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Management Accounting

Unit 3

Q: What is absorption costing? Explain briefly its advantages and limitations. (www.prepNext.com)

Ans:

Absorption costing is a conventional technique of ascertaining cost. It is the practice of charging all costs both variable and fixed to operations, processes or products. It is also known as 'full costing' technique. It is the oldest and widely used technique of ascertaining cost. The distinguishing feature of absorption costing is that **fixed factory expenses** are included in (i) unit cost and (ii) inventory value.

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Absorption costing is a costing system which treats all costs of production as product costs, regardless whether they are variable or fixed. It is the practice of charging all variable manufacturing costs (i.e. Direct Material Cost, Direct Labour Cost, Direct Expenses and Variable Production Overheads) and fixed production overheads to operations, processes or products and writing off all administration, selling and distribution overheads against the profits in the period in which they arise.

CIMA, London, defines the 'Absorption Costing' as 'the practice of charging all costs, both variable and fixed, to operations, processes or products.'

Basic Features:

- (a)** All costs are classified on functional basis as Production costs, Administration costs, Selling Costs, Distribution costs.
- (b)** All variable manufacturing costs and fixed production overheads are treated as product costs and hence are charged to operations, processes or products.
- (c)** All administration, selling and distribution overheads are treated as period costs and hence, are written off against the profits in the period in which they arise.

Advantages of Absorption Costing:

Following are the main advantages of absorption costing:

(i) Recovers total cost:

It recognizes the importance of including fixed manufacturing costs in product cost determination and framing a suitable pricing policy. Price based on absorption costing ensures that all costs are covered. Prices are well regulated where full cost is the basis.

(ii) Correct Profit calculation:

It will show correct profit calculation in case where production is done to have **sales in future** (e.g., seasonal sales) as compared to variable costing. In absorption costing, fixed cost included in closing stock is carried forward to next year and hence does not affect the profits of the current period.

(iii) Conformity to Matching Concept:

It helps to conform to accrual and matching concepts which require matching cost with revenue for a particular period.

(iv) Widely Recognised:

It has been recognised by various bodies as FASB (USA), ASC(UK), ASB(India) for the purpose of preparing external reports and for valuation of inventory.

(v) Avoids segregation of costs into fixed and variable:

It avoids the separation of costs into fixed and variable elements which cannot be done easily and accurately.

(vi) Discloses efficiency in utilisation of production resources:

It discloses inefficient or efficient utilisation of production resources by indicating under-absorption or over-absorption of factory overheads.

(vii) Helps in Fixing Responsibility:

It helps to make the managers more responsible for the costs and services provided to their centres/ departments due to correct allocation and apportionment of fixed factory overheads.

(viii) Discloses Gross Profit and Net Profit.

It helps to calculate the gross profit and net profit separately in income statement.

LIMITATIONS OF ABSORPTION COSTING:

Following are the main limitations of absorption costing:

(i) Difficulty in comparison and control of cost:

Absorption costing is dependent on level of output; so different unit costs are obtained for different levels of output. An increase in the volume of output normally results in reduced unit cost and a reduction in output results in an increased cost per unit due to the existence of fixed expenses. This makes comparison and control of cost difficult.

(ii) Not helpful in managerial decisions:

Absorption costing is not very helpful in taking managerial decisions such as selection of suitable product mix, whether to buy or manufacture, whether to accept the export order or not, choice of alternatives, the minimum price to be fixed during the depression, number of units to be sold to earn a desired profit etc.

(iii) Cost vitiated because of fixed cost included in inventory valuation:

Under absorption costing, a portion of fixed cost is carried forward to the next period because closing stock is valued at cost of production which is inclusive of fixed cost.

(iv) Fixed cost inclusion in cost not justified:

Many accountants argue that fixed manufacturing, administration and selling and distribution overheads are period costs and do not produce future benefits and, therefore, should not be included in the cost of product.

(v) Apportionment of fixed overheads on arbitrary methods:

The validity of product costs under this technique depends on correct apportionment of overhead costs. But in practice many overhead costs are apportioned by using arbitrary methods which ultimately make the product costs inaccurate and unreliable.

(vi) Not helpful for preparation of flexible budget.

Under absorption costing no distinction is made between the fixed and variable costs. It is not possible to prepare flexible budget without making this distinction.

Q: Write short note on marginal cost. (www.prepNext.com)

Ans:

VARIABLE/ MARGINAL COSTS:

Variable costs are costs that change in direct proportion to the level of activity. It may be defined 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.

Marginal cost is the variable cost comprising prime cost and variable overheads.

*Marginal Cost = Variable Cost = Direct Labour + Direct Material +
Direct Expenses + Variable Overheads.*

The Chartered Institute of Management Accountants, London, defines the term 'marginal cost' as follows:

Marginal Cost is 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. In this context a unit may be a single article, a batch of articles, an order, a stage of production capacity or a department. It relates to the change in output in the particular circumstances under consideration.

Computation of Marginal Cost/ Variable Cost

Particulars	Rs.
Direct Materials Cost	xxx
Direct Labour Cost	xxx
Direct Expenses	xxx
Variable Production Overheads	xxx
Variable Administration Overheads	xxx
Variable Selling & Distribution Overheads	xxx
Total Variable Cost	xxx

Q: What do you understand by marginal costing? What are its main features? Explain its assumptions in brief.

(www.prepNext.com)

Ans:

MARGINAL COSTING:

Marginal costing is a technique which provides presentation of cost data in such a way that true cost-volume-profit relationship is revealed. Under this technique, it is presumed that costs can be divided in two categories, i.e., fixed cost and variable cost. Fixed cost is charged to contribution of the period in which it is incurred and is considered period cost. In this technique of costing only variable costs are charged to operations, processes or products, leaving all indirect costs to be written off against profits in the period in which they arise. Marginal costing is also known as 'variable costing'

CIMA, London, has defined Marginal Costing as "the ascertainment of marginal costs and of the effect on profit of changes in volume or type of output by differentiating between fixed costs and variable costs".

Basic Characteristics/ Features of Marginal Costing:

The technique of marginal costing is based on the distinction between product costs and period costs. Only the variable costs are regarded as the costs of the products while the fixed costs are treated as period costs which will be incurred during the period regardless of the volume of output. The main characteristics of marginal costing are as follows:

- 1)** It is not an independent system of costing such as process costing or job costing. It is a technique of analysis and presentation of costs which help management in taking many managerial decisions.
- 2)** The variable costs (marginal costs) are regarded as the costs of the products.

- 3) Fixed costs are treated as period costs and are charged to profit and loss account for the period for which they are incurred.
- 4) The stocks of finished goods and work-in-process are valued at marginal costs only. Fixed costs are not considered for valuation of closing stock of finished goods and closing WIP.
- 5) Prices are determined on the basis of marginal cost by adding 'contribution' which is the excess of sales or selling price over marginal cost of sales.
- 6) All elements of costs (production, administration and selling and distribution) are classified into fixed and variable components. Even semi-variable costs are analysed into fixed and variable elements.
- 7) Profitability of departments and products is determined with reference to their contribution margin.
- 8) Variable cost alone are charged to production. Fixed costs are recovered from contribution.
- 9) Profit is calculated by deducting marginal cost and fixed cost from sales

Assumptions of Marginal Costing:

The technique of marginal costing is based upon the following assumptions:

- 1) All elements of cost – production, administration and selling and distribution – can be segregated into fixed and variable components.
- 2) Variable cost remains constant per unit of output irrespective of the level of output and thus fluctuates directly in proportion to changes in the volume of output.
- 3) The selling price per unit remains unchanged or constant at all levels of activity.
- 4) Fixed costs remain unchanged or constant for the entire volume of production.
- 5) The volume of production or output is the only factor which influences the costs.

Q: Explain the advantages and limitations of marginal costing.

(www.prepNext.com)

Ans:

The following are the important advantages of marginal costing:

1) Easy to operate and understand:

The technique of marginal costing is very simple to operate and easy to understand. Since, fixed costs are kept outside the unit cost; the cost statements prepared on the basis of marginal cost are much less complicated. It also avoids the complexities of apportionment of fixed cost which are really only arbitrary.

2) Removes complexities of under and over-absorption of overheads:

The technique of marginal costing does away with the need for allocation, apportionment and absorption of fixed overheads and hence removes the complexities of under or over-absorption of fixed overheads. *There is no problem of computing fixed overhead recovery rates and their under or over recovery as fixed overheads are charged against the contribution.*

3) Helps management in Production Planning:

Marginal cost remains the same per unit of output irrespective of the level of activity. It is constant in nature and helps the management in production planning.

4) No possibility of fictitious profits by over-valuing stocks:

The valuation of closing stock under marginal costing is done at marginal cost. Since fixed costs are not considered in valuation of closing stocks, there is no possibility of fictitious profits by over-valuing stocks.

5) Facilitates calculation of important factors like B.E.P

It provides the management with useful techniques like break even analysis, P/V ratio etc. This facilitates the calculation of various important factors, viz., break-even point, expectations of profits at different levels of production, sales necessary to earn a predetermined target of profit, effect on profit due to change in sales mixture, etc.

6) Valuable aid to management for Decision-Making

It is very valuable technique in decision-making. It provides information to management in making decisions like export decision, fixation of selling prices, selection of a profitable product/sales mix, make or buy decision, problem of key or limiting factor, determination of the optimum level of activity, close or shut down decisions, evaluation of performance and capital investment decisions, etc.

7) Facilitates study of relative profitability

It facilitates the study of relative profitability of different product lines, departments, production facilities, sales divisions, etc. It, thus, helps in evaluation of performance of different departments, divisions, salesmen, etc.

8) Complimentary to Standard Costing and Budgetary Control

It is complimentary to standard costing and budgetary control and can be used along with them to yield better results.

9) Helps in Cost Control

Fixed costs are not controllable in the short period. Marginal costing avoids arbitrary apportionment or allocation of fixed costs. It, thus, helps in cost control by concentrating on variable cost which is controllable.

10) Profit Planning

It helps the management in profit planning by making a study of relationship between cost, volume and profits. It guides the management about the profitability at various levels of production and sales. Further, break-even charts and profit graphs make the whole problem easily understandable even to a layman.

11) Management Reporting

It is very useful in management reporting. Marginal costing facilitates 'management by exception' by focusing attention of the management towards more important areas than to waste time on problems which do not require urgent attention of the higher managements.

12) Aggressive Pricing Policy:

Marginal costing permits a manufacturer to develop an aggressive pricing policy, which leads to higher sales *and possibly reduced marginal costs through increased marginal physical productivity and lower input factor prices.*

13) Pricing During Stiff Competition and Trade Depression:

During stiff competition and during depression, products may have to be sold at a price below the total cost. In such circumstances, the prices should be fixed on the basis of marginal cost in such a manner so as to cover the variable cost and contribute something towards the fixed expenses. Sometimes, to eliminate the weaker competitors from the market, price may be fixed even below the marginal cost.

14) Accepting Special Orders, Additional Orders, Export Orders and Exploring New Markets:

Bulk orders, additional orders and orders from foreign and new markets, may be accepted at a price below the normal market price so as to utilise the idle capacity. The order may be accepted at any price above the marginal cost because the fixed costs have to be incurred even otherwise. But care must be taken to see that accepting an order below the market price does not affect the normal selling price adversely.

15) Constant Product Cost: Marginal costing permits to have constant product cost since marginal cost per unit is constant from one period to another period within a short span of time. If fixed cost is included, the product cost will change from one period to another depending upon the volume of output.

LIMITATIONS OR DISADVANTAGES OF MARGINAL COSTING:

In spite of so many advantages, the technique of marginal costing suffers from the following limitations:

1. All Costs Not Divisible into Fixed and Variable:

Under marginal costing all costs are classified as either fixed or variable. There are certain costs which are semi-variable in nature, and it is very difficult and arbitrary to classify these costs into fixed and variable elements.

2. Ignorance of Marginal Cost techniques:

Some accountants are not fully conversant with the marginal cost techniques themselves, and are not, therefore, capable of explaining their use to management.

3. Not Suitable for all organisations:

It is suitable only where production is of uniform size and shape and hence it is of limited use for companies which produce goods of different shapes and sizes. It is also not suitable for companies which have high fixed cost per unit because it takes into account only variable cost per unit.

4. Ignoring Fixed Costs not logical:

In the present day of automation, the proportion of fixed costs in relation to variable costs is very high and hence managerial decisions based upon only the marginal cost may not be correct.

5. Not suitable in contract or ship-building industry:

Overheads of fixed nature cannot altogether be excluded in contract or ship-building industry because in such cases, normally the value of work-in-progress is very high and the exclusion of fixed overheads may result into losses every year and huge profit in the year of completion of the job.

6. Undervaluation of Stocks:

The exclusion of fixed costs from the stocks of finished goods and work-in-progress is illogical since fixed costs are also incurred on the manufacture of products. Stocks valued on marginal costing are undervalued and the Profit and Loss Account and Balance Sheet cannot give a true picture.

7. Under or over-absorption of Variable Overheads:

The technique of marginal costing overcomes the problem of under or over-absorption of fixed overheads because fixed expenses are deducted from total contribution. But, the problem of under or over-absorption of variable overheads still arises.

8. Inaccurate Pricing Decisions:

Fixation of selling prices cannot be done without considering fixed costs. Thus, pricing decisions cannot be based on marginal cost alone. The prices should be so fixed that they cover variable costs and fixed costs.

9. Ignores Time Factor:

Time taken for the completion of jobs is not given due attention because marginal cost excludes fixed expenses which are connected with time. Thus, if two jobs give equal contribution but one takes longer time to complete, the one which takes longer time should be regarded as costlier than the other. But this fact is ignored altogether under marginal costing.

10. Not suitable for Cost Control:

Cost control can be better achieved with the help of other techniques such as budgetary control and standard costing as marginal costing technique does not provide any standard for the evaluation of performance which is provided by standard costing and budgetary control.

11. May lead to a General reduction in selling prices:

Sometimes an order from a new customer is accepted at a very low price on the argument that if marginal cost is little less than the price of the order it will give some contribution. This may sometimes lead to a general reduction in selling prices and thus to losses.

12. Difficulty in recovering full loss in case of loss by fire:

In case of loss by fire, full loss on account of stock destroyed by fire cannot be recovered from the insurance company because marginal costing technique of valuation of stock will not take fixed expenses into consideration.

13. Limited Use for Pricing Decisions:

In spite of its advantages, due to its inherent weakness of not ensuring the coverage of fixed costs, marginal costing technique has usually been confined to pricing decisions relating to special orders. In practice, full cost pricing still forms the basis of most pricing decisions.

14. Unrealistic Assumptions:

Some of the assumptions of marginal costing are not necessarily true in a realistic situation. For example,

- (i) The assumption that fixed cost will remain static throughout is not correct
- (ii) Variable costs do not always remain constant and do not always vary in direct proportion to volume of output because of the laws of diminishing and increasing returns.
- (iii) Selling prices do not remain constant for ever and for all levels of output due to competition, discounts for bulk orders, changes in the general price level, etc.
- (iv) Fixed costs do not remain constant after a certain level of activity. After a certain level of output has been reached, an increase in Fixed costs will tend to apply.

Circumstances under which it may be justifiable to sell at a price below marginal cost for a limited period:

- 1) *Where goods are of perishable nature*
- 2) *Where stocks have been accumulated in large quantities and the market prices have fallen*
- 3) *To introduce a new product*
- 4) *To maintain sales of the profitable products in case the sales of these products is linked to the sale of product to be sold below marginal cost.*
- 5) *To capture foreign markets*
- 6) *To obviate shut down costs*
- 7) *To retain future market*
- 8) *To eliminate competitors from the market*

Q: Differentiate between absorption costing and marginal costing.

(www.prepNext.com)

Ans:

Absorption costing is the total cost technique. It is the practice of charging all costs, both variable and fixed, to operations, processes, or products.

The basic differences between Absorption costing and Marginal costing are as follows:

Basis of Difference	Absorption Costing	Marginal Costing
Product Cost	All manufacturing costs whether variable or fixed are treated as product costs.	Only variable (manufacturing) costs are treated as product cost. Fixed costs are recovered from contribution.
Inventory Valuation	In absorption costing, the stock of finished goods and work-in-process is valued at total cost which includes both variable and fixed cost. <i>In other words, value of closing stock includes fixed production overheads.</i>	In marginal costing, , the stock of finished goods and work-in-process is valued at marginal cost, i.e., variable cost only. <i>Hence, it results in higher valuation of inventories in absorption costing as compared to marginal costing.</i>
Basis of Managerial Decision-making	In absorption costing, managerial decision-making is based upon 'profit' which is the excess of sales value over total cost.	In marginal costing, the managerial decisions are guided by 'contribution' which is the excess of sale value over variable cost.
Calculation of Profit	Difference between sales and total cost is profit	Difference between sales and marginal cost is contribution and difference between contribution and fixed cost is profit or loss.

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Cost per unit	Different unit costs are obtained at different levels of output because of fixed expenses remaining same. <i>(Cost per unit reduces, as the production increases as it is fixed cost per unit which reduces, whereas, the variable cost remains the same per unit.)</i>	Marginal cost per unit will remain same at different levels of output because variable expenses vary in the same proportion in which output varies.
Carry forward of fixed cost	A portion of fixed cost is carried forward to the next period because closing stock of work-in-progress and finished goods is valued at cost of production which is inclusive of fixed cost.	Stock of work-in-progress and finished goods are valued at marginal cost which does not include fixed cost. Fixed cost of a particular period is charged to that very period and is not carried over to the next period by including it in closing stock.
Effect of increase/decrease in inventory on profit	If stocks of work-in-progress and finished goods increase during a period, absorption costing will reveal more profit as compared to marginal costing. When such stock decreases, less profits are shown by absorption costing than marginal costing because under this technique of costing closing stocks are valued at higher figures.	If stocks of work-in-progress and finished goods increase during a period, marginal costing reports less income than absorption costing. But when such stocks decrease, the technique of marginal costing reveals more income than absorption costing.
Cost Classification	Costs are classified according to functional basis such as production cost, office and administrative cost and selling and distribution cost.	Costs are classified according to the behaviour of costs i.e., fixed costs and variable costs.

Period Costs	Only administration, selling and distribution overheads are treated as period costs and hence, are written off against the profits in the period in which they arise.	All fixed costs i.e. Production/ Administration/ Selling/ Distribution Overheads are treated as period costs and hence are written off against profits in the period in which they arise.
Absorption of fixed overheads	Apportionment of fixed expenses on an arbitrary basis gives rise to over or under absorption of overheads which ultimately makes the product cost inaccurate and unreliable.	Marginal costing excludes fixed costs and therefore, question of under or over absorption of fixed costs does not arise.
Useful for decision making	Absorption costing is not very helpful in taking managerial decisions such as whether to accept the export order or not, whether to buy or manufacture, the minimum price to be charged during the depression etc.	Technique of marginal costing is very helpful in taking managerial decisions because it takes into consideration the additional cost involved only assuming fixed expenses remaining constant.
CVP Relationship	Absorption costing fails to establish relationship of cost, volume and profit as costs are seldom classified into fixed and variable.	Cost, Volume and Profit (i.e., CVP) relationship is an integral part of marginal cost studies as costs are classified into fixed and variable costs.
Basis of Managerial Decisions	Managerial Decisions are based on total profit i.e. excess of total sales revenue over total costs.	Managerial Decisions are based on contribution i.e., excess of sales revenue over variable costs

Q: What is cost-volume-profit (Break Even) analysis? What are its objectives?
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Ans:

Cost-Volume-Profit analysis is a technique for studying the relationship between cost, volume and profit. Profits of an undertaking depend upon a large number of factors. But the most important of these factors are the cost of manufacture, volume of sales and the selling prices of the products.

The three factors of CVP analysis i.e., costs, volume and profit are interconnected and dependent on one another. For example, profit depends upon sales, selling price to a large extent depends upon cost and cost depend upon volume of production as it is only the variable cost that varies directly with production, whereas fixed cost remains fixed regardless of the volume produced. In cost-volume-profit analysis an attempt is made to analyse the relationship between variations in cost with variations in volume.

ASSUMPTIONS OF BREAK-EVEN ANALYSIS:

The break-even analysis is based upon the following assumptions:

- 1) All elements of cost, i.e., production, administration and selling and distribution can be segregated into fixed and variable components. Even, semi-variable costs can be segregated into variable and fixed components
- 2) Variable cost remains constant per unit of output irrespective of the level of output and thus fluctuates directly in proportion to changes in the volume of output.
- 3) Fixed cost remains constant at all volumes of output.
- 4) Selling price per unit remains unchanged or constant at all levels of output.
- 5) Volume of production is the only factor that influences cost.
- 6) There will be no change in the general price-level.
- 7) There is only one product or in case of multi-products, the sales mix remains unchanged.
- 8) There is synchronization between production and sales.
- 9) The method of production will remain unchanged.
- 10) Productivity per worker will remain constant.
- 11) The efficiency of workers and machinery will remain the same.

OBJECTIVES OF COST-VOLUME – PROFIT ANALYSIS:

The main objectives of such analysis are given below:

- (i) This analysis helps **to forecast profit** fairly accurately as it is essential to know the relationship between profits and costs on one hand and volume on the other. *There exists close relationship between the cost, volume and profit. If volume is increased, the cost per unit will decrease and profit per unit will increase. Thus there is direct relation between volume and profit but inverse relation between volume and cost.*
- (ii) This analysis is useful in **setting up flexible budgets** which indicates costs at various levels of activity.
- (iii) This analysis assists in **evaluation of performance** for the purpose of control. In order to review profits achieved and costs incurred, it is necessary to evaluate the effects on costs of changes in volume.
- (iv) This analysis also assists in **formulating price policies** by showing the effect of different price structures on costs and profits. We are aware that pricing plays an important role in stabilising and fixing up volumes especially in depression period.
- (v) This analysis helps **to know the amount of overhead costs to be charged** to the products costs at various levels of operation as we know that pre-determined overhead rates are related to a selected volume of production.

Q: What are the uses and limitations of cost-volume-profit (Break Even) analysis? *(www.prepNext.com)*

Ans:

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USES:

The uses of break-even analysis are as follows:

- 1) To determine the selling price which will give the desired profits.
- 2) To fix a sales volume to cover a given return on capital employed.
- 3) To forecast costs and profits as a result of change in volume.
- 4) To determine cost and revenue at various levels of output
- 5) To estimate the impact of increase or decrease in fixed and variable costs on profit.
- 6) To decide on changes in capacity
- 7) To choose the most profitable alternative
- 8) To calculate sales volume required to meet proposed expenditures.
- 9) To determine the effect of change in selling price on profit
- 10) To determine the effect of change in sales volume on profit.

(You may also add these points to above mentioned objectives of cost volume profit analysis)

LIMITATIONS:

The assumptions used in the case of break-even analysis are unrealistic. Some limitations of break-even analysis are as follows:

- 1) It is difficult to segregate all costs into fixed and variable elements.
- 2) Fixed costs do not always remain constant.
- 3) Variable costs do not always vary proportionately.
- 4) Sales revenue does not always change proportionately.
- 5) Conditions of growth or expansion in an organisation are not assumed under break-even analysis.
- 6) Selling price of a product in general depends upon certain factors like market demand and supply, competition etc., so it too hardly remains constant
- 7) The sales mix used in the case of multi products does not reflect the behavior of individual product in the mix.
- 8) The operating efficiency and productivity where it depends upon manpower, hardly remains fixed.

Q: Write short notes on:

- i) Margin of safety**
- ii) Angle of Incidence**
- iii) Break Even Point**
- iv) Key or limiting factor**

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Ans:

(i) Margin of Safety:

The excess of total sales revenue over the break-even sales is known as the margin of safety (i.e., Total sales – Break-Even Sales). It represents the amount by which sales revenue can fall before a loss is incurred. As at break-even point there is no profit no loss, sales beyond the break-even point represent margin of safety because any sales above the break-even point will give some profit. A greater margin of safety indicates the soundness of the business. Margin of safety can also be expressed as a percentage to total sales.

Margin of Safety = Total sales – Sales at BEP

Margin of Safety ratio = $\frac{[(\text{Total Sales} - \text{Sales at BEP}) / \text{Total Sales}] \times 100}{100}$

Say, actual present sales are Rs. 5,00,000 and the break-even sales are Rs. 4,00,000, then margin of safety is equal to Rs. 1,00,000. i.e., 5,00,000 – 4,00,000.

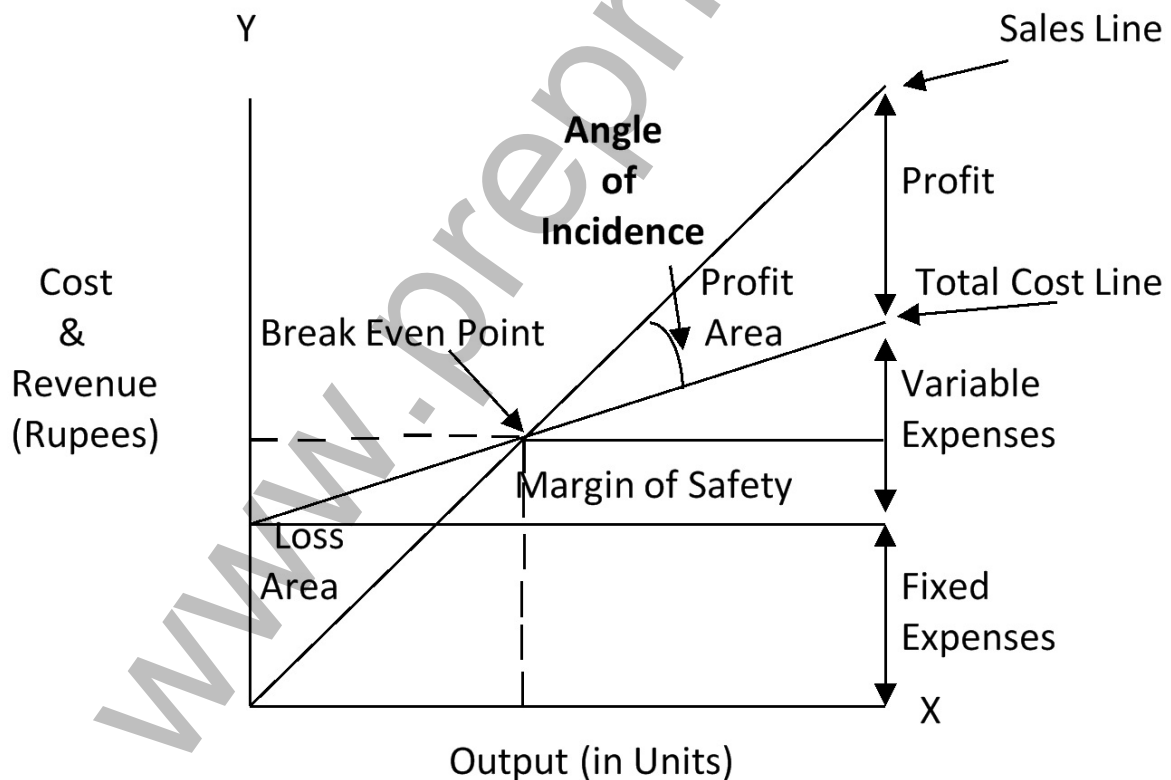
The margin of safety can be improved by taking the following steps:

- 1) By increasing the level of production.**
- 2) By increasing the selling price**
- 3) By reducing the fixed cost**
- 4) By reducing the variable cost**
- 5) By substituting existing products by more profitable products.**
- 6) By increasing contribution by changing the sales mix or by dropping unprofitable products.**

(ii) ANGLE OF INCIDENCE:

The **angle of incidence** is the angle between the sales line and the total cost line formed at the break-even point where the sales line and the total cost line intersect each other. The angle of incidence indicates the profit earning capacity of a business. A large angle of incidence indicates a high rate of profit and, on the other hand, a small angle of incidence indicates a low rate of profit.

BREAK EVEN CHART



(iii) BREAK EVEN POINT:

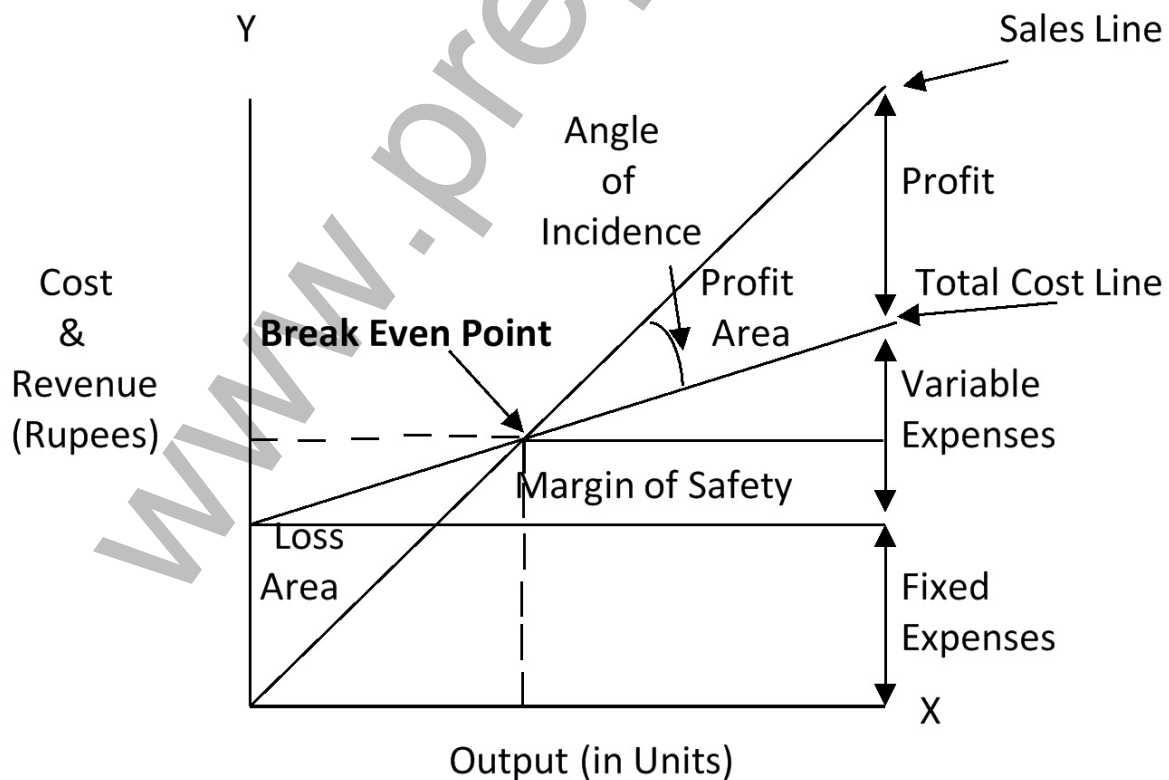
The break-even point may be defined as that point of sales volume at which total revenue is equal to total cost. It is a point of no profit, no loss. At this point, contribution equals the fixed costs (i.e. Total contribution = Fixed costs). This point is often called as 'Critical Point' or 'Equilibrium Point' or 'Balancing Point' or 'no profit, no loss'. If production/ sales is increased beyond this level, there shall be profit to the organisation and if it is decreased from this level, there shall be loss to the organisation.

Computation of the Break-Even Point:

The Break-Even Point of sales can be determined with the help of the following:

- (i) Break-Even Point (BEP in units) = $\frac{\text{Total Fixed Cost}}{\text{Contribution per unit}}$
- (ii) BEP (in Sales Value) = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}}$,
Where, P/V ratio = $(\frac{\text{Contribution}}{\text{Sales}}) * 100$

BREAK EVEN CHART



(iv) KEY FACTOR/ LIMITING FACTOR/ PRINCIPAL BUDGET FACTOR:

Key Factor is a factor which limits the activities of an undertaking. This is a factor which is a binding constraint upon an organisation i.e., the factor which prevents indefinite expansion or unlimited profits. There are always factors that do not lend themselves to managerial control. For example, if at a particular point of time there is a Government restriction on the import of a material which forms the principal ingredient of company's product, company cannot produce, as it wishes. It has to plan production taking into consideration this limiting factor.

A key factor may be sales, availability of finance, skilled labour, supplies of material or lack of space. Where a single binding constraint can be identified, then the general objective of maximising contribution can be achieved by selecting the alternative which maximises the contribution per unit of the key factor. If a factor of production is in short supply, then the best paying product becomes that which yields the highest contribution per unit of limiting factor.

The 'maximising contribution per unit of the limiting factor' rule can be of value, but can only be used where there is a single binding constraint. Where several constraints apply simultaneously, the simple maximising rule given above cannot be applied. In such cases, contribution per unit of key factor may be ascertained and maximised according to the priority.

A few examples of key factors are:

- 1) Materials : (a) Scarce raw material
 (b) Restrictions imposed by licences, quotas etc.
- 2) Labour: (a) General shortage of workers
 (b) Shortage in skilled labour

- 3) Plant : (a) Insufficient capacity due to lack of capital
 (b) Insufficient capacity due to lack of space
- 4) Sales : (a) Market Demand
 (b) Inefficient or Insufficient advertising
 (c) Shortage of good salesman
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Q: What is break even chart? What are its assumptions? Explain the advantages and limitations of break even charts.

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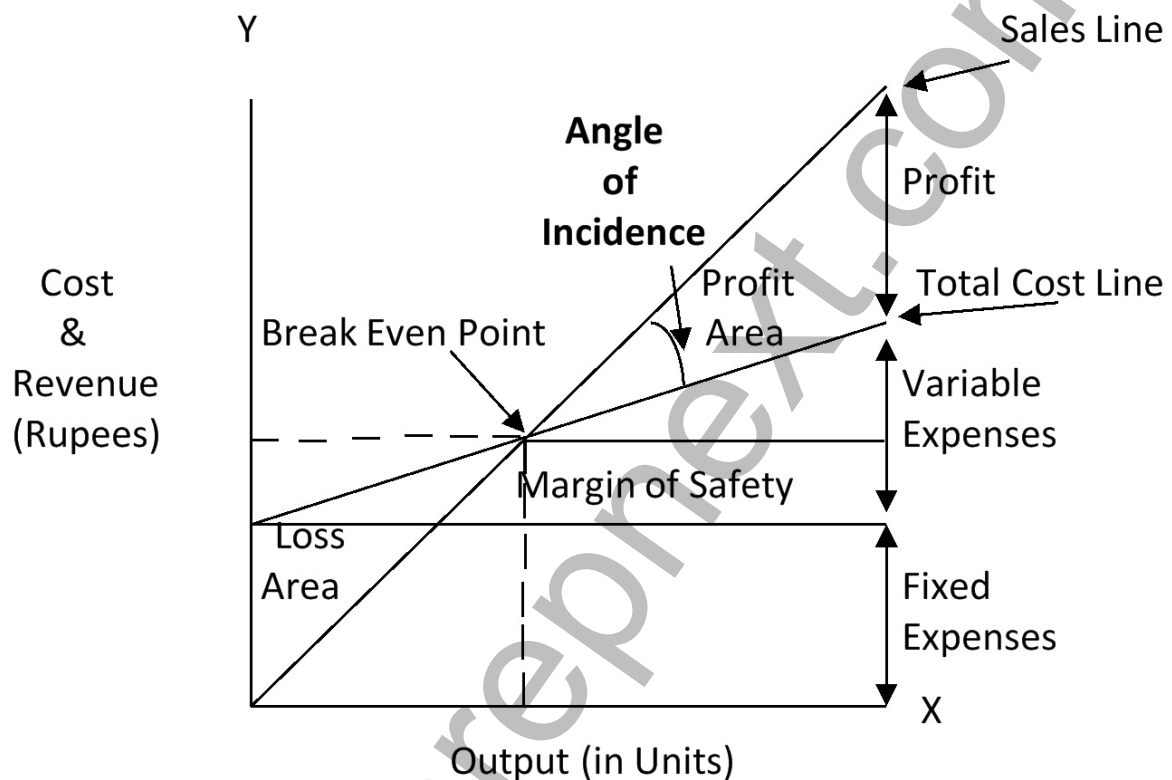
Ans:

A break-even chart is a graphical representation of marginal costing. The break-even chart portrays a pictorial view of the relationship between costs, volume and profits. It depicts the production at which neither profit nor loss can result (i.e., the break-even point), and also indicates the estimated profit or loss at various levels of output. The break-even point as indicated in the chart is the point at which the total cost line and the total sales line intersect.

Break Even Chart depicts the following information:

- (a) Cost (i.e., Fixed, Variable and Total)
- (i) Variable cost at various levels of activity
 - (ii) Fixed Cost at various levels of activity
 - (iii) Total cost at various levels of activity
- (b) Sales Value and Profit/ Loss
- (c) Break-even Point
- (d) Margin of Safety
- (e) Angle of Incidence

BREAK EVEN CHART



The Y axis represents costs and revenue. The X axis represents the number of units produced and sold. The sales line cuts the total cost line at a point where the total costs are equal to total revenues and this point of intersection of two lines is known as break even point – the point of no profit no loss. The number of units to be produced at the break even point is determined by drawing a perpendicular to the X-axis from the point of intersection of cost and sales line. The chart also indicates that if production is less than the break even point, the business shall be running at a loss and if the production is more than the break even level, profit shall result.

Assumptions Underlying Break-Even Charts:

There are a number of assumptions which are made while drawing a break-even chart, such as:

- 1) All costs can be separated into fixed and variable costs.
- 2) Fixed costs remain constant at all levels of activity.
- 3) Variable cost fluctuates in the same proportion in which the volume of output varies. In other words, prices of variable cost factors i.e., wage rates, price of material etc. will remain unchanged.
- 4) Selling price per unit remains constant at all levels of activity.
- 5) There is no opening or closing stock i.e. the number of units produces and sold will be the same.
- 6) There will be no change in operating efficiency.
- 7) Product mix remains unchanged or there is only one product. There is only one product or in the case of many products, product mix will remain unchanged.
- 8) The volume of output or production is the only factor which influences the cost.
- 9) Product specifications and methods of manufacturing and selling do not change.
- 10) General price level will remain constant.

Advantages or Uses of Break-Even Charts:

Computations of break-even point or presentation of cost, volume and profit relationship by way of break-even charts has the following advantages:

1) Easy to Understand:

A break even chart is the simple presentation of cost, volume and profit structure of the company. Information provided by the break-even chart is in a simple form and is clearly understandable even to a common person. The whole idea of the problem is presented at a glance.

2) Helps in taking Managerial Decisions:

The break-even chart is very useful to the management for taking managerial decisions because the chart studies the relationship of cost, volume and profit at various levels of output. The effects of changes in fixed costs, variable costs, selling price and volume of sales on the profits can be depicted very clearly by way of break-even charts.

3) Helps in knowing profitability:

Besides determining the break-even point, profits at various levels of output can also be determined with the help of break-even charts. It also helps in knowing and analysing the profitability of different products under various circumstances.

4) Helps in Forecasting:

A break-even chart is very useful for forecasting costs and profits at various volumes of sales.

5) Helps in Cost Control:

The break-even chart is a managerial tool for control of costs as it shows the relative importance of fixed cost and variable cost in the total cost of a product. Segregation of cost into fixed and variable helps in controlling cost.

6) The break-even charts can also be used to study the comparative plant efficiencies of business.

7) It is helpful in knowing the effect of increase or reduction in selling price.

8) It is helpful in the determination of sale price which would give desired profits or a B.E.P.

9) Helps in judging Profit Potentialities:

The profit potentialities can be best judged from a study of the position of the break even point and the angle of incidence in the break even chart. Low break- even point and large angle of incidence in the break even chart is a sign of financial stability. However, high break- even point and small angle of incidence is the worst position because it indicates a low margin of safety and a low rate of profit.

10) Break – Even Chart facilitates the determination of:

- (i) Break-Even Point
- (ii) Margin of Safety
- (iii) Angle of Incidence
- (iv) Sales required to earn a desired amount of profit
- (v) Fixed Cost, variable Cost, Total Cost, Sales, Profit at various level of operations.

11) Break- Even Chart can be used to show the effect of any of the following changes on profit:

- (i) Change in the Sales Volume
- (ii) Change in the Selling Price
- (iii) Change in the Variable Costs
- (iv) Change in the Fixed Costs.

LIMITATIONS OF BREAK-EVEN CHARTS:

Despite many advantages, a break-even chart suffers from the following limitations:

1) Unrealistic Assumptions:

A break-even chart is based upon a number of assumptions, which may not hold good under all circumstances.

For example,

- i. All costs cannot be separated into fixed and variable components with accuracy.
- ii. Fixed costs do not remain constant after a certain level of activity.
- iii. Variable costs do not always vary in direct proportion to changes in the volume of output because of the laws of diminishing and increasing returns.

- iv. Selling prices do not remain the same forever and for all levels of output due to competition, market demand and supply, and changes in the general price level.
- v. In case of multiple products, the sales mix need not necessarily be constant.
- vi. Entire production need not necessarily be sold in practice.

2) Provides limited information only:

A break-even chart provides only limited information. A number of charts will have to be drawn up to study the effects of changes in the fixed costs, variable costs and selling prices on the profitability. In such cases, it becomes rather more complicated and difficult to understand.

3) Ignores many important Factors:

Break-even charts present only cost-volume profit relationships but ignore other important considerations such as the amount of capital investment, marketing problems and government policies, etc. Therefore, managerial decisions on the basis of break even chart may not be reliable

4) Does not suggest any action:

A break-even chart does not suggest any action or remedies to the management as a tool of management decisions.

5) Presents a static view:

More often, a break-even chart presents only a static view of the problem under consideration.

6) Difficulty in segregating costs:

The break-even point is difficult to determine in many instances due to difficulty in appropriately classifying costs either fixed or variable. The task of segregating costs into fixed and variable elements cannot be carried out accurately.

Q: What do you understand by Contribution?

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Ans:

Contribution is the difference between sales and variable cost or marginal cost of sales. It may also be defined as the excess of selling price over variable cost per unit. Contribution being the excess of sales over variable cost is the amount that is contributed towards fixed expenses and profit. If the selling price of a product is Rs. 20/- per unit and its variable cost is Rs. 15/- per unit, contribution per unit is Rs. 5/- (i.e. Rs. 20 – 15).

Contribution at first contributes towards the fixed overhead and when the fixed overheads are recovered the same contributes towards profit. As soon as fixed costs are covered by the contribution, every rupee of additional contribution is an addition to the profit i.e. contribution will become profit after meeting the fixed costs. Higher the total contribution higher will be the profit since fixed overhead remains constant.

Contribution can be represented as:

Contribution = Sales – Variable (Marginal) Cost

Or, Contribution (per unit) =

Selling Price – Variable (or marginal) cost per unit

Or, Contribution = Fixed Costs + Profit (- Loss)

ADVANTAGES OF CONTRIBUTION:

The concept of contribution is a valuable aid to management in making managerial decisions. A few benefits resulting from the concept of contribution margin are given below:

- 1) It helps the management in the fixation of selling prices.
- 2) It assists in determining the break-even point.
- 3) It helps management in the selection of a suitable product mix for profit maximisation.
- 4) It helps in choosing from among alternative methods of production; the method which gives highest contribution per limiting factor is adopted.

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- 5) It helps the management in deciding whether to purchase or manufacture a product or a component.
- 6) It helps in taking a decision as regards to adding a new product in the market.

Q: Differentiate between contribution and profit.

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Ans.:

DIFFERENCES BETWEEN CONTRIBUTION AND PROFIT:

Sl. No.	Contribution	Profit
1	Contribution is the sales value less marginal cost.	Profit is the sales value less total cost
2	It includes fixed cost and profit. $C = F + P$	It does not include fixed cost
3	It is marginal cost concept	It is total cost concept
4	Contribution analysis requires knowledge of break-even concept	It does not require any such concept.
5	Contribution above BEP is profit	Profit is expected only after covering variable cost and fixed cost.

Q: Write a brief Note on Cash Break-Even Point.

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Ans:

The cash break-even point may be defined as that point of sales volume at which total revenue is equal to total cash cost. At this point, cash contribution (which is calculated after making adjustment for variable portion of depreciation) equals the cash fixed cost, i.e., fixed cost excluding depreciation and deferred expenses. This point enables the management to determine the level of activity below which the liquidity position of the firm would be adversely affected. Thus, cash break-even point may be calculated as below:

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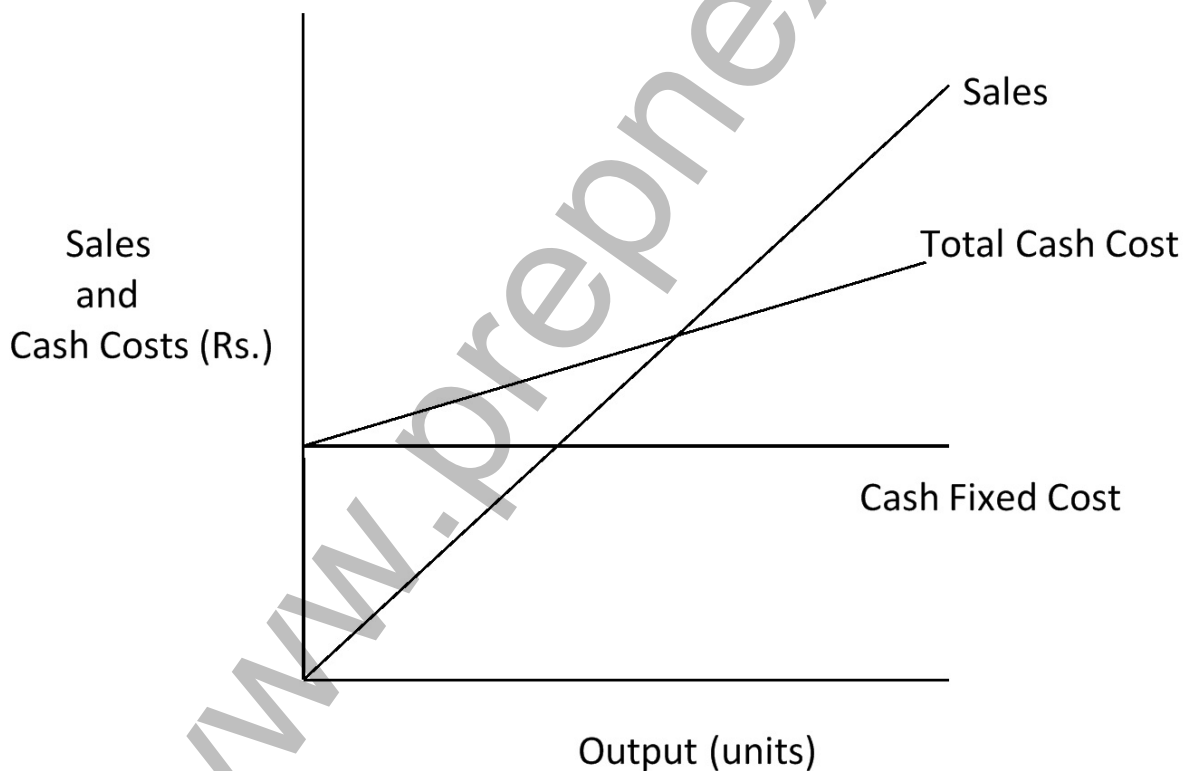
Cash Break-Even Point (in units)

$$= \text{Cash Fixed Cost} / \text{Cash Contribution per unit}$$

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

Cash Break Even Chart:

Cash Break-even Chart is a graphical representation of the Cost, Volume- Profit Relationship under which, only cash fixed costs are considered. Non cash items like depreciation etc. are excluded from the fixed cost for computation of cash break-even point. It depicts the level of output or sales at which the sales revenue will be equal to total cash *outflow*.



Q: Explain Profit/ Volume Ratio

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Ans:

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PROFIT/ VOLUME RATIO or CONTRIBUTION / SALES RATIO:

Profit/ Volume Ratio (or P/V Ratio) expresses the relationship between contribution and sales. Better P/V ratio is an index of sound 'financial health' of a company's product. The statement that P/V ratio is 35% means that contribution is Rs. 35, if size of the sale is Rs. 100. One important characteristic of P/V ratio is that it remains the same at all levels of output. P/V ratio may be expressed as:

$$\text{P/V ratio} = (\text{Contribution/ Sales}) \times 100 \text{ or}$$

$$\text{P/V Ratio} = (\text{Sales} - \text{Variable Cost}) / \text{Sales} \times 100$$

$$\text{P/V Ratio} = (\text{Change in Contribution/ Change in Sales}) \times 100$$

$$\text{P/V Ratio} = (\text{Change in profit/ loss}) / \text{Change in Sales} \times 100$$

ADVANTAGES OF P/V RATIO:

- (i) It helps in determining the break-even point
- (ii) It helps in determining profit at various sales levels
- (iii) It helps to find out the sales volume to earn a desired quantum of profit
- (iv) It helps to determine relative profitability of different products, processes and departments.
- (v) It facilitates the determination of variable cost for any given sales volume.
- (vi) P/V Ratio facilitates managerial decision-making regarding the choice of product, choice of process etc.

P/ V ratio may be improved :

- (a) by reducing variable cost, or*
- (b) by increasing the selling price, or*
- (c) by reducing variable cost and increasing the selling price, or*
- (d) by improving Sales Mix (i.e. by increasing the sales of products having higher P/V Ratio and reducing the sales of products having lower P/V Ratio).*

Q: “Marginal costs are primarily used in guiding decisions yet to be made.” Explain the statement giving examples.

OR

Explain the Applications of Marginal Costing

OR

Marginal Costing is a very useful tool for management. Explain.

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Ans:

Marginal costing technique is a valuable aid to management in taking many managerial decisions. The following are some of the important managerial problems where marginal costing technique can be applied.

1) Pricing Decisions

Under normal circumstances, the price fixed must cover total cost as otherwise profits cannot be earned. It can also be fixed on the basis of marginal cost by adding a sufficiently high margin to marginal (variable) cost so as to cover the fixed cost and profits. However, under other circumstances, products MAY have to be sold at a price below the total cost. For example, in the days of stiff competition or to meet the situation arising due to trade depression, for accepting special bulk orders or additional orders for utilising idle capacity; for exporting and exploring new markets, etc. In such circumstances, the prices should be fixed on the basis of marginal cost in such a manner so as to cover the marginal cost and contribute something towards the fixed expenses.

2) Profit Planning and Maintaining a Desired Level of Profit:

Profit planning involves the planning of future operations to achieve maximum profits or to maintain a desired level of profits. The change in the sales price, variable cost and product mix affect the profitability of a concern. With the help of marginal costing, the required value of sales for maintaining or attaining a desired level of profit may be ascertained as follows:

$$\text{Desired Sales} = (\text{Fixed Cost} + \text{Desired Profit}) / \text{P/V Ratio}$$

Make or Buy Decisions

Sometimes a concern has to decide whether a certain product or a component should be made in the factory itself (having unused production facilities) or bought from outside. In arriving at such a make or buy decision, the price asked by the outside suppliers should be compared with the marginal cost of producing the component parts. It is advisable to make than to buy if the variable (marginal) cost of the product or component is lower than the purchase price. But if the purchase price is lower than the marginal cost, it would be better to buy than to make itself.

3) Problems of Key or Limiting Factor

A limiting factor or a key factor is a factor which limits or restricts production or sales and thus prevents a concern from making unlimited profits. The limiting factor may be any factor of production such as availability of raw materials, labour, capital, plant capacity and even sales. In case a concern has two or more product lines and when limiting factor is in operation, the product which gives highest contribution per unit of limiting factor should be preferred to the one which gives lower contribution per unit of limiting factor.

4) Selection of a Suitable or Profitable Sales Mix

When a factory manufactures more than one product, a problem is faced by management as to which product mix will give the maximum profits.. The products which give the maximum contribution are to be retained and their production should be increased. The production of products which give comparatively lesser contribution should be reduced or dropped altogether. The optimum sales mix is that which gives the highest contribution.

5) Effect of Changes in Sales Price

Management is generally confronted with a problem of analysing the effect of changes in sales price upon the profitability of the concern. It may be required to reduce the prices on account of competition, depression, expansion programme or government regulations. The effect of changes in sales prices can be easily analysed with the help of contribution technique.

6) Alternative Methods of Production

Sometimes the management has to choose from among alternative methods of production, e.g., machine work or hand work. The same product may be produced either by employing Machine No. 1 or Machine No. 2, and the management may be confronted with the problem of choosing one among them. In such circumstances, technique of marginal costing can be applied and the method which gives the highest contribution can be adopted.

7) Determination of Optimum Level of Activity:

The technique of marginal costing also helps the management in determining the optimum level of activity. To make such a decision, contribution at different levels of activity can be found, and the level of activity which gives the highest contribution will be the optimum level. The level of production can be raised till the marginal cost does not exceed the selling price.

8) Evaluation of Performance:

Evaluation of performance efficiency of various departments, product lines or markets can also be made with the use of the technique of marginal costing. Contribution of different products, departments or sales divisions can be compared and the one giving higher contribution should be preferred if fixed expenses remain same.

9) Capital Investment Decisions:

Capital investment decisions are very crucial for the management. The technique of marginal costing also helps the management in taking capital investment decisions.

11) Purchasing or Leasing:

Sometimes the management is required to take decision whether a particular asset say building is to be purchased or may be taken on lease basis. In this case the total cost of the two alternatives is to be compared in order to calculate the annual saving or extra cost involved if the building is purchased as compared to leasing.

Differential cost is the change in the cost which may take place due to increase or decrease in output, change in sales volume, alternate method of production, make or buy decisions, change in product mix, etc. So, differential cost is the result of an alternative course of action. Change in cost may take place due to change in fixed costs and variable costs, so differential cost is the aggregate of changes in fixed costs and variable costs which take place due to the adoption of an alternate course of action or change in the level of output.

For example, differences in costs may arise because of replacement of labour by machinery and difference in costs of two alternative courses of action will be the differential cost. It may be remembered that differential cost may be increase or decrease in costs.

Suppose, present cost is Rs.2,50,000 when the work is done by labour and the expected cost Rs. 2,25,000 when the work is done by machinery. In this case, differential cost will be decrease in costs Rs.25,000 (i.e., Rs.2,50,000 – Rs.2,25,000) and the decision of replacement of labour by machinery should be implemented by the firm because differential cost of Rs.25,000 (decrease in cost) will increase the profits of the firm by Rs.25,000.

Difference between Differential Cost Analysis and Marginal Costing:

1) In marginal costing technique, costs are calculated on the basis of variable costs only and fixed costs are not taken, but in differential cost analysis costs are calculated on the basis of absorption or total costing technique.

2) *Marginal costs may be incorporated in the accounting records. On the other hand, Differential cost analysis is not incorporated in accounting records. Differential costs are calculated separately as analysis statements.*

3) *Marginal costs are calculated on the basis of contribution approach whereas differential costs may be ascertained on the basis of both absorption costing as well as marginal costing.*

4) In marginal costing, margin of contribution, contribution per unit of limiting factor and profit-volume ratio are the main yardsticks for evaluating the managerial decisions whereas in differential cost analysis, differential costs are compared with the differential revenues to determine whether alternate course of action should be followed or not.

Differential Costing is a technique of decision-making in which differential costs of various alternatives are compared with the differential revenues for the purposes of choosing between competing alternatives. So long as the incremental revenues exceed incremental costs, the decision should be in favour of the proposal.