MARGINAL COSTING

Q1. State why and under what conditions will profits under absorption costing be (a) higher than; (b) equal to; (c) lower than the profits under marginal costing. **[June 17 - 5 Marks]**

Answer: Profits as per absorption costing will be:

(a) Higher than in marginal costing when closing stock is more than opening stock, since some overheads will be included in the inventory value under absorption costing while Marginal Costing considers the full overheads as cost of production,

(b) Equal when the opening and closing stocks are equal.

(c) Lower when opening stock is more than dosing stock.

Since under Marginal Costing, only the current period's overheads are charged to production, while under absorption costing, a portion of the earlier period's overheads will be included in the opening stock value.

Q2. SHRIJINI LTD. having a Margin of Safety of Rs. 4 lacs make a Profit of Rs. 80,000. If its Fixed Cost is Rs. 5 lacs, what will be Break-Even Sales of SHRIJINI LTD.? **[June 15 - 2 Marks]**

Answer:

Margin of Safety	Rs. 4,00,000
Profit	Rs. 80,000
PV ratio $\left[\frac{Profit}{Margin\ of\ Safety} \times 10\right]$	$\frac{80,000}{4,00,000}$ x 100 = 20 %
Fixed Cost	Rs. 5,00,000
Break Even Sales $\left[\frac{Fixed\ cost}{PV\ Ratio}\right]$	$\frac{5,00,000}{20\%}$ = Rs. 25,00,000

Q3. Normal capacity of SUVAN LTD. is 2,40,000 Units per annum. Cost structure for the year ending 31 March, 2015 is as follows:

Direct material cost per unit	Rs. 25
Direct labour cost per unit (subject to a minimum of 2,50,000 per month)	Rs. 20
Overheads: Fixed	Rs. 18,00,000
Variable per unit	Rs. 15

Semi variable Rs. 9,60,000 per year upto 50% capacity and additional Rs. 3,00,000 for every 20% increase in capacity or part thereof. In year 2015-16 the company to be worked at 60% capacity for the first four months but it was expected that it would work at 80% capacity for the remaining 8 months. During the first four months, the selling price per unit will be fixed at Rs. 100.

Required:

What should be the price per unit in the remaining sight months to earn a total Profit of Rs. 43,80,000? **[June 15 - 10 Marks]**

Answer: **Profit Statement for first four months**

Sales Quantity (Rs. 2,40,000 x 60% x 4/12)		48,000 Units
Sales Value (Rs. 100 x 48,000)		Rs. 48,00,000
Less: Variable Cost:		
Material Cost (125 x 48,000)	12,00,000	
Overhead (15 x 48,000)	7,20,000	
Labour Cost (2,50,000 x 4)	10,00,000	Rs. 29,20,000
Contribution		Rs. 18,80,000
Less: Semi variable cost (9,60,000 + 3,00,000) x 4/12- = Rs. 4,20,000		
Fixed Cost (18,00,000 x 4/12) = Rs. 6,00,000		Rs. 10,20,000
Profit		**Rs. 8,60,000**

Desired Profit During the year = Rs. 43,80,000

Profit earned during first four months = Rs. 8,60,000

Profit to be earned during the remaining 8 months = Rs. 35,20,000

Calculation of selling price for remaining 8 months:

Unit Sold (2,40,000 x 80% x 8/12) = 1,28,000 units

Total Variable Cost:	Material Rs. 25 x 1,28,000	32,00,000
	Labour Rs. 20 x.1.28,000	25,60,000
	Overheads Rs. 15 x 1,28,000	19,20,000
		76,80,000

Semi variable cost (9,60,000 + 3,00,000 + 3,00,000) x 8/12 = Rs. 10,40,000

Fixed Cost (18,00,000 x 8/12)	Rs. 12,00,000
Total Cost	99,20,000
Desired Profit	35,20,000
Total Sale Value	1,34,40,000
Selling price (1,34,40,000/1,28,000)	Rs. 105

Q4. SHEENNA LTD., an appliance manufacturer, has always sold its product through wholesale Rs. Last year its sales were Rs. 20,00,000 and its net profit 10% of sales. As a result of the increase in appliance sales through departmental stores and e-commerce business establishment, the company is considering elimination of wholesalers and selling directly to retailed. It is estimated that this would result in a 40% drop in sales but net profit would be Rs. 1,80,000 due to the elimination of middlemen. Fixed expenses would increase from Rs. 2,00,000 to Rs. 3,00,000 owing to additional storage & logistics facilities. As a Management Accountant you are required to find out:

(a) Whether the proposed change would raise or lower the breakeven point in rupees? By how much? Give reason.

(b) What would be sale volume in rupees which would enable Sheena Ltd. to obtain as much profit as it made last year?

[June 15 - 10 Marks]

Answer:

1. Sales	Rs. 20,00,000
Net Profit 10% of sales	Rs. 2,00,000
Fixed Expenses	Rs. 2,00,000
Contribution = Profit + Fixed Expenses = Rs. 2,00,000 + 2,00,000	Rs. 4,00,000
PV Ratio = Contribution/Sales x 100 = 4,00,000/20,00,000 x 100	20 %
Break even sales = Fixed Expenses / PV Ratio = 2,00,000/20%	Rs. 10,00,000
Sales through Departmental stores = 60% of 20,00,000	Rs. 12,00,000
Profit	Rs. 1,80,000
Fixed Expenses	Rs. 3,00,000
Contribution	Rs. 4,80,000
PV Ratio = Contribution/Sales x 100 = Rs. 4,80,000/Rs. 12,00,000 X 100	40%
Break even sales = Fixed Expenses / PV Ratio = Rs. 3,00,000 /40%	Rs. 7,50,000
Break even sales will be lowered by	Rs. 2,50,000
Reason- Variable cost will be decreased due to elimination of middlemen.	
2. Sales for desired profit = Desired profit + fixed Exp./PV ratio, Rs. 2,00,000 + Rs. 3,00,000/40%	Rs. 12,50,000

Q5. Given: Sales Rs. 2,00,000; Fixed Cost Rs. 40,000; BEP Rs. 1,60,000. Ascertain the profit. **[Dec 15 - 2 Marks]**

Answer:

BEP $= \frac{\text{Fixed cost}}{\text{PV Ratio}} = 1,60,000 = \frac{40,000}{\text{PV Ratio}}$

or P/V Ratio $= \frac{1}{4} = \frac{\text{Contribution}}{\text{Sales}} = \frac{1}{4}$

Contribution $= \frac{\text{Sales}}{4} = \text{Contribution} = \frac{2,00,000}{4} = \text{Rs. } 50\,000$

Variable Cost = Sales - Contribution

Variable Cost = 2,00,000 - 50,000

= Rs. 1.50,000

Profit = Sales - FC - VC

Profit = 2,00,000 - 40,000 - 1,50,000

= Rs. 10,000.

Q6. In 2014 the turnover of Akash Ltd., which operated at a margin of safety of 25%, amounted to Rs. 12,00,000 and its profit volume ratio was 40%. During 2015 the company estimated that although the same volume of sales would be maintained, the sale value would go down due to decrease in selling price. There will be no change in variable costs. The company proposes to reduce its fixed costs through an intensive cost reduction programme. These changes will alter the profit volume ratio and margin of safety to $\frac{100}{3}$ % and 40% respectively in 2015.

You are required to present a comparative statement indicating sales, variable costs, fixed costs and profits of the company for 2014 & 2015. **[Dec 15 - 10 Marks]**

Answer: Comparative statement indicating sales, variable costs, fixed costs & profits of company for 2014 & 2015

	2014		2015	
	Note no.	Amount	Note no.	Amount
Sales (S)		12,00,000	7	10,80,000
Variable Cost (VC)	1	7,20,000	6	7,20,000
Contribution (C)	2	4,80,000	8	3,60,000
BEP	3	9,00,000	9	6,48,000
Fixed Cost (FC)	4	3,60,000	10	2,16,000
Profit (P)	5	1,20,000	11	1,44,000

Working Note:

2014	2015
P/V Ratio = 0.4 (Given)	6. VC = Rs. 7,20,000 (Same as 2014)
VC/S = 1 - P/V = 1 - 0.4 = 0.6	PA/ Ratio = 100/3% = 1/3 (Given)
MOS = 0.25 x S (Given)	VC/S = 1 -1/3 = 2/3
1. VC = (VC/S) x S = 0.6 x 12,00,000 = Rs. 7,20,000	MOS = 0.40 x S (Given)
2. C = S - VC = Rs. 4,80,000	7. S = VC x (3Rs. 2) = 7,20,000 x 3/2 = Rs. 10,80,000
3. BEP = S - MOS = S - 0.25 x S = 0.75 x S = Rs. 9,00,000	8. C = S - VC = 10,80,000 - 7,20,000 = Rs. 3,60,000
4. FC = BEP x P/V = 9,00,000 x 0.4 = Rs. 3,60,000	9. BEP = S -MOS = 10,80,000 - 0.40 x S = 10,80,000 - 4,32,000 = Rs. 6,48,000
5. P = C - FC = 4,80,000 - 3,60,000 = Rs. 1,20,000	10. FC = BEP x P/V = 6,48,000 x 100/3% = Rs. 2,16,000
	11. P = C - FC = 3,60,000 - 2,16,000 = Rs. 1,44,000.

Q7. If BEP is Rs. 39,00,000 at 65% level of sales & profit is Rs. 8,40,000 at 100% level of sales, find out P/V ratio.

[June 16 - 2 Marks]

Answer:

At 65% of level of sales BEP = Rs. 39,00,000

Total sales = $\frac{39,00,000}{65\%}$ = Rs. 60,00,000

Margin of Safety = Total Sales - Break even sales = 60,00,000 - 39,00,000 = Rs. 21,00,000

P/V ratio = $\frac{\text{Profit}}{\text{Margin of Safety}} = \frac{8,40,000}{21,00,000} \times 100 = 40\%$

Q8. If fixed cost per unit is Rs. 40 at 40% level of capacity what should be fixed cost per unit at 80% level of capacity?

[June 16 - 2 Marks]

Answer:

Fixed cost per unit is Rs. 40 at 40% level.

Therefore, fixed cost per unit at 80% = $\frac{Rs.40}{2}$ = Rs. 20 per unit

Note: As the level of capacity increases, fixed cost per unit decreases. Although total fixed cost remains the same irrespective of level of production.

Q9. ABC Ltd. has furnished the following data for the two years:

Particulars	2015-16	2016-17
Sales (Rs.)	10,00,000	?
Profit/Volume Ratio	50%	37.5%
Margin of safety sales as a % of total sales	40%	21.875%

There has been substantial savings in the fixed cost in the year 2016-17 due to the restructuring process. The company could maintain its sales quantity level of 2015-16 in 2016-2017 by reducing the selling price.

You are required to calculate the following values:

(a) Sales for 2016-17; (b) Break-even sales for 2016-17; (c) Fixed cost for 2016-17 **[June 17 - 8 Marks]**

Answer:

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}}$ = 50%

Contribution = Sales x 50% = 10,00,000 x 50% = 5,00,000

MOS = 10,00,000 x 40% = 4,00,000

Also MOS = Total Sales - Break Even Sales

4,00,000 = 10,00,000 - Break-even Sales

Break Even Sales = 6,00,000

Variable Cost = Sales - Contribution = 10,00,000-5,00,000 = 5,00,000

Fixed Cost = BEP x P/V Ratio = 3,00,000

2016-17

As sales quantity is same as in 2015-16, hence, total variable cost will remain same.

$\frac{\text{Sales} - \text{VC}}{\text{Sales}} = 37.5\% \rightarrow 1 - \frac{\text{VC}}{\text{Sales}} = 37.5\% \rightarrow 1 - \frac{5,00,000}{\text{Sales}} = 37.5\% \rightarrow \frac{5,00,000}{\text{Sales}} = 0.625$

→Sales = 8,00,000

MOS = 21.875% of Sales = 8,00,000 x 21.875% = Rs. 1,75,000

BEP = Total Sales - MOS = 8,00,000-1,75,000 = Rs. 6,25,000

Also BEP = $\frac{\text{Fixed cost}}{\text{PV Ratio}}$

6,25,000 = $\frac{\text{F.C.}}{37.5\%}$

F.C. = 6,25,000 x 37.5% = Rs. 2,34,375

Q10. A firm can produce three different products from the same raw material using the same production facilities. The requisite labour is available in plenty at Rs. 8 per hour for all products. The supply of raw material, which is imported at Rs. 8 per Kg is limited to 10,400 kg. for the budget period. The variable overheads are Rs. 5.60 per hour. The fixed overheads are Rs. 50,000. The selling commission is 10% on sales.

From the following information, you are required to suggest the sales mix which will maximize the firm's profits. Also determine the profit that will be earned at the level: **[June 17 - 7 Marks]**

Product	Market Demand (units)	Selling Price Per unit	Labour (Hours Required per unit)	Raw Material (Kg Required per unit)
X	8,000	30	1	0.7
Y	6,000	40	2	0.4
Z	5,000	50	1.5	1.5

Answer:

Particulars	X	Y	Z
Selling Price per unit Variable Cost	30	40	50
Material	5.6	3.2	12.0
Labour	8.0	16.0	12.0
Var. OH	5.6	11.2	8.4
Selling Commission	3.0	4.0	5.0
Contribution per unit	7.8	5.6	12.6
Contribution per kg of Raw material	11.14	14	8.4
Rank	II	I	III

Raw Material Wages:

Y→ 6,000 x 0.4 = 2,400 kg.

X→ 8,000 x 0.7 = 5,600 Kg.

Total = 8000

Raw Material left for Z = 10,400 - 8,000 = 2,400

Units of Z to be produced = $\frac{2,400}{1.5}$ = 1,600 units

Sales Mix: = X: 8,000 units, Y: 6,000 units, Z:600 units

Total Contribution = (8,000 x 7.8) + (6,000 x 5.6) + (1,600 x 12.6) = 1,16,160

Profit = 1,16,160 - 50,000 = Rs. 66,160

Q11. Following particulars relate to a manufacturing factory for the month of March, 2017

Variable cost per unit	Rs. 14
Fixed factory overhead	Rs. 5,40,000
Fixed selling overhead	Rs. 2,52,000
Sales price per unit	Rs. 20

(a) What is the break-even point expressed in rupee sales?

(b) How many units be sold to earn a target net income of Rs. 60,000 per month?

(c) How many units must be sold to earn a net income of 25% on cost?

(d) What should be the selling price per unit if break-even point is to be brought down to 120000 unit? **[Dec 17 - 8 Marks]**

Answer:

(a) Calculation of BEP in rupee sales:

P/V Ratio = $\frac{S-V}{S} = \frac{20-14}{14}$ x 100 = 30%

BEP = $\frac{F}{\frac{P}{V}\text{Ratio}} = \frac{5,40,000+2,52,000}{30\%}$ = Rs. 26,40,000

(b) Sales to earn a target net income of Rs. 60,000 per month:

Contribution per unit = Rs. 20 - Rs. 14 = Rs. 6.

Sales in units = $\frac{\text{F + Desired profit}}{\text{Contributions per unit}} = \frac{7,92,000 + 60,000}{6}$ = 1,42,000

(Sales in Rupees = 1,42,000 x Rs. 20 = Rs. 28,40,000.) → This is optional

(c) No. of units to be sold to earn a net income of 25% on cost:

Profit @ 25% on cost means a profit @ 20% on Sales.

Let sales be assumed as Rs. X; the desired profit will be 20% of X or .20 X.

Now, X = $\frac{\text{F + Desired profit}}{\frac{\text{P}}{\text{V}}\text{Ratio}}$

or X = $\frac{7,92,000 + 0.20x}{1} \times \frac{100}{3}$

or 30 X = 7,92,00,000 + 20X

or 10 X = Rs. 7,92,00,000

or X = Rs. 79,20,000

No. of units to be sold = $\frac{79,20,000}{20(\text{S.P.per unit})}$ = 3,96,000 units

(d) Selling Price per unit if BEP is brought down to 1,20,000 units

Contribution per unit = $\frac{\text{Fixed cost}}{\text{BEP in unit}} = \frac{7,92,000}{1,20,000}$ = 6.60 per unit.

Now, S.P. per unit = V + C = Rs. 14 + Rs. 6.60 = Rs. 20.60.

Q12. There are three similar plants under one Corporate Management who wants them to be merged for better operation. The following are the details relating to these plants.

	Plant A	Plant B	Plant C
Capacity in Operation	100%	70%	50%
	(Rs. In lacs)		
Turnover	300	280	150
Variable Cost	200	210	75
Fixed Cost	70	50	62

You are required to calculate:

(a) Capacity of merged plant to be operated to break-even

(b) Profitability of working at 75% capacity

(c) The turnover from the merged plant to give a profit of Rs. 28 lacs. **[Dec 17 - 7 Marks]**

Answer: Computation of Sales & Variable Costs for Plants B & C at 100 per cent capacity of working. (Rs. in lacs)

Capacity	Plant A	Plant B	Plant C	Merged Plant
	100%	100%	100%	100%
Sales	300	400	300	1,000
Less: Variable Cost at 100% Capacity	200	300	150	650
Contribution	100	100	150	350
Less: Fixed Cost	70	50	62	182
Profit	30	50	88	168

(a) P/V Ratio = $\frac{\text{Contribution}}{\text{sales}}$ x 100 = $\frac{350}{1000}$ x 100 = 35%

BEP (in Rs.) = $\frac{\text{Fixed cost}}{\text{P/V ratio}} = \frac{182}{35\%}$ = Rs. 520 lacs

Capacity of Rs. 520 lacs to total sales Rs. 1,000 lacs = $\frac{520}{1000}$ x 100 = 52%

(b) Sales at 75% capacity = Rs. 750 lacs

P = (Sales x P/V ratio) - Fixed Cost

= 750 x $\frac{35}{1000}$ - 182 or 262.5 - 182 = Rs. 80.5 lacs.

(c) Sales to earn a profit of Rs. 28 lacs.

Sales = $\frac{\text{Fixed cost + Desired profit}}{\text{P/V ratio}} = \frac{182 + 28}{35\%} = \frac{210}{35}$ = 600 lacs.

Q13. ANKIT LTD. a manufacturing Company which produces 3 Products furnishes following information for year 2016-17:

Particulars	Products		
	A	B	C
Selling Price (per unit)	Rs. 200	Rs. 150	Rs. 100
Profit Volume Ratio	10%	20%	40%
Raw Material content as a % of Variable Cost	50%	50%	50%
Maximum Sales Potential (units)	40,000	25,000	10,000

Fixed costs are estimated at Rs. 12 lacs. The firm uses same raw material in all the three products. Raw material is in 'Short Supply'. The firm has a quota for the supply of raw materials of the value of Rs. 36 lacs for the year 2016-17 for the production of three products to meet sales demand.

Required: Determine the optimal product mix and ascertain the maximum profit therefrom. **[June 18 - 8 Marks]**

Answer:

Marginal Cost Statement

Particulars	Product		
	A (Rs.)	B (Rs.)	C (Rs.)
Selling Price (SP)	200	150	100
Less: Variable Cost (VC) = SP – (SP × P/V Ratio)	180	120	60
Contribution per Unit (SP -VC)	20	30	40
Contribution per Key-Factor {C/KF (50% of VC)}	0.22	0.50	1.33
Ranking	III	II	1
Units Produced	20,000 (18,00,000/90)	25,000 (Maximum)	10,000 (Maximum)
Raw Material used (Rs.)	18,00,000 (Rs.36,00,000 - Rs.18,00,000)	15,00,000 (25,000 × Rs.60)	3,00,000 (10,000 × Rs.30)

Optimal Product Mix:

Product A 20,000 units (From remaining raw material)

Product B 25,000 units (Maximum)

Product C 10,000 units (Maximum)

Calculation of Profit

Particulars	(Rs.)
Product A 20,000 units x Rs. 20 (C per unit)	4,00,000
Product B 25,000 units x Rs. 30	7,50,000
Product C 10,000 units x Rs. 40	4,00,000
Total Contribution	15,50,000
Less: Fixed Cost	12,00,000
Maximum Profit	3,50,000

Q14. The following figures are obtained from the records of P. Ltd.:

	2015-16 (Rs.)	2016-17 (Rs.)
Sales	80,000	1,00,000
Net Profit	10,000	16,000

Required: Calculate the following:

(a) Profit Volume Ratio

(b) Break Even Point

(c) Profit or loss at sales of Rs. 40,000

(d) Sales required to earn a profit of Rs. 22,000

(e) Margin of Safety if sales in Rs. 55,000 **[June 18 - 7 Marks]**

Answer:

(a) Profit Volume Ratio:

P/V Ratio = (Change in Profit / Change in Sales) × 100 =(Rs.6,000/20,000)* × 100 = 30%

	Sales (Rs.)	Profit (Rs.)
*2016-17	1,00,000	16,000
2015-16	80,000	10,000
	20,000	6,000

(b) Break Even Point (BEP):

BEP = Sales x P/V Ratio (Contribution) = Fixed Cost (FC) + Profit or,

Rs. 80,000 x 30% = Fixed Cost + Rs.10,000 or,

Rs.24,000= Fixed Cost +Rs.10,000 or Fixed Cost

= Rs. 14,000

Or

Rs. 1,00,000 x 30% = FC + Rs. 16,000 or,

Rs. 30,000 = FC + Rs. 16,000 Or FC

= Rs. 14,000

Now, BEP = Sales x P/V Ratio = FC or, Sales x 30% = Rs.14,000 or BEP = Rs.46,667

Or, BEP Sales = Fixed Cost / (P/V Ratio) = Rs. 14,000/0.30 = Rs. 46,667

(c) Profit or Loss at Sales of Rs. 40,000 :

We know that: Sales × P/V Ratio = Fixed Cost + Profit

$\therefore$ Rs. 40,000 × 30% = Rs. 14,000 + Profit or,

Rs. 12,000 = Rs.14,000 + Profit or Profit = (-) Rs. 2,000

When Sales are Rs. 40,000, loss is Rs. 2,000.

(d) Sales required to earn a Profit of Rs. 22,000:

We know that: Sales × P/V Ratio= Fixed Cost + Profit or,

Sales × 30% = Rs. 14,000 + Rs. 22,000 or Sales = Rs. 1,20,000

(e) Margin of Safety if Sales is Rs. 55,000:

Margin of Safety (MS) = Sales at Activity Level - Break Even Sales = Rs. 55,000 − Rs. 46,667 or Rs. = Rs. 8,333

Q15. A company budgets for a production of 5 lacs units at a variable cost of Rs. 20 each. The fixed costs are Rs. 20 lacs. The selling price is fixed to yield a profit of 25% on cost.

You are required to calculate

(a) P/V Ratio and Breakeven point

(b) If the selling price is reduced by 20%,

Ascertain:

(A) The effect of price reduction on the P/V Ratio and BEP.

(B) The number of units required to be sold at the reduced selling price to obtain an increase of 20% over the budgeted profit.

[Dec 18 - 8 Marks]

Answer: **Statement Showing Unit Sales Price**

Particulars	Rs.
Budgeted Variable Cost per Unit	20.00
Budgeted Fixed Cost per Unit (Rs. $\frac{20,00,000}{5,00,000}$)	4.00
Total Budgeted Cost per Unit	24.00
Add: Profit (25% on Total Cost)	6.00
Per unit selling price	30.00

Statement of Budgeted Profit

Particulars	Rs.
Budgeted Sales (5,00,000 × Rs. 30)	1,50,00,000
Less: Variable Cost (5,00,000 × Rs.20)	1,00,00,000
Contribution	50,00,000
Less: Budgeted Fixed Cost	20,00,000
Budgeted Profit	30,00,000

OR

Budgeted Profit = Contribution (C) per Unit × Total Production Units - Fixed Cost

$$=\{(\text{Rs. } 30 - \text{Rs. } 20) \times 5,00,000\} - \text{Rs. } 20,00,000 = \text{Rs. } 30,00,000$$

1. P/V Ratio = (Contribution / Sales)$\times 100 = \left(\frac{50,00,000}{1,50,00,000}\right) \times 100 = \left(\frac{100}{3}\right)\%$

   Or, P/V ratio $= \frac{10}{30} \times 100 = 33\frac{1}{3}\%$ (Or $100/3\%$)

   BEP (in units) $= \frac{\text{F}}{\text{C per unit}} = \frac{20,00,000}{10} = 2,00,000$ units

   Or, BEP (in Rs.) $= \frac{\text{F}}{\text{P/V Ratio}} = \frac{\text{Rs. } 20,00,000}{33\frac{1}{3}\%} = \text{Rs. } 60,00,000$

2. (a) New P/V ratio $= \frac{\text{New C}}{\text{New SP}} \times 100 = \frac{\text{Rs.}24-20}{\text{Rs.}30-6} \times 100 = 16\frac{2}{3}\%$ (or 50/3%)

   New BEP (in Units) $= \frac{\text{Fixed cost}}{\text{New SP}} = \frac{\text{Rs.}20,00,000}{\text{Rs.}24-20} = 5,00,000$ units

   Or, New BEP (in Rs.) = (F/New P/V ratio) $= (20,00,000/50/3\%) = 1,20,00,000$

   (b) Sales units needed to attain 20% more than Budgeted Profit at reduced Selling Price.

   Desired Profit = Budgeted Profit + 20% of Budgeted Profit

   =30,00,000 + 6,00,000 = 36,00,000

   Sales (units) required $= \frac{\text{Fixed cost + Desired profit}}{\text{Contribution per unit}} = \frac{20,00,000+36,00,000}{\text{Rs. } 4 \text{ per unit}} = 14,00,000$ units.

Q16. AVONA LTD., a toy factory presents the following information for the year ended 31 March, 2018:

	Amount
Material cost	1,20,000
Labour cost	2,40,000
Fixed overheads	1,20,000
Variable overheads	60,000
Units produced	12,000
Selling Price per Unit	50

The available capacity is a production of 20,000 units per year. The firm has an offer for the purchase of 5000 additional units at a price of Rs. 40 per unit. It is expected that by accepting this offer there will be a saving of rupee one per unit in material cost on all units manufactured, the fixed overhead will increase by Rs. 35,000 and the overall efficiency will drop by 2% on all production. State whether offer is acceptable or not. **[Dec 18 - 7 Marks]**

Answer: **Profitability Statement for the year ended 31st March, 2018**

Particulars		Total Rs.	Per unit Rs.
Sales	(A)	6,00,000	50
Variable Cost:			
Materials		1,20,000	10
Labour		2,40,000	20
Variable overhead		60,000	5
Total	(B)	4,20,000	35
Contribution	(A) - (B)	1,80,000	15
Less: Fixed overheads		1,20,000	10
Profit		60,000	5

Profitability Statement (17000 units at 85% capacity) → (including 5,000 units special offer)

		Rs.	Marks
Sales			
Existing: (12000 × Rs. 50)		6,00,000	
Additional: (5000 × Rs.40)		2,00,000	
17,000 Units	Total (A)	8,00,000	0.5 + 0.5
Variable Cost:			
Material (17,000 × (10 – Re.1) or (17000 × Rs. 9)		1,53,000	0.5
Labour (17,000 × (Rs. 20 − 2% Drop) or (17000 × 20.40)		3,46,800	0.5
Variable Overhead	(17000 x Rs. 5)	85,000	
Total (B)		5,84,800	0.5
Contribution	(A) - (B)	2,15,200	0.5
Less: Fixed Costs (Rs. 1,20,000 + Rs. 35,000 increase)		1,55,000	0.5
Profit		60,200	0.5

Analysis: With the acceptance of special offer of 5,000 Units, the Profit is increased by Rs. 200 (i.e. Rs. 60,200 - Rs. 60,000). Hence, the firm can accept the special offer.

[Working Notes as under may be shown separately or as shown in above table "Profitability Statement"]

		Rs.
1. Material cost per unit		10
Less: 10% decrease		1
	Total	9
2. Labour Cost per unit		20.00
Add: 2% drop in efficiency		0.40
	Total	20.40
3. Present Production units		12,000
Add: Addl. Production units		5,000
	Total	17,000
4. Present Fixed Cost		1,20,000
Add: Increase		35,000
	Total	**1,55,000**

Alternative: Labour Cost if taken at Rs. 20.41 in the working. An alternative answer with an incremental approach lead to the same analysis.

Particulars	Amount
Sales (5000 x 40)	2,00,000
Less: Variable Cost:	
Direct Materials (DM) (5000 x 9)	45,000
Direct Labour (DL) (5000 x 20)/0.98	1,02,041
Variable Overheads (VO/Hs) $(5000 * 5)$	25,000
Contribution	27,959
Add: Savings in Materials $(12000^{*}1)$	12,000
Less: Additional Labour Cost (ADLC) $(12000^{*}0.41)$	4,920
Less: Increase in Fixed cost	35,000
Net Surplus	39
Decision: It is better to Accept the offer	

Q17. MODERN LTD. has three departments X, Y and Z, each of which makes a different product. The budgeted data for the coming year are as follows:

Particulars	X	Y	Z
Sales	22,40,000	11,20,000	16,80,000
Direct materials	2,80,000	40,000	2,80,000
Direct labour	1,12,000	1,40,000	4,48,000
Direct expenses	2,80,000	1,40,000	5,60,000
Fixed cost	5,60,000	2,80,000	5,60,000

The management of the company is considering to close down department ' Z '. There is a possibility of reducing fixed cost by Rs. 1,50,000 if department ' Z ' is closed down.

Advise the management whether or not department ' Z ' should be closed down. **[June 19 - 8 Marks]**

Answer: **Statement of Profit before closing Department ' Z '**

Particulars	X	Y	Z	Total
(1) Sales	22,40,000	11,20,000	16,80,000	50,40,000
(2) Variable Cost:				
Direct Materials	2,80,000	1,40,000	2,80,000	7,00,000
Direct Labour	1,12,000	1,40,000	4,48,000	7,00,000
Direct Expenses	2,80,000	1,40,000	5,60,000	9,80,000
(3) Total Variable Cost	6,72,000	4,20,000	12,88,000	23,80,000
(4) Contribution (1-3)	15,68,000	7,00,000	3,92,000	26,60,000
(5) Fixed Cost (As given in Question)	5,60,000	2,80,000	5,60,000	14,00,000
(6) Profit (4-5)	10,08,000	4,20,000	(1,68,000)	12,60,000

Statement of profit after closing Department 'Z'

Particulars	X	Y	Total
(1) Sales	22,40,000	11,20,000	33,60,000
(2) Variable cost:			
Direct Materials	2,80,000	1,40,000	4,20,000

Direct Labour	1,12,000	1,40,000	2,52,000
Direct Expenses	2,80,000	1,40,000	4,20,000
(3) Total Variable Cost	6,72,000	4,20,000	10,92,000
(4) Contribution (1-3)	15,68,000	7,00,000	22,68,000
(5) Fixed cost			12,50,000
(6) Profit (4-5)			10,18,000

Advice: From the comparative profitability statements stated supra, it is clear that profit is decreased by Rs. 2,42,000 that is (Rs. 12,60,000- Rs. 10,18,000) by closing down Department ' Z '. Therefore, it should not be closed down.

Q18. SRIJAN LTD. had incurred fixed expenses of Rs. 9,00,000 with sales of Rs. 20,00,000 and earned a profit of Rs. 3,00,000 during the first half-year. In the second-half, it suffered a loss of Rs. 1,50,000.

Calculate the following:

1. The P/V Ratio, Break Even Point and Margin of Safety for the first half-year.
2. The expected sales amount for the second half-year assuming that the selling price and fixed expenses remained unchanged during the second half-year.
3. The Break Even point and Margin of Safety for the whole year. **[June 19 - 7 Marks]**

Answer:

(1) P/V Ratio = (Contribution/ Sales) × 100

Where; Contribution = Fixed Cost + Profit = Rs.9,00,000 + Rs. 3,00,000 = Rs. 12,00,000

P/V Ratio = (Rs. 12,00,000/20,00,000) × 100 = 60%

Break Even Point = (Fixed Cost)/ (P/V Ratio)

= Rs. 9,00,000/60% = Rs. 15,00,000

Margin of Safety = Sales- Break Even Point

= Rs. 20,00,000 - Rs. 15,00,000 = Rs. 5,00,000

Or Margin of Safety =(Profit) / (P/V Ratio) = Rs. 3,00,000/60% = Rs. 5,00,000

(2) Contribution during the second half-year = Fixed Cost + Profit = Rs. 9,00,000 + (-Rs. 1,50,000) = Rs. 7,50,000

Expected Sales = (Contribution)/(P/V Ratio) = Rs. 7,50,000/60% = Rs. 12,50,000

(3) Break Even Point for the whole year = Fixed Cost for the whole year/(P/V Ratio)

$= \text{Rs.}\frac{18,00,000}{60}\% = \text{Rs. } 30,00,000$

Margin of Safety = Sales- Break Even Point

$= \text{Rs. } 32,50,000 - \text{Rs. } 30,00,000 = \text{Rs. } 2,50,000$

Or Margin of Safety = (Profit)/(P/V Ratio)$= \text{Rs.}\frac{1,50,000}{60}\% = \text{Rs. } 2,50,000$

Q19. HOTEL IREVNA INN, has a capacity of 200 single rooms and 40 double rooms. The average occupancy of both single and double rooms is expected to be 80% throughout the year of 365 days. The rent for double room has been fixed at 125% of the rent of a single room. The costs are as under:

Variable Costs:	Single Rooms	Rs.110 each per day
	Double Rooms	Rs.175 each per day
Fixed Costs:	Single Rooms	Rs.60 each per day
	Double Rooms	Rs.125 each per day

Required:

Calculate the rent chargeable for each single room and double room per day in such a way that the hotel earns a margin of safety of 20% on rent of rooms. **[Dec 19 - 7 Marks]**

Answer: **Occupancy (Number of room days in a year):**

Nature of Room	Calculation	Occupancy
Single Rooms	200 × 365 × 80%	58,400 Room days
Double Rooms	40×365×80%	11,680 Room days

Computation of Total Cost:

Variable Costs	Amount	Amount
Single Rooms (58,400 Room days × Rs. 110)	64,24,000	
Double Rooms (11,680 Room days × Rs. 175)	20,44,000	84,68,000
Fixed Costs:		
Single Rooms (58,400 Room days × Rs.60)	35,04,000	
Double Rooms (11,680 Room days × Rs.125)	14,60,000	49,64,000
Total Costs		**1,34,32,000**

Computation of Total Revenue:

Margin of safety 20%, Break Even Point 80%

Sales at BEP = Total Cost = Rs.1,34,32,000

Total Revenue = Rs. 1,34,32,000 / 0.80 = Rs. 1,67,90,000

Computation of Notional Single Rooms Day

Single Rooms	(58,400 × 1)	58,400
Double Rooms	(11,680 × 1.25)	14,600
Total		**(73,000)**

Computation of Room Rent:

Rent per day per Single Room = Rs. $\frac{1,67,90,000}{73,000}$ = Rs.230

Rent per day per Double Room = Rs. 230 × 1.25 = Rs. 287.50

Q20. PANCHAL LTD, a toy manufacturer earns an average net profit of Rs. 1.80 per piece on a selling price of Rs. 16.50 by producing and selling12000 pieces or 60% of the capacity. His cost of sales per toy is as under:

	Amount
Direct material	4.25
Direct wages	1.60
Works Overheads (40% fixed)	7.15
Sales Overheads (30% fixed)	0.90

During the current year, he intends to produce the same number of toys but anticipates that fixed cost will go up by 10%. Direct wages and material will increase by 6% and 4% respectively but he has no option of increasing the selling price. Under this situation, he obtains an offer for further sale of 20% of the capacity.

Required:

What minimum price you will recommend for acceptance of the offer to ensure the manufacturer an overall profit of Rs.30,100? (Show your calculations upto 3 decimal points.) **[Dec 19 - 8 Marks]**

Answer:

Computation of Profit at present after increase in Cost

	Particulars	Amount	Amount
1.	Selling Price		16.500
2.	**Variable Cost:**		
	Direct Material (4.25 ×104)/100	4.420	
	Direct Wages (1.60×106)/100	1.696	
	Works Overheads (60% of Rs.7.15)	4.290	
	Sales Overheads (70% of Rs.0.90)	0.630	
	Other Variable Cost:		
	(S.P Rs. 16.50) - (Profit Rs. 1.80) - Cost of Sales Rs. (DM 4.25 + DW 1.60 + WO 7.15 + SO 0.90)	0.800	11.836

3.	Contribution per Unit/ Piece (1 - 2)			4.664
4.	Total Contribution (12,000 Units/Pieces x Rs.4.664)			55,968
5.	Fixed Cost:	Works Overheads	2.860	
		Sales Overheads	0.270	
			3.130	
	(Rs. 3.13 × 12,000 Units = Rs. 37,560 × 110)/100			41,316
6.	Profit (4-5)			14,652

Computation of Selling Price of the Offer

Particulars	Amount
Variable Cost of order (4,000 Units/Pieces × Rs. 11.836	47,344
Add: Required Profit (Rs. 30,100 - Rs.14,652)	15,448
∴ Sales required	62,792
∴ Selling Price per Unit/Piece of the order = Rs.62,792/4,000 Units/Pieces	15.698 say Rs. 15.70

Answer: **Computation of Profit at present after increase in Cost**

	Particulars	Amount
1.	Net Profit per Piece	1.80
2.	Total Pieces	12,000
3.	Total Net Profit (1 x 2)	21,600
4.	Increased Direct Material Cost (Rs. 4.25 × 4%) × 12,000	2,040
5.	Increased Direct Wages Cost (Rs. 1.60 × 6%) × 12,000	1,152
6.	Increased Works Overhead [{(Rs. 7.15 × 40%) × 12,000} × 10%]	3,432
7.	Increased Sales Overhead [{(Rs.0.90 × 30%) × 12,000} × 10%]	324
8.	Net Profit after increase in Cost {3 - (4+5+6+7)}	14,652
9.	Expected Net Profit	30,100
10.	Net Profit required to be earned (4 - 8)	15,448

Computation of Selling Price of the Offer

	Particulars	Amount	Amount
1.	Variable Cost:		
	Material (4.25 × 104)/100	4.420	
	Wages (1.60 × 106)/100	1.696	
	Works Overheads (60% of Rs.7.15)	4.290	
	Sales Overheads (70% of Rs. 0.90)	0.630	
	Other Variable Cost	0.800	11.836
2.	Profit Per Piece (Rs. 15,448/4,000 Pieces)		3.862
3.	Selling Price per Piece of the order (1+2)		(15.698) Say Rs. 15.70

Q21. The following data pertaining to sales and profit are extracted from the records of READYAAH LTD. for two years:

	Sales	Profit
Year 2017	Rs. 12,00,000	Rs. 80,000
Year 2018	Rs. 14,00,000	Rs. 1,30,000

Required: Calculate the following:

(a) P/V Ratio

(b) Break Even Point

(c) Profit when sales are Rs. 18,00,000

(d) Sales required to earn a profit of Rs. 1,20,000

(e) Margin of safety in the year 2018. **[Dec 19 - 7 Marks]**

Answer:

	Sales	Profit
Year 2017	12,00,000	80,000
Year 2018	14,00,000	1,30,000
Difference	2,00,000	50,000

1. P/V Ratio = (Difference in Profit / Difference in Sales) × 100	
∴ P/V Ratio =(Rs.50,000/2,00,000) × 100	25%
Contribution in 2017 (12,00,000 × 25%)	Rs.3,00,000
Less: Profit	Rs.80,000
Fixed Cost	Rs.2,20,000
Alternatively:	
Contribution in 2018 (Rs. 14,00,000 × 25%)	Rs.3,50,000
Less: Profit	Rs.1,30,000
Fixed Cost	Rs.2,20,000
2. Break Even Point = Fixed Cost/PV Ratio	Rs.2,20,000/25%
	Rs. 8,80,000
Profit when sales are Rs.18,00,000	
Contribution (Rs.18,00,000 x 25%	Rs. 4,50,000
Less: Fixed Cost	Rs. 2,20,000
Profit	Rs. 2,30,000
3. Sales to earn a profit of Rs.1,20,000 = $\frac{(\text{Fixed cost+Desired Profit})}{\text{PV ratio}}$ $= \frac{\text{Rs. 2,20,000+ Rs. 1,20,000)}}{25\%}$	Rs. 13,60,000
4. Margin of Safety in 2018 = Actual Sales - Break Even Point = Rs.14,00,000 - Rs. 8,80,000	Rs. 5,20,000

Q22. ESPM Ltd sold 5,50,000 units of its product at Rs. 75 per unit. Variable costs are Rs. 35 per unit (manufacturing costs of Rs. 28 and selling cost Rs. 7 per unit). Fixed costs are incurred uniformly throughout year & amount to Rs. 70,00,000 (Including depreciation of Rs. 30,00,000). There is no opening or closing stock.

(a) Estimate the breakeven sales level quantity and cash breakeven sales level quantity.

(b) What is the P/V ratio?

(c) The sales level to be achieved an after-tax income (PAT) of Rs. 5,00,000 would be how much? (Assume 40% corporate Income Tax rate). **[Dec 21 - 6 Marks]**

Answer:

1. $\text{BEP} = \frac{70,00,000}{40}$ = 1,75,000 units

   Cash $\text{BEP} = \frac{40,00,000}{40}$ = 1,00,000 units

2. $\text{P/V Ratio} = \frac{75-35}{75}$ = 0.5333.

3. PAT = 5,00,000; PBT = 5,00,000 × $\frac{100}{60}$ = 8,33,333.33

   Contribution =8,33,333.33 + 70,00,000 = 78,33,333.33

   Sales = $\frac{78,33,333.33}{0.5333}$ = 1,46,87,500

Q23. SUBN Ltd. a single-product company sells its products at Rs. 60 per unit. In 2021, the company operated at a margin of 40%. The Fixed Costs amounted to Rs. 3,60,000 & variable cost ratio to sales was 80%. In 2022, it is estimated that the variable cost will go up by 10% & fixed costs will increase by 5%

Required:

Find the selling price required to be fixed in 2022 to earn the same P/V ratio as in 2021. Assuming the same selling price of Rs. 60 per unit in 2022, find the number of units required to be produced and sold to earn the same profit as in 2021.

[Dec 22 - 8 Marks]

Answer:

1. Computation of SP to earn the same PVR as in last year

(a) PVR of last year = 100% - Variable Cost Ratio = 100% - 89%	20%
(b) Variable Cost per unit (for last year) (Rs. 60 x 80%)	Rs. 48 per unit
(c) Variable Cost per unit (for next year) (Rs. 48 + 10%)	52.80% per unit
(d) Since PVR should be the same as last year, Variable Costs should be Price	80% of New Sale
(e) Hence, New Sale Price for next year = $\frac{\text{Rs.52.80}}{80\%}$	Rs. 66 per unit

2. Computation of Sale Quantity to earn the same profit as in last year

(a) BES of last year = $\frac{\text{Fixed Costs}}{\text{PV Ratio}} = \frac{\text{Rs.3,60,000}}{20\%}$	Rs. 18,00,000
(b) Since MOS = 40% BES =	60% of Total Sales
(c) Hence, MOS of last year = $\frac{\text{Rs.18,00,000}}{60\%} \times 40\%$	Rs. 12,00,000
(d) Profit for last year = MOS × PVR = Rs. 12,00,000 × 20% =	Rs.2,40,000
(e) Desired Contribution for next year = Next Year Fixed Cost + Profit = (Rs. 3,60,000 +5%) + Rs.2,40,000	Rs. 6,18,000
(f) Required Sale Quantity = $\frac{\text{Desired Contribution}}{\text{Contribution per Unit}} = \frac{\text{Rs. 6,18,000}}{\text{Rs. 60.00} - \text{Rs. 52.80}}$	85,833 units

Q24. PANT Ltd., producing a single product sells it at Rs. 50 per unit variable cost is Rs. 35, and the fixed cost amount to Rs. 12 lacs per annum. With this data, you are required to calculate the following treating each Independent of the other.

(a) P/V ratio and break-even sales

(b) New Break-even sales if variable cost increases by Rs. 3 per unit, without an increase in selling price

(c) Increase in sales required if profits are to be increased by Rs. 2.4 lacs

(d) Percentage increase/decrease in sales volume units to off-set

(1) An increase of Rs. 3 in the variable cost per unit

(2) A 10% increase in selling price without affecting existing profits quantum **[Dec 22 - 7 Marks]**

Answer:

(a) P/V Ratio =15/50 = 30%

BEP=12,00,000/30%=Rs.40,00,000

(b) New PN =24%

BEP=12,00,000/24%=Rs.50,00,000

(c) Sales = Profit + FC/PVR (2,40,000+12,00,000)/30% = 48,00,000
Increase in Sales =Rs.48,00,000-Rs.40,00,000=Rs.8,00,000

(d) (1) Increase 25%
(2) Decrease 25%.

Q25. M/s Alpha Ltd. manufactures a single product and has the following data for the year 2022:

Selling price per unit	Rs. 200
Direct material cost per unit	Rs. 54
Direct wages per unit	Rs. 40
Fixed overheads	Rs.1,90,000
Variable overheads	50% of direct wages
Trade discount	5%

M/s Alpha Ltd. approaches you as a qualified cost accountant and asks you to:

1. Advise the Profit Volume Ratio of the company.
2. Critically assess the Break-even Sales (in units and in Rs.).
3. Evaluate the Margin of Safety (in Rs. and as % of sales).
4. Recommend the Net profit if sales are 10% and 20% above the Break-even Volume. **[June 23 - 7 Marks]**

Answer:

Selling Price	190
Variable cost	114
Contribution	76
PVR = 76/190% = 40	
BEP = 1,90,000/40% = 4,75,000	2,500 units

(1) Margin of Safety = (4,75,000 + 10%) - 4,75,000 = 47,500

MOS as % of Sales = 47,500 / 5,22,500 = 9.09%

(2) MOS = (4,75,000 + 20%) – 4,75,000 = 95,000

MOS as % of Sales = 95,000 / 5,70,000 = 16.67%

(1) Net Profit = 2,750 × 76 – 1,90,000 = 19,000

(2) MP = 3,000 × 76 – 1,90,000 = 38,000

Q26. Mr. Lurvey is an umbrella manufacturer and marks an average Net Profit of Rs. 5 per piece on a selling price of Rs. 28.60 by producing and selling 12,000 pieces or 60% of the capacity. His cost of sales is-

Particulars	Rs.
Direct material	7.00
Direct wages	2.50
Works overheads (50% fixed)	12.50
Sales overheads (25% variable)	1.60

During the current year, he intends to produce the same number but anticipates that fixed charges will go up by 10% while direct labour rate and material will increase by 8% and 6% respectively but he has no option of increasing the selling price.

Under this situation, he obtains an offer for further 20% of the capacity. Mr. Lurvey approaches you as a cost accountant & asks you to ADVISE minimum price per unit for acceptance the offer if he wants to ensure an overall profit of Rs. 70,000.

[June 23 - 8 Marks]

Answer:

1. Step 1: Calculate the current costs and profit per unit
   - Selling price per unit: Rs. 28.60
   - Net profit per unit: Rs. 5
   - Cost per unit: Selling price - Net profit = Rs. 28.60 - Rs. 5 = Rs. 23.60

2. Breakdown of the cost per unit

Cost Component	Amount (Rs.)
Direct material	7.00
Direct wages	2.50
Works overheads (50% fixed, 50% variable)	12.50
Sales overheads (25% variable, 75% fixed)	1.60

3. Calculate the Variable and Fixed Costs

Overhead Type	Total Cost (Rs.)	Variable (Rs.)	Fixed (Rs.)
Works Overhead	12.50	6.25	6.25
Sales Overhead	1.60	0.40	1.20

4. Calculate the anticipated cost increases

Cost Component	Original (Rs.)	Increase (%)	Revised (Rs.)
Direct Material	7.00	6%	7.42
Direct Wages	2.50	8%	2.70
Works Overheads	6.25	10%	6.88
Sales Overheads	1.60	10%	1.32

5. Calculate the revised costs per unit

Cost Component	Revised (Rs.)
Direct Material	7.42
Direct Wages	2.70
Variable works Overheads	6.25
Fixed works Overheads	6.88
Variable sales Overheads	0.40
Fixed sales Overheads	1.32

6. Calculate total revised costs per unit

Cost Type	Amount (Rs.)
Variable Cost	16.77
Fixed Cost	8.20

   - Total variable cost per unit: Rs. 7.42 (material) + Rs. 2.70 (wages) + Rs. 6.25 (variable works overheads) + Rs. 0.40 (Variable sales overheads) = Rs. 16.77
   - Total fixed cost per unit: Rs. 6.88 (fixed works overheads) + Rs. 1.32 (fixed sales overheads) = Rs. 8.20

7. Calculate total costs for 12,000 units

Cost Type	Per Unit (Rs.)	Total for 12,000 Units (Rs.)
Fixed Cost	8.20	98,400
Variable Cost	16.77	201,240

   - Total fixed costs 12,000 units = 12,000 × 8.20 = 98,400
   - Total variable costs for 12,000 units = 12,000 × 16.77 = 201,240
   - Total costs for 12,000 units = 98,400 (fixed) + 201,240 (variable) = 299,640

8. Calculate total revenue required

Desired Profit (Rs.)	Total Cost (Rs.)	Total Revenue Required (Rs.)
70,000	299,640	369,640

- Total revenue for 12,000 units to ensure profit of Rs. 70,000: Rs. 299,640 (total cost) + Rs. 70,000 (desired profit) = Rs. 369,640
- Revenue per unit = 369,640 ÷ 12,000 = 30.80

9. Calculate additional units (20% of capacity)

- Capacity utilized for additional units: 20% of 20,000 (full capacity) = 4,000

10. Calculate additional variable costs for 4,000 units

Cost Type	Per Unit (Rs.)	Total for 4,000 Units (Rs.)
Variable Costs	16.77	67,080

- Additional variable costs for 4,000 units: 4,000 × Rs. 16.77 = 67,080

11. Calculate minimum price for additional units

Required Revenue (Rs.)	Additional Costs (Rs.)	Total (Rs.)	Units	Minimum Price (Rs.)
26,440	67,080	93,520	4,000	23.38

- Total required revenue from Additional units: Total desired revenue - Revenue from initial 12,000 units = 369,640 – (12,000* Rs. 28.60) = Rs. 369,640 Rs. 343,200 = Rs. 26,440
- Minimum price per unit for additional units: (Total required additional revenue + Additional variable costs) / 4,000 = (26,440 + 67,080) / 4,000 = 93,520 / 4,000 = 23.38 (approximately)

Minimum price per units for the additional 4000 units: Rs. 23.38

Q27. New Vistas Ltd. is manufacturing three household products X, Y and Z and selling them in competitive market. The following details regarding current demand, selling price and cost structure are extracted from the records of the company for the year ending March, 2023:

Particulars	X	Y	Z
Expected demand (units)	20,000	24,000	40,000
Selling price per unit (Rs.)	40	32	20
Variable cost per unit (Rs.): Direct materials (Rs. 20/kg.)	12	8	4
Direct labour (Rs. 30/hr.)	6	6	3
Variable overheads	4	2	2
Fixed overheads per unit (Rs.)	10	8	4

The company is frequently affected by acute scarcity of raw material & high labour turnover. During the next year, it is expected to have one of the following situations:

(a) Raw materials available will be only 24,200 kg.

(b) Direct labour hours available will be only 10,000 hours.

Required: Calculate Net Profit of the company in each of the above situations. **[Dec 23 - 14 Marks]**

Answer: **Statement of marginal cost**

Particular	X	Y	Z
Selling price (per unit)	40	32	20
Less: Variable cost per unit:			
Material	12	8	4
Labour	6	6	3
Variable overhead	4	2	2
Contribution per unit	**18**	**16**	**11**

W. Note: 1 Calculation of material required for each product:

	X	Y	Z
Material cost per unit	12	8	4
Rate per kg.	20	20	20
Material Required per unit	0.6 kg.	0.4 kg.	0.2 kg.

W. Note: 2 Calculation of Labour hour required for each product:

	X	Y	Z
Labour cost per unit	6	6	3
Labour hrs rate	30	30	30
Labour hrs per unit	0.2 Hrs	0.2 Hrs	0.1 Hrs

W. Note: 3 Calculation of fixed cost:

X	20,000 × 10 =	2,00,000
Y	24,000 × 8 =	1,92,000
Z	40,000 × 4 =	1,60,000
		5,52,000

(a) Statement showing optimal production mix & profitability (when Raw material available will be only 24,200 kg.)

Particulars	X	Y	Z	Total
Contribution per unit (A)	18	16	11	
Material required per unit (B)	0.6 kg.	0.4 kg.	0.2 kg.	
Contribution per kg. (A/B)	30	40	55	
Ranking	III	II	I	
Expected demand (unit)	20,000	24,000	40,000	
Raw material (kg.)	6,600 (Bal. fig.)	9600	8,000	24,200 kg
Optimal production (c)	11,000	24,000	40,000	
Total contribution for optimal production (C × A)	1,98,000	3,84,000	44,000	10,22,000
Less: Fixed cost (W. Note 3)				(5,52,000)
Net profit				**4,70,000**

(b) Statement Showing optimal production mix & profitability (when labour hours available will be only 10,000 hrs)

Particulars	X	Y	Z	Total
Contribution per unit (A)	18	16	11	
Labour hrs. required per unit (B)	0.2 hrs	0.2 hrs	0.1 hrs	
Contribution per hrs. (A/B)	90	80	110	
Ranking	II	III	I	
Expected demand (unit)	20,000	24,000	40,000	
Labour hours available	2,000	1,000 (Bal. fig.)	2,000	10,000
Optimal production (C)	20,000	10,000	40,000	
Total contribution per optimal production (C × A)	3,60,000	1,60,000	4,40,000	9,60,000
Less: Fixed cost (W. Note 3)				(5,52,000)
Net Profit				**4,08,000**

Q28. Aristocrat Ltd. while operating at 70% level of activity produces and sells two products A and B. The cost and sales data of these two products are as under:

Particulars	Product A	Product B
Units Produced and Sold	**3,000**	**2,000**
Direct Materials	10	20
Direct Labour	20	20
Factory Overheads (40% fixed)	25	15
Administration & Selling Overheads (60% fixed)	40	25
Total Cost per unit	95	80
Selling Price per unit	115	95

Factory overheads are absorbed on the basis of machine hour which is the limiting factor. The machine hour rate is Rs.10 per hour.

Aristocrat Ltd. receives an offer from USA for the purchase of product A at a price of Rs. 87.50 per unit. Alternatively, the company has another offer from UK for the purchase of product B at a price of Rs. 77.50 per unit. In both the cases, a special packing charge of Rs. 2.50 per unit has to be borne by the company. The company can accept either of the two export orders by utilising the balance 30% of its capacity.

Required:

Examine and advise the company as to which proposal should be accepted showing total profit in your support after incorporating the export proposal suggested by you. **[June 24 - 14 marks]**

Answer: **Statement of Profitability**

Particulars	Rs.	Rs.
Contribution:		
Local Sale – A	1,62,000	
Local Sale – B	72,000	
Export Sale – B	48,000	
Total Contribution		2,82,000
Fixed Cost		1,44,000
Net Profit		1,38,000

Advice: The company should accept offer received from UK and export 3,000 units resulting net profit of Rs. 1,38,000.