12 ELEMENTARY PRINCIPLES AND TECHNIQUES : MARGINAL COSTING

1. MEANING

We have studied in the earlier chapter that cost can be classified into two groups viz. fixed cost and variable cost. Variable cost varies with the changes in the volume of output or level of activity. As against this, fixed cost relates to time and does not vary with the changes in the level of activity. Because of inclusion of fixed cost in determination of total cost of a product, the cost per unit or process varies from period to period according to the volume. This has given rise to the concept of marginal costing. Marginal costing is concerned with determination of product cost which consists of direct material, direct labour, direct expenses and variable overheads. It should be kept in mind that variable costs per unit are fixed and fixed costs per unit are variable with changes in the level of output. In United Kingdom, variable costing is generally known as marginal costing. Marginal costing is also known as direct costing, contributory costing and incremental costing.

The ICMA has defined marginal cost "as the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit." From the analysis of this definition it is clear that increase/decrease in one unit of output increases/reduces the total cost from the existing level to the new level. This increase/decrease in variable cost from existing level to the new level is called as marginal cost.

Suppose the cost of producing 100 units is Rs. 200. If 101 units are manufactured the cost goes up by Rs. 2 and becomes Rs. 202. If 99 units are manufactured, the cost is reduced by Rs. 2 i.e. to Rs. 198. With the increase or decrease in the volume the cost is increased or decreased by Rs. 2 respectively. Thus Rs. 2 will be called as the marginal cost.

Marginal costing means "the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed and variable costs".

Marginal costing is not a method of costing. It is a technique of controlling by bringing out relationship between profit and volume.

2. FEATURES OF MARGINAL COSTING

1. The elements of cost are differentiated between fixed costs and variable costs.
2. Only the variable or marginal cost is considered while calculating product costs.
3. Stock of finished products and work-in-progress are valued at variable cost.
4. Contribution is the difference between sales and marginal cost.
5. Fixed costs do not find place in the product cost.
6. Prices are based on marginal cost plus contribution.
7. It is a technique of cost recording and cost reporting.

8. Profitability of various products is determined in terms of marginal contribution.

9. Presentation of data is oriented to highlight the total contribution and contribution from each product.

3. ADVANTAGES OF MARGINAL COSTING

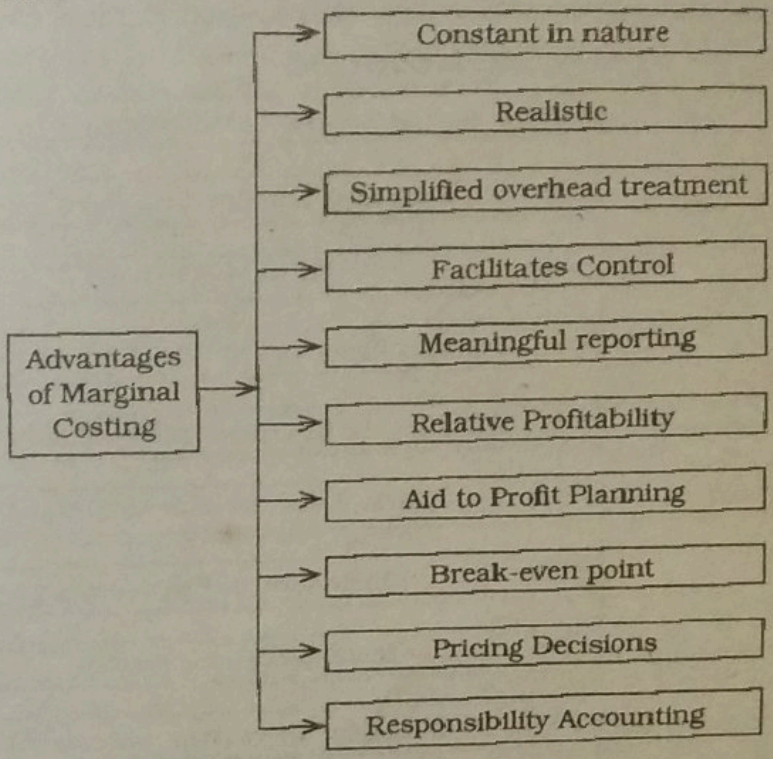

Fig. 12.1

1. **Constant in nature :** Marginal cost remains the same per unit of output whether there is increase or decrease in production.

2. **Realistic :** It is realistic as fixed cost is eliminated. Inventory is valued at marginal cost. Therefore, it is more realistic and uniform. No fictitious profit arises.

3. **Simplified Overhead Treatment :** There is no complication of over-absorption and under-absorption of overheads.

4. **Facilitates Control :** Classification of cost as fixed and variable helps to have greater control over costs.

5. **Meaningful Reporting :** The reporting made to management is more meaningful as the reports are based on sales figures rather than production. Comparison of efficiency can be done in a better way.

6. **Relative Profitability :** In case a number of products are manufactured, marginal costing helps management in the determination of relative profitability of each product.

7. **Aid to Profit Planning :** The technique of marginal costing helps management in profit planning. The management can plan the volume of sales for earning a required profit.

8. **Break-even point :** It can be determined only on the basis of marginal costing.

9. **Pricing decisions :** These decisions can be based on contribution levels of individual products.

10. **Responsibility Accounting :** It becomes more effective when based on marginal costing. Managers can identify their responsibilities clearly.

4. LIMITATIONS OF MARGINAL COSTING

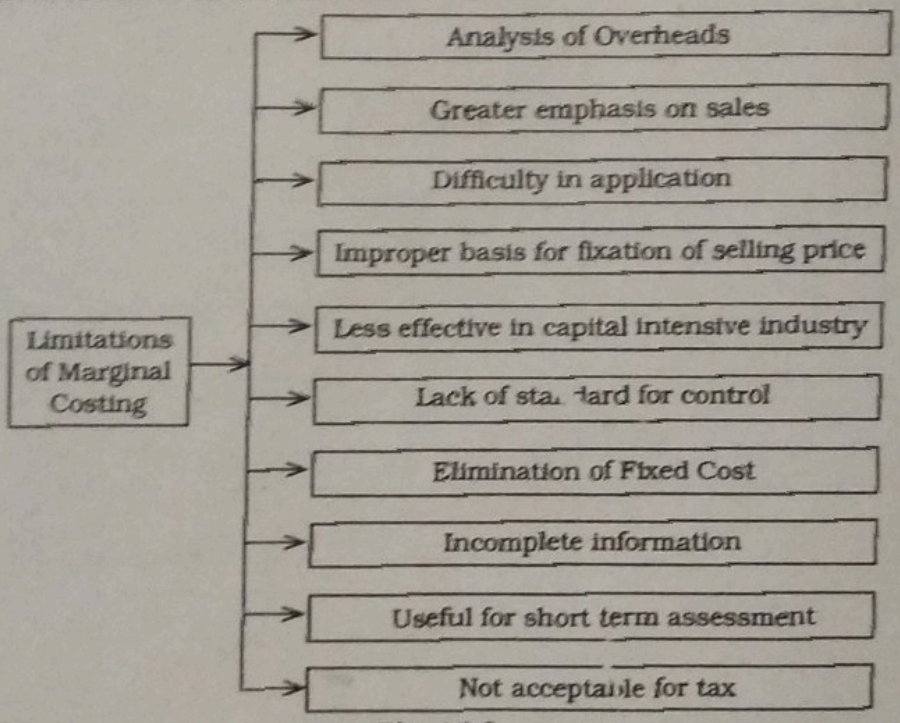

Fig. 12.2

1. **Analysis of overheads :** In marginal costing, costs are to be classified into fixed and variable costs. Considerable difficulties are experienced in analysing overheads into fixed and variable categories. Therefore, segregation of costs into fixed and variable is rather difficult and cannot be done with precision.

2. **Greater emphasis on Sales :** Marginal costing technique lays greater emphasis on sales rather than production. In fact, efficiency of business is to be judged by considering both sales and production.

3. **Difficulty in Application :** Marginal costing is not applicable in those concerns where large stocks have to be carried by way of work-in-progress.

4. **Improper basis for fixation of selling price :** In marginal costing selling price is fixed on the basis of contribution alone which is not proper.

5. **Less effective in Capital Intensive Industry :** Marginal costing technique is less effective in capital intensive industry where fixed cost is more.

6. **Lack of standard for control :** Marginal costing does not provide any standard for control purpose. In fact, budgetary control and standard costing are more effective tools in controlling costs.

7. **Elimination of Fixed Cost :** In marginal costing technique fixed costs are not included in the value of finished goods and work-in-progress. Since fixed costs are incurred, these should also form part of the costs of the product. Elimination of fixed costs from finished stock and work-in-progress results into the understanding of the stocks. The understating of the stocks affects the profit and loss account and the balance sheet, which leads to deflation of profits.

8. **Incomplete Information :** Marginal cost does not give complete information. For example, increase in production and sales may be due to so many factors such as extensive use of machinery, expansion of resources and by automation. The exact cause is not disclosed by marginal costing.

9. **Useful only for short term assessment :** Marginal costing is useful for short-term assessment of profitability. However, long-term assessment of profit can be correctly determined on full costs basis only.

10. **Not acceptable for tax :** Income tax authorities do not recognise marginal costing for inventory valuation.

5. CONCEPT OF PROFIT

Profit is known as 'Net Margin'. Net Margin is calculated after deducting fixed cost from total contribution or gross margin. Profit is an excess of contribution over fixed cost.

Profit = Contribution - Fixed Cost

6. CONTRIBUTION

Contribution is the excess of selling price over variable costs. It is known as contribution because it contributes towards recovery of the fixed costs and profits. Contribution is a pool of amount from which total fixed costs will be deducted to arrive at the profit or loss. By equation the concept of contribution can be stated as follows :

C = S - V

C = Contribution
S = Sales
V = Variable Cost.

Distinction between Contribution and Profit

	Contribution	Profit
1.	It includes fixed cost and profit.	It does not include fixed cost.
2.	This concept is used by marginal costing.	This concept decides profit or loss of a business organisation.
3.	It is equal to fixed cost at Break-even-point.	It is the result of excess of sales over break-even-point.
4.	It is used in managerial decision making.	It is used in deciding profitability of an organisation.

Illustration 1

	Rs.
Sales	12,000
Variable Cost	7,000
Fixed Cost	4,000

Calculate contribution. profit

Solution

C = S - V
= 12,000 - 7,000
= 5,000

P = C - F
= 5,000 - 4,000
= 1,000

Contribution is not profit. It covers fixed cost and the balance left out is profit. Contribution plays a very important role in decision making. It is the criteria of deciding profitability of various alternatives. The alternative which gives maximum contribution is considered as most profitable.

7. ABSORPTION VS. MARGINAL COSTING

Absorption and marginal costing are based on different concepts of income.

Absorption Costing and Marginal Costing.

	Absorption Costing		Marginal Costing
1.	All costs–fixed and variable are charged to the product.	1.	Only variable costs are charged to the product.
2.	Profit is equal to sales less cost of goods sold	2.	Profit is equal to contribution less fixed cost.
3.	It does not disclose cost volume profit relationship.	3.	Cost volume profit relationship is an integral part of marginal costing.
4.	Closing Stock is valued at total cost	4.	Closing Stock is valued at variable cost.
5.	It reveals more profit as fixed cost is included in Closing Stock.	5.	It reveals less profit as fixed cost is eliminated from Closing Stock.
6.	It may lead to over or under absorption of costs.	6.	It will not lead to the problem of under or over absorption of cost.

8. MARGINAL COST EQUATION

We have seen in the earlier paragraphs that contribution is the difference between sales and variable cost. In other words, products sold provide fund to meet fixed costs and profits. Therefore, contribution is equal to fixed cost plus profit. From this the following equation has been derived :

$$S - V = F + P$$

i.e. C = F + P Contribution (C)

where S = Sales
V = Variable Cost;
F = Fixed Costs,
P = Profit

If any three factors are given, the fourth can be ascertained. This equation is also used for ascertainment of "Break-Even-Point". (B.E.P.) i.e. the point or level where there is no profit or no loss.

9. PROFIT/VOLUME RATIO

This is popularly known as P/V Ratio. It expresses the relationship between contribution and sales. It is expressed in percentage. P/V ratio is given by the formula :

$$\text{P/V ratio} = \frac{S - V}{S} \times 100 = \frac{C}{S} \times 100$$

where C = Contribution, (being the difference between sales and variable costs)

S = Sales

V = Variable Costs

P/V ratio can be determined by expressing change in profit or loss in relation to change in sales. P/V ratio indicates the relative profitability of different products, processes and departments.

If information about two periods is given, P/V ratio is calculated as follows :

$$\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

Illustration 2

	Rs.
Sales	20,000
Variable Cost	16,000

Calculate P/V Ratio

Solution

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{4,000}{20,000} \times 100$$

$$= 20\%$$

P/V ratio is most important to watch in business. It is the indicator of the rate at which the organisation is earning profit. A high ratio indicates high profitability and a low ratio indicates low profitability. It is useful for calculating Break Even Point, profit at a given level of sales, sales required to earn a certain amount of profit etc.

Higher P.V. Ratio is an index of sound financial health of company's product. P/V Ratio can be improved by improving contribution which can be improved by taking the following steps :

a) Increase in sales

b) Reduction in marginal cost

c) Concentration on sale of profitable product.

Limitations of P.V. Ratio

Following limitations should be kept in mind while using P.V. Ratio.

a) It heavily depends on contribution.

b) It fails to consider the capital outlays required by additional productive capacity.

c) It indicates only relative profitability.

d) Over simplification may lead to erroneous conclusion.

e) Higher ratio will show the most profitable item only when other conditions are constant.

Factors Influencing P/V Ratio

Factors		P/V Ratio
A. Fixed Cost		
i) Increase	⟶	No Impact
ii) Decrease	⟶	No Impact
B. Sales Volume		
i) Increase	⟶	No Impact
ii) Decrease	⟶	No Impact
C. Selling Price		
i) Increase	⟶	Increase
ii) Decrease	⟶	Decrease
D. Variable Cost		
i) Increase	⟶	Decrease
ii) Decrease	⟶	Increase

10. BREAK-EVEN-POINT (B.E. POINT)

Break-even-point is the point at which total revenue is equal to total cost. It is that level of output (or sale) where there is no profit or no loss. At this stage contribution is just sufficient to absorb fixed cost. The organisation starts earning profit when the output or sales activity crosses this point. Output or sales below this profit results in a loss.

Algebraic Method

There are two ways of calculating break even point :

Contribution Approach

Following formulae are used in this approach :

$$\text{B.E.P. (units)} = \frac{\text{Fixed cost}}{\text{Selling Price per unit} - \text{Variable Cost per unit}}$$

$$\text{OR} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

$$\text{Or} = \frac{\text{Break Even Sales (Rs.)}}{\text{Selling price per unit}}$$

$$\text{Break Even Point (in Rs.)} = \frac{\text{Fixed Cost} \times \text{Sales}}{\text{Sales} - \text{Variable Cost}}$$

$$\text{OR} = \frac{\text{Fixed Cost} \times \text{Selling price per unit}}{\text{Contribution per unit}}$$

$$\text{OR} = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

$$\text{OR} = \frac{\text{Fixed Cost}}{\left(1 - \frac{\text{Variable cost}}{\text{Sales}}\right)}$$

$$\text{OR} = \text{B.E.P. Units} \times \text{Selling price per unit}$$

Equation Approach :

Sales – Fixed Cost – Variable Cost = Net Profit

Sales – Total Cost = Net Profit

Sales = Fixed Cost + Variable Cost + Net Profit

Sales – Variable cost = Fixed Cost + Net Profit

Contribution = Fixed Cost + Net Profit

At Break Point

Contribution = Fixed Cost

Contribution – Fixed Cost = 0

$$\text{Required Sales} = \frac{\text{Fixed Cost} + \text{Expected Profit}}{\text{P.V. Ratio}}$$

Relationship between Contribution and BEP

A. At BEP ⟶
- Contribution = Fixed Cost
- Profit/Loss = Contribution – Fixed Cost
- = Nil

B. At above BEP ⟶
- Contribution > Fixed Cost
- Profit = Contribution – Fixed Cost

C. At below BEP ⟶
- Contribution < Fixed Cost
- Loss = Fixed Cost – Contribution

Illustration 3

Total Fixed Cost	Rs. 12,000
Selling Price	12 per unit
Variable Cost	9 per unit

Calculate Break Even Point.

Solution

Contribution = S - V

= 12 - 9

= 3

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$= \frac{3}{12} \times 100 = 25\%$$

$$\text{B.E.P.} = \frac{\text{Total Fixed Cost}}{\text{P/V Ratio}}$$

$$= \frac{12,000}{25\%} = \text{Rs. } 48,000$$

Cash Break Even

It is the point in the level of activity where total cash cost is equal to total sales revenue. If the output is below cash break even, the producer could be in real difficiutlty. For calculation of cash break even fixed costs are divided into two categories :

I. Fixed cost incurred in cash such as salaries, rent, insurance, power, telephone charges etc.

II. Fixed costs which do not require immediate cash such as depreciation, deferred revenue expenditure written off, goodwill written off, notional fixed costs etc.

$$\text{Cash BEP (units)} = \frac{\text{Cash Fixed Cost}}{\text{Cash Contribution Per Unit}}$$

$$\text{Cash BEP (Rs.)} = \frac{\text{Cash Fixed Cost}}{\text{P/V Ratio}}$$

Illustration 4

Total fixed cost for the year Rs. 12,00,000. This includes depreciation of Rs. 2,00,000, write off of goodwill Rs. 1,00,000. Selling price of a product is Rs. 80 per unit and variable cost is Rs. 60.

Calculate Cash Break Even.

Solution

$$\text{Cash BEP (Units)} = \frac{\text{Cash Fixed Cost}}{\text{Cash Contribution Per Unit}}$$

$$= \frac{12,00,000 - 2,00,000 - 1,00,000}{80 - 60}$$

$$= \frac{9,00,000}{20} = 45,000 \text{ units}$$

$$\text{Cash BEP (Rs.)} = \frac{\text{Cash Fixed Cost}}{\text{P/V Ratio}}$$

$$\text{P/V Ratio} = \frac{S - V}{S} \times 100$$

$$= \frac{80 - 60}{80} \times 100$$

$$= \frac{20}{80} \times 100 = 25\%$$

$$\text{Cash BEP (Rs.)} = \frac{9,00,000}{25\%}$$

$$= \text{Rs. } 36,00,000$$

10.1 Assumptions

Break Even Analysis is based on the following assumptions :

i) Costs can be classified into fixed and variable categories.
ii) Fixed Costs remain fixed for the entire volume.
iii) Variable costs change according to the changes in output.
iv) Selling price per unit remains the same for the entire volume.
v) Market is sufficient to absorb the entire output.

10.2 Uses of Break Even Analysis

i) It facilitates determination of selling price which will give the desired profits.
ii) It makes it possible to divide the sales volume to cover a given rate of return on capital employed.
iii) The management can forecast profit and volume at levels of activity.
iv) It suggests to make a change in sales mix.
v) It helps management to do inter-firm comparison of profitability.
vi) It shows the impact of changes in costs on profits.
vii) It enables the management to plan for the optimum utilisation of capacity.

10.3 Limitations

Break Even Analysis is subject to certain limitations which are as follows :

i) B.E. Analysis is based on the assumption that costs can be classified into fixed and variable categories. In practice it is very difficult to have such a clear cut distinction between fixed and variable cost. These are certain costs which can not be classified accurately.
ii) It assumes that fixed cost remains constant. However, in practice it may change.
iii) Variable costs may not vary in direct proportion to the volume.
iv) Selling price may not remain constant.
v) The assumption that only one product is produced does not hold true in practice.
vi) The assumption regarding production and sales does not realise in practice.
vii) The analysis is static. However, circumstances are dynamic. Break Even Analysis becomes complicated when all these changes are to be incorporated.
viii) It does not consider capital employed in business . It presents only one fact of profit planning.

Factors affecting Break Even

There are three factors viz. fixed cost, variable cost and selling price which affect Break Even as follows :

Factors		Effect on BEP	
A.	Fixed Cost		
	i) Increase	i)	BEP will go up
	ii) Decrease	ii)	BEP will come down
B.	Variable Cost		
	i) Increase per unit	i)	BEP will go up
	ii) Decrease per unit	ii)	BEP will come down
C.	Selling Price		
	i) Increase per unit	i)	BEP will come down
	ii) Decrease per unit	ii)	BEP will go up

11. MARGIN OF SAFETY

It is the excess of present sales value over the break-even-sales.

Margin of safety indicates the strength of a business. High margin of safety indicates that profits will be earned even if there is a fall in the selling price. On the other hand if the margin of safety is small, a decline in sales value will be a matter of great concern to the management. In such a situation, management may be required to take the following decisions :

i) Increase the selling price,

ii) Increase the level of activity,

iii) Reduce costs,

iv) Substitute the existing product with more profitable product.

Margin of safety is also popularly known as M/s. It is the excess of actual sale of production volume over the Break-even point.

By formula Margin of Safety could be stated as

i) $M/S = \text{(Sales Units - Break-even units)}$.

ii) $M/S = \dfrac{\text{Profit}}{\text{P/V Ratio}}$

iii) M/S is directly related to profit. This is shown below :

$P = M/S \times P/V \text{ Ratio}$

iv) M/S as percentage of total sales

$= \dfrac{\text{Margin of Safety}}{\text{Total Sales}} \times 100$

If the margin of safety is large the business prospects are strong. As against this, if the margin of safety is small, the business prospects are weak.

The margin of safety indicates the profitability. The margin of safety could be improved by increasing the selling price, which improves sales revenue or by reducing the costs.

Illustration 5

From the following calculate P/V Ratio, B.E.P. and M/s :

	Rs.
Sales	1,00,000
Fixed Cost	20,000
Variable Cost	60,000

Solution

1. P/V Ratio $= \frac{S - V}{S} \times 100$

$= \frac{1,00,000 - 60,000}{1,00,000} \times 100$

$= 40\%$

2. B.E.P. $= \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$= \frac{20,000}{40\%}$

$= 20,000 \times \frac{100}{40}$

$= 50,000$

3. M/s $\approx$ Actual Sales - B.E.P.

$= 1,00,000 - 50,000$

$= 50,000$

OR

M/s $= \frac{\text{Profit}}{\text{P/V Ratio}}$

$= \frac{20,000}{40\%}$

$= 50,000$

12. BREAK-EVEN CHART

The break-even chart is a graphical representation of marginal costing. It indicates the graphic relationship between costs, volume and profits. It shows not only the BEP but also the effects of costs and revenue at varying levels of sales. Therefore, it can be more appropriately called as the cost-volume-profit graph (CVP graph). Thus the Break-even chart indicates the following information :

i) Fixed Cost,

ii) Variable costs,

iii) Total Cost,

iv) Sales Value,

v) Profit or Loss,

vi) Break-even point,

vii) Margin of safety.

12.1 Assumptions

However, the construction of Break-Even chart is based on certain important assumptions. These assumptions are as listed below :

i) Fixed cost will remain constant.

ii) Prices of variable cost factors will remain unchanged.

iii) Semi-variable cost is segregated into variable and fixed costs.

iv) Method of production will not change.

v) Operating efficiency will remain unchanged.

vi) There will be no changes in pricing policy.

vii) Sales equal production.

viii) Product-mix will remain constant.

Graphical chart can help to do Break Even analysis. Break-Even chart indicates profit or loss at different levels of sales volume. It shows fixed cost, variable cost, sales revenue and profit or loss at a given level of production.

Steps to draw Break Even Chart :

1. Select a scale for sales on horizontal axis.
2. Select a scale for cost and revenue on vertical axis.
3. Draw fixed cost line parallel to horizontal axis.
4. Draw total cost line.
5. Draw the sales line starting from the point of origin and finishing at point of maximum sales.
6. The point of intersection of two lines i.e. sales line and total cost line is the Break Even Point.
7. Draw the line from intersection to vertical axis and horizontal axis to get sales value and number of units produced at break-even point.
8. Show the loss area when production is less than the break-even point and profit area when production is more than the break-even point.
9. Show margin of safety by deducting break even sales from total sales.
10. Show the angle of incidence.

12.2 A specimen of break-even-chart is as given below :

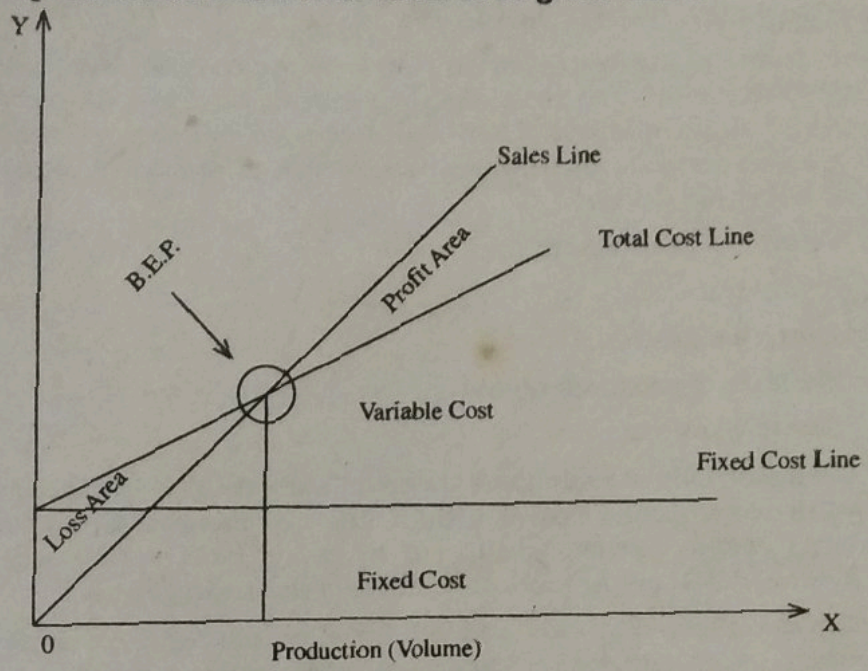

Fig. 12.3

12.3 Advantages of Break-Even-Chart

1. It is simple to construct and understand. Facts represented graphically are understood well.
2. It helps management in studying the relationship between cost, volume and profits. This enables the management in taking decisions on sales.
3. It helps management in understanding the strength and profit earning capacity of a business concern. Many important decisions can be taken on the basis of margin of safety, break-even point etc.
4. It indicates the impact of different product mixes on profits. This helps management in selecting the most profitable product-mix.

12.4 Limitations of Break-Even-Chart

1. Break-even chart indicates a static picture. It becomes out of date if there is a change in the assumptions or conditions.
2. A company manufacturing variety of products cannot represent the fact of each product in the chart.
3. Break-even chart does not consider the amount of capital employed which is very vital in many decisions.

13. ANGLE OF INCIDENCE

It is formed by the intersection of sales line and total cost line at the B.E.P. It shows the rate at which the organisation is earning profit once the B.E.P. is reached. The wider the angle, the greater is the rate of earning profits with increase in sales. A large angle of incidence with greater M/s shows an extremely favourable situation.

17. KEY POINTS

- Marginal cost is equal to variable cost.
- Contribution is excess of sales over variable cost i.e. sales - variable cost.
- P/V Ratio is a relationship between contribution and sales.

$$\text{P/V Ratio} = \frac{C}{S} \times 100$$

- B.E.P. is a no profit no loss stage in the level of activity

$$\text{B.E.P} = \frac{\text{Fixed cost}}{\text{P/V Ratio}}$$

- M/s is excess of sales over break-even sales.

$$\text{M/s} = \text{Sales} - \text{B.E. sales}$$

OR

$$\text{M/s} = \frac{\text{Profit}}{\text{P/V Ratio}}$$

- B.E. chart is a graphical presentation of B.E.P; cost, volume, etc.
- Profit chart is a pictorial presentation of cost, volume profit relationship.
- Required sales $= \frac{\text{Fixed cost + Desired profit}}{\text{P/V Ratio}}$
- The alternative which gives maximum contribution is considered as most profitable.

18. KEY TERMS

1.	**Marginal Cost**	:	It is the variable cost.
2.	**Contribution**	:	It is the excess of sales over variable cost.
3.	**P/V Ratio**	:	It is the relationship between Contribution and Sales.
4.	**B.E. Point**	:	It is the point in the level of activity where total cost is equal to total revenue.
5.	**Margin of Safety**	:	It is the excess of sales over B.E. Sales.
6.	**Angle of Incidence**	:	It shows the rate at which the organisation is earning profit once the B.E. point is reached.

19. EXERCISES

2 MARGINAL COSTING AND BREAK EVEN ANALYSIS

1. A company produces and sells 1,000 units of a product per month at the rate of Rs. 20. If the variable cost is Rs. 12 per unit and fixed costs are Rs. 3,000 per month.
Calculate:
(I) Break Even Point in units.
(ii) If selling price is reduced by 20%. Calculate new Break even point in units.
(iii) Calculate number of units to be sold at the reduced selling price to earn a profit of Rs. 4,000.

2. Your are furnished with the following information.

Fixed cost for a period	Rs. 5,000
Variable cost per unit	Rs. 10
Selling price per unit	Rs. 20
Actual units sold	750 units

Determine:
(a) PA/ ratio.
(b) Break-even point.
(c) Margin of safety sales in units and in rupees.
(d) Profits, if the sales are 1,000 units.
(e) Sales, if profit is Rs, 15,000.
(f) New BEP if selling price increases by 25%,
(g) New BEP if variable cost decreases by 20%.

3. The trading results of James Bond & Co. for the last two quarters are:

The Quarter Ended	Sales (Rs.)	Cost (Rs.)
March	50,000	40,000
June	75,000	55,000

Calculate:
(a) Profit-Volume Ratio.
(b) Fixed Costs.
(c) Break Even Sales Volume.
(d) Sales to earn a profit of Rs. 15,000.
(e) Profit when sales are Rs. 40,000.
(f) Revised BEP if Fixed Cost increases by 30%.

4. Flame Ltd., has the following data for the coming year:

	(Rs.)
Sales (10,000 Units)	1,00,000
Variable Costs	40,000
Fixed Costs	50,000

(a) Find out PA/ Ratio, BEP and Margin of safety sales.
(b) Evaluate the effect of the following on the above:
(i) 20% increase in physical sales volume;
(ii) 15% decrease in physical sales volume;
(iii) 5% increase in variable costs;

(iv) 10% decrease in fixed costs.

5. The sales and profits during the two years were as follows:

Year Ending 31st March	Sales (Rs.)	Profit (Rs.)
2004	4,00,000	40,000
2005	6,00,000	80,000

Calculate:

(a) Profit-Volume (PA/) Ratio.
(b) Fixed Cost.
(c) Break Even Point.
(d) If the company wants to have a profit of Rs. 12,000 what should be the level of sales?
(e) Profit when sales are Rs. 7,50,000.
(f) Revised BEP if Fixed Cost increases by 20%.

6.

Year ended	Total Sales (Rs.)	Total Cost (Rs.)
31-3-2004	22.23.000	19,83,600
31-3-2005	24.51.000	21,43,200

Calculate:

(a) P/V Ratio.
(b) Fixed Cost.
(c) Fixed Cost to Sales
(d) BEP
(e) MOS for 2004 and 2005

7. Three firms X, Y and Z manufacture the same product. The selling price is Rs. 8 per unit. The fixed costs for firms X, Y and z are Rs. 80,000, Rs. 2,00,000 and Rs, 3,30,000 respectively. The variable cost per unit are Rs. 6, Rs. 4 and Rs. 3 respectively. Determine the break-even points for all the three firms. How much profits are earned by each of the firms when they sell 80,000 units each?

8. From the following data calculate the Break Even Point expressed in terms of sales in Rupee.

Sales Prices	Rs. 20 per unit
Variable Manufacturing Expenses	Rs. 11 per unit
Variable Selling Expenses	Rs. 3 per unit
Fixed Factory Overhead	Rs. 5,40,000 per year
Fixed Selling Expenses	Rs. 2,52,000 per year

Also ascertain no. of units that must be sold to earn a profit of ₹ 60000 per year.

Calculate if no. of units : 132000 ii. 142000.

9. Fast-track Ltd.'s summarised performance was declared as (Rs. Lakhs):

Particulars	2005	2006
Sales	500	600
Profit	200	245

The chairman expects 50% jump in sales during 2007, over 2006.

Required to compute:

(i) Expected profit in the year 2007.
(ii) Margin of safety in year 2005.
(iii) Break-even point in year 2006.

(iv) Capacity utilization in year 2007 if the company is operating at 30% capacity in year 2005.

(v) Sales target in 2007 if profit desired in 2007 was double the 2005 profit.

Make assumptions if necessary and state them expressly.

10. Calculate P/V ratio, Margin of safety and Break Even Point (Both in terms of units and value) from the following data:

(i)	Total number of units manufactured and sold:	400
(ii)	Variable cost per unit	Rs. 30
(iii)	Total fixed cost	Rs. 5,000
(iv)	Selling price per unit	Rs. 80

11. Given:

Total number of units manufactured and sold		800
Variable cost per unit:	Rs.	20
Total fixed costs:	Rs.	1,000
Selling price per unit:	Rs.	120

(i) Calculate the PA/ ratio, the margin of safety and the break-even point (in units and in value terms).

(ii) What is the current profit? How much should the company sell to earn a target profit of Rs. 1,00,000?

12. Information of Alfa and Co. is given below.

Particulars	Per Unit Variable Cost (Rs.)	Fixed Cost (Rs.)
Direct Material	3.00	
Direct Labour	3.00	-
Factory Overhead	2.00	50,000
Selling Expenses	2.00	20,000
Administrative Overhead	2.00	10,000

Budgeted Sales are 12,500 Units @ Rs. 20.00 Per Unit. Find:

a. P/V Ratio,

b. Break Even Point Sales.

c. Profit at Budgeted Sales.

d. Margin of Safety at Budgeted Sales.

e. Profit, if Actual Sales:

(i) Decrease by 20% from budgeted sales.

(ii) Increase by 5% from budgeted sales.

13. From the following informations calculate:

(a) Break-Even Point.

(b) P/V Ratio.

(c) Profit.

(d) Profit at 75% capacity.

(e) Profit at 100% capacity.

(i) Budgeted Sales Rs. 2,00,000 (80% capacity)

(ii) Direct Materials 30% of Sales.

(iii) Direct labor 20% on sales.

(iv) Variable Overheads (Factory) 10% on sales.

(v) Variable Overheads (Administration) 15% of sales.