

Break-even analysis

From the following particulars, calculate:

- (i) Break-even point in terms of sales value and in units.
- (ii) Number of units that must be sold to earn a profit of Rs. 90,000.

	₹
Fixed Factory Overheads Cost	60,000
Fixed Selling Overheads Cost	12,000
Variable Manufacturing Cost per unit	12
Variable Selling Cost per unit	3
Selling Price per unit	24

Solution:

(i) **Break-even point** =
$$\frac{\text{Fixed Cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

Variable Cost per unit = ₹ 12 + 3 = ₹ 15

Total Fixed Cost = ₹ 60,000 + 12,000 = ₹ 72,000

B.E.P. =
$$\frac{72,000}{24 - 15} = 8,000 \text{ units}$$

B.E.P. (in sales values) = 8,000 × 24 = ₹ 1,92,000

(ii) **Number of units that must be sold to earn profit of ₹ 90,000**

Fixed Cost + Profit

=
$$\frac{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

=
$$\frac{72,000 + 90,000}{24 - 15} = \frac{1,62,000}{9} = 18,000 \text{ units.}$$

Beta company sells blouses in Washington, USA. Blouses are imported from Pakistan and are sold to customers in Washington at a profit. Salespersons are paid basic salary plus a decent commission of \$14 on each sale made by them. Selling price and expense data is given below:

Selling price per blouse	\$ 80.00
Variable expenses per blouses:	
Invoice cost	\$ 36.00
Sales commission	14.00
Total variable expenses	\$ 50.00
Annual fixed expenses:	
Rent	\$ 160,000
Marketing	300,000
Salaries	140,000
Total fixed expenses	\$ 600,000

Required:

1. Compute the break-even point in units and in dollars using the information given above.
2. What would be net operating income or loss if company sells 18,500 blouses in a year?
3. If the manager is paid a commission of \$6 blouse (in addition to the salesperson's commission), what will be the effect on company's break-even point?

Solution:

(1) Calculation of break-even point:

a. Equation method:

$$SP = VC + FC$$

$$\$80 = \$50 + \$600,000$$

$$\$80 - \$50 = \$600,000$$

$$\$30 = \$600,000$$

$$Q = \$600,000 / \$30$$

$$Q = 20,000 \text{ blouses}$$

$$20,000 \text{ blouses} \times \$80.00 \text{ per blouse} = \$1,600,000$$

b. Contribution margin method:

Break-even point = Fixed expenses/Contribution margin per unit

$$= \$600,000/\$30^*$$

$$= 20,000 \text{ blouses}$$

$$20,000 \text{ blouses} \times \$80.00 \text{ per blouse} = \$1,600,000$$

$$\text{Contribution margin per unit} \times \$80 - \$50 \text{ (SP-VC)} = \$30$$

2) Net operating income or loss if 18,500 blouses are sold in a year

Sales (18,500 blouses × \$80)	\$1,480,000
Less variable expenses (18,500 blouses × \$50)	925,000
Contribution margin	\$ 555,000
Less fixed expenses	600,000
Net operating loss	\$ (45,000)

An alternative and simpler approach is given below:

Break-even sales	20,000 blouses
Actual sales	18,500 blouses
Sales short of break-even	1,500 blouses

Net operating loss = Sales short of break-even × Contribution margin per unit

$$= 1,500 \text{ blouses} \times \$30$$

$$= \$45,000$$

3) Break-even point if manager is also paid a commission of \$6 per blouse sold:

The payment of a commission of \$6 to manager will increase variable expenses and decrease contribution margin. Now the variable expenses will be \$56 (\$50 + \$6) per unit and contribution margin will be \$24 (\$80 – \$56) per unit.

a. Equation method:

$$Sp = VC + FC$$

$$\$80 = \$56 + \$600,000$$

$$\$80 - \$56 = \$600,000$$

$$\$24 = \$600,000$$

$$Q = \$600,000 / \$24$$

$$Q = 25,000 \text{ blouses}$$

$$25,000 \text{ blouses} \times \$80.00 \text{ per blouse} = \$2,000,000$$

b. Contribution margin method:

Break-even point in units = Fixed expenses / Contribution margin per unit

$$\$600,000 / \$24^*$$

$$25,000 \text{ blouses}$$

$$25,000 \text{ blouses} \times \$80.00 \text{ per blouse} = \$2,000,000$$

$$*\$80 - \$56 = \$24$$