Overheads (working note)		7,500	6,000	6,000	19,500
c)	Total	25,000	30,000	20,000	75,000
d)	Profit per batch (b) - (c)	12,500	15,000	10,000	37,500
e)	**Cost per unit (c) / (a)**	**10**	**10**	**10**	
f)	**Profit per unit (d) / (a)**	**5**	**5**	**5**	

Overall Position of the Order for 6,000 Units

Particulars	Amount (₹)
Sales value (6,000 units x ₹15)	90,000
Less: Total cost (6,000 units x ₹10)	60,000
Profit	**30,000**

Working Note:

Calculation of overhead per hour

Particulars	October	November	December
i. Labour hours:			
$=\frac{Labour\ cost}{Labour\ rates\ per\ hour}$	$\frac{₹5,000}{2}$ ₹=2,500 hrs.	$\frac{₹6,000}{2}$=3,000 hrs.	$\frac{₹4,000}{2}$ = 2,000 hrs.
ii. Overhead per hour:			
$=\frac{Total\ Overheads}{Total\ labour\ hour}$	$\frac{₹24,000}{8,000\ hrs.}$ =₹3	$\frac{₹18,000}{9,000\ hrs.}$ = ₹2	$\frac{₹30,000}{10,000\ hrs.}$ = ₹3
iii. Overhead for the batch (i) x (ii)	₹7,500	₹6,000	₹6,000

Solution 12-

Job cost Sheet

Particulars	**Amount (₹)**
Direct materials	1,330.00
Direct wages:	
Deptt. X ₹ 47.50 × 8 hrs. = ₹ 380	
Deptt. Y ₹ 47.50 × 6 hrs. = ₹ 285	
Deptt. Z ₹ 47.50 × 4 hrs. = ₹ 190	855.00
Chargeable expenses	95.00
Prime cost	**2,280.00**
Overheads:	
Deptt. X = $\frac{₹\ 95,000}{₹\ 1,90,000}$ x 100 = 50% of ₹ 380 = ₹ 190.00	
Deptt. y = $\frac{₹\ 171,000}{₹\ 2,28,000}$ x 100 = 75% of ₹ 285= ₹ 213.75	
Deptt. Z = $\frac{₹\ 38,000}{₹\ 1,52,000}$ x 100 = 25% of ₹ 190= ₹ 47.50	451.25
Works cost	**2,731.25**
Selling expenses= $\frac{₹\ 3,80,000}{₹\ 38,00,000}$ x 100 = 10% of work cost	273.13
Total cost	3,004.38
Profit (20% of total cost)	600.88
Selling price	3,605.26 14.

Solution 1-

Journal entries are as follows:

Particulars	Dr. (₹)	Cr. (₹)
1. Finished stock ledger Control A/c Dr. To Work-in-progress Control A/c	2,10,835	 2,10,835
2. Manufacturing Overhead Control A/c Dr. To Cost Ledger Control A/c	91,510	 91,510
3. Stores Ledger Control A/c Dr. To Cost Ledger Control A/c	1,23,000	 1,23,000
4. (i) Wage Control A/c Dr. To Cost Ledger Control A/c (ii) Work-in-progress Control A/c Dr. To Wage Control A/c (iii) Manufacturing Overhead Control A/c Dr. To Wage Control A/c	72,195 50,530 21,665	 72,195 50,530 21,665
5. Cost of Sales A/c Dr. To Finished Stock Ledger A/c	1,85,890	 1,85,890
6. Work-in-Progress Control A/c Dr. To Stores Ledger Control A/c	1,27,315	 1,27,315
7. Finished Stock Ledger Control A/c Dr. To Cost of Sales A/c	5,380	 5,380
8. Cost Ledger Control A/c Dr. To Stores Ledger Control A/c	2,900	 2,900
9. Work-in-Progress Control A/c Dr. To Manufacturing Overhead Control A/c	77,200	 77,200

COST LEDGER

Cost Ledger Control Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Stores Ledger Control A/c (return)	2,900	By Balance b/d	6,65,220
To Balance c/d	9,49,025	By Manufacturing Overhead Control A/c	91,510
		By Stores Ledger Control A/c	1,23,000
		By Wage Control A/c	72,195
	9,51,925		**9,51,925**

Stores Ledger Control Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	3,01,435	By Work-in-Progress Control A/c	1,27,315
To Cost Ledger Control A/c	1,23,000	By Cost Ledger Control A/c	2,900
		By Balance c/d	2,94,220
	4,24,435		**4,24,435**

Work-in-Progress Control Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	1,22,365	By Finished Stock Ledger Control A/c	2,10,835
To Wage Control A/c	50,530	By Balance c/d	1,66,575

To Stores Ledger Control A/c	1,27,315		
To Manufacturing Overhead Control A/c	77,200		
	3,77,410		**3,77,410**

Finished Stock Ledger Control Account

Particulars	Amount (₹)	Particulars	Amount (₹)
		By Cost of Sales A/c	
To Balance b/d	2,51,945		1,85,890
To Work-in-Progress Control A/c	2,10,835	By Balance c/d	2,82,270
To Cost of Sales A/c (return at cost)	5,380		
	4,68,160		**4,68,160**

Manufacturing Overhead Control Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Cost Ledger Control A/c	91,510	By Balance b/d	10,525
		By Work-in-Progress Control A/c	77,200
To Wage Control A/c	21,665	By Balance c/d (under recovered)	25,450
	1,13,175		**1,13,175**

Wage Control Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Cost Ledger Control A/c	72,195	By Work-in-Progress Control A/c	50,530
		By Manufacturing Overhead Control A/c	21,665
	72,195		**72,195**

Cost of Sales Account

Particulars	Amount (₹)	Particulars	Amount (₹)
To Finished Stock Ledger Control A/c	1,85,890	By Finished Stock Ledger Control A/c (Return)	5,380
		By 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-Progress 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**

Solution 2-

(a) **Cost Ledger Control Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Costing Profit & Loss A/c (Sales)	3,00,000	By Balance b/d	98,000

To Stores Ledger Control A/c	3,000	By Stores Ledger Control A/c	95000
To Balance c/d	95,000	By Wages Control A/c (Productive wages + Indirect wages)	65000
		By Factory Overhead Control A/c	50,000
		By Selling & Administration Overhead Expenses	40,000
		By Costing Profit & Loss A/c	50,000
	3,98,000		3,98,000

(b) **Stores Ledger Control Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	35,000	By Cost Ledger Control A/c	3,000
To Cost Ledger Control A/c	95,000	By Work-in-Progress Control A/c	98,000
To Work-in-Progress Control A/c	3,000	By Balance c/d	32,000
	1,33,000		**1,33,000**

(c) **Work-in-Progress Control Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	38,000	By Stores Ledger Control A/c	3,000
To Stores Ledger Control A/c	98,000	By Finished Goods A/c	2,13,000
To Wages Control A/c	40,000	By Balance c/d	20,000
To Factory Overhead Control A/c	60,000		
	2,36,000		**2,36,000**

(d) **Finished Goods Control Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Balance b/d	25,000	By Cost of goods sold A/c	2,10,000
To Work-in-Progress Control A/c	2,13,000	By Balance c/d	28,000
	2,38,000		**2,38,000**

(e) **Factory Overhead Control Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Wage Control A/c (Indirect Labour)	25,000	By Work-in-Progress A/c (150% of ₹40,000)	60,000
To Cost Ledger Control A/c	50,000	By Balance c/d	15,000
	75,000		**75,000**

(f) **Costing Profit and Loss Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Cost of Goods Sold A/c	2,10,000	By Cost Ledger Control A/c (Sales)	3,00,000
To Selling and Administration Overhead A/c	40,000		
To Cost Ledger Control A/c (Costing profit - balancing fig.)	50,000		
	3,00,000		**3,00,000**

(g) **Trial Balance (as at 30th April, 2008)**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Stores Ledger Control A/c	32,000		
To Work-in-Progress Control A/c	20,000		
To Finished Goods Control A/c	28,000		
To Factory Overhead Control A/c	15,000	By Cost Ledger Control A/c	95,000
	95,000		**95,000**

Working Notes:

(1) **Wages Control Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Cost Ledger Control A/c	65,000	By Work-in-Progress Control A/c	40,000
		By Factory Overhead Control A/c	25,000
	65,000		**65,000**

(2) **Cost of Goods Sold Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Finished Goods Control A/c	2,10,000	By Costing Profit & Loss A/c	2,10,000
	2,10,000		**2,10,000**

(3) **Selling & Administrative Expenses Account**

Particulars	Amount (₹)	Particulars	Amount (₹)
To Cost Ledger Control A/c	40,000	By Costing Profit & Loss A/c	40,000
	40,000		**40,000**

Solution 3- Sept 2025

Journal entries are as follows:

			Dr.	Cr.
			(₹)	(₹)
1.	Stores Ledger Control A/c	Dr.	10,25,000	
	To Cost Ledger Control A/c			10,25,000
	(Materials purchased)			
2.	OR	Dr.	10,25,000	
	Material Control A/c	Dr.		10,25,000
	To Cost Ledger Control A/c	Dr.		
	Stores Ledger Control A/c		10,25,000	
	To Material Control A/c			10,25,000
	Work-in-Process Control A/c			
	To Store Ledger Control A/c		5,55,000	
	(Materials issued to production)			5,55,000
3.	Work-in-Process Control A/c	Dr.	3,00,000	
	To Wages Control A/c			3,00,000
	(Direct wages charged to production)			
4.	Factory Overheads Control A/c	Dr.	2,20,000	
	To Costing Profit & Loss A/c			2,20,000
	(Factory overheads over absorbed)			
5.	Costing Profit & Loss A/c	Dr.	1,40,000	
	To Administrative Overhead Control A/c			1,40,000
	(Admin overheads under absorbed)			

Solution 4-

Journal entries are as follows

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

Solution 5-

(b) **Journal Entries under Integrated system of accounting**

Particulars		(₹)	(₹)
(i) Work-in Progress Ledger Control A/c Dr.		1,60,000	
Factory Overhead control A/c	Dr.	40,000	
To Wages Control A/c			2,00,000
(Being allocation of Direct and Indirect wages)			
(ii) Wages Control A/c	Dr.	2,00,000	
To Bank A/c			2,00,000
(Being wages paid)			
(iii) Cost of Sales A/c	Dr.	50,000	
To Selling & Distribution Overhead Control A/c			50,000
(Being selling & distribution overhead allocated)			
(iv) Selling & Distribution Overhead Control A/c	Dr.	50,000	
To Bank A/c			50,000
(Being selling & distribution overhead paid)			
(v) Factory overhead control A/c	Dr.	80,000	
To Stores Ledger Control A/c			80,000
(Being normal deficiency found in stock of raw material)			
(vi) Costing Profit & Loss A/c	Dr.	60,000	
To Factory Overhead Control A/c			60,000
(Being transfer of under absorption of factory overhead)			

Solution 6-

(i) **Stores Ledger Control Account**

		(₹)			(₹)
To	Balance b/d	4,83,250	By	Work in Process Control A/c	5,79,900
”	Creditors/ Bank A/c	14,49,750	”	Balance c/d	13,53,100
		19,33,000			**19,33,000**

(ii) **Wages Control Account**

		(₹)			(₹)
To	Bank A/c	5,79,900	By	Work in Process Control A/c (Charged to batches)	3,86,600
			,,	Production Oh Control A/c (Indirect wages) (1/6th of ₹ 5,79,900)	96,650
			”	Production Oh Control A/c (Non-productive wages) [1/5th of (₹ 5,79,900 -₹ 96,650)]	96,650
		5,79,900			**5,79,900**

(iii) **Production Overhead Control Account**

		(₹)			(₹)
To	Bank A/c	2,31,960	By	Work-in-Process Control A/c (130% of ₹ 3,86,600)	5,02,580
”	Wages Control A/c (₹ 96,650 +₹ 96,650)	1,93,300			
”	Costing P&L A/c (Over-absorption, balancing figure)	77,320			
		5,02,580			**5,02,580**

(iv) **Work-in-Process Control Account**

		(₹)			(₹)
To	Balance b/d	3,86,600	By	Finished Goods Control A/c	12,56,450
”	Store Ledger Control A/c	5,79,900	”	Balance c/d (Physical value)	7,73,200
”	Wages Control A/c	3,86,600			
”	Production OH Control A/c	5,02,580			
”	Costing P&L A/c (Stock Gains)	1,73,970			
		20,29,650			**20,29,650**

(v) **Finished Goods Control Account**

		(₹)			(₹)
To	Balance b/d	6,76,550		By Costing Profit & Loss A/c (Cost of Goods Sold)	15,46,400
”	Work-in-Process Control A/c	12,56,450		” Balance c/d	3,86,600
		19,33,000			**19,33,000**

(vi) **Costing Profit & Loss Account**

		(₹)			(₹)
To	Finished Goods Control A/c	15,46,400		By Sales A/c	19,33,000
”	Balance c/d	6,37,890	”	Production OH Control A/c	77,320
			”	Work-in-Process Control A/c (Stock gain)	1,73,970
		21,84,290			21,84,290

Solution 7-

Statement of Reconciliation of profit as obtained under Cost and Financial Accounts

	(₹)	(₹)
Profit as per cost records		**5,40,400**
Add: Administrative Overhead over absorbed	24,000	
Interest & Dividend Received	65,200	
Notional rent of own premises	60,000	
Stores adjustments (Credited in financial books)	7,500	
Depreciation over charged in cost accounts	40,000	1,96,700
		7,37,100
Less: Factory overheads under absorbed	84,800	
Interest paid on bank borrowings	50,000	
Lossed on sale of fixed assets and investments	48,000	
Donations and subscriptions	18,800	
Over-valuation of closing stock of finished goods in cost accounts	1,25,000	
Income tax	1,50,000	(4,76,600)
Profit as per Financial Records		**2,60,500**

(ii) Circumstances where reconciliation statement can be avoided:
When the Cost and Financial Accounts are integrated - there is no need to have a separate reconciliation statement between the two sets of accounts. Integration means that the same set of accounts fulfil the requirement of both i.e., Cost and Financial Accounts.

Solution 8-

Reconciliation Statement

	(₹)	(₹)
Profit (loss) as per Financial Accounts		2,25,000
Add:		
Preliminary expenses written off	35,000	
Expenses on issue of shares in financial accounts	30,000	

Under recovery of administration overheads in cost accounts	25,000	
Under recovery of selling overheads in cost accounts	35,000	
		1,25,000
Less:		
Factory Overheads Over charged in cost accounts	20,000	
Undervaluation of closing stock in cost accounts	65,000	
Interest on Bank Deposits	60,000	
Notional Rent of own premises charged in cost accounts	30,000	
Bad debts recovered in financial accounts	50,000	
		(2,25,000)
Net Profit as per Cost Accounts		**1,25,000**

Solution 9- RTP Jan 2025

Statement of Reconciliation

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

Particulars	(₹)	(₹)
Net profit as per Cost Accounts		57,71,840
Add: Under valuation of closing stock in cost accounts	1,64,000	
Rent received credited in financial accounts	87,200	2,51,200
		60,23,040
Less: Under recovery of selling overheads in cost accounts	1,16,800	
Bad debts provided in financial accounts	52,000	
Income tax provided in financial accounts	2,54,400	
Under recovery of administration overheads in cost accounts	1,50,400	5,73,600
Profit as per Financial Accounts		**54,49,440**

Solution 10-

Memorandum Reconciliation Accounts

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

Solution 11-

(i) **Costing Profit & Loss Statement**

Particulars	Amount (₹)
Raw Materials	32,50,000
Direct Wages	21,75,000
Prime Cost	**54,25,000**
Add: Production Overheads (25% of Prime Cost)	13,56,250
Factory Cost	**67,81,250**
Less: Work-in-Progress	(1,32,500)
Manufacturing Cost Incurred During the Period	**66,48,750**
Add: Administration Overheads (₹14.75 x 42,000 units)	6,19,500
Cost of Production	**72,68,250**

Less: Closing Finished Goods (2,000 units x ₹ 173.05)	(3,46,100)
Cost of Goods Sold	**69,22,150**
Add: Selling & Distribution Overheads (₹11.50 x 40,000 units)	4,60,000
Cost of Sales	**73,82,150**
Profit (Balancing Figure)	18,17,850
Sales (40,000 units)	**92,00,000**

(ii) **Control Accounts**

Production Overheads A/c

Particulars	Amount (₹)	Particulars	Amount (₹)
To General Ledger Adjustment A/c	11,20,000	By WIP A/c (absorbed)	13,56,250
To Overhead Adjustment A/c (Over-absorption)	2,36,250		
Total	**13,56,250**	**Total**	**13,56,250**

Administration Overheads A/c

Particulars	Amount (₹)	Particulars	Amount (₹)
To General Ledger Adjustment A/c	6,25,000	By Finished Goods A/c	6,19,500
		By Overhead Adjustment A/c (Under-absorption)	5,500
Total	**6,25,000**	**Total**	**6,25,000**

Selling & Distribution Overheads A/c

Particulars	Amount (₹)	Particulars	Amount (₹)
To General Ledger Adjustment A/c	4,60,000	By Cost of Sales A/c	4,60,000
Total	**4,60,000**	**Total**	**4,60,000**

(iii) **Reconciliation Statement**

Particulars	Amount (₹)	Amount (₹)
Profits as per Cost Accounts		18,17,850
Add:		
– Production Overheads – over-absorbed	2,36,250	
– Dividend received	5,25,000	
– Interest from bank deposits	1,20,000	
– Write-down of Finished Stock (3,90,000 – 3,46,100)	43,900	
Total Additions		**9,25,150**
Less:		
– Administration Overheads – under- absorbed	5,500	
– Preliminary expenses written off	30,000	
– Goodwill written off	55,000	
– Fines	10,000	
– Interest on term loan	18,000	
– Loss on sale of equipment	20,000	
– Taxation	2,25,000	
Total Deductions		**3,63,500**
Profit as per Financial Accounts		**23,79,500**

Solution 12-

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

Workings:

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

Cost Sheet

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

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

Statement of Reconciliation
(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		1,48,891
Add: Factory overheads over absorbed (₹ 2,79,000 – ₹ 2,65,000)	14,000	
S & D overheads over absorbed (₹ 72,500 - ₹ 65,000)	7,500	
Opening stock overvalued (₹ 91,875 – ₹ 76,525)	15,350	

Interest received	18,500	
Rent received	72,000	1,27,350
		2,76,241
Less: Administration overheads under recovery (₹ 3,15000 – ₹ 3,02,560)	12,440	
Closing stock overvalued (₹ 48,626 – ₹ 43,250)	5,376	
Goodwill written off	95,000	
Income tax paid	72,000	
Bad debts	21,000	2,05,816
Profit as per financial accounts		**70,425**

Answer 13- May 2025

(a) (i) Statement of Reconciliation of profit as obtained under Cost and Financial Accounts

		(₹)	(₹)
	Net Loss as per Cost Records		**(9,000)**
Add:	Excess of Material Consumption (see below)	8,300	
	Factory Overhead over-absorbed (₹ 52,000 - ₹ 45,000)	7,000	
	Selling & Distribution Overhead over absorbed	6,000	
	Dividend Received	9,000	
	Depreciation over-charged (₹ 45,000 - ₹ 42,000)	3,000	33,300
			24,300
Less:	Administration Overhead under-absorbed	7,500	
	Interest on Loan	8,800	
	Over-valuation of Closing Stock of Finished Goods (₹ 41,000 - ₹ 40,000)	1,000	(17,300)
	(₹ 80 p.u. x 500 units = ₹ 40,000 in financial accounts)		
	Profit as per Financial Records		**7,000**

(ii) Statement showing calculation of excess of material consumption in cost accounts:

		(₹)	(₹)
	Net Loss as per Cost Records		**(9,000)**
Add:	Excess of Material	X	
	Consumption Factory Overhead over-absorbed	7,000	
	Selling & Distribution Overhead over-absorbed	6,000	
	Dividend Received	9,000	
	Depreciation over-charged	3,000	X + 25,000
			X + 16,000
Less:	Administration Overhead under absorbed	7,500	
	Interest on Loan	8,800	
	Over-valuation of Closing Stock of Finished Goods	1,000	(17,300)
	Profit as per Financial Records		X -1,300

Therefore, x – 1,300 = 7,000
Or x = 7,000 + 1,300 = 8,300
Excess of material consumption during the period in cost accounts is ₹ 8,300.

Material Costing

Solution 2-

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

Where, A= Annual demand for the material CEE = 1,94,400 Kgs
O = Ordering cost = ₹ 150
C = Carrying cost per unit per annum = 6% of ₹ 300 = 18

EOQ = $\sqrt{\frac{2\times1,94,400\times150}{18}}$ = **1,800 Units (Kgs.)**

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

ROL = 740 × 8 = **5,920 Kg.**
# Maximum Consumption = Average consumption +200 kg
= $\frac{1,94,400}{360}$ + 200 = 540 + 200 Kg = 740 Kg.
Maximum lead time = 8 days

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

= 1,800 + 5,920 – (340×4)
= 7,720 – 1,360 = **6,360 Kg**
*Minimum consumption = 2 × Average consumption – Maximum Consumption
= 2 × 540 – 740
= 1080 – 740 = 340 kg.

Solution 3-

(i) **Calculation of Economic Order Quantity**

EOQ == 6,000 units
Where,
A = Annual Demand = 3,60,000 units
O = Ordering cost per order = ₹1200
C = Inventory carrying cost per unit per annum = 10% of ₹240 = ₹ 24

(ii) **Re-order Level = Safety Stock + Lead Time Consu**mption

= 6,500 + (1,000 x 45) units = 51,500 units
Or,
Minimum level of cycle locks + [Average rate of consumption × Average time required to obtain fresh delivery]
= 6,500 + (1,000 x 45) units = 51,500 units

(iii) **Evaluation of Profitability of Different Options of Order Quantity**

(a) When EOQ is ordered (order size of 6,000 units)

		(₹)
Purchase Cost	(3,60,000 units × ₹240)	8,64,00,000
Ordering Cost	[(3,60,000 units/6,000 units)×₹1,200]	72,000
Carrying Cost	(6,000 units × ₹240 × 1/2 × 10/100)	72,000
Total Cost		**8,65,44,000**

(b) When Quantity Discount is accepted (order size of 30,000 units)

		(₹)
Purchase Cost	[3,60,000 units ×₹235.2 (240-4.8)]	8,46,72,000
Ordering Cost	[(3,60,000 units/30,000 units)×₹1,200]	14,400
Carrying Cost	(30,000 units × ₹235.2 × 1/2 × 10/100)	
Total Cost		**8,50,39,200**

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

Solutions 4-

Projected sales of product A	-	10,000
Unit Requirement of Material B	-	2 Kgs of B per unit of A
Yield of Material B	-	80%

Hence the revised requirement of Material B - 2.5 Kgs (2/80%)
Opening stock of Product A - 948

Product A to be produced - 9,052
Material B Required @ 2.5 Kgs per unit of A - 22,630 Kgs
Less: Opening stock of Material B - 2,630 Kgs
Purchase Requirement (A) of Material B - 20,000 Kgs
Order cost per order - ₹ 500
Purchase price per unit - ₹ 20
Carrying Cost (Interest + Obsolescene) - 25% of 20 = ₹5

(i) **EOQ** = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 20{,}000\ units \times ₹\ 500}{₹\ 5}}$ = 2,000 Kgs

(ii) **ROQ** (Quarterly Purchase policy) - 5,000 Kgs
Material Requirement - 22,630
Average Consumption - 62 Kgs
Max usage – Min Usage = 100Kgs
Max usage + Min Usage = 124Kgs (Formulating average usage with max & min)
Hence Minimum Usage = 12 Kgs and Maximum Usage = 112 Kgs
Lead time – 4 to 8 days

(iii) **Re-Order level** = Max Usage x Max Lead Time
= 112 Kgs x 8 Days = 896 Kgs

(iv) **Maximum Stock** = Re-order Level + Economic order Quantity – (Min Use x Min Lead time)
= 896 + 2000 – (12x4) = 2,848 Kgs
(If ROQ is assumed as 5,000 the answer will be different)
Maximum Stock = Re-order Level + Re-order Quantity – (Min Use x Min Lead time) = 896 + 5,000 – (12x4) = 5,848 Kgs

(v) **Minimum Stock** = Re-Order level – (Average Use x AverageLead) = 896 – (62x6) = 524 Kgs

(vi) **Profitability analysis on EOQ v. ROQ**

Particulars	EOQ	ROQ
Annual Requirement (A)	20,000	20,000
Quantity Ordered(B)	2,000	5,000
No. of Orders (C) = (A)/(B)	10	4
Order cost @ ₹500	5,000	2,000
Average Inventory	1,000	2,500
Carrying Cost @ ₹5	5,000	12,500
Associated Costs	10,000	14,500
Savings in EOQ		**4,500**

(vii) **After 5% Discount**

Particulars	EOQ	ROQ
Annual Requirement (A)	20,000	20,000
Quantity Ordered(B)	2,000	5,000
No of Orders (C) = (A)/(B)	10	4
Order cost @ ₹500	5,000	2,000
Average Inventory	1,000	2,500
Carrying Cost @ ₹5 & 4.75	5,000	11,875
Discount	0	-20000
Net Costs	10,000	-6,125
Benefit of ROQ over EOQ	**16,125**	

Solution 5-

(i) **Economic order quantity (EOQ) as calculated by the company's managing director**

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

where A = annual inventory requirement,
O = ordering cost per order and

C = carrying cost per unit per annum

$=\sqrt{\frac{2x2,50,000\ drums\ x\ ₹\ 100}{[₹\ 180+(10\%\ of\ ₹\ 200)]}}$ = 500 units

(ii) **Comparison of total cost considering purchasing manager's bonus and supplier quantity discounts**

Particulars		At EOQ of 500 units (₹)	If considered quantity discount at 1000 units (₹)
Ordering Cost	[(2,50,000 units/500 units) · ₹ 100]	50,000	
	[(2,50,000 units/1000 units) · ₹ 100]		25,000
Carrying Cost	{500 units/ 2 x [(₹ 180 + (10% of ₹ 200)]}	50,000	
	{1,000 units/ 2 x [(₹ 180 + (10% of ₹ 199.60)]}		99,980
		1,00,000	**1,24,980**
Purchasing manager's bonus	10% of (₹ 2,00,000 - ₹ 1,00,000)	10,000	
	10% of (₹ 2,00,000 - ₹ 1,24,980)		7,502
Annual inventory cost	2,50,000 units x ₹ 200	5,00,00,000	
	2,50,000 units x ₹ 199.60		4,99,00,000
Total Cost		**5,01,10,000**	**5,00,32,482**

In above comparison, the potential savings from purchasing in bulk outweigh the higher carrying costs associated with holding more inventory. Thus, Catalist Ltd. may look forward to the quantity discount offered at 1,000 units.

Solution 6-

Annual demand of material 'EXE'

= 16,000 units (per quarter) x 4 (No. of Quarter in a year) x 6 kg. (for every finished product)= 3,84,000 kg.

(i) Calculation of Economic Order Quantity (EOQ) for material 'EXE'

EOQ = $\sqrt{\frac{2\times Annual\ demand\ \times Ordering\ cost}{Carrying\ cost\ per\ unit\ per\ annum}}$ = $\sqrt{\frac{2\times 3,84,000\ kg.\ \times ₹2,000}{₹40\times 15\%}}$ = 16,000 kg.

(ii) Evaluation of Cost under different options of 'order quantity'.

Particulars	When EOQ is ordered	When discount of 2.5 % is accepted and supply is in 4 equal installments
Order size	16,000 kg.	96,000 kg. $=\frac{3,84,000\ kg.}{4}$
No. of orders	24 $=\frac{3,84,000\ kg.}{16,000\ kg.}$	4
Purchase Cost per kg.	₹40	₹39 {₹40-(₹40 x 2.5%)}
Total Purchase Cost (A)	₹1,53,60,000 (3,84,000kg. X ₹40)	₹1,49,76,000 (3,84,000 kg. X ₹39)
Ordering Cost (B)	₹48,000 (24 orders x ₹2,000)	₹8,000 (4 orders x ₹2,000)
Carrying Cost (C)	₹48,000 $=\frac{16,000\ kg.}{2}\times 15\%\times ₹40$	₹2,80,800 $=\frac{96,000\ kg.}{2}\times 15\%\times ₹39$
Total Cost (A+B+C)	**₹1,54,56,000**	**₹1,52,64,800**

COMMENT – The total cost is lower if Ani Ltd. accept an offer of 2.5% discount by the supplier, when supply of the annual requirement of material 'EXE' is made in 4 equal installments.

Solution 7-

Let the Minimum lead time be A and Maximum lead time be B

B - A = 4 ...1
Average lead time of X = 7
$\frac{A+B}{2}$ = 7
A + B = 14 ...2
From equation 1 and 2, we get
A (Minimum lead time) = 5
B (Maximum lead time) = 9
(i) **Re-order level** = Maximum re-order period/lead time × Maximum consumption
1,80,000 units = 9 × Maximum consumption

(ii) **Maximum stock of A** = Re-order level + Re-order quantity – (Minimum consumption × Minimum re-order period/lead time)
1,90,000 unit = 1,80,000 units+90,000 units – (Min. Consumption x 5)
Min. Consumption = $\frac{80{,}000\ units}{5}$ = 16,000 units

Part (ii) can also be done in following way:
(ii) Minimum Stock Level = Re-order level – (Average Consumption X Average Lead time
1,00,000 = 1,80,000 – (Average Consumption X 7)
Average Consumption per day = 11,428.57
Average Consumption per day = (Maximum consumption + Minimum consumption)/ 2
11,428.57 = (20,000 + X) /2
Minimum Consumption per day = 2,858 units

Solution 10-

Statement of Total Cost and Ranking

Item	Material Name	Units	% of Total units	Total cost (₹)	% of Total cost	Ranking
1	MA	54,105	32.80	14,855	3.49	6
2	MB	32,300	19.58	12,823	3.02	8
3	MC	28,600	17.33	13,972	3.29	7
4	MD	10,250	6.21	47,685	11.22	4
5	ME	23,410	14.19	39,015	9.18	5
6	MF	2,580	1.56	1,08,260	25.47	1
7	MG	8,900	5.39	89,410	21.04	3
8	MH	4,855	2.94	98,980	23.29	2
		1,65,000	100	4,25,000	100	

Basis for selective control
₹ 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	6	1.56	1,08,260	25.47	
2	8	2.94	98,980	23.29	
3	7	5.39	89,410	21.04	
Total	**3**	**9.89**	**2,96,650**	**69.80**	**A**
4	4	6.21	47,685	11.22	
5	5	14.19	39,015	9.18	
Total	**2**	**20.40**	**86,700**	**20.40**	**B**
6	1	32.80	14,855	3.49	
7	3	17.33	13,972	3.29	
8	2	19.58	12,823	3.02	
Total	**3**	**69.71**	**41,650**	**9.80**	**C**
Grand Total	**8**	**100**	**4,25,000**	**100**	

Solution 12-

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

Solution 13-

Stores Ledger Account

for the three months ending 30th June, 2022 (Weighted Average Method)

Date	Receipts				Issues				Balance		Rate for further Issue (Rs.)
	GRN No.	Qty. (Kg.)	Rates (Rs.)	Amounts	MR No.	Qty. (Kg.)	Rates (Rs.)	Amount (Rs.)	Qty. (Kg.)	Amount (Rs.)	
April 1									1,500	72,000	48.00
April 4						1,100	48.00	52,800	400	19,200	48.00
April 10		1,600	50.00	80,000					2,000	99,200	$\frac{99,200}{2,000}$ = 49.60
April 20		2,400	49.00	1,17,600					4,400	216,800	$\frac{2,16,800}{4,400}$ = 49.30
April 24						1,600	49.30	78,880	2,800	137,920	$\frac{1,37,920}{2,800}$ = 49.30
May 5		1,000	51.00	51,000					3,800	188,920	$\frac{1,88,920}{3,800}$ = 49.70
May 10						1,500	49.70	74,550	2,300	114,370	$\frac{1,14,370}{2,300}$ = 49.70
May 17		1,100	52.00	57,200					3,400	171,570	$\frac{1,71,570}{3,400}$ = 50.50
May 25		800	52.50	42,000					4,200	213,570	$\frac{2,13,570}{4,200}$ = 50.90
May 26						1,700	50.90	86,530	2,500	127,040	$\frac{1,27,040}{2,500}$ = 50.90
May 31					Shortage	80			2,420	127,040	$\frac{1,27,040}{2,420}$ = 52.50
June 11		900	54.00	48,600					3,320	175,640	$\frac{1,75,640}{3,320}$ = 52.90
June 15						1,500	52.90	79,350	1,820	96,290	$\frac{96,290}{1,820}$ = 52.90
June 21						1,200	52.90	63,480	620	32,810	$\frac{32,810}{620}$ = 52.90
June 24		1,400	55.00	77,000					2,020	109,810	$\frac{1,09,810}{2,020}$ = 54.40
June 30					Shortage	60			1,960	109,810	$\frac{1,09,810}{1,960}$ = 56.00

Solution 14-

Calculation of cost per unit:

Particulars	Units	(₹)
Listed Price of Materials	5,000	5,00,000
Less: Trade discount @ 10% on invoice price		(50,000)
		4,50,000
Add: GST @18% of ₹ 4,50,000		81,000
		5,31,000
Add: Toll Tax		1,800
Freight and Insurance		36,000
Commission and Brokerage Paid		10,000
Add: Cost of returnable containers: Amount deposited ₹ 30,000		
Less: Amount refunded ₹ 26,000		4,000
		5,82,800
Add: Other Expenses @ 2% of Total Cost ($\frac{₹ 5,82,800}{98}$ x 2)		11,894
Total cost of material		5,94,694
Less: Shortage material due to normal reasons @ 5%	250	-
Total cost of material of good units	**4,750**	**5,94,694**
Cost per unit (₹ 5,94,694/4,750 units)		**125.20**

Note:

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

Solution 16-

1. (i) **Calculation of Purchase Cost per Kg. of Materials**

	Wholesale Market (₹)	Farmers (₹)
Orange:		
Purchase price	18.00	15.00
Add: Loading Cost	0.20 (₹ 10 ÷ 50 Kg.)	0.10 (₹ 5 ÷ 50 Kg.)
Add: Unloading Cost	0.04 (₹ 2 ÷ 50 Kg.)	0.04 (₹ 2 ÷ 50 Kg.)
	18.24	15.14
Apple:		
Purchase price	12.00	10.00
Add: Loading Cost	0.20 (₹ 10 ÷ 50 Kg.)	0.06 (₹ 3 ÷ 50 Kg.)
Add: Unloading Cost	0.04 (₹ 2 ÷ 50 Kg.)	0.04 (₹ 2 ÷ 50 Kg.)
	12.24	20.10
Grape:		
Purchase price	32.00	25.00
Add: Import duty @ 8%	---	2.00
Add: Loading Cost	0.20 (₹ 10 ÷ 50 Kg.)	0.50 (₹ 25 ÷ 50 Kg.)
Add: Unloading Cost	0.04 (₹ 2 ÷ 50 Kg.)	0.04 (₹ 2 ÷ 50 Kg.)
	32.24	**27.54**

(ii) **Economic Order Quantity (E.O.Q)** $= \sqrt{\frac{2 \times Annual\ requirement \times Ordering\ cost}{Carrying\ cost\ per\ kg.\ per\ annum}}$

Annual Requirement (A)

Commodity		Quantity (Kg.)
Orange	(60,000 Ltr. x 3 Kg. x 12 months)	21,60,000
Apple	(20,000 Ltr. x 6 Kg. x 12 months)	14,40,000
Grape	(5,000 Ltr. x 5 Kg. x 12 months)	3,00,000

Cost per Order (O)

	Wholesale Market (₹)	Farmers (₹)
Orange:		
- Transportation cost	5,000	20,000
- Sorting and piling cost	---	1,500
	5,000	21,500
Apple:		
- Transportation cost	11,000	15,000
- Sorting and piling cost	---	1,200
	11,000	16,200
Grape:		
- Transportation cost	3,000	15,000
- Sorting and piling cost	---	---
	3,000	15,000

Carrying Cost per Kg. per annum (C x i)

	Wholesale Market (₹)	Farmers (₹)
Orange:		
- Interest on cash credit	2.736 (₹ 18.24 x 15%)	2.271 (₹ 15.14 x 15%)
- Warehouse rent*	1.0000	1.0000

	3.736	3.271
Apple:		
- Interest on cash credit	1.836 (₹ 12.24 x 15%)	3.015 (₹ 20.10 x 15%)
- Warehouse rent	1.0000	1.0000
	2.836	4.015
Grape:		
- Interest on cash credit	4.836 (₹ 32.24 x 15%)	4.131 (₹ 27.54 x 15%)
- Warehouse rent	1.0000	1.0000
	5.836	5.131

* Warehouse rent per Kg. = $\frac{₹\ 1,000}{1,000Kg.}$ = ₹ 1

Calculation of E.O.Q for each material under the both options

	Wholesale Market (Kg.)	farmers/Import (Kg.)
Orange	$\sqrt{\frac{2 \times 21,60,000\ kg. \times ₹\ 5,000}{₹\ 3.736}}$ = 76,036.72	$\sqrt{\frac{2 \times 21,60,000\ kg. \times ₹\ 21,500}{₹\ 3.271}}$ = 1,68,508.11
Apple	$\sqrt{\frac{2 \times 14,40,000Kg. \times ₹\ 11,000}{₹\ 2.836}}$ = 1,05,691.36	$\sqrt{\frac{2 \times 14,40,000Kg. \times ₹\ 16,200}{₹\ 4.015}}$ = 1,07,798.07
Grape	$\sqrt{\frac{2 \times 3,00,000Kg. \times ₹3,000}{₹\ 5.836}}$ = 17,562.19	$\sqrt{\frac{2 \times 3,00,000Kg. \times ₹15,000}{₹\ 5.131}}$ = 41,881.31

(iii) **Selection of best purchase option for the purchase of Grapes**

	Wholesale Market	Import
Annual Requirement (A) (Kg.)	3,00,000	3,00,000
Order Quantity (Q)	17,562.19	1,50,000
No. of orders $\left(\frac{A}{O}\right)$	17	2
Average Inventory $\left(\frac{O}{2}\right)$ (Kg.)	8,781	75,000
Ordering Cost (₹) (I)	51,000 (17 Orders x ₹ 3,000)	30,000 (2 Order x ₹ 15,000)
Carrying Cost (₹) (II)	51,245.92	3,84,825
(Average Inventory x Carrying cost per kg.)	(8,781 Kg. x ₹ 5.836)	(75,000 Kg. x ₹ 5.131)
Purchase Cost (₹) (III)	96,72,000	82,62,000
	(3,00,000 Kg. x ₹ 32.24)	(3,00,000 Kg. x ₹ 27.54)
Total Cost (I) + (II) + (III)	97,74,245.92	86,76,825

Importing grapes is the best purchase option for the XYZ enterprises.

Employee Cost & Direct Expenses (Labour Costing)

Solution 1-

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

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

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

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

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

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

= ₹ 4,800 + 800 = ₹ 5,600

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

Working Note:

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

= 37,280 – 28,400 – (₹ 60 × 60 hours)

= 37,280 – 28,400 – 3,600 = ₹ 5,280

(2) Calculation of bonus and time saved

Total labour cost = Normal Rate × Actual hours worked + ½ time saved × normal rate

₹ 5,280 = (₹ 80 × 60 hours) + ½ (time saved × ₹ 80)

40 × time saved = ₹ 5,280 – ₹ 4,800

Time saved = (5,280 - 4,800) ÷ 40

Time saved = 12 hours

The solution can also be presented in following way:

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

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

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

₹ 5,280 = ₹ 4,800 + 40S – 2,400

S = ₹ 2,880/40 = 72 hours

*Standard time

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

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

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

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

Solution 2-

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

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

(Under Rowan incentive plan)

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

₹ 37.5 = ₹ 30 + (4 – T) × ₹ 7.5

Or ₹ 7.5 T = ₹ 22.5

Or T= 3 hours

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

Total earnings = (Hours worked × Rate per hour) + (½ Time saved × Rate per hour)

(under 50% Halsey Incentive Scheme)
= (3 hours × ₹ 30) + (½ × 1 hour × ₹ 30)

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

Solution 3-

(b) **Earning under Halsey Plan**

Total Wages = (Time taken · Time rate) + (50% of time saved · time rate)
= (6 hrs x ₹ 25) + ((9 hrs - 6 hrs) x 50% x ₹ 25)
= ₹150 + ₹37.5 = ₹187.5

Earning under Rowan Plan

Total Wages = (Time taken × Time Rate)+ ($\frac{Time\ Saved}{Time\ Allowed}$ × Time taken × Time Rate)
= (6 hrs x ₹ 25) + ($\frac{(9\ hrs - 6\ hrs)}{9\ hrs}$ x 6 hrs x ₹ 25)
= ₹150 + ₹50 = ₹200

Note: Rowan Plan is more beneficial for a worker since he is more earning under this plan i.e. 200-187.5 = ₹ 12.50

Solution 4-

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

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

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

Effective hourly rate = ₹ 700/5 hours = ₹ 140 /hour

(ii) Let time taken = X

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

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

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

Or, 140X = 120X + 360 – 60X

Or, 80X = 360

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

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

Solution 5-

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

Step 2: Factory Cost of Worker 'Ajoy'

	(₹)
A. Material Cost	X
B. Wages (Halsey Plan)	32 Y
C. Bonus = 50% of (SH - AH) × R	4 Y
= 50% of (40 - 32) × R	
D. Overheads (32 hours × ₹ 360 per hour)	11,520
E. Factory Cost	1,24,800
Or X + 36 Y = ₹1,24,800 (Given) – ₹11,520 = ₹ 1,13,280.....equation (i)	

Step 3 : Factory Cost of Worker 'Bijoy'

	(₹)
A. Material Cost	X
B. Wages (Rowan Plan)	30 Y
C. Bonus = $\frac{30}{40}$ × (40 - 30) × Y	7.5 Y

D. Overheads (30 hours × ₹ 360 per hour))	10,800
E. Factory Cost	1,24,800
Or X + 37.5 Y = ₹ 1,24,800 (Given) – ₹ 10,800 = ₹ 1,14,000.....equation (ii)	

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

1.5Y = ₹ 720

Y = ₹ 480 per hour

(a) The normal rate of wages: ₹ 480 per hour

(b) The cost of material: X + 36 × ₹ 480 = ₹ 1,13,280

Or X = ₹ 1,13,280 – ₹ 17,280 = ₹ 96,000

Statement of the Factory Cost of the product made by the two workers

	'Ajoy' (₹)	'Bijoy' (₹)
Material cost	96,000	96,000
Direct Wages	15,360 (32 x ₹ 480)	14,400 (30 x ₹ 480)
Bonus	1,920 (4 x ₹ 480)	3,600 (7.5 x ₹ 480)
Factory Overhead	11,520	10,800
Factory Cost	1,24,800	1,24,800

Solution 6-

Working Notes:

1. **Actual time taken to produce 12,500 pieces**

= No. of working days in the month × No. of working hours per day of each worker × No. of workers

= 25 days × 8 hrs. × 128 workers = 25,600 hours

2. **Total time wages of 128 workers per month:**

= No. of working days in the month × No. of working hours per day of each worker × Hourly rate of wages × No. of workers

= 25 days × 8 hrs. × ₹ 30 × 128 workers = ₹ 7,68,000

3. **Time saved per month:**

Time allowed per piece to a worker	2.5 hours
No. of units produced during the month by 128 workers	12,500 pieces
Total time allowed to produce	12,500 pieces
(12,500 × 2.5 hours)	31,250 hours
Actual time taken to produce 12,500 pieces	25,600 hours
Time saved (31,250 hours – 25,600 hours)	5,650 hours

4. **Bonus under Halsey scheme to be paid to 128 workers:**

Bonus = (50% of time saved) × hourly rate of wages

= 50/100 × 5,650 hours × ₹ 30 = ₹ 84,750

Total wages to be paid to 128 workers are (₹ 7,68,000 + ₹ 84,750) ₹ 8,52,750, if the company considers the Introduction of Halsey Incentive Scheme to increase employee productivity.

5. **Bonus under Rowan Scheme to be paid to 128 workers:**

Bonus = $\frac{Time\ taken}{Time\ Allowed}$ × Time saved × hourly rate

= $\frac{25{,}600\ hours}{31{,}250\ hours}$ × 5,650 hours × ₹ 30 = ₹1,38,854.4

Total wages to be paid to 128 workers are (₹ 7,68,000 + ₹ 1,38,854.4) ₹ 9,06,854.4, if the company 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)

= $\frac{Total\ time\ wages\ of\ 128\ workers + Total\ bonus\ under\ Halsey\ scheme}{Total\ hours\ worked}$ = $\frac{₹\ 8{,}52{,}750}{25{,}600\ hours}$ = ₹ 33.310

(b) **Effective hourly rate of earnings under Rowan scheme:**

(Refer to Working Notes 1, 2, 3 and 5)

$$= \frac{Total\ time\ wage\ of\ 128\ workers + Total\ Bonus\ under\ Rowan\ Scheme}{Total\ Hours\ worked}$$

$$= \frac{₹\ 9,06,854.4}{25,600\ hours} = ₹35.424$$

(ii) **Efficiency in % on introduction of the incentive schemes**

$$= \frac{Time\ allowed\ as\ per\ standard}{Time\ Taken} \times 100$$

$$= \frac{31,250\ hours}{25,600\ hours} = 122.07\%$$

Labour efficiency has increased by 22.07%

(iii) (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)

= 2.5hours × ₹ 30 = ₹ 75.

Employee cost per piece (under Halsey scheme)

$$= \frac{Total\ wages\ paid\ under\ the\ scheme}{Total\ number\ of\ units\ produced} = \frac{₹\ 8,52,750}{12,500} = ₹\ 68.22$$

Saving per piece: (₹75 – ₹68.22) = ₹6.78

(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 $= \frac{₹9,06,854.4}{12,500} = ₹72.548$

Saving per piece = ₹ 75 – ₹ 72.548 = ₹ 2.452

(iv) Since the company has assured 15% increase over present earnings i.e. ₹ 7,68,000 which comes to ₹ 8,83,200 and total wages under halsey scheme and rowan scheme are ₹8,52,750 and ₹ 9,06,854.4 respectively, so the company is advised to select the rowan scheme of wage payment to fulfill its requirement of 15% increase.

Solution 7-

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

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

Or, Average No. of workers = 450

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

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

Or, No. of workers separated = 27

Labour Turnover Rate (Flux Method) $= \frac{No.\ of\ Separations + No.\ of\ accession\ (Joinings)}{Average\ No.\ of\ workers}$

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

Or, 100 (27 + No. of Accessions) = 6,300

Or, No. of Accessions = 36

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

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

Solution 8-

(c) **Employee turnover rate (Separation method)**

$$= \frac{No.\ of\ Separations(S)}{Average\ number\ of\ workers\ on\ roll} \times 100$$

$$\frac{3.5}{100} = \frac{28}{Average\ number\ of\ workers\ on\ roll}$$

Average number of workers on roll $= \frac{28 \times 100}{3.5} = 800$

(i) **Employee Turnover rate using Replacement method**

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

$$= \frac{78 \times 100}{800} = 9.75\%$$

(ii) **Employee turnover rate (Flux method)**

$$= \frac{No.\ of\ Employees\ Separated + Number\ of\ Employees\ Replaced\ during\ the\ period}{Average\ number\ of\ employees\ during\ the\ period\ on\ roll} \times 100$$

$$= \frac{28 + 78}{800} \times 100 = 13.25\%$$

Solution 9-

Workings:

(i) Computation of productive hours

Actual hours worked (given)	5,00,000
Less: Unproductive training hours	24,000
Actual productive hours	4,76,000

(ii) Productive hours lost:

Loss of potential productive hours+ Unproductive training hours = 95,000 + 24,000 = 1,19,000 hours

(iii) Loss of contribution due to unproductive hours :

$= \frac{Sales\ Value}{Actual\ Productive\ hours}$ ×Total unproductive hours $= \frac{₹2,16,80,000}{4,76,000\ hrs}$ × 1,19,000 hours= ₹ 54,20,000

Contribution lost for 1,19,000 hours= ₹ 54,20,000 x 15% = ₹8,13,000

Computation of profit forgone on account of employee turnover

	(₹)
Contribution foregone (as calculated above)	8,13,000
Settlement cost due to leaving	2,37,880
Recruitment and Selection cost	1,40,000
Training and Induction costs	1,61,950
Cost of Rectification (1500 units x ₹40)	60,000
Profit foregone	**14,12,830**

The above question can also be solved in alternative way after taking proper assumptions

Workings:

(i) Computation of productive hours

Actual hours worked (given)	5,00,000
Less: Unproductive training hours	24,000
Actual productive hours	4,76,000

(ii) Productive hours lost: Loss of potential productive hours = 95,000 hours

(iii) Loss of contribution due to unproductive hours :

$= \frac{Sales\ Value}{Actual\ productive\ hours}$ ×Total unproductive hours $= \frac{₹2,16,80,000}{4,76,000\ hrs}$ × 95,000 hours = ₹ 43,26,891

Contribution lost for 95,000 hours= ₹43,26,891 x 15% = ₹ 6,49,034(approx.)

Computation of profit forgone on account of employee turnover

	(₹)
Contribution foregone (as calculated above)	6,49,034
Settlement cost due to leaving	2,37,880
Recruitment and Selection cost	1,40,000
Training and Induction costs	1,61,950
Cost of Rectification (1500 units x ₹40)	60,000
Profit foregone	**12,48,864**

Solution 10-

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

Normal Wages are considered as basic wages = $\frac{2\times(\text{Basic wage + DA})\times 10 \text{ hours}}{200}$ = 150 × 10 hours = ₹1,500

Solution 11-

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. Shyam = 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. Shyam:**

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. Shyam (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. AB100 = ₹ 248 × 100 hours = ₹ 24,800

Solution 12-

Statement showing Earnings of Workers Pi and Qu

	Pi (₹)	Qu (₹)
Basic wages	12,000	15,000
Dearness Allowance (50% of Basic Wages)	6,000	7,500
Overtime wages (Refer to Working Note)	1,371	--
Gross wages earned	19,371	22,500
Less: Contribution to Provident fund	(1,200)	(1,500)
Less: Contribution to ESI	(210)	(263)
Net wages earned	17,961	20,737

Statement of Employee Cost:

	Pi (₹)	Qu (₹)
Gross Wages (excluding overtime)	18,000	22,500
Add: Employer's contribution to PF	1,200	1,500
Add: Employer's contribution to ESI	210	263
Gross wages earned	19,410	24,263

Statement Showing Allocation of Wages to Jobs

	Total Wages (₹)	Jobs		
		A (₹)	S (₹)	D (₹)
Worker Pi:				
- Ordinary Wages (3: 3 : 4)	19,410	5,823	5,823	7,764
- Overtime	1,371	--	1,371	--
Worker Qu:				
- Ordinary Wages (3 : 5 : 2)	24,263	7,279	12,131	4,853
	45,044	13,102	19,325	12,617

Working Note:

Over time = 2 x $\frac{Basic\ wage + DA}{210\ hours}$ x 8 hours

= 2 x $\left(\frac{₹\ 18,000}{210\ hours}\right)$ x 8 hours = ₹ 1,37

Solution 13-

Particulars	'Cee'	'Dee'
No. of binding work assigned (units)	21	30
Hour allowed per magazine (Hours)	8	8
Total hours allowed (hours)	168	240

Hours taken (Hours)	78	114
Hours Saved (Hours)	90	126

(i) Calculation of loss incurred due to incorrect rate selection

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

(ii) Amount of loss if Rowan scheme of bonus payment were followed

Particulars	'Cee' (₹)	'Dee' (₹)	Total (₹)
Basic Wages	390.00 (78 Hrs. x ₹5)	570.00 (114 Hrs. x ₹5)	960.00
Bonus (As per Rowan Scheme) $\left(\frac{Time\ Taken}{Time\ Allowed} \times time\ saved \times Excess\ Rate\right)$	208.93 $=\left(\frac{78}{168} \times 90 \times ₹5\right)$	299.25 $=\left(\frac{114}{240} \times 126 \times ₹5\right)$	508.18
Excess Wages paid	**598.93**	**869.25**	**1,468.18**

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

Particulars	'Cee' (₹)	'Dee' (₹)	Total (₹)
Wages paid under Halsey Scheme	615.00	885.00	1,500.00
Wages paid under Rowan Scheme	598.93	869.25	1,468.18
Difference (Savings)	**16.07**	**15.75**	**31.82**

Solution 14-

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

Average inflated wage rate = (₹1, 46,25,000/ 1,25,000 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 the job is charged at an inflated wage rate.
Hence, employee cost chargeable to job Z = Total hours × Inflated wage rate
= 1,125 hrs. × ₹ 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. × ₹ (175 – 100)} + {25 hrs. × ₹ (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

Solution 1-

Cost of the Service Departments	Basis
Planning and progress	Direct labour hours, Machine hours, Direct labour wages, Asset value x Hours worked
Transport Department	Crane hours, Truck hours, Truck mileage, Truck tonnage, Truck ton-hours, Tonnage handled. No. of packages of Standard size
Personnel Department	No of direct workers No. of employees etc.
Fire Protection	Capital values
Power House (electric lighting cost)	Floor area, Cubic content, No. of electric Points, Wattage.
Computer Section	Computer hours, Specific allocation to departments
Canteen and Welfare	No of direct workers No. of employees etc.
Hospital and Dispensary	No of direct workers No. of employees etc.

Solution 2-

(i) **Overhead Distribution Statement**

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

(ii) **Redistribution of Service Department's Expenses**

Particulars	Production Departments		Service Departments	
	P (₹)	Q (₹)	R (₹)	S (₹)
Overhead as per primary distribution	2,87,500	2,07,500	55,000	75,000
Expenses of service department R is apportioned among other departments P, Q & S in the ratio of number of employees (10:30:4)	12,500	37,500	(55,000)	5,000
Expenses of service department S is apportioned among other departments P & Q in the ratio of Machine hours (40:10)	64,000	16,000	-	(80,000)
Total Budgeted overheads	3,64,000	2,61,000	-	-

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

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

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

The solution can also be presented in following way for Distribution of Power expenses:

Overhead Distribution Statement

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

Power can be distributed on the basis of HP of machines x machine hours
800 x 4000 = 32,00,000, 200 x 1000 = 2,00,000, 80 x 600 = 48,000, 120 x 800 = 96,000
Ratio is 3200:200:48:96

(ii) Redistribution of Service Department's Expenses

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

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

Particulars	Production Departments	
	P (₹)	Q (₹)
Total Budgeted overheads	**3,79,552**	**2,45,448**
Actual machine hours	4000 hours	-
Actual labour hours	-	6000 hours
Actual machine/labour hour rate	**94.89**	**40.91**

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

Solution 3-

Profitability statement of each product for the year ended 31st March

Particulars	Total (₹)	Products		
		A(₹)	B(₹)	C(₹)
Sales	2,04,00,000	60,00,000	90,00,000	54,00,000
Variable Costs:				
Cost of sales	1,35,00,000	30,00,000	78,00,000	27,00,000

Commission @ 2.40% of sales	4,89,600	1,44,000	2,16,000	1,29,600
Packaging wages and materials @ ₹4.80 per parcel	36,00,000	11,52,000	14,40,000	10,08,000
Stationery @ ₹1.80 per parcel	5,29,200	1,08,000	1,62,000	2,59,200
Total Variable Costs	**1,81,18,800**	**44,04,000**	**96,18,000**	**40,96,800**
Contribution (sales - variable cost)	22,81,200	15,96,000	(6,18,000)	13,03,200
Fixed costs:				
Rent and insurance	6,00,000	2,00,000	3,00,000	1,00,000
Depreciation	2,70,000	86,400	1,08,000	75,600
Salesman's salary and expenses	11,40,000	3,35,294	5,02,941	3,01,765
Administrative wages and salaries	9,00,000	1,83,674	2,75,510	4,40,816
Total Fixed costs	**29,10,000**	**8,05,368**	**11,86,451**	**9,18,181**
Profit or loss (Contribution - fixed costs)	**(6,28,800)**	**7,90,632**	**(18,04,451)**	**3,85,019**
Percentage of Profit or loss on sales (%)	**(3.08)%**	**13.18%**	**(20.05)%**	**7.13%**

The recommendation of the finance manager is not correct. Product 'C' should not be discontinued as it is profitable.

Solution 4-

The total expenses of the two service departments will be determined as follows:

S1 = 1,60,000 + 0.10 S2

S2 = 2,40,000 + 0.20 S1

Substituting the value of S1,

S2 = 2,40,000 + 0.20 (1,60,000 + 0.1 S2)

= 2,40,000 + 32,000 + 0.02 S2

= 2,72,000 + 0.02 S2

S2 - 0.02 S2 = 2,72,000

S2 = $\left(\frac{2,72,000}{0.98}\right)$ = ₹ 2,77,551

The total of expenses of the S2 is ₹ 2,77,551 and that of the S1 is ₹ 1,87,755 i.e., ₹ 1,60,000 + 0.1 x ₹ 2,77,551.

The expenses will be allocated to the production departments as under:

	Production Department		
	Dept.-P1	**Dept.-P2**	**Dept.-P3**
S1 (25%, 35% and 20% of ₹1,87,755)	46,939	65,714	37,551
S2(35%, 30% and 25% of ₹ 2,77,551)	97,143	83,265	69,388
Total	**1,44,082**	**1,48,979**	**1,06,939**

The total of expenses apportioned to P1, P2 and P3 is ₹ 4,00,000.

Solution 5-

Computation of Machine Hour Rate

	Basis of apportionment	Total	Machines		
			P	Q	R
		(₹)	(₹)	(₹)	(₹)
(A) Standing Charges					
Insurance	Depreciation Basis	8,000	3,000	3,000	2,000
Indirect Labour	Direct Labour	24,000	6,000	9,000	9,000
Building Maintenance expenses	Floor Space	20,000	8,000	8,000	4,000
Rent and Rates	Floor Space	1,20,000	48,000	48,000	24,000
Salary of foreman	Equal	2,40,000	80,000	80,000	80,000
Salary of attendant	Equal	60,000	20,000	20,000	20,000
Total standing charges		**4,72,000**	**1,65,000**	**1,68,000**	**1,39,000**
Hourly rate for standing charges			90.36	92.00	76.12
(B) Machine Expenses:					
Depreciation	Direct	20,000	7,500	7,500	5,000

Spare parts	Final estimates	13,225	4,600	5,750	2,875
Power	K.W. rating	40,000	15,000	10,000	15,000
Consumable Stores	Direct	9,000	3,600	2,700	2,700
Total Machine expenses		82,225	30,700	25,950	25,575
Hourly Rate for Machine expenses			16.81	14.21	14.01
Total (A + B)		**5,54,225**	**1,95,700**	**1,93,950**	**1,64,575**
Machine Hour rate			**107.17**	**106.22**	**90.13**

Working Notes:

(i) Calculation of effective working hours:

No. of holidays 52 (Sundays) + 14 (other holidays) = 66
Saturday (52 – 2) = 50
No. of days (Work full time) = 365 – 66 – 50 = 249

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

Hours	
Effective capacity 85% of 2,192	1,863 (Rounded off)
Less: Normal loss of time (Breakdown) 2%	37 (Rounded off)
Effective running hour	**1,826**

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

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

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

	₹
Preliminary estimates	20,000
Add: Increase in wages @ 20%	4,000
	24,000

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

	₹
Preliminary estimates	10,000
Less: Decrease in consumption @ 10%	1,000
	9,000

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

Solution 6-

(i) Overheads of service cost centres. Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2.

S_1 = 3,52,000 + 0.10 S_2

S_2 = 33,000 + 0.10 S_1

Substituting the value of S_2 in S1 we get S_1 = 3,52,000 + 0.10 (33,000 + 0.10 S_1)

S_1 = 3,52,000 + 3,300 + 0.01 S_1

0.99 S_1 = 3,55,300

S_1 = ₹ 3,58,889

S_2 = 33,000 + 0.10 x 3,58,889 = ₹68,889

Secondary Distribution Summary

Particulars	Total (₹)	P1 (₹)	P2 (₹)
Allocated and Apportioned overheads as per primary distribution	6,95,000	4,02,000	2,93,000
S1	3,58,889	1,43,556	1,79,445
S2	68,889	34,445	27,556
		5,80,001	**5,00,001**

(ii) Working for Overhead rate per hour

Particulars	P1	P2
Total overheads cost (₹)	5,80,001	5,00,001
Production hours worked	5,840	5,840
Rate per hour (₹)	99.32	85.62

Calculation of per unit Total Cost of Product Z

Particulars	(₹)
Direct Material	500.00
Direct Labour	350.00
Prime Cost	850.00
Production overheads	
P1 2 hours x ₹ 99.32 = 198.64	
P2 3 hours x ₹ 85.62 = 256.86	455.50
Total Cost	**1,305.50**

Solution 7-

Computation of overhead absorption rate (as per the blanket rate)

Department	Budgeted factory Overheads (₹)	Budgeted direct wages (₹)
Operating	35,64,000	7,92,000
Assembly	9,66,000	24,15,000
Quality Control	4,20,000	10,50,000
Packing	12,37,500	6,93,000
Total	**61,87,500**	**49,50,000**

Overhead absorption rate = $\frac{Budgeted\ factory\ Overheads}{Budgeted\ direct\ wages} \times 100$

= $\frac{61,87,500}{49,50,000} \times 100$

= 125% of Direct wages

Selling Price of the Job No. 157

Particulars	Operating (₹)	Assembly (₹)	Quality Control (₹)	Packing (₹)	Total (₹)
Direct Materials	11,880	4,140	1,800	2,970	20,790
Direct Wages	2,376	2,484	1,080	594	6,534
Rectification cost of normal defectives			495		495
Overheads [(125% x (6,534 + 495)]					8,786.25
Total Factory Cost					**36,605.25**
Add: Mark-up (25% x ₹ 36,605.25)					9,151.31
Selling Price					**45,756.56**

(b) As the machinery is used to a varying degree in different departments, the use of departmental rates is to be preferred.

The overhead recovery rates in different departments would be as follows:

(i) Operating Department: The use of machine hours is the predominant factor of production in the Operating Department. Hence, machine hour rate should be used to recover overheads.

The overhead recovery rate based on machine hours would be calculated as follows:

Machine hour rate = $\frac{Budgeted\ factory\ overheads}{Budgeted\ machine\ hours}$ = $\frac{₹35,64,000}{7,92,000}$ = ₹ 4.50 per hour

(ii) Assembly Department: Direct labour hours is the main factor of production in the Assembly Department. Hence, direct labour hour rate should be used to recover overheads.
The overhead recovery rate based on direct labour hours would be calculated as follows:
Budgeted factory Overheads

Direct labour hour rate $= \frac{Budgeted\ factory\ overheads}{Budgeted\ direct\ labour\ hours} = \frac{₹9,66,000}{6,90,000}$ = ₹ 1.40 per hour

(iii) Quality Control Department: Direct labour hours is the main factor of production in the Quality Control Department. Hence, direct labour hour rate should be used to recover overheads.
The overhead recovery rate based on direct labour hours would be calculated as follows:

Direct labour hour rate $= \frac{Budgeted\ factory\ overheads}{Budgeted\ direct\ labour\ hours} = \frac{₹4,20,000}{3,00,000}$ = ₹ 1.40 per hour

(iv) Packing Department: Direct labour hours is the main factor of production in the Packing Department. Hence, direct labour hour rate should be used to recover overheads.
The overhead recovery rate based on direct labour hours would be calculated as follows:

Direct labour hour rate $= \frac{Budgeted\ factory\ overheads}{Budgeted\ direct\ labour\ hours} = \frac{₹12,37,500}{4,95,000}$ = ₹ 2.50 per hour

(c)

Selling Price of Job No. 157
[based on the overhead rates calculated in (b) above]

Particulars	Operating(₹)	Assembly(₹)	Quality Control (₹)	Packing(₹)	Total(₹)
Direct Materials	11,880	4,140	1,800	2,970	20,790
Direct Wages	2,376	2,484	1,080	594	6,534
Rectification cost of normal defectives			495		495
Overheads (refer working note)					10,672
Total Factory Cost					**38,491**
Add: Mark-up (25% x ₹ 38,491)					9,622.75
Selling Price					**48,113.75**

Working note:

Overhead Statement

Department	Basis	Hours	Rate (₹)	Overheads (₹)
Operating	Machine hour	1,782	4.50	8,019
Assembly	Direct labour hour	828	1.40	1,159
Quality Control	Direct labour hour	360	1.40	504
Packing	Direct labour hour	396	2.50	990
			Total	**10,672**

(d) Department-wise statement of under or over recovery of overheads

(i) As per the current policy

Particulars	Operating (₹)	Assembly (₹)	Quality Control (₹)	Packing (₹)	Total (₹)
Direct wages (Actual)	9,50,400	18,63,000	8,10,000	8,91,000	45,14,400
Overheads recovered @ 125% of Direct wages: (A)	11,88,000	23,28,750	10,12,500	11,13,750	56,43,000
Actual overheads: (B)	38,61,000	5,79,600	2,52,000	13,36,500	60,29,100
(Under)/Over recovery of overheads: (A–B)	**(26,73,000)**	**17,49,150**	**7,60,500**	**(2,22,750)**	**(3,86,100)**

(ii) As per the method suggested

	Machine hours (Operating)	Direct labour hours (Assembly)	Direct labour hours (Quality Control)	Direct labour hours (Packing)	Total (₹)
Hours worked	9,50,400	6,21,000	2,70,000	5,94,000	
Rate/hour (₹)	4.50	1.40	1.40	2.50	
Overhead recovered (₹): (A)	42,76,800	8,69,400	3,78,000	14,85,000	70,09,200

Actual overheads (₹): (B)	38,61,000	5,79,600	2,52,000	13,36,500	60,29,100
(Under)/Over recovery: (A-B)	**4,15,800**	**2,89,800**	**1,26,000**	**1,48,500**	**9,80,100**

Solution 8-

(i) Computation of predetermined overhead rate for each production departments from budgeted data

	Production Department		Service Department	
	P1	P2	S1	S2
Budgeted factory overheads for the year (₹)	2,80,50,000	2,39,25,000	66,00,000	49,50,000
Allocation of service department S1's costs to production departments P1 and P2 equally (₹)	33,00,000	33,00,000	(66,00,000)	—
Allocation of service department S2's costs to production departments P1 and P2 in the ratio of 2:1 (₹)	33,00,000	16,50,000		— (49,50,000)
Total		3,46,50,000 2,88,75,000	—	—
Budgeted machine hours in department P1 (working note 1)	2,10,000	—		
Budgeted labour hours in department P2 (working note 1)	—	3,50,000		
Budgeted machine/ labour hour rate (₹)	165	82.50		

(ii) Comparative statement reflecting Budgeted cost and Actual cost for production of the Products X and Y during the month of December, 2024

(When 8,000 and 6,000 units of products X and Y respectively were actually produced)

	Budgeted (₹)	Actual (₹)
Raw materials used in Dept. P_1:		
X : 8,000 units × ₹ 660	52,80,000	53,79,000
Y : 6,000 units × ₹ 825	49,50,000	50,16,000
Direct labour cost (on the basis of labour hours worked in department P_2)		
X : 8,000 units × 2 hrs. × ₹ 396	63,36,000	65,10,900
Y : 6,000 units × 2.5 hrs. × ₹ 412.50	61,87,500	60,72,000
Overhead absorbed on machine hour basis in Dept. P^1:		
X : 8,000 units × 1.5 hrs. × ₹ 165	19,80,000	19,18,084*
Y : 6,000 units × 1 hr. × ₹ 165	9,90,000	13,04,926*
Overhead absorbed on labour hour basis in Dept. P^2:		
X : 8,000 units × 2 hrs. × ₹ 82.50	13,20,000	14,45,496**
Y : 6,000 units × 2.5 hrs. × ₹ 82.50	12,37,500	13,04,472**

* (Refer to working note 4)

**(Refer to working note 5)

(iii) Amount of under/ over-absorption of production overheads

	Overhead absorbed	Overhead actually incurred	Overhead under/over-absorbed
Overhead in Dept. P1			
Product X	19,80,000	19,18,084	**₹ 61,916 over-absorbed**
Product Y	9,90,000	13,04,926	**₹ 3,14,926 under-absorbed**
Overhead in Dept. P2			
Product X	13,20,000	14,45,496	**₹ 1,25,496 under-absorbed**
Product Y	12,37,500	13,04,472	**₹ 66,972 under-absorbed**

Working Notes

1.

	Product X	Product Y	Total
Budgeted output (in units)	1,00,000	60,000	

Budgeted machine hours in Dept. P1	1,50,000 (1,00,000×1.5 hrs.)	60,000 (60,000×1 hr.)	2,10,000
Budgeted labour hours in Dept. P2	2,00,000 (1,00,000×2 hrs.)	1,50,000 (60,000×2.5 hrs.)	3,50,000

2.

	Product X	Product Y	Total
Actual output (in units)	8,000	6,000	
Actual machine hours utilized in Dept. P1	12,200	8,300	20,500
Actual labour hours utilised in Dept. P2	16,400	14,800	31,200

3. **Computation of actual overhead rates**

	Production Department		Service Department	
	P1	P2	S1	S2
Actual factory overheads for the month of December, 2024 (₹)	25,41,000	22,44,000	6,60,000	5,28,000
Allocation of service Dept. S_1's costs to production Dept. P_1 and P_2 equally (₹)	3,30,000	3,30,000	(6,60,000)	–
Allocation of service Dept. S_2's costs to production Dept. P_1 and P_2 in the ratio of 2:1 (₹)	3,52,000	1,76,000	–	(5,28,000)
Total	32,23,000	27,50,000	--	--
Actual machine hours in Dept. P1 (working note 2)	20,500	--		
Actual labour hours in Dept. P2 (working note 2)	--	31,200		
Actual machine/ labour hour rate (₹)	157.22	88.14		

4. **Actual overheads absorbed in Department P_1 (based on machine hours)**
   X : 12,200 hrs × ₹ 157.22 = ₹ 19,18,084
   Y : 8,300 hrs × ₹ 157.22 = ₹ 13,04,926
5. **Actual overheads absorbed in Department P_2 (based on labour hours)**
   X : 16,400 hrs × ₹ 88.14 = ₹ 14,45,496
   Y : 14,800 hrs × ₹ 88.14 = ₹ 13,04,472

Solution 9-

(i) Amount of under-absorption of production overheads during the current year

		(₹)
Total production overheads actually incurred during the current year	4,50,000	
Less : 'Written off' obsolete stores		42,000
Net production overheads actually incurred : **(A)**		4,08,000
Production overheads absorbed by 43,000 machine hours@ ₹ 8 per hour : **(B)**		3,44,000
Amount of under – absorption of production overheads : **[(A) – (B)]**		**64,000**

(ii) Accounting treatment of under absorption of production overheads

It is given in the statement of the question that 18,000 units were produced, and 5,000 units were 40% complete, 20% of the under- absorbed overheads were due to defective planning and the rest were attributable to normal increase in costs of indirect materials and indirect labour.

1.	(20 % of ₹ 64,000) i.e., ₹ 12,800 of under-absorbed overheads were due to defective planning. This being abnormal, should be debited to the Costing Profit and Loss A/c.	₹ 12,800
2.	Balance (80% of ₹ 64,000) i.e., ₹ 51,200 of under-absorbed overheads should be distributed over work-in-progress, finished goods and cost of sales by using supplementary rate.	₹ 51,200
	Total under-absorbed overheads	₹ 64,000

Apportionment of unabsorbed overheads of ₹ 51,200 over, work-in progress, finished goods and cost of sales

	Equivalent Completed Units	(₹)
Work-in-Progress		
(5,000 units × 40%×₹ 2.56)	2,000	5,120
(Refer to working note)		
Finished goods		
(8,000 units × ₹ 2.56)	8,000	20,480
Cost of sales		
(10,000 units × ₹ 2.56)	10,000	25,600
	20,000	51,200

Working Note: Supplementary rate per unit = $\frac{51,200}{20,000}$ = ₹ 2.56

Solution 10-

Working Notes:

(i) Total Productive hours = Estimated Working hours – Machine Maintenance hours
= 2,200 hours – 200 hours = 2,000 hours

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

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

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

Calculation of Machine hour rate

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

Solution 11-

Working Notes:

(i) Total Productive hours = Estimated Working hours – Machine Maintenance hours
= 2,200 hours – 200 hours = 2,000 hours

(ii) Depreciation per annum = $\frac{₹10,000 - ₹1,000}{10\ years}$ = ₹ 900

(iii) Chemical solution cost per annum = ₹ 20 × 50 weeks = ₹ 1,000

(iv) Wages of attendants (per annum) = $\frac{₹120 \times 50\ weeks}{6\ machines}$ = ₹ 1,000

Calculation of Machine hour rate

Particulars	Amount (p.a)	Amount (per hour)
A. Standing Charge		
(i) Wages of attendants	1,000	
(ii) Departmental and general works overheads	3,000	
Total Standing Charge	4,000	
Standing Charges per hour $\frac{4,000}{2,000}$		2.0
B. Machine Expense		
(iii) Depreciation	900	0.45
(iv) Electricity $\left(\frac{₹0.09 \times 16\ units \times 1,900\ hours}{2,000\ hours}\right)$	-	1.37

(v) Chemical solution	1,000	0.50
(vi) Maintenance cost	1,800	0.90
Machine operating cost per hour (A + B)		5.22

Solution 12-

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

Computation of Comprehensive Machine Hour Rate

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

Wages per machine hour

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

Answer 13-

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

Production Overhead recovery rate based on Direct Labour Costs

$= \frac{Production\ Overhead}{Direct\ Labour\ Cost} \times 100$

$= \frac{2,50,000}{5,00,000} \times 100$ = 50% of Direct Labour

Marketing & Distribution Overhead recovery rate based on Total Production Costs

$= \frac{Marketing\ \&\ Distribution\ Overhead}{Total\ Production\ Cost} \times 100$

$= \frac{1,52,000}{19,00,000} \times 100$ = 8% of Total Production Costs

Working Note: **Statement showing Total Cost for 2023**

Particulars	Amount (₹)
Opening stock of raw material	2,00,000
Add: Purchases	12,00,000
Less: Closing stock of raw material	(2,50,000)
Direct Material Consumed	11,50,000
Direct Labour Cost	5,00,000
Prime Cost	16,50,000
Add: Production Overhead	2,50,000
Production cost	19,00,000
Add: Marketing & Distribution Cost	1,52,000
Total Cost	20,52,000

(ii) **Cost Statement for the Bulk Order and Determination of Sales in 2024:**

Particulars	Amount (₹)
Direct Material Cost	3,00,000
Direct Labour Cost	1,50,000
Prime Cost	4,50,000
Add: Production Overhead (50% of Direct Labour Cost)	75,000
Production cost	5,25,000
Add: Marketing & Distribution Cost (8% of Production Cost)	42,000
Packaging and Transportation Costs	49,400
Total Cost	6,16,400
Add: Profit @ 25% on cost	1,54,100
Sales value (Price to be quoted for the order)	7,70,500

Hence the price to be quoted is ₹7,70,500

Solution 14-

(i) **Schedule of Cost Allocation among the Departments**

	Total	Production Dept.	Administration Dept.	Selling & Distribution Dept.	General Management
Raw Material Cost	5,75,00,000	5,75,00,000	-	-	-
Indirect Material Cost:	12,50,000	7,45,000	4,75,000	30,000	-
Salary & Wages	1,60,00,000	1,60,00,000	-	-	-
Rent & Property tax	90,000	-	-	90,000	-
Depreciation on Machinery	12,50,000	12,50,000	-	-	-
Power & fuel	4,90,000	4,70,000	-	20,000	-
Insurance premium on machinery	5,00,000	5,00,000	-	-	-
Printing & Stationery:	8,20,000	21,000	5,78,000	2,21,000	-
Audit fees	1,40,000	-	-	-	1,40,000
Telephone & Mobile expenses:	4,95,000	1,25,000	50,000	2,90,000	30,000
Travelling expenses	24,00,000	5,50,000	-	6,50,000	12,00,000
Software License renewal fees:	16,50,000	8,80,000	1,50,000	6,20,000	-
Total Allocated Direct Expenses	**8,25,85,000**	**7,80,41,000**	**12,53,000**	**19,21,000**	**13,70,000**

(ii) **Schedule of Cost Apportionment (Primary Distribution)**

	Basis	Total	Production Dept.	Administration Dept.	Selling & Distribution Dept.	General Management
Allocated Cost	Direct	8,25,85,000	7,80,41,000	12,53,000	19,21,000	13,70,000
Salary & Wages	Gross Salary (9:6:5:4)	2,60,00,000	97,50,000	65,00,000	54,16,667	43,33,333
Rent & Property tax	Floor Area (11:4:3:2)	30,000	16,500	6,000	4,500	3,000
Depreciation						
– Building	Floor Area (11:4:3:2)	10,50,000	5,77,500	2,10,000	1,57,500	1,05,000
– AC	RT (4:2:2:1)	2,00,000	88,889	44,444	44,444	22,222
Group Employee Insurance	Gross Salary (9:6:5:4)	3,10,000	1,16,250	77,500	64,583	51,667

Electricity Expenses	Units (14:25:10:4)	4,00,000	1,05,660	1,88,679	75,472	30,189
Meal Coupon Subsidy	No. of Employees (22,20,28)	2,25,000	66,000	60,000	84,000	15,000 (b.f.)
Miscellaneous Expenditure	Direct Expenses / (Allocated Expenses)	9,50,000	8,97,729	14,414	22,098	15,760
Total		**11,17,50,000**	**8,96,59,528**	**83,54,037**	**77,90,264**	**59,46,170**

(iii) **Schedule of Secondary Distribution:**

	Basis	**Total**	**Production Dept.**	**Administration Dept.**	**Selling & Distribution Dept.**	**General Management**
Total Allocated and Apportioned costs		11,17,50,000	8,96,59,528	83,54,037	77,90,264	59,46,170
General Management	(2:1:7)	59,46,170	11,89,234	5,94,617	41,62,319	(59,46,170)
			9,08,48,762	89,48,654	1,19,52,583	
Administration dept.	(1:1)	89,48,654	44,74,327	(89,48,654)	44,74,327	
Total			**9,53,23,089**	**-**	**1,64,26,910**	

Solution 1-

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

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

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

Particulars	Activity Drivers	Total Amount (₹)	Products		
			S	M	L
Production (units)	-	-	7500	12500	9000
Machine hours	-	-	2250 (7500 x 0.3)	5000 (12500 x 0.4)	4500 (9000 x 0.5)
			(₹)	(₹)	(₹)
Direct material cost per unit (i)			158	179	250
Direct labour cost per unit (ii)			40	45	60
Overheads					
Purchasing department cost (90:135:125)	Number of purchase orders	7,00,000	1,80,000	2,70,000	2,50,000
Machine setup cost (120:120:160)	Number of machine setups	9,00,000	2,70,000	2,70,000	3,60,000
Quality control cost (100:160:140)	Number of inspections	6,56,000	1,64,000	2,62,400	2,29,600
Machining cost (225:500:450)	Machine hours	5,64,000	1,08,000	2,40,000	2,16,000
Total Overhead			7,22,000	10,42,400	10,55,600
Overhead Cost per unit (iii)			96.27	83.39	117.29
Total Cost per unit (i+ii+iii)			**294.27**	**307.39**	**427.29**
Add: Profit @ 40%			117.71	122.96	170.92
Selling price per unit			**411.98**	**430.35**	**598.21**

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

(ii)

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

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

Solution 2-

Working note:

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

	Wholesale Category Customers	Retail Category Customers

	WC-1	WC-2	RC-1	RC-2
Number of shirts sold (a)	10,750 (215 x 50)	7,150 (110 x 65)	4,032 (18 x 224)	3,675 (15 x 245)
Revenues (At listed price)(₹): (b) {(a) x ₹1,000)}	1,07,50,000	71,50,000	40,32,000	36,75,000
Discount (₹): (c) {(a) x Discount per shirt}	32,25,000	14,30,000	4,03,200	1,83,750
Cost of shirts (₹) : (d) {(a) x ₹600}	64,50,000	42,90,000	24,19,200	22,05,000
Order taking costs (₹): (No. of purchase x ₹1,260)	63,000	81,900	2,82,240	3,08,700
Customer visits cost (₹) (No. of customer visits x ₹1,500)	15,000	19,500	37,500	33,000
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles x ₹30 per km.)	27,600	23,400	52,500	1,48,500
Cost of expediting deliveries (₹) {No. of expedited deliveries x ₹4,490}	22,450	71,840	2,24,500	2,78,380
Total cost of customer level operating activities (₹)	1,28,050	1,96,640	5,96,740	7,68,580

Computation of Customer level operating income

	Wholesale Category Customers		Retail Category Customers	
	WC-1	WC-2	RC-1	RC-2
Revenues (At list price) (Refer to working note)	1,07,50,000	71,50,000	40,32,000	36,75,000
Less : Discount (Refer to working note)	32,25,000	14,30,000	4,03,200	1,83,750
Revenue (At actual price)	75,25,000	57,20,000	36,28,800	34,91,250
Less : Cost of shirts (Refer to working note)	64,50,000	42,90,000	24,19,200	22,05,000
Gross margin	10,75,000	14,30,000	12,09,600	12,86,250
Less: Customer level operating activities costs (Refer to working note)	1,28,050	1,96,640	5,96,740	7,68,580
Customer level operating income	9,46,950	12,33,360	6,12,860	5,17,670
Operating income as a % of revenues	12.584%	21.562%	16.889%	14.828%
Rank	IV	I	II	III

Solution 3-

(i) PCP Limited's

Statement of operating income and gross margin percentage for each of its supermarket segments

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

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

	Supermarket A	Supermarket B

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

Working note:

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

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

Computation of operating cost of each distribution channel:

	Supermarket A (₹)	Supermarket B (₹)
Store delivery	1,10,000 (₹ 100 × 1,100 deliveries)	2,80,500 (₹ 100 × 2,805 deliveries)
Cartons dispatched	2,75,000 (₹ 1× 250 cartons × 1,100 deliveries)	1,40,250 (₹ 1 × 50 cartons × 2,805 deliveries)
Shelf stocking	39,600 (₹ 6 × 1,100 deliveries × 6 Av.hrs.)	25,245 (₹ 6 × 2,805 deliveries × 1.5 Av.hrs)
Line item ordering	1,07,800 (₹ 10 × 14 line item x 770 orders)	2,37,600 (₹ 10 × 12 line item x 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

Solution 4-

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 the budget period.
Total	8,00,000	
Computer Processing	2,50,000	–₹ 2,50,000 (half of ₹5,00,000) is fixed and no change is expected.
	7,50,000	–₹ 2,50,000 (variable portion) is expected to increase to three times the current level.
Total	10,00,000	
Issuing Statements	18,00,000	–Existing.
	2,00,000	–2 lakh statements are expected to be increased in budgeted period. For every increase of one lakh statement, one lakh rupees is the budgeted increase.
Total	20,00,000	
Computer Inquiries	3,60,000	–Estimated to increase by 80% during the budget period.
Total	3,60,000	(₹2,00,000 × 180%)

Solution 5-

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

	Product			
	A (₹)	**B (₹)**	**C (₹)**	**Total (₹)**
Power (Refer to working note)	10,00,000	20,00,000	15,00,000	45,00,000
	(10,000 kWh ×₹ 100)	(20,000 kWh × ₹ 100)	(15,000 kWh × ₹ 100)	
Quality Inspections (Refer to working note)	31,50,000 (3,500 inspections × ₹ 900)	22,50,000 (2,500 inspections × ₹ 900)	27,00,000 (3,000 inspections × ₹ 900)	81,00,000

Working Note:

Rate per unit of cost driver:

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

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

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

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

Solution 6-

Working note:

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

	Customers				
	A	**B**	**C**	**D**	**E**
Units sold: (a)	4,500	6,000	9,500	7,500	12,750
Revenues (at listed price) (₹): (b) {(a) ×₹6,480)}	2,91,60,000	3,88,80,000	6,15,60,000	4,86,00,000	8,26,20,000
Revenues (at listed price) (₹): © {(a) ×Actual selling price)}	2,91,60,000 (4,500 ×	3,82,32,000 (6,000 × 6,372)	5,64,30,000 (9,500 ×	4,69,80,000 (7,500 ×	7,43,58,000 (12,750 ×

	6,480)		5,940)	6,264)	5,832)
Discount (₹) (d) {(b) – (c)}	0	6,48,000	51,30,000	16,20,000	82,62,000
Cost of goods sold (₹) : (e) {(a) x ₹5,400}	2,43,00,000	3,24,00,000	5,13,00,000	4,05,00,000	6,88,50,000
Customer level operating activities costs					
Order taking costs (₹): (No. of purchase orders × ₹ 4,500)	67,500	1,12,500	1,35,000	1,12,500	1,35,000
Customer visits costs (₹) (No. of customer visits x ₹ 3,600)	7,200	10,800	21,600	7,200	10,800
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles x ₹ 7.50 per km.)	1,500	1,350	2,250	3,000	4,500
Product handling costs (₹) {(a) x ₹ 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 x ₹ 13,500}	-	-	-	-	13,500
Total cost of customer level operating activities (₹)	1,77,450	2,59,650	3,72,600	2,91,450	4,50,675

Computation of Customer level operating income

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

Solution 7-

1. **Estimation of cost-driver rate**

Activity	Overhead cost (₹)	Cost driver	Cost driver rate (₹)
Packaging	1,50,00,000	950 Packaging hours	15,789.47
Fridge	2,10,00,000	1,900 Fridge hours	11,052.63

2. **Overhead cost for chocolate ice cream**

Activity	Overhead for a 1,000 ice cream batch	Amount (₹)
Packaging	1 x ₹ 11,052.63	11,052.63

Fridge	0.5 x ₹ 15,789.47	7,894.74
Total		18,947.37

3. **Operating profit for chocolate ice cream**

Particulars	Amount (₹)
Revenue (1,000 x ₹ 75)	75,000.00
Less: Direct Material (1,000 x ₹ 15)	15,000.00
Less: Direct Labour (10,000 x ₹ 2)	20,000.00
Less: Overhead	18,947.37
Operating Profit	21,052.63

b. **Overhead per direct hour**
= Total Overhead / Total Direct Labour Hours
= ₹ 3,60,00,000 / 24,000 hours
= ₹ 1,500 per direct labour hour
Since it takes 10 direct labour hour per 1,000 Chocolate ice cream, the overhead is ₹ 15,000

Particulars	Amount (₹)
Revenue (1,000 x ₹ 75)	75,000.00
Less: Direct Material (1,000 x ₹ 15)	15,000.00
Less: Direct Labour (10,000 x ₹ 2)	20,000.00
Less: Overhead	15,000
Operating Profit	25,000

Solution 8-

(a) **Working Note:** **Cost Driver Rates**

Activity	Cost	Cost Driver Basis	Cost Driver	Cost Driver Rate
	(₹)		(Units)	(₹)
Setup	7,68,000	Number of setups	64	12,000 per setup
Processing	7,00,000	Machine Hours	1,40,000	5 per machine hour
Inspection	6,80,000	Number of inspections	544	1,250 per inspection
Packaging	7,20,000	Number of packings	600	1,200 per packing

(i) Computation of cost allocated to each product - Activity Based Costing

Products	Ginger Chai (₹)	Masala Chai (₹)	Saffron Chai (₹)
Setup Costs @ ₹ 12,000 per setup (21,22,17)	2,52,000	2,64,000	2,04,000
Machine Processing Costs @ ₹ 5 per hour (45,000, 50,000, 40,000)	2,25,000	2,50,000	2,00,000
Inspection Costs @ ₹ 1,250 per inspection (190,204,150)	2,37,500	2,55,000	1,87,500
Packaging Costs @ ₹ 1,200 per packing (190,250,150)	2,28,000	3,00,000	1,80,000
Total Costs	9,42,500	10,69,000	7,71,500

(ii) Computation of cost of unused capacity for each activity

Activity	Unused Capacity	Total Cost (₹)
Setup Costs @ ₹ 12,000 per setup	4 setups	48,000
Machine Processing Costs @ ₹ 5 per hour	5,000 machine hours	25,000
Inspection Costs @ ₹ 1,250 per inspection	-	-
Packaging Costs @ ₹ 1,200 per packing	10 packings	12,000
Total Costs		85,000

Solution 9-

(a) (i) **Statement Showing "Total cost and Cost per project - Activity Based Costing"**

Particulars	Technology	Healthcare	Education

Management of Project @ ₹ 20,250 per project (20,10,10)	4,05,000	2,02,500	2,02,500
Consulting Service Delivery @ ₹30 per hour (6,400, 5,600, 2,000)	1,92,000	1,68,000	60,000
Client Interaction and Meeting @ ₹ 7,000 per meeting (30,20,40)	2,10,000	1,40,000	2,80,000
Administration and Support @ ₹ 70 per hour (10,000, 7,000, 5,000)	7,00,000	4,90,000	3,50,000
Total Cost	15,07,000	10,00,500	8,92,500
Project	20	10	10
Cost per Project	75,350	1,00,050	89,250
Fee Charged	90,000	1,20,000	1,10,000
% of fee Charged	119.44	119.94	123.25
OR			
Profit	14,650	19,950	20,750
Profitability %	16.28%	16.63%	18.86%

(ii) Education is the most profitable sector.

Working Note: **Statement showing calculation of Cost Driver rate**

Activity	Total Cost	Cost Driver Basis	Cost Driver	Cost Driver Rate
	(₹)		(Units)	(₹)
Management of Project	8,10,000	No of Projects	40	20,250 per project
Consulting Service Delivery	4,20,000	Consulting Hours	14,000	30 per hour
Client Interaction and Meeting	6,30,000	No of client meeting	90	7,000 per meeting
Administration and Support	15,40,000	Software Development Hours	22,000	70 per hour

Solution 10-

Customer Profitability Statement

Particulars	MT Ltd.	KG Ltd.	MG Bros.
Sales (units)	2,000	1,000	800
	(₹)	(₹)	(₹)
Sales Revenue (A)	2,20,00,000	1,10,00,000	88,00,000
Less: Average Variable Cost (B) (₹ 5,500 × 60% = 3,300 p.u.)	66,00,000	33,00,000	26,40,000
Contribution [70%of Sales] ...(A)-(B)	1,54,00,000	77,00,000	61,60,000
Less: Additional Overheads			
Delivery Cost	2,00,000	1,60,000	1,80,000
(No. of K.M. × ₹ 200)			
Emergency Delivery Cost (Emergency Delivery × ₹ 21,000)	42,000	21,000	-
Order Processing Cost (No. of Orders × ₹ 6,000)	24,000	12,000	48,000
Specific Discount	55,00,000	22,00,000	13,20,000
Sales Commission	33,00,000	11,00,000	4,40,000
Advertisement Cost	8,75,000	6,15,000	4,30,000
Profit per customer*	54,59,000	35,92,000	37,42,000
Profit Margin per customer* (%)	24.81%	32.65%	42.52%
Rank	**III**	**II**	**I**

*Before deducting general fixed overhead cost

The contribution margin is 70% for each customer but when the other overheads costs per customer is included in the above profitability statement the profitability of the three customers becomes different. MG Ltd. is the most profitable customer.

Process Costing

Solution 1-

Process A Account

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

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

Process B Account

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

Cost per unit of completed units and abnormal gains:

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

Solution 2- Jan 2025

Process X Account

Particulars	Kg	Amount (₹)	Particulars	Kg	Amount (₹)
To Material	1,000	50,000	By Normal Loss (250 kg × ₹8 per kg)	250	2,000
To Direct Labour		35,000	By Abnormal loss A/c (50 kg × ₹ 150 per kg)	50	7,500
To Process Plant Time 200 hrs @ ₹ 60/hr		12,000	By Process Y (700 kg × ₹ 150 per kg)	700	1,05,000
To Departmental Overhead		17,500			
	1,000	**1,14,500**		**1,000**	**1,14,500**

Cost per kg = $\frac{₹\ 1,14,500 - ₹\ 2,000}{1,000\ kg - 250\ kg}$ = ₹150.00 per kg

Process Y Account

Particulars	Kg	Amount (₹)	Particulars	Kg	Amount (₹)
To Process X	700	1,05,000	By Normal Loss (280 kg × ₹ 5 per kg)	280	1,400
To Material	700	63,000	By Finished stock (1,150 kg × ₹190.803 per kg)	1,150	2,19,424
To Direct Labour		25,000			
To Process Plant Time 120 hrs @₹ 80/hr		9,600			
To Departmental Overheads		12,500			
To Abnormal Gain A/c (30 kg × ₹ 190.803 per kg)	30	5,724			
	1,430	**2,20,824**		**1,430**	**2,20,824**

Cost per kg = $\frac{₹\ 2,15,100 - ₹\ 1,400}{1,400\ kg - 280\ kg}$ = ₹190.803 per kg

Normal Loss Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Process X A/c	250	2,000	By Cash (Sales) (250 kg × ₹8 per kg)	250	2,000
To Process Y A/c	280	1,400	By Cash (Sales) (250 kg × ₹5 per kg)	250	1,250
			By Abnormal Gain A/c (30 kg × ₹5 per kg)	30	150
	430	**3,400**		**430**	**3,400**

Abnormal Gain Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Normal Loss (30 kg × ₹ 5 per kg)	30	150	By Process Y A/c	30	5,724
To Costing Profit and Loss		5,574			
	30	**5,724**		**30**	**5,724**

Solution 3-

Process- P Account

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

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

Process- Q Account

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

Cost per unit = $\frac{9,86,700-5,520}{6,900-690}$ = ₹158 per unit

Abnormal Loss Account

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

Abnormal Gain Account

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

Costing Profit & Loss Account for the year

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

Solution 4-

(i) **Statement of Equivalent Production (FIFO Method)**

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

(ii) **Statement of Cost per equivalent units**

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

(iii) **Cost of Abnormal Gain – 192 Units**

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

Cost of closing WIP – 700 Units

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

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

(iii) **Cost of 8,300 completed units**

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

Solution 5-

(i) **Calculation of equivalent units of production:**

Input Details	Units	Output Particulars	Units	Equivalent Units			
				Material		Conversion cost	
				%	Units	%	Units
Unit Introduced	35,000	Finished output	28,000	100	28,000	100	28,000
		Closing W-I-P	7,000	100	7,000	25	1,750
Total	**35,000**	**Total**	**35,000**		**35,000**		**29,750**

(ii) **Calculation of Moulding cost per equivalent unit:**

	Direct Material	Conversion costs
Total cost (₹)	1,15,500	59,500
Equivalent units	35,000	29,750
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	7,000	3.30	23,100
Conversion Costs	1,750	2.00	3,500
Total			**26,600**

The cost of finished products:

Costs	Equivalent units	Rate (₹)	Total Cost (₹)
Direct Material	28,000	3.30	92,400
Conversion Costs	28,000	2.00	56,000
Total			**1,48,400**

Solution 6-

Statement of Equivalent Units (Process- I)

Input (Units)	Particulars	Output (Units)	Equivalent Production			
			Materials		Labour and Overheads	
			Units	(%)	Units	(%)
40,000	Introduced and completed	36,000	36,000	100	36,000	100
	Normal loss	2,000	-	-	-	-
	Closing stock	2,000	2,000	100	1,000	50
40,000		40,000	38,000		37,000	

Computation of cost per Equivalent Unit for each element of cost (Process- I)

Elements of Cost	Total Cost (₹)	Equivalent units	Cost per Equivalent units (₹)
Direct Materials	6,00,000	38,000	15.7895
Labour	1,20,000	37,000	3.2432
Factory Overheads	2,40,000	37,000	6.4865

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost per unit (₹)	Cost (₹)	Total (₹)
Units introduced and completed	Materials	36,000	15.7895	5,68,422.00	
	Labour	36,000	3.2432	1,16,755.20	

	Overheads	36,000	6.4865		2,33,514.00 9,18,691.20
Closing stock	Materials	2,000	15.7895	31,579.00	
	Labour	1,000	3.2432	3,243.20	
	Overheads	1,000	6.4865	6,486.50	41,308.70

Process- I Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Materials	40,000	6,00,000	By Normal loss	2,000	-
To Labour		1,20,000	By Process II	36,000	9,18,691
To Overheads		2,40,000	By Closing stock	2,000	41,309
	40,000	**9,60,000**		**40,000**	**9,60,000**

Statement of Equivalent Units (Process- II)

Input (Units)	Particulars	Output (Units)	Equivalent Production			
			Materials		Labour and Overheads	
			Units	(%)	Units	(%)
36,000	**Units transferred from Process- I**					
	Normal loss	1,500	-	-	-	-
	Completed	32,000	32,000	100	32,000	100
	Closing stock (balancing figure)	2,500	2,500	100	1,250	50
36,000		36,000	34,500		33,250	

Computation of cost per Equivalent Unit for each element of cost (Process- I)

Elements of Cost	Total Cost (₹)	Equivalent units	Cost per Equivalent units (₹)
Cost of 36,000 units transferred from Process- I	9,18,691	34,500	26.6287
Labour	1,60,000	33,250	4.8120
Factory Overheads	2,00,000	33,250	6.0150

Statement of Apportionment of Cost

Items	Elements	Equivalent units	Cost per unit (₹)	Cost (₹)	Total (₹)
Units introduced and completed	Materials	32,000		26.6287 8,52,118.40	
	Labour	32,000	4.8120	1,53,984.00	
	Overheads	32,000	6.0150	1,92,480.00	11,98,582.40
Closing stock	Materials	2,500	26.6287	66,571.75	
	Labour	1,250	4.8120	6,015.00	
	Overheads	1,250	6.0150	7,518.75	80,105.50

Process- II Account

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Units introduced	36,000	9,18,691	**By Normal loss**	1,500	-
To Labour			**1,60,000 By Finished stock**	32,000	11,98,582
To Overheads			**2,00,000 By Closing stock**	2,500	80,109*
		36,000 12,78,691		36,000	12,78,691

*Differences arose due to the fact that rounding-off has been adjusted.

Solution 7-

Process A Account

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

Process B Account

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

Statement of Total Profit

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

Solution 8-

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 material	15,000	15,000	--	(Transferred)			
Direct Wages	11,200	11,200	--	Closing stock	3,700	3,700	--
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**

*Transfer Price = $\frac{Total\ cost - Closing\ stock}{75\%}$ = $\frac{44,200 - 3,700}{75\%}$ = ₹ 54,000

** Profit on Transfer = 54,000 x 25% = ₹ 13,500

Process – II Account

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening Stock	9,000	7,500	1,500	Finished stock	1,12,500	75,750	36,750
T/f from	54,000	40,500	13,500	A/c**			
process-I	15,750	15,750	--	(Transferred)	4,500	3,750	750
Direct material	11,250	11,250	--	Closing stock*			
Direct Wages	90,000	75,000	15,000				
Prime Cost	4,500	4,500	--				
Overheads	94,500	79,500	15,000				
Total Cost							

Profit* **	22,500	--	22,500				
	1,17,000	79,500	37,500		1,17,000	79,500	37,500

*Cost of Closing stock = $\frac{₹\ 75,000}{₹\ 90,000}$ x ₹ 4,500 = ₹ 3,750

**Transfer Price = $\frac{Total\ cost - Closing\ stock}{80\%}$ = $\frac{94,500 - 4,500}{80\%}$ = ₹ 1,12,500

***Profit on transfer = 1,12,500 x 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**	1,40,00	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 = $\frac{Cost\ of\ transfer\ from\ Process\ -II}{Transfer\ price\ from\ process\ -II}$ x Value of closing stock

(As per instruction given in the question)

= $\frac{₹\ 75,750}{₹\ 1,12,500}$ x ₹ 11,250 = ₹ 7,575

Joint & By Product

Solution 1-

Calculation of joint cost

Description	Amount(₹)
Material	20,000
Labour	10,000
Variable Overheads	6,000
Total Variable Cost	**36,000**
Fixed Overheads	24,000
Total Joint Cost	**60,000**

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

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

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

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

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

Allocation of Joint Cost on the basis of Contribution Margin Method:

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

Solution 2-

(i) **Statement showing profit/loss by each product after further processing products**

	Floral (in ₹)	Oriental (in ₹)	Cologne (in ₹)	Total (in ₹)
Sales price after further processing	80	200	300	
Less: Cost after split off	40	80	100	
Less: Joint Cost (already apportioned)	60	60	60	
Profit/(loss) per unit	(20)	60	140	
Quantity (in units)	5,000	3,000	2,000	
Profit/(loss)	(1,00,000)	1,80,000	2,80,000	3,60,000

(ii) **Apportionment of joint costs on the basis of Net Realisable Value method**

	Floral (in ₹)	Oriental (in ₹)	Cologne (in ₹)	Total (in ₹)
Sales price	80	200	300	
Less: Post split-off cost (Further processing cost)	40	80	100	
Net Realisable Value per unit	40	120	200	
Net Realisable Value	2,00,000	3,60,000	4,00,000	

	(₹ 40 × 5,000)	(₹ 120 × 3,000)	(₹ 200 × 2,000)	
Apportionment of Joint Cost of ₹ 6,00,000* in ratio of 5:9:10	1,25,000	2,25,000	2,50,000	
Total Profit	75,000	1,35,000	1,50,000	3,60,000

*Total Joint Cost = 60 x 5,000 + 60 x 3,000 + 60 x 2,000 = 6,00,000

Note: Profitability statement prepared after distributing joint cost based on NRV clearly shows that they are not selling its largest volume product, i.e floral at a loss. Actually, it yields a profit of ₹ 75,000.

Solution 3-

Workings -

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

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

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

Joint Costs to be borne by By-product C = Output (kg.) x ₹ 12
= 1,625 kg. × ₹ 12
= ₹ 19,500

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

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

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

(i) Statement of Profit/ (Loss) if joint products are sold without processing

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

(ii) Further processing decision

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

Therefore, Product A should be processed further as they give incremental profit. On the other hand, Product B should be sold at a split-off point as they suffer incremental losses after further processing.

Solution 4-

Statement showing operating profit/loss by each product after further processing

	Product XR (7,60,000 kg)		Product YS (1,90,000 kg)	
	Total (₹)	Cost per unit (₹)	Total (₹)	Cost per unit (₹)
Joint costs (W.N.)	1,06,40,000	14.0	60,80,000	32.0
Further processing costs	1,24,64,000	16.40	41,04,000	21.60

By-product net revenues			(1,52,000)	(0.80)
Total cost	2,31,04,000	**30.40**	1,00,32,000	52.80
Sales	2,94,88,000	38.80	1,36,80,000	72.00
Operating profit	**63,84,000**	**8.40**	**36,48,000**	**19.20**

Working Note:

Calculation of joint costs using Net realisable value method:

Particulars	Product XR (₹)	Product YS (₹)
Sales Value	2,94,88,000 (₹ 38.80 × 7,60,000 kg)	1,36,80,000 (₹ 72.00 × 1,90,000 kg)
Add: By-product net revenue	-	1,52,000 [(₹ 24.00 x 19,000 kg) - ₹ 3,04,000]
Less: Post split-off cost (Further processing cost)	(1,24,64,000)	(41,04,000)
Net Realisable Value	1,70,24,000	97,28,000
Apportionment of Joint Cost of ₹ 1,67,20,000 in ratio of 1,70,24:97,28	**1,06,40,000**	**60,80,000**

Total equivalent single rooms

Nature of room	Occupancy (Room-days)	Equivalent single rooms (Room days)
Single room	7,200 (20 rooms · 360 days · 100%)	7,200 (7,200 · 1)
Double rooms	2,880 (10 rooms · 360 days · 80%)	4,320 (2,880 · 1.5)
	10,080	11,520

Solution 5-

(i) **Statement showing the apportionment of joint costs to P, Q and C**

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

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

Products	P	Q	C
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 $\left(\frac{₹1,80,000}{18,000\ kg}\right)$	15 $\left(\frac{₹1,50,000}{10,000\ kg}\right)$	2 $\left(\frac{₹1,08,000}{54,000\ kg}\right)$
Total cost per kg (₹)	45	43	9

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

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

2. **Valuation of closing stock:**
Since the selling price per kg of products P, Q and C is more than their total costs, therefore closing stock will be valued at cost.

Products	P	Q	C	Total
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (₹)	45	43	9	
Closing stock value (₹)	45,000 (₹ 45 x 1,000 kg)	2,15,000 (₹ 43 x 5,000 kg)	90,000 (₹ 9 x 10,000 kg)	3,50,000

(iv) **Calculations for processing decision**

Products	P	Q	C
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 P and C has an incremental profit per unit after further processing, hence, these two products may be further processed.
However, further processing of product Q is not profitable hence, product Q shall be sold at split off point.

Solution 7-

Apportionment of Joint Costs

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

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

Statement showing Cost of Production of A and B

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

Working Note:

Calculation of Selling and Distribution Expenses

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

Solution 8-

(i) Statement showing allocation of Joint Cost

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

(ii) Statement of Profitability

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