

Marginal Costing

Question:

Q.1 Raj Ltd. manufactures three products X, Y and Z. The unit selling price of these products are Rs. 100, Rs. 160 and Rs. 75 respectively. The corresponding unit variables costs are Rs. 50, Rs. 80 and Rs. 30. The proportions (quantitywise) in which these products are manufacturing and sold are 20%, 30% and 50% respectively. The total fixed costs are Rs. 14, 80,000.

Calculate overall break even quantity and the productwise break up of such quantity.

Q.2 A Pharmaceutical company produces formulations having a shelf life of one year. The company has an opening stock of 30,000 boxes on 1st January, 2005 and expected to produce 1,30,000 boxes as was in the just ended year of 2004. Expected sale would be 1,50,000 boxed. Costing department has worked out escalation in cost by 25% on variable cost and 10% on fixed cost. Fixed cost for the year 2004 is Rs. 40 per unit. New price announced for 2005 is Rs. 100 per box. Variable cost on opening stock is Rs. 40 per box. You are required to compute Breakeven volume for the year 2005.

Q.3 Zed Limited sells its product at Rs. 30 per unit. During the quarter ending on 31st March, 2014, it produced and sold 16000 units and suffered a loss of Rs. 10 per unit. If the volume of sales is raised to 40000 units, it can earn a profit of Rs. 8 per unit.

You are required to calculate:

- (i) Break-Even Point in Rupees.
- (ii) Profit if the sale volume is 50000 units.
- (iii) Minimum level of production where the company needs not to close the production if unavoidable fixed cost is Rs. 1, 50,000.

Answer:

Q.1Ans Overall break-even quantity:

Product:	X	Y	Z
Selling price per unit (Rs.)	100	160	75
Less: Variable cost per unit (Rs.)	<u>50</u>	<u>80</u>	<u>30</u>
Contribution per unit (Rs.)	<u>50</u>	<u>80</u>	<u>45</u>
Contribution at break-even point (Refer to Working Note)	10R (0.20R × Rs.50)	24R (0.30 R × Rs. 80)	22.5R (0.50 R × Rs. 45)

At Break-even point:

Contribution = Fixed cost

Hence $10R + 24R + 22.5R = \text{Rs. } 14,80,000$

$$\text{Or } R = \frac{\text{Rs. } 14,80,000}{56.5} = 26,195 \text{ Units.}$$

Productwise break-up of overall break-even quantity:

Product X : $26,195 \text{ units} \times 0.20 = 5,239 \text{ units}$

Product Y : $26,195 \text{ units} \times 0.30 = 7,858 \text{ units}$

Product Z : $26,195 \text{ units} \times 0.50 = 13,098 \text{ units}$

Working Note:

Let R be the overall break-even quantity of three products X, Y and Z. At break-even R has 20%, 30% and 50% units of X, Y and Z. The productwise production and sale of three given products in terms of overall break-even quantity are 0.20R; 0.30R and 0.50R unit respectively.

Q.2Ans

Here, it is assumed that company is following FIFO method for valuing its inventory. Units available for sale are 30,000 units from opening stock and 1, 20,000 units from current year production. Thus, making a total of 1, 50,000 units. Now –

- (1) Total contribution from opening stock = No. of units of op. stock × (sale price – variable cost)
$$= 30,000 (100 - 40) = \text{Rs. } 18,00,000/-$$
- (2) New variable cost per unit = $V_e + \text{Escalation}$

$$= 40 + (25\% \text{ of Rs. } 40)$$

$$= 50 - \text{per unit}$$

(3) Current years contribution per unit = sale price per unit – new variable cost per unit

$$= 100-50$$

$$= \text{Rs. } 50 - \text{per unit}$$

(4) Fixed cost in current year = FC in previous year + Escalation

$$= (1, 30,000 \times 40) + 10\% \text{ of Rs. } 52, 00,000$$

$$= 57, 20,000$$

(FC in previous year was 1, 30,000 units \times 40/- because Production in previous year was same as planned for this year)

BEP (in units) =

$$\frac{\text{Units from opening stock (Total fixed Cost–Total Contribution from op.stock)}}{\text{Current Year's contribution per unit}}$$

$$= 30,000 + \frac{57,20,000 - 18,00,000}{50}$$

$$= 30,000 + \frac{39,20,000}{50}$$

$$= 30,000 + 78,400$$

$$= 1, 08,400 \text{ units}$$

BEP (in Rs.)

$$= \frac{\text{Units from SP stock} + (\text{Total FC} - \text{Total Contribution from op.stock})}{\text{Current year's contribution per unit}} \times \text{price}$$

$$= 30,000 + \frac{57,20,000 - 18,00,000}{50} \times 100$$

$$= \text{Rs. } 1, 08, 40,000/-$$

Q.3Ans

$$\text{P/V Ratio} = \frac{\text{Change in profit}}{\text{Change in sales value}} \times 100$$

$$= \frac{\text{Rs. } 3,20,000 + (\text{Rs. } 1,60,000)}{\text{Rs. } 12,00,000 - \text{Rs. } 4,80,000} \times 100$$

$$= \frac{\text{Rs.4,80,000}}{\text{Rs.7,20,000}} \times 100$$

$$= 66.67\%$$

(i) Break Even Point = $\frac{\text{Fixed Cost}}{\text{Contribution}}$

$$= \frac{4,80,000}{20}$$

$$= 24,000 \text{ units}$$

$$= 24,000 \times 30$$

$$= \text{Rs. } 7,20,000$$

(ii) Profit when sales = 50,000 units

$$50,000 = \frac{\text{Fixed Cost} + \text{Profit}}{\text{Contribution}}$$

$$50,000 = \frac{4,80,000 + P}{20}$$

$$P = 10,00,000 - 4,80,000 = 5,20,000.$$

Note: 1

Suppose Variable cost = x

Fixed cost = Y

$$30 \times 16,000 - 16,000x = y - 1,60,000 \dots(1)$$

$$30 \times 40,000 + 40,000x = y + 3,20,000 \dots(2)$$

$$\therefore 4,80,000 - 16,000x = 12,00,000 - 40,000x - 3,20,000 - 1,60,000$$

$$\therefore 4,80,000 - 16,000x = 7,20,000 - 40,000x$$

$$\therefore -16,000 + 40,000x = 2,40,000$$

$$\therefore x = \frac{2,40,000}{24,000}$$

$$\therefore x = 10$$

$$\therefore y = 4,80,000$$

Note: 2

Contribution = S - V

$$= 30 - 10$$

$$= 20$$

(iii) Minimum level of production where the company needs not to close the production, if unavoidable fixed cost I Rs. 1, 50,000:

$$\begin{aligned} &= \frac{\text{Avoidable fixed cost}}{\text{Contribution per unit}} \\ &= \frac{\text{Total fixed cost} - \text{Unavoidable fixed cost}}{\text{Contribution per unit}} \\ &= \frac{\text{Rs.4,80,000} - \text{Rs. 1,50,000}}{\text{Rs.30} \times 66.67\%} \\ &= \frac{\text{Rs.3,30,000}}{\text{Rs.20}} = 16,500 \text{ units} \end{aligned}$$

At production level of $\geq 16,500$ units, company needs not to close the production .