Operational Approach to Financial Decision

Lesson 19

KEY CONCEPTS

■ Financial Management ■ Costing ■ Marginal Costing ■ Breakeven Point ■ Margin of Safety ■ Angle of Incidence

Learning Objectives

To understand:

- Nature, Scope and Objectives of Costing
- Key concept of costing
- Basic Principles of Costing
- Marginal Costing-Breakeven Point, Angle of Incidence, Margin of Safety

Lesson Outline

INTRODUCTION

One of the three strategic dimensions to achieve competitive advantage in industry, together with product differentiation and focus or niche, according to Michael E. Porter's theory of generic competitive strategies, is "Cost Leadership." Cost leadership refers to delivering services or producing items at the lowest possible cost while retaining quality for more competitive pricing. It is crucial for an entity to fit into one of the three competitive strategy dimensions in a business environment where every entity strives to obtain the top position not only in domestic but also in the global competitive market. If an organisation has a strong Cost and Management Accounting system in place, it can attain cost leadership, another topic related to Cost and Management Accounting. This chapter will cover a variety of cost accounting topics as well as how they are used in manufacturing and service environments.

AN OVERVIEW OF COSTING

Any system for allocating expenses to a business component is known as costing. Costing is frequently used to create costs for customers, distribution channels, personnel, geographical regions, goods, product lines, processes, subsidiaries, and whole businesses. Planning and managing a company's operating expenses is the process of costing. In order to budget, anticipate, and monitor costs more accurately, it also involves gathering, evaluating, and reporting cost information. Cost is the price paid, which is typically calculated based on the resources given up to accomplish a specific goal. It is a price paid in exchange for certain commodities or services. Not all costs are expenses. While some expenditures are expenses, others are assets. Costs have expired (been used up).

ICWAI, India defines cost as "measurement in monetary terms, of the amount of resources used for the purpose of production of goods or rendering services"

Cost refers to the amount of payment made to acquire any goods and services. In a simpler way, the concept of cost is a financial valuation of resources, materials, risks, time and utilities consumed to purchase goods and services. From an economist's point of view, the cost of manufacturing any goods and services is often said to be the concept of opportunity cost.

The concepts, practices, procedures, and processes used in a firm to plan and regulate how its resources are used are included in the definition of cost accounting. The application of costing and cost accounting principles, methodologies, and techniques to the science, art, and practise of cost control and the determination of profitability is how CIMA (London) defines it. It also comprises the dissemination of data obtained from it for managerial decision-making.

Cost accounting is therefore the science, the art, and the practise of a cost accountant. It is a science in that it is a body of methodical knowledge that a cost accountant must possess in order to carry out his tasks and responsibilities in a professional manner. It is an art since it calls for a cost accountant's expertise and talent to apply cost accounting principles to a variety of managerial issues, such as price fixing, cost control, etc.

Nature and Scope of Costing

Costing is the process of determining costs, according to the C.I.M.A., London. It discusses methods and procedures for estimating costs as well as the guiding concepts and regulations governing how much goods and services should cost. Cost accounting is a technique for cost accounting. Analyzing the costs related to a good or activity is only one aspect of cost accounting. It considers a number of factors, such as different cost structures, possible business opportunities, budget planning, profitability analysis, and more. In this context, "scope" refers to the area of activity. Calculating the cost of a specific good or activity is referred to as cost accounting. Both internal and external reports reporting can benefit from the data it gives. Cost information is presented in detail in internal reporting:

NATURE OF COSTING

1. Cost Accounting is a Branch of Knowledge-Though cost accounting is considered as a branch of financial accounting, it is one of the important branches of knowledge. It is an organized body of knowledge consisting of its own principles, concepts and conventions. These principles and rules vary from industry to industry.

2. Cost Accounting is a Science- Cost accounting is considered as a science because it is a body of systematic knowledge relating to not only cost accounting but relating to a wide variety of subjects such as law, office practice and procedure, data processing, production and material control, etc. It is necessary for a cost accountant to have intimate knowledge of all these field of study in order to carry on day-to-day activities. But it is to be admitted that it is not a perfect science as in the case of natural science.

3. Cost Accounting is an Art. Cost accounting is an art in that it calls on the ability and expertise of a cost accountant to apply the concepts, procedures, and methods of cost accountancy to specific management issues. These issues include determining cost control, determining profitability, and other issues.

4. Cost accounting is a profession. In recent years, cost accounting has emerged as one of the crucial and most difficult occupations. These two facts make this opinion clear. First, the establishment of numerous professional organisations, including the National Association of Accountants (NAA), the Institute of Cost and Management Accountants in the United Kingdom, the Institute of Cost and Works Accounts in India, and similar organizations in developed and developing nations, has increased public awareness of the costing profession. Second, many students have enrolled in these institutions in order to gain expensive degrees and membership necessary for supporting themselves.

(a) Costing methodology and process: Costing methodology consists of two separate processes.

(i) Cost collection and classification based on numerous factors.

(ii) Apportionment and allocation of costs that cannot be directly attributed to production. Costing as a process is concerned with the regular determination of cost using the official approach.

(b) Cost estimation is done in three parts.

(i) Expenditure analysis and data collecting,

(ii) Production measurement at various stages

(iii) Compensating for production costs to accomplish the initial step. Different systems, including Historical, Estimated, and Standard Cost, have been created in costing. Costing has created a variety of techniques for achieving the second phase, including work costing, contract costing, single or output costing, etc. for completing the final phase, finally. Important methods have been established in costing, including absorption costing, marginal costing, and standard costing.

Objectives of Costing

Facts are collected into statistics.

1. Ascertainment of Cost

The first and most significant goal of costing is cost determination. In order to ensure that all costs are included in the price of the products, techniques, and costing process employed, it is important to ascertain the cost of each product, process, or operation.

It is beneficial to do preliminary research and implement a system for recording costs in order to determine the cost of management with the assistance of the costing department. Materials, labour, and other expenses are maintained in a correct and thorough manner (referred to as covered heads).As a result, the management gathers cost information on a regular basis, which is then used to establish the selling price. Therefore, the costs and sales are equal. This matching procedure assists in determining and raising the product's profitability. Importantly, costing gives managers a way to determine costs as well as a foundation for determining the profitability of any services or products being provided.

2. Cost Control

Cost estimation alone is insufficient. Naturally, it is insufficient because the cost dictates the selling price, which in turn decides the profitability. As a result, "the lower the cost, the larger to profit" is the standard that everyone tries to adhere to. It's crucial to keep costs under control in order to bring about this norm's fundamental goal of lower prices for goods and services. A comparison is conducted after budgets have been created, standards have been established, and actual have been determined. Corrective action is conducted if any discrepancy between the actual, the budget, and the standards is found. As a result, managers can increase their income or lower the selling price while also helping to control costs. As a result, the customer can gain from higher quality, which can increase consumer loyalty to the brand and business.

3. Guidelines for Management

The devoted servant of managers in a company is costing. In all practical respects, it supports managerial decision-making. Managers can work toward efficiency for the entire organisation with the use of cost data that comes from costing. Cost information offers organisational recommendations for different managerial choices. For instance, the utilisation of cost data might direct the launch of a new product line, reveal areas of untapped capacity, or draw attention to growth prospects.

Types of Costing

Cost can be defined as the amount (measured in terms of money) paid for goods and services received (or to be received).Accountants and managers use many different concepts of cost, each usually for a different purpose.

It is the classification of cost that indicates to managers how the term is being used and whether they can do anything about the cost or not.

Important **types of costs** are explained below

Costs are broadly classified into four types: fixed cost, variable cost, direct cost, and indirect cost.

Variable Cost: A variable cost changes in direct proportion to a change in the level of activity.

Fixed Cost: These costs do not change in total as activity changes.

Direct Cost: A direct cost is a cost that can be traced to specific segments of operations.

Indirect Cost: An indirect cost is a cost that cannot be identified with specific segments of operations. Common costs are shared by multiple segments.

Relevant Costs : All those costs which influence a choice of alternatives in a particular situation (decision to be taken) and are also affected by that decision are said to be relevant costs of that decision

Irrelevant Costs : All those costs which remain the same and are not affected by the decision whatever alternative is chosen are said to be irrelevant costs for that decision

Sunk Costs: Sunk costs are the historical costs that arise due to decisions made in the past and cannot be changed by any decision made in future. Example: investments in Plant & Machinery is a prime example of sunk cost; in decisions relating to replacement of old machine, the written down value of old machine adjusted for its recoverable value is a sunk cost as it has been incurred in past and cannot be changed by future decision. Since sunk costs cannot be altered in future, they are always irrelevant costs in future decision making.

Shut down Costs: These are the unavoidable fixed costs which continue to be incurred even when a plant is temporarily shut down. Example: rent, insurance and depreciation of building, salaries of permanent staff etc. Managers must take into account shutdown costs while considering shutdown or continue decisions.

Imputed/Hypothetical/Notional Costs: These are the costs for which neither any transaction has taken place nor any cash outlay is there but it represents a sacrifice or resource use capable of being measured in monetary terms. Example: a producer is doing production in his own premises for which no rent is paid but which has a market value of Rs. 15,000 per month, he can record Rs. 15,000 per month as notional factory rent while determining the cost of production of output.

Out of Pocket Cost / Explicit Costs: These are those costs that require cash outlay due to a particular managerial decision. It represents both present and future outflow of cash due to a decision.

Advantages of Costing

Costing gives useful cost information. As a result, it is crucial in managerial decision-making. A sound costing system is also important in order to provide high-quality services. The costing department has a significant impact on the benefits managers gain from costing, notably in the following dimensions:

1. **Measurement and Improvement of Efficiency**: The chief advantage to be gained is that Cost Accounting will enable a concern to, first of all, measure its efficiency and then to maintain and improve it. This is done by suitable comparisons and analysis of the differences that may be observed. Example- if materials spent upon a pair of shoes in 2001 comes to Rs. 100 and for a similar pair of shoe the amount is Rs. 120 in 2002. It is an indication of decline in efficiency. Of course, the increase may only be due to increase in price of materials; it may also be due to greater wastage in use of materials or inefficiency at the time of buying so that unnecessary high prices were paid.
2. **Profitable and Unprofitable Activities:** It will throw light upon those activities which bring profits and those activities which result in losses. This will be done only if the cost of each product or each job is ascertained and compared with the price obtained.

3. **Fixation of Prices**: In many cases a firm is able to fix a price for its products on the basis of the cost of production. In such a case, price cannot be properly fixed if no proper figures of cost are available. In case of big contracts, no quotation can be made unless the cost of completing that contract can be ascertained. If prices are fixed without costing information, it is possible that the price quoted may either be too high, in which case orders cannot be obtained, or it may be too low, in which case an order will result in a loss. It is a mistake on the part of any management to believe that mere increase in sales volume will result in profits; increased sales at prices lower than the cost may well lead the concern to the bankrupt court. Only Cost Accounting will reveal what price will be profitable.

4. **Guide in Reducing Prices**: In certain periods it becomes necessary to reduce the price even below the total cost. This will be so when there is a depression or slump. Costs, properly ascertained, will guide management in this direction.

5. **Information for Proper Planning**: For a proper system of Costing, it is necessary to have detailed information about the facilities available about machine and labour capacity. This helps in proper planning of work so that no section is overworked and no section remains idle.

6. **Control over Materials etc.** : Information about availability of stocks of various materials and stores must be constantly available if there is a good system of Cost Accounting. This helps in two ways. Firstly, production can be planned according to the availability of materials and fresh stocks can be arranged in time when old stocks are exhausted. Secondly, loss due to carelessness or pilferage or any other mischief will be known and, therefore, put down.

7. **Decision Regarding Machine vs. Labour** : Some of the important questions before management can be solved only with the help of information about costs. For example, if there is the problem of replacement of labour by machinery, Cost Accounting will at least guide management in finding out what the cost of production will be if either machinery or labour is used.

8. **Expansion in Production**: Sometimes it is necessary to decide whether production of one product or the other is to be increased. This problem can also be solved only if proper information about costs is available.

9. **Reasons for Losses Detected**: Exact causes of existence of profits or losses will be revealed by a system of Cost Accounting. For example, a concern may suffer not because the cost of production is high or prices are low but because the output is much below the capacity of the concern. It is only Cost Accounting which will reveal this reason for loss. It also helps in distinguishing between expenditure and loss which is necessary and that which is unnecessary, that is to say, between normal and abnormal losses.

10. **Helps in Taking Decisions**: Cost Accounting inculcates the habit of making calculations with pencil and paper before taking a decision. It will certainly check recklessness. Also some of the silly mistakes that sometimes occur can be avoided if there is a good Cost Accounting system. To give an instance, a well-known firm once quoted for supply of mosquito nets to the Government at a very low price. It was only after the order was obtained that the firm found that, by mistake, the price of materials was not included in the quotation.

11. **Check on Accuracy of Financial Accounts**: A good system of Cost Accounting affords an independent and most reliable check on the accuracy of financial accounts. This check operates through reconciliation of profits shown by Cost Accounts and by Financial Accounts. On the basis of various advantages of Cost Accounting, it can be easily said that 'a good system of costing serves as a means of control over expenditure and helps to secure economy in manufacture'.

Limitation of Costing

1. **Expensive** : The organization of the costing system and highly compensated cost accountants require further spending before installing it, though, care must be taken to make sure that the savings outweigh the cost of the accounting system.
2. **More Difficult** : The cost accounting system includes a lot of processes in determining cost, such as gathering and classifying expenses, allocating and apportioning expenses, etc. These procedures are regarded as difficult and demand a number of forms and paperwork to prepare the reports. Accounts will take longer to prepare as a result of this.
3. **Limited Applicability** : It is impossible for all business companies to employ the same costing methods and techniques. Everything relies on the type of business it is and the products it produces. The results of the business are misled if the incorrect technique and procedure are employed.
4. **Inappropriate:** Cost accounting systems are only appropriate for large-scale businesses; they are not ideal for small-scale businesses because they are more expensive.
5. **Lack of Uniformity**: The biggest drawback of the cost accounting method is its lack of uniformity. It does not adhere to any standard process. It is feasible for two cost accountants of comparable competence to get different conclusions using the same data. As a result, it is said that all outcomes from cost accounting are only approximations.
6. **Lack of Accuracy** - Cost Accounting accuracy varies. When estimating costs for a certain circumstance, some assumptions are always made.

BASIC PRINCIPLES OF COSTING

1. **Cause-and-effect relationships**:

   For each expense component, a cause-and-effect link needs to be defined. Each cost should be as closely tied to its root cause as feasible, and its impact on the various departments should be determined. Only units that travel through the departments at which a cost has been incurred should share that cost.

2. **Previous Costs That Could Not Be Collected in the Past Should Not Be Included in Future Costs:**

   Recovering past costs that could not be recovered in the past should not be done since it will not only skew the results of the future period's actual operations but also other statements.

3. **Charge of Cost Only Upon Incurrence**:

   Only costs that have been legitimately incurred should be included in unit costs. For instance, unit costs shouldn't be included in selling costs while an item is still being produced.

4. **Abnormal Costs Are Excluded from Cost Accounts:**

   When calculating the unit cost, all expenses incurred for unusual causes (such as theft or negligence) shouldn't be taken into account. If done thus, it will skew expense estimates and mislead management, leading to poor choices.

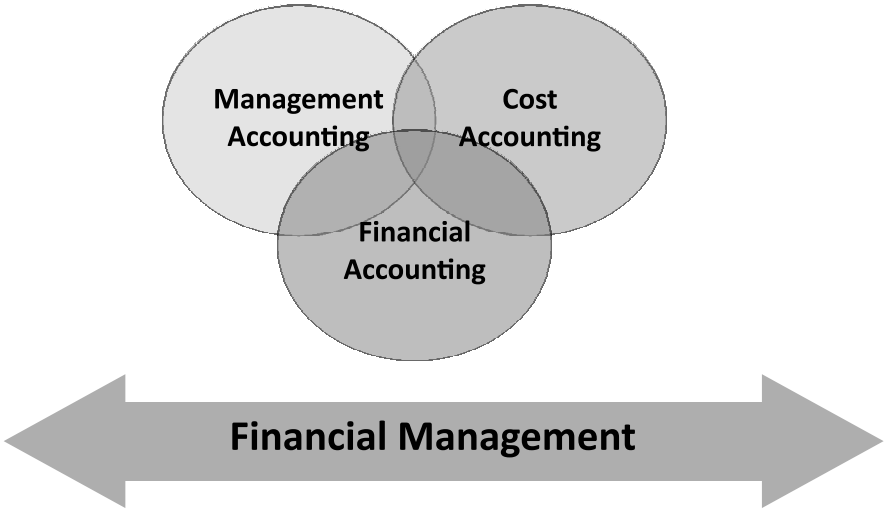
5. **Double Entry Principles Preferably Should Be Obeyed:**

   Cost ledgers and cost control accounts should, to the greatest extent possible, be maintained using double entry methods to reduce the likelihood of any error or mistake. By doing this, the accuracy of cost sheets and cost statements that are created for cost estimation and cost control would be guaranteed.

Relationship of Cost Accounting, Management Accounting, Financial Accounting and Financial Management

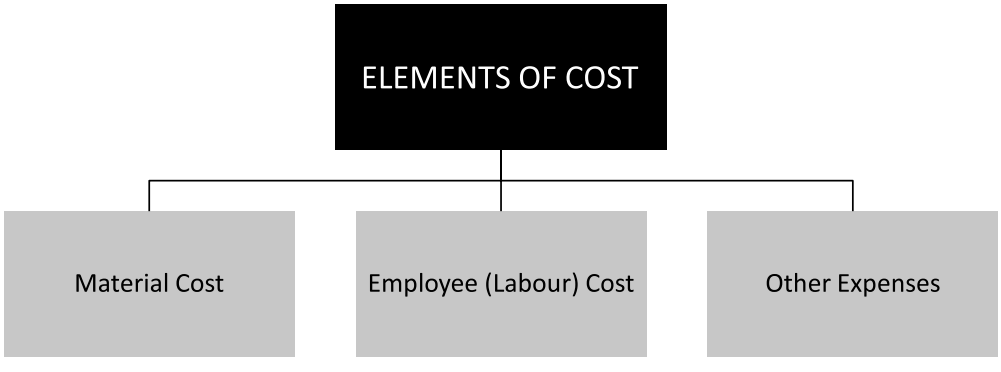
Different fields including Cost Accounting, Management Accounting, Financial Accounting, and Financial Management are closely related to one another.

These fields can occasionally interact and depend on one another.



CLASSIFICATION OF COSTS

It refers to the categorization of expenses based on their shared traits. The following categories are crucial for classifying costs: I By Nature or Element; (ii) By Functions; and (iii) By Variability or Behaviour (iv) By Capability (v) By Regularity (vi) By Costs for Managerial Decision Making.



Material cost: The price of the materials needed to produce a good or render a service is referred to as the material cost. All indirect materials required in the production process, such as cleaning supplies, are not included in the material cost.

Employee (Labour) Cost :The cost of labor is the sum of all wages paid to employees, as well as the cost of employee benefits and payroll taxes paid by an employer. The cost of labor is broken into direct and indirect (overhead) costs.

Other Expenses : Expenditure other than material and labour is the third element of cost.

It is defined by I.C.M.A. as- "The cost of service provided to an undertaking and the notional cost of the use of owned assets".

Marginal Costing

The price to manufacture a second unit of output is known as the marginal cost. Since marginal cost aids in determining the level of production that is the most effective for a manufacturing process, it is a crucial topic in cost accounting. It is estimated by estimating the costs incurred even if just one more unit is produced.

For Example:

Variable cost per unit = Rs 25

Fixed cost = Rs 1,00,000

Cost of 10,000 units = 25 × 10,000 = Rs 2,50,000

Total Cost of 10,000 units = Fixed Cost + Variable Cost

= 1,00,000 + 2,50,000

= Rs 3,50,000

Total cost of 10,001 units = 1,00,000 + 2,50,025

= Rs 3,50,025

Marginal Cost = 3,50,025 – 3,50,000

= Rs 25

Illustration 1*:* From the following particulars calculate:

a. P/V Ratio b. Fixed Cost

b. I year sales Rs. 1, 95,000 profit Rs. 9,000

c. II Year sales Rs. 2, 25,000 profit Rs. 15,000

Solution:

P/V Ratio = Change in Profit / Change in Sales

= 15,000 - 9,000 / 2,25,000 1,95,000 = 6,000 /30,000 × 100

P/V Ratio = 20%

Variable Cost= Sales (1- P/V Ratio)

= Rs. 2,25,000 (1- 0.20)

= Rs. 2,25,000 × 0.80 = Rs. 1,80,000

Fixed Cost = Sales – Variable Cost – Profit

= Rs. 2,25,000 – Rs. 1,80,000 – 15,000 = Rs. 30,000

Illustration 2: A cost sheet shows the following situations prevailing in Star Ltd., which is facing depression: Direct Materials -- Rs. 50,000 Direct Wages -- Rs. 20,000 Overheads: Variable -- Rs. 10,000 Fixed -- Rs. 20,000 -- Rs. 30,000 Total Cost -- Rs.1,00,000 Sales 4,000 units @ Rs. 23 per unit -- Rs. 92,000 Loss: -- Rs. 8,000 There is no sign of improvement in the situation. Therefore, the management wants to know whether it is desirable to stop the production. What should be the minimum price at which company should shut down its production?

Solution:

Even if there is a loss of Rs. 8,000, it is not desirable to stop the production. Because, fixed costs will be incurred

even if production is stopped and loss would be equal to fixed cost of Rs. 20,000. The RCUB, B.Com – 6th Semester Elements of Costing – II Page | 10 present loss is less because selling price is more than marginal cost and the same contributes towards recovery of fixed costs. Therefore, so long as there is contribution, it is not advisable to stop the production. The following statement gives the clear idea of the situation.

Marginal Cost	***Per Unit***	***Total (Rs.)***
Sales price of 4,000 units	23.00	92000
Less: Variable Cost Direct Material	12.50	50,000
Direct Wages	5.00	20,000
Variable Overheads	2.50	10,000
Marginal (Variable) Cost	20.00	80,000
Contribution	3.00	12,000
Less: Fixed Cost	5.00	20,000
Loss	2.00	8,000

The price per unit of Rs. 23 is more than marginal cost of Rs. 20. Therefore, the production should be continued. The minimum price at which production should be discontinued should be equal to marginal cost. In this case marginal cost is Rs. 20, so minimum price should be Rs. 20. It is better to stop the production if selling price falls below the marginal cost of Rs. 20 to avoid the loss more than fixed cost of Rs. 20,000.

Illustration 3:

The National Company has just been formed. They have a patented process that will make them the sole suppliers of Product A.

During the first year, the capacity of their plant will be 9,000 units, and this is the amount they will be able to sell. Their costs are:

- Direct labor = $15 per unit
- Raw materials = $5 per unit
- Other variable costs = $10 per unit
- Fixed costs = $240,000

There are two parts to this question:

(a) If the company aims to make a profit of $210,000 for the first year, what should the selling price be? What is the contribution margin at this price?

(b) If, at the end of first year, the company aims to increase its volume, how many units will they have to sell to realize a profit of $760,000 given the following conditions?

- An increase of $100,000 in the annual fixed costs will increase their capacity to 50,000 units
- Selling price is at $70 per unit and no other costs change
- $500,000 is invested in advertising

Solution

(a) Calculation of selling price

Direct labor (9,000 x 15) = $135,000

Raw materials (9,000 x 5) = $45,000

Other variable costs (9,000 x 10) = $90,000

Total variable costs (PU 30) = 270,000

Add: Fixed Cost = 240,000

Profit = 210,000

Total sales value of 9,000 units @ $80 per unit = 720,000

(b) Sales in units

(Fixed expenses + Desired profit) / (Sales – Variable cost)

Thus,

Fixed Expenses = 2,40,000 (given) + 1,00,000 (extra) + 50,000 (advertisement cost)

= 840,000 + Desired Profit (760,000) = $1,600,000

= 1,600,000 / (70 – 30) = 40,000 units

Illustration 4:

From the following particulars find out the amount of profit earned during the year using the marginal costing technique :

Product	*A*	*B*	*C*
Output (units)	10,000	20,000	30,000
Selling Price (per unit)	Rs. 10	Rs. 10	Rs. 5
Variable cost (per unit)	Rs. 6	Rs. 7.50	Rs. 4.5

Total Fixed Cost Rs. 80,000.

Solution

Statement of Cost and Profit (Marginal Costing)

Product

	A (Rs)	*B (Rs)*	*C (Rs)*	*Total (Rs)*
Sales Revenue	100,000	200,000	300,000	600,000
Marginal Costs	60,000	150,000	270,000	480,000
Contribution	40,000	50,000	30,000	120,000
Fixed Costs				80,000
Profit				40,000

Thus the technique of marginal costing assumes that the difference between the aggregate value of sales and the aggregate value of variable costs or marginal costs, provides a fund (called contribution) to meet the fixed costs and balance is the profit. The concept of contribution is a very useful tool to management in managerial decisions making.

Illustration 5:

Two companies A Ltd. and B Ltd. sell the same type of product. Their income statement are as follows:

	A Ltd. (Rs)	***B Ltd. (Rs)***
Sales	2,40,000	2,40,000
Less : Variable Cost	96,000	1,20,000
Fixed Costs	64,000	40,000
Profit	80,000	80,000

State which company is likely to earn greater profit if there is: (i) heavy demand, (ii) poor demand for its products.

Solution

	A Ltd. (Rs)	***B Ltd. (Rs)***
Sales	2,40,000	2,40,000
Variable Cost	96,000	1,20,000
Contribution	144,000	120,000
P/V Ratio (Contribution ÷ Sales)	0.60	0.50

In case of A Ltd., every sale of Rs. 100 gives a contribution of Rs. 60 whereas in case of B Ltd. every sale of Rs. 100 provides a contribution of Rs. 50. In case of heavy demand, profit of A Ltd. will rise much faster in comparison to B Ltd. During poor demand or decline in sales of Rs. 100 will lead to decline in contribution in A Ltd. and B Ltd. by Rs. 60 and Rs. 50 respectively.

Mathematically,

Sales = Variable cost + Fixed cost ± Profit.

Sales – Variable cost = Fixed Cost ± Profit

Sales – Variable cost = Contribution

Contribution –Fixed cost = ± Profit

To make profit, contribution should be greater than fixed cost. Further, to maximize profit, contribution should be maximized. When contribution is equal to fixed cost, then a firm is at 'no profit no loss point' called break-even point.

Formulae of Marginal Costing: The difference between the change in costs and the change in quantity is used to compute marginal cost. Assume, for instance, that a factory wants to boost its output to 10,000 units from its present 5,000 units. The marginal cost of production is equal to the difference between the factory's present cost of production ($100,000) and the cost of production ($150,000) when production is increased (10,000 - 5,000).

Need for Marginal Costing

Marginal Costing is clearly the core aspect of traditional management accounting. Some of the classical applications of management accounting, however, have begun to lose their significance. The question thus arises: What is the current role of Marginal Costing in modern management accounting?

Marginal cost means the cost of the marginal or last unit produced. It is also defined as the cost of one more or one less unit produced besides existing level of production. In this connection, a unit may mean a single commodity, a dozen, and a gross or any other measure of goods. Example, if a manufacturing firm produces X unit at a cost of Rs.300 and X+1 unit at a cost of Rs.320, the cost of an additional unit will be Rs.20 which is marginal cost. Similarly if the production of X-1 units comes down to Rs.280, the cost of marginal unit will be Rs.20 (300– 280). The marginal cost varies directly with the volume of production and marginal cost per unit remains the same. It consists of prime cost, i.e. cost of direct materials, direct labor and all variable overheads. It does not contain any element of fixed cost which is kept separate under marginal cost technique.Therefore, the need for Marginal Costing is as follows:

1. Cost-volume-profit relationship data wanted for profit planning purposes is readily obtained from the regular accounting statements. Hence management does not have to work with two separate sets of data to relate one to the other.
2. The profit for a period is not affected by changes in absorption of fixed expenses resulting from building or reducing inventory. Other things remaining equal (e.g. selling prices, costs, sales mix), profits move in the same direction as sales when direct costing is in use.
3. Manufacturing cost and income statements in the direct cost form follow management's thinking more closely than does the absorption cost form for these statements. For this reason, management finds it easier to understand and use direct cost reports.
4. The impact of fixed costs on profits is emphasised because the total amount of such cost for the period appears in the income statement.
5. Marginal income figures facilitate relative appraisal of products, territories, classes of customers, and other segments of the business without having the results obscured by allocation of joint fixed costs.
6. Marginal costing lies in with such effective plans for cost control as standard costs and flexible budgets.
7. Marginal costing furnishes a better and more logical basis for the fixation of sales prices as well as tendering for contracts when business is at low ebb.
8. Break-even point can be determined only on the basis of marginal costing.

Features of Marginal Costing

The following are characteristics of marginal costing:

1. Appropriate and accurate division of total cost into fixed and variable by picking out variable portion of semi variable costs also.
2. Marginal costing avoids, the difficulties of having to explain the purpose and basis of overhead absorption to management that accompany absorption costing. Fluctuations in profit are easier to explain because they result from cost volume interactions and not from changes in inventory valuation.
3. It is easier to make decisions on the basis of marginal cost presentations, e.g., marginal costing shows which products are making a contribution and which are failing to cover their avoidable (i.e., variable) costs. Under absorption costing the relevant information is difficult to gather, and there is the added danger that management may be misled by reliance on unit costs that contain an element of fixed cost.

4. Marginal costing is essentially useful to management as a technique in cost analysis and cost presentation. It enables the presentation of data in a manner useful to different levels of management for the purpose of controlling costs. Therefore, it is an important technique in cost control.
5. Future profit planning of the business enterprises can well be carried out by marginal costing. The contribution ratio and marginal cost ratios are very useful to ascertain the changes in selling price, variable cost etc. Thus, marginal costing is greatly helpful in profit planning.
6. When a business concern consists of several units and produces several products and evaluation of performance of such components can well be made with the help of marginal costing.
7. It is helpful in forecasting.
8. When there are different products, the determination of number of units of each product, called Optimum Product Mix, is made with the help of marginal costing.
9. Similarly, optimum sales mix i.e., sales of each and every product to get maximum profit can also be determined with the help of marginal costing.
10. Valuation of stocks such as finished goods, work-in-progress is valued at variable cost only.
11. The fixed costs are written off soon after they are incurred and do not find place in product cost or inventories.
12. Prices are based on Marginal Cost and Marginal Contribution.
13. It combines the techniques of cost recording and cost reporting.

Ascertainment of Profit under Marginal Cost

The term "contribution" refers to a sum of money equal to the selling price of a good less the marginal cost. One way to characterize contribution is as follows:

Contribution = Selling Price – Marginal Cost

Contribution = Fixed Expenses + Profit

Contribution – Fixed Expenses = Profit

Income Statement under Marginal Costing

Income Statement

For the year ended 31-03-2021

Particulars	***Amount***	***Total***
Sales		25,00,000
Less : Variable cost		
Cost of goods manufactured	12,00,000	
Variable Selling Expenses	3,00,000	
Variable Administration Exp	50000	
		15,50,000

Contribution		9,50,000
Less : fixed cost		
Fixed Administration Exp	70,000	
Fixed selling Expenses	1,30,000	200,000
		7,50,000

***Illustration 1*:** X Ltd. Made sales during a certain period for Rs. 1,00,000. The net profit for the same period was Rs. 10,000 and the fixed overheads were Rs. 15,000. Find out: (i) P/V Ratio (ii) Sales needed to generate a profit of Rs. 15,000 (iii) A net profit of Rs. 150,000 from sales. (iv) Point sales that break even.

Solution:

(i) P/V Ratio = {(F+P) / S} x 100 Here, F = Rs. 15,000, P = Rs. 10,000 and S = Rs. 1,00,000. P/V Ratio = [(15,000 + 10,000) / 1,00,000] x 100 P/V Ratio = 25%.

(ii) P/V Ratio = {(F+P) / S} x 100 Here 25 = {(15,000+15,000) /S}x100 [Given Profit = Rs. 15,000] Or, S = (30,000/25) x 100 Sales = 1,20,000 Sales required to earn a profit of Rs. 15,000 = Rs.1,20,000.

(iii) When Sales =Rs.1,50,000, Then Profit = ? P/V Ratio ={(F+P) / S} x 100 Here, 25 = [(15,000+P)1,50,000] x 100 [Given Sales= Rs.1,50,000] Or, 15,000 + P = 1,50,000 x 25 / 100 Or, 15,000 + P = 37,500 Profit = 37,500 – 15,000 = Rs.22,500 Net Profit from sales of Rs.1,50,000 = Rs. 22,500.

(iv) We know, at BEP – P/V Ratio = F+ BEP Sales x 100 Or, 25 = (15,000 / BEP Sales) x 100 Or, BEP Sales = (15,000 / 25) x 100 = 60,000 ÷ Break – even Point Sales = Rs. 60,000.

Illustration 2 : The following data relate to a manufacturing company:

Plant capacity: 4,00,000 units per annum

Present utilization 40%

Actuals for the year were

Selling price ₹ 50per unit

Materials cost ₹ 20per unit

Variable manufacturing costs ₹15 per unit

Fixedcosts ₹ 27 lakhs

In order to improve capacity utilisation the following proposals are being considered.

Reduce selling price by 10%.

Spend additionally ₹3 lakhs on sales promotion.

How many units should be made and sold in order to earn a profit of ₹5 lakhs per year?

Solution:

Revised selling price (₹50 less 10%) ₹45 per unit

Variable cost:

Material cost Rs.20

Variable manufacturing cost (per unit) Rs.15

Total variable cost Rs.35 per unit

Contribution Rs.10 per unit

Total contribution required:

Fixed costs Rs.27,00,000

Additional promotion expenses Rs.3,00,000

Profit Rs.5,00,000

Total Rs.35,00,000

Total number of units to be made and sold to earn a contribution of Rs. 35,00,000

Total Contribution

= Contribution per unit

Rs. 35,00,000

= Rs. 10 = 3,50,000 units.

***Illustration 3*:** Statement of Marginal Cost

Particulars	***Product A Rs.***	***Product B Rs.***
Sales	100	100
Direct Materials	24	16
Direct Wages @ Rs. 2.00 per hour	6	10
Variable Overheads	4	6
Marginal Cost	34	32
Contribution	66	68
Contribution per kg of material	11	17
Contribution per hour of labour:	22	13.60
Contribution per hour of machine	16.50	22.67

Working Notes:

1. Materials used in kgs = Cost of material / Cost per kg

   Product A = 24/ 4 = 6 kgs

   Product B = 16 /4 = 4 kgs

2. Contribution per kg of Material = Contribution/ Number of kgs materials used

   Product A = 66 /6 = 11 Rs per kg

   Product B = 68/4= 17 Rs per kgs

3. Contribution per hour of labour: = Contribution / Labour hours

   Product A = 66/ 3 = 22 Rs per labour hour

   Product B = 68/5 = 13.60 Rs per labour hour

   Labour hours = (A) 6/2=3hours and (B)10/2=5 hours

4. Contribution per hour of machine: = Contribution/ Machine hours used

   Product A = 66/4 = Rs 16.50 per hour of machine

   Product B = 68/3 = Rs 22.67 per hour of machine

Recommendations:

(a) Product 'B' is recommended when material is in short supply

(b) Product 'A' is recommended when labour is scarce factor

(c) Product 'B' is recommended when production capacity is the limiting factor.

Advantages of Marginal Costing

The following are some benefits of marginal costing:

1. **Effective cost control –** It divides cost into fixed and variable. Fixed cost is excluded from product. As such, management can control marginal cost effectively.
2. **Treatment of overheads simplified –** It reduces the degree of over or under-recovery of overheads due to the separation of fixed overheads from production cost.
3. **Uniform and realistic valuation –** As the fixed overhead costs are excluded from product cost, the valuation of work-in-progress and finished goods become more realistic.
4. **Helpful to management –** It enables the management to start a new line of production which is advantageous. It is helpful in determining which is profitable whether to buy or manufacture a product. The management can take decision regarding pricing and tendering.
5. **Helps in production planning –** It shows the amount of profit at every level of output with the help of cost volume profit relationship. Here the break-even chart is made use of.
6. **Better results –** When used with standard costing, it gives better results.
7. **Fixation of selling price –** The differentiation between fixed costs and variable costs is very helpful in determining the selling price of the products or services. Sometimes, different prices are charged for the same article in different markets to meet varying degrees of competition.
8. **Helpful in budgetary control –** The classification of expenses is very helpful in budgeting and flexible budget for various levels of activities.
9. **Preparing tenders –** Many business enterprises have to compete in the market in quoting the lowest price. Total variable cost, when separately calculated, becomes the 'floor price'. Any price above this floor price may be quoted to increase the total contribution.
10. **"Make or Buy" decision –** Sometimes a decision has to be made whether to manufacture a component or a product or to buy it ready-made from the market. The decision to purchase it would be taken if the price paid recovers some of the fixed expenses.
11. **Better presentation –** The statements and graphs prepared under marginal costing are better understood by management executives. The break-even analysis presents the behaviour of cost, sales, contribution etc. in terms of charts and graphs. And, thus the results can easily be grasped.

Breakeven Point

The break-even point (break-even price) for a trade or investment is determined by comparing the market price of an asset to the original cost; the break even point is reached when the two prices are equal.

The break-even point is **the point at which total cost and total revenue are equal**, meaning there is no loss or gain for your small business. In other words, you've reached the level of production at which the costs of production equals the revenues for a product.

A company's breakeven point is the point at which its sales exactly cover its expenses. **Fixed Costs ÷ (Price - Variable Costs)** = Breakeven Point in Units. Pricing a product, the costs incurred in a business, and sales volume are interrelated

The phrase "ascertainment of level of operations when total revenue equals entire costs" is used to describe break-even analysis. At any stage of operations, it is an analysis performed to determine the likely profit or loss. Break-even analysis is a technique for analysing how sales revenue, variable expenses, and fixed costs relate to one other in order to identify the operating level at which all costs are equal to sales revenue and there is no profit or loss.

This is a crucial strategy used in managerial decision-making and profit planning. Graphical charts are used to do break-even analysis. A break-even chart shows an approximation of profit or loss at various sales volume levels within a specific range. The break-even charts display sales income, fixed costs, and variable costs.

The objectives of break even analysis are given below:

(1) In order to forecast profit accurately, it is essential to know the relationship between profits and costs on the one hand and volume on the other.

(2) It is useful in setting up flexible budgets which indicate costs at various levels of activity.

(3) It is of assistance in performance evaluation for the purposes of control. For reviewing profits achieved and cost incurred the effects on costs of changes in volume are required to be evaluated.

(4) Pricing plays an important part in stabilizing and fixing up volume. Analysis of break even relationship may assist in formulating price policies to suit particular circumstances by projecting the effect which different price structures have on costs and profits.

(5) As predetermined overhead rates are related to a selected volume of production, study of break even relationship is necessary in order to know the amount of overhead costs which could be charged to product costs at various level of operation.

Steps in Construction of Break-even Chart

Building a break-even chart involves the following steps:

Step 1:

Choose a scale for the horizontal axis' sales (units).

Step 2:

Choose a scale for the vertical axis of costs and revenues.

Step 3:

Create a fixed cost line that is perpendicular to the horizontal axis.

Step 4:

Beginning at the fixed cost point on the vertical axis, draw the total cost line.

Step 5:

Draw a sales line that extends from the origin (zero) to the point of greatest sales.

Step 6:

When total costs equal total revenues, the sales line will cross the total cost line.

Step 7:

The "break-even point," or the location where there is neither a profit nor a loss, is the intersection of two lines.

Step 8:

The sales value and quantity produced at break-even point are given by the lines drawn from junction to the horizontal axis and vertical axis.

Step 9:

If the production falls below the break-even threshold, a loss is displayed, and if it exceeds the break-even point, a profit is displayed.

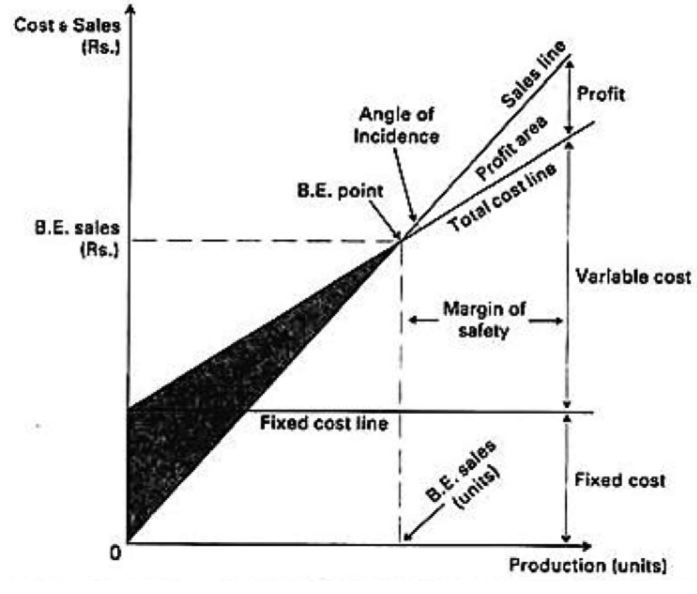
Step 10:

The margin of safety is equal to the total sales minus break-even sales.

Step 11:

The angle of incidence is the angle that the sales line creates with the total cost line when it intersects that line at the break-even point.

FIGURE 19.1 BREAK-EVEN CHART



In order to evaluate an organization's viability and make judgments about profit planning and expense control, break-even point analysis is useful. The break-even point, or point at which there is no net profitability, occurs when sales are just equal to costs. Costs are made up of both fixed and variable expenses.

It is a helpful instrument in financial planning that is used to recover expenditures and increase revenues. The break-even point will change as operating conditions, such as selling price, variable cost, and fixed cost, change. Costs must be divided into fixed and variable costs for the purpose of calculating the break-even point.

When calculating the break-even point, the fundamental premise is that the selling price per unit, variable cost per unit, and fixed cost per unit remain constant.

The fundamental premise in calculating break-even point is that selling price per unit, variable cost per unit, and total fixed expenses are constant. The operational and sales capacity needed to cover all costs is known as the break-even point. Beyond the point of break-even, any more activity or sales will result in a profit for the company.

Formulae for Break-Even Analysis:

$$\text{Break – Even point (unit)} = \frac{\text{Fixed cost}}{\text{Contribution per unit}}$$

$$\text{Break – Even point (unit) (Rs.)} = \frac{\text{Fixed cost}}{\text{p/v ratio}}$$

or = Break – even units x Selling price p.u.

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} \text{ x } 100$$

$$\text{Desired sales} = \frac{\text{Fixed cost + Desired profit}}{\text{p/v ratio}}$$

At Break – even point

Contribution = Fixed cost

Contribution – Fixed cost = 0

Illustration 1: StarX Ltd. Sold goods for ₹ 30,00,000 in a year. In that year, the variable cost is 60% of sales and profit is ₹ 8,00,000. Find out: (i) P/V Ratio, (ii) Fixed Cost, (iii) Break-even sales, (iv) sales that would still be profitable if the selling price were cut by 10% but fixed costs were raised by 1,00,000.

Solution:

Sales	30,00,000
Less: Variable Cost (60% of Sales)	18,00,000
Contribution	12,00,000
Less:Fixed Cost	*
Profit	8,00,000

Profit = C – FC

8,00,000 = 12,00,000 – FC

FC = 4,00,000..... (ii)

P/V Ratio = CS x 100 = 12,00,000 30,00,000 x 100 = 40%.....(i)

BEP = $FCPVRatio$ = 4,00,000 40% = 10,00,000.....(iii)

iv..... Required Statement

Sales (30,00,000 ÷ 10%) = 27,00,000

Less: V.C = 18,00,000

Contribution = 9,00,000

Revised P/V Ratio = CS x 100 = 9,00,000 27,00,000 x 100 = 1 3 x 100 = 33 1/ 3 %

Revised BEP $FCPVRatio$ = 4,00,000+1,00,000 331 3 % = ₹ 15,00,000

***Illustration 2*:** A company manufactures a products, currently providing 80% capacity with a turnover of ₹8, 00,000 at ₹ 25 per unit. The cost data are as under: Material cost ₹7.50 per unit, Labour cost ₹6.25 per unit. Semi-variable cost (including variable cost of ₹3.75 per unit) ₹1, 80, 000,Fixed cost ₹90,000 up to 80% level of output, beyond this an additional ₹20,000 will be incurred.

Calculate: 1. Activity level at breakeven point

Solution:

1. Number of units sold = Sales ÷ Selling price p.u. = ₹8,00,000 ÷ 25 per unit = 32,000 units

Fixed cost included in the semi-variable cost = Total semi variable cost – variable element

= ₹1,80,000 – (`3.75 p.u. x 32,000 units) = ₹60,000

Variable cost p.u. = ₹7.50 + 6.25 + 3.75 =`17.50

Contribution p.u, = Selling price – variable cost = ₹(25 – 17.50) = ₹7.50

Breakeven Point = Fixed Cost/Contribution per unit = 90000+60000/7.50 = 20,000 units

`Activity level at BEP = 80% / 32000 units * 20,000 units = 50.00%

***Illustration 3*:** MNP Ltd sold 2, 75,000 units of its product at ₹37.50 per unit. Variable costs are ₹ 17.50 per unit (manufacturing costs of ₹ 14 and selling cost ₹ 3.50 per unit). Fixed costs are incurred uniformly throughout the year and amounting to ₹ 35, 00,000 (including depreciation of ₹ 15, 00,000). There is no beginning or ending inventories. Required: COMPUTE breakeven sales level quantity and cash breakeven sales level quantity.

Solution:

Break even Sales Quantity = Fixed cost/ Contribution margin per unit = 35, 00,000 / 20 ₹ = 1, 75,000 units Cash Break-even Sales Quantity = Cash Fixed Cost/ Contribution margin per unit

= 20, 00,000/ 20 ₹ =1, 00,000 units.

Illustration 4: Mahindra Ltd. sells two products, J and K. The sales mix is 4 units of J and 3 units of K. The contribution margins per unit are ₹ 40 for J and ₹ 20 for K. Fixed costs are ₹ 6, 16,000 per month.

Sales mix (in quantity) is 4 units of Product- J and 3 units of Product- K i.e. Sales ratio is 4: 3

Composite contribution per unit by taking weights for the product sales quantity

=Product J- 40* 4/ 7 + Product K- 20*3/ 7 = ₹22.86 + ₹8.57 = Rs 31.43

Composite Break-even point = Common Fixed Cost/ Composite Contribution per unit

= 6,16,000 / 31.43 = 19,600 units

Break-even units of Product-J = 19,600*4/ 7 = 11,200 units

Break-even units of Product- K = 19,600*3/7 = 8,400 units

Assumption and Limitation of Breakeven Analysis

In doing a break-even analysis, the following presumptions and restrictions should be taken into account:

(a) To do a break-even analysis, all expenditures must be divided into fixed and variable components. Accurately separating semi-variable costs into their variable and fixed components is challenging.

(b) All fixed costs are expected to remain constant throughout all levels of activity. However, in actuality, it could not be permanently fixed.

(c) Another presumption is that variable costs actually fluctuate and are directly related to production volume. It indicates that the variable cost per unit of the product stays the same. In actuality, output and variable costs are not always strictly correlated.

(d) In a break-even analysis, it is assumed that production and sales units are equal, and that there is no inventory at the start or end of the period under consideration. In reality, inventory will always be present.

(e) Assuming that the sales mix does not change and that the selling price stays the same at all output levels, there will be no change in the selling price. In the actual world, it can be necessary to frequently alter the selling pricing and product mix in order to boost sales.

(f) It is assumed that there won't be any changes to productivity, operational effectiveness, product requirements, or methods of production and distribution. It is impracticable to assume that these factors remain constant because, in reality, operating efficiency and productivity depend on the availability of labour.

(g) A break-even chart can only show the position of one product; it is necessary to create separate charts for each product. It also fails to show the numerous items that make up the sales mix.

(h) The capital used in the business, which is one of the key factors in determining the profitability of the company and its goods, is ignored by break-even analysis.

(I) The break-even charts presumptively depict total cost and total revenue as straight lines. Costs and revenue have a curvilinear function in real life.

Profit Volume Ratio

Profit-Volume Ratio (P/V) measures the percentage of turnover that each product contributes to. It shows how the contribution to sales is related. Knowing the business's profitability is helpful.

This ratio is calculated as:

P/V Ratio = Contribution/Sales x 100

One can increase contribution by doing any of the following:

(a) A rise in the asking price

(b) Lower marginal costs through effective use of labour, resources, and machinery.

(c) Emphasize the selling of goods having a comparatively higher PV ratio.

Limitation

When utilising PV ratios in break-even analysis, the following restrictions should be kept in mind:

(a) A P.V. ratio that strongly relies on revenue surpluses over variable costs

(b) The PV ratio does not account for the capital expenditures required by the increased productive capacity as well as the increased fixed costs.

(c) It simply provides a general sense of the relative profitability of the various products and product lines. Making a final choice will not be of any assistance.

(d) The accurate division of costs into fixed and variable costs is a necessary condition for comparing profitability using the PV ratio. Oversimplifying anything can result in a wrong conclusion.

(e) The most profitable item will only be shown by a higher P.V. ratio per unit of sales or output when other conditions are constant.

***Illustration 1*:** The profit volume ratio of X Ltd. is 50% and the margin of safety is 40%. You are required to calculate the net profit if the sales volume is ₹1,00,000

Margin safety Ratio = Margin Safety/Actual Sales *100

40 = Marginal Safety/100,000*100

Margin of Safety = Rs 40,000

Marginal safety = Profit /PV ratio

Rs 40,000= Profit/50%

Profit = 40000*50%

= Rs 20,000

Illustration 2:

The following details have been provided by ABC Ltd. Sales of 20,000 units (at Rs. 5 per unit) and per unit. for variable costs: Rs. 3. A fixed cost fee of Rs. 8,000 each year. Determine the company's break-even revenue and p.v. ratio.

$$\text{P.V. Ratio} = \frac{\text{Contribution per unit}}{\text{Selling price per unit}} \times 100 = \frac{(\text{Rs. 5} - \text{Rs. 3})}{\text{Rs. 5}} \times 40\% \text{ or } 0.40$$

$$\text{Break – Even Sales} \quad \frac{\text{Fixed cost}}{\text{P.V. ratio}} = \frac{\text{Rs. 8,000}}{.40} = \text{Rs. 2,00,000}$$

Solution:

$$\text{P.V. Ratio} = \frac{\text{Contribution per unit}}{\text{Selling price per unit}} \times 100 = \frac{\text{Rs. 5} - \text{Rs. 3}}{\text{Rs. 5}} = 40\% \text{ or } 0.40$$

$$\text{Break – Even Sales} = \frac{\text{Fixed cost}}{\text{P.V. ratio}} = \frac{\text{Rs. 8,000}}{.40} = \text{Rs. 2,00,000}$$

Illustration 3:

You must use the following data to determine the break-even point. Price at time of sale: Rs. 20 Rs. 80,000 fixed cost per annum 4, 00,000 rupees in sales for the year at variable cost per unit.

The quantity of units involved matches the level of production anticipated.

Working notes:

(a) Contribution p.u. = Selling price p.u. - Variable cost p.u.

= 20 minus 4 equals 16

16 rupees worth of contribution

(b) The PV ratio is calculated as follows: Contribution p.u./Selling price p.u. x 100 = Rs.16/Rs.20 x 100 = 80% or 0.80

Break-even sales result in neither a profit nor a loss.

Verification

Break-even sales = Fixed cost - Variable cost = 0.

5,000 units times 20 rupees, 5,000 units times 4, and 80,000 rupees equal zero.

1,00,000 minus 20,000 minus 80,000 = 0.

For example : DB Ltd furnished the following information

Particulars	***2005-2006***	***2006-2007***
Sales (Rs 10/unit)	200,000	2,50,000
Profit	30,000	50,000

You are required to compute:

(a) P/V Ratio.

(b) Break-even point.

(c) Total variable cost for 2005-2006 & 2006-2007.

(d) Sales required to earn a profit of Rs. 60,000.

(e) Profit/Loss when sales are Rs. 1,00,000

Solution:

(a) P/V Ratio = Change in Profit Change in Sales x 100 Here, P/V Ratio = [(50,000–30,000) / (2,50,000–2,00,000)] x100 = 40%

(b) P/V Ratio = {(F+P) / S} x 100 In the year 2006-2007 – P/V Ratio = [(F + 50,000) / 2,50,000] x 100 Or, 40 = (F + 50,000) 2,500 Or, F + 50,000 = 1,00,000 Fixed Cost = Rs. 50,000 Now, BEP Sales = Fixed Cost / P/V Ratio x 100 ∴ BEP Sales = (50,000 /4) x 100 = Rs. 1,25,000.

(c) P/V Ratio = {(S – V) / S} x 100 In the year 2005-2006 – 40 = {(2,00,000 – V) / 2,00,000} x 100 Or, 80,000 = 2,00,000 – V Or, V = 2,00,000 – 80,000 Total Variable Cost for 2005-06 = Rs. 1,20,000. In the year 2006-07 – 40 = {(2,50,000 – V) / 2,50,000} x 100 Or, 1,00,000 = 2,50,000 – V Or, V = 2,50,000 – 1,00,000 Total Variable Cost for 2005-06 = Rs. 1,50,000.

(d) P/V Ratio = {(F + P) / S} x 100 Here, 40 = {(50,000 + 60,000) / S} x 100 Or, S = (1,10,000 / 40) x 100 ∴ Required Sales = Rs. 2,75,000.

(e) P/V Ratio = {(F + P) / S} x 100 Here, 40 = {(50,000 + P) / 1,00,000} x 100 Or, 40,000 = 50,000 + P P = (10,000) ∴ Loss = Rs. 10,000

Margin of Safety

Sales above the volume necessary to break even are referred to as the margin of safety. It stands for the discrepancy between sales at a particular activity level and sales at break-even. In order to keep the business' operations viable, there needs to be a suitable margin of safety.

A low margin of safety typically denotes large fixed expenses, meaning earnings won't be realised until there is a significant amount of activity to cover the fixed expenses. A margin of safety gives a concern strength and stability.

The margin of safety is an essential metric, particularly in periods of declining sales, to understand the true position to run profitably and to take action to raise the margin of safety.

The difference between actual sales and the break-even point is the margin of safety. The business is in a stronger financial position when there is a larger margin of safety. This implies that a higher profit margin and vice versa correspond to a higher margin of safety.

Margin of Safety is calculated by using the following formulae:

Margin of Safety = Actual Sales – Break- Even Sales

Or = Proft/ PV ratio

Or = Profit * Selling price p.u / Selling Price per unit – Variable cost per unit

Margin of Safety as % of Total Sales

= Margin of Safety / Total Sales *100

Illustration 1: From the following information of Akansha Co. Ltd. Calculate P/V Ratio and Margin of Safety.

i. Sales -- Rs. 10, 00,000

ii. Variable Cost -- Rs. 4, 00,000

iii. Profit -- Rs. 3, 00,000

Solution: Contribution = Sales – Variable Cost

= Rs. 10,00,000 – Rs. 4,00,000

= Rs. 6,00,000

Fixed Cost = Sales – Variable Cost – Profit or Contribution - Profit

= Rs. 10,00,000 – Rs. 4,00,000 – Rs. 3,00,000

= Rs. 10,00,000 – Rs. 7,00,000

= Rs. 3,00,000

P/V Ratio = 6,00,000/ 10,00,000*100

= 60%

BEP (Value) = Fixed Cost / P V Ratio

= 3, 00,000 / 0.6 = Rs. 5, 00,000

Margin of Safety = Sales – BEP

= Rs. 10, 00,000 – Rs. 5, 00,000

= Rs. 5, 00,000

Illustration 2: Surya Ltd has a total turnover of Rs. 10 lakhs. It is enjoying 30% margin of safety. Its total variable cost is 60% of sales. Determine Fixed Cost and BEP in Sales.

Solution: Variable Cost = 60% of Sales

= 0.60 × Rs. 10, 00,000 = Rs. 6,00,000

Contribution = Sales – Variable Cost

= Rs. 10,00,000 – Rs. 6,00,000

= Rs. 4,00,000

P/V Ratio = Contribution/ Sales

= 4,00,000/10,00,000*100 = 40%

Margin of Safety = 30% of Rs. 10,00,000

= Rs. 3,00,000

Margin of Safety = Profit/ P V Ratio :

Profit = Margin of Safety × P/V Ratio

= Rs. 3, 00,000 × 0.40

Profit = Rs. 1, 20,000

Fixed Cost = Contribution – Profit

= Rs. 4, 00,000 – Rs. 1, 20,000

= Rs. 2,80,000

BEP (Value) = Actual Sales – Margin of Safety

= Rs. 10,00,000 – 3,00,000

= Rs. 7,00,000

How to improve margin of Safety

The product or product line will be more profitable the bigger the margin of safety.

Any of the following measures can increase the margin of safety:

(a) Trying to maintain the maximum level of actual sales while keeping the break-even point at the lowest possible level.

(b) Increased in sales volume

(c) A rise in the asking price.

(d) Increasing contribution due to a change in product mix.

(e) Reducing in fixed costs

(f) Reducing in variable costs.

(g) Eliminating unprofitable products from the sales mix.

Illustration 3: You have access to XYZ Ltd.'s data for the fiscal year that concluded on March 31, 2009,sales of 100,000 units at Rs. 10 p.u. for variable costs: Rs. 6. 3,00,000 rupees per year in fixed costs. Determine the safety margin.

Solution:

Break-even Sales = Fixed cost/Contribution p.u. = Rs. 3,00,000/Rs. 4 = 75,000 units

Margin of Safety = Actual sales – Break-even sales

= 1,00,000 units – 75,000 units = 25,000 units

= 25,000 units x Rs. 10 = Rs. 2,50,000.

Angle of Incidence

The "angle of incidence" is the angle that the sales line creates with the total cost line. Higher profit margins are predicted by larger incidence angles, and vice versa. It serves as a gauge of profitability over the point of break-even.

If the management is given important information about its profitability by taking into consideration and studying both the margin of safety and the angle of incidence. The most profitable posture for the business concern will be one with a large margin of safety and a wider angle of incidence, and vice versa.

Relationship of BEP, Margin of Safety and Angle of Incidence:

The relationship among Break-even point, Margin of safety and Angle of incidence is summarized as follows:

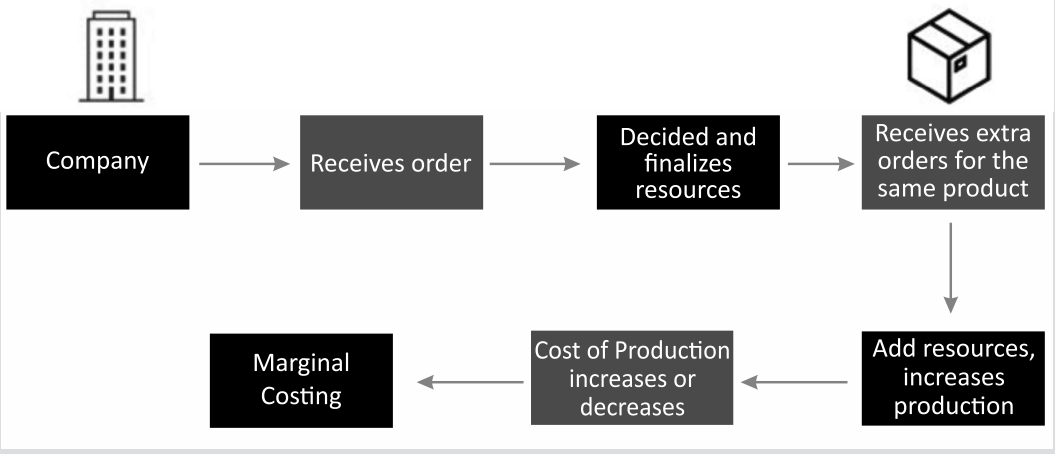
Break-Even Level: This is the production or sales level at which there is neither a profit nor a loss. As a result, there is neither a profit nor a loss at this point in the sales process. Only when actual sales exceed break-even sales does the company begin to make a profit. Better than a corporation with a higher break-even point is one with a lower break-even point.

Angle of Incidence: In a break-even chart, this angle is created by the intersection of the total cost line and the total income line. Higher profitability is indicated by a larger angle of incidence, and lesser profitability is indicated by a smaller angle.

LESSON ROUND-UP

- Costing is fundamentally a method by which we allocate costs to various company components. It is a method of calculating costs.
- In order to support strategic planning and increase cost effectiveness, cost accounting is a system for tracking and analysing the price of goods and services.
- It's crucial for management, staff, and customers, among other stakeholders in a business. Despite their interdependence, cost accounting and financial accounting have different outcomes.
- Financial accounting shows you the profit and loss for the entire organisation, whereas cost accounting informs you of the costs associated with producing specific things. While there are benefits to having a specialised cost accounting system, a business that is capable of managing all of its costs can handle all
- Marginal costing: The extra expense incurred in producing an extra unit of output is referred to as a marginal cost. A different name for this approach is the cost-profit-volume analysis. The relationship between production volume, selling price, costs, expenses, and profits is examined via marginal cost analysis. It is determined by dividing by revenue after deducting variable costs.

What is Marginal Costing?



- Managers can use it to manage budgets and profitability, control manufacturing costs, optimise production, streamline operations, and much more.
- Marginal costs are typically influenced by variable expenses. However, in situations where output is increased, it can take fixed expenses into account. When a business sets the selling price for a good or service, it optimises profits when its marginal cost and marginal income are equal.
- A break-even point is used in multiple areas of business and finance. In accounting terms, it refers to the production level at which total production revenue equals total production costs. In investing, the break-even point is the point at which the original cost equals the market price
- Generally, to calculate the break-even point in business, fixed costs are divided by the gross profit margin. This produces a dollar figure that a company needs to break even.
- Margin of safety is an investing principle that involves only procuring a security when its market price is substantially less than its intrinsic value.
- The angle that a line (such as a ray of light) falling on a surface or interface makes with the normal drawn at the point of incidence.
- P/V ratio = Contribution/ Sales. It is used to measure the profitability of the company. Contribution is the excess of sales over variable cost. So basically P/V ratio is used to measure the level of contribution made at different volumes of sales.

GLOSSARY

Costing: Costing is any system for assigning costs to an element of a business.

Cost entry: Cost entries are the result of a transfer via data connectors from general ledger entries, cost allocations, and posted cost entries in cost journals.

Cost behavior: Cost behavior classifies costs according to their behavior in relation to changes in key business activities

Level: Level is used to define allocation order

Allocation target: The allocation targets determine where the costs are allocated

P/V ratio: Contribution/ Sales.

BEP: Breakeven point

Angle of Incidence: when the entire sales line crosses the cost line from below in the break-even chart

Margin of safety: a principle of investing in which an investor only purchases securities when their market price is significantly below their intrinsic value

Contribution: something that you give, especially money or help, or do together with other people

Unit: a single thing which is complete in itself, although it can be part of something larger

TEST YOURSELF

PRACTICE QUESTIONS

(I) Very Short Answer Questions:

1. Explain Costing?
2. What do you understand by Cost Accounting?
3. List four instances of expenses which constitute cost in a ready-made garments factory.
    a) List the four primary objects of costing.
    b) List the four main distinctions between financial accounting and cost accounting.
4. To fill in the fields, choose and check the best suitable option.
    i) Cost Accounting can predict future production costs Determine; forecast; analyse; and estimate
    ii) The management receives information from cost accounting for the following reasons: a) the wellbeing of the workforce; b) decision-making; c) efficiency; and d) profitability.
    iii) Cost statements are a component of a company's accounting. A published item; B legislation; C internal; D taxation
    iv) The costing is based on.....figures. A) predicted; B) actual; C) precise; D) estimated.
    v) Management must also review the costing records. A) audited, B) prepared, C) checked, D) analyzed.

(II) Short Answer Questions:

1. What does the term "cost accounting" mean?
2. What are the top three requirements for cost accounting?
3. What does "marginal costing" mean?
4. What does "breakeven point" mean?
5. What does "Angle of Incident" mean?
6. What are the formulas and how to compute the breakeven point?
7. What are the formulas for calculating marginal cost?

(III) Long Answer Questions:

1. What part does cost accounting play in determining prices?
2. What benefits does cost accounting offer?
3. What are the different characteristics of marginal costing?
4. What are the key areas of marginal costing decision-making?
5. A business manufactures 500 units at a variable cost of $200 each. Each unit costs $250, and the fixed costs come to $12,000 per month. Calculate the break-even point for this query using both units and sales. Display the profit at 90% capacity as well.
6. A business has $80,000 in sales, $4,000 in variable costs, and $4,000 in fixed costs. Calculate the following: PVR, BEP (Sales), safety margin, profit, and profit margin.

   Determine the PVR and sales at BEP based on the facts below.

   $15 is the variable cost per unit.

   Each unit sells for $20.

   Fixed costs equal $54,000.
7. If BEP for units is decreased to 6,000 units, what should the new selling price be?
8. Using the following information, determine I PVR, (ii) BEP, and (iii) Margin of Safety: Sales are $100,000, total expenses are $80,000, fixed expenses are $20,000, and net profit is $80,000.
9. Determine the break-even point and the percentage of sales at which it occurred if 100% of the sales are Rs. 3,00,000. 80% capacity profit calculation:
10. PL creates and markets two goods. Compared to the N, which sells for Rs. 15 per unit and has a total variable cost of Rs. 4.5 per unit, the M has a total variable cost per unit of Rs. 2.94 and is priced at Rs. 7. According to the marketing division's prediction, one unit of N will be sold for every five units of M. Total fixed costs for the organisation are Rs. 36,000.
11. Determine the break-even threshold and the proportion of sales at which it occurred if 100% of the capacity sales are Rs. 3,00,000. 80% capacity profit calculation
12. PL creates and markets two goods. Compared to the N, which sells for Rs. 15 per unit and has a total variable cost of Rs. 4.5 per unit, the M has a total variable cost per unit of Rs. 2.94 and is priced at Rs. 7. According to the marketing division's prediction, one unit of N will be sold for every five units of M. Total fixed costs for the organisation are Rs. 36,000.
13. **From the following data, you are required to calculate break-even point and net sales value at this point:**

Direct material cost per unit	10
Direct labour cost per unit	5
Fixed Overhead	50,000
Variable overheads @ 60% on direct labour	
Selling price per unit	25
Trade discount	4%

If sales are 10% and 25% above the break even volume, determine the net profits.

14. Fill in the blanks of each of the following independent situation:

15. Solve and complete the table

Particulars	***Products***		
	A	***B***	***C***
No of units sold	?	20,000	10,000
Selling Price per unit	30	?	40
Variable cost of Sales%	85	85	?
Contribution	?	50,0000	75,000
Fixed Cost	1,20,000	10,000	?
Profit/Loss	40,000	?	20,000

16. For a manufacturing concern, when volume of production is 8,000 units, average cost is Rs 8 per unit and when volume of production is 20,000 units, average cost is Rs 4.50 per unit. If the break-even point is reached at 8,000 units of production and sale, find out the P/V Ratio

17. Q1. The table below displays the costs and profits of three distinct goods produced by JABRA Co. Ltd.: X, Y, and Z.

	X	***Y***	***Z***	***Total***
Sales	3,00,000	1,80,000	1,20,000	6,00,000
Variable Cost	2,40,000	1,26,000	72,000	4,38,000
Contribution	60,000	54,000	48,000	1,62,000
Fixed Cost				81,000
Profit				81,0000

Can the company's profits be raised by altering the mix of products sold? To arrive to your answer, use the marginal costing technique.

18. The information in the next section refers to a business that only makes one product.

Direct Labour Per unit	$ 22
Direct materials per unit	$ 12
Variable overhead per unit	$ 6
Fixed Cost	$ 4,00,000
Selling Price per unit	$ 60

1. Explain what "break-even" means.
2. Why, exactly, is a company with a wide range of products less likely to gain from break-even analysis?

3. Construct a break-even chart based on the information shown above, showing the bare minimum number of units that must be sold for the business to break even. Your diagram has to have complete labels.

4. Take into account the variables that any company should take into account before employing a break-even analysis as the foundation for a choice..

19. The particulars of two plant producing an identical product with the same selling price are as under:

Capacity Utilization	***Plant X 70% (in Lacs)***	***Plant Y 60% (in Lacs)***
Sales	150	90
Variable Cost	105	75
Fixed cost	30	20

It has been decided to merge Plant Y with Plant X. The additional fixed expenses involved in the merger amount to 2 lacs. You are required to find out –

(a) the break even point of Plant X and Plant Y before merger and the break -even point of the merged plant.

(b) the capacity utilization of the integrated plant required to earn a profit of ₹ 18 lacs.

20. The table below displays the costs and profits for three separate Star Co. Ltd. products: A, B, and C.

	A	***B***	***C***	***Total***
Sales	3,00,000	1,80,000	1,20,000	6,00,000
Variable Cost	2,40,000	1,26,000	72,000	4,38,000
Contribution	60,000	54,000	48,000	1,62,000
Fixed Cost				81,000
Profit				81,0000

Can the profits of the company be increased by changing the sales mix of the products? Use Marginal Costing technique to arrive at your answer?

21. Information for two successive years are given below

Year	***Units***	***Selling Price***	***Average cost***
2020	12000	50	30
2021	15000	50	38

Calculate: (i) P/V Ratio and Fixed cost; (ii)Break even sales; (iii) sales to earn profit of Rs. 12,000; (iv) selling price to earn profit of Rs. 1,50,000 by selling price 9,000 units; (v) Margin of safety when profit is Rs.30,000.

LIST OF FURTHER READINGS

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9. Maskell &Baggaley (December 19, 2003). "Practical Lean Accounting". Productivity Press, New York, NY.

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WARNING

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EXECUTIVE PROGRAMME
CORPORATE ACCOUNTING & FINANCIAL MANAGEMENT
GROUP 1 • PAPER 4

(This test paper is for practice and self study only and not to be sent to the Institute)

Time allowed: 3 hours *Maximum Mark: 100*

PART I : CORPORATE ACCOUNTING (MARKS 60)

Questions 1

(a) Gross profit ratio of a company was 25%. Its credit revenue from operations was Rs. 40,00,000 and its cash revenue from operations was 10% of the total revenue from operations. If the indirect expenses of the company were Rs. 50,000 calculate its net profit ratio.

4 Marks

(b) Company A lists Rs. 40,00,000 in short-term liabilities and Rs. 70,00,000 in long-term liabilities on their balance sheet. They've also issued Rs. 20,00,000 in preferred stock, Rs. 5,00,000 in minority interest, and have around Rs. 8,00,000 outstanding shares trading at Rs. 10 per share. Using all that information, calculate the debt-to-capital ratio.

4 Marks

(c) X Ltd., has a current ratio of 3.5:1 and quick ratio of 2:1. If excess of current assets over quick assets represented by inventories is Rs. 48,000, calculate current assets and current liabilities.

4 Marks

(d) Explain the term "True and Fair View" while preparation and presentation of Financial Statements.

3 Marks

(4+4+4+3 = Total 15 Marks)

Questions 2

(a) On 1st October, 2022, A ltd acquired 6000 equity shares of B ltd of the face value of Rs.10 each at price of Rs.85000. Following are the balance sheet of companies

Particulars	**A Ltd.**	**B Ltd.**
Liabilities:		
Equity share capital of Rs.10 each	500000	100000
General reserve (1.4.22)	210000	50000
P&L a/c (1.4.2022)	45000	20000
Profit for the year	85000	22500
Creditors	120000	46000
Bills payable	40000	30000
Total	**1000000**	**268500**

Assets:		
Goodwill	150000	35000
Land and building	200000	50000
Plant and machine	250000	50000
Stock	100000	20250
Debtors	150000	67250
Investments	100000	
Bills receivables	10000	15000
Bank	30000	25000
Cash	10000	6000
Total	**1000000**	**268500**

1. Out of debtors and bills receivable of A ltd Rs.25000 and Rs.8000 respectively represented those due from B ltd.
2. The stock in hands of B ltd includes goods purchased from A ltd at Rs.10000 which includes profit charged by latter company at 25% at cost.

   Draw consolidated balance sheet as on 31.3.2023 with necessary working notes.

(10 Marks)

(b) What is Pre-acquisition Profits / Reserves and Post-acquisition Profits / Reserves in the process of preparing consolidated financial statements?

(5 Marks)

Questions 3

(a) Given below are the balance sheets of XYZ

(Amount In Rs.)

Particulars	**01-04-2022**	**31-03-2023**
I. Equity and Liabilities :		
Equity share capital	60,000	70000
Share premium	--	6000
General Reserve	9000	13000
Profit and Loss	6000	16160
6% Debentures	--	14000
Sundry creditors	17000	18140

Provision for taxation	4500	8100
Proposed Divided	6000	7000
Total	**102500**	**152400**
II. Assets :		
Land and building	46,000	78000
Plant and machinery	17080	28000
Furniture	1100	1300
Stock	16480	19140
Sundry debtors	15000	17100
Bank balance	6840	8860
Total	**102500**	**152400**

Additional Information:

Depreciation written off during the year

Land and building 12000

Plant and machinery 10000

Furniture 240

You are required to prepare a cash flow statement

(10 Marks)

b) What are the conditions for buyback of shares? Also states which funds / reserves can be utilized for the buy-back of shares?

(5 Marks)

Q. No. 4 or 4A

Questions 4

(a) ABC Limited decided to issue 24,000 shares of Rs.100 each payable at Rs.30 on application, Rs.40 on allotment, Rs.20 on first call and balance on second and final call. Applications were received for 26,000 shares. The directors decided to reject application of 2,000 shares and their application money being refunded in full. The allotment money was duly received on all the shares, and all sums due on calls are received except on 100 shares. Record the transactions in the books of ABC Limited.

(b) Show the following transactions in the Books of XYZ Ltd with respect to issue of 12%, 1,00,000 debentures of Rs. 100 each in the following situations.

i. At par and redeemable at par.

ii. At 10% discount and redeemable at par.

iii. At 10% premium and redeemable at par.

iv. At 10% premium and redeemable at a premium of 5%.

v. At par and redeemable at a premium of 5%.

vi. At 10% discount and redeemable at a premium of 5%

(c) ABC Ltd. Issued 1,00,000 equity shares. The whole of the issue was underwritten as follows: X 40%; Y 30%; Z 30%. Applications for 80,000 shares were received in all, out of which applications for 20,000 shares had the stamp of X, those for 10,000 shares that of Y and those for 20,000 shares that of Z. The remaining applications for 30,000 shares did not bear any stamp. Determine the liability of the underwriters.

(5 Marks Each * 3 = Total 15 Marks)

Alternate to Q. No. 4

Questions 4A

(i) What do you mean by cash from operating activities? How is this calculated?

(ii) What are the disclosure requirements with respect to "Inventory" in preparation and presentation of Financial Statements?

(iii) The board of director of XYZ Limited resolved that 400 equity shares of Rs.100 each be forfeited for non-payment of the second and final call of Rs.30 per share. Out of these, 300 shares were re-issued at Rs.60 per share to Mr. Shimit. Show the necessary journal entries along with working notes.

(5 Marks Each * 3 = Total 15 Marks)

PART II: FINANCIAL MANAGEMENT (40 MARKS)

Attempt all parts of Question No. 5

Question No.5.

(a) From the following three scenarios, ascertain the present value of each cash flow using a discount rate of 7%

S. No.	Scenarios
1.	Receive $15 every year, forever, starting today.
2.	Pay $60 every year for five years, with the first payment being next year, and then subsequently receive $40 every year for 20 years.
3.	Receive $70 today and then receive $70 in four years

(12 Marks)

(b) Best Ltd. has issued 10% 10,000 Preference Shares of Rs. 100 each and has incurred the following expenses: Underwriting Commission 2%, Brokerage 1%, and Other Expenses Rs. 5,000. If the present company tax rate is 40%, what will be the cost of capital after tax and before tax? Also calculate cost of preference capital, if corporate dividend tax is 10%.

(4 Marks)

(c) Skyline Ltd. has issued 1,000 equity shares of Rs. 100 each as fully paid. It has earned a profit of Rs. 10,000 after tax. The market price of these shares is Rs. 200 per share. Find out the cost of equity capital before and after tax assuming a tax rate of 40%.

(4 Marks)

(Total = 12+4+4 =20 Marks)

Attempt all parts of Question No. 6 or Question 6(A)

Question No.6

(a) The capital structure of Great Limited and its specific costs are given below. Find out simple and the weighted average cost of capital of the company.

Source	Amount (Rs.)	Specific Cost (after tax
Long-term Debts	15,00,000	4%
Preference Shares	10,00,000	12%
Equity Shares	20,00,000	15%
Retained Earnings	5,00,000	15%

(4 Marks)

(b) Consider the following data for a certain item purchased by Excellent Ltd.

Annual Usage	20,000 units
Fixed Cost per order	Rs. 750
Purchase Price	Rs. 250 per unit
Carrying cost	20 % of inventory value.

On the assumption that a 25% trade discount is offered, if the minimum order size is 1,000 units, should the company go in for the trade discount? Also describe the concept of Economic Order Quantity.

(6 Marks)

(c) Summarized below are the income and expenditure forecasts for the month of March to August, 2023 of Enthusiasm Limited.

Amount (Rs.)

Month	Sales (all credit)	Purchases (all credit)	Wages	Manufacturing Expenses	Office Expenses	Selling Expenses
March	70,000	36,000	9,000	4,000	2,000	4,000
April	62,000	38,000	8,000	3,000	1,000	5,000

Month	Sales (all credit)	Purchases (all credit)	Wages	Manufacturing Expenses	Office Expenses	Selling Expenses
May	64,000	35,000	10,000	4,500	2,500	4,000
June	60,000	35,000	9,500	3,500	2,000	3,000
July	56,000	39,000	8,500	4,000	1,500	4,000
August	60,000	34,000	8,000	3,000	1,500	4,000

Consider the following information:

1) Plant costing Rs.20,000 is due for delivery in July payable 10 percent on delivery and the balance after three months.
2) Advance tax of Rs.7,000 each is payable in March and June.
3) Period of credit allowed by suppliers 2 months and to customers 1 month.
4) Lag in payment of manufacturing expenses one-half month.
5) Lag in payment of all other expenses one month.

Prepare a cash budget for three months starting on 1st May 2008 when there was a cash balance of Rs.20,000 and comment on its cash scenario.

(10 Marks)

(Total = 4 + 6 + 10 = 20 Marks)

OR

Question No. 6A

(i) Acme Limited belongs to a risk class for which the appropriate rate of capitalization is 10%. The total number of equity shares is 30,000. The current market price of an equity share is Rs.90. The company is thinking to declare a dividend of Rs.5 per share at the end of the current year. The company expects to have a net income of Rs.8,00,000. It has proposal of making investment of Rs.7,00,000 in new proposals. If Modigliani and Miller approach is adopted, then ascertain whether the payment or non-payment of dividend will affect the value of equity shares of the company or not?

(8 Marks)

(ii) Peak Limited is engaged in manufacturing of tyres. From the following information compute the operating cycle of the company.

Particulars	Amount (Rs.)
Average stock of raw materials and stores	5,00,000
Average work-in-progress inventory	4,00,000
Average finished goods inventory	2,80,000
Average accounts receivable	3,00,000

Average accounts payable	1,80,000
Average raw materials and stores purchased on credit and consumed per day	20,000
Average work-in-progress value of raw materials committed per day	22,500
Average cost of goods sold per day	20,000
Average sales per day	25,000

(12 Marks)

(Total = 8+12 = 20 Marks)

***