

BREAK – EVEN ANALYSIS
EXERCISES

Q.1.

- (a) Contribution is defined as the excess of price over available cost. It contributes towards the covering of the fixed costs and then towards the profit targets. It can be calculated as:

Contribution per unit = Price per unit – Variable costs per unit

$$\begin{aligned}\text{Contribution} &= \text{£ } 10 - \text{£ } 4 \\ &= \text{£ } 6\end{aligned}$$

- (b) Break even point = $\frac{\text{Fixed costs}}{\text{Contribution}}$
 $= \frac{\text{£ } 90\,000}{\text{£ } 6}$
 $= 15\,000$ kettles

$$\begin{aligned}\text{Value of Sales} &= 15\,000 \times 10 \\ &= \text{£ } 150\,000\end{aligned}$$

- (c) Current volume of output = $\frac{270\,000 + 90\,000}{6}$
 $= 60\,000$ units

- (d) (i) Sales Revenue = $60\,000 \times 10$
 $= \text{£ } 600\,000$

- (ii) Selling price = $\text{£ } 10 - 10\% (10) = \text{£ } 9$
Sales = $6\,000 + 25\% (6\,000)$
 $= 6\,000 + 1\,500$
 $= 7\,500$
Sales revenue = $7\,500 \times 9$
 $= \text{£ } 67\,500$

- (e) Change in revenue = $67\,500 - 600\,000$
 $= \text{£ } 75\,000$
Change in costs = $15\,000 \times 4$
 $= \text{£ } 60\,000$

- (f) Yes, Fair Oak Domestic Appliances should reduce its selling price by 10 per cent because of the increase in profits. The revenue increases by $\text{£ } 75\,000$ while costs only rise by $\text{£ } 60\,000$, therefore there is an overall increase in profits by $\text{£ } 15\,000$. Thus total profits would rise from $\text{£ } 270\,000$ to $\text{£ } 285\,000$.

Q.3.

- (i) Contribution = Selling price – Variable Costs
 $= \text{£ } 0.60 - \text{£ } 0.20$
 $= \text{£ } 0.40$

(ii) Break – even Output = $\frac{\text{Fixed Costs}}{\text{Contribution}}$
 $= \frac{20000}{0.40}$
 $= 50000$ mugs

(iii) Margin of Safety = Current Output – Break – even Output
 $= 90000 - 50000$
 $= 40000$ mugs

(iv) Profits at Full Capacity = Sales Revenue – Total Costs
 $= 120000 (0.6) - [120000 (0.2) + 20000]$
 $= 70000 - 44000$

(b) Quality produced = $\frac{\text{Fixed Costs} + \text{Target Profit}}{\text{Selling price} - \text{Variable Costs}}$
 $120000 = \frac{40000 + 2000}{S.P. - 0.20}$
 $S.P. - 0.20 = \frac{6000}{120000}$
 Selling price = $0.50 + 0.2$
 $= \text{£ } 0.7$

Q.5.

(i) Profits = Total Sales Revenue – Total Costs
 $= 150000 (21) - 800000 + 150000 (14)$
 $= 3150000 - 2900000$
 $= \text{£ } 250000$

(ii) Break – even output = $\frac{\text{Fixed Costs}}{\text{Contribution}}$
 $= \frac{80000}{21-14}$
 $= 114285$ units

(b) (i) Level of output = $\frac{\text{Fixed Costs} + \text{Target Profit}}{\text{Contribution}}$
 $= \frac{800000 + 200000}{7}$
 $= 142857$

(ii) Capacity at 2/3 = $150000 \times \frac{2}{3}$
 $= 100000$ units

$$\begin{aligned} \text{Level of output} &= \frac{\text{Fixed Costs} + \text{Target Profit}}{\text{Selling price} - \text{Variable Costs}} \\ 100000 &= \frac{800000 + 200000}{\text{Selling price} - 14} \\ \text{Selling price} - 14 &= \frac{1000000}{100000} \\ \text{Selling price} &= 10 + 14 \\ &= \text{£ } 24 \end{aligned}$$

Q.7.

(a) (i) Contribution is defined as the excess of price over variable costs. It contributes towards the covering of the fixed costs and then towards target profits. It is calculated as:

$$\text{Contribution} = \text{Selling price} - \text{Variable Costs}$$

(ii) Break – even level of output is the level at which the total sales revenue completely covers all the costs. It is the point at which there are no profits nor losses. It can be calculated as:

$$\text{B.E. point} = \frac{\text{Fixed Costs}}{\text{Contribution}}$$

(iii) Margin of safety is the area of profit. It is the range of output which is being produced above the break – even point. It is calculated as follows:

$$\text{Margin of Safety} = \text{Current output} - \text{Break – even output}$$

(b) (i) Contribution = 15p – 10 p
 = 5 p
 = £ 0.05

(ii) Break – even output = $\frac{1000000}{0.05}$
 = 20000000
 = 20 million units

(iii) Margin of Safety = 32 million – 20 million
 = 12 million units

(iv) Profit = 12 million × 0.05
 = £ 600000

(c) Smart price offer profits
 = Total Revenue – Total Costs
 = 32m (0.15) + 5m (0.11) – [100000 + 37m (0.10)]
 = 5.35m – 4.7m
 = £ 0.65m

In absence of the Good price offer, the company should accept the Smart price offer. This is because the price of 11 pence they offer is higher than the variable

costs of 10 pence. This is contribution towards the total profits of the company which would increase by £5000 from £ 600000 to £650000. These additional profits are favourable for the firm and it utilizes the capacity of the company which was idle which means greater capacity utilization i.e. higher efficiency. However, the company loses its brand name of Georgie Cat to Smart price for these £ 5m units. The assumption made is that there would be no rise in demand during the year. Because if there is then the company could only raise production by 3m units and may lose customers as well as the higher profits achievable at normal price.

Q.9.

(a) (i) Sale Revenue at Break Even = Output × Selling price

$$= 100000 \times 2.50$$

$$= \text{£ } 250000$$

(ii) Variable Costs = Sales Revenue – Fixed Costs

$$= 250000 - 40000$$

$$= \text{£ } 210000$$

(iii) Contribution = Selling price – Variable Costs

$$= 2.50 - 210000/100000$$

$$= 2.50 - 2.10$$

$$= \text{£ } 0.40$$

(b) Level of Output =
$$\frac{\text{Fixed Costs} + \text{Target Profit}}{\text{Contribution}}$$

$$= \frac{40000 + 66000}{0.40}$$

$$= 265000 \text{ units}$$

(c) Loss = Sales Revenue - Costs

$$= 90000 (2.5) - 90000 (2.1) + 40000$$

$$= 225000 - 229000$$

$$= \text{£ } (4000)$$

(d) Fixed Costs = 40000 + 40000 × 25%

$$= \text{£ } 50000$$

Break Even Output =
$$\frac{50000}{2.5 - 2.1}$$

Q.7.

(d) Good price offer

This offer is much better than Smart price offer. Firstly it has a selling price of 14 pence which is much closer to the company's own price of 15 pence. This generates a greater contribution towards profits and thus a higher profits. It also orders for 6m units which increases capacity utilization to 38m units of 40m units. This is greater than that of Smart price. The profits increase by £ 1800000. Also the Good price offer allows for the company's brand name of Gerogie Cat's. However Good price offer wants the same conditions for the next year as well.

This assumes that there would be no increase in demand for both years. In case of an increase in demand company would lose customers offering to pay the normal price. Nevertheless Good price offer guarantees demand of 6m units for next year as well even if other demand falls.

Mega Lecture

COSTING METHODS

1. Absorption Costing / Full Costing
2. Marginal Costing / Contribution Costing

Fixed costs are also called overheads

- ⇒ factory overheads
- ⇒ selling and distribution overheads
 - distribution costs
 - salaries & wages
- ⇒ financial overheads
 - interest payments
 - premium
- ⇒ administrative overheads
 - salaries & wages of maintenance personell

Costs centres are the departments or any area to which a cost can be directly associated and where costs are generated.

Profit centres are aspects or departments of a business from which costs and revenue as both are being generated. Products are also profit centres.

- Q.1. Evaluate full costing and marginal costing methods.
Q.2. When should a firm (a) shop making product (b) accept a contract or a purchase offer at price lower than the total cost of a product.

Q.1. Evaluate full costing and marginal costing methods.

Ans. Full costing is also known as absorption or total costing. The main principle of absorption costing is that all the overhead costs or indirect costs are 'absorbed' by cost centres. In other words, all overheads are included when calculating the cost of producing particular items. The main problem is how to allocate a firms's overheads between different cost centres. One approach is to use an arbitrary method. The other way is apportion costs to he cost centres.

There are certain advantages to a business in using the absorption cost method of apportioning indirect costs. It ensures that all costs are fully recovered. This means that the businesses will cover then costs as long as the actual costs and level fo activity are similar to the budgeted figures. It is fair provided overheads are nto allocated in an arbitrary way. This is because costs are apportioned to those activities that actually incur them. The method conforms to the accounting standard. This states that full costing should be used when valuing stocks in the final accounts. This is because it includes a share of fixed costs and is according to the matching principle.

However, the method does have some limitations. Cost information might be in accurate. This is because the figures are based on historical data which may not reflect future costs or activity levels. As a result business might underabsorb or overabsorb their overheads and set to low or high prices. Absorption costing can be complex, time consuming and expensive together detailed information from different cost centres. Some costs are difficult to apportion to particular cost centres.

Marginal costing or contribution costing ignores fixed costs and focuses on variable costs. The method involves looking at the amount of contribution a

product or order makes. Contribution can be calculated as selling price minus variable cost for a unit. Total contribution is the revenue from units sold minus the total variable costs.

There are advantages to a business in using the contribution costing method. It is simple to operate. The difficulty in sharing fixed costs between different products or cost centres is avoided. It is a useful decision making tool. It can be used when ranking products or choosing between different orders. Also helpful in deciding whether to make or buy in a particular product or component.

However, there are some disadvantages. In some industries contribution costing is inappropriate particularly when fixed costs represent the majority of a firm's costs. E.g. the cost to a train or bus operator of carrying one more passenger is almost zero, covering only these would definitely lead to huge losses. When valuing stocks in final accounts SSAP 9 states that the absorption method should be used and not marginal costing method. It can lead to bias in costing calculations. E.g. a cost center that uses a high proportion of overheads may be making a positive contribution. However, when this amount is taken into account that same cost center may be making a loss for the business.

Q.2. When should firm

(a) stop making a product

Marginal costing technique shows a firm the contribution being made by each of its products. It allows a business to see if a product is contributing towards the fixed overheads of business. It shows products with high and low contribution and so allows for ranking. If full costing is used then a product with positive contribution may be making a loss due to large overheads. If this product's production is stopped despite positive contribution, then the overall profits of the firm may be reduced.

(b) accept a contract or a purchase offer at a price lower than the total cost of a product?

Marginal costing is again used in this sort of situation when deciding whether or not to accept a contract at a price lower than total cost when a business has spare capacity. Such a decision may also have to be made if a business is trying to enter a new market segment. In case of spare capacity it is better to accept the contract as long as the price being offered is greater than the variable costs i.e. giving a positive contribution. This may lead to an increase in the profits of the firm.