Contents

CHAPTER 02: COST SHEET

Answer for Q.NO.1.

Part – 1: Income statement with supporting schedule

Cost sheet of Farewell co.

Particulars	(Rs.)	
1. Opening stock of R.M	40,000	
2. Purchases	4,60,000	
3. Closing stock of R.M	(50,000)	
4. Direct materials consumed (1 + 2 – 3)		4,50,000
5. Direct labour		3,00,000
6. Prime cost (4 + 5)		7,50,000
7. Production overheads (W.N.1)		2,14,000
8. Gross works cost (6 + 7)		9,64,000
9. Opening WIP		10,000
10. Closing WIP		(14,000)
11. Net works cost (8 + 9 – 10)		9,60,000
12. Opening finished goods		1,00,000
13. Closing finished goods		(1,50,000)
14. Cost of goods sold (11 + 12 – 13)		9,10,000

W.No.1: Production overheads

Particulars	(Rs.)	
Sandpaper	2,000	VC
Material Handling costs	70,000	VC
Lubricants & Coolants	5,000	VC
Misc. indirect labour	40,000	FC
Plant leasing	54,000	FC
Depreciation on plant	36,000	FC
Fire insurance on plant	36,000	FC
Property taxes	4,000	FC
	2,14,000	

Income statement

Particulars	(Rs.)
Sales	13,60,000
(-) Cost of goods sold	(9,10,000)
Gross profit	4,50,000

(-) Selling overheads (W.N.2)	(3,30,000)
Operating profit	1,20,000

W.N.2: Selling Overheads

Particulars	(Rs.)
Marketing promotions	60,000
Salary	1,00,000
Distribution cost	70,000
Customer service costs	1,00,000
	3,30,000

Part – 2: Calculation of D. Material & Plant leasing cost p.i. when production is 9,00,000 u (raw materials consumed)

a) D. material p.u = $\frac{Rs.4,50,000}{9,00,000\,u}$ = Rs.0.50 p.u.

b) Plant leasing cost p.u = $\frac{Rs.54,000}{9,00,000\,u}$ = Rs.0.06

Part - 3: Calculation of D. materials & plant leasing cost when production increases to 10,00,000 u.

a) D. material cost p.u = $\frac{Rs.5,00,000}{10,00,000\,u}$ = Rs.0.50 p.u.

W.N.1: Consumed Units

F 4,50,000 9,00,000 u

x 10,00,000 u

x = Rs.5,00,000

b) Plant leasing cost p.u = $\frac{Rs.54,000}{10,00,000\,u}$ = Rs.0.054 p.u

Part - 4: Variable cost remains same in per unit level

D.M p.u. did not change because it is a variable cost

Variable cost are constant p.uy. @ all volume levels.

Plant leasing cost p.u changes because it is a fixed cost.

Fixed cost remains constant on total but varies on a p.u. level

Answer for Q.NO.2.

Step - 1: Cost sheet of LG Ltd.

Production = 24,000 u

Particulars	p.u	(Rs.)
D. material consumed	20	4,80,000
D. Labour	37	8,88,000
Prime cost	57	13,68,000

Production overheads (W.N.1)	73	17,52,000
Gross works cost	130	31,20,000
Less: Closing finished goods	130	(5,20,000)
Cost of goods sold	130	26,00,000

W.N.1: POH

Variable POH	48	11,52,000
Fixed POH	25 $\left(\frac{6,00,000}{24,000}\right)$	6,00,000
Total POH	73	17,52,000

W.N.2: Valuation of closing FG

a. Units produced 24,000

b. Units sold 20,000

c. Closing stock of FG (a – b) 4,000

d. WP p.u Rs.130

e. Value of closing stock of FG (c x d) 5,20,000

Step – 2: Income statement (units sold = 20,000 u)

Particulars	p.u	(Rs.)
Sales	185	37,00,000
(-) Cost of goods sold	(130)	(26,00,000)
Gross profit	55	11,00,000
(-) SOH	43	8,60,000
Operating profit	12	2,40,000
(-) Tax @ 30%	-	(72,000)
Operating profit		(1,68,000)

Closing stock = Rs.5,20,000

Net income = Rs.1,68,000

Part – 3: Impact of volume on cost

a. D.2 p.u will not change because variable cost are always constant p.u

b. Fixed manufacturing OH will not change because fixed cost remains constant in total. However FC p.u increases when the volume decreases

c. Fixed S & D OH will not change on a p.u & total level because these costs are tied to sales volume and NOT to production volume.

d. Average production cost p.u of Rs.130 will increase on a p.u level because of increase in fixed manufacturing OH p.u.

Answer for Q.NO.3.

I. FIFO Method

Step – 1: Cost sheet (Production: 5,000 u)

Particulars	p.u	(Rs.)
1. Direct Materials consumed (W.N.1)	265	13,25,000
2. Direct labour	135	6,75,000
3. Prime cost	400	20,00,000
4. Production OH	200	10,00,000
5. GWC / NEW / Cost of production	600	30,00,000
6. Opening Stock of FG	550	5,50,000
7. Closing stock of FG (W.N.2)	(600)	(9,00,000)
8. Cost of Goods sold (W.N.2)	600	26,50,000

W.N.1: Direct materials consumed

OP. Rm 10,000 kgs @ Rs.20 / kg

Purchases 50,000 kgs @ Rs.25 / kg

RM Consumed = 55,000 kgs

10,000 kgs @ Rs.20 / kg = Rs.2,00,000

45,000 kgs @ Rs.25(bal. fig) = Rs.11,25,000

Rs.13,25,000

W.N.2: Valuation of FG = COGS

Opt. Stock of FG = 1,000 @ Rs.550

Production = 5,000 @ Rs.600

6,000

WGS =4,500

Closing stock – FG 1,500 (bal. fig = 1,500 @ Rs.600 = Rs.9,00,000

1,000 @ Rs.550

3,500 @ Rs.600

= 5,50,000 = 21,00,000

Rs.26,50,000

Step – 2: Income statement (Sales – 4500 u)

Particulars	p.u	(Rs.)
Sales	750	33,75,000
(-) COGS	(600)	(26,50,000)
Gross profit	150	7,25,000
(-) AOH	(55.55)	(2,50,000)
(-) SOH	(66.66)	(3,00,000)
Operating profit	38.88	1,75,000

II. Weighted Average Method:

Step – 1: Cost sheet (produced = 5,000 u)

Particulars	p.u	(Rs.)
1. Direct Materials consumed (W.N.3)	265.83	13,29,167
2. Direct labour	135.00	6,75,000
3. Prime cost	400.83	20,04,168
4. Production OH	200	10,00,000
5. GWC / NEW / Cost of production	600.83	30,04,168
6. Opening Stock of FG	550	5,50,000
7. Closing stock of FG (W.N.2)	(592.3613)	(8,88,542)
8. Cost of Goods sold (W.N.4)	592.3613	26,65,626

W.N.3: Direct materials consumed

OP. Rm 10,000 kgs @ Rs.20 / kg = Rs.2,00,000

Purchases 50,000 kgs @ Rs.25 / kg = Rs.12,50,000

60,000 Rs.14,50,000

Weighted Average price = $\frac{Rs.14,50,000}{60,000 kgs}$ = Rs.24.167 / kg

60,000 kgs

DM consumed

55,000 kgs

= Rs.13,29,167

Closing RM

5,00,000 kgs

= Rs.1,20,833

Rs.13,25,000

W.N.4: Valuation of FG = COGS

Opt. Stock of FG	=	1,000 @ Rs.550	=	Rs.5,50,000
Cost of Production	=	5,000 @ Rs.600.83	=	30,04,168
Cost of goods available		6,000		35,54,168

35,54,168

COGS	Closing stock – FG
4,500 u @ 592.3613	= 1,500 u @ 592.3613
= Rs.26,65,626	= Rs.8,88,542

Step – 2: Income statement (Sold = 4,500 u)

Particulars	p.u	(Rs.)
Sales	750	33,75,000
(-) COGS	(592.3613)	(26,65,626)
Gross profit	157.6386	7,09,374
(-) AOH	(55.55)	(2,50,000)
(-) SOH	(66.66)	(3,00,000)
Operating profit	35.4764	1,59,374

Answer for Q.NO.4.

Step – 1: Cost sheet of Easy Feet shoe co.

Production = a = 40,000 b = 1,20,000 u

Particulars	Type – A		Type – B	
	p.u	Rs.	p.u	Rs.
1. Direct materials (W.N.1)	15.00	6,00,000	7.50	9,00,000
2. Direct wages (W.N.2)	7.50	3,00,000	4.50	5,40,000
3. Prime cost	22.50	9,00,000	12.00	14,40,000
4. Production OH (W.N.3)	2.25	90,000	2.25	2,70,000
5. GWC / NWC / Cop	24.75	9,90,000	14.25	17,10,000
6. Opening FG	-	-	-	-
7. Closing FG (W.N.4)	24.75	99,000	14.25	2,85,000
8. Cost of goods sold	24.75	8,91,000	14.25	14,25,000

Step – 2: Income statement (units sold = 0 = 36,000 u b = 1,00,000 u)

Particulars	Type – A		Type – B	
	p.u	Rs.	p.u	Rs.
Sales	44.000	15,84,000	28.00	28,00,000

(-) COGS	(24.75)	(8,91,000)	(14.25)	(14,25,000)
GP	19.25	6,93,000	13.75	13,75,000
(-) AOH	(12.50)	(4,50,000)	(8.10)	(8,10,000)
(-) SOH	(1.50)	(54,000)	(150)	(1,50,000)
Operating profit	5.25	1,89,000	4.150	4,15,000

Note: 150% of d. wages should be calculated on total amount not at a per unit level

W.N.1: Apportionment of D. materials cost

Ratio	A	:	B
Consumption	2	:	1
Production	40,000	:	1,20,000
Wt. ratio	80,000		1,20,000
	= 2 : 3		

D.M consumed = Rs.15,00,000

Type – A (2 : 3) Type – B

= Rs.6,00,000 = Rs.9,00,000

W.N.2: Apportionment of D.Wages

Ratio	A	:	B
Consumption	100	:	60
Production	40,000	:	1,20,000
Wt. ratio	40,00,000		72,00,000
	= 5 : 9		

D. Wages = Rs.8,40,000

A (5:9) B

= 3,00,000 = Rs.5,40,000

W.N.3: Apportionment of POH

Ratio	A	:	B
Consumption	1	:	1
Production	40,000	:	1,20,000
Wt. ratio	40,000		1,20,000
	= 1 : 3		

P.O.H = Rs.3,60,000

Type A Type B

= 90,000 = Rs.2,70,000

W.N.4: Valuation of closing FG

Particulars	A	B
Production	40,000	1,20,000
(-) Sales	(36,000)	(1,00,000)
1. Closing FG (in units)	4,000	20,000
2. COP p.u	24.75	14.25
Cl. GF (in Rs.) (1 x 2)	99,000	2,85,000

Answer for Q.NO.5.

Cost sheet of M/s. Bright shoe polish Co.

(Production & sales) (75,000 & 72,00,000) (25,000 & 30,000)

Particulars	Total	Black		Brown	
		p.u	Rs.	p.u	Rs.
1. D. Materials					
- Polish	2,46,000	2.40	1,80,000	2.64	66,000
- Tins	1,20,000	1.20	90,000	1.20	30,000
2. D. Wages	2,04,000	2.00	1,50,000	2.16	54,000
3. Prime cost	5,70,000	5.60	4,20,000	6.00	1,50,000
4. P. OH	3,06,000	3.00	2,25,000	3.24	81,000
5. GWC / NWC / COP	8,76,000	8.60	6,45,000	9.24	2,31,000
6. + OP. FG	94,560	8.60	20,640	9.24	73,920
7. (-) Cl. FG	(74,160)	(8.60)	(46,440)	(9.24)	(27,270)
8. COGS	8,96,400	8.60	6,19,200	9.24	2,77,200
9. AOH & SOH	1,02,000	1.00	72,000	1.00	30,000
10. COS	9,98,400	9.60	6,91,200	10.24	3,49,200
11. + Project	2,64,600	2.40	1,72,800	3.06	91,800
12. Sales	12,63,000	12.00	8,64,000	13.30	3,99,000

W.N.1: Computation of production quantities

Units produced = Sales + Cl. Stock – Op. stock

Black = 72,000 + 5400 – 2400

= 75,000 u

Brown = 30,000 + 3000 – 8000

= 25,000 u

W.N.2: Apportionment of d. material cost

1. Polish

Ratio Black brown

Consumption	100		110
Production	75,000		25,000
W.T. ratio	300	:	110

2. Tins

Ratio	Black		brown
Consumption (Equal)	1		1
Production	75,000		25,000
W.T. ratio	3	:	1

W.N.3: Apportionment of direct wages

Ratio	Black		brown
Consumption	100		108
Production	3		1
W.T. ratio	300	:	108
	25		9

W.N.4: POH

Same as D.Wages

W.N.5: Valuation of F.G

Type	Op. Stock	Cl. Stock
Black	2400 x 8.60 = 20,640	5400 x 8.60 = 46,440
Brown	8000 x 9.24 = 73,920	3000 x 9.24 = 27,720
	94,560	74,160

W.N.6: AOH & SOH

Ratio	Black		Brown
Consumption	1		1
Sales	72,000	:	30,000
	12 : 5		

Answer for Q.NO.6.

Missing Figures – Cost sheet

Particulars	Rs.
1. D. material (25% of P.C	40,000
2. D. Labour (75% of P.C)	1,20,000
3. Prime cost	1,60,000
4. Prod. OH	1,19,000

5. GWC	2,79,000
6. + OP. WIP	21,000
7. (-) Cl. WIP	62,000
8. NWC / COP	2,38,000
9. + OP. FG	37,000
10. COGAS	2,75,000
11. (-) Cl. FG	44,000
12. COGS (70% of Sales	2,31,000
13. GP @ 30%	99,000
14. Sales	3,30,000

Ans: The estimate of inventories destroyed by fire are as flows:

- Cl. FG = Rs.44,000

- Cl. WIP = Rs.62,000

Answer for Q.NO.7.

Part – 1 Calculation of closing

Particulars		**Amount (Rs.)**	
	Opening stock of RM	given	16,000
+	Purchases of RM	given	1,60,000
(-)	Closing stock of RM	(16,000 + 1,60,000 – 1,14,000)	(62,000)
=	Direct materials consumed	(4,14,000 – 3,00,000)	1,14,000
+	Direct labour	given	1,80,000
=	Prime cost	given	2,94,000
+	Prod. OH	W.N.1)	1,20,000
=	Gross works cost	(2,94,000 + 1,20,000)	4,14,000
+	Opening WIP	Given	34,000
(-)	Closing WIP	(4,14,000 + 34,000 – 42,000)	(28,000
=	NWS / COP	(4,50,000 – 30,000)	4,20,000
+	Opening FG	Given	30,000
=	COGAS		4,50,000
(-)	Closing FG	(4,00,000 – 4,50,000)	(50,000)
=	COGS		4,00,000
+	GP – 20% on sales	(5,00,000 x 20%)	1,00,000
=	Sales	Given	5,00,000

W.N.1: Calculation of POH:

CC = DL + DE + POH

CC = 1,80,000 + POH

(POH is 60% of CC)

CC = 1,80,000 / 60% = 3,00,000

POH = 40% (3,00,000) = 1,20,000

If you are excluding an item, then always write a note with reasons for such treatment

Answer for Q.NO.8.

Cost sheet

	Particulars	**Amount (Rs.)**
	Opening stock of RM	4,00,000
+	Purchases of RM & carriage inwards	48,75,000
(-)	Closing stock of RM	(5,00,000)
=	Direct materials consumed	47,75,000
+	Direct labour	17,50,000
=	Prime cost	65,25,000
+	POH (W.N.1)	11,97,500
=	Gross works cost	77,22,500
+	Opening WIP	1,50,000
(-)	Closing WIP	(1,00,000)
=	Net works cost	77,72,500
+	Quality control	15,000
+	Research & Development	15,000
=	Cost of production	78,02,500
+	Opening FG	60,000
(-)	Closing FG	(1,50,000)
=	Cost of Goods sold	77,12,500
+	AOH (W.N.2)	5,25,000
+	SOH (1,00,000 + 92,500)	1,92,500
=	Cost of sales	84,30,000
+	Profit (bal. figure)	(5,70,000)
=	Sales (given)	90,000

W.N.1: POH

Particulars	**Rs.**
1. Works manager salary	3,00,000
2. Salary – Factory	3,00,000

3. Factory rent	72,500
4. Power	95,000
5. Other Prod. Exp	4,20,000
6. Loose tools	10,000
	11,97,500

W.N.2: AOH

Salary – Office staff	2,00,000
Gen. exp	3,20,000
Bank Charges	5,000
	5,25,000

W.N.2: Exclusions from cost sheet

	Particulars	(Rs.)	Reason
1.	Bad debts	15,000	Inefficiency in collection (Non- Operating item)
2.	Deb. Interest	50,000	Financial item
3.	Div. paid	10,000	Appropriation of profits
4.	IT provision	5,000	Profit based outflow (Non – Operating item)
5.	Goodwill w/off	1,00,000	Amortization of an intangible asset (Non – Operating item)
6.	GST	1,60,000	Collection & remittance On behalf of Govt. (Not a revenue / cost)
7.	T/F to machinery	1,00,000	Appropriation of profits
8.	Int. on loan	75,000	Financial expenses
9.	Discount allowed	27,000	It is policy based transaction (Non- Operating expenses)

Note: GST on composition scheme – APP to purchases cost

Trade discount – reduce it from sales (or) add to SOH

Answer for Q.NO.9.

Cost sheet

Particulars	(Rs.)	
Opening stock of RM	18,00,000	
Purchases	10,00,00,000	
+ freight	11,20,600	
(-) Closing stock of RM	(9,60,000)	
D. Materials consumed		10,19,60,600
+ D. Labour		

- Wages to factory workers	29,20,000	
- Rent to c'es PF and ESI	3,60,000	
- Prod. Bonus to factory	2,90,000	35,70,000
+ D. Expenses		
- Royalty paid for prod.	1,72,600	
- Power & Fuel	4,62,000	
- Amortized cost of moulds & Patens (8,96,000 / 2 yrs)	4,48,000	
- Job charges	8,12,000	18,94,600
Prime cost		10,74,25,200
+ Production OH		
- Depn. Factory building	84,000	
- Stores and spares	1,12,000	
- Depn. P & M	1,26,000	
- Supervisor salary	1,26,000	
- Repairs – P & M	48,000	
- Insurance – P & M	31,000	
- Insurance factory building	18,100	
- Insurance – stock and WIP	36,000	
- Pollution control	26,600	6,07,900
Gross works cost		10,80,33,100
+ Opening WIP		9,20,000
(-) Closing WIP		(8,70,000)
Net works cost		10,80,83,100
Quality control		
- Expenses	19,600	
- Salary to the staff	96,200	1,15,800
Admin OH related to production		
- Expenses	1,18,600	
- Prod. Control salary to manager	9,60,000	
R & D cost		18,200
Primary packing		96,000
(-) Sale of scrap		(86,000)
Cost of production		10,93,05,900
+ OP. FG		11,00,000

(-) Cl. FG		(18,00,000)
COGS		10,84,05,900
+ AOH		
- Depn. Office building	56,000	
- Repairs on vehicles	19,600	
- Salary to A/c's manager	9,18,000	
- Salary to General Manager	12,56,000	
- Auditors fee	1,80,000	
- Legal fees	1,20,000	
- Ind. directors	2,20,000	27,69,600
+ SOH		
- Depn. Delivery vehicles	86,000	
- Repairs – sales building	18,000	
- Salary – marketing	10,12,000	
- Secondary packing	1,12,000	
- Performance bonus	1,80,000	14,08,000
Int. & Finance charges paid		7,20,000
Cost of sales		11,35,33,300

Ans: 11,35,03,300

Note:

1. Interest & finance charges paid is considered as it is considered as per ICAI SM.

2. GST paid on purchase of RM will not form pat c as it is eligible for ITC.

3. Interest and finance charges should not form part of cost sheet.

4. Expenses for pollution control is to be considered as prod. OH

Answer for Q.NO.10.

Cost sheet

Particulars	(Rs.)	
Opening stock of RM	2,42,000	
+ Purchases	52,50,000	
(-) Closing stock of RM	2,00,000	
D. Materials consumed (7.5 L x 100 / 150)		52,00,000
+ D. Labour (52 L x 50%)		26,00,000
Prime cost		78,00,000
+ Production OH (3,50,000 + 2,00,000)		5,50,000

Gross works cost		83,50,000
+ O.P WIP (given)		2,00,000
(-) Closing WIP (given)		(5,00,000)
- Net works cost		80,50,000
+ QC (Given)		
+ R & D (given)		2,50,000
(-) Sale of scrap (1,00,000 x 4% x Rs.61)		(2,44,000)
Cost of production (96,000 x Rs.36)		82,56,000
+ Op. FG		-
(-) Cl. FG (5,000 x Rs.86)		(4,30,000)
Cost of goods sold (given)		78,26,000
+ AOH		2,24,000
+ SOH (95,000 x Rs.2 + 4,13,000)		6,03,000
Cost of sales		86,53,000
Profit (bal fig.)		13,57,000
Sales (9,000 x Rs.110)		1,00,10,000

W.N.1: Calculation of units sold

Targeted units = 1,00,000

(-) Normal loss @ 4% = (4,000)

(-) Cl. Stock of FG = (5,000)

Units sold = 91,000

Eff. Units produced = 91000 + 5000

Goods available for sale = 96,000

Note:

When stock at cl. FG. / COF we units and sold assumed is produced in current year to arrive at p.u cost of production.

Answer for Q.NO.11.

Profit and Loss Statement of G.K Co. for the year ended 31st March

	(Rs.)	**(Rs.)**
Gross Sales	7,68,000	
Less: Returns and rebates	(14,000)	7,54,000
Less: Cost of Sales [Refer to Schedule (i)]		(7,14,020)
Net Operating Profit		39,980
Less: Interest on borrowed funds (2,000+2,000)		(4,000)
Net Profit		**35,980**

(i) Schedule of Cost of Sales

	(Rs.)	(Rs.)
Raw Material (Inventory opening balance)		1,40,000
Add: Material Purchased	3,20,000	
Add: Freight on Material	16,000	
Less: Purchase Returns	(4,800)	3,31,200
		4,71,200
Less: Closing Raw Material Inventory		(1,80,000)
Materials consumed in Production		2,91,200
Direct employee cost (Rs.1,60,000 + Rs.8,000)		1,68,000
Prime Cost		**4,59,200**
Factory Overheads:		
Indirect employee cost (Rs.18,000 + Rs.1,200)	19,200	
Factory Supervision	10,000	
Repairs and factory up-keeping expenses	14,000	
Heat, Light and Power (Rs.65,000 × 8/10)	52,000	
Rates and Taxes (Rs.6,300 × 2/3rd)	4,200	
Miscellaneous Factory Expenses	18,700	
Depreciation of Plant (10% of Rs.4,60,500)	46,050	
Depreciation of Buildings (4% of Rs.2,00,000 × 8/10)	6,400	1,70,550
Gross Works Cost		**6,29,750**
Add: Opening Work-in-Process inventory		2,00,000
Less: Closing Work-in-Process inventory		(1,92,000)
Cost of production		**6,37,750**
Add: Opening Finished Goods inventory		80,000
Less: Closing Finished Goods inventory		(1,15,000)
Cost of Goods Sold		**6,02,750**
Add: Administration Expenses [See Schedule (iii)]		18,870
Add: Selling and Distribution Expenses [See Schedule (ii)]		92,400
Cost of Sales		**7,14,020**

(ii) Schedule of Selling and Distribution Expenses

	(Rs.)
Sales Commission	33,600
Sales Travelling	11,000
Sales Promotion	22,500
Distribution Deptt.—Salaries and Expenses	18,000

Heat, Light and Power	6,500
Depreciation of Buildings	800
	92,400

(i) Schedule of Administration Expenses

	(Rs.)
Office Salaries and Expenses	8,600
Depreciation of Office Appliances	870
Depreciation of Buildings	800
Heat, Light and Power	6,500
Rates and Taxes	2,100
	18,870

Answer for Q.NO.12. .

Cost sheet

Particulars	**30,000 units**		**1,00,000 units**	
	p.u	**Rs.**	**p.u**	**Rs.**
Works cost	380.00	114,00,000	310.00	310,00,000
+ Fixed AOH	5.00	1,50,000	1.50	1,50,000
+ Fixed SOH	8.33	2,50,000	2.50	2,50,000
Variable dist. OH	30.00	9,00,000	30.00	30,00,000
SPL. Costs			30.00	30,00,000
- Gift			1.00	1,00,000
- Lucky draw (50,000 + 25,000 + 10,000 + 3 x 5000)				
- Refreshments			1.00	1,00,000
- Sponsorship			20.00	20,00,000
Cost of sales	423.33	1,27,00,000	396.00	396,00,000
+ Profit (bal. fig)	126.77	38,00,000	104.00	104,00,000
Sales	550	165,00,000	500	5,00,00,000

Note: Three consultation prices multiplied Rs.5,000 by 3

Answer for Q.NO.13. .

Step 1: Calculation of overheads recovery rates

Particulars	**Last year actuals**	**Computation**

OP. stock – RM	1,50,000	Given
+ Purchases	18,50,000	Given
(-) Closing stock of RM	(2,00,000)	Given
D. materials consumed	18,00,000	Subtotal
+ D. labour	9,50,000	Given
Prime cost	27,50,000	Sub total
+ Factory overheads	3,80,000	Given 3,80,000 / 1,50,000 x 100 = 40%
Gross works cost / Net works cost	31,30,000	
+ Admin OH related to production	2,50,400	2,50,400 / 31,30,000 x 100 = 8%
Cost of production	33,80,400	subtotal

Step 2: Cost statement & price to be quoted for the order received next year

Particulars	Last year actuals	Computation
D. materials	8,00,000	Given
D. Labour	4,50,000	Given
Prime cost	12,50,000	Sub total
+ Factory OH	1,80,000	40% x 4,50,000
GWC / NWC	14,30,000	Sub total
+ Admin OH related to production	1,14,400	8% x 14,30,000
Cost of production	15,44,400	Sub total
+ SOH	45,000	Given
Cost of sales	15,89,400	Sub total
+ Profit @ 10% on sales	1,76,600	
1/10 on sales 1/9 on cost		15,89,400 / 90 x 10
Sales	17,66,000	Sub total

Answer for Q.NO.14.

Particulars	Existing		Proposed	
	Workings	Rs.	Workings	Rs.
D. materials	0.5c	1000	0.5c x 120%	1200
+ D. Wages	0.3c	600	0.3c x 110%	660
+ OH	0.2c	400	0.2c x 110%	440
Total cost of sales	C	2000	1.15c	2300
+ Profit	P	1000	0.7P	700
- Selling price	3000	3,000	3000	3000

Let present cost be 'c' & present profit be 'p'

c + p = 3000 – 1

1.15x + 0.7p = 3000 – 2

Multiply – 1 by 1.15

=> 1.15c + 1.15p = 3450

1.15c + 0.7p = 3000 - 2

0.45p = 450

=> p = 1000

=> c + p = 3000

c + 1000 = 3000

c = 2000

Part – 2:

Present GP% = $\frac{1000}{2000} \times 100 = 50\%$ on cost

New selling price (Rs.) = new cost + GP margin

= 2300 + 50% (2300)

= 2300 + 1150

= 3450

Answer for Q.NO.15.

Let x = FOH as a % on D. labour

Let y = SOH as a % on factory cost

Particulars	A	B
D. materials	19,000	15,000
D. labour	15,000	25,000
Prime cost	34,000	40,000
+ FOH	(x × 15,000)	(25,000 × x)
Factory cost	34,000 + 15,000x	40,000 + 25,000x
+ SOH	(34,000 + 15,000)y	(40,000 + 25,000)y
Cost of sales	48000 (60k – 12k)	60,000 (80k – 20k)
+ Profit	12,000 (60k × 1/5)	20,000 (80k × 25%)
Sales	60,000	80,000

Prod. A = (34,000 + 15,000x) + (34,000 + 15,000x) y

= 34,000 + 15000x (1 + y) = 48,000 – 1

Prod. B = (40,000 + 25,000x) + (40,000 + 25,000x)y

= 40,000 + 25,000x (1 + y) = 60,000 – 2

Dividing 1 by 2

$= \frac{34,000+15,000x(1+y)}{40,000+25,000x(1+y)} = \frac{48,000}{60,000}$

$= = \frac{1000(34+15x)}{1000(40+25x)} = \frac{48}{60}$

= 60 (34 + 15x) = 48 (40 + 25x)

= 2040 + 900x = 1920 + 1200x

= 120 = 300x

X = 0.4 or 40% on d. labour

Substituting x = 0.4 in - 1

= (34,000 + 15,000 (0.4) (1 + y) = 48,000

= 4000 (1 + y) = 48,000

= 1 + y = $\frac{48,000}{4000}$

= 1 + y = 1.2

= y = 0.2 or 20% on factory cost

CHAPTER 03: OVERHEADS – ABSORPTION COSTING METHOD

Answer for Q.NO.1.

Primary distribution summary

Particulars	Total	Basis	P_1	P_2	P_3	S_1	S_2
Ind. Mat	4250	Direct allocation	950	1200	200	1500	400
Ind. Wages	3950	Direct allocation	900	1100	300	1000	650
Power & light	6,000	Kw : hrs (40 : 44 : 16 : 15 : 5)	2000	2200	800	750	250
Insurance assets	1,000	Capital value (10 : 12 : 8 : 6 : 4)	250	300	200	150	100
Rents & rates	2,800	Area (4 : 4 : 3 : 2 : 1)	800	800	600	400	200
Meals	3,000	E'ers (90 : 120 : 30 : 40 : 20)	900	1200	300	400	200
Depn. On capital assets	2000	Capital value (10 : 12 : 8 : 6 : 4)	500	600	400	300	200
Primary distribution	23,000		6,300	7,400	2,800	4,500	2,000

Answer for Q.NO.2.

1. Direct re-distribution method:

Particulars	P_1	P_2	S_1	S_2
Primary Distribution	7,000	6,000	18,000	8,000
S_1 (4 : 5)	8,000	10,000	(18,000)	-
S_2 (5 : 3)	5,000	8,000	-	(8,000)
Secondary distribution	20,000	19,000	-	-

2. Step – ladder method:

a) Apportioning S_1 cost first

Particulars	P_1	P_2	S_1	S_2
Primary Distribution	7,000	6,000	18,000	8,000
S_1 (4 : 5 : 1)	7,200	9,000	(18,000)	1,800
S_2 (5 : 3)	6,125	3,675	-	(9,800)
Secondary distribution	20,325	18,675	-	-

b) Apportioning S_2 cost first

Particulars	P_1	P_2	S_1	S_2
Primary Distribution	7,000	6,000	18,000	8,000
S_1 (5 : 3 : 2)	4,000	2,400	1,600	(8,000)
S_2 (5 : 3)	8,711	10,889	(19,600)	-
Secondary distribution	19,711	19,289	-	-

3. Repeated distribution method:

Particulars	P_1	P_2	S_1	S_2
Primary Distribution	7,000	6,000	18,000	8,000
S_1 (4 : 5 : 1)	7,200	9,000	(18,000)	1,800
S_2 (5 : 3 : 2)	4,900	2,940	1,960	-
S_1 (4 : 5 : 1)	784	980	(1,960)	196
S_2 (5 : 3 : 2)	98	59	39	(196)
S_1 (4 : 5 : 1)	16	19	(39)	4
S_2 (5 : 3 : 2)	2	2	-	(4)
	20,000	19,000	-	-

4. Simultaneous equation method

Step 1: Forming equations

Let OH of S_1 be x

S_2 be y

X = 18,000 + 0.20 y

Y = 8,000 + 0.10 x

Step 2: Solving equations

Substituting – 1 in – 2

$\Rightarrow$ y = 8,000 + 0.10(18,000 + 0.20yt)

$\Rightarrow$ y = 8,000 + 18,000 + 0.02y

$\Rightarrow$ 0.98y = 9800

$\Rightarrow$ y = 10,000

$\Rightarrow$ x = 18,000 + 0.20 (y)

$\Rightarrow$ x = 18,000 + 0.20 (10,000)

$\Rightarrow$ x = 20,000

Step 3: Apportionment

Particulars	P_1	P_2	S_1	S_2
Primary Distribution	7,000	6,000	18,000	8,000
S_1 (4:5:1)	8,000	10,000	(20,000)	2,000

S_2 (5:3:2)	5,000	2,000	2,000	(10,000)
Secondary distribution	20,000	19,000	-	-

5. Trial & Error method:

Step 1: Re distribution of service dept. OH

Particulars	S_1	S_2
Primary Distribution	18,000	8,000
$S_1 \rightarrow S_2$ (10% x 1800)		1,800
$S_2 \rightarrow S_1$ (20% x 9800)	1,960	
$S_1 \rightarrow S_2$ (10% x 1960)		196
$S_2 \rightarrow S_1$ (20% x 196)	39	
$S_1 \rightarrow S_2$ (10% x 39)		4
$S_2 \rightarrow S_1$ (rounded off)	1	
	20,000	10,000

Step 2: Apportionment

Particulars	P_1	P_2
Primary Distribution	7,000	6000
S_1 (90% x 20,000) (4 : 5)	8,000	10,000
S_2 (80% x 10,000) (5 : 3)	5,000	3,000
Secondary distribution	20,000	19,000

Answer for Q.NO.3.

Step 1: Forming equation

Let B.H OH be x

P.R OH be y

$X = 234000 + 0.20y \rightarrow 1$

$Y = 3,00,000 + 0.10x \rightarrow 2$

Substituting $\rightarrow 1$ in $\rightarrow 2$

$Y = 300000 + 0.10 (234000 + 0.20y)$

$Y = 30000 + 23400 + 0.02$

$0.98y = 323400$

$Y = 330,000$

Substituting y in $\rightarrow 1$

$X = 234000 + 0.20 (330000)$

$X = 234000 + 66000$

$X = 300000$

Step 2: Apportionment

Particulars	A	B	C	BH	PR
Primary Distribution	8,00,000	7,00,000	5,00,000	2,34,000	3,00,000
S_1 (2 : 4 : 3 : 1)	60,000	1,20,000	90,000	(3,00,000)	30,000
S_2 (4 : 2 : 2 : 2)	1,32,000	66,000	66,000	60,000	(3,30,000)
Secondary distribution	9,92,000	8,86,000	6,56,000	-	-

Answer for Q.NO.4.

TK – No. of employees

ST – No. of requisitions

Maintenance – Machine hours

Service receiver

	TK	ST	M
TK	-	✓	✓
ST	×	-	✓
M	×	×	-

- Self service is to be disregarded

TK → ST → M One way traffic

To find order of apportionment

TK – 2

ST – 1

M – (-)

always apportion in descending order of service provision

Step – ladder method:

Particulars	P_1	P_2	M	ST	TK
Primary distribution	24,000	16,000	3,000	5,000	4,000
TK (20 : 15 : 5 : 10)	1600	1200	400	800	(4,000)
ST (12, 10 : 3)	2784	2320	696	(5800)	-
M (24 : 6)	3277	819	(4096)	-	-
Secondary distribution	31661	20339	-	-	-

Notes:

1. It can be observed that there are no reciprocal services among service dept. hence we can use step ladder method.
2. While distributing OH, distribute OH of that dept which provides services to maximum no. of other service dept's and go in descending order.

Answer for Q.NO.5.

Part – 1: Allocation of service dept. cost under repeated distribution method.

Step 1: Cost driver allocation percentage

1. Factory office:

Cost driver = No. of employees

Snow mobile = 1080 / 1500 = 72%

Boat engine = 270 / 1500 = 18%

Maintenance = 150 / 1500 = 10%

2. Maintenance Dept.

Cost driver = No. of work orders

Snow mobile = 570 / 800 = 71.25%

Boat engine = 190 / 800 = 23.75%

Factory office = 40 / 800 = 5%

Step 2: Repeated distribution method:

Particulars	SM	BE	FO	MD
Primary	6,00,000	17,00,000	3,00,000	2,40,000
MD (71.25 : 23.75 : 5)	1,171,000	57,000	12,000	(2,40,000)
FO (72 : 18 : 10)	2,24,640	56,160	(3,12,000)	31,200
MD (71.25 : 23.75 : 5)	22,230	7,410	1,560	(31,200)
FO (72 : 18 : 10)	1,123	281	(1,560)	156
MD (71.25 : 23.75 : 5	111	44	-	(156)
Secondary distribution	10,19,104	18,20,895	-	-

Part 2: Allocation of service dept. cost under direct distribution method.

Step 1: Cost driver allocation %

1. Factory Office

Cost driver = No. of employees

Snow mobile = 1080 / (1080 + 270) = 80%

Boat engine = 270 / (1080 + 270) = 20%

2. Maintenance

Cost driver = No. of work orders

Snow mobile = 570 / (570 + 190) = 75%

Boat engine = 190 / (5700 + 190) = 20%

Step 2: Direct distribution method

Particulars	SM	BE	FO	M
Primary	6,00,000	17,00,000	3,00,000	2,40,000

MD (75 : 25)	1,80,000	60,000	-	(2,40,000)
FO (80 : 20)	2,40,000	60,000	(3,00,000)	-
Secondary distribution	10,20,000	18,20,000	-	-

Answer for Q.NO.6.

Step 1: Primary distribution of overheads

Particulars	Production Dept.				Service Dept.	
	Basis	X	Y	Z	A	B
Rent & Rates (2 : 2.5 : 3 : 2 : 0.5	Floor space	2000	2500	3000	2000	500
Lighting & Electricity (2 : 3 : 4 : 2 : 1)	Light Points	200	300	400	200	100
Indirect wages (6 : 4 : 6 : 3 : 1)	Direct wages	900	600	900	450	150
Power (12 : 6 : 30 : 2 : 0)	HP of machine	1200	600	1000	200	-
Depreciation (12 : 16 : 20 : 1 : 1)	Cost of machine	4800	6400	8000	400	400
Other expenses (6 : 4 : 6 : 3 : 1)	Direct wages	6,000	4,000	6,000	3,000	1,000
Direct wages of service dept.	Direct Allocation	-	-	-	3000	1000
Primary Distribution		15,100	14,400	19,300	9,250	3,150

Rs.61,200

Step 2: Secondary Distribution

Since reciprocal services are observed. Simultaneous equation method is being selected

a. Equation:

Let OH of Dept. A = A

Let OH of Dept. B = B

Total own OH + Other dept.

$\Rightarrow$ A = 9,250 + 0.10 B $\rightarrow$ 1

$\Rightarrow$B = 3,150 + 0.10 A $\rightarrow$ 2

b. Solving equation:

Substituting 2 in 1

$\Rightarrow$ A = 9,250 + 0.10 (3150 + 0.10A)

$\Rightarrow$ A = 9250 + 315 + 0.01 A

$\Rightarrow$ 0.99 A = 9565

$\Rightarrow$ A = 9662

$\Rightarrow$ B = 3150 + 0.10 A

$\Rightarrow$ B = 3150 + 0.10 (9662)

$\Rightarrow$ B = 4116

c. Apportionment

Particulars	X	Y	Z	A	B
Primary distribution	15100	14400	19300	9250	3150
A1 (9662) – 2 : 3 : 4 : 1	1932	2899	3865	(9662)	966
B1 (4116) – 4 : 2 : 3 : 1	1646	823	1235	4 + 2	(4116)
Secondary distribution	18678	18122	24400	-	-

Step 3: Absorption

a. Calculation of absorption rate:

Particulars	X	Y	Z
1. Secondary Distribution	18678	18122	24400
2. Labour hrs	4670	3020	3050
3. Lab rate / (1 ÷ 2)	Rs.4 / hr	Rs.6 / hr	Rs.8 / hr

b. Charging of overheads

OH = Absorption rate x Base quantity consumed

Dept. X = Rs.4 / hrs. x 2 hrs = Rs.8

Dept. Y = Rs.6 / hrs. x 3 hrs = Rs.18

Dept. Z = Rs.8 / hrs. x 4 hrs = Rs.32

OH WST p.u Rs.58

Step 4: Total cost p.u

Particulars	**Rs.**
D. materials	80
D. wages	40
Prime cost	120
+ Overheads	58
Total cost p.u	178

Answer for Q.NO.7.

Step 1: Calculation of absorption rate (all six types)

S. No	Formula	Calculation	Absorption rate
1.	Labour hour rate = $\frac{\text{Overheads}}{\text{Labour hrs}}$	$\frac{3,00,000}{25,000\text{hrs}}$	Rs.12 / labour hr.

2.	Machine hour rate = $\frac{\text{Overheads}}{\text{Machine hrs}}$	$\frac{3,00,000}{15,000\text{hrs}}$	Rs.20 / machine hr
3.	D. material cost rate = $\frac{\text{Overheads}}{\text{D.materials}} \times 100$	$\frac{3,00,000}{1,00,000} \times 100$	300% of D. materials cost
4.	D. labour cost rate = $\frac{\text{Overheads}}{\text{D.labour cost}} \times 100$	$\frac{3,00,000}{50,000} \times 100$	600% of D. labour cost
5.	Prime cost = $\frac{\text{Overheads}}{\text{Primecost}} \times 100$	$\frac{3,00,000}{1,50,000} \times 100$	200% of Prime cost
6.	Product ion unit rate = $\frac{\text{Overheads}}{\text{No.of jobs}}$	$\frac{3,00,000}{300\text{jobs}}$	Rs.1000 / job

Step 2: Calculation of cost estimate under each & absorption rate methods

Method	**D.M (1)**	**D.L (2)**	**P.C (1 + 2) = (3)**	**POH (4)**	**T.C (5) = (3 + 4)**
1	250	200	450	80 hrs x Rs.12 / hr.	1410
2	250	200	450	50 hrs x Rs.20 / hr.	1450
3	250	200	450	250 x 300 % = 750	120
4	250	200	450	200 x 600 % = 1200	1650
5	250	200	450	450 x 200 % = 900	1350
6	250	200	450	1000 x = 1000	1450

Answer for Q.NO.8.

Step 1: Calculation of under / over absorption during the year

		(Rs.)
a. Total POH actually incurred	=	6,00,000
(-) **b.** Written off absolute stores	=	(45,000)
Wages paid for strike period	=	(30,000)
c. Net POH actually incurred (Note – 1)	=	5,25,000
d. Absorbed POH (absorption rate x machine hrs) = (Rs.10 x 48,000)	=	4,80,000
e. Under absorption (c – d)	=	45,000

Note 1: (b) – are excluded from actual OH incurred as they are directly chargeable to costing P & L A/c as period costs.

Step 2: Classification of under absorption into product / period cost:

Rs.45,000

Period cost	Product cost
↓	↓
1/3 due to inefficiency	Rs.30,000
= Rs.15,000	(bal. fig)
	(price level changes)

Step 3: Apportionment of product cost between the products using supplementary rate

Particulars	Units	Computation	Rs.
a. FG sold	18,000	18,000 x Rs.1.25	22,500
b. FG unsold (cl. Stock)	2000 20,000 – 18,000	2,000 x Rs.1.25	2,500
c. WIP (8000 u x 50%)	4,000	4,000 x Rs.1.25	5,000
	24,000		30,000

$$\text{Supplementary rate} = \frac{\text{Under absorption}^*}{\text{total equivalent units produced}}$$

$$^*\text{only to extent of product cost ua} = \frac{\text{Rs.30,000}^*}{\text{24,000u}} = \text{Rs.1.25 / u}$$

Date	Particulars		Debit	Credit
	Cost of sales A/c	Dr	22,500	
	FG A/c	Dr	2,500	
	WIP A/c	Dr	5,000	
	Costing P & L A/c	Dr	15,000	
	To POH A/c			45,000
	(Being under absorption accounted for)			

Note 2: Due to the above adjustment current year profit comes down by Rs.27,500 (22,500 + 15,000) & stock increases by Rs.7,500 (2500 + 5000)

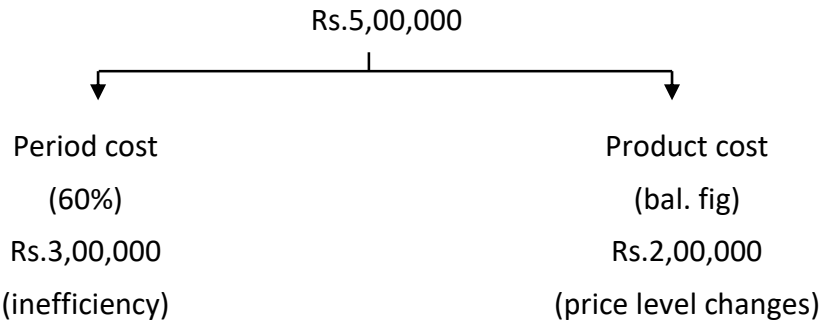
Answer for Q.NO.9.

Step 1: Calculation of under / over absorption:

	Particulars		Rs.
a.	Total POH actually incurred		45,00,000
b.	Factory OH incurred for the period but not accounted		2,00,000
c.	POH actually incurred		47,00,000
d.	Strike wages	1,25,000	
	Penalty – central excise	25,000	
	Obsolete stores	40,000	
	Prior period settlement	10,000	(2,00,000)

e.	Net POH actually incurred		45,00,000
f.	Absorbed OHS (Rs.20 x 2,00,000)		40,00,000
g.	Under absorbed OH (e – f)		5,00,000

Step 2: Classification of under absorption into product & period cost



Step 3: Apportionment of UA to output using supplementary rate

	Particulars	Units	Computation	(Rs.)
a.	Units sold FG	30,000	30,000 x Rs.5	1,50,000
b.	Units unsold FG	5,000	5,000 x Rs.5	25,000
c.	Cl. WIP (10,000 x 50%)	5,000	5,000 x Rs.5	25,000
		40,000		2,00,000

$$\text{Supplementary rate} = \frac{\text{under absorption (Product cost)}}{\text{Units Produced}} = \frac{\text{Rs.2,00,000}}{40,000} = \text{Rs.5 / unit}$$

Particulars		Debit	Credit
Cost of sales A/c	Dr.	1,50,000	
FG A/c	Dr.	25,000	
WIP A/c	Dr.	25,000	
Costing P & L A/c	Dr.	3,00,000	
To POH (Being treatment of under absorption)			5,00,000

Note: Due to above adjustment, profit comes down by Rs.4,50,000 & stock value increases by Rs.50,000 (Rs.25,000 & 25,000)

Answer for Q.NO.10.

Step 1: Calculation of under absorption

	Particulars	(Rs.)
a.	Total POH actually incurred	4,26,544
b.	Absorbed OH (Note)	3,65,904
c.	Under absorption (a – b)	60,640

Step 2:

A) UA – Rs.60,640 treated as period cost

Costing P & L A/c Dr. 60,640

To POH 60,640

Due to this adjustment, the profit reduces by Rs.60,640

B) VA – Rs.60,640 treated as product cost

	Particulars	Units	Computation	(Rs.)
a.	WIP	1,41,480	1,41,480 x 5%	7077
b.	FG stock	2,30,732	2,30,732 x 5%	11534
c.	FG Sold	8,40,588	8,40,588 x 5%	42029
		12,12,800		Rs.60,640

Supplementary rate = $\frac{\text{VA}}{\text{Cost of production}} = \frac{\text{Rs.60,640}}{\text{Rs.12,12,800}}$

Note: Since value is given, sup. Rate is calculated as a %

Cost of sales A/c Dr. 42029

FG A/c Dr. 11534

WIP A/c Dr. 7077

To POH 60,640

Note:

i. Absorbed / Applied / Recovered / Accounted are inter chargeably usable words i.e. absorbed OH

ii. Due to above adjustment reduced by Rs.42029 & stock value invreases Rs.18611 (11534 + 7077)

Answer for Q.NO.11.

a) Calculation of department – wise actual rates

	Particulars	(1)	(2)	(3)	(4)
a.	Actual OH (Rs.)	12320	44385	18180	16720
b.	Actual labour hours	30800	80700	40400	30400
c.	Actual absorption rate (a ÷ b) (per labour hr)	Rs.0.40 / hr	Rs.0.55 / hr	Rs.0.45 / hr	Rs.0.55 / hr

b) Increase / Decrease in WIP & FG due to under / over absorption department

	Particulars	(1)	(2)	(3)	(4)
a.	Overhead incurred	12,320	44,385	18,180	16,720
b.	Overhead absorbed	15,400	36,315	16,160	15,200
c.	UA / (OA) (a – b)	(3,080)	8,070	2,020	1,520
		(OA)	VA	VA	VA
		Rs.8,530 (under absorption)			

Calculation of labour hrs for units sold

Apportionment of VA / (OA) to products:

Particulars	1 (OA)		2 (VA)		3 (VA)		4 (VA)	
	Lab. Hrs.	Rs.	Lab. Hrs.	Rs.	Lab. Hrs.	Rs.	Lab. Hrs.	Rs.
a. WIP	3000	(300)	10400	1040	1900	95	7200	360
b. FG – Unsold	4300	(430)	8300	830	4000	200	2900	145
c. FG sold	23500	(2350)	62000	6200	34500	1725	20300	1015
Total (a + b + c)	30800	(3080)	80700	8070	40400	2020	30400	1520
Supplementary rate $\left[\frac{UA/(OA)}{lab.hrs.}\right]$	Rs.0.1 / lab. Hr. $\left(\frac{3080}{30,800}\right)$		Rs.0.1 / lab. Hr. $\left(\frac{8070}{80,700}\right)$		Rs.0.05 / lab. Hr. $\left(\frac{2020}{40,400}\right)$		Rs.0.05 / lab. Hr. $\left(\frac{1520}{30400}\right)$	

Summary:

	Particulars	Computation	(Rs.)
a.	WIP	(300) + 1040 + 95 + 360	1,195
b.	FG – Unsold	(430) + 830 + 200 + 145	745
c.	FG – Sold	(2350) + 6200 + 1725 + 1015	6,590
	Net under absorption for the company		8,530

WIP	A/c	Dr.	1,195	
FG	A/c	Dr.	745	
Cost of sales	A/c	Dr.	6,590	
To POH				8,530

(Being VA A/c –ad)

c) Impact on total profit of company

The total profit of the company will be reduced by Rs.6,590 in view of correction made in (b) above.

Answer for Q.NO.12.

Part – A: Effect on company's income due to use of plant-wise rate instead of departmental rate

Step 1: Overhead cost changed to products using plant wise rate.

$$\text{Absorption rate} = \frac{\text{Budgetedtotal OH}}{\text{Budgetedtotallabourhours}}$$

$$= \frac{\text{Rs.3,40,000}}{\text{2,00,000hrs.}} = \text{Rs.1.70/hr}$$

Prod. A = 5 hrs x Rs.1.70 = Rs.8.50

Prod. B = 5 hrs x Rs.1.70 = Rs.8.50

Step 2: Overhead cost changed to products using departmental rate

	Particulars	D1	D2
a.	Overheads	2,40,000	1,00,000
b.	Labour hrs.	1,00,000	1,00,000
c.	Absorption rate (a ÷ b)	Rs.2.40 / hr.	Rs.1.00 / hr.

Prod. A = (4 hrs x Rs.2.4) + (1 hr x Rs.1) = Rs.10.60

Prod. B = (1 hr x Rs.2.4) + (4 hrs x Rs.1) = Rs.6.40

Step 3: Impact on profit

Particulars	A	B
Blanket rate (Rs.)	8.50 10.60	8.50 6.40
	2.10 (under costed)	2.10 (over costed)
Stock (units)	Rs.4200 (under valued)	Rs.12,600 (Over valued
	Rs.8400 (Overvalued)	

Due to over valuation of cl. Stock on account of using blanket rate the profit stands overstated by 8,400/-

Part –B: Computation of selling price p.u of Prod. A using plant wise rate & Departmental rate:

Particulars	A	B
Material & labour	10.00	10.00
+ Overheads	8.50	10.60
Total cost	18.50	20.60
+ Profit – 40%	7.40	8.24
Selling price	Rs.5.90	Rs.28.84

Due to use by blanket rate, Prod. A has been under – priced by Rs.2.94 (Rs.28.94 = 25.90)

Answer for Q.NO.13.

W.N.1: Computation of hrs for which 6 operators are available for 6 months

Particulars	6 operators for 6 months
a. Normal available hrs (204 hrs x 6 months x 6 operators)	7,488
b. Absenteeism without pay	(108)

(18 hrs x 6 operators)	
c. Paid hrs (a – b)	7,380
d. leave with pay (20 hrs. x 6 operators)	(120)
e. Normal idle time (10 hrs x 6 operators)	(60)
f. Effective working hrs (c – d – e)	7,200

As the machine cannot be worked without an operator wholly engaged on them. Therefore the effective working hrs of 6 operators for 6 months are the hrs for which the machines can be used. Hence 7200 hrs represent hrs of machine operation.

W.N.2: Computation of operators wages

Average rate of wages = $\frac{Rs.800}{8hrs.}$ = Rs.100 / hr.

∴ Total wages paid to 6 operators for 6 months = 7380 hrs x Rs.100 / hr. = Rs.7,38,000

Computation of comprehensive machine hour rate of machine shop:

	Particulars	**(Rs.)**
1.	Operator's wages (W.N.2)	7,38,000
2.	Production Bonus (15% x 7,38,000)	1,10,700
3.	Power consumed	80,500
4.	Supervision	33,000
5.	Lighting & Electricity	12,000
6.	Repairs (3% x Rs.8,00,000 x 6m / 12m)	12,000
7.	Insurance (Rs.40,000 x 6m / 12m)	20,000
8.	Depreciation (Rs.8,00,000 x 10% x 6m / 12m)	40,000
9.	Sundry expenses (Rs.12,000 x 6m / 12m)	6,000
10.	Gen. management expenses (Rs.54,530 x 6m / 12m)	27,265
	Total overheads	10,79,465

Comprehensive machine hr rate = $\frac{Total\,overheads}{Total\,machine\,hrs\,(W.N.1)}$

= $\frac{Rs.10,79,465}{7200hrs}$

= Rs.149.925

Answer for Q.NO.14.

Step 1: Calculation of machine hrs with & without use of computers

Total machine hrs = 3,500 hrs

(600 + 900 + 400 + 600 + 1000)

Machine hrs without Computers	Machine hrs with Computers
= 600 + 900	= 400 + 600 + 1000
= 1500 hrs	= 2000 hrs

Step 2: Calculation of total OH of the machine & computer per month:

1. Total overheads of machine per month:

Rent (Rs.17,500 x 1/3)	5,833
Depreciation (Rs.2,00,000 x 1/12)	16,667
Indirect charges (1,50,000 x 1/12)	12,500
	35,000

2. Computer hire (4,20,000 x 1/12) 35,000

Step 3: Calculation of total overheads with & without use of computer

1. Overheads for using machine without computers $\left(\frac{Rs.35,000}{35000\ hrs} \times 1500\ hrs.\right) = Rs.15,000$

2. Overheads for using machine with computers

$\left(\frac{Rs.35,000}{35000\ hrs} \times 2000\ hrs.\right) + Rs.35000 = Rs.55,000$

Step 4: Calculation of machine hr rate

1. With computer = $\frac{Rs.55,000}{2000hrs} = Rs.27.5/machinehr.$

2. Without computer = $\frac{Rs.15,000}{1500\,hrs}$ x Rs.10/machinehr.

Step 5: Computation of machine hr rate for individual jobs

Particulars	Rate hour	A		B		C	
		Hrs	Rs.	Hrs	Rs.	Hrs	Rs.
Overheads							
w/o computer	10	600	6,000	900	9,000	-	-
W/ computer	27.500	400	11,000	600	16,500	1,000	27,500
Total		1,000	17,000	1500	25,500	1000	27,500
Machine hr rate $\left(\frac{Total\,overheads}{Total\,hours}\right)$		Rs.17 / hr		Rs.17/hr		Rs.27.5/hr	

Answer for Q.NO.15.

Let the factory overheads as a % of direct wages be = f

Let the admin overheads as a % of factory cost be = a

Particulars	Job 101		Job 102	
	Workings	Rs.	Workings	Rs.
D. materials	54,000	54,000	37,500	37,500
D. wages	42,000	42,000	30,000	30,000
Prime cost	96,000	96,000	67,500	67,500
+ Fac OH	42,000F	25,200	30,000F	18,000
+ Fac. Cost	96,000 + 42,000F	1,21,200	67,400 + 30,000 F	85,500
+ Admin OH	(96,000 + 42000F) A	30,300	(67,500 + 30,000F)A	21,375
Total cost	1,51,500	1,51,500	1,06,875	1,06,875
+ Profit	15,150 (1,66,650 x 1/1)	15,150	21,375 (1,28,250 x 1/6)	21,375
S.P	1,66,650	1,66,650	1,28,250	1,28,250

Fac. Cost + Admin OH = Total cost

1 $\rightarrow$ Job 101: (96,000 + 42,000F) + [(96,000 + 42,000F)A] = 1,51,500

2 $\rightarrow$ Job 102: (67,500 + 30,000 F) + [(67,500 + 30,000F)A] = 1,06,875

(or)

$$\frac{96,000+42,000F(1+A)}{67,500+30,000F(1+A)}=\frac{1,51,500}{1,06,875}$$

$$\frac{96+42F}{67.5+30F}=\frac{1212}{855}$$

82,080 + 35910 F = 81,810 + 36,360F

290 = 450F

F = 0.6 or 60%

Substituting in $\rightarrow$ 1

= 96,000 + (42,000 x 0.6) + [(96,000 + 42,000 x 0.6) A]

= 1,51,500

= 1,21,200 + 1,21,200A = 1,51,500

= 1,21,200A = 30,300

= B = 0.25 or 25%

$\therefore$ % of recovery rate:

Factory overheads = 60% of direct wages

Admin overheads = 25% of factory cost

Computation of selling price of job 103:

Particulars	Rs.
D. Materials	24,000
D. Wages	20,000
Prime cost	44,000
+ Factory OH (60% x 20,000)	12,000
Factory Cost	56,000
+ Admin OH (25% x 56,000)	14,000
Total cost	70,000
+ Profit (12.5% on SP)	10,000
Selling price	80,000

Answer for Q.NO.16. .

Computation of works cost for job 198:

Particulars		Rs.
D. Materials		6,000
D. Labour		4,000
Prime cost		10,000
+ Factory overheads		
1. Machine 215 : (40 hrs x Rs.35)	1,400	
2. Machine 160 : (30 hrs x Rs.40)	1,200	
3. Welders labour cost (6 welders x 5 days x 8 hrs /day x Rs.20 / hr)	4,800	
4. General expenses (10% x 4000)	400	7,800
Total works cost for job 198		17,800

W.N.1: Absorption for Gen. expenses = $\frac{\text{Total General exp.}}{\text{Total D. wages}} \times 100$

$= \frac{20,000}{200,000} \times 100 = 10\% \text{ of d. wages}$

Answer for Q.NO.17.

Part A:

Step 1: Calculation of overhead absorption rate as per current policy:

Dept.	Budgeted Factory OH	Budgeted factory wages
Machinery	3,60,000	80,000
Assembly	1,40,000	3,50,000
Packing	1,25,000	70,000

Total	6,25,000	5,00,000

OH Absorption rate = $\frac{\text{Budgeted OH}}{\text{Budgeted D.wages}} \times 100$

= $\frac{\text{Rs.4,25,000}}{\text{Rs.5,00,000}} \times 100$ = 125% of direct wages

Step 2: Calculation of selling price of job cw 7083:

Particulars	Rs.
D. Materials (1200 + 600 + 300)	2,100
D. Wages (240 + 240 + 180)	660
Prime cost	2,760
+ Factory OH (125% x 660)	825
Factory cost	3,585
+ S & D OH + Profit mark up – 30%	1,075.50
Selling price p.u	4660.50

Part B: Methods available for absorbing factory OH & their overhead absorption rate in different dept.

1. **Machinery Dept.**

   Note: In the machining dept. the use of machine time is predominant factor of production. Hence machine hr rate should be used to recover OH is this dept.

   Machine hr rate = = $\frac{\text{Budgeted Factory OH}}{\text{Budgeted Machine hrs}}$

   = $\frac{\text{Rs.3,60,000}}{\text{80,000 hrs.}}$ = Rs.4.50 / machine hr.

2. **Assembly Dept.**

   Note: In this department direct labour hrs is main factor of production. Hence D. labour rate should be used to recover OH.

   D. Labour = $\frac{\text{Budgeted Factory OH}}{\text{Budgeted D.labour hrs}}$

   = $\frac{\text{Rs.1,40,000}}{\text{1,00,000 hrs.}}$ = Rs.1.40 / labour hr.

3. **Packing Dept.**

   Note: In this dept. labour is important factor of production. Hence D. labour hr rate should be used to recover OH is this dept.

   D. Labour rate = $\frac{\text{Budgeted Factory OH}}{\text{Budgeted labour hrs}}$

   = $\frac{\text{Rs.1,25,000}}{\text{50,000 hrs.}}$ = Rs.2.5 / labour hr.

Part C: Calculation of selling price using recovery rate as in part B

Particulars	Rs.
D. Materials (1200 + 600 + 300)	2,100
D. Wages (240 + 360 + 60)	660
Prime cost	2,760
+ Factory OH (W.N.1)	1,078
Factory cost	3838.00
+ 30% mark up	1,151.40
Selling price	4,989.40

W.N.1: OH summary

	Particulars	Basis	Hrs.	Rate	(Rs.)
1.	Machining	Machine hrs	180	Rs.4.50	810
2.	Assembly	Labour hrs.	120	Rs.1.40	168
3.	Packing	Labour hrs.	40	Rs.2.50	100
					1078

Part D: Department wise statement of under / over absorption of OH

a) Current policy

Particulars	Machining	Assembly	Packing	Total
D. wages	96,000	2,70,000	90,000	
a. Absorbed OH (125% on D. wages)	1,20,000	3,37,500	1,12,500	5,70,000
b. Actual OH	3,90,000	84,000	1,35,000	6,09,000
c. VA / C (OA) (a-b)	2,70,000	(2,53,500)	22,500	39,000

b) Proposed policy:

Particulars	Machining	Assembly	Packing	Total
Hours worked (actual)	96,000 (Machine hrs)	90,000 (Labour hrs)	60,000 (labour hrs)	
Rate per hr	Rs.4.5	Rs.1.4	Rs.2.5	
a. Absorbed OH (hrs x rate)	Rs.4,32,000	Rs.1,26,000	Rs.1,58,000	Rs.7,08,000
b. Actual OH	3,90,000	84,000	1,35,000	6,09,000
c. VA / C (OA) (a-b)	(42,000)	(42,000)	(15,000)	(99,000)

Answer for Q.NO.18.

Cost sheet for the week ending aug 21st

Particulars		Rs.
D. materials (all items)		780

D. labour (20 hrs. @ 15/hr)		300
Prime cost		
Machine facilities:		
Machine 1 (4 hrs @ Rs.45/hr.)	180	
Machine 2 (6 hrs @ Rs.65/hr.)	390	580
Total		1650
+ Overheads (Rs.8 / hrs. x 20 hrs)		160
Total cost – 1		1,810
+ Supplementary rates (W.N.1)		
Overheads (Rs.2 / hr. x 20 hrs.)	40	
Machine facilities (W.N.2)		
- Machine 1 (Rs.15 x 4 hrs)	60	
- Machine 2 (Rs.15 hr x 6 hrs.	90	190
Total cost – 2		2,000

W.N.1: Overheads:

Note: Budgeted OH (3000 hrs x Rs.8) = Rs.24,000

In the absence of information, it is assumed that budgeted OH is same as actual OH.

$\therefore$ Actual OH = Rs.24,000

$\Rightarrow$ Actual man hrs. = 2400 hrs

$\Rightarrow$ Actual rate = Rs.24,000 / 2400 hrs = Rs.10/hr

Supplementary rate = Rs.2/hr.

(AR – PR – Rs.10 – 8)

W.N.2: Machine facilities

Particulars	M1	M2
1. Budgeted OH (Assumed to equal to actual OH)	1,800 (40 hrs x Rs.45)	2,600 (40 hrs x Rs.65)
2. Actual hrs.	30	32.50
3. Actual rate (1 ÷ 2)	Rs.60 / hr	Rs.80 / hr
4. Predetermined rate	Rs.45 / hr	Rs.65 / hr
5. Supplementary rate (AR – PR)	Rs.15 / hr	Rs.15 / hr

Answer for Q.NO.19.

Part A: Calculation of pre-determined rate for each production dept.

Particulars	P1	P2	S1	S2
Budgeted OH	25,50,000	21,75,000	6,00,000	4,50,000

S1 (1 : 1)	3,00,000	3,00,000	(6,00,000)	-
S2 (2 : 1)	3,00,000	1,50,000	-	(4,50,000)
Total OH	31,50,000	26,25,000	-	-

Budgeted hrs

(W.N.1)	Machine hrs	1,05,000	-
(W.N.2)	Labour hrs	-	1,75,000
	Pre determined rate (Rs. / hr.)	Rs.30/hr	Rs.15/hr

W.N.1: Budgeted machine hrs / labour hrs.

Particulars	A	B	Total
Budgeted output (u)	50,000	30,000	-
Budgeted Machine hrs. (P1)	75,000 (50,000,x 1.5)	30,000 (30,000 x 1)	1,05,000
Budgeted Machine hrs. (P2)	1,00,000 (50,000 x 2)(	75,000 (300,000 x 2.5)	1,75,000

Part B: Performance report for july 2020 when 4000 u of prod A & 3000 u of prod. B were act produced

	Budgeted (Standard)	Actuals
Raw materials (exclusively in P1)		
Prod. A (4000 x Rs.120)	4,80,000	4,89,000
Prod. B (3000 x Rs.150)	4,50,000	4,56,000
Wages (exclusively in P2)		
Prod. A (4000 x 2 hrs x Rs.72)	5,74,000	5,91,000
Prod. B (3000 x 2.5 hrs x Rs.75)	5,62,500	5,52,000
Overheads absorbed on machine hr basis (P1)		
A (4000 x 1.5 hrs x Rs.30)	1,80,000	1,74,400*
B (3000 x 1 hr x Rs.30)	90,000	1,18,649*
Labour hr. (P2)		
A (4000 x 2 hrs x Rs.15)	1,20,000	1,31,364*
B (3000 x 2.5 hrs x Rs.15)	1,12,500	1,18,548*
Total	25,71,000	26,31,861

*W.N.4:

W.N2: Calculation of actual machine hrs & actual labour hrs.

Particulars	A	B	Total
Actual output (u)	4,000	3,000	-
Actual machine hrs in P1	6,100	4,150	10,250

Actual labour hrs. in P2	8,200	7,400	15,600

W.N.3: Calculation of actual absorption rate

Particulars	P1	P2	S1	S2
Actual factory	2,31,000	2,04,000	60,000	48,000
Overheads				
S1 (1 : 1)	30,000	30,000	(60,000)	-
S2 (2 : 1)	32,000	16,000	-	(48,000)
Total	2,93,000	2,50,000	-	-

Actual hrs. (W.N.2)

Machine	10,250	-
Labour	-	15,600
Actual rate (1 ÷ 2)	Rs.28.59 / mach. Hr.	Rs.16.02 / lab. Hr.

W.N.4: Actual OH absorbed = Act. Hrs x act. Rate

1. **Based on machine hrs (P1)**

   A = (6.00 x Rs.28.59 / hr.) = 1,74,400

   B = (7400 x Rs.28.59 / hr) = 1,18,649

2. **Based on labour hrs. (P2)**

   A = (8200 x Rs.16.02 / hr.) = 1,31,364

   B = (7400 x Rs.16.02 / hr) = 1,18,548

CHAPTER 04: ACTIVITY BASED COSTING

Answer for Q.NO.1.

Part – 1: Calculation of OH cost per unit using tradition at OH Absorption system

Calculation of absorption rate:

Machine hr. rate = $\frac{\text{OH}}{\text{Machinehrs.}} = \frac{1,00,000}{10,000\text{H}} = \text{Rs.}10/\text{M.H}$

Changing OH to the products

Rs.1,00,000

Prod A	Prod B
↓	↓
500 H x 10	500 H x 10
↓	↓
Rs.50,000	Rs.50,000

OH Cost per unit = $\frac{50,000}{200} = \text{Rs.}250\text{ p.u}$

OH Cost per unit = $\frac{50,000}{100} = \text{Rs.}500\text{ p.u}$

Part 2: Activity based costing:

Step 1: Calculation of cost driver rate:

Activity **1**	**Cost pool** **2**	**Cost driver** **3**	**Cost driver Qty.** **4**	**CD rate** **5**
Machine	60,000	Machine hrs	10,000H	6/mh
Setup	15000	Setup time	5000H	3/ setup
Inspection	25000	Inspection	5000H	5/Inspection

Step 2: Appropriation OH

	Prod. P1		**Prod. P2**	
	CDQ	**Rs.**	**CDQ**	**Rs.**
Machine	5000	30,000	5000	30,000
Setup	3000	9000	2000	6,0000
Inspection	1500	7500	3500	17,500
		46,500		53,500
		2004		1004
		232.50		535

Since ABC system uses appropriate cost drivers to apportion cost it is more accurate than traditional costing system.

Answer for Q.NO.2.

Part I: Calculation of product cost using traditional costing system:

Particulars	A	B	C	D
Direct mat	40	50	30	60
Direct lab	28	21	14	21
Preferred cost	68	71	44	81
(+) OH (W.N.1)	80 (4H x 20)	60 (3H x 20)	40 (2H x 20)	60 (3H x 20)
Total	148	131	84	141

W.N.1: Calculation of machine hr. rate

Products	Units	Hrs / unit	Hrs
A	1204	4	480H
B	1004	3	300H
C	804	2	160H
D	1204	3	360H
		Total machine hrs	1300H

Machine hr rate = $\frac{\text{OH}}{\text{Machinehr}} = \frac{26,000}{1300} = \text{Rs.}20/\text{mH}$

Part II: Activity based costing:

Step 1: Calculation of cost driver rate:

Activity 1	Cost pool 2	Cost driver 3	Cost driver Qty. 4	Cost Driver rate 5 = 2 ÷ 4
Machine dept. activity	10430	Machine hrs	1300	8002/MH
Setup	5250	No. of production	21 (W.N.2)	250 / Prod.
Stores	3600	Req. raised (20 x 4)	80	45/Req
Inspection	2100	No. of prod	21 (W.N.2)	100/Prod
Handling (Dispatch)	4620	Order executed	42 (W.N3)	110/prod

W.N.2: Calculation of prod. runs:

Prod.	Units	Calculation	Rund
A	120	(120/ 20)	6
B	100	(100 / 20)	5
C	80	(80 / 20)	4
D	120	(120 / 20)	6
		Total	21

W.N.3: Calculation of order executed:

Prod.	Units	Calculation	Rund
A	120	120 / 10	12

B	100	100 / 10	10
C	80	8 / 10	8
D	120	120 / 10	12
		Total	42

Step 2: Apportionment of cost also called as charging of OH's:

Activity	A		B		C		D	
	CDQ	Rs.	CDQ	Rs.	CDQ	Rs.	CDQ	Rs.
Machine dept.	480	3851	300	2407	160	1284	360	2888
Setup	6	1500	5	1250	4	1000	6	1500
Stores received	20	900	20	900	20	900	20	900
Inspected	6	600	5	500	4	400	6	600
Mutual handling	12	1320	10	1100	8	880	12	1320
Total	**8171**		**6157**		**4464**		**7207**	

Units	120	100	80	120
OH / P.u	68.09	61.57	55.8	60.07

Step 3: Total cost under ABC system

Particulars	A	B	C	D
DM	40	50	30	60
DL	28	21	14	21
(+) POH	68.09	61.57	55.8	60.07
	136.09	132.57	99.8	141.047

Answer for Q.NO.3.

Part I: Calculation of unit manual cost of equipment using traditional costing system

Particulars	Equip Y	Equip Z
Direct materials	300	450
Direct labour	450	600
Prime cost	750	1050
(+) POH (W.N.1)	186.375 (62.125 x 3)	248.50 (62.125 x 4)
Total manual cost	936.375	1298.50

W.No.1: Calculation of labour hr rate

$$\text{Labour hr rate} = \frac{\text{Lab.hrs}}{\text{Lab.hr.rate}} = \frac{12,42,500}{20,000} = 62.125 / H$$

Part II: Calculation of Total equipment cost p.u using ABC system

Step 1: Calculation of cost driver rate

Activity 1	Cost pool 2	Cost driver 3	Cost Qty. 4	Cost Rate 5
Order	2,10,000	Order processed	600	350 / P. or
Machine	8,75,000	Machine loss	50,000	17.5 / P.M
Product	1,57,500	Inspection cost	15,000	10.5 / Ins Co.

Step 2: Apportionment

Particulars (Activity)	Equip Y		Equip Z	
	CDQ	Rs.	CDQ	Rs.
Order	350	1,22,500	250	87,500
Machines	23,000	4,02,500	27000	4,72,500
Inspection	4,000	42,000	11,000	1,15,500
Total		**5,67,000**		**6,75,500**
Units		25,004		31,254
POH / u		226.8		2,16,016

Step 3: Total cost under ABC

Particulars	Equip Y Rs.	Equip Z Rs.
Direct materials	300	450
DL	450	600
Prime cost	750	1050
(+) POH	226.8	216.16
Total cost	976.80	1266.16

Part III: Calculation of cost distraction:

Particulars	Equip Y	Equip Z
Traditional	936.375	1298.50
Costing system	976.8	1266.16
ABC	40.425	32.34
Cost distortion	(Under costed)	(Over costed)

Answer for Q.NO.4.

Part I: Cost per cubic meter(M^3) using basic budgeted information

Particulars	John Rs.	George Rs.	Paul Rs.
Packing material (W.N.1)	300000	900000	750000
Lab:			

Basic (30 : 45 : 25)	105000	157500	87500
Overtime (30 : 45 : 25)	9000	13500	7500
Occupancy (30 : 45 : 25)	150000	225000	125000
Admin and management(30 : 45 : 25)	18000	27000	15000
Total cost	5,82,000	13,23,000	2,85,000
Cubic meter	30000u	45000	25000
Cub / meter p.u	19.44	29.44	39.44

W.N.1: Apportionment of packing material cost:

	J : G : P
Computation ratio	1 : 2 : 3
Volume (M^3)	30 : 45 : 25
Weighted ratio	30 : 90 : 75

X = 19,50,000

30 : 90 : 75

3,00,000 : 9,00,000 7,50,000

W.N.2: Apportionment of other costs:

Customer	Labour basic	Labour overtime	Occupancy	Packing
J. Ltd.	1,05,000 $\left(3.5L\times\frac{30}{100}\right)$	9000	1,50,000	18,000
G. Ltd.	1,57,500 $\left(3.5L\times\frac{45}{100}\right)$	13500	225000	27000
P. Ltd.	87500 $\left(3.5L\times\frac{25}{100}\right)$	7500	125000	15000

Note: In the absence of any specific info we apportion all the other cost in the ratio of cubic meters

Part – II: ABC system

Activity	Cost pool	Cost driver name	Cost drive Qty (W.N.4)	Cost driver
Reception	1,91,500	Minutes	15500	12.35 / hr
Storage	3,45,500	Sq. mts	27500	12.56 / sq. mt
Packing	4,03,000	Minutes	76,750	5.25 / hr

Construction of activity cost pool:

Costs	Receipts		Storage		Packing	
	%	Rs.	%	Rs.	%	Rs.

Labour cost – Basic	15	52500	10	35000	75	262500
Overtime	50	15000	15	4500	35	10500
Occupancy	20	100000	60	300000	20	100000
Admin & management	40	24000	10	6000	50	30000
Cost pool		191500		345500		403000

W.N.4: Calculatin of cost driver qty:

Step 1: Inspection time

Customer **1**	**Computation** **2**	**Time (units)** **3**	**Time (hrs)** **3 ÷ 60m**
John Ltd.	30000 x 5	1,50,000	2500H
George Ltd.	45000 x 9	4,05,000	6750H
Paul Ltd	25000 x 15	3,75,000	6250H
			15500H

Step 2: Storage

Customer	**Computation**	**Sq. mts**
John Ltd.	30000 x 0.3	9000
George Ltd.	45000 x 0.3	13500
Paul Ltd	25000 x 0.2	5000
	Total	27500 m^2

Step 3: Packing

Customer **1**	**Computation** **2**	**Minutes** **3**	**hrs** **3 ÷ 60**
John Ltd.	30000 x 36	10,80,000	13000HH
George Ltd.	45000 x 45	20,25,000	33750H
Paul Ltd	25000 x 60	15,00,000	25000H
		Total	76750H

Part II: Apportionment of OH:

Activity	**J Ltd.**		**G Ltd.**		**P Ltd.**	
	CDQ	**Rs.**	**CDQ**	**Rs.**	**CDQ**	**Rs.**
Reception	2500	30887	6750	83395	6250	77218
Storage	9000	113073	13500	169600	5000	62818
Packing	18000	94515	33750	177215	25000	131270
Total		**238475**		**430219**		**271306**

Step 3: Calculation of cost per cubic meter

Particulars	**J Ltd.**	**G Ltd.**	**P Ltd.**
Prime cost (W.N.1)	300000	900000	750000

(+6) POH	238475	430219	271306
Total cost	538475	1330219	1021306
Cubic meters	30000	45000	25000
Cost per cubic meter	17.95	29.56	40.85

Answer for Q.NO.5.

Working notes:

1. Total support cost:

	(Rs.)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support Cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{\text{Rs.}45,00,000}{\text{Rs.}1,50,00,000} \times 100 = 30\%$$

Activity (1)	**Total cost (Rs.) (2)**	**Cost allocation base (3)**	**Cost driver rate (4)=[(2) ÷ (3)]**
Ordering	7,80,000	1,560 purchase orders	Rs. 500 per purchase order
Delivery	12,60,000	3,150 deliveries	Rs. 400 per delivery
Shelf-stocking	8,64,000	8,640 hours	Rs. 100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	Rs. 1 per item sold

(i) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks (Rs.)	**Fresh Produce (Rs.)**	**Packaged Foods (Rs.)**	**Total (Rs.)**
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS):	30,00,000	75,00,000	45,00,000	1,50,00,000

(B)				
Support cost (30% of COGS): (C) (Refer working notes)	9,00,000	22,50,000	13,50,000	45,00,000
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: E= {(A)-(D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (E/A) × 100)	1.70%	7.17%	3.30%	4.97%

(ii) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity- based costing system)

	Soft drinks (Rs.)	**Fresh Produce (Rs.)**	**Packaged Food (Rs.)**	**Total (Rs.)**
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540 : 5400 : 2700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income C:{(A)- (B)}	4,27,500	63,000	5,29,500	10,20,000
Operating income as a % of revenues	10.78%	0.60%	8.75%	4.97%

* Refer to working note 3

Answer for Q.NO.6.

Part I:

Particulars	General Super market	Drug store	Chemist shop	Total
Revenue	28041750	23821875	14973750	66837375
(-) COGS	(27225000)	(226,87500)	(13612500)	63525000
Gross profit	816750	1134375	1361250	3312375
Less (-) Operating income				(827970)
Operating profit				2484405
GP%	2.91%	4.76%	9.09%	16.76
Operating profit				3.75%

Part – II: ABC system cost allocation base of fine activity areas

Activity	Cost pool	Cost driver name	Cost driver Qty.	Cost driver rate
Purchase order	220000	Orders	5500	40/order
Line items	175500	Line item	58520	3/item
Stores	195250	Store deliver	3905	50/store
Cartons	209000	Cartons	209000	1/ carton
Shelf	28160	Hours	1760	16/hr.

Activity	J Ltd.		G Ltd.		P Ltd.	
	CDQ	Rs.	CDQ	Rs.	CDQ	Rs.
No. of order	385	15400	990	39600	4125	165000
Line item	5399	10170	11880	35640	41250.12	3750
Stores	330	16500	825	41250	2750	137500
Aug.	99000	99000	66000	66000	44000	44000
Aug.	990	15840	495	7920	275	4400
Total		162910		190410		47650

Apportionment under ABC

Particulars	General	Drug	Chemist
Revenue	28041750	23821875	14973750
(+) COGS	(27225000)	(22687500)	(13612500)
GP	816750	1134375	1361250
(-) DBH	162910	190410	474650
Operating income	653840	943965	886600
Operating income %	2.33	3.96	5.92
POH %	0.58%	0.80%	3.17%

Answer for Q.NO.7.

Statement Showing "Budgeted Cost per unit of the Product"

Activity	Activity Cost (Budgeted) (Rs.)	Activity Driver	No. of Units of Activity Driver (Budget)	Activity Rate (Rs.)	Deposits (Rs.)	Loans (Rs.)	Credit Cards (Rs.)
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					(Rs.) 50	(Rs.) 30	(Rs.) 60

Working Note

Activity	Budgeted Cost (Rs.)	Remark
ATM Services:		
(a) Machine Maintenance	4,00,000	- All fixed, no change.
(b) Rents	2,00,000	- Fully fixed, no change.
(c) Currency Replenishment Cost	2,00,000	- Doubled during budget period.
Total	8,00,000	
Computer Processing	2,50,000	- Rs. 2,50,000 (half of Rs. 5,00,000) is fixed and no change is expected.
	7,50,000	
Total	10,00,000	- Rs. 2,50,000 (variable portion) is expected to increase to three times the current level.
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. (Rs. 2,00,000 x 180%)
Total	3,60,000		

Answer for Q.NO.8. .

Part I: Computation of cost allocate from each quantity:

Step 1: Calculation of cost drive rate:

Activity	Cost pool	Cost driver name	Cost driver Qty.	Cost driver rate
Power	200000	Kilowatt	5000	4 / P.H.C
Quality	300000	Quality inspection	10000	30 / P.H

Step 2: Apportionment

Particulars	M		S		T		Total
Power	10000	40000	20000	80000	15000	40000	180000
Quality	3500	105000	2500	75000	3000	90000	270000

Part II: Cost of unused capacity for each quantity

Particulars	Rs.
Power (5000 kwt x 4) (2L – 180000)	20,000
Inspection (1000 x 30) (300000 – 270000)	30000
Total cost of unused capacity	50000

Part III: Factors to be considered in choosing a capacity level:

1. Effect on product costing and capacity management
2. Effect on pricing decisions.
3. Effect on performance evaluation
4. Effect on financial statements.

CHAPTER 05: COST ACCOUNTING SYSTEM

Answer for Q.NO.1.

Journal entries

No	Particulars		Debit	Credit
1.a.	SLC A/c	Dr.	9000	
	To GLA A/c			9000
	(Being pur mode)			
b.	WIP A/c	Dr.	400	
	To GLA A/c			400
	(Being pur mode)			
c.	SLC A/c	Dr.	1000	
	To GLA			1000
	(Cash pur)			
2.	GLA A/c	Dr.	500	
	To SLC A/c			500
	(Being returns made)			
3.	WIP A/c	Dr.	6000	
	To SLC A/c			6000
	(Being mat issued)			
4.	POH A/c	Dr.	600	
	To SLC A/c			600
5.	SLC A/c	Dr.	100	
	To WIP A/c			100
	(Being returned to SLC)			
6.	Job no 11 A/c	Dr.	200	
	To Job no 10			200

Answer for Q.NO.2.

Transaction	Entry		Debit	Credit
Incurrence of wages	Wages Control A/c	Dr.	11050	
	To GLA A/c			11050
	(1,00,000 + 250 + 800)			
Utilization of wages	WIP A/c	Dr.	8000	
	POH A/c	Dr.	1050	
	AOH A/c	Dr.	800	

	SOH A/c	Dr.	1200	
	To wages control A/c			11050

Answer for Q.NO.3.

S. No	Transaction	Journal entries		Rs.	Rs.
1.a.	POH incurred	POH A/c	Dr.	2120	
		To GLA			2120
1.b.	AOH incurred	AOH A/c	Dr.	1010	
		To GLA			1010
1.c.	SOH incurred	SOH A/c	Dr.	2070	
		To GLA A/c			2070
2.a.	Absorption of POH	WIP A/c	Dr.	1900	
		To POH A/c			1900
2.b.	Absorption of AOH	COS A/c / FG A/c	Dr.	1050	
		To AOH A/c			1050
2.c.	Absorption of SOH	COS A/c	Dr.	2000	
		To SOH A/c			2000
3.a.	Under absorption	C P & L A/c	Dr.	220	
		To POH			220
3.b.	Over absorption	AOH A/c	Dr.	40	
		To C P & L A/c			40
3.c.	Under absorption	C P & L A/c	Dr.	70	
		To SOH A/c			70

Answer for Q.NO.4.

Dr. SLC A/c Cr.

To Bal b/d	5000	By GLA	200
To GLA A/c	29500	By WIP	30500
		By AL	400
		By POH	1300
		By Bal c/d	2100
	34500		**34500**

Dr. WIP Control A/c Cr.

To Bal b/d	2000	By FG	66000
To GLA (SJ)	1800		
To Wages (DW)	20500		

To GLA (DE)	2200		
To SLC (DM)	30500		
To POH (WN)	11000		
		By Bal c/d	2000
	68000		**68000**

Dr. FG Control A/c Cr.

To Bal b/d	1000	By COS	69500
To AOH	7200	By Bal c/d	4700
To WIP	66000		
	74200		**74200**

Dr. Wages Control A/c Cr.

To GLA	31,100	By WIP	20500
		By POH	4500
		By AOH	3400
		By SOH	2400
		By AL	300
	31,100		**31,100**

Dr. POH A/c Cr.

To Wages	4500	By WIP (WN)	11000
To GLA	5100		
To SLC	1300		
To C – P & L	100		
OA			
	11000		**11000**

WN – Absorbed POH

DM - 32300 [30500 + 1800]

DL – 5100

DF – 2200

PC – 55000

POH absorbed = [55000 x 20%] = 11000

Dr. AOH A/c Cr.

To Wages	3400	By FG	7200
To GLA	4100	By C – P & L A/c	300
		UA	
	7500		7500

Dr. SOH A/c Cr.

To Wages	2400	By COS (80,000 x 6%)	4800
To GLA	2600	By C – P & L A/c	200
		UA	
	5000		5000

Dr. COS A/c Cr.

To SOH	4800	By C – P & L A/c	74300
To FG	69500	↓	300
		Expired cost	
	74300		74300

Dr. C - P & L A/c Cr.

To AOH (UA)	300	By GLA (Sales)	80,000
To SOH (UA)	200	By POH (OA)	100
To AL	700		
To COS A/c	74300		
To GLA A/c (Profit)	4600		
	80100		80100

Dr. Abnormal loss A/c Cr.

To wages	300	By C – P & L A/c	700
To SLC	400		
	700		700

Dr. GLA A/c Cr.

To SLC	200	By bal b/d	8000
To C – P & L	80,000	By SLC	29500
		By WIP	1800
		By wages control	31100
		By WIP	2200
		By POH	5100
		By AOH	4100
		By SOH	2600
		By C –P & L (profit)	4600
To bal c/d			
	8800		
	89000		89000

Trial balance

Particulars	Debit	Credit
SLC A/c	2100	
WIP A/c	2000	
FG A/c	4700	
GLA A/c		8800
	8800	8800

Answer for Q.NO.5.

Journal entries are as follows:

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

COST LEDGERS

Cost Ledger Control Account

Particulars	(Rs.)	Particulars	(Rs.)
ToStores Ledger Control A/c (return)	2,900	ByBalance b/d	6,65,220
” Balance c/d	9,49,025	” Manufacturing OH Control A/c	91,510
		” Stores Ledger Control A/c	1,23,000
		” Wages Control A/c	72,195
	9,51,925		9,51,925

Stores Ledger Control Account

Particulars	(Rs.)	Particulars	(Rs.)
ToBalance b/d	3,01,435	ByWork in Process Control A/c	1,27,315
” Cost Ledger Control A/c	1,23,000	” Cost Ledger Control A/c	2,900
		” Balance c/d	2,94,220
	4,24,435		4,24,435

Wages Control Account

Particulars	(Rs.)	Particulars	(Rs.)
ToCost Ledger Control A/c	72,195	ByWork in Process Control A/c	50,530
		” Manufacturing OH Control A/c	21,665
	72,195		72,195

Manufacturing Overhead Control Account

Particulars	(Rs.)	Particulars	(Rs.)
ToCost Ledger Control A/c	91,510	ByBalance b/d	10,525
” Wages Control A/c	21,665	” Work in Process Control A/c	77,200
		” Balance c/d	25,450
	1,13,175		1,13,175

Work-in-Process Control Account

Particulars	(Rs.)	Particulars	(Rs.)
ToBalance b/d	1,22,365	ByFinished Stock Ledger Control A/c	2,10,835
” Wages Control A/c	50,530	” Balance c/d	1,66,575
” Stores Ledger Control A/c	1,27,315		
” Manufacturing OH Control A/c	77,200		
	3,77,410		3,77,410

Finished Stock Ledger Control Account

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	2,51,945	ByCost of Sales Control A/c	1,85,890
” Work in Process Control A/c	2,10,835	” Balance c/d	2,82,270
” Cost of Sales Control A/c (Return at cost)	5,380		
	4,68,160		4,68,160

Cost of Sales Account

Particulars	(Rs.)	Particulars	(Rs.)
ToFinished Stock Ledger Control	1,85,890	ByFinished Stock Ledger Control (Return)	5,380
		” Balance c/d	1,80,510
	1,85,890		1,85,890

Trial Balance

Particulars	Dr.	Cr.
	(Rs.)	(Rs.)
Stores Ledger Control A/c	2,94,220	
Work-in-Process Control A/c	1,66,575	
Finished Stock Ledger Control A/c	2,82,270	
Manufacturing Overhead Control A/c	25,450	
Cost of Sales A/c	1,80,510	
Cost Ledger Control A/c		9,49,025
	9,49,025	**9,49,025**

Answer for Q.NO.6.

Dr. SLC A/c Cr.

To bal b/d	36000	By POH	4000
To creditor	200,000	By WIP	2,20,000
		By bal c/d	12000

Dr. WIP A/c Cr.

To bal b/d	34000		
To wages	174000	By FG	430,000
To SLC	2,20,000	By bal. c/d	94000
To POH	96000		
	5,24,000		5,24,000

Dr. FG A/c Cr.

To bal b/d	26000	By Cos	440,000
To WIP	430,000	By bal c/d	16,000
	456000		456000

Dr. Wages control P A/c Cr.

To bank	184000	By WIP	174000
		By POH	10,000
	184000		184000

Dr. POH A/c Cr.

To wages	10,000	By WIP	174000
TO SLC	4000	By prepaid exp.	600
To bank	80,000		
To Dep	2600		
	96600		96600

Dr. AOH A/c Cr.

To Bank	24000	By P & L A/c	24000
	24000		24000

Dr. SOH A/c Cr.

To bank	28000	By COC	28000
		↓	
		If abs SOH is not given assume it as fully abs	
	28000		28000

Dr. COS A/c Cr.

To FG	440,000	By C – P & L A/c	468000
To SOH	28000		
	468000		468000

Dr. C – P & L A/c Cr.

To COS	468000	By sales	600,000
To P & L (EBIT)	132000		
	600,000		600,000

Dr. Bank A/c Cr.

To bal b/d	20,000	By wages	184000
To Debtors	580,000	By POH	80,000
		By AOH	24000
		By SOH	28000
		By Creditors	202000
		By FA	4000
		By Donation	2000
		By Fines	1000
		By int	200
		By income tax	40,000
		By bal c/d	34800
	600,000		600,000

Dr. Creditors A/c Cr.

To Bank	202000	By bal b/d	16000
To bal c/d	14000	By SLC	200,000

Dr. FA A/c Cr.

To bal b/d	1,10,000		
To Bank	4000		
		By bal c/d	1,14,000
	1,14,000		1,14,000

Dr. P & L A/c Cr.

To Donations	2000	By bal b/d	64000
To Fines	1000	By C – P & L A/c	132000
To Int	200		
To Income tax	40,000		
To AOH	24000		
To bal c/d	128,800		
	196000		196000

Trial Balance

Particulars	Dr.	Cr.
SLC	12000	
WIP	94000	
FG	16000	
Bank	34800	
Crs		14000

FA	1,14,000	
Deb	44000	
Share capital		160,000
Pro for dep		1260
Prepaid	600	
P & L		128800
	315400	315400

Notes:

1. AOH can be treated in 3 ways

Product cost	Period cost	Not at all a cost but exp
↓	↓	↓
Debit to FG A/c	Debit to COS A/c	W/o to P & L A/c
		↓
		This is financial P & L and not C – P & L A/c

2. Entries passed for depreciation

A. Financial A/c's

1. Depreciation A/c	Dr.	2600		
To pro for depreciation A/c				2600
2. P & L A/c	Dr.	2600		
To Dep. A/c				2600
POH A/c	Dr.	2600		
To Dep. A/c				2600

Since it is works dept. it is debited to POH suppose it is Dep on office equipment, it will be debited to AOH.

3. Treatment of prepaid exp.

A. Entry already passed

POH A/c	Dr.	600		
To Bank A/c				600

B. Correct entry

Prepaid exp A/c	Dr.	600		
To Bank				600

C. Rectifying entry

Prepaid exp A/c	Dr.	600		
To POH A/c				600

CHAPTER 06: JOB COSTING

Answer for Q.NO.1.

Job Cost Sheet

Customer Details ——— Job No._____

Date of commencement —— Date of completion _____

Particulars	**Amount Rs.**
Direct materials	70
Direct wages:	
Deptt. X Rs. 2.50 × 8 hrs. = Rs. 20.00	
Deptt. Y Rs. 2.50 × 6 hrs. = Rs. 15.00	
Deptt. Z Rs. 2.50 × 4 hrs. = Rs. 10.00	45
Chargeable expenses	5
Prime cost	120
Overheads:	
Deptt. X = $\frac{Rs.5,000}{Rs.10,000}\times 100$ = 50% of Rs. 20 = Rs. 10.00	
Deptt. Y = $\frac{Rs.9,000}{Rs.12,000}\times 100$ = 75% of Rs. 15 = Rs. 11.25	
Deptt. Z = $\frac{Rs.2,000}{Rs.8,000}\times 100$ = 25% of Rs. 10 = Rs. 2.50	23.75
Works cost	143.75
Selling expenses= $\frac{Rs.20,000}{Rs.2,00,000}\times 100$ = 10% of work cost	14.38
Total cost	158.13
Profit (20% of total cost)	31.63
Selling price	189.76

Answer for Q.NO.2.

Factory Cost Statement of Completed Job.

Month	**JobNo.**	**Materials**	**Direct labour**	**Factoryoverheads (80% of direct labour cost)**	**Factory cost**
	(Rs.)	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**
September	115	1,325	800	640	2765
October	115	--	125	100	225
Total		1,325	925	740	2,990

September	118	810	500	400	1,710
October	118	515	330	264	1,109
Total		1,325	830	664	2,819
September	120	765	475	380	1,620
October	120	665	245	196	1,106
Total		1,430	720	576	2,726

Invoice Price of Complete Job

Job No.	**115 (Rs.)**	**118 (Rs.)**	**120 (Rs.)**
Factory cost	2,990.00	2,819.00	2,726.00
Administration and sellingoverheads @ 10% of factory cost	299.00	281.90	272.60
Total cost	3,289.00	3,100.90	2,998.60
Profit (20% of total cost)	657.80	620.18	599.72
Invoice Price	3,946.80	3,721.08	3,598.32

Assumption: - Indirect labour costs have been included in the factory overheadwhich has been recovered as 80% of the labour cost.

Answer for Q.NO.3.

Actual loss due to spoilage = 8% of Rs. 1,00,000 = Rs.8,000 and Normal loss = 2% of Rs. 1,00,000 = Rs.2,000, therefore abnormal loss = Rs.6,000.

The rejection has a realisable value of Rs. 2,000, which is to be apportioned betweennormal loss and abnormal loss in the ratio of 2 : 6.

The accounting entries necessary for recording the above facts would be:

		(Rs.)	**(Rs.)**
Material Control Account	Dr.	2,000	
Overhead Control Account	Dr.	1,500	
Costing Profit and Loss Control Account	Dr.	4,500	
To Work-in-Progress Control Account			8,000

In the case of defectives being inherent in the manufacturing process, the rectification cost may be charged to the specific jobs in which they have arisen. In case detectives cannot be identified with jobs, the cost of rectification may betreated as factory overheads. Abnormal defectives should be written off to theCosting Profit and Loss Account.

Answer for Q.NO.4.

(a) Calculation of Total Cost for the Hostel Job:

Particulars	Amount (Rs.)	Amount (Rs.)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note-3)	3,866.07	
- Stainless steel faucet - $15\,\text{units} \times \left(\frac{6 \times \text{Rs.}204 + 15 \times \text{Rs.}209}{21\,\text{units}} \right)$	3,113.57	
- Valve - $6\,\text{units} \times \left(\frac{8 \times \text{Rs.}404 + 15 \times \text{Rs.}402 + 14 \times \text{Rs.}424}{32\,\text{units}} \right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours × Rs. 50) + (12 hours × Rs. 25)]	9,300.00	
- Helper [(192 hours × Rs. 35) + (24 hours × Rs. 17.5)]	7,140.00	16,440.00
- Overheads [Rs. 13 × (180 + 192) hours]		4,836.00
Total Cost		44,367.95

(b) Price to be charged for the job work:

	Amount (Rs.)
Total Cost incurred on the job	44,367.95
Add: 25% Profit on Job Price $\left(\frac{44,367.95}{75\%} \text{x} 25\% \right)$	14,789.32
	59,157.27

Working Note:

1. Cost of 15mm GI Pipe

Date		**Amount (**Rs.**)**
17-08-2022	8 units × Rs. 600	4,800.00
28-08-2022	$10\ \text{units} \times \left(\frac{4 \times \text{Rs.}600 + 35 \times \text{Rs.}628}{39\,\text{units}} \right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (Rs.)
12-08-2022	2 units × Rs. 660	1,320.00
28-08-2022	$2 \text{ units} \times 6\text{units} \times \left(\frac{8 \times Rs.660 + 30 \times Rs.610 + 20 \times Rs.660}{58\text{units}} \right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (Rs.)
12-08-2022	18 units × Rs. 26	468.00
17-08-2022	30 units × Rs. 26	780.00
28-08-2022	$34 \text{ units} \times \left(\frac{12 \times Rs.26 + 150 \times Rs.28}{162\text{units}} \right)$	946.96
30-08-2022	$60 \text{ units} \times \left(\frac{12 \times Rs.26 + 150 \times Rs.28}{162\text{units}} \right)$	1,671.11
		3,866.07

Answer for Q.NO.5.

SLC A/c

To bal b/d	70000	By WIP	36000
To GLA	48000	By POH	4000
To WIP (Job 121)	200		
		By Bal c/d	78200
	118200		

Particulars	Job 110	Job 115	Job 119	Job 121	Job 122	Job 123	Particulars	Job 110	Job 115	Job 119	Job 121	Job 122	Job 123
To bal b/d	20000	20000	15000				By SLC	-	-	-	200	-	-
TO SLC A.c	2000	-	8000	10000	9000	7000							
To wages	10000	15000	30000	25000	20000	6000	By FG	37000	52000			39000	
TO OH	5000	7500	15000	12500	10000	3000	By Bal c/d			68000	47300		16000
	37000	52500	68000	47500	39000	16000		37000	52500	68000	47500	39000	16000

FG Control A/c

To WIP	128500	By COS	128500
(37000 + 52000 + 59000)			
	128500		128500

Wages Control A/c

To GLC (106000 + 14000)	120000	By WIP	106000
		By POH	14000
	120000		120000

POH Control A/c

To SLC	4000	By WIP(50% x 106000)	53000
To Wages control	14000		
To GLA	22000		
TO Costing P / L (OA)	13000		
	53000		53000

COS A/c

To FG	128500	By Costing P/L	128500

Costing P/L A/c

To Cos	128500	By GLA (75k + 65k + 60k)	200000
To GLA A/c	84500	By POH	13000
	213,000		213,000

GLA A/c

To costing P/L	900000	By bal b/d	135000
		By SLC	48000
		By Wages	120000
TO bal c/d	2095000	By POH	22000
		By Costin P/L	84500
	409500		409500

Trial balance

	Dr.	Cr.
1. SLC A/c	782200	
2. WIP		
- Job 119	68000	
- Job 121	47300	
- Job 123	16000	
3. GLC A/c		209500
	209500	209500

CHAPTER 07: UNIT & BATCH COSTING

Answer for Q.NO.1.

Statement of Cost per Unit No. of units produced: 10,000 units

Particulars	Cost per unit (Rs.)	Amount (Rs.)
Raw Materials Consumed	40.00	4,00,000
Direct Wages	24.00	2,40,000
Prime cost	64.00	6,40,000
Add: Manufacturing Overheads (3,200 hours × Rs.40)	12.80	1,28,000
Works cost	76.80	7,68,000
Add: Office Overheads (10% of Works Cost)	7.68	76,800
Cost of goods sold	84.48	8,44,800
Add: Selling Overheads (10,000 units × Rs.20)	20.00	2,00,000
Cost of sales / Total cost	104.48	10,44,800
Add: Profit (Bal Figure)	15.52	1,55,200
Sales	120.00	12,00,000

Answer for Q.NO.2.

Statement of Cost and Selling price for 2,000 units of output

Particulars	Cost per unit (Rs.)	Total Cost (Rs.)
Direct Materials	7.50	15,000
Direct Labour	3.00	6,000
Prime cost	10.50	21,000
Add: Factory Overheads (Refer working note-2)	17.50	35,000
Total cost	28.00	56,000
Add: Profit (20% of Sales is equivalent to 25% of Cost)	7.00	14,000
Sales	35.00	70,000

Working Notes:

(1) Direct Material and Direct Labour cost is varying directly in proportion to units produced and shall remain same per unit of output. Thus, direct material cost is equal to Rs.9000 ÷ 1200 units = Rs.7.50 per unit and labour cost is equal to Rs.3600 ÷ 1200 units = Rs.3 per unit.

(2) Calculation of Factory Overheads- An observation of cost related to different output levels for factory overheads shall reveal 2 things

a. Total cost increases from Rs.31,000 to Rs.34,000 along with increase in output from 1,200 units to 1,800 units but cost per unit is not constant. Thus it is not a variable cost.Cost per unit is reducing along with increase in output from Rs.25.83 (Rs.31,000 ÷ 1,200 units) to Rs.18.89 (Rs.34,000 ÷ 1,800 units)

b. Since the cost is varying with the output, it is also not a fixed cost.

Hence, we can see that the cost is a semi- variable cost and has to be calculated for 2,000 units by analysing its fixed and variable components

Week Number	Units Manufactured	Factory Overheads
1	1,200	31,000
2	1,600	33,000
Difference	400	2,000

Therefore, Variable Cost per unit = Change in Factory Overheads ÷ Change in output

= Rs.2,000 ÷ 400 = Rs.5

Now total factory overheads for week 2 = Rs.33,000

Out of this, Variable Overheads = 1,600 units × Rs.5 = Rs.8,000 Thus, fixed component

= Rs.33,000 – Rs.8,000 = Rs.25,000

Therefore, Variable Cost for 2,000 units = 2,000 units × Rs.5 = Rs.10,000

Fixed Cost will not change and hence will be = Rs.25,000

Therefore, Total Factory Cost = Variable Overheads + Fixed Overheads

Overheads for 2,000 units = Rs.10,000 + Rs.25,000 = Rs.35,000

Answer for Q.NO.3.

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

Particulars	Cost per batch (Rs.)	Total Cost (Rs.)
Direct Material Cost	500.00	6,000
Direct Wages	50.00	600
Oven set-up cost	150.00	1,800
Add: Production Overheads (20% of Direct wages)	10.00	120
Total Production cost	710.00	8,520
Add: S&D and Administration overheads (10% of Total production cost)	71.00	852
Total Cost	781.00	9,372
Add: Profit (1/3rd of total cost)	260.33	3,124
Selling price	1,041.33	12,496
Selling Price per unit = 1041.33÷ 50 = Rs.20.83		

Answer for Q.NO.4.

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 500 \times 12 \times 60}{0.1 \times 20}} = 600 \text{ units}$$

Answer for Q.NO.5.

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

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48{,}000 \times 3{,}200}{12}} = 5{,}060 \text{ units}$$

(ii) Number of Optimum runs = 48,000 ÷ 5,060 = 9.49 or 10 run

Interval between 2 runs (in days) = 365 days ÷ 10 = 36.5 days

(iii) Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum

Average Inventory = 5,060 units ÷ 2 = 2,530 units Carrying Cost per unit per annum= Rs.1 × 12 months = Rs.12

Minimum Inventory Holding Costs = 2,530 units × Rs.12 = Rs.30,360

Answer for Q.NO.6.

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

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48{,}000 \times 384}{2.4}} = 3919.18 \text{ or } 3{,}920 \text{ units}$$

Number of Optimum runs = 48,000 ÷ 3,920 = 12.245 or 13 run

(ii) Interval between 2 runs (in days) = 365 days ÷ 13 = 28 days Or 365÷12.24=29.82 days

(iii) Statement showing Total Cost at Production Run size of 3,600 and 8,000 bearings

A.	Annual requirement	48,000	48,000
B.	Run Size	3,920	8,000
C.	No. of runs (A/B)	12.245	6
D.	Set up cost per run	Rs.384	Rs.384
E.	Total set up cost (C x D)	Rs.4,702	Rs.2,304
F.	Average inventory (B/2)	1,960	4,000
G.	Carrying cost per unit p.a.	2.40	2.40
H.	Total Carrying cost (F x G)	4,704	9,600
I.	Total cost (E+H)	9,406	11,904

Extra cost incurred, if run size is of 8,000=Rs.11,904-9,406= Rs.. 2,498

(iv) To save cost the company should run at optimum batch size ie 3,920 Units. It saves Rs.2,498. Run size should match with the Economic production run of bearing manufacture. When managers of a manufacturing operation make decisions about the number of units to produce for each production run, they must consider the costs related to setting up the production process and the

costs of holding inventory

Answer for Q.NO.7.

(i)

Production Batch Size (Lt.)	Set-up costs per annum (Rs.)	Holding Costs per annum (Rs.)	Total Costs per annum (Rs.)
4,000	1,250	400	1,650
5,000	1,000	500	1,500
6,000	833	600	1,433
7,000	714	700	1,414
8,000	625	800	1,425
9,000	556	900	1,456
10,000	500	1000	1,500

As the total cost is minimum at 7,000 ltr. i.e. Rs.1,414, thus economic production lot would be 7,000 Litres

Answer for Q.NO.8. .

Statement of Cost and Total Sales Amount **(Rs.)**

Particulars	First 3 months	Next 9 months	Total
Capacity Utilisation (No of units)	120,000x3/12x50% =15,000	120,000x9/12 x 50% =72,000	87,000
Direct Material	13,50,000	64,80,000	78,30,000
Direct Labour	9,00,000	43,20,000	52,20,000
Add: Overheads:			
- Fixed (1:3)	7,50,000	22,50,000	30,00,000
- Variable	15,00,000	72,00,000	87,00,000
Semi Variable	5,00,000 (For first 3 months at the rate of Rs.20,00,000)	21,00,000 (at the rate of Rs.28,00,000 for 9 months)	26,00,000
Total cost	50,00,000	2,23,50,000	2,73,50,000
Add: Profit			20,00,000
Sales			2,93,50,000

Average Selling Price = Rs.2,93,50,000 ÷ 87,000 units = Rs.337.356

Answer for Q.NO.9. .

Statement of Cost and Profit per unit of each batch

	January	**February**	**March**	**Total**
a) Batch Output (Nos.)	1,250	1,500	1,000	3,750
b) Sales Value (@ Rs.15 per unit)	(Rs.) 18,750	(Rs.) 22,500	(Rs.) 15,000	(Rs.) 56,250

Cost				
Material Wages	6,250	9,000	5,000	20,250
Overheads	2,500	3,000	2,000	7,500
	3,750	3,000	3,000	9,750
c) Total	12,500	15,000	10,000	37,500
d) Profit per batch (b) – (c)	6,250	7,500	5,000	18,750
e) Cost per unit (c) ÷ (a)	10	10	10	
f) Profit per unit (d) ÷ (a)	5	5	5	

Overall Position of the Order for 3,000 Units

Sales value (3,000 units × Rs.15)	Rs.45,000
Less: Total cost (3,000 units × Rs.10)	30,000
Profit	15,000

Calculation of overhead per hour:

	January	**February**	**March**
i. Labour hours:			
$= \frac{\text{Labour cost}}{\text{Labour rates per hour}}$	$\frac{Rs.2,500}{2} = 1,250$	$\frac{Rs.3.000}{2} = 1,500$	$\frac{Rs.2,000}{2} = 1,000$
ii. Overhead per hour:			
$= \frac{\text{Total Overheads}}{\text{Total labour hour}}$ Total Overheads Total labour hour	$\frac{Rs.12,000}{4,000} = Rs.3$	$\frac{Rs.9,000}{4,500} = Rs.2$	$\frac{Rs.15,000}{5,000} = Rs.3$
iii. Overhead for batch (i) × (ii)	Rs.3,750	Rs.3,000	Rs.3,000

Answer for Q.NO.10. .

Particulars	**Jan.**	**Feb.**	**March**	**April**	**May**	**June**	**Total**
Batch output (in units)	210	200	220	180	200	220	1,230
Sale value (Rs.)	1,680	1,600	1,760	1,440	1,600	1,760	9,840
Material cost (Rs.)	650	640	680	630	700	720	4,020
Direct wages (Rs.)	120	140	150	140	150	160	860

Overheads* (Rs.)	600	672	672	621	780	800	4,145
Total cost (Rs.)	1,370	1,452	1,502	1,391	1,630	1,680	9,025
Profit per batch (Rs.)	310	148	258	49	(30)	80	815
Total cost per unit (Rs.)	6.52	7.26	6.83	7.73	8.15	7.64	7.34
Profit per unit (Rs.)	1.48	0.74	1.17	0.27	(0.15)	0.36	0.66

Overall position of the order for 1,200 units

Sales value of 1,200 units @ Rs.8 per unit	Rs.9,600
Total cost of 1,200 units @ Rs.7.34 per unit	Rs.8,808
Profit	Rs.792

Answer for Q.NO.11.

(a) Optimum production run size (Q) = $\sqrt{\frac{2DS}{C}}$

where,

D = No. of units to be produced within one year.

S = Set-up cost per production run

C = Carrying cost per unit per annum.

$$=\sqrt{\frac{2DS}{C}}=\sqrt{\frac{2\times 24{,}000\times Rs.324}{0.10\times 12}}=3{,}600 \text{ bearings}$$

(b) Total Cost (of maintaining the inventories) when production run size (Q) are 3,600 and 6,000 bearings respectively

Total cost = Total set-up cost + Total carrying cost.

	When run size is 3,600 bearings	**When run size is 6,000 bearings**
Total set up cost	$=\frac{24{,}000}{3{,}600}xRs.324=Rs.2{,}160$ Or, No. of setups = 6.67 (7 setups) = 7 x 324 = Rs.2,268	$=\frac{24{,}000}{6{,}000}xRs.324=Rs.1{,}296$
Total Carrying cost	1/2×3,600 × 0.10P × 12 = Rs.2,160	1/2 × 6,000 × 0.10P × 12 = Rs.3,600
Total Cost	Rs.4,320/ Rs.4,428	Rs.4,896

Rs.576/ Rs.468 is the excess cost borne by the firm due to run size not being economic batch quantity.

(c) Inventory holding cost at EBQ = 1/2 Q × C

(when Q = 3,600 bearings) = 1/2 × 3,600 bearings × 0.10P × 12

= Rs.2,160

CHAPTER 08. MATERIAL COST

Answer for Q.NO.1.

Computation of cost per unit

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

Answer for Q.NO.2.

Part I: Calculation of ordering cost and holding cost

Step 1: Ordering cost

Ordering cost = $\text{No. of orders} \times \text{Ordering cost per order}$

No of. Orders = $\frac{\text{Annual Consumption}}{\text{Ordering Qty}} = \frac{A}{OQ}$

$= \frac{A}{OQ} \times O$

$= \frac{120000}{10000} \times 100 = 1200$

Step 2: Holding cost:

Holding cost = Avg inventory held x holding cost p.u. / p.a

Avg inventory $= \frac{1}{2} \times OQ \times C/\text{p.u.}/\text{p.a}$

$= \frac{1}{2} \times 100004 \times 6$

= 30000

Total relevant Inventory cost = 30000 + 1200 = Rs.31200

Part – II: Calculation of EOQ

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

The order Qty at which the total cost is minimum is called EOQ.

Where A = Annual mat requirement

O = Ordering cost / P.O

C = Carrying cost / P.a / P.U

EOQ = $\sqrt{\frac{2 \times 120000 \times 100}{6}}$ = 2000 u

Answer for Q.NO.3.

(i) Carrying cost (C) = Storage rate = 2%

Interest Rate = 12% Obsolescence Rate = 6%

Total = 20% per annum C = 20% of Rs. 20 = Rs. 4 per unit per annum.

E.O.Q = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2\times5000\times16}{4}} = \sqrt{40,000} = 200\text{units}$

Total cost:

Purchase price of 5,000 units @ Rs. 20.00 per unit	=	Rs. 1,00,000
Ordering cost = $\frac{5000}{200}$ =25 orders @ Rs. 16	=	Rs. 400
Carrying cost of average Inventory = $\frac{200}{2}$ =100 units @ Rs. 4	=	Rs. 400
Total cost		Rs. **1,00,800**

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

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

E.O.Q. = $\sqrt{\frac{2\times5000\times16}{2.56}}$ = 250 units

Total cost:

Purchase price of 5,000 units @ Rs. 12.80 per unit	= Rs. 64,000
Ordering cost = $\frac{5000}{250}$ = 20 orders @ Rs. 16	= Rs. 320
Carrying cost (of average inventory) = $\frac{250}{2}$ =125 units @ Rs. 2.56	= Rs. 320
Total variable cost	= Rs. **64,640**

Answer for Q.NO.4.

Calculation of EOQ

Annual carrying cost = $\frac{1}{2}\times EOQ\times C$

= $\frac{1}{2}\times EOQ\times 306$

$\frac{9000\times2}{3.6} = EOQ$

EOQ = 5000 u

Answer for Q.NO.5.

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

Where,

A = Annual Demand

O = Ordering cost per order

C = Inventory carrying cost per unit per annum

(i) Calculation of EOQ

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

(ii) Total annual relevant cost = Total annual relevant ordering costs +

Total annual relevant carrying cost

	Super Grow	**Nature's Own**
Number of Orders = Annual Requirement ÷EOQ	2,000/100 =20 orders	1,280/80 =16 orders
Ordering Cost	20 × 1200 = Rs. 24000	16 × 1400 = Rs.22,400
Carrying Cost	½ × 100× 480= Rs.24,000	½ × 80× 560 =Rs.22,400
Total of Ordering and Carrying Cost	=Rs. 24,000+ Rs. 24,000 = Rs. 48,000	Rs. 22,400 + Rs. 22,400 = Rs. 44,800

(iii) Number of deliveries for Super Grow and Nature's own fertilizer per year

$$= \frac{\text{Annual demand for fertilizer bags}}{EOQ}$$

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

Answer for Q.NO.6.

Basic Data:

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

O (Ordering cost per order) = Rs. 4,000

C (Annual cost of storage per unit) = Rs. 10

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

Computations:

(i) =

(i) Re-ordering level (ROL)	=	Maximum usage per period × Maximum lead time
	=	2,000 units per day × 15 days
	=	**30,000 units**
(ii) Maximum level		ROL + ROQ – [Min. rate of consumption × Min. lead time] (Refer to working notes 1 and 2)
	=	30,000 units + 20,000 units – [1,000 units per day×5 days]
	=	**45,000 units**
(iii) Minimum level	=	ROL–Average rate of consumption× Average re-order-period
	=	30,000 units – (1,500 units per day × 10 days)
	=	**15,000 units**
(iv) Danger level	=	Average consumption × Lead time for emergency purchases
	=	1,500 units per day × 4 days
	=	**6,000 units**

Working Notes:

1. Minimum rate of consumption per day

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

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

2. Re-order Quantity (ROQ)= $\sqrt{\frac{2 \times 50{,}000 \text{units} \times \text{Rs.}4{,}000}{10}} = 20{,}000$ units

Answer for Q.NO.7.

Step 1: POQ (or) EOQ

$EOQ = \sqrt{\frac{2AO}{C}}$ O = 100; C = 15/p.u/p.a

A = 504 x 52 weeks

= 2600

$$\left[A = \frac{\text{Normal usage} \times 52 \text{ weeks}}{\text{per. week}} \right]$$

$$= \sqrt{2 \times \frac{2600 \times 100}{15}} = 1864$$

Step 2: Re order level

ROL = Maximum consumption x Maxi Lead time

= 754 x 6 weeks

= 450 u

Step 3: Min level : safety stock

= ROL – (Avg. consum x Avg LT)

= 4504 – [504 x 5]

= 450u – 250u = 200u

Step 4: Maxi level:

ROL – [Mini consumption x Mini LT] + ROQ

= 450 – [25u x 4 day] + 186

= 450 – [100] + 186

= 350 + 286

= 536u

Step 5: Avg. stock level

Formula 1	**Formula 2**
$\frac{\text{Mini level}(+)\text{Maxi level}}{2}$ $= \frac{200+536}{2}$ = 3684	$\text{Mini level} + \frac{1}{2} \times \text{ROQ}$ $= 200 + \frac{1}{2} \times 186$ = 200 + 93 = 2934

Answer for Q.NO.8. .

(i) Calculation of Economic Order Quantity

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

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

a. When EOQ is ordered

		(Rs.**)**
Purchase Cost	(8,000 units × Rs. 400)	32,00,000
Ordering Cost	[(8,000 units/200 units) × Rs. 200]	8,000
Carrying Cost	(200 units × Rs.400 × ½ × 20/100)	8,000
Total Cost		**32,16,000**

b. When Quantity Discount is accepted

		(Rs.**)**
Purchase Cost	(8,000 units × Rs. 384*)	30,72,000
Ordering Cost	[(8,000 units/4000 units) × Rs.200]	400

Carrying Cost	(4000 units × Rs. 384 × ½ × 20/100)	1,53,600
Total Cost		**32,26,000**

*Unit Cost Rs.400

Less Quantity Discount @ 4% = 16

Purchase Cost = 400- 16 = Rs.384

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

Answer for Q.NO.9.

Part I: Optimum order Qty (FOQ) and No. of order per year

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

A = 48000

O = 250/p.u

C = 5 x 30% = 1.5/p.u/p.a

= $= \sqrt{\frac{2 \times 48000 \times 250}{1.5}}$

= 4000 u

No. of orders = $\frac{\text{AnnualDemand}}{300\text{days}}$

= $\frac{48000}{4000} = 12\,\text{orders}$

Part II: Re order point / ROC (this is certain)

ROC = Consumption per day x lead time

Consumption per day = $\frac{\text{Annualdemand}}{300\text{days}}$

= $\frac{48000}{300} = 160$

= 160 x 10 days

ROL = 1600 u

Part III: Extra cost incurred due to the policy of placing order are in 3 months

No. of orders in a year = $1 \times \frac{12}{3} = 4\,\text{orders}$

Order Qty = $\left[\frac{A}{\text{No. of orders}}\right] = \frac{48000}{4}$ = 12000 u.

Particulars	Formula	OQ (EOQ = 4000)	OQ (EOQ = 12000)
Ordering cost	No. of orders x O	= 12 x 250 = 3000	4 x 250 = 1000
Carrying cost	$= \frac{1}{2} \times EOQ \times C$	$= \frac{1}{2} \times 4000 \times 1.5$	$\frac{1}{2} \times 12000 \times 1.5$
Total relevant cost		Rs.6000	Rs.10000

The extra cost incurred is Rs.4000 (10K – 6K)

Answer for Q.NO.10.

(i) Minimum stock of A

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

= 8,000 – (200 × 10 × 2) = **4,000 kgs**.

(ii) Maximum stock of B

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

= 4,750 + 5,000 – (175 × 4 × 3)

= 9,750 – 2,100 = **7,650 kgs**.

(iii) Re-order level of C

Maximum delivery period × Maximum usage

= 4 × 225 × 6 = 5,400 kgs.

OR

Re-order level of C

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

= 2,000 + [(200 × 6) × 3] kgs = **5,600 kgs**.

(iv) Average stock level of A

= Minimum stock level of A + ½ Re-order quantity of A

= 4,000 + ½ × 10,000 = 4,000 + 5,000 = **9,000 kgs**

OR

Average Stock level of A

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

(Refer to working note)

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

Working note:

Maximum stock of A = ROL+ ROQ – (Minimum consumption x Minimum re-order period)

= 8,000 + 10,000 – [(175 x 10) x 1] = 16,250 kgs

Answer for Q.NO.11.

Computation of Stock-out and Inventory carrying cost

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

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

Working Note:

Computation of Probability of Stock-out

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

Answer for Q.NO.12.

Order Qty 1	No. of orders $\left[\frac{A}{OQ}\right]$ 2	Aug invent 3 $\left(\frac{1}{2}\times OQ\right)$	Carrying cost p.u / p.a 4 20% of per price	Total ordering cost 5 2 x Rs.6	Total carrying cost 6 3 x 4	Total per cost 7 A x per price	Total cost 8 5 + 6
200	20	100	1.2 / pu / pa	120	120	24000	2424
250	16	125	1.18	96	147.50	23600	
800	5	400	1.16	30	464	23200	
2000	2	1000	1.14	12	1140	22800	
4000	1	2000	1.12	6	2240	22400	

Since the total cost is lowest when the orders us 800T EOQ = 800T

Answer for Q.NO.13.

Order Qty 1	No. of orders $\left[\frac{A}{OQ}\right]$ 2	Aug invent 3 $\left(\frac{1}{2}\times OQ\right)$	Ordering cost 4 (2 x Rs.10)	Holding cost 5 (3 x Rs.1)	Dis raid 6 (A x Discount)	Total recreate 4 + 6
5	10	2.5	100	2.5	0	102.5
10	5	5	50	5	25	30
50	1	25	10	25	50	(15)
100	0.5	50	5	50	80	(125)

EOQ = 100 containers since the total relevant is the lowest when the order Qty. is 100 containers.

Answer for Q.NO.14.

Date	Particulars	Budgets			Issue			Balance		
		Qty	Rate	Rs.	Qty	Rate	Rs.	Qty	Rate	Rs.
1	Op Bal	-	-	-	-	-	-	500	25	12500
3	MRN No	-	-	-	70	25	1750	430	25	10750
4	MRN No	-	-	-	100	25	2500	330	25	8250
8	MR No.	-	-	-	80	25	2000	250	25	6250
13	GRN No	200	24.5	4900				200	24.5	4900
14	MR. No	15	24	360				15	24	360
15	Stock packing				5	25	125			
16	HRN No.				180	25	4500	605	25	16

								200	24.5	4900
								15	24	360
20	GRN No	240	24.75	5940				65	25	1625
								200	24.5	4900
								15	24	360
								240	24.75	5940
24	MRN No				65	25	1625			
					200	24.5	4900			
					15	24	360			
					24	24.75	594			
								216	24.75	5346
25	GRN	320	24.5	7840						
								320	24.5	7840
26	MRN				112	24.75	2772	104	24.75	2574
								320	24.5	7840
27	Stock				8	24.75	198	96	24.75	2376
								320	24.5	7840
								12	24.5	294
28	GEN	100	25	2500				96	24.75	2376
								320	24.5	7840
								12	24.5	294
								100	25	2500
								528		13010

Answer for Q.NO.15.

Date	Particulars	Receipts			Issue			Balance	
		Qty	Rate	Rs.	Qty	Rate	Rs.	Qty	Rs.
1	GRN No	100	10	1000	-	-	-	100	1000
2	GRN No	200	10.2	2040	-	-	-	300	3040
5	MRN No	-	-	-	250	10.1	2525	50	515
7	GRN No	300	10.5	3150	-	-	-	350	3665
10	GRN No	200	10.8	2160	-	-	-	550	5825
13	MRN				200	10.5	2100	350	3125
18	MRN				200	10.65	2130	150	1595
20	GRN	100	11	1100				250	2695
25	MRN				150	10.9	1635	100	1060

Date	Particulars	Receipts			Issue			Balance		
		Qty	Rate	Rs.	Qty	Rate	Rs.	Qty	Rate	Rs.
1	GRN	100	10	1000	-	-	-	100	10	1000
2	GRN	200	10.2	2040	-	-	-	300	10.13	3040
5	MRN-1				250	10.13	2533	50	10.14	507
7	GRN	300	10.5	3150	-	-	-	350	10.45	3657
10	GRN	200	10.8	2160	-	--		550	10.58	5817
13	MRN				200	10.58	2116	350	10.58	3701
18					200	10.58	2116	150	10.58	1585
20	GRN	100	11	1100	-	-	-	250	10.75	2685
25					150	10.75	1613	100	10.72	1072

Answer for Q.NO.16.

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

Date	Receipts			Issues			Balance of Stock		
Sep.	Qty (kg.)	Rate (Rs.)	Amount (Rs.)	Qty (kg.)	Rate (Rs.)	Amount (Rs.)	Qty (kg.)	Rate (Rs.)	Amount (Rs.)
1	-	-	-	-	-	-	6,000	285.00	17,10,000
8	-	-	-	4,875	285.00	13,89,375	1,125	285.00	3,20,625
9	17,500	276.00	48,30,000	-	-	-	18,625	276.54	51,50,625
10	-	-	-	12,000	276.54	33,18,480	6,625	276.54	18,32,145
12	2,375	276.54	6,56,783	-	-	-	9,000	276.54	24,88,928
15	9,000	288.00	25,92,000	-	-	-	18,000	282.27	50,80,928
17	-	-	-	700	288.00	2,01,600	17,300	282.04	48,79,328
20	-	-	-	9,500	282.04	26,79,380	7,800	282.04	2199948
30	-	-	-	900*	282.04	2,53,836	6,900	282.04	19,46,112
30	-	-	-	300**	-	-	6,600	294.87	19,46,112

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

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

Answer for Q.NO.17.

(a) Total number of units purchased = 2,500 Total number of units issued = 2,300

The closing stock at the end of six months' period i.e., on 30th September, 2022 will be 200 units Upto the end of August 2022, total purchases coincide with the total issues i.e., 1,900 units. It means that at the end of August 2022, there was no closing stock. In the month of September 2022, 600 units were purchased out of which 400 units were issued. Since there was only one

purchase and one issue in the month of September, 2022 and there was no opening stock on 1st September 2022, the Closing Stock of 200 units is to be valued at Rs. 20 per unit.

In the view of this, the argument of the Chief Accountant appears to be correct. Where there is only one purchase and one issue in a month with no opening stock, the method of pricing of material issues becomes irrelevant. Therefore, in the given case one should agree with the argument of the

Chief Accountant that the value of closing stock remains the same no matter which method of pricing the issue is used.

It may, however, be noted that the argument of Chief Accountant would not stand if one finds the value of the Closing Stock at the end of each month.

(b) LIFO method has an edge over FIFO or any other method of pricing material issues due to the following advantages:

(i) The cost of the materials issued will be either nearer or will reflect the current market price. Thus, the cost of goods produced will be related to the trend of the market price of materials. Such a trend in price of materials enables the matching of cost of production with current sales revenues.

(ii) The use of the method during the period of rising prices does not reflect undue high profit in the income statement, as it was under the first-in-first-out or average method. In fact, the profit shown here is relatively lower because the cost of production takes into account the rising trend of material prices.

(iii) In the case of falling prices, profit tends to rise due to lower material cost, yet the finished products appear to be more competitive and are at market price.

(iv) During the period of inflation, LIFO will tend to show the correct profit and thus, avoid paying undue taxes to some extent.

Answer for Q.NO.18.

Step 1L Calculation of indifference point:

$$\text{Indifference point} = \frac{\text{DiffinFC}}{\text{DiffinVC}}$$

$$= \frac{4000 - 0}{4.4 - 4.2}$$

$$= 20{,}000u$$

When the order qty is 20000 u both the suppliers are equally good twice they have the same cost.

Particulars	A	B
VC	88000	84000
(+) FC	0	4000
Total cost	88000	88000

Step 2: Supplier to be selected if order Qty 15000u.

OQ	Supplier	No reason
Less than 20000	A	Fixed cost
Equal to 20000	A & B	Indifference point
Less than 20000	B	Low VC / P.U

Answer for Q.NO.19.

Statement of Total Cost and Ranking

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

Basis for selective control (Assumed)

Rs. 50,000 & above -- 'A' items

Rs. 15,000 to 50000 -- 'B' items

Below Rs. 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 (Rs.)	% of Total Cost	Category
1	11	5.2512	81,650	22.9502	
2	2	10.9589	72,000	20.2378	
3	5	17.3516	57,000	16.0216	
Total	**3**	**33.5617**	**2,10,650**	**59.2096**	**A**
4	1	3.1963	35,000	9.8378	
5	12	1.8721	25,420	7.1451	

6	6	18.2648	20,000	5.6216	
7	3	0.6849	15,000	4.2162	
Total	**4**	**24.0181**	**95,420**	**26.8207**	**B**
8	4	0.2740	13,200	3.7103	
9	7	27.3973	12,000	3.3730	
10	10	13.2420	11,600	3.2605	
11	8	1.3699	10,500	2.9513	
12	9	0.1370	2,400	0.6746	
Total	**5**	**42.4202**	**49,700**	**13.9697**	**C**
Grand Total	12	100	3,55,770	100	

Answer for Q.NO.20.

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

Cost of materials consumed	**Material A (Rs.)**	**Material B (Rs.)**
Opening stock	10,000	9,000
Add: Purchases	52,000	27,000
	62,000	36,000
Less: Closing stock	6,000	11,000
Materials consumed	56,000	25,000
Average inventory: (Opening Stock + Closing Stock) ÷ 2	8,000	10,000
Inventory Turnover ratio: (Consumption ÷ Average inventory)	**7 times**	**2.5 times**
Inventory Turnover (Number of Days in a year/IT ratio)	**52 days**	**146 days**

Comments: Material A is moving faster than Material B.

Answer for Q.NO.21.

Step 1: Calculation of total material cost

Purchase price of Sealing ring = 1000 u x 2 x 17.2

= 24400

(+) 100% of invoice customers = 34400

(+) Freight = 1400

(+) Clearing = 1800

Purchase price = 72000

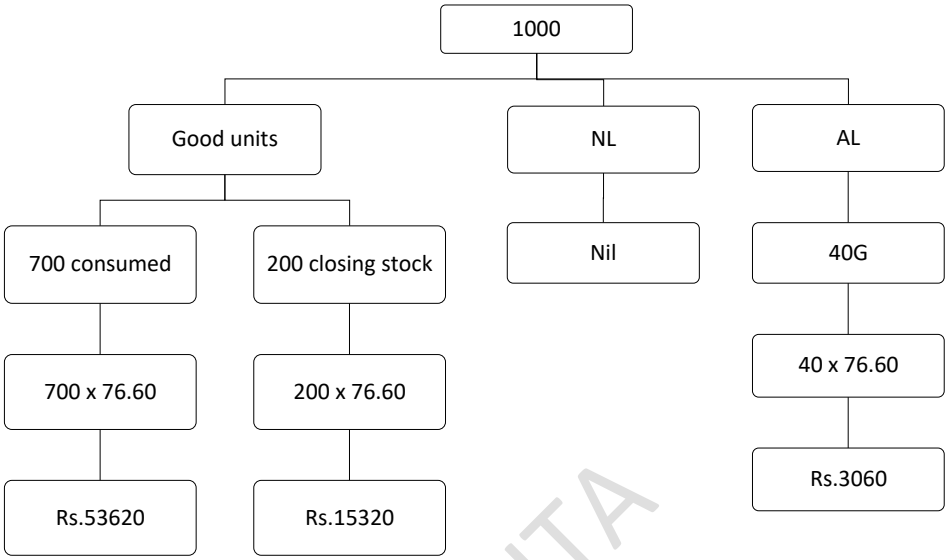
Step 2: Cost per price

$$\text{Cost per price} = \frac{\text{PerPrice} - \text{NLScrapIncome}}{\text{PurchaseQty} - \text{NLUnits}}$$

$$\frac{72000-0}{1000-60} = \text{Rs.}76.5957/\text{kg}$$

= (or)

76.60



Dr. SLC A/c Cr.

	Rs.		Rs.
To Bank	72000	By WIP	53620
		By AL	3060
		By Bal c/d	15320

Dr. AL A/c Cr.

	Rs.		Rs.
To SLC	3060	By Costing P & L	3060
	3060		

Answer for Q.NO.22.

Part 1: Treating the Loss as normal loss:

RM consumed = (6000 kg x 150)

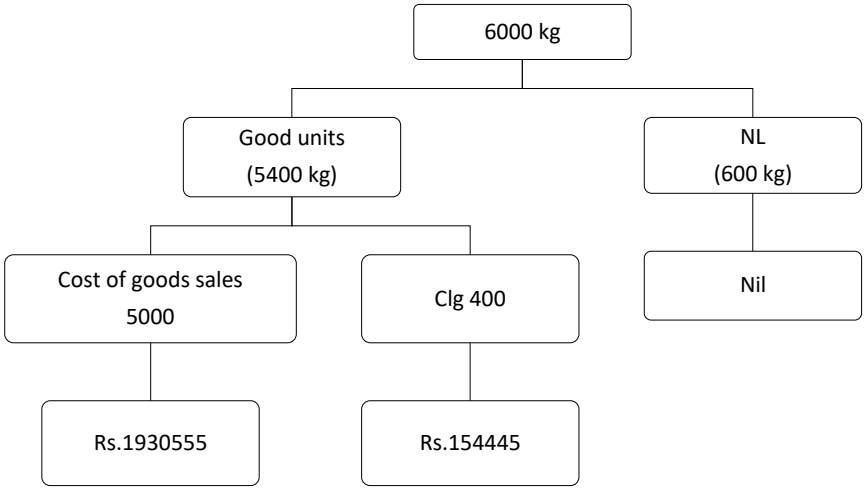
= 9,00,000

(+) Operating cost = 12,00,000

Total manuf. Cost = 21,00,000

$$\text{Cost per kg} = \frac{\text{Total cost} - \text{NL Scrap income}}{\text{Input Qty} - \text{NL units}}$$

$$= \frac{21,00,000 - (600 \times 25)15\,000}{6000-600} = \text{Rs.}386.11/\text{kg.}$$



Dr. WIP A/c Cr.

	Rs.		Rs.
To SLC	29,00,000	By NC scrap income	15,000
To Conversion cost	12,00,000	By FG A/c	2085000
	21,00,000		21,00,000

NL Scrap income:

	Rs.		Rs.
To WIP	15000	By Bank	15000
	15000		15000

FGAI:

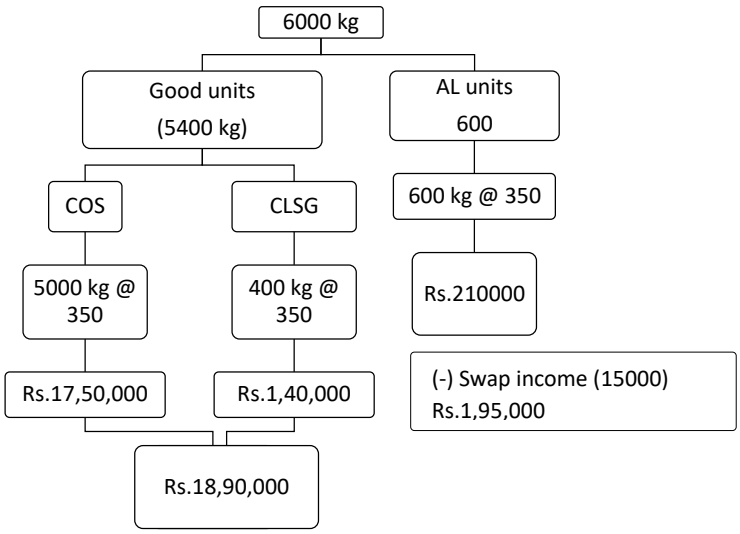
Dr. WIP A/c Cr.

	Rs.		Rs.
To WIP A/c	2085000	By COS	1930555
		By Cls FG	164445
	2085000		2085000

Part II: Treating the loss as Abnormal loss:

$$\text{Cost per kg} = \frac{\text{Total cost} - \text{NL Scrap Income}}{\text{Input Qty} - \text{NL units}}$$

$$= \frac{21,00,000 - 0}{6000\text{kg} - 0} = \text{Rs.}350/\text{kg}$$



Dr. WIP A/c Cr.

	Rs.		Rs.
To SLC	9,00,000	By AL	2,10,000
To Conversion cost	12,00,000	By FG	18,90,000
	21,00,000		21,00,000

Dr. FG A/c Cr.

	Rs.		Rs.
To WIP	18,90,000	By COS	17,50,000
		By Balance	1,40,000
	18,90,000		18,90,000

Dr. AL A/c Cr.

	Rs.		Rs.
To WIP	21,00,000	By Bank A/c	15000
		By Costing P & L	1,95,000
	21,00,000		21,00,000

CHAPTER 09: EMPLOYEE COST AND DIRECT EXPENSES

Answer for Q.NO.1.

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

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

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

Answer for Q.NO.2.

Part I: Simple time rate system

Wages = Time taken x Time Rate

Time taken = 44H

Time rate = 15/H

Wages = 44 x 15 = Rs.660

Part –II: Straight Piece rate system:

Wages = Unit produce x Piece Rate

Calculation of piece rate = 1Hr = Rs.15

$$= 1\ \text{Hr} = 44 \left[\frac{60\,\text{min}}{15\,\text{min}}\right]$$

44 = Rs.15

14 = 23.75

(15 / 4)

Wages = 200 u x Rs.3.75

= Rs.750

Note: If this piece rate wage turns out to he less than 660 then he will get an guarantee wages of Rs.660

Part – III & IV: Rowan & Hasley system

Time take = 44H

Time allowed = $\left[\frac{15\,\text{min}}{60\,\text{min}}\right] \times 120\%$ x 200u

= 60 hrs

Time saved = 60H – 444 = 16 hrs

Rowan $\Rightarrow$ Basis wage

$\downarrow$

TT x TR

44H x 15 = 660

Bonus $\Rightarrow \left[\frac{TT}{TA} \times TS \times TR\right]$ = $\frac{44}{60} \times 16 \times 15$

= Rs.176

Total wage under Rowan 836

Hasley = basic = TT x TR = 44H x 15 = 660

Bonus = 50% of 16 x 150

= 120

Total wage = 780

Answer for Q.NO.3.

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

Step 2 : Factory Cost of Workman 'A'

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

Step 3: Factory Cost of Workman 'B'

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

Step 4 : Subtracting equation (i) from equation (ii) 3Y = Rs.60

Y = Rs.60/3 = Rs.20 per hour.

(a) The normal rate of wages: Rs.20 per hour

(b) The cost of material: X + 45 x Rs. 20 = Rs. 3,400 or, X = Rs. 3,400 – Rs. 900 = Rs. 2,500

(c) Comparative Statement of the Factory Cost of the product made by the two workmen.

	'A' (Rs.)	**'B' (Rs.)**
Material cost	2,500	2,500
Direct Wages	600 (30 x Rs.20)	800 (40 x Rs.20)
Bonus	240 (12 x Rs.20)	100 (5 x Rs.20)
Factory Overhead	150	200
Factory Cost	3,490	3,600

Answer for Q.NO.4.

Calculation of earnings under different wage schemes:

i. Day wages

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

Average labour cost to produce 100 pieces:

$$=\frac{\text{Totalwagespaid}}{\text{Totaloutput}}\times 100=\frac{\text{Rs.1,800}}{\text{400units}}\times 100=\text{Rs.450}$$

ii. Piece rate

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

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

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

iii. Halsey Scheme

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

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

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

iv. Rowan Scheme:

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

* Bonus hours = $\frac{\text{TimeSaved}}{\text{Std.Time}}\times \text{Actualtime}$

Average cost of labour for the company to produce 100 pieces

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

Answer for Q.NO.5.

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

Bonus under Rowan Plan : = $\frac{AH}{SH}$ x (SH - AH) x R (ii)

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

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

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

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

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

SH	AH	Time saved	Basic wages (AH x Rs.8) (B x Rs.8)	Bonus under Halsey System $\left[\frac{50}{100}\times C\times 8\right]$	Bonus under Rowan system $\left[\frac{B}{A}\times C\times 8\right]$	Total Earnings under Halsey System D+E	Total Earnings under Rowan System D+F	Hourly Earnings under Halsey System G/B	Hourly Earnings under Rowan System H/B
A Hours	B Hours	C = (A-B) Hours	D (Rs.)	E (Rs.)	F (Rs.)	G (Rs.)	H (Rs.)	I (Rs.)	J (Rs.)
8	8	-	64	-	-	64	64	8.00	8.00
8	7	1	56	4	7	60	63	8.57	9.00
8	6	2	48	8	12	56	60	9.33	10.00
8	5	3	40	12	15	52	55	10.40	11.00
8	4	4	32	16	16	48	48	12.00	12.00
8	3	5	24	20	15	44	39	14.67	13.00
8	2	6	16	24	12	40	28	20.00	14.00
8	1	7	8	28	7	36	15	36.00	15.00

Answer for Q.NO.6.

Total earnings (under 50% Halsey Scheme) = Hours worked x Rate per hour + ½ x time saved x Rate per hour

= 3 hours x Rs. 30 + ½ x 1 hour x Rs.30

= Rs.105

Effective hourly rate = Total earnings Hours taken

$\frac{\text{Total earnings}}{\text{Hours taken}} = \frac{\text{Rs.105}}{\text{3hours}} = \text{Rs.35}$

Working Note:

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

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

Time taken x Rate per hr

Rs.37.5 T = T x Rs.30 + $\frac{(4-T)}{4}$

(both sides are divided by T)

Rs. 37.5 = Rs. 30 + (4 – T) ⍰ Rs. 7.5

Rs. 37.5 = Rs. 30 + Rs.30 - 7.5T

or, Rs. 7.5 T = Rs.60-Rs.37.5

or, Rs. 7.5 T = Rs. 22.5

or, T = 3 hours.

Answer for Q.NO.7.

Working Notes:

1. Actual time taken to produce 1,250 pieces

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

= 25 days × 8 hrs. × 10 workers = 2,000 hours

2. Total time wages of 10 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. × Rs.40 × 10 workers = Rs.80,000

3. Time saved per month:

Time allowed per piece to a worker 2 hours

No. of units produced during the month by 10 workers x 1,250 pieces

Total time allowed to produce 1,250 pieces (1,250 × 2 hours) 2,500 hours

Actual time taken to produce 1,250 pieces 2,000 hours

Time saved (2,500 hours – 2,000 hours) 500 hours

4. Bonus under Halsey scheme to be paid to 10 workers:

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

= 50/100 × 500 hours × Rs.40 = Rs.10,000

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

5. Bonus under Rowan Scheme to be paid to 10 workers:

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

= $\frac{2000\text{hours}}{2500\text{hours}} \times 500\text{hours} \times \text{Rs.}40 = \text{Rs.}16{,}000$

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

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

(i) (a) Effective hourly rate of earnings under Halsey scheme: (Refer to Working Notes 1, 2, 3 and 4)

$$= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Halsey scheme}}{\text{Total hours worked}}$$

$$= \frac{\text{Rs.}80{,}000 + \text{Rs.}10{,}000}{2{,}000\text{hours}} = \text{Rs.}45$$

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

$$= \frac{\text{Total time wages of 10 workers} + \text{Total bonus under Rowan scheme}}{\text{Total hours worked}}$$

$$= \frac{\text{Rs.}80{,}000 + \text{Rs.}16{,}000}{2{,}000\text{hours}} = \text{Rs.}48$$

(ii) (a) Saving in terms of direct Employee cost per piece under Halsey scheme:

(Refer to Working Note 4)

Employee cost per piece (under time wage scheme)

= 2hours × Rs.40 = Rs.80.

Employee cost per piece (under Halsey scheme)

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

Saving per piece: (`80 – `72) = `8

(b) Saving in terms of direct Employee cost per piece under Rowan Scheme:

(Refer to Working Note 5)

Employee cost per piece under Rowan scheme

= Rs.96,000/1,250 units = Rs.76.80

Saving per piece = Rs.80 – Rs.76.80 = Rs.3.20

Answer for Q.NO.8.

Step 1: Calculation of time allowed

Job No	Computation		Time allowed
Job 1	4H : 1000 6H : 1500		6H
Job 2	3H : 1000 5H : 1800	$= \left(5.4 \times \frac{100}{90}\right)$	6H
Job 3	1000 : 6H 1800 : 54H		54H
Job 4	4 hrs x 125%		5H

Job 5	1000 2000	8H 16H	=	16H x 50%	8H
	Total				79 Hrs.

Step 2: Calculation of earnings:

Basic wages = Hrs paid x Time rate

= 48H x 2.5

= Rs.120

Bonus under Rowan = Time allowed = 79H

Time taken = 44

(hrs worked) (1m 8 – 4)

Time saved = 35H

$= \frac{TT}{TA} \times TS \times TR$

$= \frac{44}{79} \times 35 \times 2.5$

= Rs.48.73

Total earnings = 120 + 48.73

= Rs.168.73

Answer for Q.NO.9.

Step 1: Calculation of time saved

Particulars	A	B	C
Time allowed	100 Hr	100 Hr	100Hr
Time taken	60 hr	70 Hr	95Hr
Time saved	40 Hr	30 Hr	5 Less
% of TS to TA	40%	80%	5%

Step 2: Bonus to Worker A:

Slab	Time	Bonus computation	Bonus
First 10% of TS / TA	10H	10H x 10% x 10	10
110 to 20% of TS / TA	10H	10H x 15% x 10	15
20% balance	20H	20H x 20% x 10	40
			Rs.65

Step 3: Bonus for worker B

Slab	Time	Bonus computation	Bonus
First 10%	10H	10H x 10% x 10	10
Next 11 to 20%	10H	10H x 15% x 10	15
Balance 10%	10H	10H x 20% x 10	20

		Bonus	Rs.45

Step 4: Bonus for worker C:

Slab	Time	Bonus computation	Bonus
First 5%	5H	5H x 10% x 10	5
		Bonus	5

Step 5: Calculation of total earnings and earnings per hr:

Particulars	A	B	C
Basic wage (TT x TR)	600 (60H x 10)	700 (70H x 10)	950 (95H x 10)
Bonus	65	45	5
Total earnings	665	745	955
Earnings per hr	11.08 / hr	10.64 / hr	10.05 / hr

Answer for Q.NO.10.

Part 1: Calculation of rate & amount of bonus for the week

A. Standard weekly production (200 x 1200) = 240000

B. Actual weekly production (Given) = 276000

C. Excess over standard prodn. = 36000 u

D. % excess over standard prodn. = 15

$$\left(\frac{C}{A}\times 100\right) \qquad \left(\frac{36000}{240000}\times 100\right)$$

E. Bonus % = $\left(\frac{1}{2}\times 15\%\right)$ = 7.5%

= 1080

Part – II: Calculation of earnings of X and Y:

Particulars	X	Y
1. hrs works	45H	48H
2. Time rate for Basic wage	Rs.10	Rs.11
3. Basic wages (1 x 2)	Rs.450	Rs.528
4. For Bonus	40.5 (45H x 12 x 7.5%)	43.2 (48H x 12 x 7.5%)
5. Total earnings	490.50	571.2

Answer for Q.NO.11.

Step 1: Calculation of reward to the worker:

Particulars	Before Jig	After Jig
a. Units manufactures	30000	30000
b. Standard time per unit	2 hrs (or) 120 min	180 min
c. Actual time permit $\left(\frac{TA}{TT}\right)=60\%$	$\left(\frac{120}{60\%}\right)=200\text{min (or) } 3.33\text{hrs}$	$\left(\frac{108}{60\%}\right)=180\text{min (or) } 3\text{hrs}$
d. Actual time taken	30000 x 3.33 = 1,00,000H	300000 x 3 = 90000H
e. Wage rate $\left(\frac{Rs.40}{8}\right)=Rs.5$	Rs.5,00,000	Rs.50000

Earnings in labour

Cost P.A = 50000 (5,00,000 – 4,50,000)

Award = 50000 x 3/12 = Rs.12500

Part – II: Competitive statement of cost

Particulars	Before Jig	After Jig
a. Materials (30000 x 10kg x Rs.2)	6,00,000	6,00,000
b. Wages	5,00,000	4,50,000
c. Reward	-	12500
d. OHS	10,00,000 (1,00,000H x Rs.10)	9,00,000 (90,000 x Rs.10)
e. Material handling	12000 (6,00,000 x 2%)	12000 (6,00,000 x 2%)
f. Cost of Jig	-	3000
Total	21,12,000	19,77,500

It is recommended to implement the Jig scheme

Answer for Q.NO.12.

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

Another feature of this scheme is that a worker cannot increase his earnings or bonus by merely increasing its work speed. The reason for this is that the bonus under Rowan Scheme is maximum

when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too. Lastly, Rowan System provides a safeguard in the case of any loose fixation of the standards by the rate-setting department. It may be observed from the following illustration that in the Rowan Scheme the bonus paid will be low due to any loose fixation of standards. Workers cannot take undue advantage of such a situation. The above three features of Rowan Plan can be discussed with the help of the following illustration:

(i) Time allowed = 4 hours

Time taken = 3 hours

Time saved = 1 hour

Rate = Rs.5 per hour

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

$$= \frac{3\text{hours}}{4\text{hours}} \times 1\text{hour} \times \text{Rs.}5 = \text{Rs.}3.75$$

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

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

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

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

$$= \frac{1\text{hour}}{4\text{hours}} \times 3\text{hours} \times \text{Rs.}5 = \text{Rs.}3.75$$

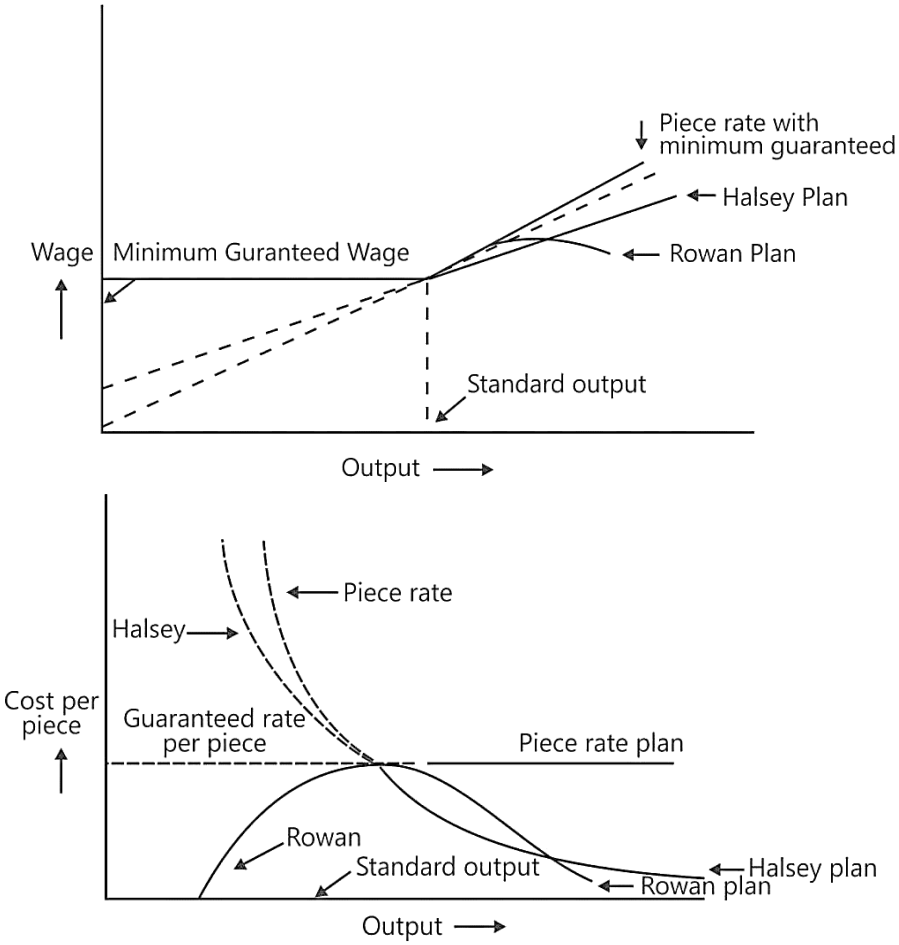
The above figures of bonus clearly show that when time taken is half of the time allowed, the bonus is maximum. When the time taken is reduced from 2 to 1 hour, the bonus figure fell by Rs.1.25. Hence, it is quite apparent to workers that it is of no use to increase speed of work. This feature of Rowan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

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

$$\text{Bonus} = \frac{3\text{hours}}{10\text{hours}} \times 7\text{hours} \times \text{Rs.}5 = \text{Rs.}10.75$$

The bonus paid for saving 7 hours thus is Rs.10.50 which is approximately equal to the wages of 2 hours. In other words, the bonus paid to the workers is low. Hence workers cannot take undue

advantage of any mistake committed by the time setting department of the concern.



Answer for Q.NO.13.

Part A: Overtime is regular

Step 1: Total wages for the year including over time premium

Normal wages = (22,000H x 12) = 264000

Daily wages = (2000H x 16) / (12 + 4) = Rs.32000

Weekend wages = (1000H x 24) / (12 + 12) = Rs.24000

Total annual wages = 3,20,000

Step 2: Wage rate per hr $= \frac{\text{Total Annual wages}}{\text{Total hrs}}$

$= \frac{320000}{25000\,H} = 12.8/\text{P.H}$

Step 3: Wages chargeable to Jobs

A : 340H x 12.8 = 4352

B : 565H x 12.8 = 7232

C : 535H x 12.8 =Rs.6848

Note: If we total the wages changed to all the Jobs (A, B, C, D, E……) it will be Rs.3,20,000

The wages has he changed as prime cost

Part B: Overtime is worked due to seasonal production requirements:

Step 1: Wage rate per hr:

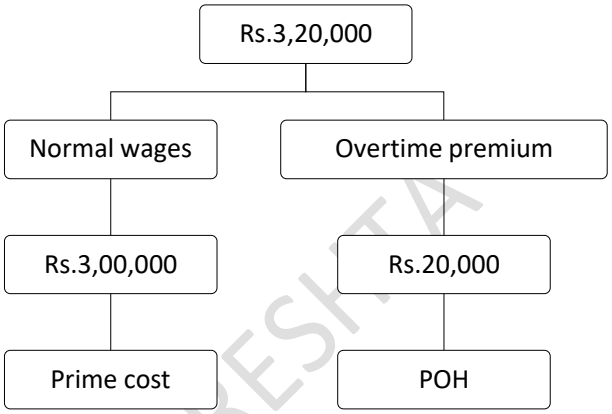
Normal = 22000H x 12 = 264000

= 2000H x 12 = 24000

= 1000H x 12 = 12000

Total Normal wages = 5,00,000

Wage rate per hr = $\frac{3,00,000}{25000\,H} = 12/\text{per hr.}$



Step 2: Wages charged to Jobs:

A = 340H x 12 = 4080

B = 565H x 12 = 6780

C = 535H x 12 = 6420

Total 17280

Note: If we total the wages charged to all the jobs (A, B, C, D…….) it will be Rs.3,00,000. The balance Rs.20,000 is debited to POH A/c

Part C: Overtime is due to specific customer request:

Job A = (340H x 12) + (30 x 4) + (10 x 12)

= 4080 + 120 + 120 = 4320

Job B = (565H x 12) + (60 x 4) + (5 x 12)

= 6780 + 240 + 60 = 7080

Job C = (535H x 12) + (105 x 4) + (30 x 12)

= 6420 + 420 + 360 = 7200

= 18,600

Note: When total the wages charged to all the jobs (A, B, C, D,…..) it will total to Rs.3,20,000. The overtime premium is treated as prime cost

Part D: Overtime is due to abnormal reasons:

All the calculations are similar to Part B that overtime premium of Rs.20,000 is charged to the costing P & L instead of POA A/c.

Answer for Q.NO.14.

Statement showing Earnings of Workers A and B

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

Working Notes

1. Normal Wages are considered as basic wages

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

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

Answer for Q.NO.15.

1. Calculation of hours to be paid for worker A:

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

2. Calculation of hours to be paid for worker B:

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

(*Worker-B has neither worked more than 9 hours in any day nor more than48 hours in the week)

3. Calculation of hours to be paid for worker C:

	Normal hours	**Extra hours**	**Overtime hours**	**Equivalent normal hours for overtimeworked**	**Total normal hours**
Monday	8	1	1½	3	12
Tuesday	8	---	---	---	8

Wednesday	8	1	1½	3	12
Thursday	8	1	½	1	10
Friday	8	1	1½	3	12
Saturday	8*	---	---	---	8
Total	**48**	**4**	**5**	**10**	**62**

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

4. Wages payable:

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

Answer for Q.NO.16.

Workings:

(i) Computation of productive hours

Actual hours worked (given)	4,45,000
Less: Unproductive training hours	15,000
Actual productive hours	4,30,000

(ii) Productive hours lost:

Loss of potential productive hours + Unproductive training hours

= 1,00,000 + 15,000 = 1,15,000 hours

(iii) Loss of contribution due to unproductive hours:

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

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

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

Computation of profit forgone on account of employee turnover

	(Rs.)
Contribution foregone (as calculated above)	4,44,130
Settlement cost due to leaving	43,820

Recruitment cost	26,740
Selection cost	12,750
Training costs	30,490
Profit foregone	5,57,930

Answer for Q.NO.17.

No. of separations = 20 + 80 = 100

No. of replacements = 60 (Given)

No. of new joinings = 500 – 60 = 440

No. of accessions = (440 + 60) = 500 workers

Avg. no. of workers = $\frac{1800+2200}{2} = 2000 \text{ workers}$

Separation method = $\frac{\text{No. of separations}}{\text{Avg. No. of workers}} \times 100$

= $\frac{100}{2000} \times 100 = 5\% \times 12 = 60\%$

= 5% x 12m = 60% p.a

Replacement method = $\frac{\text{No. of replacement}}{\text{Avg. No. of workers}}$

= $\frac{600}{2000} \times 100$

= 3% x 12m = 36% p.a

Flux method = $\frac{\text{No. of sepeartions} + \text{No. of acessions}}{\text{Avg. No. of workers}}$

= $\frac{100+500}{2000} \times 100$

= 30% x 12m = 360% p.a

Answer for Q.NO.18.

Working Note:

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

Employee Turnover rate using Replacement method

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

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

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

i. Number of workers recruited and joined:

Employee turnover rate (Flux method)

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

Or, $\frac{10}{100} = \frac{18^* + A}{600}$ or, $A = \left[\frac{6000}{100} - 80\right] = 42$

No. of workers recruited and joined 42

ii. Number of workers left and discharged:

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

Hence, number of workers left and discharged comes to 18

iii. Calculation of Equivalent employee turnover rates:

= Employee Turnover rate for the quarter(s)×4 quarters Number of quarter(s)

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

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

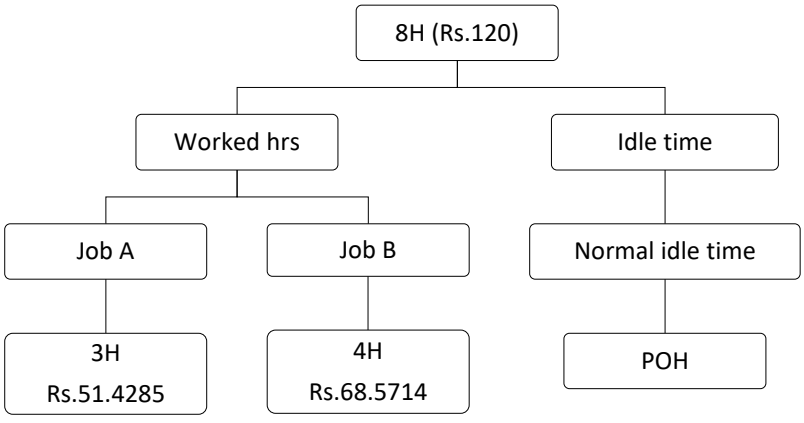
Using Separation method = $\frac{3\%}{1} \times 4 = 12\%$

Answer for Q.NO.19.

Part A = Ram

Cost per hr $= \frac{\text{Totalwages}}{\text{hrspaid} - \text{Normalidletime}}$

$$= \frac{120}{8H - 1H} = \frac{120}{7H} = \text{Rs.}17.14285$$



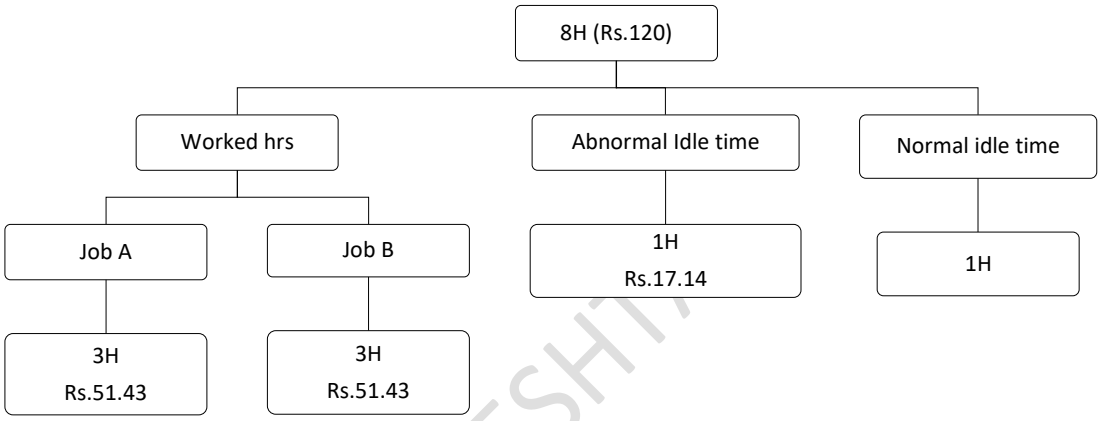
Part B: Raju

Raju is an indirect worker have the entire wages paid to him is treated as POH irrespective of where it is working time or idle time.

Part C: Dev

$$\text{Cost per hr} = \frac{\text{Total wages}}{\text{hrs paid} - \text{Normal idle time}}$$

$$= \frac{120}{8H - 1H} = \frac{120}{7H} = \text{Rs.}17.14285$$



Answer for Q.NO.20.

Working notes:

(i) Total effective hours in a week:

[(8 hrs. – (30 mts. + 10 mts.)] × 6 days = 44 hours

(ii) Total wages for a week:

(Rs. 100 + 120% of Rs. 100) × 6 days = Rs. 1,320

(iii) Wage rate per hour = 1320 ÷ 44 hours = Rs. 30

(iv) Time wasted waiting for job (Abnormal idle time):

= 44 hrs. – (15 hrs. + 12 hrs. + 13 hrs.) = 4 hrs.

Allocation of wages in Cost Accounting

	(Rs.)
Allocated to Job X : 15 hours × Rs. 30	450
Allocated to Job Y : 12 hours × Rs. 30	360
Allocated to Job Z : 13 hours × Rs. 30	390
Charged to Costing Profit & Loss A/c : 4 hours × Rs. 30	120
Total	**1,320**

Answer for Q.NO.21.

Calculation of Direct expenses

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

Note:

(i) Office and administration cost is classified as overheads.

(ii) Salary paid to office attendants is classified under office and administration cost.

(iii) Salary paid to marketing manager is classified under selling overheads

Answer for Q.NO.22.

Calculation of Direct Expenses

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

Notes:

(i) Wages paid to factory workers is direct employee cost.

(ii) Administrative overhead is indirect expense.

(iii) Commission paid to sales staffs comes under selling expenses.

CHAPTER 10: PROCESS & OPERATION COSTING

Answer for Q.NO.1.

Dr. Process I A/c Cr.

	Units	Amount		Units	Amount
To Materials	100	1800	By Process II (Transfer) (100 x 24)	100	2400
To wages		100			
To Dir. Exp		300			
To POH		200			
	100	**2400**		**100**	**2400**

Cost per kg of process I output = 2400 / 100 = Rs.24 / Kg.

I should always do this because it is not necessary that the entire output of P1 should be transferred to P2 maybe, P2 can process only 50 units at a time. In that case, I need cost per unit details to value transfer & stock

Dr. Process II A/c Cr.

	Units	Amount		Units	Amount
To P I	100	2400	By Process II (Transfer) (100 x 33)	100	3300
To Materials	-	300			
To Wages	-	200			
To Dir. Exp.	-	-			
To POH	-	400			
	100	**3300**		**100**	**3300**

Cost per Kg of process II output = 3300 / 100 = Rs.33 / kg

Dr. Process II A/c Cr.

	Units	Amount		Units	Amount
To P II	100	3300	By FG A/c	100	3900
To Materials	-	100			
To Wages	-	100			
To Dir Exp	-	200			
To POH	-	200			
	100	3900			

Cost per kg of KG = 3900 / 100 = Rs.39

Answer for Q.NO.2.

Dr. **Process I A/c** **Cr.**

	Units	Amount		Units	Amount
To Input	1000	3000	By NL Scrap	50	100
To Materials	-	2600	By Process – II	950	9500
To Wages	-	2000			
To POH (100%)	-	2000			
	1000	9600		1000	9600

Cost per unit = $\frac{\text{Total cost} - \text{NL Scrap}}{\text{Input} - \text{NL}}$

= $\frac{9600 - 100}{1000 - 50} = \text{Rs.}10/\text{u}$

Dr. **Process II A/c** **Cr.**

	Units	Amount		Units	Amount
To P – I	950	9500	By NL Scrap @ Rs.4	95	380
To Materials	-	1980	By Process – III	840	16800
To Labour	-	3000	By Abnormal Loss	15	300
To POH (100%)	-	3000			
	950	17480		950	17480

Cost per unit = $\frac{\text{TC} - \text{NL Scrap}}{\text{Input} - \text{NL}}$

= $\frac{17480 - 380}{950 - 95}$ = Rs.20 / u

Dr. **Process III A/c** **Cr.**

	Units	Amount		Units	Amount
To P – II	840	16800	By NL Scrap @ Rs.5	126	630
To Materials		2962	By FG	750	28500
To wages		4000			
To POH (100%)		4000			
To Abnormal gain	36	1368			
	876	29130		876	29130

Cost per unit = $\frac{\text{TC} - \text{NL Scrap}}{\text{Input} - \text{NL}}$

= $\frac{27762 - 630}{840 - 126}$ = Rs.38 / u

Dr. **Income A/c** **Cr.**

To P – I	100	By Bank	100

To P – II	380	By Bank	380
To P – III	630	By Bank (90 x 5)	450
		By Abnormal gain	180

Dr. Abnormal Loss A/c Cr.

To P – II	300	By Bank (15 x 4)	60
		By Costing P/L	240

Dr. Abnormal Gain A/c Cr.

To NL Scrap	180	By process III	1368
To Costing P/L	1188		
	1368		1368z

Answer for Q.NO.3.

Cost p.u = $\frac{TC}{units} = \frac{1760}{100} = 1.76$

Step 1: Statement of equivalent units

Input	Output		Equivalent units	
1000	Completed	800	100	800
	WIP	200	40	80
		1000		880

Step 2: Statement of cost per Equivalent unit

Items	Cost	Eq units	Cost per Eq unit
Total cost	1760	880	2

Step 3: Statement of Apportionment

A Process II 800 x 2 = 1600

B WIP 80 x 2 = 160

1760

Step 4:

Process I A/c

	Units	Amount		Units	Amount
To Input	1000	1760	By Process II	800	1600
To Materials		2962	By Cl. Bal c/d	200	160
	1000	1760		1000	1760

Answer for Q.NO.4.

Step 1: Statement of Equivalent units (FIFO Method)

Inputs	Output	Eq. units

	Units		Units	%	Units
Op WIP	200	OP WIP completed	200	60%	120
Introduced	1050	Intro. completed	900	100%	900
		Cl. WIP	150	70%	105
	1250		1250		1125

Step 2: Statement of cost per Equivalent unit

Items	Cost	Eq. units	Cost per Eq. unit
Total cost	2250	1125	2

Step 3: Statement of Apportionment

A. Completed

(i) Introduced & Completed (*900 x2) = 1800

(ii) OP WIP completed

- Current period cost (120 x 2) = 240
- Last period cost (given) = 500

2540

B. Cl. WIP (105 x 2) = 210

Step 4:

Process I A/c

	Units	Amount		Units	Amount
To OP WIP	200	500	By Process II	1100	2540
To Input	1050	2250	By Cl. WIP	150	210
	1250	2750		1250	2750

Answer for Q.NO.5.

Few important points

1. N. Loss cab be expressed as a % of input or production when expressed as a% of production remember the formula production = Input = Cl. WIP
2. In short of environment units:
   a. Normal Los is always taken as zero since its cost is shared by others.
   b. Abnormal loss – Percentage of computation of abnormal loss even it's depend on when the loss is deducted. i.e. when I inspect the loss at 80% stage % of completion of abnormal loss will be 80% & eq. units of Abnormal loss is calculated accordingly. If the question is silent, assume that inspection was done at the end i.e. 100%.

Step 1: Statement of Equivalent units

Input		Output		Eq. Units	
	Units		Units	%	Units

Op WIP	100	OP WIP completed	100	60%	60
Introduced	11000	Intros completed	8500	100%	8500
		Cl. WIP	1100	70%	770
		Normal Loss	1000	-	-
		Ab. Normal	400	100%	400
	11100		**11100**		**9730**

Step 2: Statement of cost per Equivalent unit

Items	cost	eq. units	cost per eq. units
Total cost	29190	9730	3

Step 3: Statement of Apportionment

A. Completed

i) Intro is completed (8500 x 3) = 25500

ii) OP WIP completed

- Current period cost (60 x 3) = 180
- Pre. Period cost b/f (given) = 1000

26680

B. Cl. WIP (770 x 3) 2310

C. Abnormal Loss (400 x 3) 1200

Step 4:

Process A A/c

	Units	**Amount**		**Units**	**Amount**
To OP WIP	100	1000	By N. Loss Scrap	1000	-
To Input	11000	29190	By Process B	8600	26680
			By Cl. WIP	1100	2310
			By Ab loss	400	1200
	11100	**30190**		**11100**	**30190**

Note:

1.

Normal Loss percentage is expressed in

↓ ↓

As a percentage of input | As a percentage of production

↓ ↓

Input = OP WIP + Newly Introduced | Production = Input – Cl. WIP

2. In this problem N. Loss is 10% of production

Production = 11100 u – 100 u = 10000u

N. Loss = 10% x 10000u = 1000 u

Answer for Q.NO.6.

Part B: Cost of RM consumed

= 10000 kgs x 5 = Rs.5,00,000

Part C: Variability of FG due to RM cost variability

RM per kg	Total RM cost	FG	FG cost per kg
Rs.5	Rs.5,00,000	40,000	Rs.125
Rs.4 (reduce by 1)	Rs.4,00,000	40,000	Rs.10
Rs.6 (reduce by 1)	Rs.6,00,000	40,000	Rs.15

For every Rs.1 RM change, FG cost changes by Rs.2.5

Alternatively, variability = $\frac{\text{Input}}{\text{Output}} = \frac{100}{40} = 2.5$

Step 1: Statement of equivalent units (FIFO)

Input		Output		Equivalent units					
				Materials		Labour		Overheads	
				%	Units	%	Units	%	Units
Op WIP	900	OP WIP completed	900	8%	0	40%	360	40%	360
Introduced	9100	Intros completed	6900	100%	6900	100%	6900	100%	6900
		Cl. WIP	1000	100%	1000	80%	800	80%	800
		N. Loss	1000	-	-	-	-	-	-
		Ab. Loss	200	100%	200	70%	140	70%	140
	10000		10000		8100		8200		8200

Step 2: Statement of cost per equivalent unit

Items	Cost	Eq. units	Cost per Eq. unit
Materials	24300	8100	3
Labour	8200	8200	1
OH	16400	8200	2
			6

W.N:

Materials = 27300

NL Scrap = (3000) [1000 x 3]

Matt cost net of scrap income 24300

Step 3: Statement of Apportionment

A. Closing WIP

- Materials (1000 x 3) = 3000
- Labour (800 x 1) = 800
- OHs (800 x 2) = 1600

5400

B. Abnormal Loss

- Materials (200 x 3) = 600
- Labour (140 x 1) = 140
- OHs (140 x 2) = 280

1020

C. Completed

i) Intro & completed (6900 x 6) = 41400

ii) OP WIP

A. Current period cost

- Materials = 0
- Labour (360 x 1) = 360
- OHs (360 x 2) = 720

1080

B. Blr. Period cost b/f 45000

46980

Step 4:

Dr. **Process I** **Cr.**

	Unit	Amount		Unit	Amount
To OP WIP	900	4500	By NL Scrap Inc	1000	3000
To Materials	9100	27300	By Process II	7800	46980
To Labour	-	8200	By Cl. WIP	1000	5400
To POH	-	16400	By Abnormal Loss	200	1000
	10000	56400		10000	56400

Answer for Q.NO.7.

Step 1: Statement of equivalent units (FIFO)

Input		Output		Equivalent Units					
				TIM		Matts		Lab / OH	
Items	Units	Items	Units	%	Units	%	Units	%	Units
OP WIP	500	OP WIP completed	500	0%	0	30%	150	50%	250
Introduced	21300	Intros completed	18400	100%	18400	100%	18400	100%	18400
		Cl. WIP	1800	100%	1800	80%	1440	60%	1080
		N Loss	1000	-	-	-	-	-	-
		Ab Loss	100	100%	100	100%	100	80%	80
	21800		21800		20300		20090		19810

Step 2: Statement of cost per Eq. unit

Items	Cost	Eq. units	Cost per Eq. units
TIM	1,62,400	20,300	8
Materials	80,360	20090	4
Labour	39,620	19810	2
OHs	19,810	19810	1
			15

Step 3: Statement of Apportionment

A. Closing WIP

- TIM (1800 x 7) = 14400
- Materials (1440 x 4) = 5760
- Labour (1080 x 2) = 2160
- OHs (1080 x 1) = 1080

23400

B. Abnormal Loss

- TIM (100 x 8) = 800
- Materials (100 x 4) = 400
- Labour (80 x 2) = 160
- OHs (80 x 2) = 80

1440

C. Completed

i) Intro & completed (18,400 x 15) = 2,76,000

ii) OP WIP

A. Current period cost

- TIM = 800
- Materials (150 x 4) = 600
- Labour (250 x 2) = 500
- OHs (250 x 1) = 250
- Previous month b/f 7200

B. Blr. Period cost b/f 45000

284550

Step 4:

Dr. **Process I** **Cr.**

	Unit	Amount		Unit	Amount
To OP WIP	500	7200	By NL Scrap Inc	1000	3000
To Trans from P-II	21300	165400	By Process II	18900	284550

To Materials	-	80360	By Cl. WIP	1800	23400
To Labour		39620	By Abnormal Loss	100	1440
To POH		19810			
	21800	312390		21800	312390

Answer for Q.NO.8. .

Dr. Ab. Loss A/c Cr.

To Process III	1440	By Bank (100 x 3)	300
		By costing P/L	1140
	1440		**1440**

Step 1: Statement of Equivalent units

Input		**Output**		**Equivalent Units**					
				TIM		**Matts**		**Lab / OH**	
Items	**Units**	**Items**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**
OP WIP	800	OP WIP completed	300	0%	0	30%	160	40%	320
Introduced	21200	Intros completed	18400	100%	12400	100%	18400	100%	18400
		Cl. WIP	2000	100%	2000	100%	1400	100%	1000
		N Loss	1000	-	-	-	-	-	-
		Ab Gain	(200)	100%	(200)	100%	(200)	100%	(200)
	22000		22000		20200		19750		19520

Ab. Gain – units unexpectedly completed – Hence mat., labours = 100% completed

The 200 units of the gain is included in the process –III units of 19200 units.

i.e. they expected to Only 19000 u to P – III but ended up transferring 19200 u.

Note: Abnormal Gain = Completed units

It is nothing but units produced in excess of what is expected. For it, the % completion is 100% for all the cost.

Do not mistake abnormal loss % completion with Abnormal gain. They are entirely different.

Step 2: Statement of cost per eq. unit

Items	**Cost**	**Eq. units**	**Cost per Eq. unit**
TIM	16,1600	20200	8
Materials	79040	17960	4
Labour	39040	19520	2
OH	19520	19520	1

WN:

TIM cost = 164600

NL Scrap Income = (3000)

Net cost = 161600

Step 3: Statement of Apportionment

A. Closing WIP

- TIM (2000 x 8) = 16000
- Materials (1400 x 4) = 5600
- Labour OHs (1000 x (2+1)) = 3000

24600

B. Abnormal Gain (200 x 15) 3000

C. Completed Units

i) Intro & completed (18,400 x 15) = 2,76,000

ii) OP WIP completed

A. Current period cost

- Materials (160 x 4) = 640
- Labour OHs (250 x 2) = 960
- Previous month b/f = 10300

2,87,900

Step 4:

Dr. Process III A/c Cr.

	Unit	Amount		Unit	Amount
To OP WIP	800	10300	By NL Scrap Income	1000	3000
To Trans from P-II	21200	164600	By Process 4	19200	287900
To Materials	-	79040	By Cl. WIP	2000	24600
To wages	-	39040			
To POH		19520			
To Ab gain	200	3000			
	22200	315500		22200	315500

Dr. NL Scrap Inc. A/c Cr.

	Amount		Amount
To Process III	3000	By Bank (800 x 3)	2400
		By Ab. Gain	600
	3000		3000

Dr. Ab. Gain A/c Cr.

	Amount		Amount
To NL Scrap Inc (200 x3)	600	By Process III	3000
To Costing P/L	2400		
	3000		3000

Answer for Q.NO.9.

Step 1: Statement of Equivalent units

Input		Output		Equivalent units			
Items	**Units**	**Items**	**Units**	**Materials**		**Lab O/H**	
				%	**Units**	**%**	**Units**
Op WIP	20000	Completed	160000	100%	60000	100%	60000
Intro	80000	Cl. WIP	40000	100%	40000	25%	10000
	100000		**100000**		**100000**		**70000**

Step 2: Statement of cost per Equivalent unit

Items	Prev. period (OP WIP)	Current period	Total	Equivalent units	Cost per Eq. units
Materials	4500	18500	23000	100000	0.23
Labour	1300	9200	10500	70000	0.15
OHs	800	6200	7000	70000	0.10
					0.48

Step 3: Statement of Apportionment

A. Cl. WIP

Materials (40000 x 0.23)

Lab / OHs (10000 x 0.25) } 11700

B. Completed (60000 x 0.48) 28800

Step 4:

Dr. **Process I A/c** **Cr.**

	Unit	**Amount**		**Unit**	**Amount**
To OP WIP	20000	6600	By Process II	60000	28800
To Materials	80000	18500	By Cl. WIP	40000	11700
To Labour	-	9200			
To OHs	-	6200			
	100000	40500		100000	40500

Answer for Q.NO.10. .

Part A: Calculation of process I input if process IV output is 40000 kg

Particulars	**P1**	**P2**	**P3**	**P4**
Input	100	75	60	48
Output	75	60	48	40

Input	Output
100	40
1,00,000 kg	40000 kg

The Co should input 1,00,000 kg of raw materials to get 40000 kg as output

Cost of RM = 1,00,000 x 5 = Rs.5,00,000

Part B: Variability of end product due to raw materials cost variability:

RM cost per kg of output = $\frac{\text{raw material cost per kg}}{40000\text{ kg}} x100$

$= \frac{\text{raw material cost per kg}}{\text{kg of input}} x12.5$

$\therefore$ for every one rupee increase or decrease in raw mat price the output cost increase / decrease by Rs.2.5

Answer for Q.NO.11.

Process- I Account

Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)	Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)
Openingstock	7,500	7,500	--	Process- II A/c*	54,000	40,500	13,500
Direct materials	15,000	15,000	--	Closing Stock	3,700	3,700	--
Direct wages	11,200	11,200	--				
Prime Cost	33,700	33,700					
Overheads	10,500	10,500	--				
Total Cost	44,200	44,200					
Profit**	13,500	--	13,500				
	57,700	44,200	13,500		57,700	44,200	13,500

*Transfer price = $\frac{\text{Total cost} - \text{Closing Stock}}{75\%} = \frac{44,200 - 3,700}{75\%} = \text{Rs.}54,000$

**Profit on transfer = 54,000 × 25% = Rs.13,500

Process- II Account

Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)	Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)
Openingstock	9,000	7,500	1,500	Finished Stock A/c**	1,12,500	75,750	36,750

Transferred from Process- I	54,000	40,500	13,500	Closingstock*	4,500	3,750	750
Direct materials	15,750	15,750	--				
Direct wages	11,250	11,250	--				
Prime cost	90,000	75,000	15,000				
Overheads	4,500	4,500	--				
Total cost	94,500	79,500	15,000				
Profit***	22,500	--	22,500				
	1,17,000	79,500	37,500		1,17,000	79,500	37,500

* Cost of Closing Stock = $\frac{Rs.75,000}{Rs.90,000} \times Rs.4,500 = Rs.3,750$

**Transfer price = $\frac{Total\ cost - Closing\ Stock}{80\%} = \frac{94,500 - 4,500}{80\%} = Rs.1,12,500$

***Profit on transfer = 1,12,500 × 20% = Rs.22,500

Finished Stock Account

Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)	Particulars	Total (Rs.)	Cost (Rs.)	Profit (Rs.)
Opening stock	22,500	14,250	8,250	Costing P&L A/c	1,40,000	82,425	57,575
Process- II	1,12,500	75,750	36,750	Closing stock*	11,250	7,575	3,675
Profit	16,250	--	16,250				
	1,51,250	90,000	61,250		1,51,250	90,000	61,250

* Cost of Closing Stock =

$$\frac{Cost\ of\ transfer\ from\ Process\text{-}II}{Transfer\ price\ from\ Process\text{-}II} \times Value\ of\ closing\ stock$$

(As per instruction given in the question)

$$= \frac{Rs.75,750}{Rs.1,12,500} \times Rs.11,250 = Rs.7,575$$

CHAPTER 11: JOINT PRODUCTS AND BY PRODUCTS

Answer for Q.NO.1.

Step 1: Apportionment of Joint cost using physical units method:

Products	Units	Proportion	Share of Joint cost
A	30000	0.3	1,50,000
B	20000	0.2	1,00,000
C	50000	0.5	2,50,000
	1,00,000	1	5,00,000

Step 2: Profitability of the products:

Products	**Sales**	**Share of joint cost**	**Profit**
A	225000	150000	75000
B	500000	100000	4,00,000
C	150000	250000	(1,00,000)
Total sales	875000	5L	375000

Answer for Q.NO.2.

Average cost per unit = $\frac{\text{Total joint costs}}{\text{Units produced}} = \frac{\text{Rs.60,0}}{\text{1,000 units}} = \text{Rs.60}$

The joint costs apportioned @ Rs. 60 are as follows:

Products	**Units**	**Cost per unit (Rs.)**	**Value (Rs.)**
A	500	60	30,000
B	200	60	12,000
C	300	60	18,000
			60,000

Answer for Q.NO.3.

Part I: Sales value @ split off point method:

Step 1: Apportionment of joint cost:

Product	**Sales value @ Split off point**	**Proportion**	**Share of Joint cost**
A	2,25,000	0.2571	128571
B	5,00,000	0.5714	285714
C	1,50,000	0.1715	85719
			500000

Step 2: Gross Margin:

Product 1	Sales 2	Share of JC 3	Further processing cost 4	Profit 2 – 3 – 4	Gross Margin %
A	300000	128571	30000	141429	47.143%
B	600000	285714	80000	234286	39.047%
C	250000	85715	50000	114285	42.714%
	1150000	500000	160000	490000	42.608%

Part II: Sales value after further processing method:

Step 1: Apportionment of joint cost

Product 1	Sales value after further processing 2	Proportion 3	Shares of JC 4
A	3,00,000	0.2608	130435
B	6,00,000	0.5217	260870
C	2,50,000	0.21739	108695
	11,50,000	1	5,00,000

Step 2: Gross Margin %

Product 1	Sales value 2	Share of JC 3	Further processing cost 4	Profit 5	Gross Margin 6
A	3,00,000	(1,30,435)	(30000)	139565	46.52%
B	6,00,000	(2,60,870)	(80000)	259130	43.19%
C	2,50,000	(1,08,695)	(50000)	91305	36.52%
	1150000	5,00,000	160000	490000	42.608%

Answer for Q.NO.4.

The above apportionment is wrong. SV for JC apart is the sales value of units produced and not the sales value of unit sold

Production	Production value	Proportion	Share of JC
A	300000	0.75	375000
B	100000	0.25	125000
	4,00,000		5,00,000

Answer for Q.NO.5.

The marginal cost (variable cost) of Rs. 4,400 is apportioned over the jointproducts A and B in the ratio of their physical quantity i.e 100 : 120

Marginal cost for Product A : Rs. 4,400 × $\frac{100}{220}$ = Rs. 2,000

Marginal cost for Product B : Rs. 4,400 × $\frac{120}{220}$ = Rs. 2,400

The fixed cost of Rs. 3,900 is apportioned over the joint products A and B in theratio of their contribution margin i.e. 40 : 12

(Refer to working note)

Product A : Rs. 3,900 × 40/52 = Rs. 3,000Product B : Rs. 3,900 × 12/52 = Rs. 900

Working Note:

Computation of contribution margin ratio

Products	Sales revenue	Marginal cost	Contribution
	(Rs.)	(Rs.)	(Rs.)
A	6,000	2,000	4,000
B	3,600	2,400 (Refer to above)	1,200

Contribution ratio is 40 : 12

Answer for Q.NO.6.

Step 1: Calculation by product income:

Sales value = (5000 kg x Rs.6) = Rs.30,000

(-) Future = (5000)

Processing cost

NRV of by product = Rs.25000

Step 2: Apportionable joint cost

Joint cost = 5,25,000

(-) NRV of

By product = (25000)

Apportionable JC = 5,00,000

Step 3: Apportionment of JC

Product	Units	Proportion	Share of JC
A	30000	0.6	3,00,000
B	20000	0.4	2,00,000
	50000	1	5,00,000

Dr. **Joint Process A/c** **Cr.**

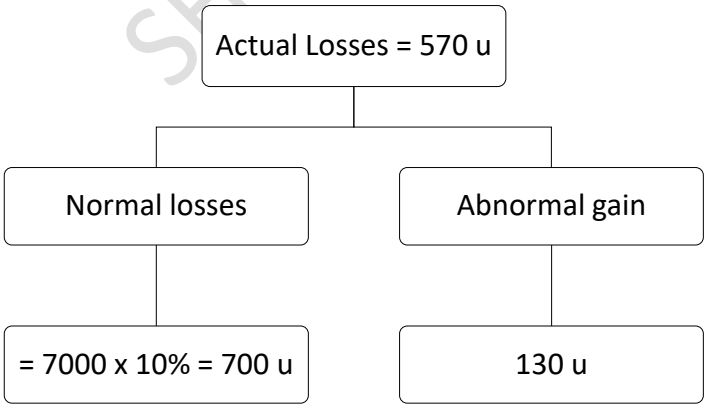
Particulars	Units	Rs.	Particulars	Units	Rs.
Total cost	55000	525000	By By-product	5000	25000
			By Product A	50000	3L
			By Product B	20000	2L
	55000	525000		55000	525000

Dr. **By Product income A/c** **Cr.**

Particulars	Rs.	Particulars	Rs.
To FPC	5000	By Bank	30000
To Joint Process	25000		
	30000		30000

Dr. **Process I A/c** **Cr.**

Particulars	Units	Rs.	Particulars	Units	Rs.
To Material	7000	8500	By NL Scrap	700	280
To Lab SOH		4340	By Process II	6430	7716
To Abnormal Gain	130	156			
	7130	**7996**		**7130**	**7996**



$$\text{Cost per kg} = \frac{\text{Total cost} - \text{NL Scrap Income}}{\text{Input} - \text{NL}}$$

$$= \frac{7840 - 280}{7000 - 700} = \frac{7560}{6300} = \text{Rs.}1.2/\text{p.u}$$

Abnormal Gain A/c

To NL Scrap income (130 x 0.4)	52	By Process I	156
To Costing P & L	104		
	156		156

The cost of output transferrd to process Ii Rs.7716 and the net savings due to Abnormal gain is Rs.104

Process II A/c (Physical units method)

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I	6430	7716	By Byproduct	430	645
To Lab SOH		4340	By Prod E	2000	6400
			By Prod F	4000	12300
	6430	19845		6430	19845

By Product income A/c

To Further processing cost (0.3 x 430)	129	By Bank A/c	774
To Process II	645		
	774		774

W.N. Apportionment of joint cost

Production	Units	Proportion	Share of JC
E	2000	0.33	6400
F	4000	0.67	12800
	6000	1	19200

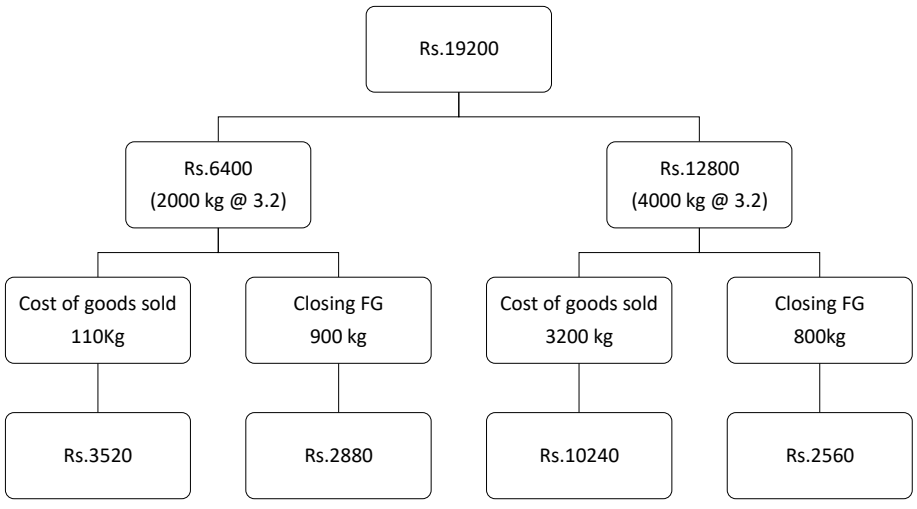
Process II A/c (Sale value)

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I	6430	7716	By Byproduct	430	645
To Lab SOH	-	12129	By Prod E	2000	6200
			By Prod F	4000	8000
	6430	19845		6430	19845

W.N. Apportionment of Joint cost using market value's

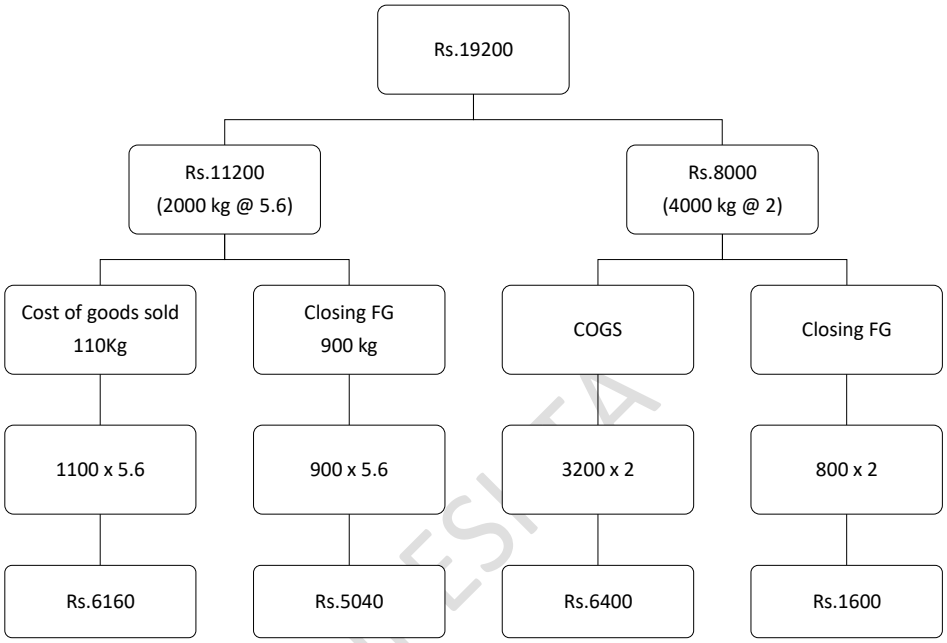
Product	Units	SP	Sales value	Proportion	Share of JC
E	2000	7	14000	0.583	11200
F	4000	2.5	10000	0.417	8000
			24000	1	19200

Valuation of closing stock and calculation of profit (physical units method)



Particulars	E	F	Total
Sales	7700 (1100 x 7)	8000 (3200 x 2.5)	15700
(-) COGS	3520	10240	13760
Profit	4180	(2240)	1940

Calculation of closing stock and calculation of profit market value methods



Particulars	E	F	Total
Sales	7700	8000	15700
(-) COGS	(6160)	(6400)	(12560)
Profit	1540	1600	3140

Answer for Q.NO.7.

Product A

As the question says that "Products B and C must be processed further before they can be sold", it means Product A can be sold at the split-off point.

Cost to process Product A after the split-off point = Rs.3 6,00,000

Additional revenue to be eamned by processing further = Rs.3,00,000
(% 100 increase in selling price per unit x 3,000 units)

Therefore, Product A will not be processed further, and the sales value at split-off for A will be used for allocating the joint costs.

Sales value at the split-off for A = Rs.6,00,000
(% 200 x 3,000 units)

Product B

Since Product B must be processed further, we use its net realizable value for the joint cost allocation.

Net realizable value of Product B = Rs.15,00,000
[(% 350 x 6,000 units) — Rs.6,00,000] further processing costs]

Product C

Product C, the by-product, must also be processed further to be sold.

Net realizable value of Product C = Rs.3,00,000
[(Rs.100 x 9,000 units) – Rs.6,00,000 in further processing costs]

Joint Cost Allocation

Joint production cost = Rs.33,60,000

Since, by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated = Rs.30,60,000
(Rs.33,60.000 – Rs.3,00,000 NRV of Product C)

Allocation of joint costs between Product A and B will be on the basis of Rs.6.00,000: Rs.15,00,000

Joint Cost allocated to Product A =% 30,60,000 x $\frac{Rs.6,00,000}{Rs.21,00,000} = Rs.8,74,286$

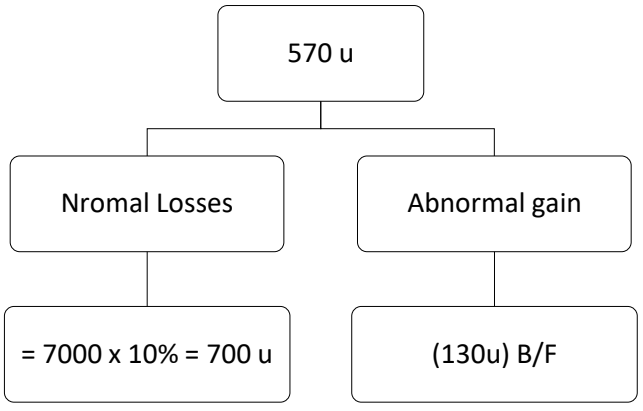
Answer for Q.NO.8. .

Process I A/c

Dr. Cr.

Particulars	Units	Rs.	Particulars	Units	Rs.
To Material	7000	8500	By NL scrap	700	280
To Lab SOH		4340	By Process II	6430	7716
To Abnormal Gain	130	156			
	7130	7996		7130	7996

Actual Losses = 570 u



Cost per kg = $\frac{\text{Total cost} - \text{NL Scrap Income}}{\text{Input} - \text{NL}}$

= $\frac{7480 - 280}{7000 - 700} = \frac{7560}{6300} = \text{Rs.}1.2/\text{pu}$

Abnormal gain A/c

To NL Scrap income (130 x 0.4)	52	By Process II	156
To Costing P & L	104		
	156		156

The cost of output transferred to Process II 7716 and the net earnings due to abnormal gain is Rs.104

Answer for Q.NO.9. .

Further process or not decision:

Product	Sales value after FP	Sales value at split off profit	sales
A	600000	5,00,000	1,00,000
B	750000	5,00,000	2,50,000

	Further processing cost (B)	Net Benefit (A –B)
A	(1,50,000)	(50,000)
B	(1,50,000)	1,00,000

Since product A has a negative net benefit it should be sold @ split off point.

Product B has a positive Net benefit and hence should be sold after further processing.

Note: For furnter process or not decision the joint cost is irrelevant.

Process II A/c (Physical units method)

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I	6430	7716	By byproduct	430	645
To Lab SOH		12129	By Prod E	2000	6400
			By Prod F	4000	12800
	6430	19845		6430	19845

By Product Income A/c

To further processing cost (0.3 x 430)	129	By Bank A/c	774
To Process II	645		
	774		774

W.n.: Apportionment of joint cost

Prod	Units	Proportion	Share of x
E	2000	0.33	6400
F	4000	0.67	12800
	6000	1	19200

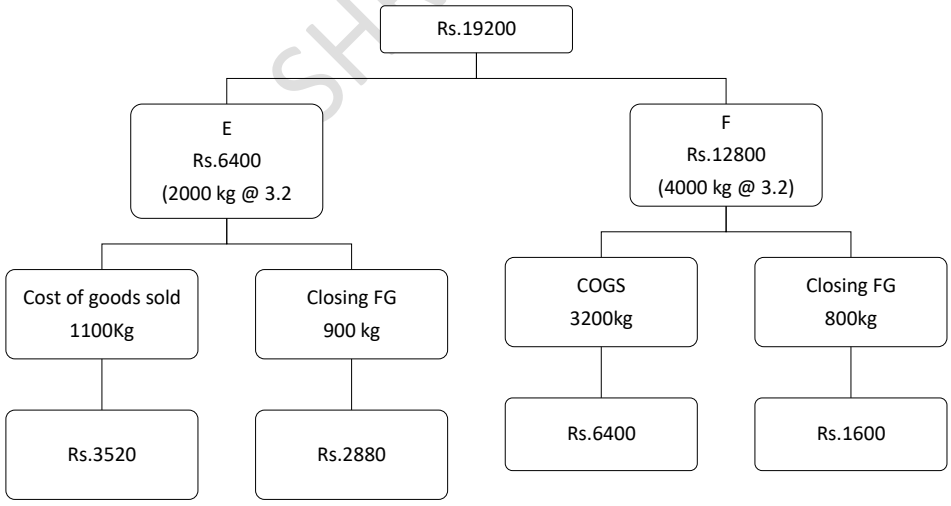
Process II A/c (Sale value)

Particulars	Units	Rs.	Particulars	Units	Rs.
To Process I	6430	7716	By byproduct	430	645
To Lab SOH	-	12129	By Prod E	2000	11200
			By Prod F	4000	8000
	6430	19845		6430	19845

W.N.: Apportionment of joint cost using market value:

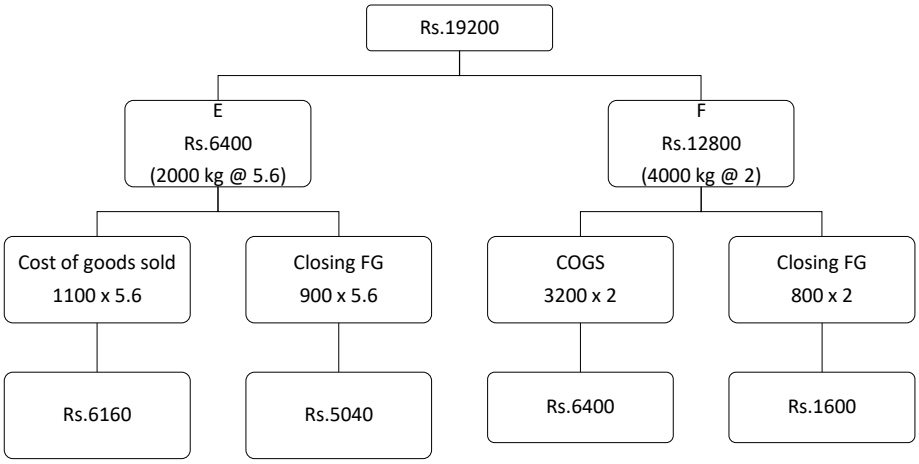
Prod	Units	SP	Sales value	Proportion	Share of x
E	2000	7	14000	0.583	11200
F	4000	2.5	10000	0.417	8000
			24000	1	19200

Valuation of closing stock and calculation of profit (Physical units method)



Particulars	E	F	Total (Rs.)
Sales	7700 (1000 x 7)	8000 (3200 x 2.5)	15700
(-) COGS	3520	10240	13760
Profit	4180	(2240)	1940

Valuation of closing stock and calculation of profit market value methods



Particulars	E	F	Total
Sales	7700	8000	15700
(-) COGS	(6160)	(6400)	(12560)
Profit	1540	1600	3140

Answer for Q.NO.10. .

1.

a. Sales value at split- off point method

Products	Sales (inTonne)	SellingPrice per Tonne (Rs.)	SalesRevenue (Rs.)	Joint Cost Apportioned (Rs.)
Caustic Soda	1,200	50	60,000	50,000
Chlorine	800	75	60,000	50,000
			1,20,000	1,00,000

Apportionment of joint cost

$$\frac{\text{Total joint cost}}{\text{Total sale value}} \times \text{Sale revenue of each product}$$

$$\text{Joint cost apportioned to Caustic Soda} = \frac{\text{Rs.1,00,000}}{\text{Rs.1,20,000}} \times \text{Rs. 60,000} = \text{Rs.50,000}$$

$$\text{Joint cost apportioned to Chlorine} = \frac{\text{Rs.1,00,000}}{\text{Rs.1,20,000}} \times \text{Rs. 60,000} = \text{Rs.50,000}$$

b. Physical measure method

Products	Sales (in Tonne)	Joint Cost Apportioned (Rs.)
Caustic Soda	1,200	60,000
Chlorine	800	40,000
		1,00,000

Apportioned joint cost

$$= \frac{\text{Total joint cost}}{\text{Total physical value}} \times \text{Physical units of each product}$$

$$\text{Joint cost apportioned to Caustic Soda} = \frac{\text{Rs.1,00,000}}{\text{2,000 tonnes}} \times \text{1,200 tonnes} = \text{Rs.60,000}$$

$$\text{Joint cost apportioned to chlorine} = \frac{\text{Rs.1,00,000}}{\text{2,000 tonnes}} \times \text{800 tonnes} = \text{Rs.40,000}$$

c. Estimated net realisable value method:

	Caustic SodaAmount (Rs.)	**Chlorine Amount (Rs.)**
Sales Value	60,000 (Rs.50 × 1,200 tonnes)	1,00,000 (Rs.200 × 500 tonnes)
Less: Post split-off cost (Further processing cost)	-	(20,000)
Net Realisable Value	60,000	80,000
Apportionment of Joint Costof Rs.1,00,000 in ratio of 3:4	42,857	57,143

2. Incremental revenue from further processing of Chlorine into PVC (500 tonnes × Rs.200 – 800 tonnes × Rs.75) Rs.40,000

Less : Incremental cost of further processing of Chlorine into PVC Rs.20,000

Incremental operating income from further processing Rs.20,000

The operating income of Inorganic Chemicals will be reduced by Rs.20,000 in August if it sells 800 tonnes of Chlorine to Lifetime Swimming Pool Products, instead of further processing of Chlorine into PVC for sale.

Answer for Q.NO.11.

Working Note:

Apportionment of joint costs on the basis of Net Realisable Value method

Products	**Sales Value (Rs.)**	**Post separation Cost (Rs.)**	**Net Realisable Value (Rs.)**	**Apportioned Cost (Rs.)**
A	50,00,000 (2,00,000 units × Rs. 25)	12,50,000	37,50,000	26,25,000
B	5,10,000 (30,000 units × Rs. 17)	1,50,000	3,60,000	2,52,000

C	3,00,000 (25,000 units × Rs. 12)	50,000	2,50,000	1,75,000
D	2,00,000 (20,000 units × Rs. 10)	—	2,00,000	1,40,000
E	15,00,000 (75,000 units × Rs. 20)	1,50,000	13,50,000	9,45,000
			59,10,000	41,37,000

Total joint cost = Raw material costs + Manufacturing expenses

= Rs. 35,90,000 + Rs. 5,47,000 = Rs. 41,37,000

Apportioned joint cost

$$= \frac{\text{Total joint cost}}{\text{Total net realisable value}} \times \text{Net realisable value of each product}$$

Apportioned joint cost for Product A

$$= = \frac{\text{Rs.41,37,0 00}}{\text{Rs.59,10,0 00}} \times \text{ Rs. 37,50,000 = Rs. 26,25,000}$$

Similarly, the apportioned joint cost for products B, C, D and E are Rs. 2,52,000, Rs. 1,75,000, Rs. 1,40,000 and Rs. 9,45,000 respectively.

a) Statement showing income forecast of the company assuming that none of its products are further processed

	Products					**Total (Rs.)**
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**	
Sales revenue	34,00,000 (Rs.17 × 2,00,000)	3,90,000 (Rs.13 × 30,000)	2,00,000 (Rs.8 × 25,000)	2,00,000 (Rs.10 × 20,000)	10,50,000 (Rs.14 × 75,000)	52,40,000
Less: Apportioned Costs (Refer Working note)	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
	7,75,000	1,38,000	25,000	60,000	1,05,000	11,03,000
Less: FixedCost						4,73,000
Profit						6,30,000

b) Statement showing income forecast of the company: assuming that products A, B, C and E are further processed (Refer to working note)

	Products					**Total (Rs.)**
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**	
A. Sales revenue	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000	75,10,000

B. Apportioned Costs	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
C. Furtherprocessing cost	12,50,000	1,50,000	50,000	-	1,50,000	16,00,000
D. Totalprocessing cost (B + C)	38,75,000	4,02,000	2,25,000	1,40,000	10,95,000	57,37,000
E. Excess of sales revenue (A - D)	11,25,000	1,08,000	75,000	60,000	4,05,000	17,73,000
F. Fixed Cost						4,73,000
G. Profit (E -F)						13,00,000

Suggested production plan for maximising profits:

On comparing the figures of excess of revenue over cost of manufacturingin the above statements one observes that the concern is earning more after further processing of A, C and E products but is loosing a sum of Rs. 30,000 in the case of product B (if it is processed further). Hence the best production plan will be to sell A, C and E after further processing andB and D at the point of split off. The profit statement based on this suggested production plan is as below:

Profit statement based on suggested production plan

	Products					
	A (Rs.)	**B (Rs.)**	**C (Rs.)**	**D (Rs.)**	**E (Rs.)**	**Total (Rs.)**
A. Sales revenue	50,00,000	3,90,000	3,00,000	2,00,000	15,00,000	73,90,000
B. Apportioned Costs	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
C. Further processing cost	12,50,000	-	50,000	-	1,50,000	14,50,000
D. Total processing cost(B+ C)	38,75,000	2,52,000	2,25,000	1,40,000	10,95,000	55,87,000
E. Excess of sales revenue (A-D)	11,25,000	1,38,000	75,000	60,000	4,05,000	18,03,000
F. Fixed Cost						4,73,000
G. Profit (E - F)						13,30,000

Hence the profit of the company has increased by Rs. 30,000.

CHAPTER 12: MARGINAL COSTING

Answer for Q.NO.1.

Part A

a) PVR = $\frac{Cn/p.u}{Salesprice} = \frac{4}{10} \times 100 = 40\%$

b) BES = $\frac{FC}{PVR} = \frac{400}{40\%} = 100 = 40\%$

c) Sales 13500

(-) VC (8100)

CN 5400

(-) FC 400

Profit 5000

Sales = 13500 in units = 13500 / 10 = 1350u.

PVR = $\frac{Cn}{Sales} \times 100 = 40\% = \frac{5400}{Sales}$

d) Sales 3000

(-) VC (1800)

Cn 1200

(-) FC (400)

Profit 800

e) SP = 10

(-) 10% (1)

9

Sales 9

(-) VC 16

On 3

$\frac{Cn}{Sales} \times 100 = \frac{3}{9}$

PVR = 33.33%

Break even point = $\frac{FC}{PVR}$

BEP = $\frac{400}{33.33\%}$

BEP = 1200

BEP in units = $\frac{400}{34} = 133\,u$

f) MOS = $\frac{Profit}{PVR} = \frac{200}{40\%} = 500$ invalue

Answer for Q.NO.2.

Aye = sales 50000

(-) VC (30000)

PVR = 100% - VC ratio

= 100% - 60% = 40%

Cn 20000

(-) FC 12000

Profit 8000

Selling price P.u = 50000 / 10000

Contribution (-) FC) – a) S.P. / P.u = 5/u

b) Profit = 8000

Calculation of using figures of Bye = Sales (4000 x 50) = 2,00,000

(-) VC = (1260000)

Cn = 80000

(-) FC (60000)

Profit 20000

d) Fixed cost = Cn (+) Profit

= 80000 (+) 20000

= 60000

c) Variable cost p.u = PVR = $\frac{Cn}{Sales} \times 100$

= $\frac{8,00,000}{2,00,000} \times 100 = 40\%$

PVR = 100% - VCF

40% = 100% - VCB

VCR = 60%

Cee :	Sales	20	6,00,000	1,50,000
	(-) VC	(15)	(450000)	
	Cn	5	150000	
	(-) FC		120000	
	Profit		30000	

d) Sales = 6,00,000 ÷ 20 = 30000 u

f) Contribution = 150000

Answer for Q.NO.3.

Sales	993000
(-) VC	(693000)
Contribution	3,00,000
(-) FC	2,50,000
Profit	50000

(i) Contribution

= 50000 + 2,50,000

= 3,00,000

$$PVR = \frac{Cn}{Sales} \times 100 = \frac{3,00,000}{9,93,000} \times 100 = 30.21\%$$

$$BEP = \frac{Fixed cost}{PVR} = \frac{250000}{3.2115\%} = Rs.827500$$

Answer for Q.NO.4.

Selling price = 100

VC = 75

Contribution = 25

$$BEP = \frac{FC}{Cn} = \frac{270000}{25}$$

= 10800

(-) (1800)

BEP = 9000

$$BEP = \frac{FC}{Cn}$$

$$9000 = \frac{270000}{Cn}$$

Cn = 30

Cn + VC = SP

(30 (+) 75 = SP

SP = 105

Answer for Q.NO.5.

Part A:

Margin of safety = 240000 (40% of sales)

Sales = 240000 / 40% = 6,00,000

Sales = MOS + BEP

6,00,000 = 240000 + BEP

a) BEP = 360000

Part B: Profit when sales is Rs.9,00,000

MOS = Sales = BES

MOS = 9,00,000 – 360000

MOS = 540000

$$MOS = \frac{Profit}{PVR}$$

= 5,40,000 x 30%

= 162000

2) PVR = $\frac{On}{Sales} \times 100$

PVR = $\frac{2,00,000}{8,00,000} \times 100$ = 25%

MOS = $\frac{Profit}{PVR}$ = $\frac{150000}{25\%} = 6,00,000$

BES = $\frac{FC}{PVR}$

= $\frac{90000}{30\%}$

BES = 3,000,00

Sales x 60% = 3,00,000

Sales = $\frac{3,00000}{60\%}$

Sales = 5,00,000

At 75% capacity = sales = 3,75,000

(-) VC = (262500)

(-) FC (90000)

Profit = 225000

(or)

Sales = 375000

BES = 3,00,000

Margin of safety = 75000

MOS = $\frac{Profit}{PVR}$

75000 = $\frac{Profit}{30\%}$ = 22500

4) PVR = 50%

MOS = 40% MOS = 40000

When sales = 1,00,000 BEP = 60000

PVR = $\frac{Cn}{Sales} \times 100$ BEP = $\frac{FC}{PVR}$ = 60000 = $\frac{FC}{60\%}$

50% = $\frac{Cn}{1,00,000}$ Cn = 50000

5) BEP = $\frac{FC}{PVR}$ FC = 30000

PVR = 25% Cn = 30000 Profit = 20000

Cn = 50000 PVR = 50% BEP = 40%

Profit = 10000 Sales = 60000 NP = 12%

4) MOS = 40% x sales

40% x 1,00,000 = 40,000

Profit = MOS x PVR

= 40000 x 50%

= Rs.20000

5) BEP = FC / PVR

1,60,000 = 40000 / PVR

PVR = 25%

Cn = Sales x 25%

= 2,00,000 x 25%

Cn = 50,000

Profit = Cn – FC

= 50000 – 40000 = 10000

6) PVR = FC / BES x 100

= 20000 / 40000 x 100

PVR = 50%

Contribution = 30000 = (20000 + 10000)

$$\left[\frac{\text{Contribution}}{\text{PVR}}\right]\text{sales} = 60000$$

7) Net profit = MOS x PVR

12% = 60% x Cn / sales

Cn = 20%

$$\frac{\text{BES}}{\text{Sales}} = 40\%$$

$$\therefore \frac{\text{MOS}}{\text{Sales}} = 60\%$$

Net profit ratio = Profit / Sales = 12%

$$\text{PVR} = \frac{\text{P}}{\text{S}} \times \frac{\text{S}}{\text{MOS}}$$

$$\text{PVR} = \frac{12\%}{60\%} = \text{PVR} = 20\%$$

Answer for Q.NO.6.

(i) In the First half year:

Contribution = Fixed cost + Profit

= 4,50,000 + 3,00,000 = Rs. 7,50,000

P/V ratio $= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{7,50,000}{15,00,000} \times 100 = 50\%$

Break-even point $= \frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{4,50,000}{50\%} \times 100 = \text{Rs.}9,00,000$

Margin of safety = Actual sales – Break-even point

= 15,00,000 – 9,00,000 = Rs. 6,00,000

(ii) In the second half year:

Contribution = Fixed cost – Loss

= 4,50,000 – 1,50,000 = Rs. 3,00,000

Expected sales volume $= \frac{\text{Fixed cost - Loss}}{\text{P/V ratio}} = \frac{3,00,000}{50\%} = \text{Rs.}6,00,000$

(iii) For the whole year:

B.E. point $= \frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{4,50,000 \times 2}{50\%} = \text{Rs.}18,00,000$

Margin of safety $= \frac{\text{Profit}}{\text{P/V ratio}} = \frac{3,00,000 - 1,50,000}{50\%} = \text{Rs.}3,00,000$

Answer for Q.NO.7.

I. Break even sales volume

Variable cost = 79%

SP = 100%

PVR = 21%

BES = PC / PVR

FC = 315000

BES = 315000 / 21% = 15,00,000

II. Profit at budgeted sales volume

FC = 315000

Sales = 1850000

VC = 1850000 x 79%

= 1461500

Cn = Sales – VC

= 1850000 – 1461500

= 388500

Profit = Cn – FC

= 388500 – 315000

= 73500

III. Profit if actual sales decreased by 10%

Sales = 1850000

(-) 10% = (185000)

Sales = 1665000

FC = 315000

Cn = 1665000 x 21%

Cn = 349650

Profit = Cn – FC

= 349650 – 315000

Profit = 34650

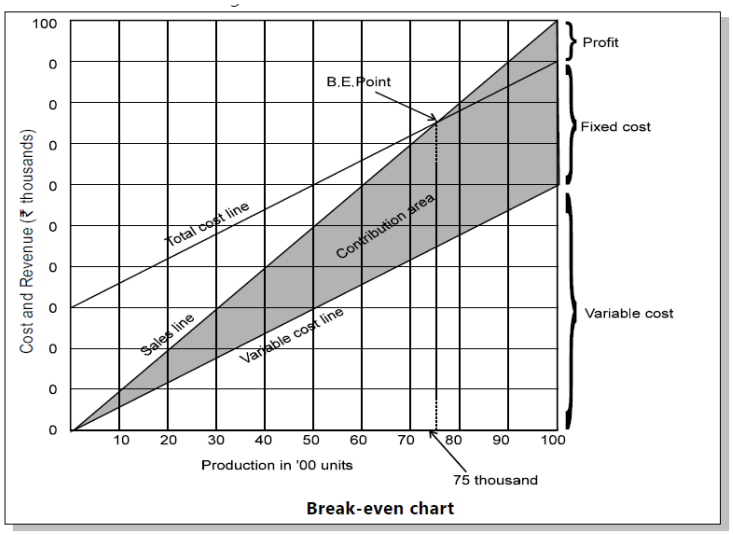
Answer for Q.NO.8. .

$$\text{P / V ratio} = \frac{\text{Sales - Variable Cost}}{\text{Sales}} = \frac{1,00,000 - 60,000}{1,00,000} = 40\%$$

$$\text{Break Even Point} = \frac{\text{Fixed Cost}}{\text{P / V ratio}} = \frac{30,000}{40\%} = \text{Rs.}75,000$$

Margin of safety = Actual Sales – BE point = 1,00,000 – 75,000 = Rs. 25,000

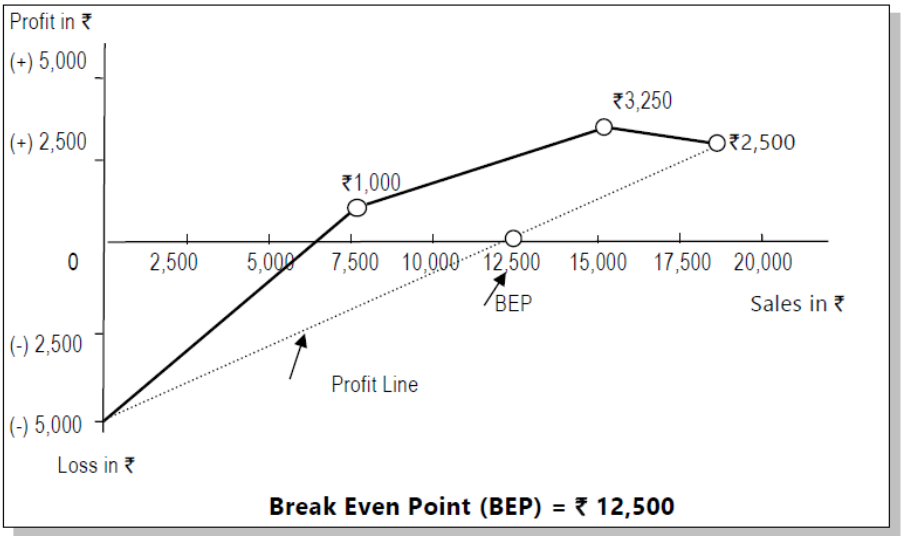
Break even chart showing contribution is shown below:



Answer for Q.NO.9.

Statement Showing Cumulative Sales & Profit

Sales	Cumulative Sales		Variable Cost	Contribution	Cumulative Contribution	Cumulative Profit
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
A	7,500	7,500	1,500	6,000	6,000	1,000
B	7,500	15,000	5,250	2,250	8,250	3,250
C	3,750	18,750	4,500	(750)	7,500	2,500



Answer for Q.NO.10.

$$\text{Break even Sales Quantity} = \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{\text{Rs.35,00,000}}{\text{Rs.20}} = \text{Rs.1,75,000 units}$$

$$\text{Cash Break-even Sales Quantity} = \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{\text{Rs.20,00,000}}{\text{Rs.20}} = 1{,}00{,}000 \text{ units}$$

Answer for Q.NO.11.

$$\text{Indifference point} = \frac{\text{Diff. in FC}}{\text{Diff. in VC}} = = \frac{90000 - 60000}{9 - 5} = 7500 \text{ u}$$

When the volume is 7500 u the total cost of with the company will be the same.

Analysis:

1. Volume / sales	2. Company	3. Reason
Less than 7500 u	P	Lower FC
= 7500 U	9 (or) Q	Indifference
> 7500 u	Q	Lower VC

Answer for Q.NO.12.

(i) Cost Indifference Point

	A and B	A and C	B and C
	(Rs.)	(Rs.)	(Rs.)
Differential Fixed Cost (I)	Rs.30,000	Rs.1,10,000	Rs.80,000
	(Rs.45,000 – Rs.15,000)	(Rs.1,25,000 – Rs.15,000)	(Rs.1,25,000 – Rs.45,000)
Differential Variable Costs (II)	Rs.100	Rs.200	Rs.100

	(Rs.240 – Rs.140)	(Rs.240 – Rs.40)	(Rs.140 – Rs.40)
Cost Indifference Point (I/II)	300	550	800
(Differential Fixed Cost / Differential Variable Costs per case)	Cases	Cases	Cases

Interpretation of Results

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

No. of Cases	**Alternative to be Chosen**
Cases ≤ 300	Alternative 'A'
300 ≥ Cases ≤ 800	Alternative 'B'
Cases ≥ 800	Alternative 'C'

(ii) Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go upto 850 cases, alternative C is most appropriate.

Answer for Q.NO.13.

Part I: Break-even point:

	AB Ltd.	CD ltd.
Fixed cost	15000	35000
PVR $\left(\frac{Cn}{Sales}\right)$	20% $\left(\frac{50000}{150000}\right)$	33.33% $\left(\frac{50000}{150000}\right)$
BEP $\left(\frac{FC}{PVR}\right)$	75000 $\left(\frac{15000}{20\%}\right)$	105000 $\left(\frac{35000}{33.33\%}\right)$

Part II: Sales volume at which profit Rs.50000

	AB Ltd.	CD ltd.
Profit	5000	5000
(+) FC	15000	35000
Contribution	20000	40000
PVR	20%	33.33%
Sales	1,00,000	1,20,000

Part III: Analysis of volume and profit

$$\text{Indifferencepoint} = \frac{\text{DiffinFC}}{\text{DiffinPVR}}$$

$$= \frac{20000}{13.33\%}$$

= Rs.1,50,000

When the sales is Rs.1,50,000 both AB Ltd. and CDF Ltd. earn the same profit

Sales	Company:	Reason:
Less than 1,50,000	AB Ltd	Low FC
= 1,50,000	AB (or) CD	Indifferention
> 150000	CD Ltd	Low VC ration on high PV ratio

Answer for Q.NO.14.

Statement Showing "Cost and Profit for the Next Year"

Particulars	**Existing Volume, etc.**	**Volume, Costs, etc. after 10% Increase**	**Estimated Sale, Cost, Profit, etc.***
	(Rs.)	**(Rs.)**	**(Rs.)**
Sales	5,00,000	5,50,000	5,72,000
Less: Direct Materials	2,50,000	2,75,000	2,69,500
Direct Labour	1,00,000	1,10,000	1,07,800
Variable Overheads	40,000	44,000	43,120
Contribution	1,10,000	1,21,000	1,51,580
Less: Fixed Cost#	60,000	60,000	58,800
Profit	50,000	61,000	92,780

(*) for the next year after increase in selling price @ 4% and overall cost reduction by 2%. (#) Fixed Cost = Existing Sales – Existing Marginal Cost – 12.5% on Rs.4,00,000

= Rs.5,00,000 – Rs.3,90,000 – Rs.50,000 = Rs.60,000

Percentage Profit on Capital Employed equals to 23.19% $\left(\frac{\text{Rs.92,780}}{\text{Rs.4,00,000}} \times 100\right)$

Since the Profit of Rs.92,780 is more than 23% of capital employed, the proposal of the Sales Manager can be adopted.

Answer for Q.NO.15.

	Sales	**Profit**
Year 2021-22	Rs. 1,20,000	8,000
Year 2022-23	Rs. 1,40,000	13,000
Difference	Rs. 20,000	5,000

i. P/V Ratio = $\frac{\text{Difference in profit}}{\text{Difference in Sales}} \times 100 = \frac{5,000}{20,000} \times 100 = 25\%$ (Rs.)

Contribution in 2021-22 (1,20,000 x 25%) 30,000

Less: Profit			8,000
Fixed Cost*			22,000
*Contribution		=	Fixed cost + Profit
∴ Fixed cost		=	Contribution - Profit

ii. Break-even point = $\frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{22,000}{25\%} = \text{Rs.}88,000$

iii.	Profit when sales are Rs.1,80,000	(Rs.)
iv.	Contribution (Rs.1,80,000 × 25%)	45,000
v.	Less: Fixed cost	22,000
	Profit	23,000

vi. Sales to earn a profit of Rs.12,000

$$\frac{\text{Fixed cost} + \text{Desired profit}}{\text{P/V ratio}} = \frac{22,000 + 12,000}{25\%} = \text{Rs.}1,36,000$$

vii. Margin of safety in 2022-23 –

Margin of safety = Actual sales – Break-even sales

= 1,40,000 – 88,000 = Rs. 52,000.

Answer for Q.NO.16. .

Calculation of P/V Ratio **(Rs.' 000)**

	Sales	Profit
North : Actual	1,100	135
Add : Under budgeted	400	180
Budgeted	1,500	315

P/V ratio = $\frac{\text{Difference in profit}}{\text{Difference in sales}} = \frac{315-135}{1,500-1,100} \times 100 = \frac{180}{400} \times 100 = 45\%$

(Rs. '000)

	Sales	Profit
East : Actual	1,450	210
Less : Over budgeted	(150)	(90)
Budgeted	1,300	120

P/V ratio = $\frac{90}{150}$ x 100 = 60%

(Rs.' 000)

	Sales	Profit
South : Actual	1,200	330
Add: Under budgeted	200	110
Budgeted	1,400	440

P/V ratio = $\frac{110}{200}$ x 100 = 55%

i. Calculation of fixed cost

Fixed Cost = (Actual sales ⍰ P/V ratio) – Profit

North	= (1,100 x 45%) – 135 =	360
East	= (1,450 x 60%) – 210 =	660
South	= (1,200 x 55%) – 330 =	330
Total Fixed	Cost	1,350

ii. Calculation of break-even sales (in Rs.' 000)

B.E. Sales = $\frac{\text{FixedCost}}{\text{P/Vratio}}$

North = $\frac{360}{45\%}$ = 800

East = $\frac{660}{60\%} = 1{,}100$

South = $\frac{330}{55\%} = 600$

Total 2,500

Answer for Q.NO.17. .

Part I: Calculation of PVR, BEP

PVR = Cn / Sales x 100

SP / Pu = 150000 / 15000 = 10%

Cn / p.u = SP – VC

= 10 – 6 = 4

Cn = 15000 u x 4 = 60000

PVR = 60000 / 150000 x 100 = 40%

BEP = FC / PVR = 34000 / 40% = 85000 = 8500 / p.u

MOS = Sales – BEP

= 150000 – 85000

= 65000 = 6500 / p.u

Part II: Sensitivity analysis

Situation	PVR $\left(\frac{Cn}{Sales}\times 100\right)$ = 40%	BEP $\left(\frac{FC}{PVR}\right)$ = 85000	MOS (Sales – BES) = 65,000
1. Selling Price	33.33%	11334	3666

↓ by 10%	$\left(\frac{3}{9}\right)$	$\left(\frac{34000}{33}\right)$	(15000 – 11334)
2. Increase in VC by 10%	34% $\left(\frac{3.4}{10}\right)$	1000 $\left(\frac{34000}{3.4}\right)$	5000 (15000 – 10000)
3. Volume ↑ by 2000 units	-	-	8500 u (17000 u – 8500 u)
4. Increase of Rs.6000 in FC		10000 u $\left(\frac{40000}{4}\right)$	(15000 u – 10000)

Answer for Q.NO.18. .

Revised Sales Value = $\frac{\text{Desired Contribution}}{\text{Revised P/V Ratio}^*} = \frac{0.40}{0.25} = 1.6$

This means sales value to be increased by 60% of the existing sales.

*Revised P/V Ratio = $\frac{\text{Revised Contribution}}{\text{Revised Selling Price}} = \frac{0.80 - 0.60}{0.80} = 0.25$

Required Sales Quantity =- $\frac{\text{Desired Contribution}}{\text{Revised P/V Ratio}^* \times \text{Revised Selling Price}} = \frac{0.40}{0.25 \times 0.80} = 2$

Therefore, Sales value to be increased by 60% and sales quantity to be doubled to offset the reduction in selling price.

Proof:

Let selling price per unit is Rs.10 and sales quantity is 100 units.

Data before change in selling price:

	(Rs.)
Sales (Rs.10 × 100 units)	1,000
Contribution (40% of 1,000)	400
Variable cost (balancing figure)	600

Data after the change in selling price:

Selling price is reduced by 20% that means it became Rs.8 per unit. Since, we have to maintain the earlier contribution margin i.e. Rs.400 by increasing the sales quantity only. Therefore, the target contribution will be Rs.400.

The new P/V Ratio will be

	(Rs.)
Sales	8.00
Variable cost	6.00

Contribution per unit	2.00
P/V Ratio	25%

Sales Value = $\frac{\text{Desired Contribution}}{\text{Revised P/V Ratio}} = \frac{\text{Rs.400}}{0.25} = \text{Rs.1,600}$

Sales quantity = $\frac{\text{Sales value}}{\text{Selling price per unit}} = \frac{\text{Rs.1600}}{\text{Rs.8}} = 200 \text{ units}$

Answer for Q.NO.19. .

In 2021-22, PV ratio = 50%

Variable cost ratio = 100% - 50% = 50%

Variable cost in 2021-22 = Rs. 8,00,000 × 50% = Rs. 4,00,000

In 2022-23, sales quantity has not changed. Thus, variable cost in 2022-23 is Rs. 4,00,000.

In 2022-23, P/V ratio = 37.50%

Thus, Variable cost ratio = 100% × 37.5% = 62.5%

(i) Thus, sales in 2022-23 $= \frac{4,00,000}{62.5\%} = \text{Rs.6,40,000}$

In 2022-23, Break-even sales = 100% × 21.875% (Margin of safety) = 78.125%

(ii) Break-even sales = 6,40,000 × 78.125% = Rs. 5,00,000

(iii) Fixed cost = B.E. sales × P/V ratio

= 5,00,000 × 37.50% = Rs.1,87,500.

Answer for Q.NO.20. .

Statement Showing "Cost and Profit for the Next Year"

Particulars	Existing Volume, etc.	Volume, Costs, etc. after 10% Increase	Estimated Sale, Cost, Profit, etc.*
	(Rs.)	(Rs.)	(Rs.)
Sales	5,00,000	5,50,000	5,72,000
Less: Direct Materials	2,50,000	2,75,000	2,69,500
Direct Labour	1,00,000	1,10,000	1,07,800
Variable Overheads	40,000	44,000	43,120
Contribution	1,10,000	1,21,000	1,51,580
Less: Fixed Cost#	60,000	60,000	58,800
Profit	50,000	61,000	92,780

(*) for the next year after increase in selling price @ 4% and overall cost reduction by 2%. (#) Fixed Cost = Existing Sales – Existing Marginal Cost – 12.5% on Rs.4,00,000

= Rs.5,00,000 – Rs.3,90,000 – Rs.50,000 = Rs.60,000

Percentage Profit on Capital Employed equals to 23.19% $\left(\frac{Rs.92,780}{Rs.4,00,000}\times 100\right)$

Since the Profit of Rs.92,780 is more than 23% of capital employed, the proposal of the Sales Manager can be adopted.

Answer for Q.NO.21. .

Part I:

Step 1: Calculation of Cn p.u:

Particulars	X	Y
SP	40	30
(-) Dm	(20)	(18)
(-) DW	16	14
(-) Wages	16	14
Contribution	8	4

Step 2: Calculation of profit under difference sales mix

Scenario 1 = 100 units of X Y = 200 u

Cn = (100 x 8) (+) (200 x 4)

= 800 + 800 = 1600

(-) FC = (1600)

Profit = 0

Scenario 2 = X = 150 u Y = 150 u

Cn = (150 x 8) (+) (150 x 4)

= 1200 + 600

= 1800

(-) FC = (1600)

Profit = 200

Scenario 3 = X = 200 u Y = 100 u

Cn = (200 x 8) + (100 x 4)

= 1600 + 400

Cn = 2000

(-) FC = (1600)

Profit = 400

Part II:

Step 1: Sales mix to earn a profit Rs.300 volume of 300u.

Let No. of units of X be "x"

Let no. of units of Y be "300 – x"

Cn = 8x + 4 (300 – x)

(-) FC = (1600)

Profit 300

8x – 4x + 1200 – 1600 = 300

4x = 700

X = 1754

Y = 300 -175 = 125u

The co sells when x = 175u y = 125u it will earn the profit of Rs.300

Volume = 300u

Profit = 600

Cn = 8x + 4 (300 – x)

(-) FC = (1600)

Profit 600

8x + 1200 – 4x – 1600 = 600

4x = 1000

X = 250 u

Y = 300 – 250

= 50 u

The co sells 250 u of x and 50u of y

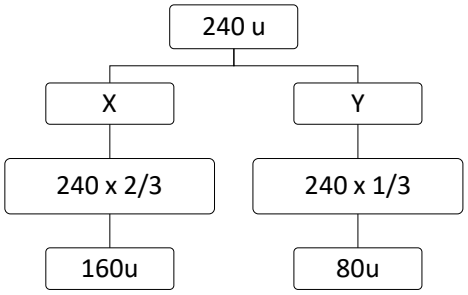
Part III: Calculation of BEP: When the sales mix 2: 1:

Weighted C.P.U = $\left[8 \times \frac{2}{3}\right](+)\left[4 \times \frac{4}{3}\right]$

= 5.33 + 1.33

= 6.67

BES = $\frac{FC}{WeightedCnP.u} = \frac{1600}{6.67} = 240\,u$



When the co sells 160u of X and 80u of Y it earns 8 profit

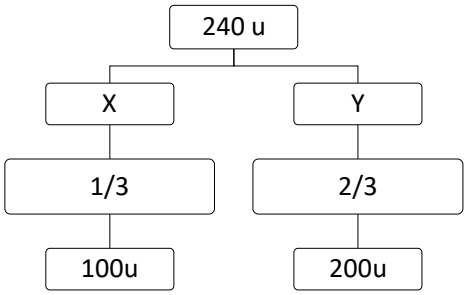
Part IV: Calculation of BEP when the sales mix of 1 : 2:

Weighted CP.U =

Weighted C.P.U = $\left[8 \times \frac{1}{3}\right](+)\left[4 \times \frac{2}{3}\right]$

= 2.67 (+) 2.67 = 5.334

$$BES = \frac{FC}{WeightedCnP.u} = \frac{1600}{5.33} = 300u$$



When the co sells the 100 u of X and 200u of Y to earn a profit of 0.

Answer for Q.NO.22. .

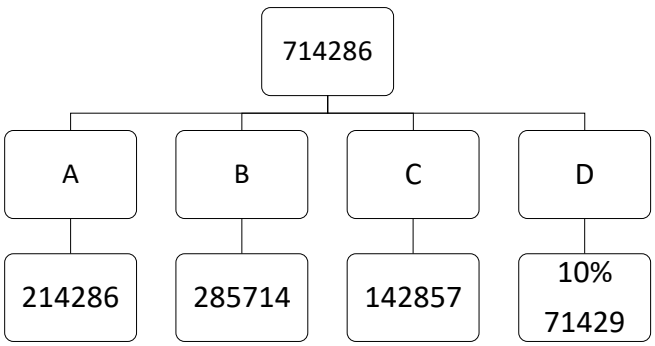
Step 1: Calculated of budgeted profit with existing sales mix:

Product	Sales (Rs.)	PVR	Contribution
A	3,00,000	40%	1,20,000
B	4,00,000	30%	1,20,000
C	2,00,000	20%	40,000
D	1,00,000	70%	70,000
	10,00,000		3,50,000
(-) FC			(2,50,000)
	Profit		1,00,000

Step 2: Break even sales with current sales mix:

Product	Sales mix	PVR	Weighted PVR
A	0.30	40%	12%
B	0.40	30%	12%
C	0.2	20%	4%
D	0.10	70%	7%
		Weighted PVR	35%

$$BES = \frac{FC}{WeightedPVR} = \frac{2,50,000}{35\%} = 714286$$



When the co sells its product work Rsw.714286 in the proportion.

70 : 40 : 20 : 10 of A : B : C : D profit 0.

Step 3: Calculation of profit under charged sales mix

Product	Sales (Rs.)	PVR	Contribution
A (25%)	250000	40%	1,00,000
B (40%)	400000	30%	1,20,000
C (30%)	300000	20%	60,000
D (5%)	50000	70%	35,000
	10,00,000		3,15,000
	– (FC)		2,50,000
		Profit	65000

Step 4: understanding the reason for drop in profit:

⇉ Despite the sales & FC remaining the same the profit has dropped by Rs.35000

⇉ This is way of drop in PV ratio due to change in sales mix

⇉ Existing PVR is 35% New PVR = $\frac{3,15,000}{1,00,000}$ = 31.5%

Decrease in PVR = 35 – 31.5%

= 3.5%

Decrease in profit = Sales x Decrease in PVR

10,00,000 x 3.5% = Rs.35000

The PVR lias droped due to change in sales mix which can be analysed as follows

Product	Sales Mix	PVR	Δ PVR
A	↓5%	40%	↓2%
B	-	30%	-
C	↑10%	20%	↑2%
D	↓5%	70%	↓3.5%
			↓3.5%

Answer for Q.NO.23. .

Step 1: Details of merged plant at 100% capacity:

(Rs. In lakhs)

Particulars	A	B	C	Merged
Sales	300	400 (280 x 100 ÷ 70)	300	1000
(-) VC	(200)	(300)	(150)	(650)
Cn	100	100	150	350

(-) FC	(70)	(50)	(62)	(182)
Profit	30	50	88	168

If the merged plant works at 110% capacity it can earn a profit of Rs.168L

Step 2:

Part I: Capacity to break even:

$$PVR = \frac{Cn}{Sales} = \frac{350}{1000} = 35\%$$

$$BES = \frac{FC}{PVR} = \frac{182}{35\%} = 520L$$

% capacity to break even = $\frac{520}{1000} \times 100$ = 52%

Part II: Profit at 75% capacity of the merged plant:

Contribution (350 x 75%) = 262.50

(-) FC (182)

Profit = 80.5

Part III: Turnover for the merged plant to given a project Rs.28L

Contribution = FC + Req. profit

= 182 + 28

= 210

Sales = Cn / PVR = 210 / 35% = 600L

Answer for Q.NO.24.

	X	Y	Z
I. Contribution per unit (Rs.)	4	3	5
II. Units (Lower of Production / Market Demand)	2,000	2,000	900
III. Possible Contribution (Rs.) [I × II]	8,000	6,000	4,500
IV. Opportunity Cost* (Rs.)	6,000	8,000	8,000

(*) Opportunity cost is the maximum possible contribution forgone by not producing alternative product i.e. if Product X is produced then opportunity cost will be maximum of (Rs. 6,000 from Y, Rs. 4,500 from Z).

Answer for Q.NO.25.

Step 1: Calculation CPU of A and B:

Particulars	A	B
SP	100	120
(-VC)		
DM	(10)	(15)

DW	(15)	(10)
DE	(15)	(16)
(-) VOH	(15)	(20)
VC	45	51
CPU	55	69

Note: Fixed OH to be ignored for decision making

Step 2: Ranking the products when raw material is a counting factor:

Particulars	A	B
CP.u	55	69
Kgs	2Kg	3Kg
On / Prk	27.5	23
Rank	I	II

Step 3: Ranking the products when machine hrs is a counting factor:

Particulars	A	B
CP.u	55	69
Machine hrs	3 hrs	2 hrs
Ch / P.H	18.33	34.5
Rank	II	I

Step 4: Allocation of 10000 kg of raw materials to maximize contribution:

Rank	Product	Units	Kg / u	Kg / Consumed	Kgs consumed
I	A	3500 u	2 kg	7000 kg	7000 kg
II	B	1000 u	3 kg	3000	10000 kg

Step 5: Calculation of Total Cn

Product	Units	CPU	Contribution
A	3500 u	55	192500
B	1000 u	69	69000
			261500

Answer for Q.NO.26.

(i)

	Part A	Part B
Machine "P" (4,000 hrs)	6,666	16,000
Machine "Q" (4,500 hrs)	9,000	8,181
Alloy Available (13,000 kg.)	8,125	8,125
Maximum Number of Parts to be manufactured (Minimum of the	6,666	8,125

above three)		

		(Rs.)	(Rs.)
Material (Rs.12.5 × 1.6 kg.)		20.00	20.00
Variable Overhead: Machine "P"		48.00	20.00
Variable Overhead: Machine "Q"		50.00	55.00
Total Variable Cost per unit		118.00	95.00
Price Offered		145.00	115.00
Contribution per unit		27.00	20.00
Total Contribution for units produced	(I)	1,79,982	1,62,500

Spare Part A will optimize the contribution.

(ii)

	Part A
Parts to be manufactured numbers	6,666
Machine P : to be used	4,000
Machine Q : to be used	3,333
Underutilized Machine Hours (4,500 hrs. – 3,333 hrs.)	1,167
Compensation for unutilized machine hours (1,167hrs. × Rs.60) (II)	70,020
Reduction in Price by 10%, Causing fall in Contribution of Rs.14.50 per unit (6,666 units × Rs.14.5) (III)	96,657
Total Contribution (I + II – III)	1,53,345

Answer for Q.NO.27.

PVR = 100% - 80% = 20%

Avoidable FC = Total FC – Unavoidable FC

= 1,20,000 – 40,000 = 80000

Shutdown point = $\frac{\text{AFC} - \text{Shutdown cost}}{\text{PVR}}$

= 80000 – 0 / 20% = 4,00,000

Estimated SD point

Sales	Decision
< 4,00,000	Shack down
= 4,00,000	Indifference
> 4,00,000	Continue

Answer for Q.NO.28. .

Particulars		(Rs.)
Suppose sales		100
Variable cost		60
Contribution		40
P/V ratio		40%
Fixed cost		= Rs. 80,000
(i)	Break-even point = Fixed Cost ÷ P/V ratio = 80,000 ÷40% or Rs. 2,00,000	
(ii)	15% return on Rs. 2,00,000	30,000
	Fixed Cost	80,000
	Contribution required	1,10,000
	Sales volume required = Rs. 1,10,000 ÷ 40% or Rs. 2,75,000	
(iii)	Avoidable fixed cost if business is locked up = Rs. 80,000 - Rs. 25,000 = Rs. 55,000	
	Minimum sales required to meet this cost: Rs. 55,000 ÷40% or Rs. 1,37,500	

Mr. X will be better off by locking his business up, if the sale is less than Rs. 1,37,500

Answer for Q.NO.29.

Part I: Calculation of profit under marginal costing system:

Particulars	Q1	Q2	Q3	Q4
A. Sales	208000	192000	224000	256000
Opening stock	0	-	24000	8000
Variable cost of prodn	104000	120000	96000	120000
(-) Closing stock	0	(24000)	(8000)	0
B. Variable COGS	104000	96000	112000	128000
C. Gross contribution (A – B)	104000	96000	112000	128000
D. Variable & selling	-	-	-	-
E Cn	104000	96000	112000	128000
F. Fixed cost	(52000)	(52000)	(52000)	(52000)
Profit	52000	44000	60000	76000

Part II: Calculation of profit under absorption costing system

Particulars	Q1	Q2	Q3	Q4
A. Sales	208000	192000	224000	256000
B. Opening stock	0		36000	12000
(+) COP @ Rs.6	156000	180000	144000	180000
(-) Closing stock	0	(36000)	(12000)	-
	156000	144000	168000	192000

C. Gross Profit (A – B)	52000	48000	56000	64000
D. Selling & Admin	-	-	-	-
E Under / over absorption	-	8000	(4000)	+ 8000
F. Profit (C – D ± E)	(52000)	56000	52000	72000

WQ.N.1: Calculation of under / over absorption:

Particulars	Q1	Q2	Q3	Q4
Actual OHs	52000	52000	52000	52000
Absorbed OHs (Actual x pre determined)	52000	60000	48000	60000
Under / over	-	8000 ↓ Over	4000 4000 ↓ under	8000 ↓ Over

Statement recounting marginal costing & absorption costing method:

Particulars	Q1	Q2	Q3	Q4
Opening stock	-	-	6000	2000
Closing stock	-	6000	2000	-
Net stock	-	+ 6000 (Cr.)	4000 (Dr.)	2000 (Dr.)
Fixed cost in net stock	-	12000	(8000)	(4000)
Marginal costing profit	52000	44000	60000	76000
Absorption costing profit	52000	56000	52000	72000

Answer for Q.NO.30.

(a) Fixed production costs absorbed:	**(**Rs.**)**
Budgeted fixed production costs	1,60,000
Budgeted output (normal level of activity 800 units)	
Therefore, the absorption rate: 1,60,000/800 = Rs. 200 per unit	
During the first quarter, the fixed production	
cost absorbed by ZEST would be (220 units × Rs. 200)	44,000
(b) Under /over-recovery of overheads during the period:	**(**Rs.**)**
Actual fixed production overhead	40,000
(1/4 of Rs. 1,60,000)	
Absorbed fixed production overhead	44,000
Over-recovery of overheads	4,000

(c) Profit for the Quarter (Absorption Costing)

	(Rs.)	(Rs.)
Sales revenue (160 units × Rs. 2,000): (A)		3,20,000
Less: Production costs:		
- Variable cost (220 units × Rs. 800)	1,76,000	
- Fixed overheads absorbed (220 units × Rs. 200) Add: Opening stock	44,000	2,20,000
Less: Closing Stock $\left(\frac{Rs.2,20,000}{220\,units}\times 60\,units\right)$		--
Cost of Goods sold		(60,000)
Less: Adjustment for over-absorption of fixed production overheads		1,60,000
Add: Selling & Distribution Overheads:		(4,000)
- Variable (160 units × Rs.400)	64,000	
- Fixed (1/4th of Rs. 2,40,000)	60,000	1,24,000
Cost of Sales (B)		2,80,000
Profit {(A) – (B)}		40,000

(d) Profit for the Quarter (Marginal Costing)

	(Rs.)	(Rs.)
Sales revenue (160 units × Rs. 2,000): (A)		3,20,000
Less: Production costs:		1,76,000
- Variable cost (220 units × Rs. 800)		--
Add: Opening stock		
Less: Closing Stock $\left(\frac{Rs.1,76,000}{220\,units}\times 60\,units\right)$		(48,000)
Variable cost of goods sold		1,28,000
Add: Selling & Distribution Overheads:		64,000
- Variable (160 units × Rs.400) Cost of Sales (B)		1,92,000
Contribution {(C) = (A) – (B)}		**1,28,000**
Less: Fixed Costs:	(40,000)	
- Production cost	(60,000)	(1,00,000)
- Selling & distribution cost Profit		28,000

Answer for Q.NO.31.

Working Notes:

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

	Rs.
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 x (Rs.300 — Rs.180)}	24,00,000
Balance Contribution to be recovered	55,20,000

Units to be produced to get balance contribution

= Rs.55,20,000 / Rs.300 – Rs.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

CHAPTER 13: STANDARD COSTING

Answer for Q.NO.1.

Standard Quantity of input for actual output (SQ) = 2,10,000 kg × $\frac{100kg}{70kg}$ = 3, 00,000 kg.

Actual Price (AP) = (Rs.2,52,000 ÷ 2, 80,000 kg) = Rs.0.90 per kg.

(a) Material Usage Variance = (SQ – AQ) × SP

= (3,00,000 – 2,80,000) × 1= Rs.20,000 (F)

(b) Material Price Variance = (SP – AP) × AQ

= (1 – 0.90) × 2,80,000= Rs.28, 000 (F)

(c) Material Cost Variance = (SQ × SP) – (AQ × AP)

= (3, 00,000 × 1) – (2, 80,000 × 0.90)

= Rs.48, 000 (F)

Check MCV = MPV + MUV

Rs.48, 000 (F) = Rs.28, 000 (F) + Rs.20, 000 (F)

Answer for Q.NO.2.

Basic Calculation

Material	Standard for 180 kg. output			Actual for 182 kg. output		
	Qty. Kg.	Rate (Rs.)	Amount (Rs.)	Qty Kg.	Rate (Rs.)	Amount (Rs.)
A	80	20	1,600	90	18	1,620
B	120	30	3,600	110	34	3,740
Total	200		5,200	200		5,360
Less: Loss	20	-	-	18	-	-
	180		5,200	182		5,360

Std. cost of actual output = Rs.5,200 × $\frac{182}{180}$ = Rs.5, 257.78

Calculation of Variances

1. Material Cost Variance = (Std. cost of actual output – Actual cost)

= (5,257.78 – 5,360) = Rs.102.22 (A)

2. Material Price Variance= (SP – AP) × AQ

Material A = (20 – 18) × 90 = Rs.180.00 (F)

Material B = (30 – 34)) × 110 = Rs.440.00 (A)MPV = Rs.260.00 (A)

3. Material Usage Variance

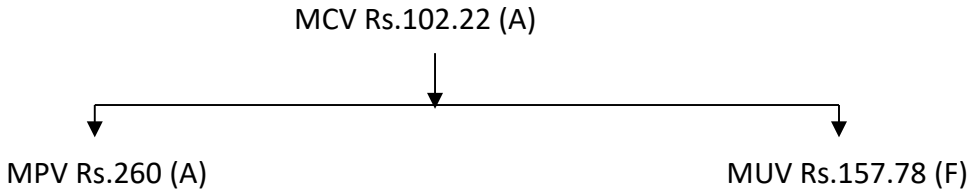
= (Std. Quantity for actual output – Actual Quantity) × Std. Price

Material A = $\left(80 \times \frac{182}{180} - 90\right) \times 20$ = Rs.182.22 (A)

Material B= $\left(120 \times \frac{182}{180} - 100\right) \times 30$ = Rs.340.00 (F)

MUV = Rs.157.78 (F)

Check



Answer for Q.NO.3.

Types of material	Standard			Actual		
	Qty. (Kg.)	Rate (Rs.)	Amount (Rs.)	Qty.(Kg.)	Rate(Rs.)	Amount (Rs.)
A	800	4	3,200	35	4	140.00
				795	4.25	3,378.75
B	1200	3	3,600	40	3	120.00
				1,150	2.50	2,875.00
Total	**2,000**		**6,800**	**2,020**		**6,513.75**

(i) Material price variance

= Actual qty. (Std. price – Actual price)

Material A: Since the actual price and standard price in respect of 35 kg. ofraw materials A are same i.e. Rs.4, there will be no price variance in respect of this quantity. Price variance will be in respect of only 795 kg. as given below:

= 795 kg. (Rs.4 – Rs.4.25) = Rs.198.75 (A)

Material B: For Material B also, price variance will only be in respect of 1,150 kg. as given below:

= 1,150 kg. (Rs.3 – Rs.2.50) = Rs.575 (F)

Total = Rs.198.75 (A) + 575 (F) = Rs.376.25(F)

(ii) Material usage variance

= (Std. qty. for actual output – Actual qty.) × Std. price

Material A	**= (800 – 830) × 4**	**= 120 (A)**
Material B	= (1,200 – 1,190) × 3	= 30 (F)
		Rs.**90 (A)**

(iii) Material yield variance

= (Std. qty. - Revised Std. qty.) × Std. Price

Material A = (800 – 808) × 4 = 32 (A)

Material B = (1,200 – 1,212) ×3 = 36 (A)

Rs.**68 (A)**

(iv) Material mix variance

= (Revised std. qty. – Actual qty.) × Std. Price

Material A = (808 – 830) × 4 = 88 (A)

Material B = (1,212 – 1,190) × 3 = 66 (F)

Rs.22 (A)

Check

MUV = MMV + MYV

90 (A) = 22 (A) + 68 (A)

(v) Total material cost variance

= Std. cost for actual output – Actual cost = 6,800 – 6,513.75 = 286.25 (F)

Check

MCV = MPV + MUV

286.25 (F) = 376.25 (F) + 90 (A)

Working Notes:

1. Standard quantity for actual output

The standard loss being 15%. It means to produce, 1,700 kg. of the article,standard quantity of material required is:

$= \frac{100}{85} \times 1,700 \text{ kgs.} = 2,000 \text{ kg.}$

Out of 2,000 kg. of material used, 40% is of type A and 60% is of type B, i.e.,Standard quantity for actual output for:

Material A = $2,000 \times \frac{40}{100} = 800$ kg.

Material B = $2,000 \times \frac{60}{100} = 1,200$ kg.

2. Actual quantity of material

= Opening stock + Purchases – Closing stock

Material A = 35 + 800 – 5 = 830 kg.

Material B = 40 + 1,200 – 50 = 1,190 kg.

3. Standard cost per unit

$= \frac{\text{Total standard cost}}{\text{Total standard output of std. mix}} = \frac{\text{Rs.}6,800}{1,700\text{kg.}} = \text{Rs.}4 \text{ per kg.}$

4. Revised Standard Quantity

Material A = $\frac{2,020}{2,000} \times 800 = 808$ kg.

Material B = $\frac{2,020}{2,000} \times 1,200$ = 1,212 kg.

Answer for Q.NO.4.

(a) Std. labour cost (Rs.)

(1,000 hours × Rs.50) 50,000

(b) Actual wages paid 36,000

(a) Actual rate per hour: Rs.36,000/900 hours = Rs.40

Variances

(i) Labour Rate variance = Actual time (Std. rate – Actual rate)

= 900 hours (Rs.50 – Rs.40) = Rs.9,000 (F)

(ii) Efficiency variance = Std. rate per hr. (Std. time – Actual time)

= Rs.50 (1,000 hrs. – 900 hrs.) = Rs.5,000 (F)

(iii) Total labour cost variance = Std. labour cost – Actual labour cost

= {(Rs.50 × 1,000 hours) – Rs.36,000}

= (Rs.50,000 – Rs.36,000) = Rs.14,000 (F)

Answer for Q.NO.5.

Working Notes:

1. Calculation of standard man hours

When 100 worker works for 1 hr., then the std. output is 25 units.

Std. man hour per unit = $\frac{100\text{hrs.}}{25\text{units}}$ = 4 hrs.

2. Calculation of std. man hours for actual output

Total std. man hours = 1,040 units × 4 hrs. = 4,160 hrs.

Standard for actual			**Actual**					
Hours	**Rate (Rs.)**	**Amount (Rs.)**	**No. of workers**	**Actual hours paid**	**Idle time hrs.**	**Production hours**	**Rate (Rs.)**	**Amount paid (Rs.)**
4,160	6	24,960	10	420	21	399	6.20	2,604
			30	1,260	63	1,197	6.00	7,560
			60	2,520	126	2,394	5.70	14,364
4,160	**6**	**24,960**	**100**	**4,200**	**210**	**3,990**		**24,528**

1. Labour cost variance

= Std. labour cost – Actual labour cost

= 24,960 – 24,528 = Rs.432 (F)

2. Labour rate variance

= (SR – AR) × AH_{Paid}

= (6 – 6.20) × 420 = 84 (A)

= (6 - 6) × 1260 = NIL

= (6 - 5.70) × 2,520 = 756 (F)

= 672 (F)

3. Labour efficiency variance

= (SH – AH) × SR

= (4,160 – 3,990) × 6 = 1,020 (F)

4. Labour Idle time variance

= Idle Hours × SR

= 210 × 6 = 1,260 (A)

Answer for Q.NO.6.

	SH	SR	AH	AR
Unskilled A	22000 H (11000 x 2)	Rs.10	22000 H	Rs.11
Skilled B	11000 H (11000 x 1)	Rs.20	8000 H	Rs.22

Labour cost variance

= (SH x SR) – (AH – AR)

Unskilled = 22000 x 10 – 22000 x 11

= 22000 – 242000 = 22000 (A)

Skilled = (11000 H x 20) – (8000 H x 22)

= 220000 – 176000 = 44000F

Labour rate variance

(SR – AR) x Actual hrs.

Skilled = (10 – 10) x 22000 H

= 22000 (A)

Unskilled = (20 – 22) x 31000H

= 16000 (A)

Labour efficiency Variance

(SH – AH) x Standard rate

Skilled = (22000H – 22000H) x 100

= 0

Unskilled = (11000H – 8000H) x 20

= (3000H x 20)

= 6000 (F)

Labour Gang variance

Labour yield Variance

(RAH – AH) x Standard Rate	(SH – AH) x Standard rate
Skilled = (20000 – 22000) x 10	Skilled = (22000H – 20000) x 100
= 20000 (A)	= 20000F
Unskilled = (10000 – 8000) x 20	Unskilled = (11000 – 10000) x 20
= 30000 30000 40000F	= 20000 F
20000 F	= 40000 (F)

Answer for Q.NO.7.

Working Notes:

	Budget			**Standard for actual**			**Actual**		
	Hours	**Rate (Rs.)**	**Amount (Rs.)**	**Hours**	**Rate (Rs.)**	**Amount (Rs.)**	**Hours**	**Rate (Rs.)**	**Amount (Rs.)**
Skilled	2	6	12	20,000	6	1,20,000	18,000	7	1,26,000
Semi-skilled	3	4	12	30,000	4	1,20,000	33,000	3.5	1,15,500
Unskilled	5	3	15	50,000	3	1,50,000	58,000	4	2,32,000
	10		**39**	**1,00,000**		**3,90,000**	**1,09,000**		**4,73,500**

	Idle Hours	**Hours worked**
Skilled	500	17,500
Semi-skilled	700	32,300
Unskilled	800	57,200
	2,000	**1,07,000**

(a) (i) Labour Cost Variance= (SH×SR – AH×AR)

Skilled 20,000 × 6 – 18,000× 7 = Rs.6,000 (A)

Semi-Skilled 30,000 ×4 – 33,000 × 3.5 = Rs.4,500 (F)

Unskilled 50,000× 3 – 58,000 × 4 = Rs.82,000 (A)

Total Rs.83,500 (A)

(ii) Labour Rate Variance = (SR – AR)×AH$_{Paid}$

Skilled (6 – 7) × 18,000 = Rs.18,000 (A)

Semi-Skilled (4 – 3.5) × 33,000 = Rs.16,500 (F)

Unskilled (3 – 4) × 58,000 = Rs.58,000 (A)

Total Rs.59,500 (A)

(iii) Labour Efficiency Variance = (SH – AH) × SR

Skilled (20,000 –17,500) ×6 = Rs.15,000 (F)

Semi- Skilled (30,000 –32,300) ×4 = Rs.9,200 (A)

Unskilled	(50,000 –57,200)×3	=	Rs.21,600 (A)
Total			**Rs.15,800 (A)**

Labour Idle Time Variance = (Idle Hours × SR)

Skilled	500 × 6	=	Rs.3,000 (A)
Semi- Skilled	700 × 4	=	Rs.2,800 (A)
Unskilled	800 × 3	=	Rs.2,400 (A)
Total			**Rs.8,200 (A)**

(iv) Labour Mix Variance = (RSH – AH_{Worked})×SR

$$\text{Revised Std. hours (RSH)} = \frac{\text{Std.Hours}}{\text{TotalStd.hours}} \times \text{TotalActualHours}$$

Skilled $\left(\frac{20,000}{1,00,000} \times 1,07,000 - 17,500\right) \times 6$ = Rs.23,400 (F)

Semi- Skilled $\left(\frac{30,000}{1,00,000} \times 1,07,000 - 32,300\right) \times 4$ = Rs.800 (A)

Unskilled $\left(\frac{50,000}{1,00,000} \times 1,07,000 - 57,200\right) \times 3$ = Rs.11,100 (A)

Total Rs.11,500 (F)

(v) Labour Yield Variance = (SH – RSH) × SR

Skilled $\left(20,000 - \frac{20,000}{1,00,000} \times 1,07,000\right) \times 6$ = Rs.8,400 (A)

Semi- Skilled $\left(30,000 - \frac{30,000}{1,00,000} \times 1,07,000\right) \times 4$ = Rs.8,400 (A)

Unskilled $\left(50,000 - \frac{50,000}{1,00,000} \times 1,07,000\right) \times 3$ = Rs.10,500 (A)

Total Rs.27,300 (A)

(b) Labour Rate Variance = (SR – AR) ×AH_{Paid}

Skilled	(6 – 5.5) ×5,000		
	(6 – 7) ×13,000	=	Rs.10,500 (A)
Semi- Skilled	(4 – 3.5) ×33,000	=	Rs.16,500 (F)
Unskilled	(3 – 4) × 58,000	=	Rs.58,000 (A)
Total			Rs.**52,000 (A)**

Answer for Q.NO.8. .

For Material Cost Variances

	SQ × SP	AQ × AP	AQ × SP
A	12,000 × 4 = 48,000	12,500 × 4.40 = 55,000	12,500 × 4 = 50,000

B	18,000 × 3 = 54,000	18,000 × 2.80 = 50,400	18,000 × 3 = 54,000
C	90,000 × 1 = 90,000	88,500 × 1.20 = 1,06,200	88,500 × 1 = 88,500
Total	Rs.1,92,000	Rs.2,11,600	Rs.1,92,500

Variances:

Material Price Variance = Actual quantity (Std. price – Actual price)

Or, = (AQ × SP) – (AQ × AP)

Or, = Rs.1,92,500 – Rs.2,11,600

= Rs.19,100 (A)

Material Usage Variance = Standard Price (Std. Quantity – Actual Quantity)

Or, = (SP × SQ) – (SP × AQ)

Or, = Rs.1,92,000 – Rs.1,92,500 = Rs.500 (A)

For Labour Cost Variance :

	SH × SR	**AH × AR**	**AH × SR**
Labour	(6,000 × 3) ×Rs.8 = 1,44,000	2,500 × 12 = 30,000 15,000 × 8 = 1,20,000	17,500 × 8 = 1,40,000
Total	Rs.1,44,000	Rs.1,50,000	Rs.1,40,000

Variances:

Labour Rate Variance: Actual Hours (Std. Rate – Actual Rate)

Or, = (AH × SR) – (AH × AR)

Or, = Rs.1,40,000 – Rs.1,50,000

= Rs.10,000 (A)

Labour Efficiency Variance: Standard Rate (Std. Hours – Actual Hours)

Or, = (SR × SH) – (SR × AH)

Or, = Rs.1,44,000 – Rs.1,40,000

= Rs.4,000 (F)

Answer for Q.NO.9.

Workings:

1. Standard cost per unit = $\frac{\text{Rs.1,20,000}}{\text{6,000units}} = \text{Rs.20}$

2. Standard cost per hour = $\frac{\text{Rs.1,20,000}}{\text{6,000units} \times \text{2hours}} = \text{Rs.10}$

i. Variable Overhead Cost Variance:

= Std. Overhead for actual production – Actual overhead incurred

= Rs.20 × 5,900 units – Rs.1,22,000 = Rs.4,000 (A)

ii. Variable Overhead Expenditure Variance:

= Std. overhead for Actual hours – Actual Overhead

= Rs.10 ×11,600 hours - Rs.1,22,000 = Rs.6,000 (A)

iii. Variable Overhead Efficiency Variance:

= Std.rate per hour × (Std. hours for actual production – Actual hours)

= Rs.10 (2 hours × 5,900 units – 11,600 hours) = Rs.2,000 (F)

Answer for Q.NO.10. .

(i) Fixed Overhead Cost Variance:

= Overhead absorbed for actual production – Actual overhead incurred

$= \left(\frac{Rs.15,00,000}{7,500} \times 7,800\right) - Rs.15,60,000 = 0$

(ii) Fixed Overhead Expenditure Variance:

= Budgeted overhead – Actual overhead

= Rs.15,00,000 - Rs.15,60,000 = Rs.60,000 (A)

(iii) Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted overhead

$= \left(\frac{Rs.15,00,000}{7,500} \times 7,800\right) - Rs.15,60,000 = Rs.60,000(F)$

(iv) Fixed Overhead Efficiency Variance:

= Std. Rate (Std. hours for actual production - Actual hours)

$= = \frac{Rs.15,00,000}{7,500 \times 2}$ {(2 hours × 7,800 hours) -16,000 hours}

= Rs.100 (15,600 -16,000) = Rs.40,000 (A)

(v) Fixed Overhead Capacity Variance:

= Std. Rate (Actual hours - Budgeted hours)

$= \frac{Rs.15,00,000}{7,500 \times 2}$ x (16,000 hours -15,000 hours}

= Rs.100 (16,000- 15,000) = Rs.1,00,000 (F)

Answer for Q.NO.11.

Working Notes:

		Budget	**Actual**
(1)	Fixed overheads for the month	1,44,000	1,42,000
(2)	Working days per month	25	24
(3)	Working hours per month	(120 machines × 8hrs. × 25 days) = 24,000	(840 machines hours × 24 days) = 20,160

(4)	Production units per month	$\frac{24{,}000 \text{ hrs.}}{4 \text{ hrs.}} = 6{,}000$	5,305

(5) Standard hours for actual production

= Actual production units × Std. hours per unit

= 5,305 × 4 = 21,220 hrs.

(6) Standard fixed overhead rate per unit = $\frac{Rs.1,44,000}{6000 units} = Rs.24$ = Rs.24

(7) Standard fixed overhead rate per hour = $\frac{Rs.1,44,000}{24,000 hrs.} = Rs.6$

(8) Standard fixed overhead per day = $\frac{Rs.1,44,000}{25 days} = Rs.5,760$

1. **Efficiency variance**

   = Std. rate per hr. (Std. hrs. for actual production – Actual hrs.)

   = 6 × (21,220 – 20,160) = Rs.6,360 (F)

2. **Capacity variance**

   = Std. Rate (Actual hours - Budgeted hours)

   = 6 × {20,160 – (24 days × 120 machine × 8 hrs.)} = Rs.17,280 (A)

3. **Calendar variance**

   = (Actual No. of days – Budgeted No. of days) × Std. rate per day

   = (24 – 25) × 5,760 = Rs.5,760 (A)

4. **Expenditure variance**

   = Budgeted overhead – Actual overhead

   = 1,44,000 – 1,42,000 = Rs.2,000 (F)

5. **Volume variance**

   = Absorbed overhead – Budgeted overhead

   = (5,305 × 24) – 1,44,000 = Rs.16,680 (A)

6. **Total fixed overhead Variance**

   = Absorbed overhead – Actual overhead incurred

   = (5,305 × 24) – 1,42,000 = Rs.14,680 (A)

Answer for Q.NO.12. .

Assumption = ICSI says working hrs is 8 hrs a day

Fixed OH cost variance

(SH – SR) – Actual FOH

(192 x 2500) – 490000 = 10000A

Expenditure variance Volume variance

Bud FOH – Actual OH		(SH x SR) – Bud FOH
5L – 4.9L		(192 x 2500) – 5L
= 10000F		= 20000A
Fo Capacity variance	Calendar	Efficiency
(AH x SR) – Possible FOH	Possible FOH / Bud FOH	(SH x SR) – (AH x SR)
(184 x 2500) – 460000	460000 – 5L	480000 – 460000
= 0	= 40000A	= 20000F

SH = 192

SR = 5,00,000 ÷ 200H = 2500

Actual FOH = 490000

Bud OH = 5,00,000

AH = 184

Possible FOH = 460000

$$\left[5{,}00{,}000 \times \frac{23}{25}\right]$$

Answer for Q.NO.13.

(a) <u>Variable Overhead Variances</u>

(i) Variable Overhead Variance:

= Std. overhead for actual production – Actual overhead

$$= \left(\frac{\text{Rs.}1{,}20{,}000}{4{,}000\,\text{units}} \times 3{,}800\,\text{units}\right) - \text{Rs.}1{,}20{,}000$$

= Rs.1,14,000 – Rs.1,20,000 = Rs.6,000 (A)

(ii) Variable Overhead Expenditure Variance:

= Std. overhead for actual hours – Actual overhead

$$= \left(\frac{\text{Rs.}1{,}20{,}000}{8{,}000\,\text{hours}} \times 7{,}800\,\text{hours}\right) - \text{Rs.}1{,}20{,}000$$

= Rs.15 × 7,800 hours - Rs.1,20,000 = Rs.3,000 (A)

(iii) Variable Overhead Efficiency Variance:

= Std. Rate per hour (Std. hours for actual production – Actual hours)

$$= \frac{\text{Rs.}1{,}20{,}000}{8{,}000\,\text{hours}} \times \left[\left(\frac{8{,}000\,\text{hours}}{4{,}000\,\text{units}} \times 3{,}800\,\text{hours}\right) - 7{,}800\,\text{hours}\right]$$

= Rs.15 × (7,600 hours – 7,800 hours) = Rs.3,000 (A)

(b) <u>Fixed Overhead Variance:</u>

(i) Fixed Overhead Variance:

= Absorbed overhead – Actual overhead

$$= \left(\frac{\text{Rs.4,00,000}}{\text{4,000 units}} \times \text{3,800 units} \right) - \text{Rs.3,90,000}$$

= Rs.3,80,000 - Rs.3,90,000 = 10,000 (A)

(ii) Fixed Overhead Expenditure Variance:

= Budgeted Overhead – Actual Overhead

= Rs.4,00,000 - Rs.3,90,000 = Rs.10,000 (F)

(iii) Fixed Overhead Volume Variance:

= Absorbed overhead – Budgeted Overhead

$$= \left(\frac{\text{Rs.4,00,000}}{\text{4,000 units}} \times \text{3,800 units} \right) - \text{Rs.4,00,000}$$

= Rs.3,80,000 - Rs.4,00,000 = Rs.20,000 (A)

(iv) Fixed Overhead Efficiency Variance:

= SR × (Std. hours for actual production – Actual hours)

= Rs.50 × {(2 hours × 3,800 units) – 7,800 hours}

= Rs.3,80,000 - Rs.3,90,000 = Rs.10,000 (A)

(v) Fixed Overhead Capacity Variance:

= SR × (Actual hours – Revised budgeted hours)

$$= \text{Rs.50} \times \left[\text{7,800 hours} - \frac{\text{8,000}}{\text{20 days}} \times \text{21 days} \right]$$

= Rs.50 × (7,800 hours – 8,400 hours) = Rs.30,000 (A)

(vi) Fixed Overhead Calendar Variance:

= Rate per day (Budgeted days – Actual days)

$$= = \frac{\text{Rs.4,00,000}}{\text{20 days}} \times (20 \text{ days} - 21 \text{ days}) = 20{,}000 \text{ (F)}$$

Answer for Q.NO.14. .

Overheads volume variance (in case of fixed overhead):

Standard fixed overheads per unit (SR): Rs.3,000 (Given) Actual production : 100 units

Standard production (capacity) : 200 unitsFixed Overhead Volume Variance:

= Absorbed overhead – Budgeted Overhead

= (Rs.3,000× 100 units) – (Rs.3,000× 200 units)

= Rs.3,00,000 - Rs.6,00,000 = Rs.3,00,000 (Adverse)

Overhead expense variances

= Budgeted Overhead – Actual Overhead

= (Rs.3,000 × 200 units) – (Total overhead – Variable overhead)

= (Rs.3,000 × 200 units) – (Rs.11,50,000 - Rs.1,500×100 units)

= Rs.6,00,000 – (Rs.11,50,000 - Rs.1,50,000)

= Rs.6,00,000 –Rs.10,00,000 = Rs.4,00,000 (Adverse)

Answer for Q.NO.15.

(i) Actual Price of Material A

Let Actual Price of Material A be 'X'

Material Price Variance (A) = Rs.105 (A)

Material Price Variance = (SP – AP) × AQ(20 – X) × 70 = 105 (A)

1,400 – 70X = -105

X = 1,505 ÷ 70 = 21.5

Therefore X (Actual Price) = Rs.21.5

(ii) Actual Quantity of Material B

Let Actual Quantity of Material B be 'X '

Material Cost Variance = (SQ× SP) – (AQ× AP)

Material Cost Variance = 275 (A)

{(60 × 20) – (70 × 21.5)} + {(40 × 30) – ('X' × 30)} = 275 (A)

{(1,200 – 1,505) + (1,200 – 30X)} = -275

(895 – 30X) = -275

X = 1,170 ÷ 30 = 39 units

(iii) Material Price Variance = (SP – AP) × AQ

Material A = (20 – 21.5) × 70 = Rs.105 (A)

Material B = (30 – 30) × 39 = Rs.0

Total = Rs.105 (A)

(iv) Material Usage Variance = (SQ– AQ) × SP

Material A = (60 – 70) × 20 = Rs.200 (A)

Material B = (40 – 39) × 30 = Rs.30 (F)

Total = Rs.170 (A)

(v) Material Mix Variance = (RSQ– AQ) × SP

Material A = $(\frac{109}{100} \times 60 - 70) \times 20$ = Rs.92 (A)

Material B = $(\frac{109}{100} \times 40 - 39) \times 30$ = Rs.138 (F)

Total = Rs.46 (F)

(vi) Material Yield Variance = (SQ – RSQ) × SP

Material A = $(60 - \frac{109}{100} \times 60) \times 20$ = Rs.108 (A)

Material B = $(40 - \frac{109}{100} \times 40) \times 30$ = Rs.108 (A)

Total = Rs.216 (A)

Answer for Q.NO.16. .

(i) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}

Rs.3,625 = (SQ × SP) – Rs.59,825

(SQ × SP) = Rs.63,450

(SQ_A × SP_A) + (SQ_B × SP_B) = Rs.63,450

(940 kg × SP_A) + (705 kg ×Rs.30)= Rs.63,450

(940 kg × SP_A) + Rs.21,150 = Rs.63,450

(940 kg × SP_A) = Rs.42,300

$SPA = \frac{Rs.42,300}{940kg}$

Standard Price of Material-A = Rs.45 Working Note:

SQ i.e. quantity of inputs to be used to produce actual output

$= \frac{1,480\ kg}{90\%} = 1,645$ kg

$SQ_A = \frac{800\ kg}{(800+600)} \times 1,645kg.$

$SQ_B = \frac{600\ kg}{(800+600)} \times 1,645kg.$

(ii) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)}

Rs.175 = (AQ × SP) – Rs.59,825

(AQ × SP) = Rs.60,000

(AQ_A × SP_A) + (AQ_B × SP_B) = Rs.60,000

[900 kg × Rs.45 (from (i) above)]

+ (AQ_B × Rs.30) = Rs.60,000

Rs.40,500 + (AQ_B × Rs.30) = Rs.60,000(AQ_B × Rs.30) = Rs.19,500

$AQB = \frac{19,500}{30}$ = 650 kg

Actual Quantity of Material B = 650 kg.

(iii) (AQ × AP) = Rs.59,825

(AQ_A × AP_A) + (AQ_B × AP_B) = Rs.59,825

(900 kg × AP_A) + (650 kg (from (ii) above) × Rs.32.5) = Rs.59,825

(900 kg × AP_A) + Rs.21,125 = Rs.59,825

(900 kg × AP_A) = Rs.38,700

$AP_A = \frac{38,700}{900} = 43$

Actual Price of Material-A = Rs.43

(iv) Total Actual Quantity of Material-A and Material-B

= 940 kg

= 705 kg

= $AQ_A + AQ_B$ = 900 kg + 650 kg (from (ii) above)

= 1,550 kg

Now,

Revised $SQ_A = \frac{800\,kg}{(800+600)} \times 1,550kg. =$ **886 kg**

Revised $SQ_B = \frac{600\,kg}{(800+600)} \times 1,550kg. =$ **664 kg**

(v) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}

= {(RSQA × SPA) + (RSQB × SPB) – 60,000}

= (886 kg (from (iv) above) × Rs.45 (from above)) + (664 kg (from (iv) above) × Rs.30) - Rs.60,000

= (39,870+19,920)–60,000= Rs.**210 (A)**

Answer for Q.NO.17.

i. Material Variances

	Budget			Std. for actual			Actual		
	Quantity	Price (Rs.)	Amount (Rs.)	Quantity	Price (Rs.)	Amount (Rs.)	Quantity	Price (Rs.)	Amount (Rs.)
Material	0.5	60	30	5,000	60	3,00,000	5,700	58	3,30,600

Material Cost Variance = (SQ×SP – AQ ×AP)

3,00,000 – 3,30,600 = Rs.30,600(A)

Material Price Variance = (SP – AP) AQ

(60 -58) 5,700 = Rs.11,400 (F)

Material Usage Variance = (SQ – AQ) SP

(5,000 – 5,700) 60 = Rs.42,000 (A)

ii. Variable Overheads variances

Variable overhead cost Variance = (Standard variable overhead – Actual Variable Overhead)

Standard Variable Overheads: 10,000 units × 10 = 1,00,000

(1,00,000 – 1,12,200) = Rs.12,200(A)

Variable overhead Efficiency Variance = (Standard Hours – Actual Hours) × Standard Rate per Hour

Let Actual Hours be 'X'

(10,000 – X) × 10 = 2,000 (A)

1,00,000 – 10X = -2,000

X = 1,02,000 ÷ 10

Therefore, Actual Hours (X) = 10,200

Variable overhead Expenditure Variance = (Variable Overhead at Actual Hours - Actual Variable Overheads)

10,200 × 10 – 1,12,200 = Rs.10,200 (A)

iii. Labour variances

	Budget			Std. for actual			Actual		
	Hours	**Rate (Rs.)**	**Amount (Rs.)**	**Hours**	**Rate (Rs.)**	**Amount (Rs.)**	**Hours**	**Rate (Rs.)**	**Amount (Rs.)**
Labour	1	20	20	10,000	20	2,00,000	10,200	22	2,24,400

Actual Rate = Rs.2,24,400÷10,200 hours = Rs.22

Labour Cost Variance = (SH × SR) – (AH × AR)

10,000× 20 – 10,200 × 22 = Rs.24,400 (A)

Labour Rate Variance = (SR – AR) × AH

(20 – 22) × 10,200 = Rs.20,400 (A)

Labour Efficiency Variance = (SH – AH) × SR

(10,000 – 10,200) × 20 = Rs.4,000 (A)

CHAPTER 14: BUDGET AND BUDGETARY CONTROL

Answer for Q.NO.1. .

Step 1: Production budget (units)

Particulars	A	B
Sales	15000 u	17500 u
(+) Closing stock	1750	3375
(-) Opening stock	(750)	(1875)
Production	16000 u	20000 u

Step 2: Material consumption budget (kgs)

Particulars	A	B
A 16000 u (2 kg : 3 1/8 kg)	32000	50000
B 20000 u (4 : 1)	80000	20000
	P = 112000	Q = 70000

Step 3: Material purchase budget:

Particulars	P	Q
RM consumption	112000	70000
(-) Closing stock (WN)	8000	5000
(-) Opening stock of RW	(12000)	(8000)
Purchases (in kg)	108000	67000
Price (Rs.)	3	2
In value	324000	134000

W.N.1: Closing stock of RM (2 days consumption)

P = 112000 x 2/28 = 7000 Kg

Q = 70000 x 2/28 = 5000 kg

Answer for Q.NO.2.

Step 1: Production budget (units)

Particulars	A	B	
Sales	9000	5000	12000
(+) Closing stock	1000	-	2000
(-) Opening stock	-	(5000)	(4000)
Production			

Step 2: Labour less budget:

Operations	A	B	C	Total
Operation X	180000 min (10000 u x 18)	420000 min (10000u x 42)	300000 min (10000 u x 30)	900000 min (or) 15000 hrs
Operation Y	-	120000 min (10000 u x 12)	240000 min (10000 x 24)	360000 min (or) 6000 hrs
Operation Z	120000 min (10000 u x 12)	60000 min (10000 u x 16)	-	180000 min (or) 3000 hrs

Step 3: Labour cost budget

Operation	Hrs	Rate	Cost
X	15000 H	2	Rs.30000
Y	6000 H	2.550	Rs.15300
Z	3000 H	3	Rs.9000

Step 4: No. of operations / workers

Operations	X	Y	Z
A. Hrs required per quarter	15000	6000	3000
B. Hrs available per worker / per quarter (8 hrs x 6 days x 13 weeks (-) 124 hrs)	500 H	500 H	500 H
C. No. of workers required	30 workers	12 workers	6 workers

Answer for Q.NO.3.

Working Note:

Calculation of total annual production

	(Units)
Sales in 4 quarters	1,53,750
Add: Closing balance	12,250
	1,66,000
Less: Opening balance	(6,000)
Total number of units to be produced in the next year	1,60,000

(i) Production Budget (in units)

Quarters	I Units	II Units	III Units	IV Units	Total Units
Sales	30,000	37,500	41,250	45,000	1,53,750
Production in current quarter	24,000	30,000	33,000	36,000	

(80% of the sale of current quarter)					
Production for next quarter (20% of the sale of next quarter)	7,500	8,250	9,000	12,250	
Total production	31,500	38,250	42,000	48,250	1,60,000

(ii) Raw material consumption budget in quantity

Quarters	**I**	**II**	**III**	**IV**	**Total**
Units to be produced in each quarter: (A)	31,500	38,250	42,000	48,250	1,60,000
Raw material consumption p.u. (kg.): (B)	2	2	2	2	
Total raw material consumption (Kg.) : (A × B)	63,000	76,500	84,000	96,500	3,20,000

(iii) Raw material purchase budget (in quantity)

	Qty. (kg.)
Raw material required for production	3,20,000
Add : Closing balance of raw material	5,000
	3,25,000
Less : Opening balance	(10,000)
Material to be purchased	3,15,000

Raw material purchase budget (in value)

Quarters	**% of annual requirement**	**Qty. of material**	**Rate per kg. (Rs.)**	**Amount (Rs.)**
(1)	**(2)**	**(3)**	**(4)**	**(5)=(3×4)**
I	30	94,500 (3,15,000 kg. × 30%)	2	1,89,000
II	50	1,57,500 (3,15,000 kg. × 50%)	3	4,72,500
III	20	63,000 (3,15,000 kg. × 20%)	4	2,52,000
Total		3,15,000		9,13,500

Priced Stores Ledger Card

(of the raw material using FIFO method)

	Quarters											
	I			II			III			IV		
	Kg.	Rate	Value	Kg.	Rate	Value	Kg.	Rate	Value	Kg.	Rate	Value
		(Rs.)	(Rs.)		(Rs.)	(Rs.)		(Rs.)	(Rs.)		(Rs.)	(Rs.)
Opening balance	10,000	2	20,000	41,500	2	83,000	1,22,500	3	3,67,500	38,500	3	1,15,500
(A)										63,000	4	2,52,000
Purchases: (B)	94,500	2	1,89,000	1,57,500	3	4,72,500	63,000	4	2,52,000	–	–	–
Consumption: (C)	63,000	2	1,26,000	41,500	2	83,000	84,000	3	2,52,000	38,500	3	1,15,500
				35,000	3	1,05,000				58,000	4	2,32,000
Balance: (D)	41,500	2	83,000	1,22,500	3	3,67,500	38,500	3	1,15,500	5,000	4	20,000
(D) = (A) +(B)– (C)							63,000	4	2,52,000			

Answer for Q.NO.4.

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

Number of units to be produced

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

(i) Material Purchase Budget

	Material-X (Kg.)	Material-Y (Kg.)
Material required:		
Product-A	12,400 (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		
$\left(\frac{25,300\text{ kgs.}}{20\text{ days}}\times 10\text{ days}\right)$	12,650	10,716
$\left(\frac{25,300\text{ kgs.}}{20\text{ days}}\times 10\text{ days}\right)$		
Less: Opening stock	1,000	500

Quantity to be purchased	36,950	45,936
Rate per kg. of Material	Rs. 4	Rs. 6
Total Cost	Rs. 1,47,800	Rs. 2,75,616

(ii) Wages Budget

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

Total Hours to be paid = 43,410 hours (11,160 + 32,250)

Hours to be paid at normal rate = 4 weeks × 40 hours × 180 workers

= 28,800 hours

Hours to be paid at premium rate = 43,410 hours – 28,800 hours = 14,610 hours

Total wages to be paid = 28,800 hours × Rs. 25 + 14,610 hours × Rs. 37.5

= Rs. 7,20,000 + Rs. 5,47,875

= Rs. 12,67,875

Answer for Q.NO.5.

Working Note:

1. Statement showing contribution:

Sub- assemblies	**ABC**	**MCB**	**DP**	**Total**
	(Rs.)	**(Rs.)**	**(Rs.)**	**(Rs.)**
Selling price per unit (p.u.) : (A)	520	500	350	
Marginal Cost per unit.				
Components				
- Base board	60	60	60	
- IC08	160	40	40	
- IC12	48	120	48	
- IC26	16	48	64	
Labour				

- Grade A	40	30	20	
- Grade B	64	48	32	
Variable production overhead	36	24	24	
Total marginal cost per unit. : (B)	424	370	288	
Contribution per unit. : (C) = (A) – (B)	96	130	62	
Sales ratio : (D)	3	4	2	
Contribution × Sales ratio: [(E) = (C) × (D)]	288	520	124	932

2. Desired Contribution for the forthcoming month December

	(Rs.)
Fixed overheads	7,57,200
Desired profit	12,00,000
Desired contribution	19,57,200

3. Sales mix required i.e. number of batches for the forthcoming month December

Sales mix required = Desired contribution/contribution × Sales ratio

= Rs.19,57,200/932 (Refer to Working notes 1 and 2)

= 2,100 batches

Budgets for the month of December

(a) Sales budget in quantity and value

Sub-assemblies	ACB	MCB	DP	Total
Sales (Qty.)	6,300	8,400	4,200	
	(2,100×3)	(2,100×4)	(2,100×2)	
Selling price p.u. (Rs.)	520	500	350	
Sales value (Rs.)	32,76,000	42,00,000	14,70,000	89,46,000

(b) Production budget in quantity

Sub-assemblies	ACB	MCB	DP
Sales	6,300	8,400	4,200
Add : Closing stock	720	1,080	2,520
(Opening stock less 10%)	____	____	____
Total quantity required	7,020	9,480	6,720
Less : Opening stock	(800)	(1,200)	(2,800)
Production	6,220	8,280	3,920

(c) Component usage budget in quantity

Sub-assemblies	ACB	MCB	DP	Total
Production	6,220	8,280	3,920	—
Base board (1 each)	6,220	8,280	3,920	18,420
Component IC08 (8:2:2)	49,760	16,560	7,840	74,160

	(6,220 × 8)	(8,280 × 2)	(3,920 × 2)	
Component IC12	24,880	82,800	15,680	1,23,360
(4:10:4)	(6,220× 4)	(8,280 × 10)	(3,920 × 4)	
Component IC26 (2:6:8)	12,440	49,680	31,360	93,480
	(6,220× 2)	(8,280 × 6)	(3,920 × 8)	

(d) Component Purchase budget in quantity and value

Sub-assemblies	Base board	IC08	IC12	IC26	Total
Usage in production	18,420	74,160	1,23,360	93,480	
Add: Closing stock (Opening stock less 10%)	1,440	1,080	5,400	3,600	
	19,860	75,240	1,28,760	97,080	
Less: Opening stock	(1,600)	(1,200)	(6,000)	(4,000)	
Purchase (Qty.)	18,260	74,040	1,22,760	93,080	
Purchase price (Rs.)	60	20	12	8	
Purchase value (Rs.)	10,95,600	14,80,800	14,73,120	7,44,640	47,94,160

(e) Manpower budget showing the number of workers and the amount of wages payable

Sub-assemblies	Budgeted Production	Direct labour				Total
		Grade A		Grade B		
		Hours p.u.	Total hours	Hours p.u.	Total hours	
ACB	6,220	8	49,760	16	99,520	
MCB	8,280	6	49,680	12	99,360	
DP	3,920	4	15,680	8	31,360	
(A) Total hours			1,15,120		2,30,240	
(B) Hours per man per month			200		200	
(C) Number of workers per month: (A/B)			576		1,152	
(D) Wage rate per month (Rs.)			1,000		800	
(E) Wages payable (Rs.) : (C × D)			5,76,000		9,21,600	14,97,600

Answer for Q.NO.6.

(i) Production Budget of 'X' for the Second Quarter

Particulars	Bags (Nos.)
Budgeted Sales	1,50,000

Add: Desired Closing stock	33,000
Total Requirements	1,83,000
Less: Opening stock	(45,000)
Required Production	1,38,000

(ii) Raw–Materials Purchase Budget in Quantity as well as in Rs. **for 1,38,000 Bags of 'X'**

Particulars	**'Y'** **Mtr.**	**'Z'** **Mtr.**	**Empty Bags** **Nos.**
Production Requirements Per bag of 'X'	2.5	7.5	1.0
Requirement for Production	3,45,000 (1,38,000 × 2.5)	10,35,000 (1,38,000 × 7.5)	1,38,000 (1,38,000 × 1)
Add: Desired Closing Stock	78,000	1,41,000	84,000
Total Requirements	4,23,000	11,76,000	2,22,000
Less: Opening Stock	(96,000)	(1,71,000)	(1,11,000)
Quantity to be purchased	3,27,000	10,05,000	1,11,000
Cost permtr./Bag	Rs.160	Rs.30	Rs.110
Cost of Purchase (Rs.)	5,23,20,000	3,01,50,000	1,22,10,000

(iii) Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'

Particulars	**(**Rs.**)**
Raw – Material	
Y 2.5 mtr @160	400.00
Z 7.5 mtr @30	225.00
Empty Bag	110.00
Direct Labour (Rs.70× 9 minutes / 60 minutes)	10.50
Variable Manufacturing Overheads	60.00
Variable Cost of Production per bag	805.50

Answer for Q.NO.7.

Statement Showing Sales Budget for 2022-23

Division	**Product X**			**Product Y**			**Total**
	Qty.	**Rate (Rs.)**	**Amt. (Rs.)**	**Qty.**	**Rate (Rs.)**	**Amt. (Rs.)**	**Amt. (Rs.)**
East	1,020[1]	20	20,400	815[3]	40	32,600	53,000
West	1,430[2]	20	28,600	1,225[4]	40	49,000	77,600
Total	1,200		49,000	1,000		81,600	1,30,600

Workings

1. 800 × 112.5% +120 = 1,020 units

2. 1,200 × 107.5% + 140 = 1,430 units

3. 600 × 122.5% + 80 = 815 units

4. 1,000 × 112.5% + 100 = 1,225 units

Statement Showing Sales Budget for 2021-22

Division	Product X			Product Y			Total
	Qty.	Rate (Rs.)	Amt. (Rs.)	Qty.	Rate (Rs.)	Amt. (Rs.)	Amt. (Rs.)
East	800	18	14,400	600	42	25,200	39,600
West	1,200	18	21,600	1,000	42	42,000	63,600
Total	2,000		36,000	1,600		67,200	1,03,200

Statement Showing Actual Sales for 2021-22

Division	Product X			Product Y			Total
	Qty.	Rate (Rs.)	Amt. (Rs.)	Qty.	Rate (Rs.)	Amt. (Rs.)	Amt. (Rs.)
East	1,000	18	18,000	400	42	16,800	34,800
West	1,400	18	25,200	800	42	33,600	58,800
Total	2,400		43,200	1,200		50,400	93,600

Answer for Q.NO.8.

Master Budget for the year ending _____

Sales:			(Rs.)
Toughened Glass			6,00,000
Bent Glass			2,00,000
Total Sales			8,00,000
Less: Cost of production:			
Direct materials (60% of Rs.8,00,000)		4,80,000	
Direct wages (20 workers × Rs.150 × 12months)		36,000	
Prime Cost		5,16,000	
Fixed Factory Overhead:			
Works manager's salary (500 × 12)	6,000		
Foreman's salary (400 × 12)	4,800		
Depreciation	12,600		
Light and power (assumed fixed)	3,000	26,400	
Variable Factory Overhead:			

Stores and spares	20,000		
Repairs and maintenance	8,000		
Sundry expenses	3,600	31,600	
Works Cost			5,74,000
Gross Profit (Sales – Works cost)			2,26,000
Less: Adm., selling and distribution expenses			36,000
Net Profit			1,90,000

Answer for Q.NO.9.

ABC Ltd.

Budget for 85% capacity level for the period 2022-23

Budgeted production (units)		**85,000**
	Per Unit (Rs.**)**	**Amount (**Rs.**)**
Direct Material (note 1)	21.60	18,36,000
Direct Labour (note 2)	10.50	8,92,500
Variable factory overhead (note 3)	2.10	1,78,500
Variable selling overhead (note 4)	4.32	3,67,200
Variable cost	38.52	32,74,200
Fixed factory overhead (note 3)		2,20,000
Fixed selling overhead (note 4)		1,15,000
Administrative overhead		1,76,000
Fixed cost		5,11,000
Total cost		37,85,200
Add: Profit 20% on sales or 25% on total cost		9,46,300
Sales		47,31,500
Contribution (Sales – Variable cost)		14,57,300

Working Notes:

1. Direct Materials:

	(Rs.)		**(Rs.)**
75% Capacity	15,00,000	65% Capacity	13,00,000
65% Capacity	13,00,000	55% Capacity	11,00,000
10% change in capacity	**2,00,000**	10% change in capacity	**2,00,000**

For 10% increase in capacity, i.e., for increase by 10,000 units, the total direct material cost

regularly changes by Rs. 2,00,000

Direct material cost (variable) = Rs. 2,00,000 ÷ 10,000 = Rs. 20

After 8% increase in price, direct material cost per unit = Rs. 20 × 1.08

= Rs. 21.60

Direct material cost for 85,000 budgeted units = 85,000 × Rs. 21.60

= Rs. 18,36,000

2. Direct Labour:

	(Rs.)		(Rs.)
75% Capacity	7,50,000	65% Capacity	6,50,000
65% Capacity	6,50,000	55% Capacity	5,50,000
10% change in capacity	**1,00,000**	10% change in capacity	**1,00,000**

For 10% increase in capacity, direct labour cost regularly changes by Rs. 1,00,000.

Direct labour cost per unit = Rs. 1,00,000 ÷ 10,000 = Rs. 10

After 5% increase in price, direct labour cost per unit = Rs. 10 × 1.05 = Rs. 10.50

Direct labour for 85,000 units = 85,000 units × Rs. 10.50 = Rs. 8,92,500.

3. Factory overheads are semi-variable overheads:

	(Rs.)		**(Rs.)**
75% Capacity	3,50,000	65% Capacity	3,30,000
65% Capacity	3,30,000	55% Capacity	3,10,000
10% change in capacity	**20,000**	10% change in capacity	**20,000**

Variable factory overhead = Rs. 20,000 ÷ 10,000 = Rs. 2

Variable factory overhead for 75,000 units = 75,000 × Rs. 2 = Rs.1,50,000

Fixed factory overhead = Rs.3,50,000 – Rs. 1,50,000 = Rs. 2,00,000.

Variable factory overhead after 5% increase = Rs. 2 × 1.05 = Rs. 2.10

Fixed factory overhead after 10% increase = Rs. 2,00,000 × 1.10 = Rs. 2,20,000.

4. Selling overhead is semi-variable overhead:

	(Rs.)		(Rs.)
75% Capacity	4,00,000	65% Capacity	3,60,000
65% Capacity	3,60,000	55% Capacity	3,20,000
10% change in capacity	**40,000**	10% change in capacity	**40,000**

Variable selling overhead = Rs. 40,000 ÷ 10,000 units = Rs. 4

Variable selling overhead for 75,000 units = 75,000 × Rs. 4 = Rs. 3,00,000.

Fixed selling overhead = Rs. 4,00,000 – Rs. 3,00,000 = Rs. 1,00,000

Variable selling overhead after 8% increase = Rs. 4 × 1.08 = Rs. 4.32

Fixed selling overhead after 15% increase = Rs. 1,00,000 × 1.15 = Rs. 1,15,000

5. Administrative overhead is fixed:

After 10% increase = Rs. 1,60,000 × 1.10 = Rs. 1,76,000

Answer for Q.NO.10.

Head of Account	**Control basis**	**70%**	**80%**	**90%**	**100%**
Budgeted hours		7,000	8,000	9,000	10,000
		(Rs.**)**	**(**Rs.**)**	**(**Rs.**)**	**(**Rs.**)**
Variable expenses	Variable	1,260	1,440	1,620	1,800
Semi-variable expenses	Semi-variable	1,200	1,200	1,320	1,440
Fixed expenses	Fixed	1,800	1,800	1,800	1,800
Total expenses		4,260	4,440	4,740	5,040
Recovery rate per hour:					
Total expenses/Bud hours		0.61	0.55	0.53	0.50

Conclusion:

We notice that the recovery rate at 70% activity is Rs. 0.61 per hour. If in a particular month the factory works 8,000 hours, it will be incorrect to estimate the allowance as Rs.4,880 @ Rs.0.61. The correct allowance will be Rs.4,440 as shown in the table. If the actual expenses are Rs.4,500 for this level of activity, the company has not saved any money but has over-spent by Rs.60 (Rs.4,500 – Rs.4,440).

Answer for Q.NO.11.

(i) Calculation of Budgeted profit for the FY 2021-22

	60,000 units	
	Per unit (Rs.)	**Amount (Rs.)**
Sales **(A)**	800.00	4,80,00,000
Variable Costs:		
- Direct Material	300.00	1,80,00,000
- Direct Wages	100.00	60,00,000
- Variable Overheads	100.00	60,00,000
- Direct Expenses	60.00	36,00,000
- Variable factory expenses (75% of Rs.80 p.u.)	60.00	36,00,000
- Variable Selling & Dist. exp. (80% of Rs.40 p.u.)	32.00	19,20,000
Total Variable Cost **(B)**	652.00	3,91,20,000

Contribution **(C) = (A – B)**	148.00	88,80,000
Fixed Costs:		
- Office and Admin. exp. (100%)	--	12,00,000
- Fixed factory exp. (25%)	--	12,00,000
- Fixed Selling & Dist. exp. (20%)	--	4,80,000
Total Fixed Costs **(D)**	--	28,80,000
Profit **(C – D)**	--	60,00,000

(ii) Expense Budget of P Ltd. for the FY 2022-23 at 50% & 60% level

	60,000 units		**72,000 units**	
	Per unit (Rs.)	**Amount (Rs.)**	**Per unit (Rs.)**	**Amount (Rs.)**
Sales **(A)**	880.00	5,28,00,000	880.00	6,33,60,000
Variable Costs:				
- Direct Material	360.00	2,16,00,000	360.00	2,59,20,000
- Direct Wages	120.00	72,00,000	120.00	86,40,000
- Variable Overheads	120.00	72,00,000	120.00	86,40,000
- Direct Expenses	72.00	43,20,000	72.00	51,84,000
- Variable factory expenses	72.00	43,20,000	72.00	51,84,000
- Variable Selling & Dist. exp.	38.40	23,04,000	38.40	27,64,800
Total Variable Cost **(B)**	782.40	4,69,44,000	782.40	5,63,32,800
Contribution **(C) = (A – B)**	97.60	58,56,000	97.60	70,27,200
Fixed Costs:				
- Office and Admin. exp. (100%)	--	13,80,000	--	13,80,000
- Fixed factory exp. (25%)	--	13,80,000	--	13,80,000
- Fixed Selling & Dist. exp. (20%)	--	5,52,000	--	5,52,000
Total Fixed Costs **(D)**	--	33,12,000	--	33,12,000
Profit **(C – D)**	--	25,44,000	--	37,15,200

Answer for Q.NO.12.

Budget Showing Current Position and Position for 2022-23

	Position for 2021-22			**Position for 2022-23**			
	A	**B**	**Total (A+B)**	**A**	**B**	**C**	**Total (A+B+C)**
Sales (units)	2,00,000	1,00,000	–	1,50,000	50,000	2,00,000	–
	(Rs.)	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**	**(Rs.)**
(A) Sales	4,00,000	3,50,000	7,50,000	3,00,000	1,75,000	3,50,000	8,25,000
Direct Material	1,00,000	75,000	1,75,000	75,000	37,500	80,000	1,92,500

Direct wages	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Factory overhead (variable)	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Other variable costs	50,000	30,000	80,000	37,500	15,000	50,000	1,02,500
(B) Marginal Cost	2,50,000	2,05,000	4,55,000	1,87,500	1,02,500	2,30,000	5,20,000
(C) Contribution (A-B)	1,50,000	1,45,000	2,95,000	1,12,500	72,500	1,20,000	3,05,000
Fixed costs – Factory			1,00,000				1,00,000
– Others			80,000				80,000
(D) Total fixed cost			1,80,000				1,80,000
Profit (C – D)			1,15,000				1,25,000

Comments: Introduction of Product C is likely to increase profit by Rs. 10,000 (i.e. from Rs. 1,15,000 to Rs. 1,25,000) in 2022-23 as compared to 2021-22. Therefore, introduction of product C is recommended.

Answer for Q.NO.13.

(i) Statement showing Flexible Budget and its comparison with actual

		Master Budget 80,000 units	**Flexible Budget (at standard cost)**		**Actual for 72,000 units**	**Variance**
			Per unit	**72,000 units**		
A.	Sales	3,20,000	4.00	2,88,000	2,80,000	8,000 (A)
B.	Direct material	80,000	1.00	72,000	73,600	1,600 (A)
C.	Direct wages	1,20,000	1.50	1,08,000	1,04,800	3,200 (F)
D.	Variable overhead	40,000	0.50	36,000	37,600	1,600 (A)
E.	Total variable cost	2,40,000	3.00	2,16,000	2,16,000	
F.	Contribution	80,000	1.00	72,000	64,000	
G.	Fixed overhead	40,000	0.50	40,000	39,200	800 (F)
H.	Net profit	40,000	0.50	32,000	24,800	7,200 (A)

(ii) Variances:

Sales Price Variance = Actual Quantity (Standard Rate – Actual Rate)

= 72,000 nits (Rs. 4.00 – Rs. 3.89) =Rs. 8,000 (A)

Direct Material Cost Variance	=	Standard Cost for Actual output –Actual cost
	=	Rs. 72,000 – Rs. 73,600 = Rs. 1,600 (A)
Direct Material Price Variance	=	Actual Quantity (Standard rate – Actual Rate)
	=	$78,400 \text{ units} \left(Rs.1.00 - \frac{Rs.73,600}{78,400 \text{ units}} \right)$
	=	4,800 (F)
Direct Material Usage Variance	=	Standard Rate (Std. Qty. – Actual Quantity)
	=	Rs. 1 (72,000 units – 78,400 units)
	=	Rs. 6,400 (A)
Direct Labour Cost Variance	=	Standard Cost for actual output – Actual cost
	=	Rs. 1,08,000 – Rs.1,04,800 = Rs.3,200 (F)
Direct Labour Rate Variance	=	Actual Hour (Std Rate – Actual Rate)
	=	$70,400 \text{ hours} \left(Rs.1.5 - \frac{Rs.1,04,800}{70,400 \text{ units}} \right)$
	=	Rs. 800 (F)
Direct Labour Efficiency	=	Standard Rate (Standard Hour –Actual Hour)
	=	Rs. 1.5 (72,000 – 70,400) = Rs. 2,400 (F)
Variable Overhead	=	Recovered variable overhead – Actual variable overhead
	=	(72,000 units x Rs. 0.50) – Rs.37,600
	=	Rs.1,600(A)
Fixed Overhead Expenditure	=	Budgeted fixed overhead – Actual fixed overhead
	=	Rs. 40,000 – Rs. 39,200 = Rs. 800 (F)
Sales Volume (Profit) Variance	=	Std. Profit (Budgeted Quantity – Actual Quantity)
	=	Rs. 0.50 (80,000 – 72,000) = Rs.4,000(A)

Answer for Q.NO.14.

Maximum Capacity in a budget period

= 50 Employees × 8 Hrs. × 5 Days × 4 Weeks = 8,000 Hrs. Budgeted Hours

40 Employees × 8 Hrs. × 5 Days × 4 Weeks = 6,400 Hrs. Actual Hrs. = 6,000 Hrs. (given)

Standard Hrs. for Actual Output = 7,000 Hrs.

Budget No. of Days = 20 Days = 20 Days (4 Weeks x 5 Days)

Actual No. of Days = 20 – 1 = 19 Days

1. **Efficiency Ratio** = $\frac{\text{StandardHours}}{\text{ActualHours}} \times 100 = \frac{7000\text{Hours}}{6000\text{Hours}} \times 100 = 116.67\%$

2. **Activity Ratio** = $\frac{\text{Standard Hours}}{\text{BudgetedHours}} \times 100 = \frac{7000\text{hours}}{6,400\text{Hours}} \times 100 = 109.375\%$

3. **Calendar Ratio** $= \frac{\text{Available working days}}{\text{Budgeted working days}} \times 100 = \frac{19 \text{ days}}{20 \text{ days}} \times 100 = 95\%$

4. **Standard Capacity Usage Ratio** $= \frac{\text{Budgeted Hours}}{\text{Max. possible hours in the budgeted period}} \times 100$

$= \frac{6400 \text{Hours}}{8000 \text{Hours}} \times 100 = 80\%$

5. **Actual Capacity Usage Ratio** $= \frac{\text{Actual Hours worked}}{\text{Max. possible working hours in a period}} \times 100$

$= \frac{6,000}{8,000 \text{ hours}} \times 100 = 75\%$

6. **Actual Usage of Budgeted Capacity Ratio** $= \frac{\text{Actual working Hours}}{\text{Budgeted Hours}} \times 100$

$= \frac{6,000 \text{Hours}}{6,400 \text{Hours}} \times 100 = 93.75\%$

CHAPTER 15: SERVICE COSTING

Answer for Q.NO.1.

Weighted Average or Absolute basis – MT – Kilometer:

= (20 MT × 80 Kms) + (12 MT × 120 Kms) + (16 MT × 160 Kms)

= 1,600 + 1,440 + 2,560 = 5,600 MT - Kilometer

Simple Average or Commercial basis – MT – Kilometer:

= [{(20+12+16) / 3} MT × {(80+120+160) Kms]

=16 MT × 360 Kms = 5,760 MT – Kilometer

Answer for Q.NO.2.

Working Note:

(1) Total Kilometers run per annum:

= Number of Buses × Distance × Number of days in the Month × Number oftrips × 12 months

= 1 Bus × 40 kms × 25 Days × 6 Single trips (3 Round Trips) × 12 months =72,000 kms.

(2) Total Passenger Kilometers per annum:

Total Kilometers run per annum × Seating Capacity

= 72,000 Kms × 40 Seats = 28,80,000 Passenger-Kms.

(3) Petrol & oil Consumption per annum:

Total Kilometers run per annum × Petrol Consumption per KM

= 72,000 Kms × (Rs.500 / 100 Kms) = Rs. 3,60,000

Statement of Cost per Passenger – Km

Particulars	Per Annum	Per Passenger - Kilometer
A. Standing Charges:		
Insurance @ 3% on Rs.10,00,000	30,000	
Annual Tax	20,000	
Garage rent (Rs.20,000 × 12)	2,40,000	
Depreciation	4,00,000	
Salary of Driver (fixed part)	3,60,000	
Salary of Conductor (fixed part)	3,00,000	
Stationary	12,000	
Manager-cum-accountant's salary	2,04,000	
Total Standing Charges	**15,66,000**	0.5438
B. Running Charges:		
Diesel and other Oil (WN-3)	3,60,000	

Commission to Driver* (10%×Rs.28,40,000×1/2)	1,42,000	
Commission to Conductor* (10%×Rs.28,40,000×1/2)	1,42,000	
Total Running Charges	**6,44,000**	0.2236
C. Maintenance Charges:		
Repairs	2,04,000	0.0708
Grand Total (A+B+C)	**24,14,000**	0.8382
Profit (15%×Rs.28,40,000)	4,26,000	0.1479
Fare per Passenger Kilometer		**0.9861**

*Total takings = Standing Charges + (Running cost + Commission on takings)

+ Maintenance cost + ProfitLet Takings = X

Or, X = 15,66,000 + (3,60,000 + 0.1X) + 2,04,000 + 0.15X

Or, X – 0.25X = 21,30,000Or, X = 28,40,000

Answer for Q.NO.3.

i. Statement of Expenses of operating bus/ buses for a year

Particulars	Rate (Rs.)	Per Busper annum (Rs.)	Fleet of 5buses p.a. (Rs.)
(i) Standing Charges:			
Driver's salary	4,500 p.m	54,000	2,70,000
Cleaner's salary	3,500 p.m	8,400	42,000
Licence fee, taxes etc.	8,600 p.a.	8,600	43,000
Insurance	10,000 p.a.	10,000	50,000
Depreciation (15,00,000 – 3,00,000) ÷ 12 yrs	1,00,000 p.a.	1,00,000	5,00,000
(ii) Maintenance Charges:			
Repairs & maintenance	35,000 p.a.	35,000	1,75,000
(iii) Operating Charges:			
Diesel (Working Note 1)		1,62,000	8,10,000
Total Cost [(i) + (ii) + (iii)]		3,78,000	18,90,000
Cost per month		31,500	1,57,500
Total no. of equivalent students		150	750
Total Cost per half fareequivalent student		Rs. 210	Rs. 210

ii. Average cost per student per month:

A. Students coming from distance of upto 4 km. from school

$$= \frac{\text{Total cost per month}}{\text{Total no. of equivalent students}} = \frac{\text{Rs.}31,500}{150 \text{ students}} = \text{Rs. } 210$$

B. Students coming from a distance beyond 4 km. from school

= Cost of per half fare student × 2 = Rs. 210 × 2 = Rs. 420

Working Notes:

1. Calculation of Diesel cost per bus :

Distance travelled in a year:

(8 round trip × 8 km. × 25 days × 9 months)Distance travelled p.a.: 14,400 km.

Cost of diesel (per bus p.a.): $\frac{14,400 \text{km.}}{4 \text{kmpl}} \times \text{Rs. } 45 = \text{Rs.}1,62,000$

2. Calculation of equivalent number of students per bus :

Seating capacity of a bus 50 students

Half fare students (50% of 50 students) 25 students

Full fare students (50% of 50 students) 25 students

Total number of students equivalent to half farestudents

Full fare students (25 students × 2)	50 students
Add: Half fare students	25 students
Total Equivalent number of students in a trip	75 students
Total number of equivalent students in two trips(Senior + Junior)	150 students

Answer for Q.NO.4.

i. Calculation of total monthly cost for running truck:

	Particulars	Amount per annum (Rs.)	Amount per month (Rs.)
(i)	**Standing Charges:**		
	Annual fixed costs	6,00,000	50,000
(ii)	**Maintenance Charges:**	1,20,000	10,000
(iii)	**Running Cost:**		
	Running charges 2,94,400		
Less:	Penalty paid for overloading (12,400)		2,82,000
	Total monthly cost		3,42,000

(a) Cost per commercial tonne-km. $= \frac{\text{Rs.}3,42,000}{44,856 \text{ton} - \text{km.}} = \text{Rs. } 7.62$

(Refer to working note-1)

(b) Cost per absolute tonne-km. $= \frac{\text{Rs.}3,42,000}{44,720 \text{ton} - \text{km.}} = \text{Rs. } 7.65$

(Refer to working note-2)

ii. Calculation of Net Profit/Loss for the month of January:

Particulars	(Rs.)	(Rs.)
Truck hire charges received during the month:		
From Outward journey [(10 + 2) trips × 6 tonne × Rs. 2,400]	1,72,800	
From return journey {(5 trips × 8 tonne × Rs. 2,200) + [(6 + 1) trips × 6 tonne × Rs. 2,200]}	1,80,400	3,53,200
Less: Monthly running cost {as per (i) above}		(3,42,000)
Operating profit		11,200
Less: Penalty paid for overloading		(12,400)
Net Loss for the month		(1,200)

Working Notes:

1. Calculation of Commercial Tonne-km:

Particulars		Tonne-km.
A. Total Distance travelled		
To and fro (300 km × 2× 12 trips) (in km)		7,200
B. Average weight carried:		
Outward (12 journeys × 6 tonne + 2 journeys × 4 tonne)	80	
Return (5 journeys × 8 tonne + 6 journeys × 6 tonne + 1 journey × 6 tonne)	82	
Total weight	162	
No. of journeys	26	
Average weight (in tonne) (162÷26)	**6.23**	
Total Commercial Tonne-km (A×B)		44,856

2. Calculation of Absolute Tonne-km:

Particulars	Tonne-km.	Tonne-km.
Outward journeys:		
From city A to city B (10 journey × 300 km. × 6 tonne)	18,000	
From city A to city C (2 journeys × 140 km. × 6 tonne)	1,680	
From city C to city B (2 journeys × 160 km. × 4 tonne)	1,280	20,960
Return journeys:		
From city B to city A (5 journeys × 300 km. × 8 tonne) + (6 journeys × 300 km. × 6 tonne)	22,800	
From city B to city C (1 journey × 160 km. × 6 tonne)	960	23,760
Total Absolute Tonne-km		44,720

Answer for Q.NO.5.

Step 1: Calculation of Ton km travelled per trip for each source:

IOCL = 12 km x 5T = 60 Ton km

Bharath = 8 km x 5T = 40 Ton km

Step 2: Calculation of kms travelled per trip for each source

IOCL = 12 km x 2 = 24 km

BPCL = 8 km x 2 = 16 km

Step 3: Variable cost per trip for each source

IOCL = 24 km x 0.6 = Rs.14.4

BPCL = 16 km x 0.6 = Rs.9.6

Step 4: Time taken per trip

Particulars	IOCL	BPCL
Filling time	40 min	30 min
Time emptying	40 min	40 min
Travelling time	60 min $\left[\frac{60m}{24}\times 12\times 2\right]$	40 min $\left[\frac{60m}{24}\times 8\times 2\right]$
Total time (min)	140 min	110 min
Total time (hrs)	2.33 hrs	1.83 hrs

Step 5: Fixed cost per trip:

IOCL = 7.5 x 2.33 = Rs.17.5

BPCL = 7.5 x 1.83 = Rs.13.75

Step 6: Cost per ton km

Particulars	IOCL	BPCL
VC	14.40	9.6
FC	17.5	13.75
Total cost	31.90	23.35
Ton Km	60 Ton	40 Ton
Cost per Ton km	0.5317	0.58

Answer for Q.NO.6.

Calculation of relative costs of three proposals and their ranking

	per annum (Rs.)	I Use of company's car per km. (Rs.)	II Use of own car per km. (Rs.)	III Use of hired car per km. (Rs.)
Reimbursement		--	10.00	9.00*
Fixed cost:				
Insurance	1,200	0.06	0.06	--
Taxes	800	0.04	--	0.04
Depreciation (Rs. 6,00,000 - Rs.80,000) ÷ 5 year	1,04,000	5.20	--	--
Running and Maintenance Cost:				
Petrol	--	6.00	--	6.00
Repairs and Maintenance	--	0.20	--	--
Tyre	--	0.12	--	0.12
Total cost per km.	--	11.62	10.06	15.16
Cost for 20,000 km.		2,32,400	2,01,200	3,03,200
Ranking of proposals		II	I	III

* (Rs. 1,80,000 ÷ 20,000 km.)

The Second alternative i.e., use of own car by the executive and reimbursement of expenses by the company is the best alternative from company's point of view.

Answer for Q.NO.7.

Working Notes:

Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Chandigarh	250	2	8	4,000
Delhi to Agra	210	2	10	4,200
Delhi to Jaipur	270	2	6	3,240
				11,440

Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger- Km. per month
		(%)	Seats		
Delhi to Chandigarh & Back	800 (50 seats × 2 trips × 8 days)	90	720	250	1,80,000 (720 seats × 250 km.)
Delhi to Agra & Back	1,000 (50 seats × 2 trips × 10 days)	85	850	210	1,78,500 (850 seats × 210 km.)
Delhi to Jaipur & Back	600 (50 seats × 2 trips × 6 days)	100	600	270	1,62,000 (600 seats × 270 km.)
Total					5,20,500

Monthly Operating Cost Statement

	(Rs.)	(Rs.)
(i) Running Costs		
Diesel {(11,440 km ÷ 4 km) x Rs. 56}	1,60,160	
Lubricant oil {(11,440 km ÷ 100) x Rs. 10}	1,144	1,61,304
(ii) Maintenance Costs		
Repairs & Maintenance		1,000
iii) Standing charges		
Salary to driver	24,000	
Salary to conductor	21,000	
Salary of part-time accountant Insurance (Rs. 4,800 ÷12)	5,000	
	400	
Road tax (Rs. 15,915 ÷12)	1,326.25	
Permit fee	315	
Depreciation {(Rs. 12,00,000 ? 20%) ? 12}	20,000	72,041.25
Total costs per month before Passenger Tax (i) + (ii) + (iii)		2,34,345.25
Passenger Tax*		93,738.10
Total Cost		3,28,083.35
Add: Profit*		1,40,607.15
Total takings per month		4,68,690.50

*Let, total takings be X then

X = Total costs per month before passenger tax + 0.2 X (passenger tax) + 0.3 X (profit)

X = Rs. 2,34,345.25 + 0.2 X + 0.3 X

0.5 X = Rs. 2,34,345.25 or, X = Rs.4,68,690.50

Passenger Tax = 20% of Rs.4,68,690.50 = Rs. 93,738.10

Profit = 30% of Rs.4,68,690.50 = Rs. 1,40,607.15

Calculation of Rate per passenger km. and fares to be charged for different routes

Rate per Passenger-Km. = $\frac{\text{Total takings per month}}{\text{Total Passenger - Km. per month}} = \frac{\text{Rs.4,68,690.50}}{\text{5,20,500 passenger – k.m}} = \text{Rs.0.90}$

Bus fare to be charged per passenger.

Delhi to Chandigarh	=	Rs. 0.90 × 250 km	=	Rs. 225.00
Delhi to Agra	=	Rs. 0.90 × 210 km	=	Rs. 189.00
Delhi to Jaipur	=	Rs. 0.90 × 270 km	=	Rs. 243.00

Answer for Q.NO.8. .

Working Notes:

(i) Total equivalent single room suites

Nature of suite	Occupancy (Room-days)	Equivalent singleroom suites (Room-days)
Single room suites	36,000 (100 rooms ⨯ 360 days ⨯ 100%)	36,000 (36,000 ⨯ 1)
Double rooms suites	14,400 (50 rooms ⨯ 360 days ⨯ 80%)	36,000 (14,400 ⨯ 2.5)
Triple rooms suites	6,480 (30 rooms ⨯ 360 days ⨯ 60%)	32,400 (6,480 ⨯ 5)
		1,04,400

(ii) Statement of total cost:

	(Rs.)
Staff salaries	14,25,000
Room attendant's wages	4,50,000
Lighting, heating and power	2,15,000
Repairs and renovation	1,23,500
Laundry charges	80,500
Interior decoration	74,000
Sundries	1,53,000
	25,21,000
Building rent {(Rs.10,000 ⨯ 12 months) + 5% on totaltaking}	1,20,000+ 5% on total takings
Total cost	26,41,000 + 5% on total takings

Profit is 20% of total takings

∴ Total takings = Rs. 26,41,000 + 25% (5% +20%) of total takings

Let R be rent for single room suite

Then 1,04,400 R = 26,41,000 + (0.25 × 1,04,400 R)

Or, 1,04,400 R = 26,41,000 + 26,100 R

Or, 78,300 R = 26,41,000

Or, R = Rs.33.73

Alternatively

Let total takings be x

∴ X= 26,41,000 + .25X (5% + 20%)

∴ X = 35,21,333

Let the rent of single room be R Then 1,04,400 R = 35,21,333Or, R = Rs.33.73

Rent to be charged:

Rent to be charged for single room suite	=	Rs.33.73
Rent for double rooms suites Rs. 33.73 ⨯ 2.5	=	Rs.84.33
Rent for triple rooms suites Rs.33.73 ⨯ 5	=	Rs.168.65

Answer for Q.NO.9.

Working Notes:

(i) Total Room days in a year

Season	Occupancy (Room-days)	Equivalent Full Roomcharge days
Season – 80% Occupancy	100 Rooms × 80% × 6 months × 30 days in a month = 14,400 Room Days	14,400 Room Days ×100% = 14,400
Off-season – 40% Occupancy	100 Rooms × 40% × 6 months × 30 days in a month = 7,200 Room Days	7,200 Room Days ×50% = 3,600
Total Room Days	14,400 + 7,200 = 21,600 Room Days	18,000 Full Room days

(ii) Lighting Charges:

It is given in the question that lighting charges for 8 months is Rs.120 per month and during winter season of 4 months it is Rs.30 per month. Further it is also given that peak season is 6 months and off season is 6 months.

It should be noted that – being Hill station, winter season is to be consideredas part of Off season. Hence, the non-winter season of 8 months include – Peak season of 6 months and Off season of 2 months.

Accordingly, the lighting charges are calculated as follows:

Season	Occupancy (Room-days)
Season & Non-winter – 80% Occupancy	100 Rooms × 80% × 6 months × Rs.120 permonth = Rs. 57,600
Off- season & non-winter – 40% Occupancy (8 – 6 months)	100 Rooms × 40% × 2 months × Rs.120 permonth = Rs. 9,600
Off- season & -winter – 40% Occupancy months)	100 Rooms × 40% × 4 months × Rs. 30 per month = Rs. 4,800
Total Lighting charges	Rs. 57,600+ 9,600 + 4,800 = Rs. 72,000

Statement of total cost:

	(Rs.)
Staff salary	5,50,000
Repairs to building	2,61,000
Laundry & Linen	80,000
Interior	1,75,000
Sundries Expenses	1,90,800
Depreciation on Building (Rs. 200 Lakhs × 80% × 5%)	8,00,000
Depreciation on Furniture & Equipment (Rs. 200 Lakhs × 20% × 15%)	6,00,000
Room attendant's wages (Rs. 10 per Room Day for 21,600 Room Days)	2,16,000
Lighting charges	72,000
Total cost	29,44,800
Add: Profit Margin (20% on Room rent or 25% on Cost)	7,36,200
Total Rent to be charged	36,81,000

Calculation of Room Rent per day:

Total Cost / Equivalent Full Room days = Rs. 36,81,000/ 18,000 = Rs.204.50

Room Rent during Season – Rs.204.50

Room Rent during Off season = Rs.204.50 × 50% = Rs. 102.25

Answer for Q.NO.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 (Rs. 2,000 per patient per day × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (Rs. 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) – (Rs.)	6,00,000	
Medicines (Variable) – (Rs.)	7,50,000	
Bed Hire Charges (Rs.100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (Rs. 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × Rs.25,000 × 12)	6,00,000	
Nurses (4 persons × Rs. 20,000 × 12)	9,60,000	
Ward Boys (4 persons × Rs. 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses – (Rs.)	10,80,000	
Administration expenses allocated – (Rs.)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

1. **Calculation of Contribution per Patient day**

   Total Contribution – Rs. 1,03,95,000

   Total Patient days – 8,000

   Contribution per Patient day – Rs. 1,03,95,000 / 8,000 = Rs. 1,299.375

2. **Breakeven Point = Fixed Cost / Contribution per Patient day**

   = Rs. 48,61,000 / Rs.1,299.375

   = 3,741 patient days

Answer for Q.NO.11.

Working Notes:

(1) Calculation of Cost per month and Overhead absorption rate

Particulars	Total Per Annum	Per PersonPer Annum	Per PersonPer Month
Salary to Software Engineer (5 Persons)	Rs.15,00,000	Rs. 3,00,000	Rs.25,000
Salary to Project Leaders(2 persons)	Rs. 9,00,000	Rs. 4,50,000	Rs. 37,500
Salary to Project Manager	Rs. 6,00,000	Rs. 6,00,000	Rs. 50,000
Total	Rs. 30,00,000		Rs. 1,12,500

(2) Total Overhead = Repairs & maintenance + Administration overheads

= Rs. 3,00,000 + Rs.12,00,000 = Rs.15,00,000

(3) Calculation of Overhead absorption rate

= Total Overhead / Total Salary = Rs.15,00,000 / Rs.30,00,000 = 50%

Project Cost Sheet

		(Rs.)
Salary Cost:		
Salary of Software Engineers	(3 × Rs. 25,000 × 6 months)	4,50,000
Salary of Project Leader	(Rs. 37,500 × 6 months)	2,25,000
Salary of Project Manager	(Rs. 50,000 × 2 months)	1,00,000
Total Salary		7,75,000
Overheads	(50% of Salary)	3,87,500
Travel Expenses		1,87,500
Depreciation on Laptops	(Rs.1,00,000 / 2 years × 6 months)	25,000
Total Project Cost		13,75,000

Answer for Q.NO.12. .

Calculation of cost for the month of April

Particulars		(Rs.)
Salary to Collection Personnel	(3 Shifts × 4 persons per shift ×30 days × Rs. 550 per day)	1,98,000
Salary to Supervisor	(2 Shifts × 1 persons per shift ×30 days × Rs. 750 per day)	45,000
Salary to Security Personnel	(3 Shifts × 6 persons per shift ×30 days × Rs. 450 per day)	2,43,000
Salary to Toll Booth Manager	(2 Shifts × 1 persons per shift ×30 days × Rs. 900 per day)	54,000

Electricity		8,00,000
Telephone		1,40,000
Maintenance cost		30,00,000
Total operating cost (A)		44,80,000
Depreciation and amortisation expenses (B)		1,50,00,000
Total Cost (A + B)		**1,94,80,000**

(i) Calculation of cost per kilometer per month:

$$= \frac{\text{Total Cost}}{\text{Total km.}} = \frac{\text{Rs.}1,94,80,000}{60\text{ km.}} = \text{Rs. } 3,24,666.67$$

(ii) Calculation of toll rate per vehicle:

$$= \frac{\text{Total Cost} + 25\%\text{ profit}}{\text{Vehicles per month}} = \frac{\text{Rs. } 1,94,80,000 + \text{Rs.}48,70,000}{10,00,000 \text{ vehicles}} = \text{Rs. } 24.35$$

Working:

No. of vehicles using the highway per month

$$\frac{\text{Total estimated vehicles}}{10\text{years}} \times \frac{1\text{month}}{12\text{months}} = \frac{12\text{crore}}{10\text{years}} \times \frac{1\text{month}}{12\text{months}} = 10\text{lakhs}$$

Answer for Q.NO.13.

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

Activities	**Amount (Rs. 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 (Rs. 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

= Rs.12,67,000 + Rs.1,90,050

= Rs.14,57,050

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

= Rs.19.06 per equivalent vehicle

Vehicle type-wise toll fee:

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

Working Note:

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

Sl. No.	Type of vehicle	Dailytraffic 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 commercialvehicles	816	0.45	9	7,344
	Total				76,444

Answer for Q.NO.14. .

Calculation of Cost per annum

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
Re-apportionment of Economics & Mathematicsteachers' salary (W.N- 2)	(84,000)	1,45,091	(61,091)	-
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600

Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200
Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administrationexpenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000
Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

(i) Calculation of cost per student per annum

Particulars	Arts (Rs.)	Commerce(Rs.)	Science(Rs.)	Total (Rs.)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student perannum	17,397	9,533	19,238	13,610

(ii) Calculation of profitability

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Fees per annum	12,000	12,000	12,000	
Cost per student perannum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

(iii) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts(Rs.)	Commerce(Rs.)	Science(Rs.)
Cost per student per annum	17,397	9,533	19,238
Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764

Working Notes:

(1) Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (Rs. 35,000 x 12)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

(2) Re-apportionment of Economics and Mathematics teachers' salary

	Economics		Mathematics	
Particulars	**Arts**	**Commerce**	**Science**	**Commerce**

No. of classes	832	208	940	160
Salary re-apportionment (Rs.)	(84,000)	84,000	(61,091)	61,091
	$\left(\frac{Rs.4,20,000}{1,040}\times 208\right)$		$\left(\frac{Rs.4,20,000}{1,100}\times 160\right)$	

(3) Principal's salary has been apportioned on the basis of time spent byhim for administration of classes.

(4) Lab attendants' salary has been apportioned on the basis of lab classesattended by the students.

(5) Salary of library staffs are apportioned on the basis of time spent by thestudents in library.

(6) Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

	Amount (Rs.**)**
Peon dedicated for higher secondary (1 peon × Rs.10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × Rs.10,000 × 12 months)}	54,000
	1,74,000

(7) Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.

(8) Examination expenses has been apportioned taking number of students into account (It may also be apportioned on the basis of number of examinations).

Answer for Q.NO.15. .

(i) Calculation of total cost for 'Professionals Protection Plus policy

	Particulars	**Amount (Rs.)**	**Amount (Rs.)**
1.	**Marketing and Sales support:**		
	- Policy development cost	11,25,000	
	- Cost of marketing	45,20,000	
	- Sales support expenses	11,45,000	67,90,000
2.	**Operations:**		
	- Policy issuance cost	10,05,900	
	- Policy servicing cost	35,20,700	
	- Claims management cost	1,25,600	46,52,200
3.	**IT Cost**		74,32,000
4.	**Support functions**		
	- Postage and logistics	10,25,000	

	- Facilities cost	15,24,000	
	- Employees cost	5,60,000	
	- Office administration cost	16,20,400	47,29,400
	Total Cost		**2,36,03,600**

(ii) Calculation of cost per policy = $\frac{\text{Total cost,}}{\text{No. of policies}} = \frac{\text{Rs.2,36,03,600}}{528} = \text{Rs.44,703.79}$

(iii) Cost per rupee of insured value =- $\frac{\text{Total cost,}}{\text{Total insured value}} = \frac{\text{Rs.2.36 crore}}{\text{Rs.1,320 crore}}$ = Rs. 0.0018

Answer for Q.NO.16. .

Statement showing computation of the cost of processinga typical home loan application

	(Rs.)
Direct professional labour cost	2,40,000
(4 employees @ Rs. 60,000 each)	
Service overhead cost (25% of Rs. 1,81,000)	45,250
Total processing cost per month	2,85,250
No. of applications processed per month	500
Total processing cost per home loan application	570.5

Answer for Q.NO.17. .

Cost Statement of Ignus Thermal Power Station

Total units generated 20,00,000 kwh.

	Per annum (Rs.)	**Per kWh (Rs.)**
Fixed costs:		
Plant supervision	6,00,000	
Administration overheads	40,00,000	
Depreciation (5% of Rs. 5,00,00,000 p.a.)	25,00,000	
Total fixed cost: (A)	71,00,000	3.55
Variable costs:		
Operating labour	30,00,000	
Lubricants, spares and stores	8,00,000	
Repairs & maintenance	10,00,000	
Coal cost (Refer to working note)	17,00,000	
Total variable cost: (B)	65,00,000	3.25
Total cost [(A) + (B)]	1,36,00,000	6.80

Working Note:

Coal cost (20,00,000 kwh. ÷ 5 kwh) × Rs. 4.25 per kg. = Rs. 17,00,000

Answer for Q.NO.18. .

Working:

1. Estimated power generated in a year

= 1000 Megawatt × 85% × 365 days

= 3,10,250 Megawatt

Calculation of 1 kW power generation cost:

	Cost particulars	**Amount (Rs. in Lakh)**
A.	Employee cost per year	2500
B.	Solar panel maintenance cost per year	250
C.	Site maintenance cost per year	150
D.	Depreciation per year	5940
E.	Total Cost [A+B+C+D]	8840
F.	Estimated power generated (in Megawatt)(Refer working note-1)	3,10,250
G.	Cost of generating 1 Megawatt (Rs.)[(E÷F)×1,00,000]	2,849.31
H.	**Cost of 1 kW (**Rs.**) [G÷1,000]**	**2.849**