



UNIT-I

INTRODUCTION TO ECONOMICS

ECONOMICS

Economics is the science that deals with the production and consumption of goods and services and the distribution and rendering of these for human welfare.

The following are the economic goals.

- A high level of employment
- Price stability
- Efficiency
- An equitable distribution of income
- Growth

Some of the above goals are interdependent. The economic goals are not always complementary; in many cases they are in conflict. For example, any move to have a significant reduction in unemployment will lead to an increase in inflation.

Flow in an Economy

The flow of goods, services, resources and money payments in a simple economy are shown in Fig. 1.1. Households and businesses are the two major entities in a simple economy. Business organizations use various economic resources like land, labour and capital which are provided by households to produce consumer goods and services which will be used by them. Business organizations make payment of money to the households for receiving various resources. The households in turn make payment of money to business organizations for receiving consumer goods and services. This cycle shows the interdependence between the two major entities in a simple economy.

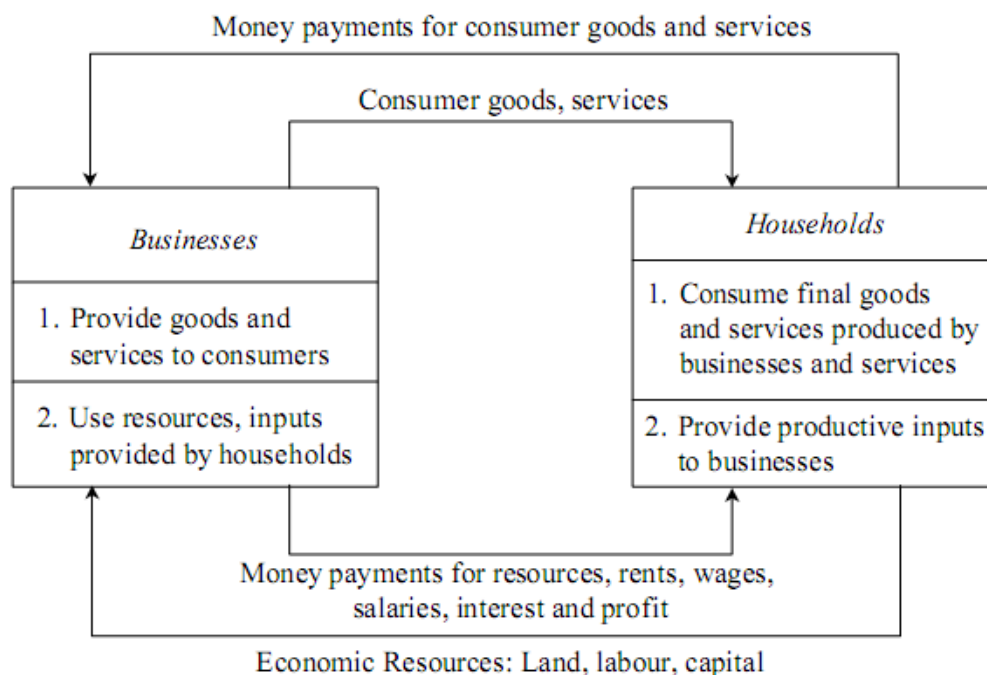


Fig. 1.1 Flow of goods, services, resources and money payments in a simple economy.

LAW OF SUPPLY AND DEMAND

An interesting aspect of the economy is that the demand and supply of a product are interdependent and they are sensitive with respect to the price of that product. The interrelationships between them are shown in Fig. 1.2.

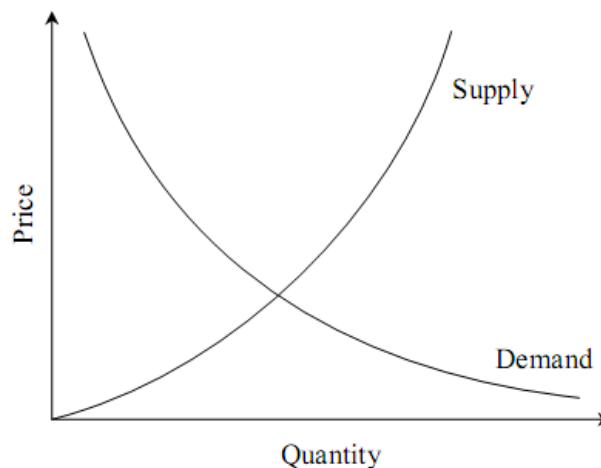


Fig. 1.2 Demand and supply curve.

From Fig. 1.2 it is clear that when there is a decrease in the price of a product, the demand for the product increases and its supply decreases. Also, the product is more in demand and hence the demand of the product increases. At the same time, lowering of the price of the product makes the producers restrain from releasing more quantities of the product in the market. Hence, the supply of the product is decreased. The point of intersection of the supply curve and the demand curve is known as the equilibrium point. At the price corresponding to this point, the quantity of supply is equal to the quantity of demand. Hence, this point is called the equilibrium point.

Factors influencing demand

The shape of the demand curve is influenced by the following factors:

- Income of the people
- Prices of related goods
- Tastes of consumers

If the income level of the people increases significantly, then their purchasing power will naturally improve. This would definitely shift the demand curve to the north-east direction of Fig. 1.2. A converse situation will shift the demand curve to the south-west direction. If, for instance, the price of television sets is lowered drastically its demand would naturally go up. As a result, the demand for its associated product, namely VCDs would also increase. Hence, the prices of related goods influence the demand of a product.

Over a period of time, the preference of the people for a particular product may increase, which in turn, will affect its demand. For instance, diabetic people prefer to have sugar-free products. If the incidence of diabetes rises, naturally there will be increased demand for sugar-free products.

Factors influencing supply

The shape of the supply curve is affected by the following factors:

- Cost of the inputs
- Technology
- Weather
- Prices of related goods

If the cost of inputs increases, then naturally, the cost of the product will go up. In such a situation, at the prevailing price of the product the profit margin per unit will be less. The producers will then reduce the production quantity,

which in turn will affect the supply of the product. For instance, if the prices of fertilizers and cost of labour are increased significantly, in agriculture, the profit margin per bag of paddy will be reduced. So, the farmers will reduce the area of cultivation, and hence the quantity of supply of paddy will be reduced at the prevailing prices of the paddy.

If there is an advancement in technology used in the manufacture of the product in the long run, there will be a reduction in the production cost per unit. This will enable the manufacturer to have a greater profit margin per unit at the prevailing price of the product. Hence, the producer will be tempted to supply more quantity to the market.

Weather also has a direct bearing on the supply of products. For example, demand for woollen products will increase during winter. This means the prices of woollen goods will be increased in winter. So, naturally, manufacturers will supply more volume of woollen goods during winter.

Again, take the case of television sets. If the price of TV sets is lowered significantly, then its demand would naturally go up. As a result, the demand for associated products like VCDs would also go up. Over a period of time, this will lead to an increase in the price of VCDs, which would result in more supply of VCDs.

CONCEPT OF ENGINEERING ECONOMICS

Science is a field of study where the basic principles of different physical systems are formulated and tested. Engineering is the application of science. It establishes varied application systems based on different scientific principles. From the discussions in the previous section, it is clear that price has a major role in deciding the demand and supply of a product. Hence, from the organization's point of view, efficient and effective functioning of the organization would certainly help it to provide goods/services at a lower cost which in turn will enable it to fix a lower price for its goods or services.

The following section discusses the different types of efficiency and their impact on the operation of businesses and the definition and scope of engineering economics.

Types of Efficiency

Efficiency of a system is generally defined as the ratio of its output to input. The efficiency can be classified into *technical efficiency* and *economic efficiency*.

Technical efficiency

It is the ratio of the output to input of a physical system. The physical system may be a diesel engine, a machine working in a shop floor, a furnace, etc.

$$\text{Technical efficiency (\%)} = \frac{\text{Output}}{\text{Input}} \times 100$$

The technical efficiency of a diesel engine is as follows:

$$\text{Technical efficiency (\%)} = \frac{\text{Heat equivalent of mechanical energy produced}}{\text{Heat equivalent of fuel used}} \times 100$$

In practice, technical efficiency can never be more than 100%. This is mainly due to frictional loss and incomplete combustion of fuel, which are considered to be unavoidable phenomena in the working of a diesel engine.

Economic efficiency

Economic efficiency is the ratio of output to input of a business system.

$$\text{Economic efficiency (\%)} = \frac{\text{Output}}{\text{Input}} \times 100 = \frac{\text{Worth}}{\text{Cost}} \times 100$$

'Worth' is the annual revenue generated by way of operating the business and 'cost' is the total annual expenses incurred in carrying out the business. For the survival and growth of any business, the economic efficiency should be more than 100%.

Economic efficiency is also called 'productivity'. There are several ways of improving productivity.

- Increased output for the same input
- Decreased input for the same output

- By a proportionate increase in the output which is more than the proportionate increase in the input
- By a proportionate decrease in the input which is more than the proportionate decrease in the output
- Through simultaneous increase in the output with decrease in the input.

Increased output for the same input: In this strategy, the output is increased while keeping the input constant. Let us assume that in a steel plant, the layout of the existing facilities is not proper. By slightly altering the location of the billet-making section, and bringing it closer to the furnace which produces hot metal, the scale formation at the top of ladles will be considerably reduced. The molten metal is usually carried in ladles to the billet-making section. In the long run, this would give more yield in terms of tonnes of billet produced. In this exercise, there is no extra cost involved. The only task is the relocation of the billet-making facility which involves an insignificant cost.

Decreased input for the same output: In this strategy, the input is decreased to produce the same output. Let us assume that there exists a substitute raw material to manufacture a product and it is available at a lower price. If we can identify such a material and use it for manufacturing the product, then certainly it will reduce the input. In this exercise, the job of the purchase department is to identify an alternate substitute material. The process of identification does not involve any extra cost. So, the productivity ratio will increase because of the decreased input by way of using cheaper raw materials to produce the same output.

Less proportionate increase in output is more than that of the input: Consider the example of introducing a new product into the existing product mix of an organization. Let us assume that the existing facilities are not fully utilized and the R&D wing of the company has identified a new product which has a very good market and which can be manufactured with the surplus facilities of the organization. If the new product is taken up for production, it will lead to—

- an increase in the revenue of the organization by way of selling the new product in addition to the existing product mix and
- an increase in the material cost and operation and maintenance cost of machineries because of producing the new product.

If we examine these two increases closely, the proportionate increase in the revenue will be more than the proportionate increase in the input cost. Hence, there will be a net increase in the productivity ratio.

When proportionate decrease in input is more than that of the output: Let us consider the converse of the previous example, i.e. dropping an uneconomical product from the existing product mix. This will result in the following:

- A decrease in the revenue of the organization.
- A decrease in the material cost, and operation and maintenance cost of machinery.

If we closely examine these two decreases, we will see that the proportionate decrease in the input cost will be more than the proportionate decrease in the revenue. Hence, there will be a net increase in the productivity ratio.

Simultaneous increase in output and decrease in input: Let us assume that there are advanced automated technologies like robots and automated guided vehicle system (AGVS), available in the market which can be employed in the organization we are interested in. If we employ these modern tools, then:

- There will be a drastic reduction in the operation cost. Initially, the cost on equipment would be very high. But, in the long run, the reduction in the operation cost would break-even the high initial investment and offer more savings on the input.
- These advanced facilities would help in producing more products because they do not experience fatigue. The increased production will yield more revenue.

In this example, in the long run, there is an increase in the revenue and a decrease in the input. Hence, the productivity ratio will increase at a faster rate.

Definition and Scope of Engineering Economics

As stated earlier, efficient functioning of any business organization would enable it to provide goods/services at a lower price. In the process of managing organizations, the managers at different levels should take appropriate economic decisions which will help in minimizing investment, operating and maintenance expenditures besides increasing the revenue, savings and other related gains of the organization.

Definition

Engineering economics deals with the methods that enable one to take economic decisions towards minimizing costs and/or maximizing benefits to business organizations.

Scope

The issues that are covered in this book are elementary economic analysis, interest formulae, bases for comparing alternatives, present worth method, future worth method, annual equivalent method, rate of return method, replacement analysis, depreciation, evaluation of public alternatives, inflation adjusted investment decisions, make or buy decisions, inventory control, project management, value engineering, and linear programming.

ELEMENTS OF COSTS

Cost can be broadly classified into *variable cost* and *overhead cost*. Variable cost varies with the volume of production while overhead cost is fixed, irrespective of the production volume. Variable cost can be further classified into direct material cost, direct labour cost, and direct expenses. The overhead cost can be classified into factory overhead, administration overhead, selling overhead, and distribution overhead.

Direct material costs are those costs of materials that are used to produce the product. Direct labour cost is the amount of wages paid to the direct labour involved in the production activities. Direct expenses are those expenses that vary in relation to the production volume, other than the direct material costs and direct labour costs.

Overhead cost is the aggregate of indirect material costs, indirect labour costs and indirect expenses. Administration overhead includes all the costs that are incurred in administering the business. Selling overhead is the total expense that is incurred in the promotional activities and the expenses relating to salesforce. Distribution overhead is the total cost of shipping the items from the factory site to the customer sites.

The selling price of a product is derived as shown below:

(a) Direct material costs + Direct labour costs + Direct expenses = Prime cost

(b) Prime cost + Factory overhead = Factory cost

(c) Factory cost + Office and administrative overhead = Costs of production

(d) Cost of production + Opening finished stock – Closing finished stock = Cost of goods sold

(e) Cost of goods sold + Selling and distribution overhead = Cost of sales

(f) Cost of sales + Profit = Sales

(g) Sales/Quantity sold = Selling price per unit

In the above calculations, if the opening finished stock is equal to the closing finished stock, then the cost of production is equal to the cost of goods sold.

OTHER COSTS/REVENUES

The following are the costs/revenues other than the costs which are presented in the previous section:

- Marginal cost
- Marginal revenue
- Sunk cost
- Opportunity cost

Marginal Cost

Marginal cost of a product is the cost of producing an additional unit of that product. Let the cost of producing 20 units of a product be Rs. 10,000, and the cost of producing 21 units of the same product be Rs. 10,045. Then the marginal cost of producing the 21st unit is Rs. 45.

Marginal Revenue

Marginal revenue of a product is the incremental revenue of selling an additional unit of that product. Let, the revenue of selling 20 units of a product be Rs. 15,000 and the revenue of selling 21 units of the same product be Rs. 15,085. Then, the marginal revenue of selling the 21st unit is Rs. 85.

Sunk Cost

This is known as the past cost of an equipment/asset. Let us assume that an equipment has been purchased for Rs. 1,00,000 about three years back. If it is considered for replacement, then its present value is not Rs. 1,00,000. Instead, its present market value should be taken as the present value of the equipment for further analysis. So, the purchase value of the equipment in the past is known as its sunk cost. The sunk cost should not be considered for any analysis done from now onwards.

Opportunity Cost

In practice, if an alternative (X) is selected from a set of competing alternatives (X , Y), then the corresponding investment in the selected alternative is not available for any other purpose. If the same money is invested in some other alternative (Y), it may fetch some return. Since the money is invested in the selected alternative (X), one has to forego the return from the other alternative (Y). The amount that is foregone by not investing in the other alternative (Y) is known as the opportunity cost of the selected alternative (X). So the opportunity cost of an alternative is the return that will be foregone by not investing the same money in another alternative.

Consider that a person has invested a sum of Rs. 50,000 in shares. Let the expected annual return by this alternative be Rs. 7,500. If the same amount is invested in a fixed deposit, a bank will pay a return of 18%. Then, the corresponding total return per year for the investment in the bank is Rs. 9,000. This return is greater than the return from shares. The foregone excess return of Rs. 1,500 by way of not investing in the bank is the opportunity cost of investing in shares.

BREAK-EVEN ANALYSIS

The main objective of break-even analysis is to find the cut-off production volume from where a firm will make profit.

Let

s = selling price per unit

v = variable cost per unit

FC = fixed cost per period

Q = volume of production

The total sales revenue (S) of the firm is given by the following formula:

$$S = s \times Q$$

The total cost of the firm for a given production volume is given as

$$\begin{aligned} TC &= \text{Total variable cost} + \text{Fixed cost} \\ &= v \times Q + FC \end{aligned}$$

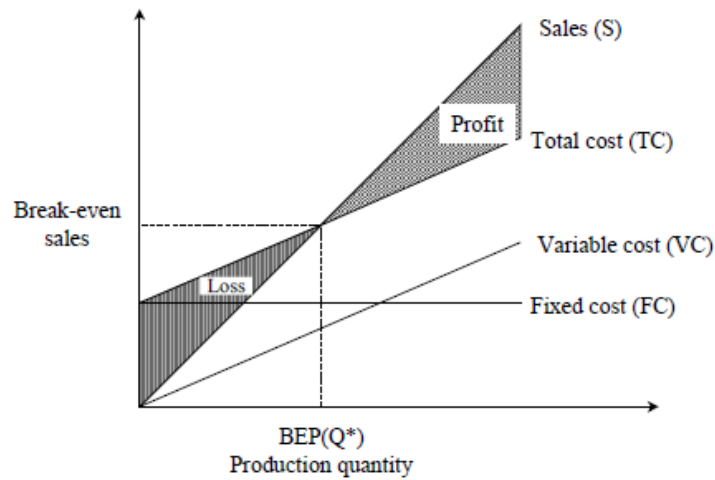


Fig. 1.3 Break-even chart.

The linear plots of the above two equations are shown in Fig. 1.3. The intersection point of the total sales revenue line and the total cost line is called the break-even point. The corresponding volume of production on the X-axis is known as the break-even sales quantity. At the intersection point, the total cost is equal to the total revenue. This point is also called the no-loss or no-gain situation. For any production quantity which is less than the break-even quantity, the total cost is more than the total revenue. Hence, the firm will be making loss.

For any production quantity which is more than the break-even quantity, the total revenue will be more than the total cost. Hence, the firm will be making profit.

$$\begin{aligned} \text{Profit} &= \text{Sales} - (\text{Fixed cost} + \text{Variable costs}) \\ &= s \times Q - (FC + v \times Q) \end{aligned}$$

The formulae to find the break-even quantity and break-even sales quantity

$$\begin{aligned} \text{Break-even quantity} &= \frac{\text{Fixed cost}}{\text{Selling price/unit} - \text{Variable cost/unit}} \\ &= \frac{FC}{s - v} \text{ (in units)} \end{aligned}$$

$$\begin{aligned} \text{Break-even sales} &= \frac{\text{Fixed cost}}{\text{Selling price/unit} - \text{Variable cost/unit}} \times \text{Selling price/unit} \\ &= \frac{FC}{s - v} \times s \text{ (Rs.)} \end{aligned}$$

The contribution is the difference between the sales and the variable costs. The margin of safety (M.S.) is the sales over and above the break-even sales. The formulae to compute these values are

$$\text{Contribution} = \text{Sales} - \text{Variable costs}$$

$$\text{Contribution/unit} = \text{Selling price/unit} - \text{Variable cost/unit}$$

$$\text{M.S.} = \text{Actual sales} - \text{Break-even sales}$$

$$= \frac{\text{Profit}}{\text{Contribution}} \times \text{sales}$$

$$\text{M.S. as a per cent of sales} = (\text{M.S./Sales}) \times 100$$

EXAMPLE 1.1 Alpha Associates has the following details:

Fixed cost = Rs. 20,00,000

Variable cost per unit = Rs. 100

Selling price per unit = Rs. 200

Find

(a) The break-even sales quantity,

(b) The break-even sales

(c) If the actual production quantity is 60,000, find (i) contribution; and
(ii) margin of safety by all methods.

Solution

Fixed cost (FC) = Rs. 20,00,000

Variable cost per unit (v) = Rs. 100

Selling price per unit (s) = Rs. 200

$$\begin{aligned} \text{(a) Break-even quantity} &= \frac{FC}{s - v} = \frac{20,00,000}{200 - 100} \\ &= 20,00,000/100 = 20,000 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{(b) Break-even sales} &= \frac{FC}{s - v} \times s \text{ (Rs.)} \\ &= \frac{20,00,000}{200 - 100} \times 200 \\ &= \frac{20,00,000}{100} \times 200 = \text{Rs. } 40,00,000 \end{aligned}$$

$$\begin{aligned} \text{(c) (i) Contribution} &= \text{Sales} - \text{Variable cost} \\ &= s \times Q - v \times Q \\ &= 200 \times 60,000 - 100 \times 60,000 \\ &= 1,20,00,000 - 60,00,000 \\ &= \text{Rs. } 60,00,000 \end{aligned}$$

(ii) Margin of safety

METHOD I

$$\begin{aligned} \text{M.S.} &= \text{Sales} - \text{Break-even sales} \\ &= 60,000 \times 200 - 40,00,000 \\ &= 1,20,00,000 - 40,00,000 = \text{Rs. } 80,00,000 \end{aligned}$$

METHOD II

$$\text{M.S.} = \frac{\text{Profit}}{\text{Contribution}} \times \text{Sales}$$

$$\begin{aligned} \text{Profit} &= \text{Sales} - (FC + v \times Q) \\ &= 60,000 \times 200 - (20,00,000 + 100 \times 60,000) \\ &= 1,20,00,000 - 80,00,000 \\ &= \text{Rs. } 40,00,000 \end{aligned}$$

$$\text{M.S.} = \frac{40,00,000}{60,00,000} \times 1,20,00,000 = \text{Rs. } 80,00,000$$

$$\text{M.S. as a per cent of sales} = \frac{80,00,000}{1,20,00,000} \times 100 = 67\%$$

1.6 PROFIT/VOLUME RATIO (P/V RATIO)

P/V ratio is a valid ratio which is useful for further analysis. The different formulae for the P/V ratio are as follows:

$$P/V \text{ ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{\text{Sales} - \text{Variable costs}}{\text{Sales}}$$

The relationship between BEP and P/V ratio is as follows:

$$\text{BEP} = \frac{\text{Fixed cost}}{P/V \text{ ratio}}$$

The following formula helps us find the M.S. using the P/V ratio:

$$\text{M.S.} = \frac{\text{Profit}}{P/V \text{ ratio}}$$

EXAMPLE 1.2 Consider the following data of a company for the year 1997:

Sales = Rs. 1,20,000

Fixed cost = Rs. 25,000

Variable cost = Rs. 45,000

Find the following:

- (a) Contribution
- (b) Profit
- (c) BEP
- (d) M.S.

Solution

$$\begin{aligned} \text{(a) Contribution} &= \text{Sales} - \text{Variable costs} \\ &= \text{Rs. } 1,20,000 - \text{Rs. } 45,000 \\ &= \text{Rs. } 75,000 \end{aligned}$$

$$\begin{aligned} \text{(b) Profit} &= \text{Contribution} - \text{Fixed cost} \\ &= \text{Rs. } 75,000 - \text{Rs. } 25,000 \\ &= \text{Rs. } 50,000 \end{aligned}$$

(c) BEP

$$\begin{aligned} P/V \text{ ratio} &= \frac{\text{Contribution}}{\text{Sales}} \\ &= \frac{75,000}{1,20,000} \times 100 = 62.50\% \end{aligned}$$

$$\text{BEP} = \frac{\text{Fixed cost}}{P/V \text{ ratio}} = \frac{25,000}{62.50} \times 100 = \text{Rs. } 40,000$$

$$\text{M.S.} = \frac{\text{Profit}}{P/V \text{ ratio}} = \frac{50,000}{62.50} \times 100 = \text{Rs. } 80,000$$

EXAMPLE 1.3 Consider the following data of a company for the year 1998:

Sales = Rs. 80,000

Fixed cost = Rs. 15,000

Variable cost = 35,000

Find the following:

- (a) Contribution
- (b) Profit
- (c) BEP
- (d) M.S.

Solution

$$\begin{aligned} \text{(a) Contribution} &= \text{Sales} - \text{Variable costs} \\ &= \text{Rs. } 80,000 - \text{Rs. } 35,000 \\ &= \text{Rs. } 45,000 \end{aligned}$$

$$\begin{aligned} \text{(b) Profit} &= \text{Contribution} - \text{Fixed cost} \\ &= \text{Rs. } 45,000 - \text{Rs. } 15,000 \\ &= \text{Rs. } 30,000 \end{aligned}$$

(c) BEP

$$P/V \text{ ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{45,000}{80,000} \times 100 = 56.25\%$$

$$\text{BEP} = \frac{\text{Fixed cost}}{P/V \text{ ratio}} = \frac{15,000}{56.25} \times 100 = \text{Rs. } 26,667$$

$$\text{(d) M.S.} = \frac{\text{Profit}}{P/V \text{ ratio}} = \frac{30,000}{56.25} \times 100 = \text{Rs. } 53,333.33$$

ELEMENTARY ECONOMIC ANALYSIS

Whether it is a business situation or a day-to-day event in somebody's personal life, there is a large number of economic decisions making involved. One can manage many of these decision problems by using simple economic analysis. For example, an industry can source its raw materials from a nearby place or from a far-off place. In this problem, the following factors will affect the decision:

- Price of the raw material
- Transportation cost of the raw material
- Availability of the raw material
- Quality of the raw material

Consider the alternative of sourcing raw materials from a nearby place with the following characteristics:

- The raw material is more costly in the nearby area.
- The availability of the raw material is not sufficient enough to support the operation of the industry throughout the year.
- The raw material requires pre-processing before it is used in the production process. This would certainly add cost to the product.
- The cost of transportation is minimal under this alternative.

On the other hand, consider another alternative of sourcing the raw materials from a far-off place with the following characteristics:

- The raw material is less costly at the far off place.
- The cost of transportation is very high.
- The availability of the raw material at this site is abundant and it can support the plant throughout the year.
- The raw material from this site does not require any pre-processing before using it for production.

Under such a situation, the procurement of the raw material should be decided in such a way that the overall cost is minimized.



UNIT-II

MAKE OR BUY DECISION

Introduction

In the process of carrying out business activities of an organization, a component/product can be made within the organization or bought from a subcontractor. Each decision involves its own costs. So, in a given situation, the organization should evaluate each of the above make or buy alternatives and then select the alternative which results in the lowest cost. This is an important decision since it affects the productivity of the organization. In the long run, the make or buy decision is not static. The make option of a component/product may be economical today; but after some time, it may turn out to be uneconomical to make the same.

Thus, the make or buy decision should be reviewed periodically, say, every 1 to 3 years. This is mainly to cope with the changes in the level of competition and various other environmental factors.

Criteria for Make or Buy

In this section the criteria for make or buy are discussed.

Criteria for make

The following are the criteria for make:

1. The finished product can be made cheaper by the firm than by outside suppliers.
2. The finished product is being manufactured only by a limited number of outside firms which are unable to meet the demand.
3. The part has an importance for the firm and requires extremely close quality control.
4. The part can be manufactured with the firm's existing facilities and similar to other items in which the company has manufacturing experience.

Criteria for buy

The following are the criteria for buy:

1. Requires high investments on facilities which are already available at suppliers' plant.
2. The company does not have facilities to make it and there are more profitable opportunities for investing company's capital.
3. Existing facilities of the company can be used more economically to make other parts.
4. The skill of personnel employed by the company is not readily adaptable to make the part.
5. Patent or other legal barriers prevent the company from making the part.
6. Demand for the part is either temporary or seasonal.

VALUE ENGINEERING

Value analysis is one of the major techniques of cost reduction and cost prevention. It is a disciplined approach that ensures necessary functions for minimum cost without sacrificing quality, reliability, performance, and appearance. According to the Society of American Value Engineers (SAVE),

“Value Analysis is the systematic application of recognized techniques which identify the function of a product or service, establish a monetary value for the function and provide the necessary function reliably at the lowest overall cost.”

It is an organized approach to identify unnecessary costs associated with any product, material part, component, system or service by analysing the function and eliminating such costs without impairing the quality, functional reliability, or the capacity of the product to give service.

When to apply value analysis?

One can definitely expect very good results by initiating a VA programme if one or more of the following symptoms are present:

1. Company's products show decline in sales.
2. Company's prices are higher than those of its competitors.
3. Raw materials cost has grown disproportionate to the volume of production.
4. New designs are being introduced.
5. The cost of manufacture is rising disproportionate to the volume of production.
6. Rate of return on investment has a falling trend.
7. Inability of the firm to meet its delivery commitments.

Value Analysis vs. Value Engineering

Often the terms value analysis and value engineering are used synonymously.

Though the philosophy underlying the two is same, i.e. identification of unnecessary cost, yet they are different. The difference lies in the time and the stage at which the techniques are applied.

Value analysis is the application of a set of techniques to an existing product with a view to improve its value. It is thus a remedial process. *Value engineering* is the application of exactly the same set of techniques to a new product at the design stage, project concept or preliminary design when no hardware exists to ensure that bad features are not added. *Value engineering*, therefore, is a preventive process.

Value

The term 'value' is used in different ways and, consequently, has different meanings. The designer equates the value with reliability; a purchase person with price paid for the item; a production person with what it costs to manufacture, and a sales person with what the customer is willing to pay. Value, in value investigation, refers to "economic value", which itself can be divided into four types: cost value, exchange value, use value, and esteem value. These are now briefly described.

Cost value. It is the summation of the labour, material, overhead and all other elements of cost required to produce an item or provide a service compared to a base.

Exchange value. It is the measure of all the properties, qualities and features of the product, which make the product possible of being traded for another product or for money. In a conventional sense, exchange value refers to the price that a purchaser will offer for the product, the price being dependent upon satisfaction (value) which he derives from the product. Value derived from the product consists of two parts "use value" and "esteem value", which are now described.

Use value. It is known as the function value. The use value is equal to the value of the functions performed. Therefore, it is the price paid by the buyer (buyer's view), or the cost incurred by the manufacturer (manufacturer's view) in order to ensure that the product performs its intended functions efficiently. The use value is the fundamental form of economic value. An item without "use value" can have neither "exchange value" nor "esteem value".

Esteem value. It involves the qualities and appearance of a product (like a TV set), which attract persons and create in them a desire to possess the product. Therefore, esteem value is the price paid by the buyer or the cost incurred by the manufacturer beyond the use value.

Performance

The performance of a product is the measure of functional features and properties that make it suitable for a specific purpose. Appropriate performance requires that (a) the product reliably accomplish the intended use of work or service requirement (functional requirements), (b) the product provide protection against accident, harmful effects on body and danger to human life (safety requirements), (c) the product give trouble-free service cover during its specified life span (reliability requirements), (d) service and maintenance work can be carried out on the product with ease and with simple tools (maintainability requirements), and (e) appearance of the product creates an impression on the buyer and induces in him or her the desire to own the product (appearance requirements).

Performance and cost must be interwoven. Desired performance at the least cost should be achieved by selecting appropriate materials and manufacturing operations, which is the measure of value. Therefore, the value of the product is the ratio of performance (utility) to cost. Thus,

$$\text{Value} = \frac{\text{Performance (utility)}}{\text{Cost}}$$

Value can be increased by increasing the utility for the same cost or by decreasing the cost for the same utility. Satisfactory performance at lesser cost through identification and development of low cost alternatives is the philosophy of Value analysis.

FUNCTION

Function is the purpose for which the product is made. Identification of the basic functions and determination of the cost currently being spent on them are the two major considerations of value analysis.

Function identifies the characteristics which make the product/component/part/item/device to work or sell. "Work functions" lend performance value while "sell functions" provide esteem value. Verbs like "support", "hold", "transmit", "prevent", "protect", "exhibits", "control", etc., are used to describe work functions, while "attract", "enhance", "improve", "create", etc., are used to describe "sell" functions. For example, in a "bus driver cabin", the functional analysis of some of the parts are given in Table 15.1.

Table 15.1 Functional Analysis of Some Parts of a Bus Driver Cabin

<i>Component of study</i>	<i>Functional analysis</i>	
	<i>Verb</i>	<i>Noun</i>
Steering wheel	Control	Direction
Gear box	Change	Speed
Brake system	Stop	Vehicle
Wiper	Clear	Water
Horn	Make	Sound
Side mirror	Show	Side traffic

Classification of the functions

Rarely do all functions assume equal importance. Usually, some functions are more important than others. Functions can be classified into the following three categories:

1. Primary function
2. Secondary function
3. Tertiary function

Primary functions are the basic functions for which the product is specially designed to achieve. Primary functions, therefore, are the most essential functions whose non-performance would make the product worthless, e.g. a photo frame exhibits photographs, a chair supports weight, a fluorescent tube gives light.

Secondary functions are those which, if not in-built, would not prevent the device from performing its primary functions, e.g., arms of a chair provide support for hands. Secondary functions are usually related to convenience. The product can still work and fulfill its intended objective even if these functions are not in-built and yet they may be necessary to sell the product.

Tertiary functions are usually related to esteem appearance. For example, Sunmica top of a table gives esteem appearance for the table.

Let us consider a single example of painting a company bus to explain all the above three functions. Here, the primary function of painting is to avoid corrosion. The secondary function is to identify the company to which the bus belongs by the colour of the paint (e.g. blue colour for Ashok Leyland Ltd.). The tertiary function is to impart a very good appearance to the bus by using brilliant colours.

Aims

The aims of value engineering are as follows:

1. Simplify the product.
2. Use (new) cheaper and better materials.
3. Modify and improve product design.
4. Use efficient processes.
5. Reduce the product cost.
6. Increase the utility of the product by economical means.

7. Save money or increase the profits.

The value content of each piece of a product is assessed using the following questions:

1. Does its use contribute to value?
2. Is its cost proportionate to its usefulness?
3. Does it need all its features?

These three questions pertain to the function of the part which may decide the elimination of parts.

Is there anything better for the intended use?

Can company or vendor standard be used?

Can a usable part be made by a lower-cost method?

Is it made with the proper tooling, considering volume?

Does the part yield suitable profit?

Can another vendor furnish the same at a lower cost?

Value Engineering Procedure

The basic steps of value engineering are as follows:

- | | |
|------------|---|
| (a) Blast | (i) Identify the product. |
| | (ii) Collect relevant information. |
| | (iii) Define different functions. |
| (b) Create | (iv) Different alternatives. |
| | (v) Critically evaluate the alternatives. |
| (c) Refine | (vi) Develop the best alternative. |
| | (vii) Implement the alternative. |

Step 1: Identify the product. First, identify the component for study. In future, any design change should add value and it should not make the product as obsolete one. Value engineering can be applied to a product as a whole or to sub-units.

Step 2: Collect relevant information. Information relevant to the following must be collected:

- Technical specifications with drawings
- Production processes, machine layout and instruction sheet
- Time study details and manufacturing capacity
- Complete cost data and marketing details
- Latest development in related products

Step 3: Define different functions. Identify and define the primary, secondary and tertiary functions of the product or parts of interest. Also, specify the value content of each function and identify the high cost areas.

Step 4: Different alternatives. Knowing the functions of each component part and its manufacturing details, generate the ideas and create different alternatives so as to increase the value of the product. Value engineering should be done after a **brain storming** session. All feasible or non-feasible suggestions are recorded without any criticism; rather, persons are encouraged to express their views freely.

INTEREST FORMULAS

While making investment decisions, computations will be done in many ways. To simplify all these computations, it is extremely important to know how to use interest formulas more effectively. Before discussing the effective application of the interest formulas for investment-decision making, the various interest formulas are presented first.

Interest rate can be classified into simple interest rate and compound interest rate.

In simple interest, the interest is calculated, based on the initial deposit for every interest period. In this case, calculation of interest on interest is not applicable. In compound interest, the interest for the current period is computed based on the amount (principal plus interest up to the end of the previous period) at the beginning of the current period.

The notations which are used in various interest formulae are as follows:

P = principal amount

n = No. of interest periods

i = interest rate (It may be compounded monthly, quarterly, semi-annually or annually)

F = future amount at the end of year n

A = equal amount deposited at the end of every interest period

G = uniform amount which will be added/subtracted period after period to/ from the amount of deposit A1 at the end of period 1

Single-Payment Compound Amount

Here, the objective is to find the single future sum (F) of the initial payment (P) made at time 0 after n periods at an interest rate i compounded every period. The cash flow diagram of this situation is shown in Fig. 3.2.

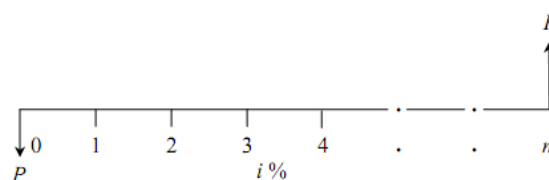


Fig. 3.2 Cash flow diagram of single-payment compound amount.

The formula to obtain the single-payment compound amount is

$$F = P(1 + i)^n = P(F/P, i, n)$$

Where,

$(F/P, i, n)$ is called as single-payment compound amount factor.

EXAMPLE 3.1: A person deposits a sum of Rs. 20,000 at the interest rate of 18% compounded annually for 10 years. Find the maturity value after 10 years.

Solution

$$P = \text{Rs. } 20,000$$

$$i = 18\% \text{ compounded annually}$$

$$n = 10 \text{ years}$$

$$\begin{aligned} F &= P(1 + i)^n = P(F/P, i, n) \\ &= 20,000 (F/P, 18\%, 10) \\ &= 20,000 \times 5.234 = \text{Rs. } 1,04,680 \end{aligned}$$

The maturity value of Rs. 20,000 invested now at 18% compounded yearly is equal to Rs. 1,04,680 after 10 years.

Single-Payment Present Worth Amount

Here, the objective is to find the present worth amount (P) of a single future sum (F) which will be received after n periods at an interest rate of i compounded at the end of every interest period.

The corresponding cash flow diagram is shown in Fig. 3.3.

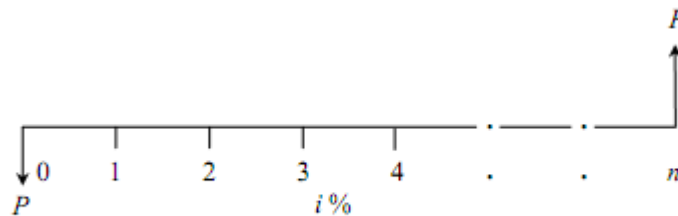


Fig. 3.3 Cash flow diagram of single-payment present worth amount.

The formula to obtain the present worth is

$$P = \frac{F}{(1 + i)^n} = F(P/F, i, n)$$

Where, $(P/F, i, n)$ is termed as single-payment present worth factor.

EXAMPLE 3.2 A person wishes to have a future sum of Rs. 1,00,000 for his son's education after 10 years from now. What is the single-payment that he should deposit now so that he gets the desired amount after 10 years? The bank gives 15% interest rate compounded annually.

Solution

$$F = \text{Rs. } 1,00,000$$

$$i = 15\%, \text{ compounded annually}$$

$$n = 10 \text{ years}$$

$$\begin{aligned} P &= F/(1 + i)^n = F(P/F, i, n) \\ &= 1,00,000 (P/F, 15\%, 10) \\ &= 1,00,000 \times 0.2472 \\ &= \text{Rs. } 24,720 \end{aligned}$$

The person has to invest Rs. 24,720 now so that he will get a sum of Rs. 1,00,000 after 10 years at 15% interest rate compounded annually.

Equal-Payment Series Compound Amount

In this type of investment mode, the objective is to find the future worth of n equal payments which are made at the end of every interest period till the end of the n^{th} interest period at an interest rate of i compounded at the end of each interest period. The corresponding cash flow diagram is shown in Fig. 3.4.

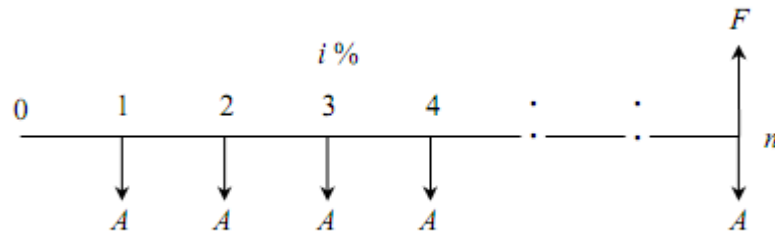


Fig. 3.4 Cash flow diagram of equal-payment series compound amount.

A = equal amount deposited at the end of each interest period

n = No. of interest periods

i = rate of interest

F = single future amount

The formula to get F is

$$F = A \frac{(1 + i)^n - 1}{i} = A(F/A, i, n)$$

Where, $(F/A, i, n)$ is termed as equal-payment series compound amount factor.

EXAMPLE 3.3 A person who is now 35 years old is planning for his retired life. He plans to invest an equal sum of Rs. 10,000 at the end of every year for the next 25 years starting from the end of the next year. The bank gives 20% interest rate, compounded annually. Find the maturity value of his account when he is 60 years old.

Solution

$A = \text{Rs. } 10,000$

$n = 25 \text{ years}$

$i = 20\%$

$F = ?$

The corresponding cash flow diagram is shown in Fig. 3.5.

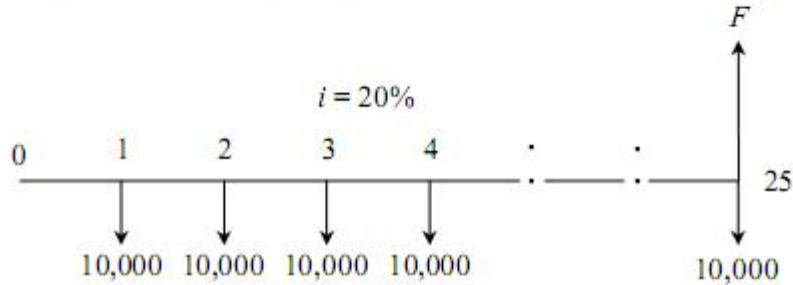


Fig. 3.5 Cash flow diagram of equal-payment series compound amount.

$$\begin{aligned}
 F &= A \frac{(1 + i)^n - 1}{i} \\
 &= A(F/A, i, n) \\
 &= 10,000(F/A, 20\%, 25) \\
 &= 10,000 \times 471.981 \\
 &= \text{Rs. } 47,19,810
 \end{aligned}$$

The future sum of the annual equal payments after 25 years is equal to Rs. 47,19,810.

Equal-Payment Series Sinking Fund

In this type of investment mode, the objective is to find the equivalent amount (A) that should be deposited at the end of every interest period for n interest periods to realize a future sum (F) at the end of the nth interest period at an interest rate of i. The corresponding cash flow diagram is shown in Fig. 3.6.

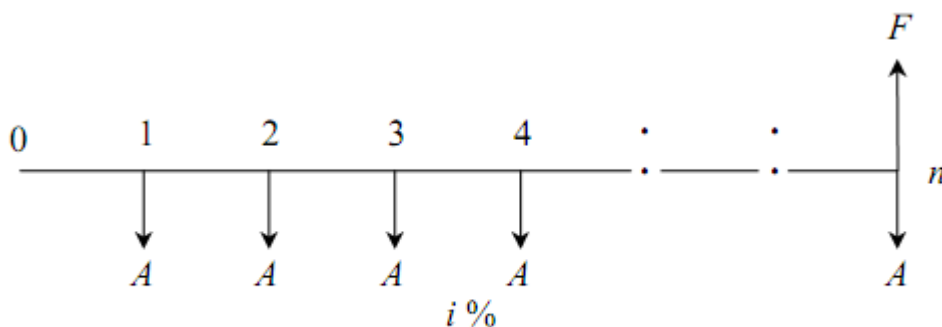


Fig. 3.6 Cash flow diagram of equal-payment series sinking fund.

A = equal amount to be deposited at the end of each interest period

n = No. of interest periods

i = rate of interest

F = single future amount at the end of the nth period

The formula to get F is

$$A = F \frac{i}{(1+i)^n - 1} = F(A/F, i, n)$$

Where,

(A/F, i, n) is called as equal-payment series sinking fund factor.

EXAMPLE 3.4 A company has to replace a present facility after 15 years at an outlay of Rs. 5,00,000. It plans to deposit an equal amount at the end of every year for the next 15 years at an interest rate of 18% compounded annually. Find the equivalent amount that must be deposited at the end of every year for the next 15 years.

Solution

$$F = \text{Rs. } 5,00,000$$

$$n = 15 \text{ years}$$

$$i = 18\%$$

$$A = ?$$

The corresponding cash flow diagram is shown in Fig. 3.7.

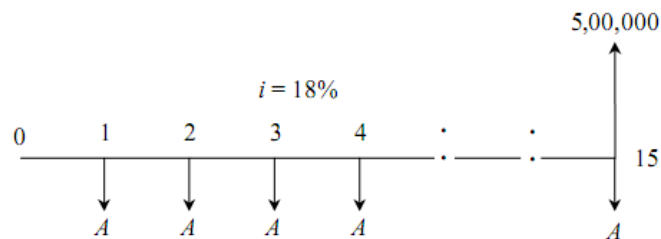


Fig. 3.7 Cash flow diagram of equal-payment series sinking fund.

$$\begin{aligned} A &= F \frac{i}{(1+i)^n - 1} = F(A/F, i, n) \\ &= 5,00,000(A/F, 18\%, 15) \\ &= 5,00,000 \times 0.0164 \\ &= \text{Rs. } 8,200 \end{aligned}$$

The annual equal amount which must be deposited for 15 years is Rs. 8,200.

Equal-Payment Series Present Worth Amount

The objective of this mode of investment is to find the present worth of an equal payment made at the end of every interest period for n interest periods at an interest rate of i compounded at the end of every interest period.

The corresponding cash flow diagram is shown in Fig. 3.8. Here,

P = present worth

A = annual equivalent payment

i = interest rate

n = No. of interest periods

The formula to compute P is

$$P = A \frac{(1+i)^n - 1}{i(1+i)^n} = A(P/A, i, n)$$

Where,

$(P/A, i, n)$ is called equal-payment series present worth factor.

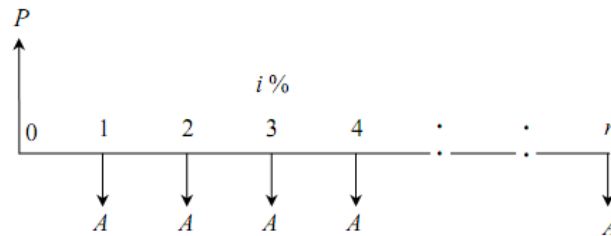


Fig. 3.8 Cash flow diagram of equal-payment series present worth amount.

EXAMPLE 3.5 A company wants to set up a reserve which will help the company to have an annual equivalent amount of Rs. 10,00,000 for the next 20 years towards its employees welfare measures. The reserve is assumed to grow at the rate of 15% annually. Find the single-payment that must be made now as the reserve amount.

Solution

$$A = \text{Rs. } 10,00,000$$

$$i = 15\%$$

$$n = 20 \text{ years}$$

$$P = ?$$

The corresponding cash flow diagram is illustrated in Fig. 3.9.

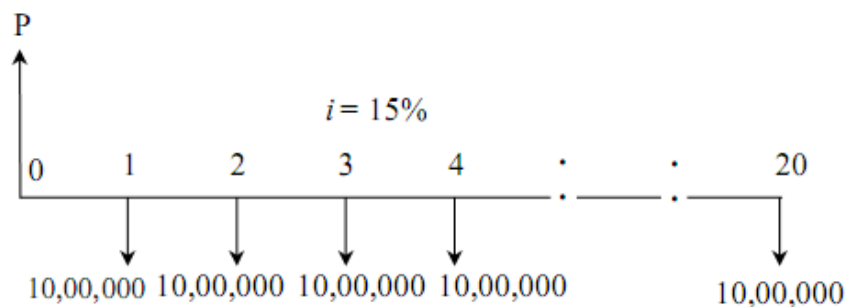


Fig. 3.9 Cash flow diagram of equal-payment series present worth amount.

$$\begin{aligned} P &= A \frac{(1 + i)^n - 1}{i(1 + i)^n} = A(P/A, i, n) \\ &= 10,00,000 \times (P/A, 15\%, 20) \\ &= 10,00,000 \times 6.2593 \\ &= \text{Rs. } 62,59,300 \end{aligned}$$

The amount of reserve which must be set-up now is equal to Rs. 62,59,300.

Equal-Payment Series Capital Recovery Amount

The objective of this mode of investment is to find the annual equivalent amount (A) which is to be recovered at the end of every interest period for n interest periods for a loan (P) which is sanctioned now at an interest rate of i compounded at the end of every interest period (see Fig. 3.10).

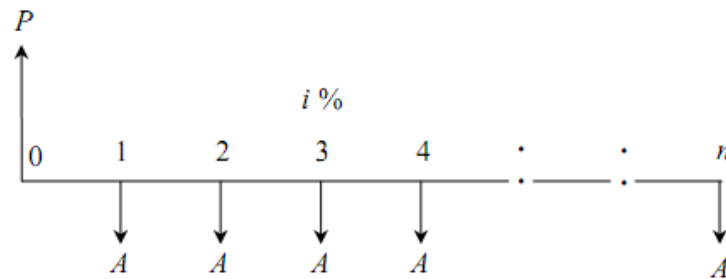


Fig. 3.10 Cash flow diagram of equal-payment series capital recovery amount.

P = present worth (loan amount)

A = annual equivalent payment (recovery amount)

i = interest rate

n = No. of interest periods

The formula to compute P is as follows:

$$A = P \frac{i(1+i)^n}{(1+i)^n - 1} = P(A/P, i, n)$$

where,

$(A/P, i, n)$ is called *equal-payment series capital recovery factor*.

EXAMPLE 3.6 A bank gives a loan to a company to purchase an equipment worth Rs. 10,00,000 at an interest rate of 18% compounded annually. This amount should be repaid in 15 yearly equal installments. Find the installment amount that the company has to pay to the bank.

Solution

$$P = \text{Rs. } 10,00,000$$

$$i = 18\%$$

$$n = 15 \text{ years}$$

$$A = ?$$

The corresponding cash flow diagram is shown in Fig. 3.11.

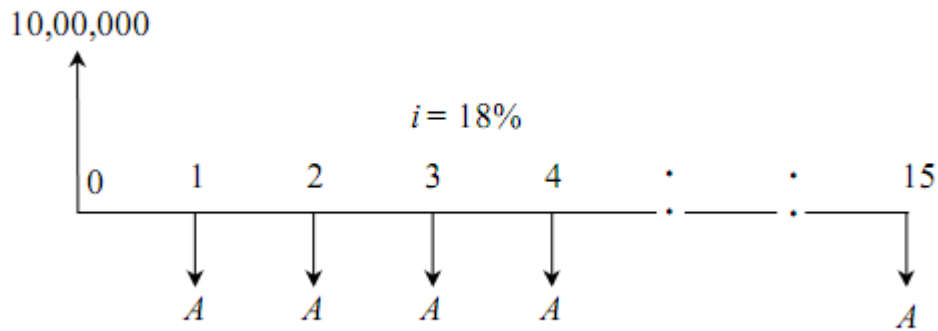


Fig. 3.11 Cash flow diagram of equal-payment series capital recovery amount.

$$\begin{aligned}
 A &= P \frac{i(1+i)^n}{(1+i)^n - 1} = P(A/P, i, n) \\
 &= 10,00,000 \times (A/P, 18\%, 15) \\
 &= 10,00,000 \times (0.1964) \\
 &= \text{Rs. } 1,96,400
 \end{aligned}$$

The annual equivalent installment to be paid by the company to the bank is Rs. 1,96,400.

Uniform Gradient Series Annual Equivalent Amount

The objective of this mode of investment is to find the annual equivalent amount of a series with an amount A_1 at the end of the first year and with an equal increment (G) at the end of each of the following $n - 1$ years with an interest rate i compounded annually. The corresponding cash flow diagram is shown in Fig. 3.12

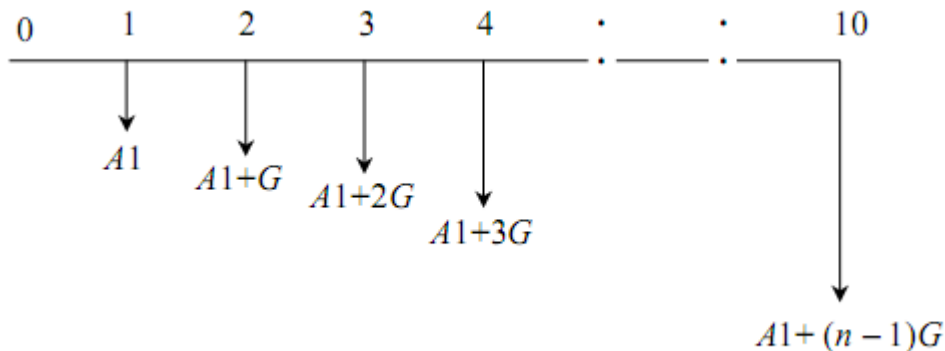


Fig. 3.12 Cash flow diagram of uniform gradient series annual equivalent amount.

The formula to compute A under this situation is

$$\begin{aligned}
 A &= A_1 + G \frac{(1+i)^n - in - 1}{i(1+i)^n - i} \\
 &= A_1 + G (A/G, i, n)
 \end{aligned}$$

where

$(A/G, i, n)$ is called *uniform gradient series factor*.

EXAMPLE 3.7 A person is planning for his retired life. He has 10 more years of service. He would like to deposit 20% of his salary, which is Rs. 4,000, at the end of the first year, and thereafter he wishes to deposit the amount with an annual increase of Rs. 500 for the next 9 years with an interest rate of 15%. Find the total amount at the end of the 10th year of the above series.

Solution Here,

$$A1 = \text{Rs. } 4,000$$

$$G = \text{Rs. } 500$$

$$i = 15\%$$

$$n = 10 \text{ years}$$

$$A = ? \text{ \& } F = ?$$

The cash flow diagram is shown in Fig. 3.13.

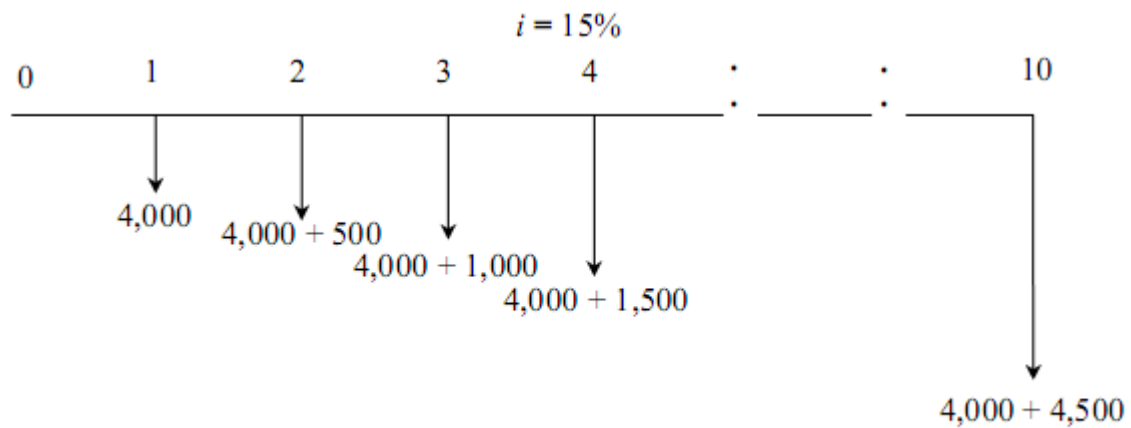


Fig. 3.13 Cash flow diagram of uniform gradient series annual equivalent amount.

$$\begin{aligned} A &= A1 + G \frac{(1+i)^n - in - 1}{i(1+i)^n - i} \\ &= A1 + G(A/G, i, n) \\ &= 4,000 + 500(A/G, 15\%, 10) \\ &= 4,000 + 500 \times 3.3832 \\ &= \text{Rs. } 5,691.60 \end{aligned}$$

This is equivalent to paying an equivalent amount of Rs. 5,691.60 at the end of every year for the next 10 years. The future worth sum of this revised series at the end of the 10th year is obtained as follows:

$$\begin{aligned} F &= A(F/A, i, n) \\ &= A(F/A, 15\%, 10) \\ &= 5,691.60(20.304) \\ &= \text{Rs. } 1,15,562.25 \end{aligned}$$

At the end of the 10th year, the compound amount of all his payments will be Rs. 1,15,562.25.

EXAMPLE 3.8 A person is planning for his retired life. He has 10 more years of service. He would like to deposit Rs. 8,500 at the end of the first year and thereafter he wishes to deposit the amount with an annual decrease of Rs. 500 for the next 9 years with an interest rate of 15%. Find the total amount at the end of the 10th year of the above series.

Solution Here,

$$A1 = \text{Rs. } 8,500$$

$$G = -\text{Rs. } 500$$

$$i = 15\%$$

$$n = 10 \text{ years}$$

$$A = ? \text{ \& } F = ?$$

The cash flow diagram is shown in Fig. 3.14.

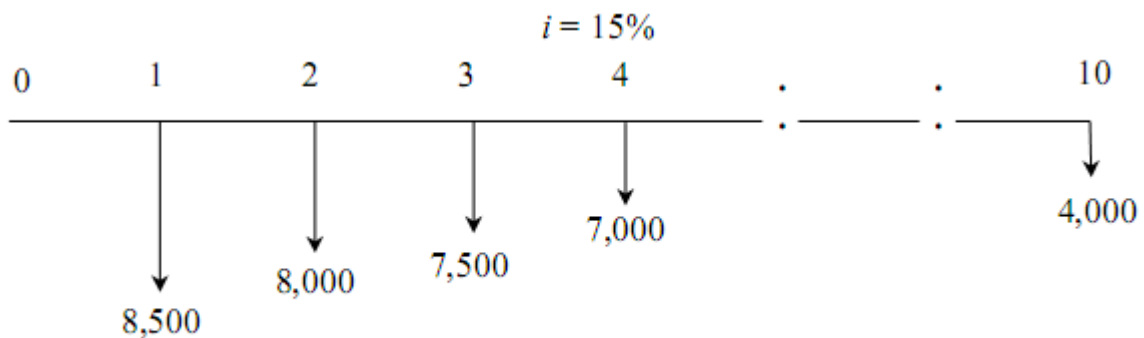


Fig. 3.14 Cash flow diagram of uniform gradient series annual equivalent amount.

$$\begin{aligned} A &= A1 - G \frac{(1+i)^n - in - 1}{i(1+i)^n - i} \\ &= A1 - G (A/G, i, n) \\ &= 8,500 - 500(A/G, 15\%, 10) \\ &= 8,500 - 500 \times 3.3832 \\ &= \text{Rs. } 6,808.40 \end{aligned}$$

This is equivalent to paying an equivalent amount of Rs. 6,808.40 at the end of every year for the next 10 years.

The future worth sum of this revised series at the end of the 10th year is obtained as follows:

$$\begin{aligned} F &= A(F/A, i, n) \\ &= A(F/A, 15\%, 10) \\ &= 6,808.40(20.304) \\ &= \text{Rs. } 1,38,237.75 \end{aligned}$$

At the end of the 10th year, the compound amount of all his payments is Rs. 1,38,237.75.

Effective Interest Rate

Let i be the nominal interest rate compounded annually. But, in practice, the compounding may occur less than a year. For example, compounding may be monthly, quarterly, or semi-annually. Compounding monthly means that the interest is computed at the end of every month. There are 12 interest periods in a year if the interest is compounded monthly. Under such situations, the formula to compute the effective interest rate, which is compounded annually, is

$$\text{Effective interest rate, } \bar{R} = (1 + i/C)^C - 1$$

where,

i = the nominal interest rate

C = the number of interest periods in a year.

EXAMPLE 3.9 A person invests a sum of Rs. 5,000 in a bank at a nominal interest rate of 12% for 10 years. The compounding is quarterly. Find the maturity amount of the deposit after 10 years.

Solution

$P = \text{Rs. } 5,000$

$n = 10$ years

$i = 12\%$ (Nominal interest rate)

$F = ?$

METHOD 1

No. of interest periods per year = 4

No. of interest periods in 10 years = $10 \times 4 = 40$

Revised No. of periods (No. of quarters), $N = 40$

Interest rate per quarter, $r = 12\%/4$

= 3%, compounded quarterly.

$$\begin{aligned} F &= P(1 + r)^N = 5,000(1 + 0.03)^{40} \\ &= \text{Rs. } 16,310.19 \end{aligned}$$

METHOD 2

No. of interest periods per year, $C = 4$

Effective interest rate, $R = (1 + i/C)^C - 1$

$$= (1 + 12\%/4)^4 - 1$$

= 12.55%, compounded annually.

$$\begin{aligned} F &= P(1 + R)^n = 5,000(1 + 0.1255)^{10} \\ &= \text{Rs. } 16,308.91 \end{aligned}$$



UNIT-III

METHODS OF COMPARISON OF ALTERNATIVES

Bases for Comparison of Alternatives:

In most of the practical decision environments, executives will be forced to select the best alternative from a set of competing alternatives. Let us assume that an organization has a huge sum of money for potential investment and there are three different projects whose initial outlay and annual revenues during their lives are known. The executive has to select the best alternative among these three competing projects.

There are several bases for comparing the worthiness of the projects. These bases are:

1. Present worth method
2. Future worth method
3. Annual equivalent method
4. Rate of return method

PRESENT WORTH METHOD OF COMPARISON

Introduction

In this method of comparison, the cash flows of each alternative will be reduced to time zero by assuming an interest rate i . Then, depending on the type of decision, the best alternative will be selected by comparing the present worth amounts of the alternatives.

The sign of various amounts at different points in time in a cash flow diagram is to be decided based on the type of the decision problem.

In a cost dominated cash flow diagram, the costs (outflows) will be assigned with positive sign and the profit, revenue, salvages value (all inflows), etc. will be assigned with negative sign.

In a revenue/profit-dominated cash flow diagram, the profit, revenue, salvage value (all inflows to an organization) will be assigned with positive sign. The costs (outflows) will be assigned with negative sign.

In case the decision is to select the alternative with the minimum cost, then the alternative with the least present worth amount will be selected. On the other hand, if the decision is to select the alternative with the maximum profit, then the alternative with the maximum present worth will be selected.

Revenue-Dominated Cash Flow Diagram

A generalized revenue-dominated cash flow diagram to demonstrate the present worth method of comparison is presented in Fig. 4.1.

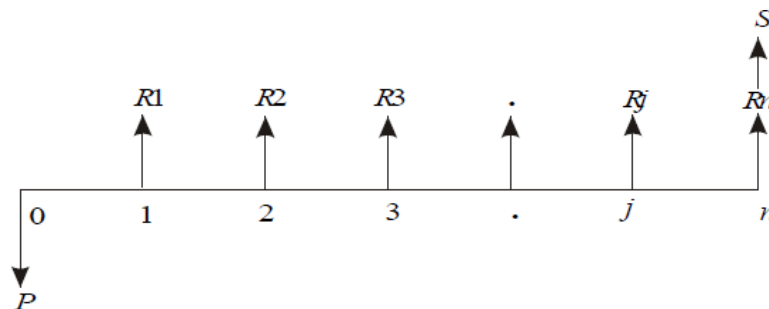


Fig. 4.1 Revenue-dominated cash flow diagram.

In Fig. 4.1, P represents an initial investment and R_j the net revenue at the end of the j^{th} year. The interest rate is i , compounded annually. S is the salvage value at the end of the n^{th} year.

To find the present worth of the above cash flow diagram for a given interest rate, the formula is

$$PW(i) = -P + R1[1/(1+i)^1] + R2[1/(1+i)^2] + \dots \\ + Rj[1/(1+i)^j] + Rn[1/(1+i)^n] + S[1/(1+i)^n]$$

In this formula, expenditure is assigned a negative sign and revenues are assigned a positive sign.

If we have some more alternatives which are to be compared with this alternative, then the corresponding present worth amounts are to be computed and compared. Finally, the alternative with the maximum present worth amount should be selected as the best alternative.

Cost-Dominated Cash Flow Diagram

A generalized cost-dominated cash flow diagram to demonstrate the present worth method of comparison is presented in Fig. 4.2.

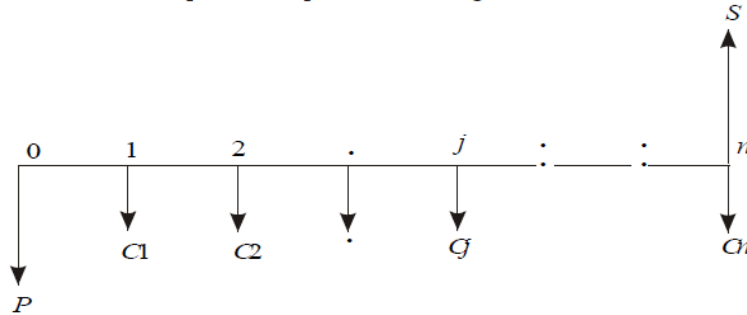


Fig. 4.2 Cost-dominated cash flow diagram.

In Fig. 4.2, P represents an initial investment, C_j the net cost of operation and maintenance at the end of the j^{th} year, and S the salvage value at the end of the n^{th} year. To compute the present worth amount of the above cash flow diagram for a given interest rate i , we have the formula

$$PW(i) = P + C1[1/(1+i)^1] + C2[1/(1+i)^2] + \dots + Cj[1/(1+i)^j] \\ + Cn[1/(1+i)^n] - S[1/(1+i)^n]$$

In the above formula, the expenditure is assigned a positive sign and the revenue a negative sign. If we have some more alternatives which are to be compared with this alternative, then the corresponding present worth amounts are to be computed and compared. Finally, the alternative with the minimum present worth amount should be selected as the best alternative.

EXAMPLES

EXAMPLE 4.1 Alpha Industry is planning to expand its production operation. It has identified three different technologies for meeting the goal. The initial outlay and annual revenues with respect to each of the technologies are summarized in Table 4.1. Suggest the best technology which is to be implemented based on the present worth method of comparison assuming 20% interest rate, compounded annually.

Table 4.1

	Initial outlay (Rs.)	Annual revenue (Rs.)	Life (years)
Technology 1	12,00,000	4,00,000	10
Technology 2	20,00,000	6,00,000	10
Technology 3	18,00,000	5,00,000	10

Solution In all the technologies, the initial outlay is assigned a negative sign and the annual revenues are assigned a positive sign.

TECHNOLOGY 1

Initial outlay, $P = \text{Rs. } 12,00,000$

Annual revenue, $A = \text{Rs. } 4,00,000$

Interest rate, $i = 20\%$, compounded annually

Life of this technology, $n = 10$ years

The cash flow diagram of this technology is as shown in Fig. 4.3.

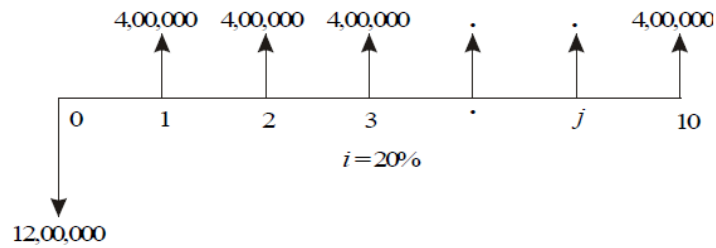


Fig. 4.3 Cash flow diagram for technology 1.

The present worth expression for this technology is

$$\begin{aligned}
 PW(20\%)_1 &= -12,00,000 + 4,00,000 \times (P/A, 20\%, 10) \\
 &= -12,00,000 + 4,00,000 \times (4.1925) \\
 &= -12,00,000 + 16,77,000 \\
 &= \text{Rs. } 4,77,000
 \end{aligned}$$

TECHNOLOGY 2

Initial outlay, $P = \text{Rs. } 20,00,000$

Annual revenue, $A = \text{Rs. } 6,00,000$

Interest rate, $i = 20\%$, compounded annually

Life of this technology, $n = 10$ years

The cash flow diagram of this technology is shown in Fig. 4.4.

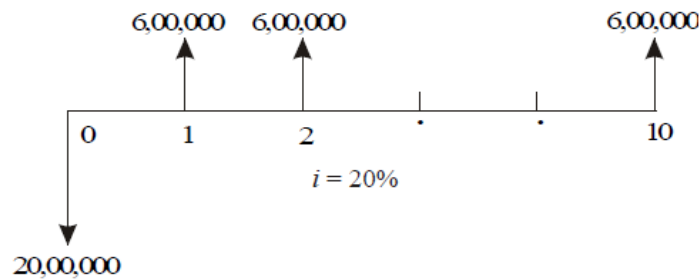


Fig. 4.4 Cash flow diagram for technology 2.

The present worth expression for this technology is

$$\begin{aligned}
 PW(20\%)_2 &= -20,00,000 + 6,00,000 \times (P/A, 20\%, 10) \\
 &= -20,00,000 + 6,00,000 \times (4.1925) \\
 &= -20,00,000 + 25,15,500 \\
 &= \text{Rs. } 5,15,500
 \end{aligned}$$

TECHNOLOGY 3

Initial outlay, $P = \text{Rs. } 18,00,000$

Annual revenue, $A = \text{Rs. } 5,00,000$

Interest rate, $i = 20\%$, compounded annually

Life of this technology, $n = 10$ years

The cash flow diagram of this technology is shown in Fig. 4.5.

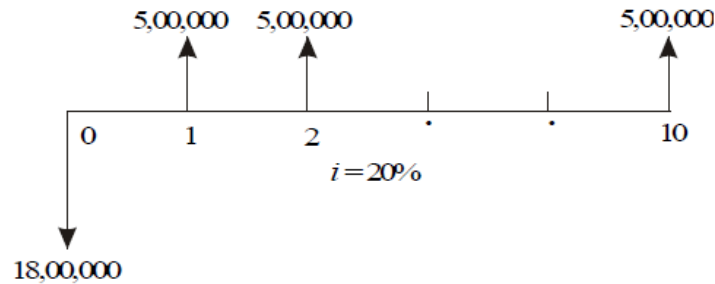


Fig. 4.5 Cash flow diagram for technology 3.

The present worth expression for this technology is

$$\begin{aligned}
 PW(20\%)_3 &= -18,00,000 + 5,00,000 \times (P/A, 20\%, 10) \\
 &= -18,00,000 + 5,00,000 \times (4.1925) \\
 &= -18,00,000 + 20,96,250 \\
 &= \text{Rs. } 2,96,250
 \end{aligned}$$

From the above calculations, it is clear that the present worth of technology 2 is the highest among all the technologies. Therefore, technology 2 is suggested for implementation to expand the production.

EXAMPLE 4.2 An engineer has two bids for an elevator to be installed in a new building. The details of the bids for the elevators are as follows:

<i>Bid</i>	<i>Engineer's estimates</i>		
	<i>Initial cost</i> (Rs.)	<i>Service life</i> (years)	<i>Annual operations & maintenance cost</i> (Rs.)
Alpha Elevator Inc.	4,50,000	15	27,000
Beta Elevator Inc.	5,40,000	15	28,500

Determine which bid should be accepted, based on the present worth method of comparison assuming 15% interest rate, compounded annually.

Solution

Bid 1: Alpha Elevator Inc.

Initial cost, $P = \text{Rs. } 4,50,000$

Annual operation and maintenance cost, $A = \text{Rs. } 27,000$

Life = 15 years

Interest rate, $i = 15\%$, compounded annually.

The cash flow diagram of bid 1 is shown in Fig. 4.6.

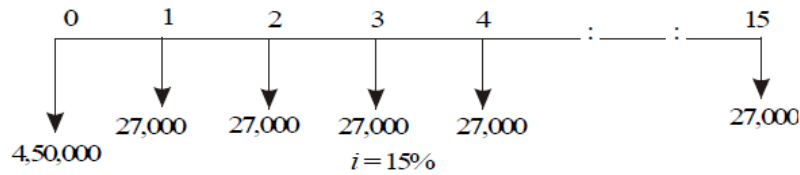


Fig. 4.6 Cash flow diagram for bid 1.

The present worth of the above cash flow diagram is computed as follows:

$$\begin{aligned} PW(15\%) &= 4,50,000 + 27,000(P/A, 15\%, 15) \\ &= 4,50,000 + 27,000 \times 5.8474 \\ &= 4,50,000 + 1,57,879.80 \\ &= \text{Rs. } 6,07,879.80 \end{aligned}$$

Bid 2: Beta Elevator Inc.

Initial cost, $P = \text{Rs. } 5,40,000$

Annual operation and maintenance cost, $A = \text{Rs. } 28,500$

Life = 15 years

Interest rate, $i = 15\%$, compounded annually.

The cash flow diagram of bid 2 is shown in Fig. 4.7.

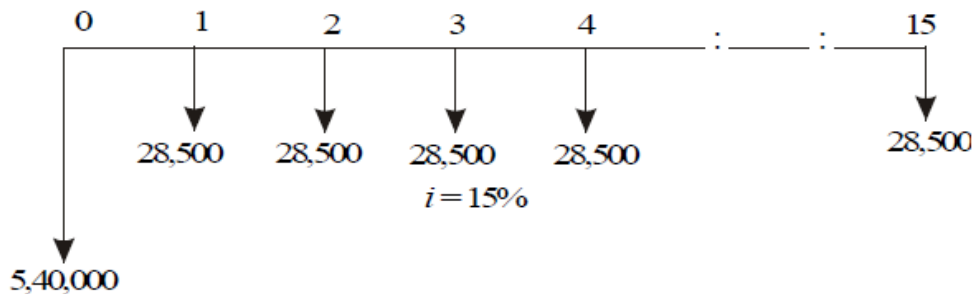


Fig. 4.7 Cash flow diagram for bid 2.

The present worth of the above cash flow diagram is computed as follows:

$$\begin{aligned} PW(15\%) &= 5,40,000 + 28,500(P/A, 15\%, 15) \\ &= 5,40,000 + 28,500 \times 5.8474 \\ &= 5,40,000 + 1,66,650.90 \\ &= \text{Rs. } 7,06,650.90 \end{aligned}$$

The total present worth cost of bid 1 is less than that of bid 2. Hence, bid 1 is to be selected for implementation. That is, the elevator from Alpha Elevator Inc. is to be purchased and installed in the new building.

EXAMPLE 4.3 Investment proposals A and B have the net cash flows as follows:

Proposal	End of years				
	0	1	2	3	4
A (Rs.)	-10,000	3,000	3,000	7,000	6,000
B (Rs.)	-10,000	6,000	6,000	3,000	3,000

Compare the present worth of A with that of B at $i = 18\%$. Which proposal should be selected?

Solution

Present worth of A at $i = 18\%$. The cash flow diagram of proposal A is shown in Fig. 4.8.

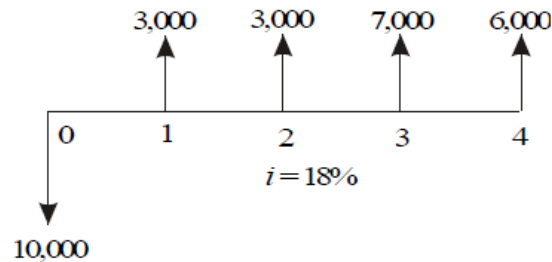


Fig. 4.8 Cash flow diagram for proposal A.

The present worth of the above cash flow diagram is computed as

$$\begin{aligned}
 PW_A(18\%) &= -10,000 + 3,000(P/F, 18\%, 1) + 3,000(P/F, 18\%, 2) \\
 &\quad + 7,000(P/F, 18\%, 3) + 6,000(P/F, 18\%, 4) \\
 &= -10,000 + 3,000(0.8475) + 3,000(0.7182) \\
 &\quad + 7,000(0.6086) + 6,000(0.5158) \\
 &= \text{Rs. } 2,052.10
 \end{aligned}$$

Present worth of B at $i = 18\%$. The cash flow diagram of the proposal B is shown in Fig. 4.9.

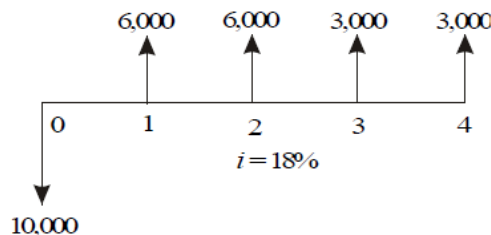


Fig. 4.9 Cash flow diagram for proposal B.

The present worth of the above cash flow diagram is calculated as

$$\begin{aligned}
 PW_B(18\%) &= -10,000 + 6,000(P/F, 18\%, 1) + 6,000(P/F, 18\%, 2) \\
 &\quad + 3,000(P/F, 18\%, 3) + 3,000(P/F, 18\%, 4) \\
 &= -10,000 + 6,000(0.8475) + 6,000(0.7182) \\
 &\quad + 3,000(0.6086) + 3,000(0.5158) \\
 &= \text{Rs. } 2,767.40
 \end{aligned}$$

At $i = 18\%$, the present worth of proposal B is higher than that of proposal A. Therefore, select proposal B.

EXAMPLE 4.4 A granite company is planning to buy a fully automated granite cutting machine. If it is purchased under down payment, the cost of the machine is Rs. 16,00,000. If it is purchased under installment basis, the company has to pay 25% of the cost at the time of purchase and the remaining amount in 10 annual equal installments of Rs. 2,00,000 each. Suggest the best alternative for the company using the present worth basis at $i = 18\%$, compounded annually.

Solution There are two alternatives available for the company:

1. Down payment of Rs. 16,00,000
2. Down payment of Rs. 4,00,000 and 10 annual equal installments of Rs. 2,00,000 each

Present worth calculation of the second alternative. The cash flow diagram of the second alternative is shown in Fig. 4.10.

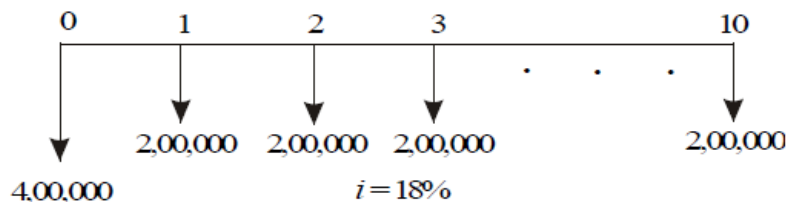


Fig. 4.10 Cash flow diagram for the second alternative.

The present worth of the above cash flow diagram is computed as

$$\begin{aligned}
 PW(18\%) &= 4,00,000 + 2,00,000(P/A, 18\%, 10) \\
 &= 4,00,000 + 2,00,000 \times 4.4941 \\
 &= \text{Rs. } 12,98,820
 \end{aligned}$$

The present worth of this option is Rs. 12,98,820, which is less than the first option of complete down payment of Rs. 16,00,000. Hence, the company should select the second alternative to buy the fully automated granite cutting machine.

EXAMPLE 4.5 A finance company advertises two investment plans. In plan 1, the company pays Rs. 12,000 after 15 years for every Rs. 1,000 invested now. In plan 2, for every Rs. 1,000 invested, the company pays Rs. 4,000 at the end of the 10th year and Rs. 4,000 at the end of 15th year. Select the best investment plan from the investor's point of view at $i = 12\%$, compounded annually.

Solution *Plan 1.* The cash flow diagram for plan 1 is illustrated in Fig. 4.11.

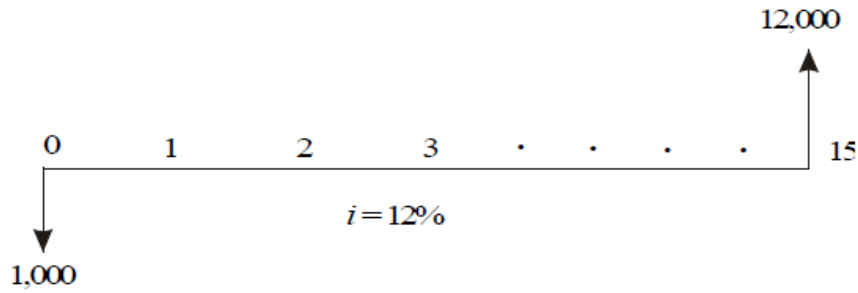


Fig. 4.11 Cash flow diagram for plan 1.

The present worth of the above cash flow diagram is calculated as

$$\begin{aligned}
 PW(12\%) &= -1,000 + 12,000(P/F, 12\%, 15) \\
 &= -1,000 + 12,000(0.1827) \\
 &= \text{Rs. } 1,192.40
 \end{aligned}$$

Plan 2. The cash flow diagram for plan 2 is shown in Fig. 4.12.

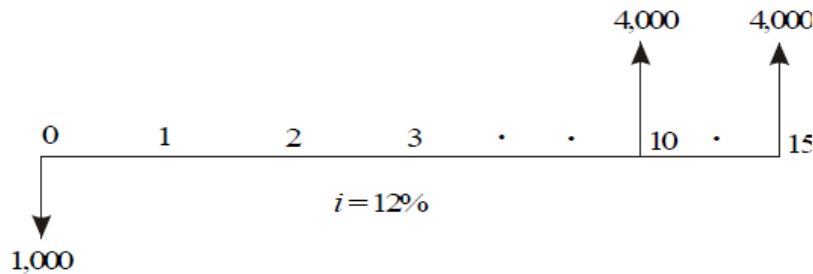


Fig. 4.12 Cash flow diagram for plan 2.

The present worth of the above cash flow diagram is computed as

$$\begin{aligned}
 PW(12\%) &= -1,000 + 4,000(P/F, 12\%, 10) + 4,000(P/F, 12\%, 15) \\
 &= -1,000 + 4,000(0.3220) + 4,000(0.1827) \\
 &= \text{Rs. } 1,018.80
 \end{aligned}$$

The present worth of plan 1 is more than that of plan 2. Therefore, plan 1 is the best plan from the investor's point of view.

EXAMPLE 4.6 Novel Investment Ltd. accepts Rs. 10,000 at the end of every year for 20 years and pays the investor Rs. 8,00,000 at the end of the 20th year. Innovative Investment Ltd. accepts Rs. 10,000 at the end of every year for 20 years and pays the investor Rs. 15,00,000 at the end of the 25th year. Which is the best investment alternative? Use present worth base with $i = 12\%$.

Solution *Novel Investment Ltd's plan.* The cash flow diagram of Novel Investment Ltd's plan is shown in Fig. 4.13.

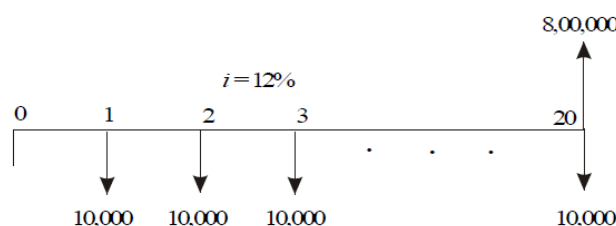


Fig. 4.13 Cash flow diagram for Novel Investment Ltd.

The present worth of the above cash flow diagram is computed as

$$\begin{aligned} PW(12\%) &= -10,000(P/A, 12\%, 20) + 8,00,000(P/F, 12\%, 20) \\ &= -10,000(7.4694) + 8,00,000(0.1037) \\ &= \text{Rs. } 8,266 \end{aligned}$$

Innovative Investment Ltd's plan. The cash flow diagram of the Innovative Investment Ltd's plan is illustrated in Fig. 4.14.

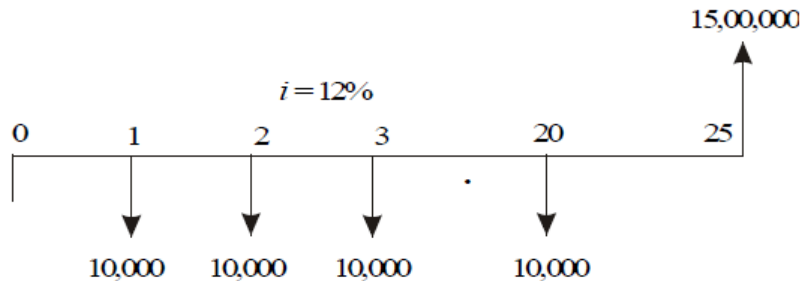


Fig. 4.14 Cash flow diagram for Innovative Investment Ltd.

The present worth of the above cash flow diagram is calculated as

$$\begin{aligned} PW(12\%) &= -10,000(P/A, 12\%, 20) + 15,00,000(P/F, 12\%, 25) \\ &= -10,000(7.4694) + 15,00,000(0.0588) \\ &= \text{Rs. } 13,506 \end{aligned}$$

The present worth of Innovative Investment Ltd's plan is more than that of Novel Investment Ltd's plan. Therefore, Innovative Investment Ltd's plan is the best from investor's point of view.

EXAMPLE 4.7 A small business with an initial outlay of Rs. 12,000 yields Rs. 10,000 during the first year of its operation and the yield increases by Rs. 1,000 from its second year of operation up to its 10th year of operation. At the end of the life of the business, the salvage value is zero. Find the present worth of the business by assuming an interest rate of 18%, compounded annually.

Solution

- Initial investment, $P = \text{Rs. } 12,000$
- Income during the first year, $A = \text{Rs. } 10,000$
- Annual increase in income, $G = \text{Rs. } 1,000$
- $n = 10$ years
- $i = 18\%$, compounded annually

The cash flow diagram for the small business is depicted in Fig. 4.15.

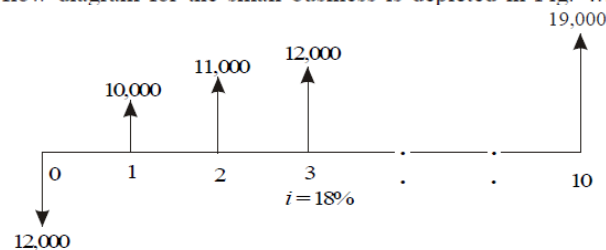


Fig. 4.15 Cash flow diagram for the small business.

The equation for the present worth is

$$\begin{aligned} PW(18\%) &= -12,000 + (10,000 + 1,000 \times (A/G, 18\%, 10)) \times (P/A, 18\%, 10) \\ &= -12,000 + (10,000 + 1,000 \times 3.1936) \times 4.4941 \\ &= -12,000 + 59,293.36 \\ &= \text{Rs. } 47,293.36 \end{aligned}$$

The present worth of the small business is Rs. 47,293.36.

FUTURE WORTH METHOD

INTRODUCTION

In the future worth method of comparison of alternatives, the future worth of various alternatives will be computed. Then, the alternative with the maximum future worth of net revenue or with the minimum future worth of net cost will be selected as the best alternative for implementation.

Revenue-Dominated Cash Flow Diagram

A generalized revenue-dominated cash flow diagram to demonstrate the future worth method of comparison is presented in Fig. 5.1.

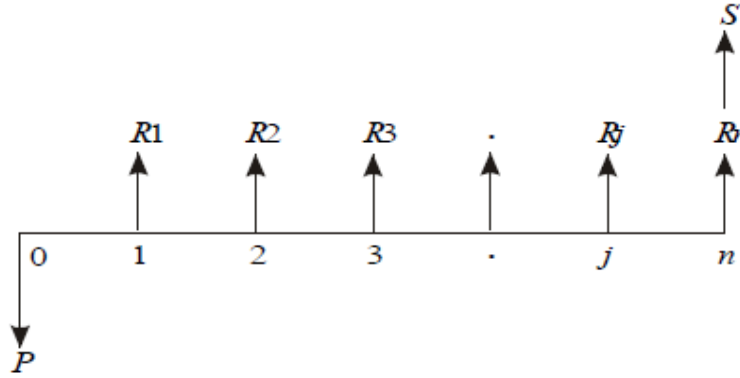


Fig. 5.1 Revenue-dominated cash flow diagram.

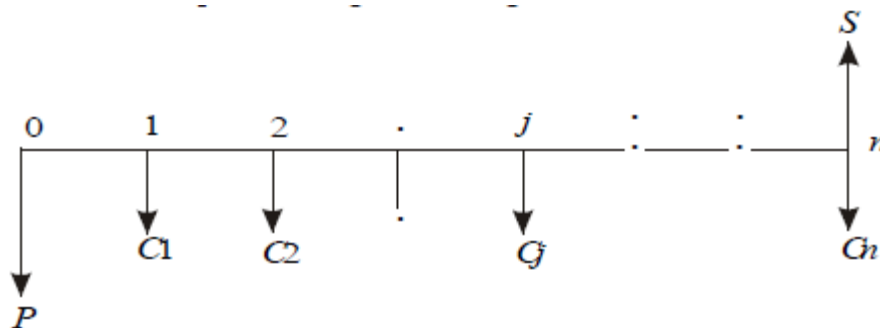
In Fig. 5.1, P represents an initial investment, R_j the net-revenue at the end of the j^{th} year, and S the salvage value at the end of the n^{th} year. The formula for the future worth of the above cash flow diagram for a given interest rate, i is

$$FW(i) = -P(1+i)^n + R_1(1+i)^{n-1} + R_2(1+i)^{n-2} + \dots + R_j(1+i)^{n-j} + \dots + R_n + S$$

In the above formula, the expenditure is assigned with negative sign and the revenues are assigned with positive sign. If we have some more alternatives which are to be compared with this alternative, then the corresponding future worth amounts are to be computed and compared. Finally, the alternative with the maximum future worth amount should be selected as the best alternative.

Cost-Dominated Cash Flow Diagram

A generalized cost-dominated cash flow diagram to demonstrate the future worth method of comparison is given in Fig. 5.2.



In Fig. 5.2, P represents an initial investment, C_j the net cost of operation and maintenance at the end of the j^{th} year, and S the salvage value at the end of the n^{th} year.

The formula for the future worth of the above cash flow diagram for a given interest rate, i is

$$FW(i) = P(1+i)^n + C_1(1+i)^{n-1} + C_2(1+i)^{n-2} + \dots + C_j(1+i)^{n-j} + \dots + C_n - S$$

In this formula, the expenditures are assigned with positive sign and revenues with negative sign. If we have some more alternatives which are to be compared with this alternative, then the corresponding future worth amounts are to be computed and compared. Finally, the alternative with the minimum future worth amount should be selected as the best alternative.

EXAMPLES

EXAMPLE 5.1 Consider the following two mutually exclusive alternatives:

	<i>End of year</i>				
<i>Alternative</i>	0	1	2	3	4
A (Rs.)	- 50,00,000	20,00,000	20,00,000	20,00,000	20,00,000
B (Rs.)	- 45,00,000	18,00,000	18,00,000	18,00,000	18,00,000

At $i = 18\%$, select the best alternative based on future worth method of comparison.

Solution : Alternative A

Initial investment, $P = \text{Rs. } 50,00,000$

Annual equivalent revenue, $A = \text{Rs. } 20,00,000$

Interest rate, $i = 18\%$, compounded annually

Life of alternative A = 4 years

The cash flow diagram of alternative A is shown in Fig. 5.3.

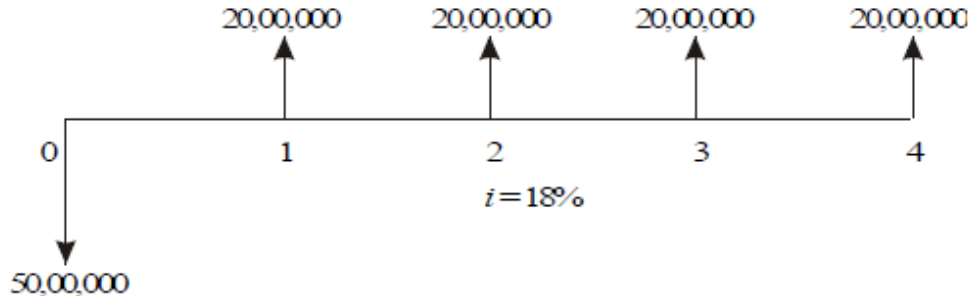


Fig. 5.3 Cash flow diagram for alternative A.

The future worth amount of alternative B is computed as

$$\begin{aligned}
 FW_A(18\%) &= -50,00,000(F/P, 18\%, 4) + 20,00,000(F/A, 18\%, 4) \\
 &= -50,00,000(1.939) + 20,00,000(5.215) \\
 &= \text{Rs. } 7,35,000
 \end{aligned}$$

Alternative B

Initial investment, $P = \text{Rs. } 45,00,000$

Annual equivalent revenue, $A = \text{Rs. } 18,00,000$

Interest rate, $i = 18\%$, compounded annually

Life of alternative B = 4 years

The cash flow diagram of alternative B is illustrated in Fig. 5.4.

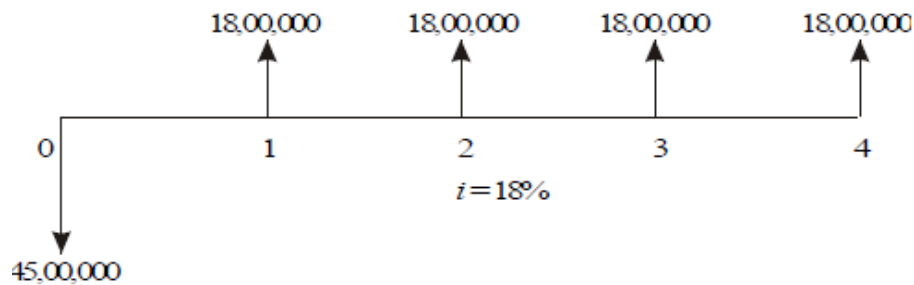


Fig. 5.4 Cash flow diagram for alternative B.

The future worth amount of alternative B is computed as

$$\begin{aligned}
 FW_B(18\%) &= -45,00,000(F/P, 18\%, 4) + 18,00,000 (F/A, 18\%, 4) \\
 &= -45,00,000(1.939) + 18,00,000(5.215) \\
 &= \text{Rs. } 6,61,500
 \end{aligned}$$

The future worth of alternative A is greater than that of alternative B. Thus, alternative A should be selected.

EXAMPLE 5.2 A man owns a corner plot. He must decide which of the several alternatives to select in trying to obtain a desirable return on his investment. After much study and calculation, he decides that the two best alternatives are as given in the following table:

	<i>Build gas station</i>	<i>Build soft ice-cream stand</i>
First cost (Rs.)	20,00,000	36,00,000
Annual property taxes (Rs.)	80,000	1,50,000
Annual income (Rs.)	8,00,000	9,80,000
Life of building (years)	20	20
Salvage value (Rs.)	0	0

Evaluate the alternatives based on the future worth method at $i = 12\%$.

Alternative 1—Build gas station

First cost = Rs. 20,00,000

Net annual income = Annual income – Annual property tax

$$= \text{Rs. } 8,00,000 - \text{Rs. } 80,000$$

$$= \text{Rs. } 7,20,000$$

Life = 20 years

Interest rate = 12%, compounded annually

The cash flow diagram for this alternative is depicted in Fig. 5.5.

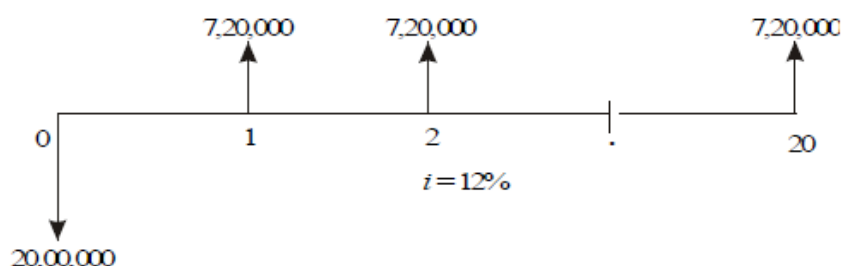


Fig. 5.5 Cash flow diagram for alternative 1.

The future worth of alternative 1 is computed as

$$\begin{aligned} FW_1(12\%) &= -20,00,000(F/P, 12\%, 20) + 7,20,000(F/A, 12\%, 20) \\ &= -20,00,000(9.646) + 7,20,000(72.052) \\ &= \text{Rs. } 3,25,85,440 \end{aligned}$$

Alternative 2—Build soft ice-cream stand

First cost = Rs. 36,00,000

Net annual income = Annual income – Annual property tax

$$= \text{Rs. } 9,80,000 - \text{Rs. } 1,50,000$$

$$= \text{Rs. } 8,30,000$$

Life = 20 years

Interest rate = 12%, compounded annually

The cash flow diagram for this alternative is shown in Fig. 5.6.

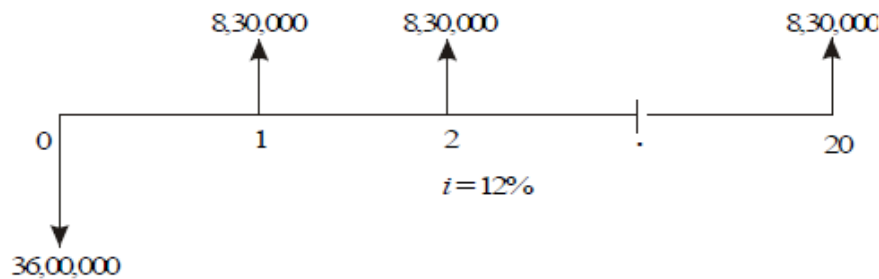


Fig. 5.6 Cash flow diagram for alternative 2.

The future worth of alternative 2 is calculated as

$$\begin{aligned} FW_2(12\%) &= -36,00,000(F/P, 12\%, 20) + 8,30,000(F/A, 12\%, 20) \\ &= -36,00,000(9.646) + 8,30,000(72.052) \\ &= \text{Rs. } 2,50,77,560 \end{aligned}$$

The future worth of alternative 1 is greater than that of alternative 2. Thus, building the gas station is the best alternative.

EXAMPLE 5.3 The cash flow diagram of two mutually exclusive alternatives are given in Figs. 5.7 and 5.8.

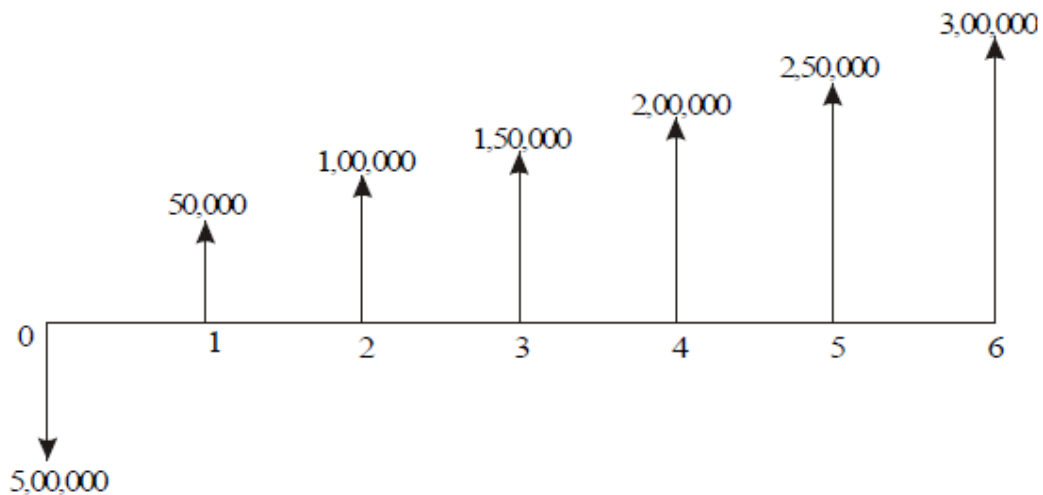


Fig. 5.7 Cash flow diagram for alternative 1.

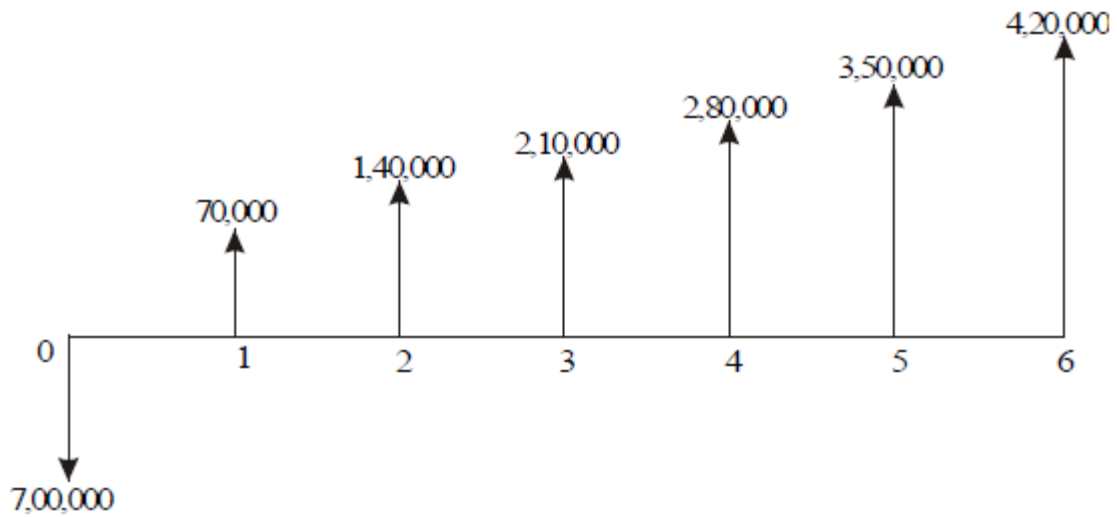


Fig. 5.8 Cash flow diagram for alternative 2.

- (a) Select the best alternative based on future worth method at $i = 8\%$.
 (b) Rework part (a) with $i = 9\%$ and 20%

(a) *Evaluation at $i = 8\%$*

Alternative 1—This comes under equal payment gradient series.

$$P = \text{Rs. } 5,00,000$$

$$A_1 = \text{Rs. } 50,000$$

$$G = \text{Rs. } 50,000$$

$$i = 8\%$$

$$n = 6 \text{ years}$$

The formula for the future worth of alternative 1 is

$$\begin{aligned} FW_1(8\%) &= -P(F/P, 8\%, 6) + [A_1 + G(A/G, 8\%, 6)] \times (F/A, 8\%, 6) \\ &= -5,00,000(1.587) + [50,000 + 50,000(2.2764)] \times 7.336 \\ &= -79,35,000 + 1,63,820 \times 7.336 \\ &= -79,35,000 + 12,01,784 \\ &= \text{Rs. } 4,08,283.52 \end{aligned}$$

Alternative 2—This comes under equal payment gradient series.

$$P = \text{Rs. } 7,00,000$$

$$A_1 = \text{Rs. } 70,000$$

$$G = \text{Rs. } 70,000$$

$$i = 8\%$$

$$n = 6 \text{ years}$$

The formula for the future worth of alternative 2 is

$$\begin{aligned}
 FW_2(8\%) &= -P(F/P, 8\%, 6) + [A1 + G(A/G, 8\%, 6)] \times (F/A, 8\%, 6) \\
 FW_2(8\%) &= -7,00,000 \times 1.587 + [70,000 + 70,000 \times 2.2764] \times 7.336 \\
 &= -11,10,900 + 16,82,497 \\
 &= \text{Rs. } 5,71,596.93
 \end{aligned}$$

The future worth of alternative 2 is more than that of alternative 1. Therefore, alternative 2 must be selected.

(b) (i) Evaluation at i = 9%: Alternative 1

$$P = \text{Rs. } 5,00,000$$

$$A1 = \text{Rs. } 50,000$$

$$G = \text{Rs. } 50,000$$

$$n = 6 \text{ years}$$

The formula for the future worth of alternative 1 is as follows:

$$\begin{aligned}
 FW_1(9\%) &= -P(F/P, 9\%, 6) + [A1 + G(A/G, 9\%, 6)] \times (F/A, 9\%, 6) \\
 &= -5,00,000 (1.677) + [50,000 + 50,000 (2.2498)] \times 7.523 \\
 &= -8,38,500 + 12,22,412.27 \\
 &= \text{Rs. } 3,83,912.27
 \end{aligned}$$

Alternative 2

$$P = \text{Rs. } 7,00,000$$

$$A1 = \text{Rs. } 70,000$$

$$G = \text{Rs. } 70,000$$

$$n = 6 \text{ years}$$

The formula for the future worth of the alternative 2 is

$$\begin{aligned}
 FW_2(9\%) &= -P(F/P, 9\%, 6) + [A1 + G(A/G, 9\%, 6)] \times (F/A, 9\%, 6) \\
 &= -7,00,000 \times 1.677 + [70,000 + 70,000 \times 2.2498] \times 7.523 \\
 &= -11,73,900 + 17,11,377.18 \\
 &= \text{Rs. } 5,37,477.18
 \end{aligned}$$

The future worth of alternative 2 is more than that of alternative 1. Therefore, alternative 2 must be selected.

(ii) Evaluation at i = 20%: Alternative 1

$$P = \text{Rs. } 5,00,000$$

$$A1 = \text{Rs. } 50,000$$

$$G = \text{Rs. } 50,000$$

$$n = 6 \text{ years}$$

The formula for the future worth of alternative 1 is

$$\begin{aligned}
 FW_1(20\%) &= -P(F/P, 20\%, 6) + [A_1 + G(A/G, 20\%, 6)] \times (F/A, 20\%, 6) \\
 &= -5,00,000(2.986) + [50,000 + 50,000(1.9788)] \times 9.93 \\
 &= -14,93,000 + 14,78,974.20 \\
 &= \text{Rs. } -14,025.80
 \end{aligned}$$

The negative sign of the future worth amount indicates that alternative 1 incurs loss.

Alternative 2

$$P = \text{Rs. } 7,00,000$$

$$A_1 = \text{Rs. } 70,000$$

$$G = \text{Rs. } 70,000$$

$$n = 6 \text{ years}$$

The formula for the future worth of alternative 2 is

$$\begin{aligned}
 FW_2(20\%) &= -P(F/P, 20\%, 6) + [A_1 + G(A/G, 20\%, 6)] \times (F/A, 20\%, 6) \\
 &= -7,00,000 \times 2.986 + [70,000 + 70,000 \times 1.9788] \times 9.93 \\
 &= -20,90,200 + 20,70,563.88 \\
 &= \text{Rs. } -19,636.12
 \end{aligned}$$

The negative sign of the above future worth amount indicates that alternative 2 incurs loss. Thus, none of the two alternatives should be selected.

EXAMPLE 5.4 M/S Krishna Castings Ltd. is planning to replace its annealing furnace. It has received tenders from three different original manufacturers of annealing furnace. The details are as follows.

	<i>Manufacturer</i>		
	1	2	3
Initial cost (Rs.)	80,00,000	70,00,000	90,00,000
Life (years)	12	12	12
Annual operation and maintenance cost (Rs.)	8,00,000	9,00,000	8,50,000
Salvage value after 12 years	5,00,000	4,00,000	7,00,000

Which is the best alternative based on future worth method at $i = 20\%$?

Solution *Alternative 1—Manufacturer 1*

$$\text{First cost, } P = \text{Rs. } 80,00,000$$

$$\text{Life, } n = 12 \text{ years}$$

Annual operating and maintenance cost, $A = \text{Rs. } 8,00,000$

Salvage value at the end of furnace life = $\text{Rs. } 5,00,000$

The cash flow diagram for this alternative is shown in Fig. 5.9.

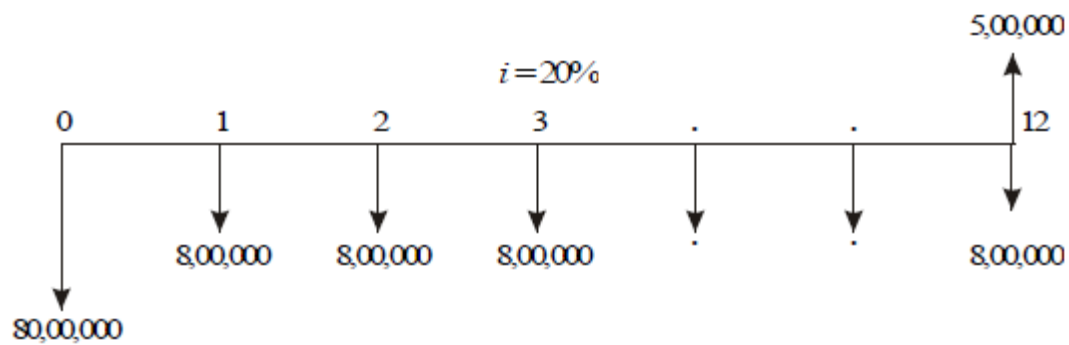


Fig. 5.9 Cash flow diagram for manufacturer 1.

The future worth amount of alternative 1 is computed as

$$\begin{aligned} FW_1(20\%) &= 80,00,000(F/P, 20\%, 12) + 8,00,000(F/A, 20\%, 12) - 5,00,000 \\ &= 80,00,000(8.916) + 8,00,000(39.581) - 5,00,000 \\ &= \text{Rs. } 10,24,92,800 \end{aligned}$$

Alternative 2—Manufacturer 2

First cost, $P = \text{Rs. } 70,00,000$

Life, $n = 12$ years

Annual operating and maintenance cost, $A = \text{Rs. } 9,00,000$

Salvage value at the end of furnace life = $\text{Rs. } 4,00,000$

The cash flow diagram for this alternative is given in Fig. 5.10.

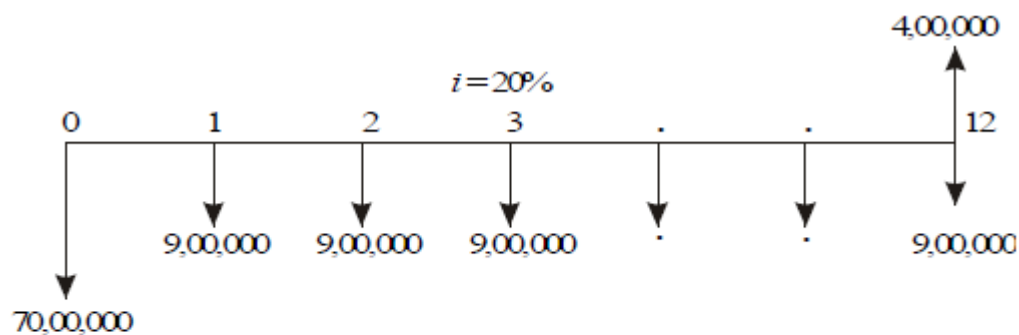


Fig. 5.10 Cash flow diagram for manufacturer 2.

The future worth amount of alternative 2 is computed as

$$\begin{aligned} FW_2(20\%) &= 70,00,000(F/P, 20\%, 12) + 9,00,000(F/A, 20\%, 12) - 4,00,000 \\ &= 70,00,000(8.916) + 9,00,000(39.581) - 4,00,000 \\ &= \text{Rs. } 9,76,34,900 \end{aligned}$$

Alternative 3—Manufacturer 3

First cost, $P = \text{Rs. } 90,00,000$

Life, $n = 12$ years

Annual operating and maintenance cost, $A = \text{Rs. } 8,50,000$
 Salvage value at the end of furnace life = $\text{Rs. } 7,00,000$

The cash flow diagram for this alternative is illustrated in Fig. 5.11.

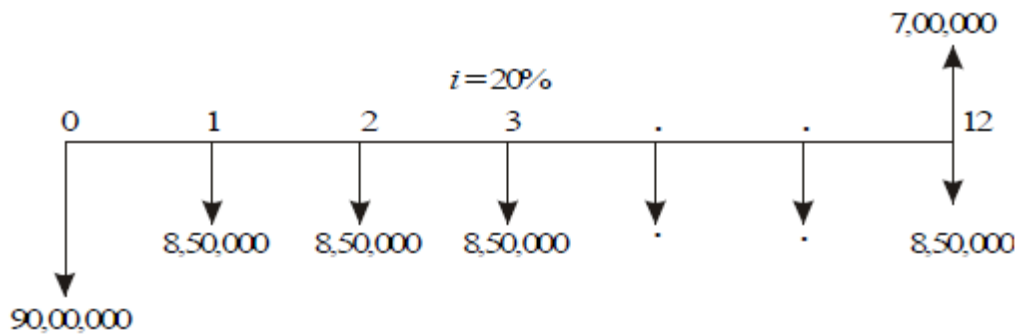


Fig. 5.11 Cash flow diagram for manufacturer 3.

The future worth amount of alternative 3 is calculated as

$$\begin{aligned} FW_3(20\%) &= 90,00,000(F/P, 20\%, 12) + 8,50,000(F/A, 20\%, 12) - 7,00,000 \\ &= 90,00,000(8.916) + 8,50,000(39.581) - 7,00,000 \\ &= \text{Rs. } 11,31,87,850 \end{aligned}$$

The future worth cost of alternative 2 is less than that of the other two alternatives. Therefore, M/s. Krishna castings should buy the annealing furnace from manufacturer 2.

EXAMPLE 5.5 A company must decide whether to buy machine A or machine B :

	<i>Machine A</i>	<i>Machine B</i>
Initial cost	Rs. 4,00,000	Rs. 8,00,000
Useful life, in years	4	4
Salvage value at the end of machine life	Rs. 2,00,000	Rs. 5,50,000
Annual maintenance cost	Rs. 40,000	0

At 12% interest rate, which machine should be selected? (Use future worth method of comparison).

Solution Machine A

Initial cost of the machine, $P = \text{Rs. } 4,00,000$

Life, $n = 4$ years

Salvage value at the end of machine life, $S = \text{Rs. } 2,00,000$

Annual maintenance cost, $A = \text{Rs. } 40,000$

Interest rate, $i = 12\%$, compounded annually.

The cash flow diagram of machine A is given in Fig. 5.12.

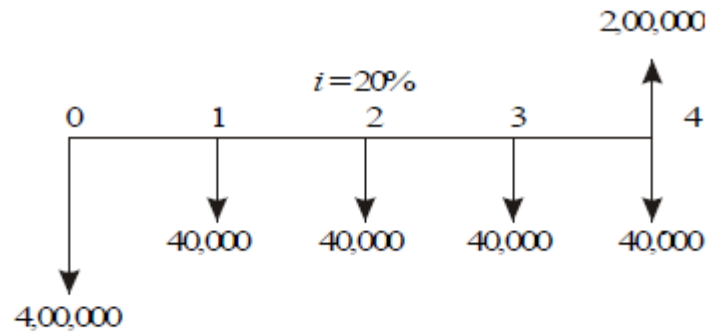


Fig. 5.12 Cash flow diagram for machine A.

The future worth function of Fig. 5.12 is

$$\begin{aligned}
 FW_A(12\%) &= 4,00,000 \times (F/P, 12\%, 4) + 40,000 \times (F/A, 12\%, 4) - 2,00,000 \\
 &= 4,00,000 \times (1.574) + 40,000 \times (4.779) - 2,00,000 \\
 &= \text{Rs. } 6,20,760
 \end{aligned}$$

Machine B

Initial cost of the machine, $P = \text{Rs. } 8,00,000$

Life, $n = 4$ years

Salvage value at the end of machine life, $S = \text{Rs. } 5,50,000$

Annual maintenance cost, $A = \text{zero}$.

Interest rate, $i = 12\%$, compounded annually.

The cash flow diagram of the machine B is illustrated in Fig. 5.13.

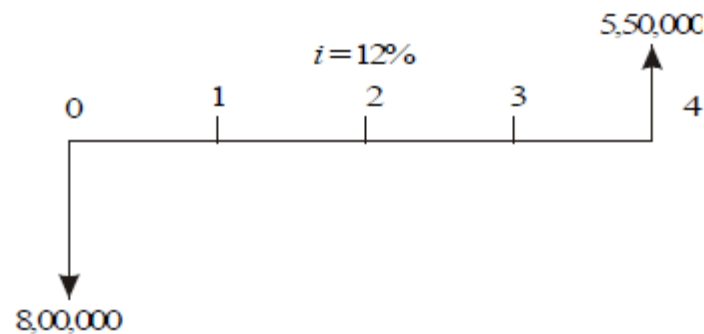


Fig. 5.13 Cash flow diagram for machine B.

The future worth function of Fig 5.13 is

$$\begin{aligned}
 FW_B(12\%) &= 8,00,000 \times (F/P, 12\%, 4) - 5,50,000 \\
 &= 8,00,000 \times (1.574) - 5,50,000 \\
 &= \text{Rs. } 7,09,200
 \end{aligned}$$

The future worth cost of machine A is less than that of machine B. Therefore, machine A should be selected.

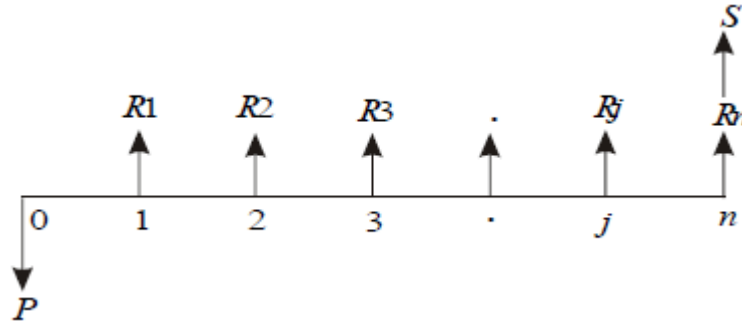
ANNUAL EQUIVALENT METHOD

INTRODUCTION

In the annual equivalent method of comparison, first the annual equivalent cost or the revenue of each alternative will be computed. Then the alternative with the maximum annual equivalent revenue in the case of revenue-based comparison or with the minimum annual equivalent cost in the case of cost-based comparison will be selected as the best alternative.

Revenue-Dominated Cash Flow Diagram

A generalized revenue-dominated cash flow diagram to demonstrate the annual equivalent method of comparison is presented in Fig. 6.1.



P represents an initial investment, R_j the net revenue at the end of the j th year, and S the salvage value at the end of the n th year. The first step is to find the net present worth of the cash flow diagram using the following expression for a given interest rate, i :

$$PW(i) = -P + R_1/(1+i)^1 + R_2/(1+i)^2 + \dots + R_j/(1+i)^j + \dots + R_n/(1+i)^n + S/(1+i)^n$$

In the above formula, the expenditure is assigned with a negative sign and the revenues are assigned with a positive sign.

In the second step, the annual equivalent revenue is computed using the following formula:

$$A = PW(i) \frac{i(1+i)^n}{(1+i)^n - 1}$$

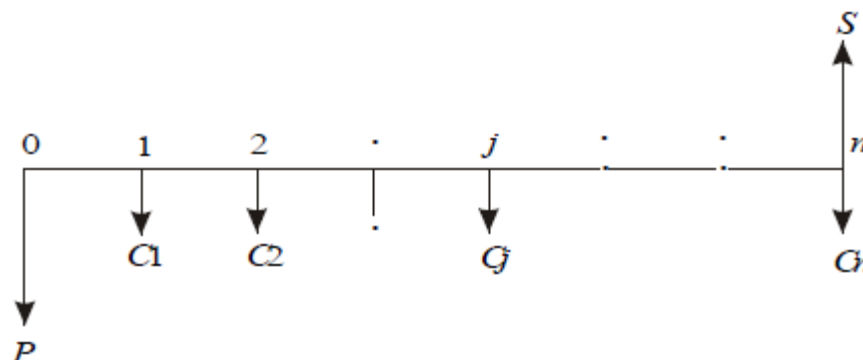
$$= PW(i) (A/P, i, n)$$

where $(A/P, i, n)$ is called equal payment series capital recovery factor.

If we have some more alternatives which are to be compared with this alternative, then the corresponding annual equivalent revenues are to be computed and compared. Finally, the alternative with the maximum annual equivalent revenue should be selected as the best alternative.

Cost-Dominated Cash Flow Diagram

A generalized cost-dominated cash flow diagram to demonstrate the annual equivalent method of comparison is illustrated in Fig. 6.2.



In Fig. 6.2, P represents an initial investment, C_j the net cost of operation and maintenance at the end of the j^{th} year, and S the salvage value at the end of the n^{th} year.

The first step is to find the net present worth of the cash flow diagram using the following relation for a given interest rate, i .

$$PW(i) = P + C_1/(1+i)^1 + C_2/(1+i)^2 + \dots + C_j/(1+i)^j + \dots + C_n/(1+i)^n - S/(1+i)^n$$

In the above formula, each expenditure is assigned with positive sign and the salvage value with negative sign. Then, in the second step, the annual equivalent cost is computed using the following equation:

$$\begin{aligned} A &= PW(i) \frac{i(1+i)^n}{(1+i)^n - 1} \\ &= PW(i) (A/P, i, n) \end{aligned}$$

Where, $(A/P, i, n)$ is called as equal-payment series capital recovery factor.

As in the previous case, if we have some more alternatives which are to be compared with this alternative, then the corresponding annual equivalent costs are to be computed and compared. Finally, the alternative with the minimum annual equivalent cost should be selected as the best alternative.

If we have some non-standard cash flow diagram, then we will have to follow the general procedure for converting each and every transaction to time zero and then convert the net present worth into an annual equivalent cost/revenue depending on the type of the cash flow diagram. Such procedure is to be applied to all the alternatives and finally, the best alternative is to be selected.

Alternate Approach

Instead of first finding the present worth and then figuring out the annual equivalent cost/revenue, an alternate method which is as explained below can be used. In each of the cases presented in Sections 6.2 and 6.3, in the first step, one can find the future worth of the cash flow diagram of each of the alternatives. Then, in the second step, the annual equivalent cost/revenue can be obtained by using the equation:

$$\begin{aligned} A &= F \frac{i}{(1+i)^n - 1} \\ &= F(A/F, i, n) \end{aligned}$$

where $(A/F, i, n)$ is called equal-payment series sinking fund factor.

EXAMPLE 6.1 A company provides a car to its chief executive. The owner of the company is concerned about the increasing cost of petrol. The cost per litre of petrol for the first year of operation is Rs. 21. He feels that the cost of petrol will be increasing by Re.1 every year. His experience with his company car indicates that it averages 9 km per litre of petrol. The executive expects to drive an average of 20,000 km each year for the next four years. What is the annual equivalent cost of fuel over this period of time?. If he is offered similar service with the same quality on rental basis at Rs. 60,000 per year, should the owner continue to provide company car for his executive or alternatively provide a rental car to his executive? Assume $i = 18\%$. If the rental car is preferred, then the company car will find some other use within the company.

Solution

Average number of km run/year = 20,000 km
 Number of km/litre of petrol = 9 km

Therefore,

$$\text{Petrol consumption/year} = 20,000/9 = 2222.2 \text{ litre}$$

$$\text{Cost/litre of petrol for the 1st year} = \text{Rs. } 21$$

$$\begin{aligned} \text{Cost/litre of petrol for the 2nd year} &= \text{Rs. } 21.00 + \text{Re. } 1.00 \\ &= \text{Rs. } 22.00 \end{aligned}$$

$$\begin{aligned} \text{Cost/litre of petrol for the 3rd year} &= \text{Rs. } 22.00 + \text{Re. } 1.00 \\ &= \text{Rs. } 23.00 \end{aligned}$$

$$\begin{aligned} \text{Cost/litre of petrol for the 4th year} &= \text{Rs. } 23.00 + \text{Re. } 1.00 \\ &= \text{Rs. } 24.00 \end{aligned}$$

$$\text{Fuel expenditure for 1st year} = 2222.2 \times 21 = \text{Rs. } 46,666.20$$

$$\text{Fuel expenditure for 2nd year} = 2222.2 \times 22 = \text{Rs. } 48,888.40$$

$$\text{Fuel expenditure for 3rd year} = 2222.2 \times 23 = \text{Rs. } 51,110.60$$

$$\text{Fuel expenditure for 4th year} = 2222.2 \times 24 = \text{Rs. } 53,332.80$$

The annual equal increment of the above expenditures is Rs. 2,222.20 (G).

The cash flow diagram for this situation is depicted in Fig. 6.3.

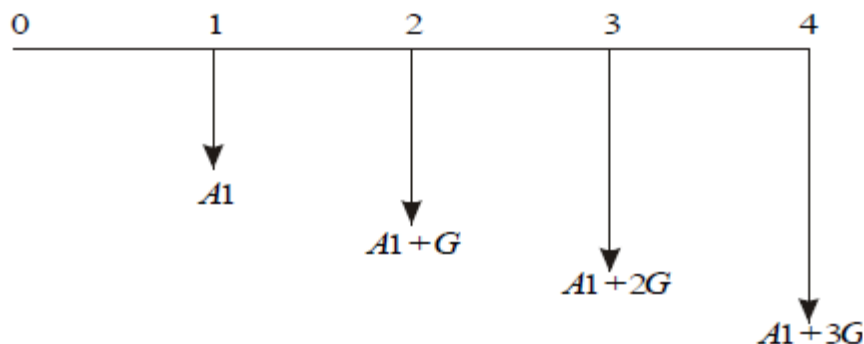


Fig. 6.3 Uniform gradient series cash flow diagram.

In Fig. 6.3, $A1 = \text{Rs. } 46,666.20$ and $G = \text{Rs. } 2,222.20$

$$\begin{aligned} A &= A1 + G(A/G, 18\%, 4) \\ &= 46,666.20 + 2222.2(1.2947) \\ &= \text{Rs. } 49,543.28 \end{aligned}$$

The proposal of using the company car by spending for petrol by the company will cost an annual equivalent amount of Rs. 49,543.28 for four years. This amount is less than the annual rental value of Rs. 60,000. Therefore, the company should continue to provide its own car to its executive.

EXAMPLE 6.2 A company is planning to purchase an advanced machine centre. Three original manufacturers have responded to its tender whose particulars are tabulated as follows:

Manufacturer	Down payment (Rs.)	Yearly equal installment (Rs.)	No. of installments
1	5,00,000	2,00,000	15
2	4,00,000	3,00,000	15
3	6,00,000	1,50,000	15

Determine the best alternative based on the annual equivalent method by assuming $i = 20\%$, compounded annually.

Solution Alternative 1

Down payment, $P = \text{Rs. } 5,00,000$
 Yearly equal installment, $A = \text{Rs. } 2,00,000$
 $n = 15$ years
 $i = 20\%$, compounded annually

The cash flow diagram for manufacturer 1 is shown in Fig. 6.4.

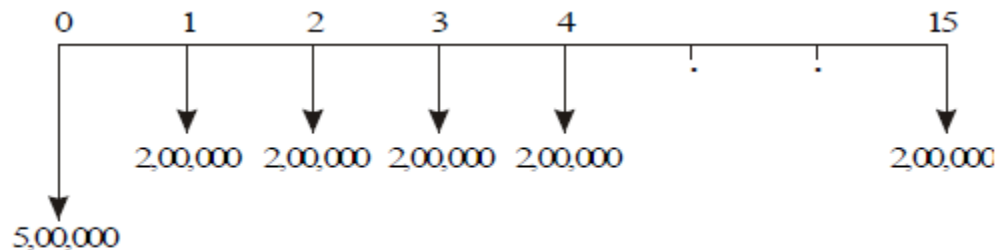


Fig. 6.4 Cash flow diagram for manufacturer 1.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE_1(20\%) &= 5,00,000(A/P, 20\%, 15) + 2,00,000 \\ &= 5,00,000(0.2139) + 2,00,000 \\ &= 3,06,950 \end{aligned}$$

Alternative 2

Down payment, $P = \text{Rs. } 4,00,000$
 Yearly equal installment, $A = \text{Rs. } 3,00,000$
 $n = 15$ years
 $i = 20\%$, compounded annually

The cash flow diagram for the manufacturer 2 is shown in Fig. 6.5.

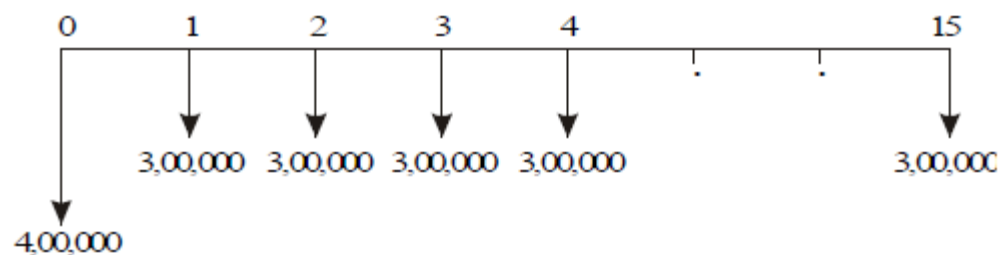


Fig. 6.5 Cash flow diagram for manufacturer 2.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE_2(20\%) &= 4,00,000(A/P, 20\%, 15) + 3,00,000 \\ &= 4,00,000(0.2139) + 3,00,000 \\ &= \text{Rs. } 3,85,560. \end{aligned}$$

Alternative 3

Down payment, $P = \text{Rs. } 6,00,000$

Yearly equal installment, $A = \text{Rs. } 1,50,000$

$n = 15$ years

$i = 20\%$, compounded annually

The cash flow diagram for manufacturer 3 is shown in Fig. 6.6.

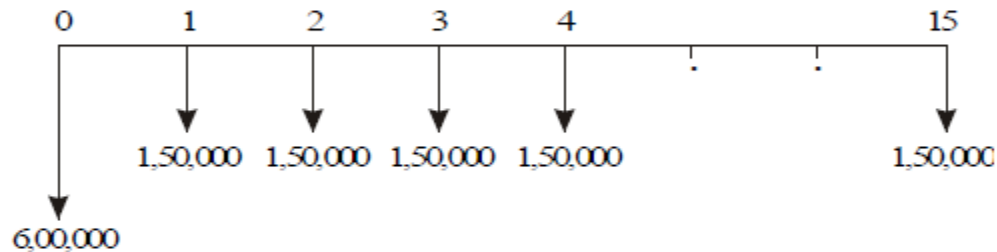


Fig. 6.6 Cash flow diagram for manufacturer 3.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE_3(20\%) &= 6,00,000(A/P, 20\%, 15) + 1,50,000 \\ &= 6,00,000(0.2139) + 1,50,000 \\ &= \text{Rs. } 2,78,340. \end{aligned}$$

The annual equivalent cost of manufacturer 3 is less than that of manufacturer 1 and manufacturer 2. Therefore, the company should buy the advanced machine centre from manufacturer 3.

EXAMPLE 6.3 A company invests in one of the two mutually exclusive alternatives. The life of both alternatives is estimated to be 5 years with the following investments, annual returns and salvage values.

	<i>Alternative</i>	
	A	B
Investment (Rs.)	- 1,50,000	- 1,75,000
Annual equal return (Rs.)	+ 60,000	+ 70,000
Salvage value (Rs.)	+ 15,000	+ 35,000

Determine the best alternative based on the annual equivalent method by assuming $i = 25\%$.

Solution Alternative A

Initial investment, $P = \text{Rs. } 1,50,000$

Annual equal return, $A = \text{Rs. } 60,000$

Salvage value at the end of machine life, $S = \text{Rs. } 15,000$

Life = 5 years

Interest rate, $i = 25\%$, compounded annually

The cash flow diagram for alternative A is shown in Fig. 6.7.

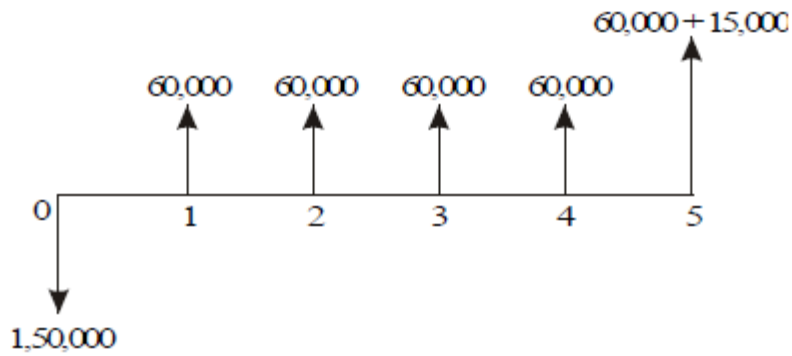


Fig. 6.7 Cash flow diagram for alternative A.

The annual equivalent revenue expression of the above cash flow diagram is as follows:

$$\begin{aligned} AE_A(25\%) &= -1,50,000(A/P, 25\%, 5) + 60,000 + 15,000(A/F, 25\%, 5) \\ &= -1,50,000(0.3718) + 60,000 + 15,000(0.1218) \\ &= \text{Rs. } 6,057 \end{aligned}$$

Alternative B

Initial investment, $P = \text{Rs. } 1,75,000$

Annual equal return, $A = \text{Rs. } 70,000$

Salvage value at the end of machine life, $S = \text{Rs. } 35,000$

Life = 5 years

Interest rate, $i = 25\%$, compounded annually

The cash flow diagram for alternative B is shown in Fig. 6.8.

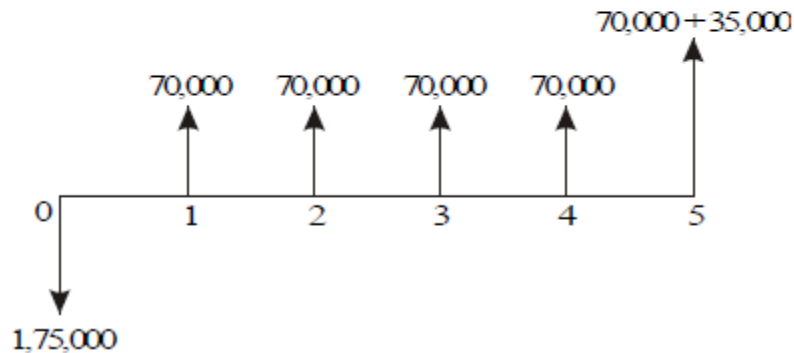


Fig. 6.8 Cash flow diagram for alternative B.

The annual equivalent revenue expression of the above cash flow diagram is

$$\begin{aligned} AE_B(25\%) &= -1,75,000(A/P, 25\%, 5) + 70,000 + 35,000(A/F, 25\%, 5) \\ &= -1,75,000(0.3718) + 70,000 + 35,000(0.1218) \\ &= \text{Rs. } 9,198 \end{aligned}$$

The annual equivalent net return of alternative B is more than that of alternative A. Thus, the company should select alternative B.

EXAMPLE 6.4 A certain individual firm desires an economic analysis to determine which of the two machines is attractive in a given interval of time. The minimum attractive rate of return for the firm is 15%. The following data are to be used in the analysis:

	<i>Machine X</i>	<i>Machine Y</i>
First cost	Rs. 1,50,000	Rs. 2,40,000
Estimated life	12 years	12 years
Salvage value	Rs. 0	Rs. 6,000
Annual maintenance cost	Rs. 0	Rs. 4,500

Which machine would you choose? Base your answer on annual equivalent cost.

Solution Machine X

First cost, $P = \text{Rs. } 1,50,000$

Life, $n = 12$ years

Estimated salvage value at the end of machine life, $S = \text{Rs. } 0$.

Annual maintenance cost, $A = \text{Rs. } 0$.

Interest rate, $i = 15\%$, compounded annually.

The cash flow diagram of machine X is illustrated in Fig. 6.9.

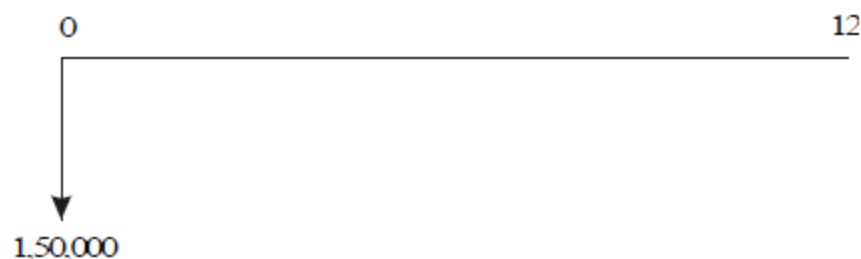


Fig. 6.9 Cash flow diagram for machine X.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 AE_X(15\%) &= 1,50,000(A/P, 15\%, 12) \\
 &= 1,50,000(0.1845) \\
 &= \text{Rs. } 27,675
 \end{aligned}$$

Machine Y

First cost, $P = \text{Rs. } 2,40,000$

Life, $n = 12$ years

Estimated salvage value at the end of machine life, $S = \text{Rs. } 60,000$

Annual maintenance cost, $A = \text{Rs. } 4,500$

Interest rate, $i = 15\%$, compounded annually.

The cash flow diagram of machine Y is depicted in Fig. 6.10.

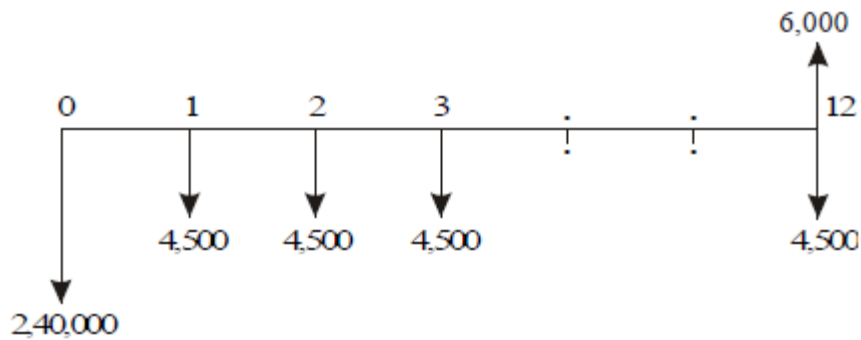


Fig. 6.10 Cash flow diagram for machine Y.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 AE_Y(15\%) &= 2,40,000(A/P, 15\%, 12) + 4,500 - 6,000(A/F, 15\%, 12) \\
 &= 2,40,000(0.1845) + 4,500 - 6,000(0.0345) \\
 &= \text{Rs. } 48,573
 \end{aligned}$$

The annual equivalent cost of machine X is less than that of machine Y. So, machine X is the more cost effective machine.

EXAMPLE 6.5 Two possible routes for laying a power line are under study. Data on the routes are as follows:

	<i>Around the lake</i>	<i>Under the lake</i>
Length	15 km	5 km
First cost (Rs.)	1,50,000/km	7,50,000/km
Useful life (years)	15	15
Maintenance cost (Rs.)	6,000/km/yr	12,000/km/yr
Salvage value (Rs.)	90,000/km	1,50,000/km
Yearly power loss (Rs.)	15,000/km	15,000/km

If 15% interest is used, should the power line be routed around the lake or under the lake?

Solution Alternative 1—Around the lake

$$\text{First cost} = 1,50,000 \times 15 = \text{Rs. } 22,50,000$$

$$\text{Maintenance cost/yr} = 6,000 \times 15 = \text{Rs. } 90,000$$

$$\text{Power loss/yr} = 15,000 \times 15 = \text{Rs. } 2,25,000$$

$$\begin{aligned}
 \text{Maintenance cost and power loss/yr} &= \text{Rs. } 90,000 + \text{Rs. } 2,25,000 \\
 &= \text{Rs. } 3,15,000
 \end{aligned}$$

$$\text{Salvage value} = 90,000 \times 15 = \text{Rs. } 13,50,000$$

The cash flow diagram for this alternative is shown in Fig. 6.11.

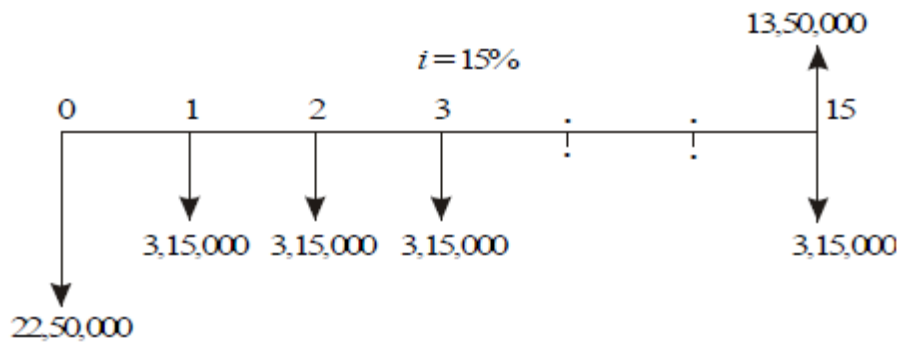


Fig. 6.11 Cash flow diagram for alternative 1.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE_1(15\%) &= 22,50,000(A/P, 15\%, 15) + 3,15,000 - 13,50,000(A/F, 15\%, 15) \\ &= 22,50,000(0.1710) + 3,15,000 - 13,50,000(0.0210) \\ &= \text{Rs. } 6,71,400 \end{aligned}$$

Alternative 2—Under the lake

First cost = $7,50,000 \times 5 = \text{Rs. } 37,50,000$

Maintenance cost/yr = $12,000 \times 5 = \text{Rs. } 60,000$

Power loss/yr = $15,000 \times 5 = \text{Rs. } 75,000$

Maintenance cost and power loss/yr = $\text{Rs. } 60,000 + \text{Rs. } 75,000$
 $= \text{Rs. } 1,35,000$

Salvage value = $1,50,000 \times 5 = \text{Rs. } 7,50,000$

The cash flow diagram for this alternative is shown in Fig. 6.12.

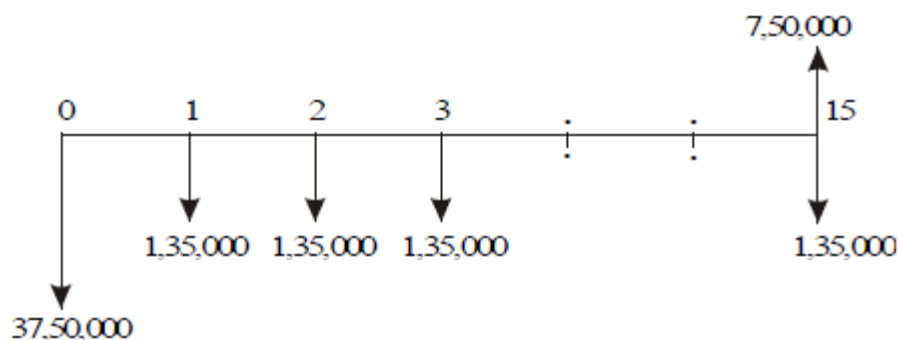


Fig. 6.12 Cash flow diagram for alternative 2.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE_2(15\%) &= 37,50,000(A/P, 15\%, 15) + 1,35,000 - 7,50,000(A/F, 15\%, 15) \\ &= 37,50,000(0.1710) + 1,35,000 - 7,50,000(0.0210) \\ &= \text{Rs. } 7,60,500 \end{aligned}$$

The annual equivalent cost of alternative 1 is less than that of alternative 2. Therefore, select the route around the lake for laying the power line.

EXAMPLE 6.6 A suburban taxi company is analyzing the proposal of buying cars with diesel engines instead of petrol engines. The cars average 60,000 km a year with a useful life of three years for the petrol taxi and four years for the diesel taxi. Other comparative details are as follows:

	<i>Diesel</i>	<i>Petrol</i>
Vehicle cost (Rs.)	3,90,000	3,60,000
Fuel cost per litre (Rs.)	8	20
Mileage in km/litre	30	20
Annual repairs (Rs.)	9,000	6,000
Annual insurance premium (Rs.)	15,000	15,000
Resale value at the end of vehicle life (Rs.)	60,000	90,000

Determine the more economical choice if interest rate is 20%, compounded annually.

Solution Alternative 1—Purchase of diesel taxi

Vehicle cost = Rs. 3,90,000

Life = 4 years

Number of litres/year $60,000/30 = 2,000$ litres

Fuel cost/yr = $2,000 \times 8 =$ Rs. 16,000

Fuel cost, annual repairs and insurance premium/yr

= Rs. 16,000 + Rs. 9,000 + Rs. 15,000 = Rs. 40,000

Salvage value at the end of vehicle life = Rs. 60,000

The cash flow diagram for alternative 1 is shown in Fig. 6.13.

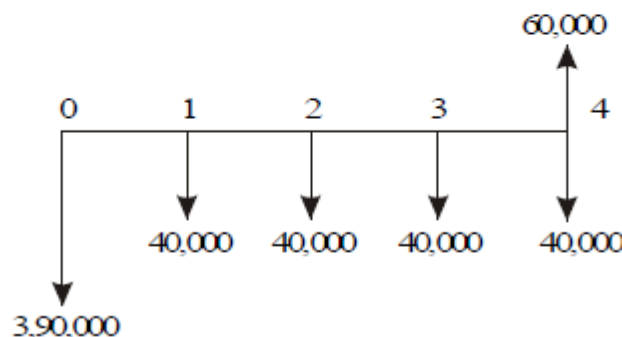


Fig. 6.13 Cash flow diagram for alternative 1.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 AE(20\%) &= 3,90,000(A/P, 20\%, 4) + 40,000 - 60,000(A/F, 20\%, 4) \\
 &= 3,90,000(0.3863) + 40,000 - 60,000(0.1863) \\
 &= \text{Rs. } 1,79,479
 \end{aligned}$$

Alternative 2—Purchase of petrol taxi

Vehicle cost = Rs. 3,60,000

Life = 3 years

Number of litres/year $60,000/20 = 3,000$ litres

Fuel cost/yr = $3,000 \times 20 =$ Rs. 60,000

Fuel cost, annual repairs and insurance premium/yr
 = Rs. 60,000 + Rs. 6,000 + Rs. 15,000 = Rs. 81,000
 Salvage value at the end of vehicle life = Rs. 90,000
 The cash flow diagram for alternative 2 is shown in Fig. 6.14.

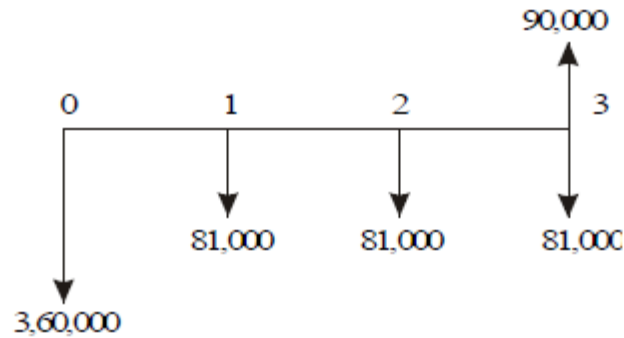


Fig. 6.14 Cash flow diagram for alternative 2.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 AE(20\%) &= 3,60,000(A/P, 20\%, 3) + 81,000 - 90,000(A/F, 20\%, 3) \\
 &= 3,60,000(0.4747) + 81,000 - 90,000(0.2747) \\
 &= \text{Rs. } 2,27,169
 \end{aligned}$$

The annual equivalent cost of purchase and operation of the cars with diesel engine is less than that of the cars with petrol engine. Therefore, the taxi company should buy cars with diesel engine. (Note: Comparison is done on common multiple lives of 12 years.)

EXAMPLE 6.7 Ramu, a salesman, needs a new car for use in his business. He expects that he will be promoted to a supervisory job at the end of third year and so his concern now is to have a car for the three years he expects to be “on the road”. The company will reimburse their salesman each month the fuel cost and maintenance cost. Ramu has decided to drive a low-priced automobile. He finds, however, that there are two different ways of obtaining the automobile. In either case, the fuel cost and maintenance cost are borne by the company.

- (a) Purchase for cash at Rs. 3,90,000.
- (b) Lease a car. The monthly charge is Rs. 10,500 on a 36-month lease payable at the end of each month. At the end of the three-year period, the car is returned to the leasing company.

Ramu believes that he should use a 12% interest rate compounded monthly in determining which alternative to select. If the car could be sold for Rs. 1,20,000 at the end of the third year, which option should he use to obtain it?

Alternative 1—Purchase car for cash

Purchase price of the car = Rs. 3,90,000

Life = 3 years = 36 months

Salvage value after 3 years = Rs. 1,20,000

Interest rate = 12% (nominal rate, compounded annually)
 = 1% compounded monthly

The cash flow diagram for alternative 1 is shown in Fig. 6.15.

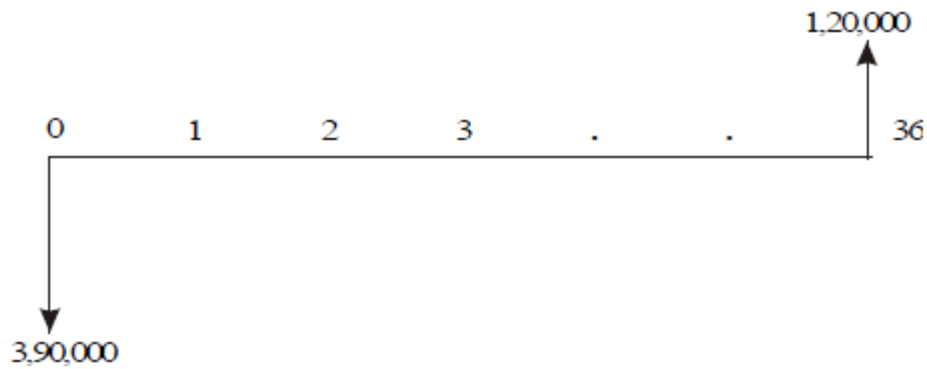


Fig. 6.15 Cash flow diagram for alternative 1.

The monthly equivalent cost expression $[ME(1\%)]$ of the above cash flow diagram is

$$\begin{aligned}
 ME(1\%) &= 3,90,000(A/P, 1\%, 36) - 1,20,000(A/F, 1\%, 36) \\
 &= 3,90,000(0.0332) - 1,20,000(0.0232) \\
 &= \text{Rs. } 10,164
 \end{aligned}$$

Alternative 2—Use of car under lease

Monthly lease amount for 36 months = Rs. 10,500

The cash flow diagram for alternative 2 is illustrated in Fig. 6.16.

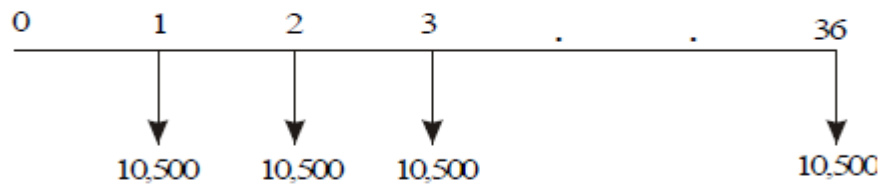


Fig. 6.16 Cash flow diagram for alternative 2.

Monthly equivalent cost = Rs.10,500.

The monthly equivalent cost of alternative 1 is less than that of alternative 2. Hence, the salesman should purchase the car for cash.

EXAMPLE 6.8 A company must decide whether to buy machine A or machine B.

	<i>Machine A</i>	<i>Machine B</i>
Initial cost (Rs.)	3,00,000	6,00,000
Useful life (years)	4	4
Salvage value at the end of machine life (Rs.)	2,00,000	3,00,000
Annual maintenance (Rs.)	30,000	0

At 15% interest rate, which machine should be purchased?

Solution Machine A

Initial cost = Rs. 3,00,000

Useful life (years) = 4

Salvage value at the end of machine life = Rs. 2,00,000

Annual maintenance = Rs. 30,000

Interest rate = 15%, compounded annually

The cash flow diagram of machine A is depicted in Fig. 6.17.

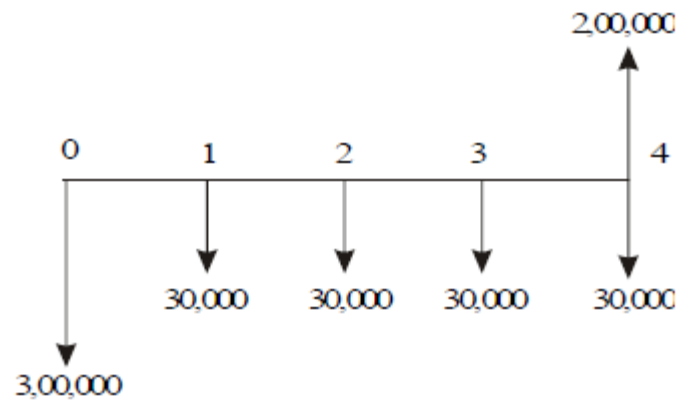


Fig. 6.17 Cash flow diagram for machine A.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE(15\%) &= 3,00,000(A/P, 15\%, 4) + 30,000 - 2,00,000(A/F, 15\%, 4) \\ &= 3,00,000(0.3503) + 30,000 - 2,00,000(0.2003) \\ &= \text{Rs. } 95,030 \end{aligned}$$

Machine B

Initial cost = Rs. 6,00,000

Useful life (years) = 4

Salvage value at the end of machine life = Rs. 3,00,000

Annual maintenance = Rs. 0.

Interest rate = 15%, compounded annually

The cash flow diagram of machine B is illustrated in Fig. 6.18.

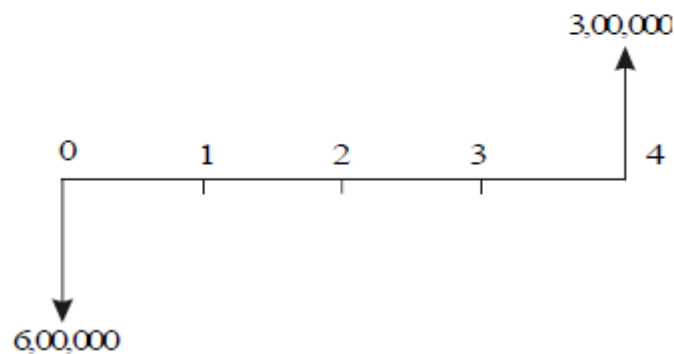


Fig. 6.18 Cash flow diagram for machine B.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE(15\%) &= 6,00,000(A/P, 15\%, 4) - 3,00,000(A/F, 15\%, 4) \\ &= 6,00,000(0.3503) - 3,00,000(0.2003) \\ &= \text{Rs. } 1,50,090 \end{aligned}$$

Since the annual equivalent cost of machine A is less than that of machine B, it is advisable to buy machine A.

EXAMPLE 6.9 Jothi Lakshimi has arranged to buy some home recording equipment. She estimates that it will have a five year useful life and no salvage value at the end of equipment life. The dealer, who is a friend has offered Jothi Lakshimi two alternative ways to pay for the equipment.

- Pay Rs. 60,000 immediately and Rs. 15,000 at the end of one year.
- Pay nothing until the end of fourth year when a single payment of Rs. 90,000 must be made.

If Jothi Lakshimi believes 12% is a suitable interest rate, which alternative is the best for her?

Solution Alternative 1

Down payment = Rs. 60,000

Payment after one year = Rs. 15,000

The cash flow diagram for alternative 1 is shown in Fig. 6.19.



Fig. 6.19 Cash flow diagram for alternative 1.

The present worth equation of the above cash flow diagram is

$$\begin{aligned}
 PW(12\%) &= 60,000 + 15,000(P/F, 12\%, 1) \\
 &= 60,000 + 15,000(0.8929) \\
 &= 73,393.50
 \end{aligned}$$

The above present worth is represented in Fig. 6.20.

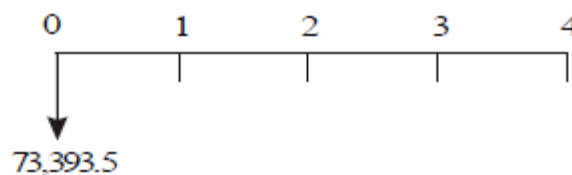


Fig. 6.20 Resultant cash flow diagram.

The annual equivalent expression of the above cash flow diagram is

$$\begin{aligned}
 AE(12\%) &= 73,393.5(A/P, 12\%, 4) \\
 &= 73,393.5(0.3292) \\
 &= \text{Rs. } 24,161.14
 \end{aligned}$$

Alternative 2

Payment after four years = Rs. 90,000

The cash flow diagram for alternative 2 is shown in Fig. 6.21.

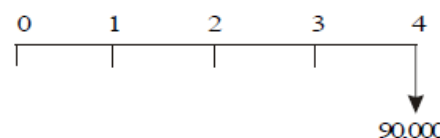


Fig. 6.21 Cash flow diagram of alternative 2.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE(12\%) &= 90,000(A/F, 12\%, 4) \\ &= 90,000(0.2092) \\ &= \text{Rs. } 18,828 \end{aligned}$$

The annual equivalent cost of alternative 2 is less than that of alternative 1. Hence, Jothi Lakshimi should select alternative 2 for purchasing the home equipment.

EXAMPLE 6.10 A transport company has been looking for a new tyre for its truck and has located the following alternatives:

<i>Brand</i>	<i>Tyre warranty (months)</i>	<i>Price per tyre (Rs.)</i>
A	12	1,200
B	24	1,800
C	36	2,100
D	48	2,700

If the company feels that the warranty period is a good estimate of the tyre life and that a nominal interest rate (compounded annually) of 12% is appropriate, which tyre should it buy?

Solution In all the cases, the interest rate is 12%. This is equivalent to 1% per month.

Brand A

Tyre warranty = 12 months

Price/tyre = Rs. 1,200

The cash flow diagram for brand A is shown in Fig. 6.22.

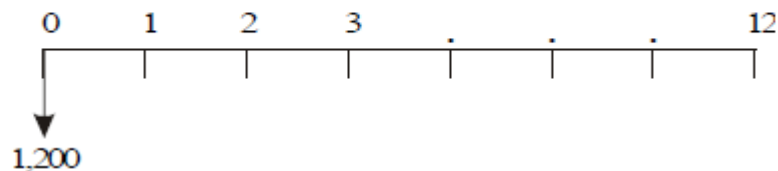


Fig. 6.22 Cash flow diagram of brand A.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned} AE(1\%) &= 1,200(A/P, 1\%, 12) \\ &= 1,200(0.0888) \\ &= \text{Rs. } 106.56 \end{aligned}$$

Brand B

Tyre warranty = 24 months

Price/tyre = Rs. 1,800

The cash flow diagram for brand B is shown in Fig. 6.23.

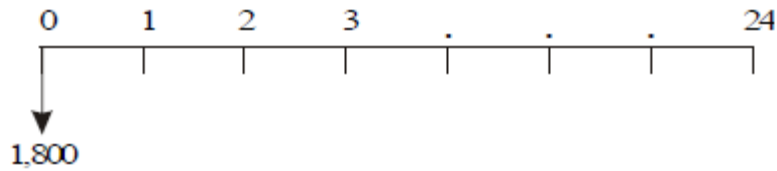


Fig. 6.23 Cash flow diagram of brand B.

Fig. 6.23 Cash flow diagram of brand B.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 AE(1\%) &= 1,800(A/P, 1\%, 24) \\
 &= 1,800(0.0471) \\
 &= \text{Rs. } 84.78
 \end{aligned}$$

Brand C

Tyre warranty = 36 months

Price/tyre = Rs. 2,100

The cash flow diagram for brand C is shown in Fig. 6.24.

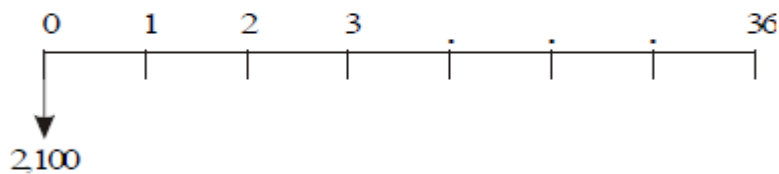


Fig. 6.24 Cash flow diagram of brand C.

The annual equivalent expression of the above cash flow diagram is

$$\begin{aligned}
 AE(1\%) &= 2,100(A/P, 1\%, 36) \\
 &= 2,100(0.0332) \\
 &= \text{Rs. } 69.72
 \end{aligned}$$

Brand D

Tyre warranty = 48 months

Price/tyre = Rs. 2,700

The cash flow diagram for brand D is shown in Fig. 6.25.

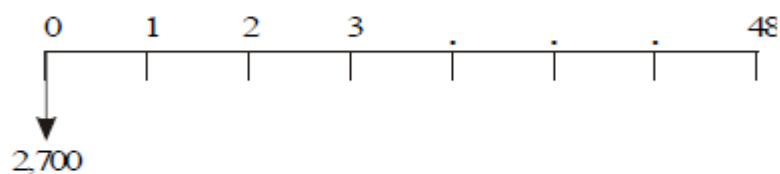


Fig. 6.25 Cash flow diagram of brand D.

The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 AE(1\%) &= 2,700(A/P, 1\%, 48) \\
 &= 2,700(0.0263) \\
 &= \text{Rs. } 71.01
 \end{aligned}$$

Here, minimum common multiple lives of tyres is considered. This is 144 months. Therefore, the comparison is made on 144 month's basis.

The annual equivalent cost of brand C is less than that of other brands. Hence, it should be used in the vehicles of the trucking company. It should be replaced four times during the 144-month period.



UNIT IV

Principles of management: Basic concepts of management–Scientific management–Henry Fayol’s Principles of management–Types and functions of management. Types of Organisation –characteristics, merits and demerits. Types of industrial ownership–Characteristics, merits and demerits.

UNIT IV

2 MARKS

1. DEFINE MANAGEMENT?

Management is a universal phenomenon. It is a very popular and widely used term. All organizations - business, political, cultural or social are involved in management because it is the management which helps and directs the various efforts towards a definite purpose.

According to **Harold Koontz**, “Management is an art of getting things done through and with the people in formally organized groups. It is an art of creating an environment in which people can perform and individuals and can co-operate towards attainment of group goals”.

According to **F.W. Taylor**, “Management is an art of knowing what to do, when to do and see that it is done in the best and cheapest way”.

2. WHAT ARE THE FEATURES & NATURE & IMPORTANCE OF MANAGEMENT?

1. Management is a Goal-Oriented process
2. Management integrates Human, Physical and Financial Resources
4. Management is a Group Activity
5. Getting Maximum Results with Minimum Efforts
6. Increasing the Efficiency of factors of Production
7. Maximum Prosperity for Employer & Employees
8. Human betterment & Social Justice
9. It helps in achieving group goals
10. Optimum utilization of resources
12. Reduces costs by proper planning
13. Establishes Sound Organization
14. Management is a social
15. Management is an integrating process
16. Management is a continuous process

3. WHAT ARE THE LEVELS OF MANAGEMENT?

The term “Levels of Management” refers to a line of demarcation between various managerial positions in an organization. The number of levels in management increases when the size of the business and work force increases and vice versa. The level of management determines a chain of command, the amount of authority & status enjoyed by any managerial position. The levels of management can be classified in three broad categories: -



4. STATE THE IMPORTANT MANAGERIAL SKILLS REQUIRED FOR A MANAGER?

There are four skills of managers are expected to have ability of:

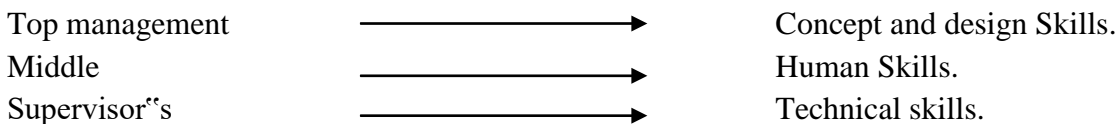
(1) Technical skills: Technical skills that reflect both an understanding of and a proficiency in a specialized field. For example, a manager may have technical skills in accounting, finance, engineering, manufacturing, or computer science.

Human Skills: Human skills are skills associated with manager’s ability to work well with others, both as a member of a group and as a leader who gets things done through other.

Concept Skills: Conceptual skills related to the ability to visualize the organization as a whole, discern interrelationships among organizational parts, and understand how the organization fits into the wider context of the industry, community, and world. Conceptual skills, coupled with technical skills, human skills and knowledge base, are important ingredients in organizational performance.

Design Skills: It is the ability to solve the problems in ways that will benefit the enterprise. Managers must be able to solve the problems.

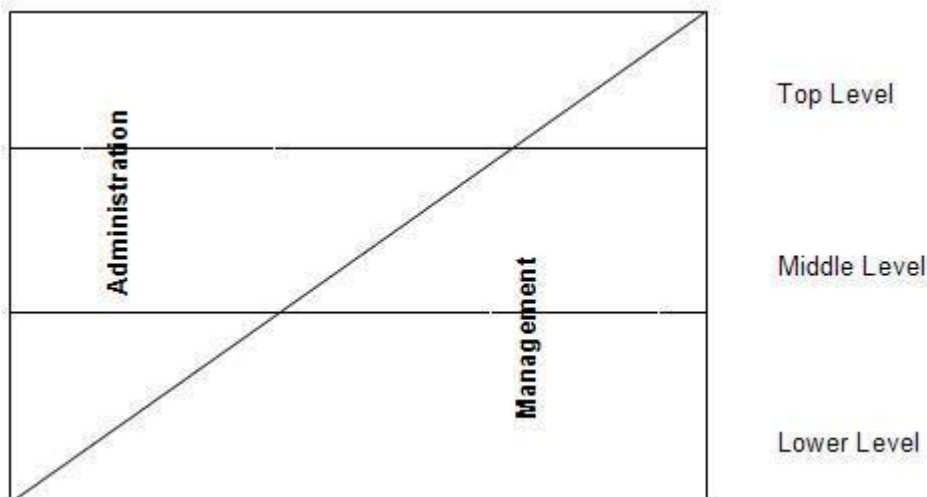
The Skills vary at different levels:



5. MANAGEMENT AND ADMINISTRATION – DIFFERENTIATE.

The difference between Management and Administration can be summarized under 2 categories:

1. **Functions**
2. **Usage / Applicability**



On the Basis of Usage: -

Basis	Management	Administration
Applicability	It is applicable to business concerns i.e. It is applicable to profit-making organization.	It is applicable to non-business concerns i.e. profit-clubs, schools, hospitals etc.
Influence	The management decisions are influenced by the values, opinions, beliefs & decisions of the managers.	The administration is influenced by public opinion, govt. policies, religious organizations, customs etc.
Status	Management constitutes the employees of the organization who are paid remuneration (in the form of salaries & wages).	Administration represents owners of the enterprise who earn return on their capital invested & profits in the form of dividend.

On the Basis of Functions: -

Basis	Management	Administration
Meaning	Management is an art of getting things done through others by directing their efforts towards achievement of pre-determined goals.	It is concerned with formulation of broad objectives, plans & policies.
Nature	Management is an executing function.	Administration is a decision-making function.
Process	Management decides who should do it & how should he do it.	Administration decides what is to be done & when it is to be done.
Function	Management is a doing function because managers get work done under their supervision.	Administration is a thinking function because plans & policies are determined under it.
Skills	Technical and Human skills	Conceptual and Human skills
Level	Middle & lower level function	Top level function

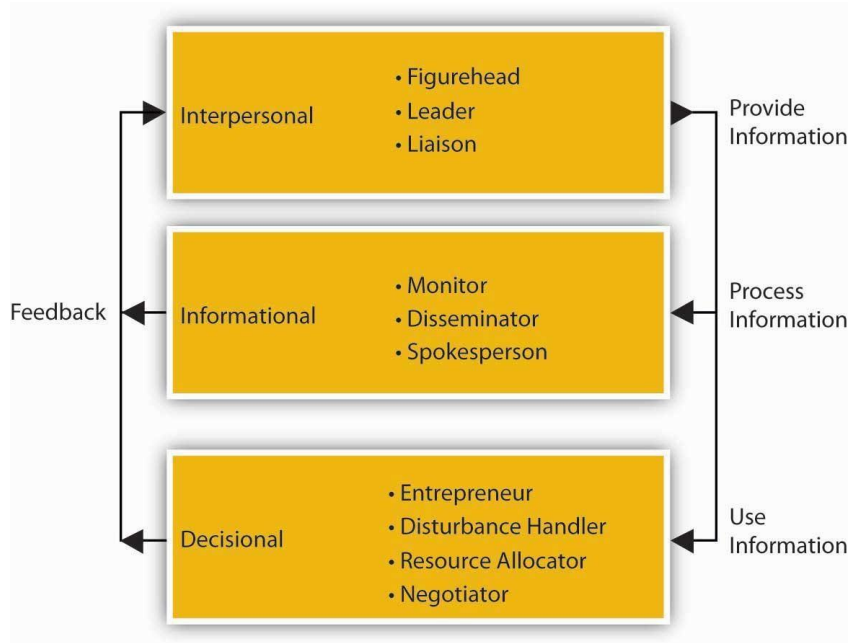
6. STATE THE ROLES OF MANAGEMENT OR MANAGER?

The 10 roles are then divided up into three categories, as follows:

Interpersonal Category

The roles in this category involve providing information and ideas.

1. **Figurehead** - As a manager, you have social, ceremonial and legal responsibilities. You're expected to be a source of inspiration. People look up to you as a person with authority, and as a figurehead.
2. **Leader** - This is where you provide leadership for your team, your department or perhaps your entire organization; and it's where you manage the performance and responsibilities of everyone in the group.
3. **Liaison** - Managers must communicate with internal and external contacts. You need to be able to network effectively on behalf of your organization.



Informational Category

The roles in this category involve processing information.

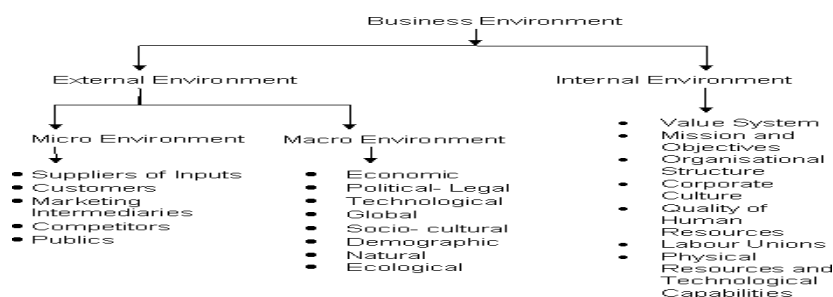
1. **Monitor** - In this role, you regularly seek out information related to your organization and industry, looking for relevant changes in the environment. You also monitor your team, in terms of both their productivity, and their well-being.
2. **Disseminator** - This is where you communicate potentially useful information to your colleagues and your team.
3. **Spokesperson** - Managers represent and speak for their organization. In this role you're responsible for transmitting information about your organization and its goals to the people outside it.

Decisional Category

The roles in this category involve using information.

1. **Entrepreneur** - As a manager, you create and control change within the organization. This means solving problems, generating new ideas, and implementing them.
2. **Disturbance Handler** - When an organization or team hits an unexpected roadblock, it's the manager who must take charge. You also need to help mediate disputes within it.
3. **Resource Allocator** - You'll also need to determine where organizational resources are best applied. This involves allocating funding, as well as assigning staff and other organizational resources.
4. **Negotiator** - You may be needed to take part in, and direct, important negotiations within your team, department, or organization.

7. WHAT ARE THE ENVIRONMENTAL FACTORS AFFECTING BUSINESS ENVIRONMENT OR ENVIRONMENTAL FOUNDATION FOR A BUSINESS?



8. WHAT IS MEANT BY BUSINESS ENVIRONMENT?

Business Environment refers to those aspects of the surroundings of business enterprises which affect or influence its operations and determine its effectiveness. It includes factors like socio-economic, technological, suppliers, competitor and the government. There are two more factors i.e., physical or natural environment and global environment.

DEFINITION:-

The environment includes factors outside the firm, which can lead to opportunities for or threats to the firm. Although there are many factors, the most important of the sectors are socio-economic, technological, suppliers, competitors and government.

9. WHAT IS THE MEANING OF ORGANISATION?

Organisation is the foundation upon which the whole structure of management is built. Organisation is related with developing a frame work where the total work is divided into manageable components in order to facilitate the achievement of objectives or goals. Thus, organisation is the structure or mechanism (machinery) that enables living things to work together. In a static sense, an organisation is a structure or machinery manned by group of individuals who are working together towards a common goal.

10. DEFINITIONS OF ORGANISATION? (Ariil"2012)

According to **Chester I. Barnard**, "Organisation is a system of co-operative activities of two or more persons."

According to **Louis A. Allen**, "Organisation is the process of identifying and grouping the work to be performed, defining and delegating responsibility and authority, and establishing relationship for the purpose of enabling people to work most effectively together in accomplishing objectives."

According to **Mooney and Railey**, "Organisation is the form of every human association for the attainment of a common purpose."

11. WHAT ARE THE CHARACTERISTICS / FEATURES OF ORGANISATION?

The main characteristics or Features of organisation are as follows:

Outlining the Objectives: Born with the enterprise are its long-life objectives of profitable manufacturing and selling its products. Other objectives must be established by the administration from time to time to aid and support this main objective.

Identifying and Enumerating the Activities: After the objective is selected, the management has to identify total task involved and its break-up closely related component activities that are to be performed by and individual or division or a department.

Assigning the Duties: When activities have been grouped according to similarities and common purposes, they should be organized by a particular department. Within the department, the functional duties should be allotted to particular individuals.

Defining and Granting the Authority: The authority and responsibility should be well defined and should correspond to each other. A close relationship between authority and responsibility should be established.

Creating Authority Relationship: After assigning the duties and delegations of authority, the establishment of relationship is done. It involves deciding who will act under whom, who will be his subordinates, what will be his span of control and what will be his status in the organisation. Besides these formal relationships, some informal organizations should also be developed.

12. STATE THE IMPORTANCE / NEED / ADVANTAGES / SIGNIFICANCE OF ORGANISATION?

It Facilitated Administration and management: Organisation is an important and the only tool to achieve enterprise goals set b administration and explained by management. A sound organisation increases efficiency, avoids delay and duplication of work, increases managerial efficiency, increases promptness, motivates employees to perform their responsibility.

It Help in the Growth of Enterprise: Good organisation is helpful to the growth, expansion and diversifications of the enterprise.

It Ensures Optimum Use of Human Resources: Good organisation establishes persons with different interests, skills, knowledge and viewpoints.

It Stimulates Creativity: A sound and well-conceived organisation structure is the source of creative thinking and initiation of new ideas.

A Tool of Achieving Objectives: Organisation is a vital tool in the hands of the management for achieving set objectives of the business enterprise.

Prevents Corruption: Usually corruption exists in those enterprises which lack sound organisation. Sound organization prevents corruption by raising the morale of employees. They are motivated to work with greater efficiency, honesty and devotion.

Co-ordination in the Enterprises: Different jobs and positions are welded together by structural relationship of the organisation. The organizational process exerts its due and balanced emphasis on the co-ordination of various activities.

13. DEFINE ORGANISATIONAL STRUCTURE?

Organisational structure is defined as the “**relatively enduring allocation of work roles and administrative mechanisms that creates a pattern of interrelated work activities and allows the organisation to conduct, co-ordinate and control its work activities**”

To put it in simple words Organisational structure refers to the levels of management and division of responsibilities within an organisation.

14. WHAT IS LINE ORGANISATION?

It is perhaps the oldest and the simple organisational structure. In this kind of structure every manager exercise a direct authority over his subordinate who in turn directly reports to their superiors.

15. WHAT IS FUNCTIONAL ORGANISATION?

The organisation is divided into a number of functional areas. This organisation has grouping of activities in accordance with the functions of an organisation such as production, marketing, finance, human resource and so on. The specialist in charge of a functional department has the authority over all other employees for his function.

16. WHAT IS LINE AND STAFF ORGANISATION?

It is a combination of line and functional structures. In this organisation a structure, the authority flows in a vertical line and get the help of staff specialist who are in advisory. When the line executives need advice, information about any specific area, these staff specialists are consulted.

For example Chief accountant has command authority over accountants and clerks in the accounts departments but he has only advisory relationship with other departments like production or sales.

17. WHAT IS PROJECT ORGANISATION?

The project structure consists of a number of horizontal organisational units to complete projects of a long duration. A team of specialists from different areas is created for each project. Usually this team is managed by the project manager. The project staff is separate from and independent of the functional departments.

18. WHAT IS MATRIX ORGANISATION?

Matrix organisation combines two structures – functional departmentation and project structure. Functional department is a permanent feature of the matrix structure and retains authority for overall operation of the functional units. Project teams are created whenever specific projects require a high degree of technical skill and other resources for a temporary period.

19. DIFFERENTIATE - FORMAL & INFORMAL ORGANISATION

Formal organization	Informal organisation
<p>1. Origin It is a deliberate or intentional creation by management done for purpose of achieving the objectives of the enterprise.</p> <p>2. Objectives Its different departments have specific objectives which are developed through definite planning and decision-making process.</p> <p>3. Functioning To pre-planned rules, polices, procedures and programmes.</p> <p>4. Authority-responsibility relationships There are clear-cut and properly defined, authority and responsibility relationship which are usually shown through organizational chart.</p> <p>5. Leadership Every group manager, is a leader; by virtue of, his official status and authority.</p> <p>6. Communication system There is well planned system of communication routed through the scalar-chain.</p> <p>7. Stability It is most stable</p> <p>8. Political domination At least on the face of it, is away form political domination.</p>	<p>It is a „self-generating process“. It comes into existence; due to the operation of certain socio-psychological factors.</p> <p>It does not have any specific objectives evolved through planning etc.</p> <p>There is no such rules and procedure of functioning.</p> <p>There are no such specific authority and responsibility relationships. It represents a natural-social structure-never depicted on a chart.</p> <p>Leaders are those who are popularly accepted by all or a majority of the group-to act as leaders of the group.-Personal power.</p> <p>It is of a grapevine nature i.e it might spread from any person to any person, in any manner and in any direction.</p> <p>It is least stable.</p> <p>In a large number of cases are politically dominated.</p>

20. DEFINE PLANNING?

Definition: Planning is deciding in advance what is to be done. It involves the selection of objectives , policies, procedures, and programmes from among alternatives.

Planning is the process of thinking through and making explicit the strategy, actions and relationships necessary to accomplish an overall objective or purpose.

21. DEFINE PLANNING PREMISES?

According to Koontz and O.Donnell “planning premises are the anticipated environment in which plans are expected to operate”. They include assumptions or forecasts of the future and known conditions that will affect the course of plans, such as prevailing policies, and existing company plans that control the basic nature of supporting plans.

22. WHAT ARE THE TYPES OF PLANNING PREMISES?

External Premises : External premises are those which lie outside the firm eg., general business environment – economical, technological, political and social conditions demand& supply forces for the product or service, the market for land, labour and capital.

Internal Premises : Internal Premises are those which lie inside of the firm **Eg.,**sales forecast, capital investment in plant and equipment, competency of managerial personnel, skill of labour force etc.,

Tangible premises : Tangible forces are those which can be quantified eg., money, units of production.

Intangible premises : It refers to qualitative factors like public relations, company reputation, employee morale etc.,

Controllable premises : They are entirely within the control of the management eg., policies, rules, programmes etc.,

Uncontrollable premises : Premises over which an enterprise has no absolute control. Eg., union-management relations, supply position in industry etc.

23. WHAT ARE THE CHARACTERISTICS OR FEATURES OF PLANNING?

- | | |
|--------------------------------------|-------------------------------------|
| (i) Planning is goal-oriented | (ii) Planning is a primary function |
| (iii) Planning is all-pervasive | (iv) Planning is a mental exercise |
| (v) Planning is a continuous process | (vi) Planning involves choice |
| (vii) Planning is forward looking | (viii) Planning is flexible |

24. WHAT ARE THE KINDS OF PLANNING?

1.Strategic and Functional Planning: In strategic or corporate planning, the top management determines the general objectives of the enterprise and the steps necessary to accomplish them in the light of resources currently available and likely to be available in the future.

Functional planning, on the other hand, is planning that covers functional areas like production, marketing, finance and purchasing.

2. Long-range and Short-range Planning: Long-range planning sets long-term goals for the enterprise and then proceeds to formulate specific plans for attaining these goals. It involves an attempt to anticipate, analyze and make decisions about basic problems and issues which have significance reaching well beyond the present operating horizon of the enterprise.

Short-range planning, on the other hand, is concerned with the determination of short-term activities to accomplish long term objectives. Short-range planning relates to a relatively short period and has to be consistent with the long-range plans. Operational plans are generally related to short periods.

3. Ad hoc and Standing Planning:

Ad hoc planning committees may be constituted for certain specific matters, as for instance, project planning. But standing plans are designed to be used over and over again. They include organizational structure, standard procedures, standard methods, etc.

4. Administrative and Operational Planning: Administrative planning is done by the middle level management, which provides the foundation for operative plans. The lower level managers to put the administrative plans into action, on the other hand, do operative planning.

5. Formal and Informal Planning: Various types of planning discussed above are of formal nature. The management carries them on systematically. They specify in black and white, the specific goals and the steps to achieve them. They also facilitate the installation of internal control systems. Informal planning, on the other hand, is mere thinking by some individuals, which may become the basis of formal planning in future.

25. WHAT ARE THE LEVELS OF PLANNING?

Top Level Planning. It is also known as overall or strategic planning, by the top management, i.e., board of directors or governing body. It encompasses the long-range objectives and policies of organization and is concerned with corporate results rather than sectional objectives. Top level planning is entirely long-range and is inextricably linked with long-term objectives. It might be called the „what“ of planning.

Second Level Planning. Also known as **tactical planning**, it is done by middle level managers or departmental heads. It is concerned with „how“ of planning. It deals with deployment of resources to the best advantage. It is concerned mainly, but not exclusively, with long-range planning, but its nature is such that the time spans are usually shorter than those of strategic planning. This is because its attentions are usually devoted to the step-by-step attainment of the organization's main objectives. It is, in fact, oriented to functions and departments rather than to the organization as a whole.

Third Level Planning. Also known as operational or **activity planning**, it is the concern of departmental managers and supervisors. It is confined to putting into effect the tactical or departmental plans. It is usually for a short term and may be revised quite often to be in tune with the tactical planning.

Corporate Planning. Corporate planning is a new concept, which has gained popularity these days. It may be defined as a **systematic and comprehensive process of long range planning** taking account of the resources and capability of the organization and the environment within which it has to operate, and viewing the organization as a total, corporate unit. Corporate planning is specifically strategic in nature as it takes the overall view of the organization. Its time span is normally over a minimum period of five years and frequently extends very much longer than this. A corporate plan must be frequently updated. Most organizations review performance at least once a year so that modifications may be made in the light of experience.

26. DEFINE STRATEGY?

Strategy: A unified, comprehensive and integrated plan that relates to the strategic advantages of the firm to the challenges of the environment. It is designed to ensure that the basic objectives of the enterprise are achieved through proper execution by the organization.

Definition: “The determination of basic long term goals and objectives of an enterprise and the adoption of course of action and the allocation of resources necessary for carrying out these goals” **ALFRED D. CHANDLER**

“A plan or course of action which is of vital pervasive, or continuing importance to the organization as a whole” – **ARTHUR SHARPLIN**

27. DEFINITIONS OF STRATEGIC MANAGEMENT?

“strategic management is concerned with deciding on strategy and planning how that strategy is to be put into effect”

“it is a continuous, iterative, cross functions process aimed at keeping an organization as a whole appropriately matched to its environment”- **SAMUEL C. CERTO AND J. PAUL PETER**

“The on-going process of formulating, implementing and controlling broad plans guide the organization in achieving the strategic goods given its internal and external environment”.

28. WHAT ARE THE STRATEGY AT DIFFERENT LEVELS OF A BUSINESS?

Corporate Strategy - is concerned with the overall purpose and scope of the business to meet stakeholder expectations. This is a crucial level since it is heavily influenced by investors in the business and acts to guide strategic decision-making throughout the business. Corporate strategy is often stated explicitly in a "mission statement".

Business Unit Strategy - is concerned more with how a business competes successfully in a particular market. It concerns strategic decisions about choice of products, meeting needs of customers, gaining advantage over competitors, exploiting or creating new opportunities etc.



Operational Strategy - is concerned with how each part of the business is organised to deliver the corporate and business-unit level strategic direction. Operational strategy therefore focuses on issues of resources, processes, people etc.

29. STATE THE IMPORTANCE OR FEATURES OF STRATEGY?

1. Strategy is Significant because it is not possible to foresee the future. Without a perfect foresight, the firms must be ready to deal with the uncertain events which constitute the business environment.
2. Strategy deals with long term developments rather than routine operations, i.e. it deals with probability of innovations or new products, new methods of productions, or new markets to be developed in future.
3. Strategy is created to take into account the probable behavior of customers and competitors. Strategies dealing with employees will predict the employee behavior.

30. DEFINE STAFFING?

Definition: In the words of *Koontz, O'Donnell, and Weihrich*, "The managerial function of staffing involves manning the organizational structure through proper and effective selection, appraisal, and development of personnel to fill the role designed into the structure". The staffing function of management pertains to recruitment, selection, training, development, appraisal and remuneration of personnel. It is the duty of every manager to perform these activities. The Personnel Department is created to provide the necessary help to the managers in performing the staffing or personnel function.

31. STATE THE IMPORTANT OBJECTIVES OF STAFFING?

The general objective of Staffing is to contribute towards the accomplishment of the goals of an enterprise. However, the Staffing in any working organization should have the following specific objectives:

- (i) To attain maximum individual development;
- (ii) To establish desirable working relationship between employers and employees and between groups of employees;
- (iii) To mould effectively the human resources;
- (iv) To ensure satisfaction of the workers so that they are freely ready to work;
- (v) To provide fair wages, good working conditions and service benefits to the workers;
- (vi) To ensure that every employee makes his maximum contribution to the success of the enterprise.

32. DEFINE CONTROLLING? (April"2012)

Controlling consists of verifying whether everything occurs in conformance with the plans adopted, instructions issued and principles established. Controlling ensures that there is effective and efficient utilization of organizational resources so as to achieve the planned goals. Controlling measures the deviation of actual performance from the standard performance, discovers the causes of such deviations and helps in taking corrective actions

According to **Brech**, "Controlling is a systematic exercise which is called as a process of checking actual performance against the standards or plans with a view to ensure adequate progress and also recording such experience as is gained as a contribution to possible future needs."

According to **Donnell**, "Just as a navigator continually takes reading to ensure whether he is relative to a planned action, so should a business manager continually take reading to assure himself that his enterprise is on right course."

33. STATE THE FEATURES OF CONTROLLING FUNCTION?

Following are the characteristics of controlling function of management-

- **Controlling is an end function-** A function which comes once the performances are made in conformance with plans.
- **Controlling is a pervasive function-** which means it is performed by managers at all levels and in all type of concerns.
- **Controlling is forward looking-** because effective control is not possible without past being controlled. Controlling always look to future so that follow-up can be made whenever required.
- **Controlling is a dynamic process-** since controlling requires taking reviewal methods, changes have to be made wherever possible.
- **Controlling is related with planning-** Planning and Controlling are two inseparable functions of management. Without planning, controlling is a meaningless exercise and without controlling, planning is useless. *Planning presupposes controlling and controlling succeeds planning.*

34. WHAT IS LEADERSHIP? (Dec"2012)

Leadership is a process by which an executive can direct, guide and influence the behavior and work of others towards accomplishment of specific goals in a given situation. Leadership is the ability of a manager to induce the subordinates to work with confidence and zeal.

Leadership is the potential to influence behaviour of others. It is also defined as the capacity to influence a group towards the realization of a goal. Leaders are required to develop future visions, and to motivate the organizational members to want to achieve the visions.

According to **Keith Davis**, "Leadership is the ability to persuade others to seek defined objectives enthusiastically. It is the human factor which binds a group together and motivates it towards goals."

35. DIFFERENCE BETWEEN LEADER VS MANAGER.

1. A leader is always at the helm, and the manager is at the helm of his/her own tribe, but ultimately guided by a leader
2. A leader has a tribe and does not have their own leader. A manager has a tribe and also has a leader
3. A leader empowers the right managers who in turn will empower their teams, who in turn will do a great job
4. A manager knows how to do things right, a leader knows the right things to do
5. A leader works towards a vision. A manager shares that vision and also works towards it
6. A manager is great at efficiency; a leader knows the importance of effectiveness

36. STATE THE IMPORTANCE OF LEADERSHIP (April"2011)

1. **Initiates action-** Leader is a person who starts the work by communicating the policies and plans to the subordinates from where the work actually starts.
2. **Motivation-** A leader proves to be playing an incentive role in the concern's working. He motivates the employees with economic and non-economic rewards and thereby gets the work from the subordinates.
3. **Providing guidance-** A leader has to not only supervise but also play a guiding role for the subordinates. Guidance here means instructing the subordinates the way they have to perform their work effectively and efficiently.
4. **Creating confidence-** Confidence is an important factor which can be achieved through expressing the work efforts to the subordinates, explaining them clearly their role and giving them guidelines to achieve the goals effectively. It is also important to hear the employees with regards to their complaints and problems.

5. **Building morale-** Morale denotes willing co-operation of the employees towards their work and getting them into confidence and winning their trust. A leader can be a morale booster by achieving full co-operation so that they perform with best of their abilities as they work to achieve goals.
6. **Builds work environment-** Management is getting things done from people. An efficient work environment helps in sound and stable growth. Therefore, human relations should be kept into mind by a leader. He should have personal contacts with employees and should listen to their problems and solve them. He should treat employees on humanitarian terms.
7. **Co-ordination-** Co-ordination can be achieved through reconciling personal interests with organizational goals. This synchronization can be achieved through proper and effective co-ordination which should be primary motive of a leader.

37. WHAT ARE THE TYPES OF LEADERSHIP STYLES?

The following are main types of leadership styles:

- (1) Autocratic Leadership Style
- (2) Democratic Leadership Style
- (3) Laissez-faire Leadership Style

38. WHAT IS AUTOCRATIC LEADERSHIP STYLE?

This style is also known as the leader-centred style. Under this style, the leader keeps all the authority centred in his hands and the employees have to perform the work exactly as per his orders. If any employee is careless in his work performance, he is punished. The leader does not decentralise his authority for the fear of losing his importance. Consequently, the responsibility of the success or failure of management remains with the manager.

leadership style cannot be called more useful.

39. WHAT IS DEMOCRATIC LEADERSHIP STYLE?

This style is also known as group-centered leadership style. These days this leadership style is very much in vogue. Under this style, decisions regarding different works are not taken by the manager alone but they are taken in consultation with the employees.

This leadership style is based on decentralisation. The manager respects the suggestions made by his subordinates, and also makes efforts to fulfill their necessities.

40. WHAT IS LAISSEZ-FAIRE OR FREE-REIN LEADERSHIP STYLE OR DELEGATIVE STYLE?

This leadership style is also described as Individual- centered style. In this style, the manager or the leader takes little interest in managerial functions and the subordinates are left on their own. It refers to that leadership style in which the leader gives his subordinates complete freedom to make decisions.

Overall objectives help the subordinates in determining their own objectives. Apart from this, they provide resources for work performance and, if need be, they also advise the employees. This style is absolutely different from the autocratic leadership style.

41. DEFINITIONS OF MANAGEMENT BY OBJECTIVES MBO?

According to George Odhome, MBO is "a process whereby superior and subordinate managers of an Organisation jointly define its common goals, define each individual's major areas of responsibility in terms Of results expected of him and use these measures as guides for operating the unit and assessing the contribution of each of its members."

According to John Humble, MBO is "a dynamic system which seeks to integrate the company's needs to clarify and achieve its profits and growth goals with the manager's need to contribute and develop himself. It is a demanding and rewarding style of managing a business."

42. WHAT ARE THE FEATURES OF MANAGEMENT BY OBJECTIVES MBO?

Superior-subordinate participation: MBO requires the superior and the subordinate to recognize that the development of objectives is a joint project/activity. They must be jointly agree and write out their duties and areas of responsibility in their respective jobs.

Joint goal-setting: MBO emphasizes joint goal-setting that are tangible, verifiable and measurable. The subordinate in consultation with his superior sets his own short-term goals. However, it is examined both by the superior and the subordinate that goals are realistic and attainable. In brief, the goals are to be decided jointly through the participation of all.

Joint decision on methodology: MBO focuses special attention on what must be accomplished (goals) rather than how it is to be accomplished (methods). The superior and the subordinate mutually devise methodology to be followed in the attainment of objectives. They also mutually set standards and establish norms for evaluating performance.

Makes way to attain maximum result: MBO is a systematic and rational technique that allows management to attain maximum results from available resources by focussing on attainable goals. It permits lot of freedom to subordinate to make creative decisions on his own. This motivates subordinates and ensures good performance from them.

Support from superior: When the subordinate makes efforts to achieve his goals, superior's helping hand is always available. The superior acts as a coach and provides his valuable advice and guidance to the subordinate. This is how MBO facilitates effective communication between superior and subordinates for achieving the objectives/targets set.

43. WHAT IS DECISION MAKING? (Dec"2012)

Decision-making is the key part of manager's activities. Decisions are important as they determine both managerial and organizational actions. A decision may be defined as "a course of action which is consciously chosen from among a set of alternatives to achieve a desired result." It represents a well-balanced judgment and a commitment to action.

Decision-making pervades all managerial actions. It is a continuous process. Decision-making is an indispensable component of the management process itself.

44. DEFINITIONS OF DECISION-MAKING?

The *Oxford Dictionary* defines the term decision-making as "the action of carrying out or carrying into effect".

According to *Trewatha & Newport*, "Decision-making involves the selection of a course of action from among two or more possible alternatives in order to arrive at a solution for a given problem".

According to *Peter Drucker*, "Whatever a manager does, he does through decision-making". A manager has to take a decision before acting or before preparing a plan for execution.

45. WHAT ARE THE IMPORTANCE OF DECISION MAKING?

1. Better Utilisation of Resources

Decision making helps to utilise the available resources for achieving the objectives of the organisation. The available resources are the 6 Ms, i.e. Men, Money, Materials, Machines, Methods and Markets. The manager has to make correct decisions for all the 6 Ms. This will result in better utilisation of these resources.

2. Facing Problems and Challenges

Decision making helps the organisation to face and tackle new problems and challenges. Quick and correct decisions help to solve problems and to accept new challenges.

3. Business Growth

Quick and correct decision making results in better utilisation of the resources. It helps the organisation to face new problems and challenges. It also helps to achieve its objectives. All this results in quick business growth. However, wrong, slow or no decisions can result in losses and industrial sickness.

4. Achieving Objectives

Rational decisions help the organisation to achieve all its objectives quickly. This is because rational decisions are made after analysing and evaluating all the alternatives.

5. Increases Efficiency

Rational decisions help to increase efficiency. Efficiency is the relation between returns and cost. If the returns are high and the cost is low, then there is efficiency and vice versa. Rational decisions result in higher returns at low cost.

6. Facilitate Innovation

Rational decisions facilitate innovation. This is because it helps to develop new ideas, new products, new process, etc. This results in innovation. Innovation gives a competitive advantage to the organisation.

7. Motivates Employees

Rational decision results in motivation for the employees. This is because the employees are motivated to implement rational decisions. When the rational decisions are implemented the organisation makes high profits. Therefore, it can give financial and non-financial benefits to the employees.

46. WHAT ARE THE CHARACTERISTICS OF DECISION MAKING?

- **Continuous activity/process:** Decision-making is a continuous and dynamic process. It pervades all organizational activity. Managers have to take decisions on various policy and administrative matters. It is a never ending activity in business management.
- **Mental/intellectual activity:** Decision-making is a mental as well as intellectual activity/process and requires knowledge, skills, experience and maturity on the part of decision-maker. It is essentially a human activity.
- **Based on reliable information/feedback:** Good decisions are always based on reliable information. The quality of decision-making at all levels of the Organisation can be improved with the support of an effective and efficient management information system (MIS).
- **Goal oriented process:** Decision-making aims at providing a solution to a given problem/ difficulty before a business enterprise. It is a goal-oriented process and provides solutions to problems faced by a business unit.
- **Means and not the end:** Decision-making is a means for solving a problem or for achieving a target/objective and not the end in itself.
- **Relates to specific problem:** Decision-making is not identical with problem solving but it has its roots in a problem itself.

47. WHAT ARE THE IMPORTANCE OR SIGNIFICANCE OF STAFFING

- The Staffing function of management deals with the proper handling of personnel in the organization. If people working in the organization are not handled or managed properly, good industrial relations will not develop in the enterprise, which will jeopardize the survival of the enterprise. It is not possible to achieve the organizational goals without active cooperation of the personnel.
- The significance of personnel management has increased with the growth of industrial undertakings. Now it is recognized that personnel management is not only the responsibility of personnel manager, but also of all managers in the enterprise.

- The various aspects of personnel function are procurement, development, compensation and motivation of the personnel. Every manager has some responsibility towards these areas, but now it has been recognized that these functions cannot be the specialty of every line manager. So it is very common to create the personnel department under a Personnel Director or Personnel Manager.
- Though personnel department does not produce anything, which is tangible, yet it helps the other departments to contribute towards organizational objectives.
- Personnel function has become a specialized task and so it is entrusted to the person who is well conversant with the principles of personnel management.
- The personnel manager organizes the personnel department to carry out the functions entrusted to him. Personnel department develops the sources of recruitment, selects the people and help the line manager in rectifying placements by devising a suitable transfer policy. Personnel department keep the, record of every person in the organization and provides important information to departmental heads in taking decisions about promotion and transfers.

48. WHAT ARE THE TYPES OF DECISION MAKING?

- 1. Programmed and non programmed decisions:** Programmed decisions are those which are normally repetitive in nature and are taken as a routine job and responsibilities. These types of decisions are made by middle level management in accordance with some policies, rules and procedures. They have short term impact. For example: – granting a leave to an employee, purchasing office materials etc. non programmed decisions are non repetitively taken by top executives. They need to collect data and analyze then and forecast the strategic plans
- 2. Major and minor decisions:** among different decisions some decisions are considerably more important than others and are prioritized. They are called major decisions. For example, replacement of man by machine, diversification of product etc. contrary to that, some of the remaining decisions are considerably less important than others and are not so prioritized. They are minor decisions. For example, store of raw materials etc.
- 3. Routine and strategic decisions:** Routine decisions are those decisions which are considered as tactical decisions. They are taken frequently to achieve high degree of efficiency in the organizational activities. For example, parking facilities, lighting and canteen etc. strategic decisions are those which are related to lowering the prices of products, changing the product etc. they take more fund and degree of partials.
- 4. Organizational and personal decision:** Organizational decision is taken by top executives. For official purpose. They affect the organizational activities directly. Authority is also delegated. Personal decisions are concerned to an employee. The executives whenever takes the decisions personally that is known as personal decisions
- 5. Individual and group decisions:** When a single employee is involved in decision making it is called individual decision. They are taken by sole proprietor when the problem is of routine nature. On the other hand when the decision is of group taken in a large organization where important and strategic decisions are taken then it is a group decision
- 6. Policy and operating decisions:** Policy decisions are taken by top level management to change the rules, procedures, organizational structure etc and they have a long term effect. Operational decisions are taken by low level management which have short term effect and which affect the day to day operation of the organization.

49. GIVE THE CONCEPT OF DIRECTING?

- Directing function of management involves guiding, inspiring, overseeing and leading people for the accomplishment of predetermined objectives.
- Directing constitutes the all-important *actuating* link between the other managerial functions, namely, planning, organizing, staffing, coordinating and controlling.
- Directing implies moving into action.
- Directing involves issuing orders and instructions and taking steps to get them carried out properly.

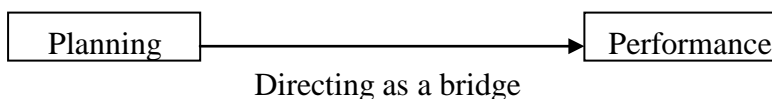
50. DEFINE DIRECTING?

- “Directing consists of the process and techniques utilized in issuing instructions and making certain that operations are carried out as originally planned”.
- “Direction is the interpersonal aspect of managing by which subordinates are led to understand and contribute effectively to the attainment of enterprise objectives”.

51. STATE THE PROCESS OF DIRECTING

Issuing orders and instructions to subordinates

1. Continuous guidance and supervision of employees to ensure that they carry out their assignments in the proper manner
2. Motivating subordinates to work efficiently for the achievement of organizational objectives
3. Communicating with employees to understand their needs, aspirations, problems and suggestions
4. Maintaining discipline and rewarding those who perform efficiently and
5. Providing leadership to the subordinates so that they work with real and confidence.

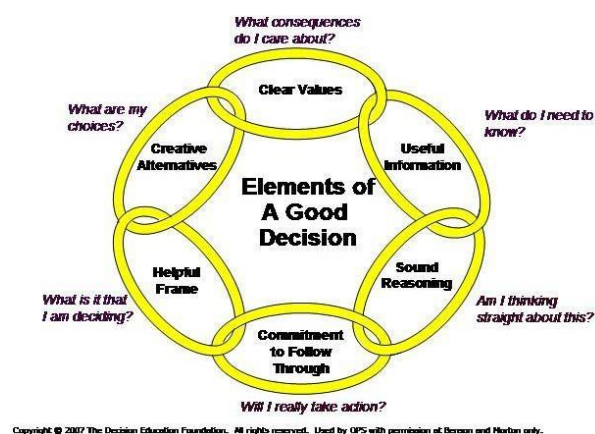


52. STATE THE ELEMENTS OF DIRECTING

The directing function includes the following,

1. Supervision
2. Motivation
3. Leadership
4. Communication.

53. WHAT ARE THE ELEMENTS OF DECISION MAKING? (April“2010)



11 MARKS

1. EXPLAIN THE FEATURES & NATURE & IMPORTANCE OF MANAGEMENT. (Dec,2012, April" 2010)

- **Management is Goal-Oriented:** The success of any management activity is assessed by its achievement of the predetermined goals or objective. Management is a purposeful activity. It is a tool which helps use of human & physical resources to fulfill the pre-determined goals. **Management integrates Human, Physical and Financial Resources:** In an organization, human beings work with non-human resources like machines. Materials, financial assets, buildings etc. Management integrates human efforts to those resources. It brings harmony among the human, physical and financial resources.
- **Management is a Group Activity:** Management is very much less concerned with individual's efforts. It is more concerned with groups. It involves the use of group effort to achieve predetermined goal of management of ABC & Co. is good refers to a group of persons managing the enterprise.
- **Getting Maximum Results with Minimum Efforts -** The main objective of management is to secure maximum outputs with minimum efforts & resources. Management is basically concerned with thinking & utilizing human, material & financial resources in such a manner that would result in best combination. This combination results in reduction of various costs.
- **Increasing the Efficiency of factors of Production -** Through proper utilization of various factors of production, their efficiency can be increased to a great extent which can be obtained by reducing spoilage, wastages and breakage of all kinds, this in turn leads to saving of time, effort and money which is essential for the growth & prosperity of the enterprise.
- **Maximum Prosperity for Employer & Employees -** Management ensures smooth and coordinated functioning of the enterprise. This in turn helps in providing maximum benefits to the employee in the shape of good working condition, suitable wage system, incentive plans on the one hand and higher profits to the employer on the other hand.
- **Human betterment & Social Justice -** Management serves as a tool for the upliftment as well as betterment of the society. Through increased productivity & employment, management ensures better standards of living for the society. It provides justice through its uniform policies.
- **It helps in Achieving Group Goals -** It arranges the factors of production, assembles and organizes the resources, integrates the resources in effective manner to achieve goals. It directs group efforts towards achievement of pre-determined goals. By defining objective of organization clearly there would be no wastage of time, money and effort. Management converts disorganized resources of men, machines, money etc. into useful enterprise. These resources are coordinated, directed and controlled in such a manner that enterprise work towards attainment of goals.
- **Optimum Utilization of Resources -** Management utilizes all the physical & human resources productively. This leads to efficacy in management. Management provides maximum utilization of scarce resources by selecting its best possible alternate use in industry from out of various uses. It makes use of experts, professional and these services leads to use of their skills, knowledge, and proper utilization and avoids wastage. If employees and machines are producing its maximum there is no under employment of any resources.
- **Reduces Costs -** It gets maximum results through minimum input by proper planning and by using minimum input & getting maximum output. Management uses physical, human and financial resources in such a manner which results in best combination. This helps in cost reduction.

2. IS MANAGEMENT A SCIENCE OR AN ART OR A PROFESSION – DISCUSS?

Management as a Science: Science is a systematic body of knowledge pertaining to a specific field of study that contains general facts which explains a phenomenon. It establishes cause and effect relationship

between two or more variables and underlines the principles governing their relationship. These principles are developed through scientific method of observation and verification through testing.

It cannot be denied that management has a systematic body of knowledge but it is not as exact as that of other physical sciences like biology, physics, and chemistry etc. The main reason for the inexactness of science of management is that it deals with human beings and it is very difficult to predict their behavior accurately. Since it is a social process, therefore it falls in the area of social sciences. It is a flexible science & that is why its theories and principles may produce different results at different times and therefore it is a behavior science. Ernest Dale has called it as a *Soft Science*.

Management as an Art: Art implies application of knowledge & skill to trying about desired results. An art may be defined as personalized application of general theoretical principles for achieving best possible results. Art has the following characters -

Practical Knowledge: Every art requires practical knowledge therefore learning of theory is not sufficient. It is very important to know practical application of theoretical principles. E.g. to become a good painter, the person may not only be knowing different colour and brushes but different designs, dimensions, situations etc to use them appropriately. A manager can never be successful just by obtaining degree or diploma in management; he must have also know how to apply various principles in real situations by functioning in capacity of manager.

Personal Skill: Although theoretical base may be same for every artist, but each one has his own style and approach towards his job. That is why the level of success and quality of performance differs from one person to another. E.g. there are several qualified painters but M.F. Hussain is recognized for his style. Similarly management as an art is also personalized. Every manager has his own way of managing things based on his knowledge, experience and personality, that is why some managers are known as good managers (like Aditya Birla, Rahul Bajaj) whereas others as bad.

- **Creativity:** Every artist has an element of creativity in line. That is why he aims at producing something that has never existed before which requires combination of intelligence & imagination. Management is also creative in nature like any other art. It combines human and non-human resources in useful way so as to achieve desired results. It tries to produce sweet music by combining chords in an efficient manner.
- **Perfection through practice:** Practice makes a man perfect. Every artist becomes more and more proficient through constant practice. Similarly managers learn through an art of trial and error initially but application of management principles over the years makes them perfect in the job of managing.
- **Goal-Oriented:** Every art is result oriented as it seeks to achieve concrete results. In the same manner, management is also directed towards accomplishment of pre-determined goals. Managers use various resources like men, money, material, machinery & methods to promote growth of an organization.

Thus, we can say that management is an art therefore it requires application of certain principles rather it is an art of highest order because it deals with moulding the attitude and behavior of people at work towards desired goals.

Management As Both Science And Art

Management is both an art and a science. The above mentioned points clearly reveals that management combines features of both science as well as art. It is considered as a science because it has an organized body of knowledge which contains certain universal truth. It is called an art because managing requires certain skills which are personal possessions of managers. Science provides the knowledge & art deals with the application of knowledge and skills.

A manager to be successful in his profession must acquire the knowledge of science & the art of applying it. Therefore management is a judicious blend of science as well as an art because it proves the principles and the way these principles are applied is a matter of art. Science teaches to "know" and art teaches to "do". E.g. a person cannot become a good singer unless he has knowledge about various ragas & he also applies his personal skill in the art of singing. Same way it is not sufficient for manager to first know the principles but he must also apply them in solving various managerial problems that is why, science and art are not mutually exclusive but they are complementary to each other (like tea and biscuit, bread and butter etc.).

The old saying that “Manager are Born” has been rejected in favor of “Managers are Made”. It has been aptly remarked that management is the oldest of art and youngest of science. To conclude, we can say that science is the root and art is the fruit.

Management as a Profession

- It does not restrict the entry in managerial jobs for account of one standard or other.
- No minimum qualifications have been prescribed for managers.
- No management association has the authority to grant a certificate of practice to various managers.
- All managers are supposed to abide by the code formulated by AIMA,
- Competent education and training facilities do not exist.
- Managers are responsible to many groups such as shareholders, employees and society. A regulatory code may curtail their freedom.
- Managers are known by their performance and not mere degrees.
- The ultimate goal of business is to maximize profit and not social welfare. That is why Haymes has rightly remarked, “The slogan for management is becoming - “He who serves best, also profits most

3. EXPLAIN THE LEVELS OF MANAGEMENT.

The term “Levels of Management” refers to a line of demarcation between various managerial positions in an organization. The number of levels in management increases when the size of the business and work force increases and vice versa. The level of management determines a chain of command, the amount of authority & status enjoyed by any managerial position. The levels of management can be classified in three broad categories: -



Top Level of Management: It consists of board of directors, chief executive or managing director. The top management is the ultimate source of authority and it manages goals and policies for an enterprise. It devotes more time on planning and coordinating functions.

The role of the top management can be summarized as follows -

1. Top management lays down the objectives and broad policies of the enterprise.
2. It issues necessary instructions for preparation of department budgets, procedures, schedules etc.
3. It prepares strategic plans & policies for the enterprise.
4. It appoints the executive for middle level i.e. departmental managers.
5. It controls & coordinates the activities of all the departments.
6. It is also responsible for maintaining a contact with the outside world.
7. It provides guidance and direction.

8. The top management is also responsible towards the shareholders for the performance of the enterprise.

Middle Level of Management: The branch managers and departmental managers constitute middle level. They are responsible to the top management for the functioning of their department. They devote more time to organizational and directional functions. In small organization, there is only one layer of middle level of management but in big enterprises, there may be senior and junior middle level management. Their role can be emphasized as -

1. They execute the plans of the organization in accordance with the policies and directives of the top management.
2. They make plans for the sub-units of the organization.
3. They participate in employment & training of lower level management.
4. They interpret and explain policies from top level management to lower level.
5. They are responsible for coordinating the activities within the division or department.
6. It also sends important reports and other important data to top level management.
7. They evaluate performance of junior managers.
8. They are also responsible for inspiring lower level managers towards better performance.

Lower Level or supervisor or first level of Management: Lower level is also known as supervisory / operative level of management. It consists of supervisors, foreman, section officers, superintendent etc. According to R.C. Davis, "Supervisory management refers to those executives whose work has to be largely with personal oversight and direction of operative employees". In other words, they are concerned with direction and controlling function of management. Their activities include -

1. Assigning of jobs and tasks to various workers.
2. They guide and instruct workers for day to day activities.
3. They are responsible for the quality as well as quantity of production.
4. They are also entrusted with the responsibility of maintaining good relation in the organization.
5. They communicate workers problems, suggestions, and recommendatory appeals etc to the higher level and higher level goals and objectives to the workers.
6. They help to solve the grievances of the workers.
7. They supervise & guide the sub-ordinates.
8. They are responsible for providing training to the workers.
9. They arrange necessary materials, machines, tools etc for getting the things done.
10. They prepare periodical reports about the performance of the workers.
11. They ensure discipline in the enterprise.
12. They motivate workers.
13. They are the image builders of the enterprise because they are in direct contact with the workers.

4. EXPLAIN THE ELEMENTS OR PRINCIPLES OR FUNCTIONS OF MANAGEMENT.

For theoretical purposes, it may be convenient to separate the function of management but practically these functions are overlapping in nature i.e. they are highly inseparable. Each function blends into the other & each affects the performance of others.

1. Planning: Planning involves the formulation of what is to be done, how, when and where it is to be done, who is to do it and what results are to be evaluated. Planning means looking ahead, it is mental work, it is selecting from among many choices following the procedure given below:

- i. Lay down the company *objective/targets*.
- ii. Collect and classify the *information* relating to company objectives.

- iii. Develop *alternative* course of action to do the things.
- iv. *Compare* the alternatives in terms of objectives, feasibility and consequences
- v. Select the optimum course of action yielding maximum benefit/gain
- vi. Establish policies, procedure, methods, schedules, programmes, systems, standards and budgets for the optimum course of action selected.

2. Organizing:

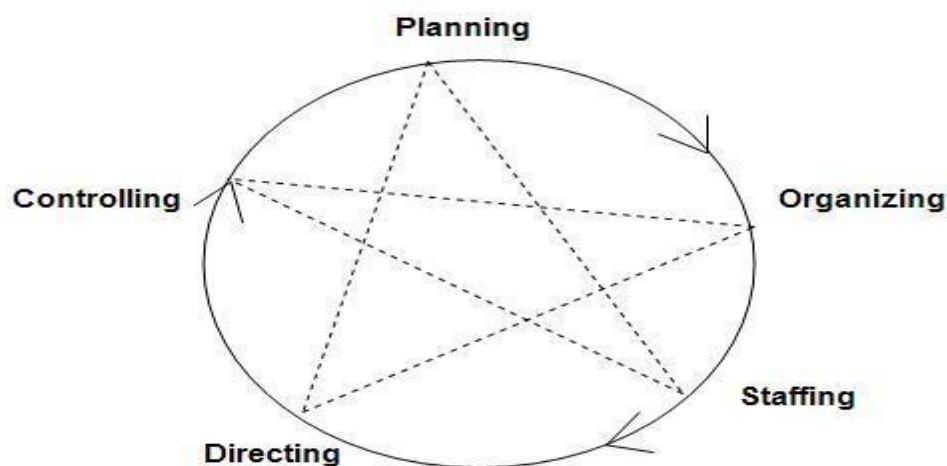
* After determining the course and make-up of action, the next step, in order to accomplish the task, is to distribute the necessary work among the working groups.

* It is the process of by which the structure and allocation of jobs is determined.

It means, organizing people, materials, job, time etc., and establishing framework in which responsibilities are defined and authorities and laid down

The process of organizing involves:

- Divide the *work* into component activities
- Assign *people* to task (component activities)
- Define *responsibilities*
- Delegate *authority*
- Establish structural relationship (i.e *organization structure*) to secure coordination



Staffing

It is the function of manning the organization structure and keeping it manned. Staffing has assumed greater importance in the recent years due to advancement of technology, increase in size of business, complexity of human behavior etc. The main purpose of staffing is to put right man on right job i.e. square pegs in square holes and round pegs in round holes. According to Kootz & O'Donell, "Managerial function of staffing involves manning the organization structure through proper and effective selection, appraisal & development of personnel to fill the roles designed on the structure". Staffing involves:

1. Manpower Planning (estimating man power in terms of searching, choose the person and giving the right place).
2. Recruitment, selection & placement.
3. Training & development.
4. Remuneration.
5. Performance appraisal.
6. Promotions & transfer.

Directing

It is that part of managerial function which actuates the organizational methods to work efficiently for achievement of organizational purposes. It is considered life-spark of the enterprise which sets it in motion the action of people

because planning, organizing and staffing are the mere preparations for doing the work. Direction is that inert-personnel aspect of management which deals directly with influencing, guiding, supervising, motivating sub-ordinate for the achievement of organizational goals. Direction has following elements:

1. Supervision
2. Motivation
3. Leadership
4. Communication

Supervision- implies overseeing the work of subordinates by their superiors. It is the act of watching & directing work & workers.

Motivation- means inspiring, stimulating or encouraging the sub-ordinates with zeal to work. Positive, negative, monetary, non-monetary incentives may be used for this purpose.

Leadership- may be defined as a process by which manager guides and influences the work of subordinates in desired direction.

Communications- is the process of passing information, experience, opinion etc from one person to another. It is a bridge of understanding.

Controlling

It implies measurement of accomplishment against the standards and correction of deviation if any to ensure achievement of organizational goals. The purpose of controlling is to ensure that everything occurs in conformities with the standards. An efficient system of control helps to predict deviations before they actually occur. According to *Theo Haimann*, "Controlling is the process of checking whether or not proper progress is being made towards the objectives and goals and acting if necessary, to correct any deviation". According to *Koontz & O'Donell* "Controlling is the measurement & correction of performance activities of subordinates in order to make sure that the enterprise objectives and plans desired to obtain them as being accomplished". Therefore controlling has following steps:

1. Establishment of standard performance.
2. Measurement of actual performance.
3. Comparison of actual performance with the standards and finding out deviation if any.
4. Corrective action, if necessary
5. Follow up

5. EXPLAIN FAYOL'S 14 PRINCIPLES OF MANAGEMENT OR FATHER OF MODERN AND ADMINISTRATIVE MANAGEMENT (April'2010)

A principle refers to a fundamental truth. It establishes cause and effect relationship between two or more variables under given situation. They serve as a guide to thought & actions. Therefore, management principles are the statements of fundamental truth based on logic which provides guidelines for managerial decision making and actions. These principles are derived: -

1. On the basis of observation and analysis i.e. practical experience of managers.
2. By conducting experimental studies.

There are 14 Principles of Management described by Henri Fayol.

Division of Labor

- Henry Fayol has stressed on the specialization of jobs.
- He recommended that work of all kinds must be divided & subdivided and allotted to various persons according to their expertise in a particular area.
- Subdivision of work makes it simpler and results in efficiency.
- It also helps the individual in acquiring speed, accuracy in his performance.
- Specialization leads to efficiency & economy in spheres of business.

Party of Authority & Responsibility

- Authority & responsibility are co-existing.
- If authority is given to a person, he should also be made responsible.
- In a same way, if anyone is made responsible for any job, he should also have concerned authority.
- Authority refers to the right of superiors to get exactness from their sub-ordinates whereas responsibility means obligation for the performance of the job assigned.
- There should be a balance between the two i.e. they must go hand in hand.
- Authority without responsibility leads to irresponsible behavior whereas responsibility without authority makes the person ineffective.

Principle of One Boss

3. A sub-ordinate should receive orders and be accountable to one and only one boss at a time.
4. In other words, a sub-ordinate should not receive instructions from more than one person because -

- It undermines authority
- Weakens discipline
- Divides loyalty
- Creates confusion
- Delays and chaos
- Escaping responsibilities
- Duplication of work
- Overlapping of efforts

1. Therefore, dual sub-ordination should be avoided unless and until it is absolutely essential.
2. Unity of command provides the enterprise a disciplined, stable & orderly existence.
3. It creates harmonious relationship between superiors and sub-ordinates.

Unity of Direction

1. Fayol advocates one head one plan which means that there should be one plan for a group of activities having similar objectives.
2. Related activities should be grouped together. There should be one plan of action for them and they should be under the charge of a particular manager.
3. According to this principle, efforts of all the members of the organization should be directed towards common goal.
4. Without unity of direction, unity of action cannot be achieved.
5. In fact, unity of command is not possible without unity of direction.

Basis	Unity of command	Unity of direction
Meaning	It implies that a sub-ordinate should receive orders & instructions from only one boss.	It means one head, one plan for a group of activities having similar objectives.
Nature	It is related to the functioning of personnel's.	It is related to the functioning of departments, or organization as a whole.
Necessity	It is necessary for fixing responsibility of each subordinates.	It is necessary for sound organization.
Advantage	It avoids conflicts, confusion & chaos.	It avoids duplication of efforts and wastage

		of resources.
Result	It leads to better superior sub-ordinate relationship.	It leads to smooth running of the enterprise.

Therefore it is obvious that they are different from each other but they are dependent on each other i.e. unity of direction is a pre-requisite for unity of command. But it does not automatically comes from the unity of direction.

Equity

1. Equity means combination of fairness, kindness & justice.
2. The employees should be treated with kindness & equity if devotion is expected of them.
3. It implies that managers should be fair and impartial while dealing with the subordinates.
4. They should give similar treatment to people of similar position.
5. They should not discriminate with respect to age, caste, sex, religion, relation etc.
6. Equity is essential to create and maintain cordial relations between the managers and sub-ordinate.
7. But equity does not mean total absence of harshness.
8. Fayol was of opinion that, “at times force and harshness might become necessary for the sake of equity”.

Order

1. This principle is concerned with proper & systematic arrangement of things and people.
2. Arrangement of things is called material order and placement of people is called social order.
3. Material order- There should be safe, appropriate and specific place for every article and every place to be effectively used for specific activity and commodity.
4. Social order- Selection and appointment of most suitable person on the suitable job. There should be a specific place for every one and everyone should have a specific place so that they can easily be contacted whenever need arises.

Discipline

1. According to Fayol, “Discipline means sincerity, obedience, respect of authority & observance of rules and regulations of the enterprise”.
2. This principle applies that subordinate should respect their superiors and obey their order.
3. It is an important requisite for smooth running of the enterprise.
4. Discipline is not only required on path of subordinates but also on the part of management.

Initiative

1. Workers should be encouraged to take initiative in the work assigned to them.
2. It means eagerness to initiate actions without being asked to do so.
3. Fayol advised that management should provide opportunity to its employees to suggest ideas, experiences & new method of work.
4. It helps in developing an atmosphere of trust and understanding.
5. People then enjoy working in the organization because it adds to their zeal and energy.
6. To suggest improvement in formulation & implementation of place.
7. They can be encouraged with the help of monetary & non-monetary incentives.

Fair Remuneration

1. The quantum and method of remuneration to be paid to the workers should be fair, reasonable, satisfactory

& rewarding of the efforts.

2. As far as possible it should accord satisfaction to both employer and the employees.
3. Wages should be determined on the basis of cost of living, work assigned, financial position of the

business, wage rate prevailing etc.

4. Logical & appropriate wage rates and methods of their payment reduce tension & differences between

workers & management creates harmonious relationship and pleasing atmosphere of work.

5. Fayol also recommended provision of other benefits such as free education, medical & residential facilities

to workers.

Stability of Tenure

1. Fayol emphasized that employees should not be moved frequently from one job position to another i.e. the period of service in a job should be fixed.
2. Therefore employees should be appointed after keeping in view principles of recruitment & selection but once they are appointed their services should be served.
3. According to Fayol. "Time is required for an employee to get used to a new work & succeed to doing it well but if he is removed before that he will not be able to render worthwhile services".
4. As a result, the time, effort and money spent on training the worker will go waste.
5. Stability of job creates team spirit and a sense of belongingness among workers which ultimately increase the quality as well as quantity of work.

Scalar Chain

1. Fayol defines scalar chain as "The chain of superiors ranging from the ultimate authority to the lowest".
2. Every orders, instructions, messages, requests, explanation etc. has to pass through Scalar chain.

Sub-Ordination of Individual Interest to General Interest

1. An organization is much bigger than the individual it constitutes therefore interest of the undertaking should prevail in all circumstances.
2. As far as possible, reconciliation should be achieved between individual and group interests.
3. But in case of conflict, individual must sacrifice for bigger interests.

Espirit De" Corps (can be achieved through unity of command)

1. It refers to team spirit i.e. harmony in the work groups and mutual understanding among the members.
2. Spirit De" Corps inspires workers to work harder.
3. There should be proper co-ordination of work at all levels
4. Subordinates should be encouraged to develop informal relations among themselves.
5. Efforts should be made to create enthusiasm and keenness among subordinates so that they can work to the maximum ability.
6. Efficient employees should be rewarded and those who are not up to the mark should be given a chance to improve their performance.
7. Subordinates should be made conscious of that whatever they are doing is of great importance to the business & society.

Centralization & De-Centralization

1. Centralization means concentration of authority at the top level. In other words, centralization is a situation in which top management retains most of the decision making authority.

2. Decentralization means disposal of decision making authority to all the levels of the organization. In other words, sharing authority downwards is decentralization.
3. According to Fayol, "Degree of centralization or decentralization depends on no. of factors like size of business, experience of superiors, dependability & ability of subordinates etc.
4. Anything which increases the role of subordinate is decentralization & anything which decreases it is centralization.
5. Fayol suggested that absolute centralization or decentralization is not feasible. An organization should strike to achieve a lot between the two.

6. EXPLAIN SCIENTIFIC MANAGEMENT OR F.W. TAYLOR CONTRIBUTIONS TOWARDS MANAGEMENT

F.W. Taylor and Henry Fayol are generally regarded as the founders of scientific management and administrative management and both provided the bases for science and art of management.

Features of Scientific Management:

1. It was closely associated with the industrial revolution and the rise of large-scale enterprise.
2. Classical organization and management theory is based on contributions from a number of sources. They are scientific management, Administrative management theory, bureaucratic model, and micro-economics and public administration.
3. Management thought focused on job content division of labour, standardization, simplification and specialization and scientific approach towards organization.

TAYLOR'S SCIENTIFIC MANAGEMENT (USA 1856-1915):

Started as an apprentice machinist in Philadelphia, USA. He rose to be the chief engineer at the Midvale Engineering Works and later on served with the Bethlehem Works where he experimented with his ideas and made the contribution to the management theory for which he is so well known. Frederick Winslow Taylor well-known as the founder of scientific management was the first to recognize and emphasize the need for adopting a scientific approach to the task of managing an enterprise. He tried to diagnose the causes of low efficiency in industry and came to the conclusion that much of waste and inefficiency is due to the lack of order and system in the methods of management. He found that the management was usually ignorant of the amount of work that could be done by a worker in a day as also the best method of doing the job. As a result, it remained largely at the mercy of the workers who deliberately shirked work. He therefore, suggested that those responsible for management should adopt a scientific approach in their work, and make use of "scientific method" for achieving higher efficiency. The scientific method consists essentially of

- (a) Observation
- (b) Measurement
- (c) Experimentation and
- (d) Inference.

He advocated a thorough planning of the job by the management and emphasized the necessity of perfect understanding and co-operation between the management and the workers both for the enlargement of profits and the use of scientific investigation and knowledge in industrial work. He summed up his approach in these words:

1. Science, not rule of thumb
2. Harmony, not discord
3. Co-operation, not individualism
4. Maximum output, in place of restricted output
5. The development of each man to his greatest efficiency and prosperity.

ELEMENTS OF SCIENTIFIC MANAGEMENT:

1. Scientific Task and Rate-setting, work improvement, etc.
2. Planning the Task.
3. Vocational Selection and Training
4. Standardization (of working conditions, material equipment etc.)

5. Specialization

6. Mental Revolution.

1. **Scientific Task and Rate-Setting (work study):** Work study may be defined as the systematic, objective and critical examination of all the factors governing the operational efficiency of any specified activity in order to effect improvement. Work study includes.

(a) **Methods Study:** The management should try to ensure that the plant is laid out in the best manner and is equipped with the best tools and machinery. The possibilities of eliminating or combining certain operations may be studied.

(b) **Motion Study:** It is a study of the movement, of an operator (or even of a machine) in performing an operation with the purpose of eliminating useless motions.

(c) **Time Study (work measurement):** The basic purpose of time study is to determine the proper time for performing the operation. Such study may be conducted after the motion study. Both time study and motion study help in determining the best method of doing a job and the standard time allowed for it.

(d) **Fatigue Study:** If, a standard task is set without providing for measures to eliminate fatigue, it may either be beyond the workers or the workers may over strain themselves to attain it. It is necessary, therefore, to regulate the working hours and provide for rest pauses at scientifically determined intervals.

(e) **Rate-setting:** Taylor recommended the differential piece wage system, under which workers performing the standard task within prescribed time are paid a much higher rate per unit than inefficient workers who are not able to come up to the standard set.

2. **Planning the Task:** Having set the task which an average worker must strive to perform to get wages at the higher piece-rate, necessary steps have to be taken to plan the production thoroughly so that there is no bottle neck and the work goes on systematically.

3. **Selection and Training:** Scientific Management requires a radical change in the methods and procedures of selecting workers. It is therefore necessary to entrust the task of selection to a central personnel department. The procedure of selection will also have to be systematized. Proper attention has also to be devoted to the training of the workers in the correct methods of work.

4. **Standardization:** Standardization may be introduced in respect of the following.

(a) **Tools and equipment:** By standardization is meant the process of bringing about uniformity. The management must select and store standard tools and implements which will be nearly the best or the best of their kind.

(b) **Speed:** There is usually an optimum speed for every machine. If it is exceeded, it is likely to result in damage to machinery.

(c) **Conditions of Work:** To attain standard performance, the maintenance of standard conditions of ventilation, heating, cooling, humidity, floor space, safety etc., is very essential.

(d) **Materials:** The efficiency of a worker depends on the quality of materials and the method of handling materials.

5. **Specialization:** Scientific management will not be complete without the introduction of specialization. Under this plan, the two functions of 'planning' and 'doing' are separated in the organization of the plant. The 'functional foremen' are specialists who join their heads to give thought to the planning of the performance of operations in the workshop. Taylor suggested eight functional foremen under his scheme of functional foremanship.

(a) **The Route Clerk:** To lay down the sequence of operations and instruct the workers concerned about it.

(b) **The Instruction Card Clerk:** To prepare detailed instructions regarding different aspects of work.

(c) **The Time and Cost Clerk:** To send all information relating to their pay to the workers and to secure proper returns of work from them.

(d) **The Shop Disciplinarian:** To deal with cases of breach of discipline and absenteeism.

(e) **The Gang Boss:** To assemble and set up tools and machines and to teach the workers to make all their personal motions in the quickest and best way.

(f) **The Speed Boss:** To ensure that machines are run at their best speeds and proper tools are used by the workers.

(g) **The Repair Boss:** To ensure that each worker keeps his machine in good order and maintains cleanliness around him and his machines.

(h) **The Inspector:** To show to the worker how to do the work.

6. **Mental Revolution:** At present, industry is divided into two groups – management and labour. The major problem between these two groups is the division of surplus. The management wants the maximum possible share of the surplus as profit; the workers want, as large share in the form of wages. Taylor has in mind the enormous gain that arises from higher productivity. Such gains can be shared both by the management and workers in the form of increased profits and increased wages.

BENEFITS OF SCIENTIFIC MANAGEMENT:

The benefits of scientific management are:-

1. Replacement of traditional rule of thumb method by scientific techniques.
2. Proper selection and training of workers.
3. Incentive wages to the workers for higher production.
4. Elimination of wastes and rationalization of system of control.
5. Standardization of tools, equipment, materials and work methods.
6. Detailed instructions and constant guidance of the workers.
7. Establishment of harmonious relationship between the workers.
8. Better utilization of various resources.
9. Satisfaction of the needs of the customers by providing higher quality products at lower prices.

CRITICISM OF SCIENTIFIC MANAGEMENT

Although it is accepted that the scientific management enables the management to put resources to its best possible use and manner, yet it has not been spared of severe criticism.

Workers Viewpoint

- **Unemployment** - Workers feel that management reduces employment opportunities from them through replacement of men by machines and by increasing human productivity less workers are needed to do work leading to chucking out from their jobs.
- **Exploitation** - Workers feel they are exploited as they are not given due share in increasing profits which is due to their increased productivity. Wages do not rise in proportion as rise in production. Wage payment creates uncertainty & insecurity (beyond a standard output, there is no increase in wage rate).
- **Monotony** - Due to excessive specialization the workers are not able to take initiative on their own. Their status is reduced to being mere cogs in wheel. Jobs become dull. Workers loose interest in jobs and derive little pleasure from work.
- **Weakening of Trade Union** - To everything is fixed & predetermined by management. So it leaves no room for trade unions to bargain as everything is standardized, standard output, standard working conditions, standard time etc. This further weakens trade unions, creates a rift between efficient & in efficient workers according to their wages.
- **Over speeding** - the scientific management lays standard output, time so they have to rush up and finish the work in time. These have adverse effect on health of workers. The workers speed up to that standard output, so scientific management drives the workers to rush towards output and finish work in standard time.

Employer's Viewpoint

1. **Expensive** - Scientific management is a costly system and a huge investment is required in establishment of planning dept., standardization, work study, training of workers. It may be beyond reach of small firms. Heavy fixed investment leads to increase in overhead costs.
2. **Time Consuming** - Scientific management requires mental revision and complete reorganizing of organization. A lot of time is required for work, study, standardization & specialization. During this overhauling of organization, the work suffers.
3. **Deterioration of Quality**

7. EXPLAIN THE STEPS AND FUNCTIONS INVOLVED IN ORGANISATION OR ORGANISING.

Steps In The Process Of Organisation

Division of work

The main function is divided into sub-functions and entrusted to the different departmental heads. The result is the establishment of departments like Purchase, Sales, Production, Accounts, Publicity and Public relations. The departments can be further classified just as production department into (1) Planning (2) Designing, (3) Operations, (4) Production Control and (5) Repairs and Maintenance. The division of the work is based upon the fact that specialization is keynote of efficient organisation.

Grouping of Job and Departmentation

The second step is to group similar or related jobs into larger units, called departments, divisions or sections. Grouping process is called departmentation.

The department may be based upon functions such as manufacturing, marketing and financing etc. Department may also be based on products, such as textiles, cosmetic, stationery etc. These departments may have different sections as per requirement.

Grouping jobs or Departmentation aims at achieving coordination and facilitates unity of efforts. The departments are linked together on the basis of interdependence. The divided task is assigned to specific individual or group of individuals who are supposed to be the most qualified and specialized persons for the task.

Assigning duties

The work to be performed by every individual is clearly defined and made known to him. Every one must know, what he is required to do in order to avoid any misunderstanding, duplication or overlapping in the work.

Granting authorities and fixing responsibilities

Assigning of duties to individuals must coincide with the appropriate and relevant authorities. Every employee must know, what the authorities granted to him and for what and to whom he will be responsible, liable and accountable.

Delegation of authority

Those who are made responsible for specific tasks are given due authority. Both responsibility and authority go hand in hand together. Reasonable powers are delegated to heads and supervisory staff to enable them to do their work with ease and efficiency.

Effective communication

Effective communication is the keynote of efficient organisation. There should be proper arrangement of communication messages from executives to subordinates and vice-versa. Proper communication system establishes harmonious relationship between employees and enables execution of work in the right manner at the appropriate time and in an atmosphere of perfect mutual adjustment.

Co-ordination of activities for common objectives

Business activity is a team work or the group activity, so the efforts of every employee must be co-ordinate effectively to achieve the common objectives of the enterprise.

Functions Of An Organisation

1. To define the role of the individual:

An individual employed in an enterprise must know his role, position and relationship with other personnel in his department and with others. Organisation becomes necessary so that the persons involved in the enterprise can identify themselves in the enterprise. It is through the organisation that one can know his position and role in the unit. He can relate his position with other members of the enterprise.

2. Determination of authority:

The assignment of a certain role proposes the granting of certain authority so that performance can be possible. Organisation is necessary to define the authority i.e., the rights and powers of men in different positions which would help them to discharge their assigned roles.

3. Fixation of responsibility:

Each individual is assigned a certain duty organisational structure defines what performance is expected of a member of the unit of the department of the enterprise. Absence or faulty determination of responsibility will lead to irresponsible functions, behaviour and attitudes.

4. Specialisation:

Modern production and management techniques are based on the idea of specialization which means the performance of different parts of a job by persons specifically suited for them.

Organisation is basically required to promote specialization. Efficient and smooth functioning is possible when different elements of a job are performed by experts and their efforts are pooled to attain the desired and product.

5. Coordination:

Since the pattern of managerial operations is to be based on die division' of labour, there arises the need of coordinating the activities of various individuals or that of different departments. They perform diverse, activities and these have to be woven into the main fabric.

6. Proper utilisation of human resources:

The most important thing for enterprises is to make the best possible use of its human resources. There must not be wastage or misapplication of human efforts. This is of great importance for economy as well as for the achievement of objectives.

It can be possible only by suitable organisation, which avoid all bottlenecks-chances of work being held up and allow smooth flow of performances.

7. Efficient functioning:

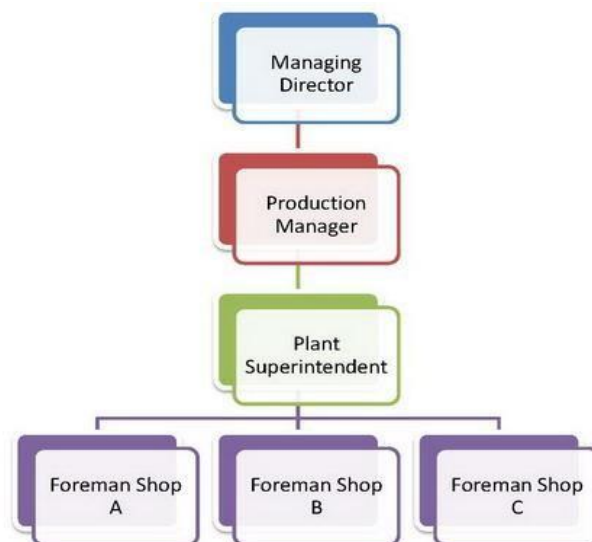
Efficiency is to be the watchword of an enterprise, all the factors mentioned above will have a great impact on the efficient functioning of the enterprise, and Organisation avoids all duplication in jobs, overlapping and wastage. It promotes speedy, smooth and efficient functioning of the enterprise.

8. EXPLAIN THE TYPES OF ORGANISATIONAL STRUCTURE (April"2011)

LINE ORGANISATION

It is perhaps the oldest and the simple organisational structure. In this kind of structure every manager exercise a direct authority over his subordinate who in turn directly reports to their superiors.

1. There is a hierarchical arrangement of authority.
2. Each department is self contained and works independently of other departments.
3. Lines of authority are vertical i.e. from top to bottom.
4. There are no staff specialists.



Advantages

1. Simple to establish and operate
2. Promotes prompt decision making.
3. Easy to control as the managers have direct control over their subordinates.
4. Communication is fast and easy as there is only vertical flow of communication.

Disadvantages

1. Lack of specialisation
2. Managers might get overloaded with too many things to do.
3. Failure of one manager to take proper decisions might affect the whole organisation.

However, line structures are suitable for

1. small businesses where there are few subordinates
2. organisations where there is largely of routine nature and methods of operations are simple.

FUNCTIONAL ORGANISATION

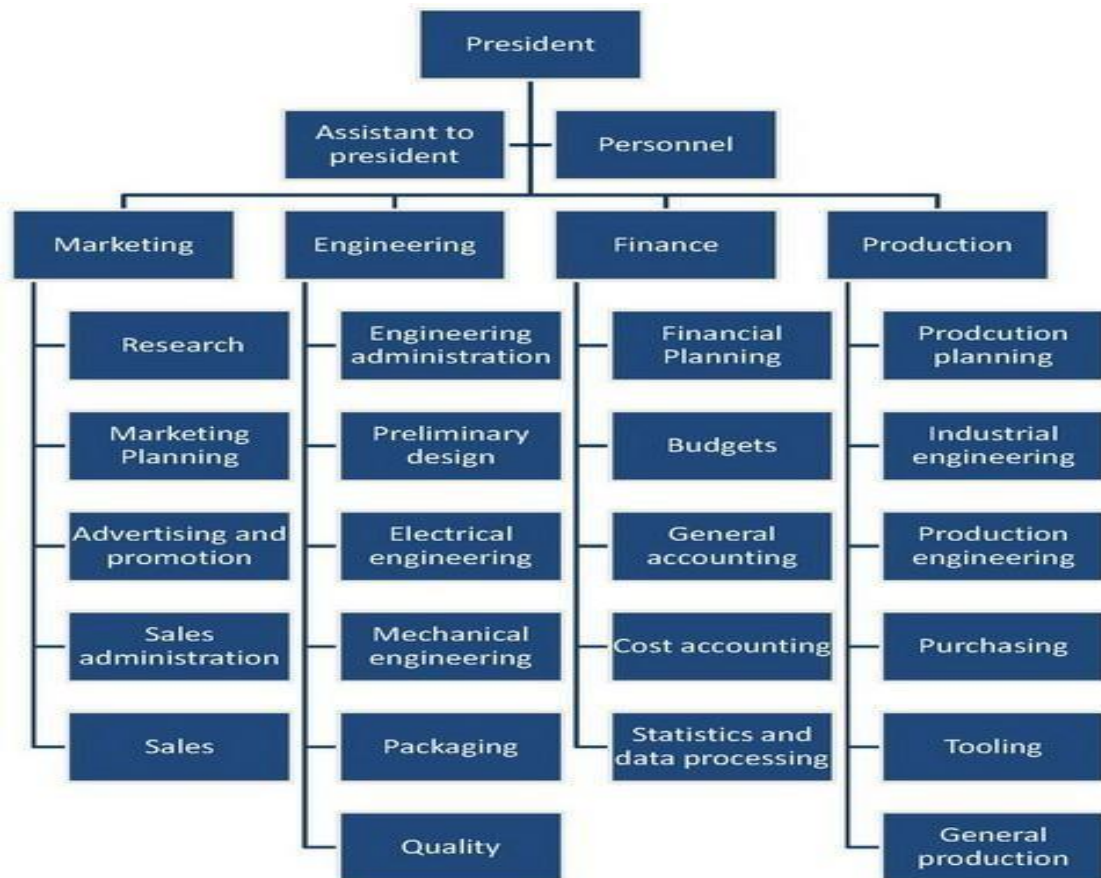
The organisation is divided into a number of functional areas. This organisation has grouping of activities in accordance with the functions of an organisation such as production, marketing, finance, human resource and so on. The specialist in charge of a functional department has the authority over all other employees for his function.

Advantages

1. Is logical and reflection of functions
2. Follows principle of occupation specialisation
3. Simplifies training
4. Better control as the manager in charge of each functional department is usually an specialist

Disadvantages

1. Overspecialisation and narrow viewpoints of key personnel can limit the organisation growth.
2. Reduced coordination between functions.
3. Conflicts between different functions could be detrimental for the organisation as a whole.
4. Difficult for general managers to coordinate different departments.



However, it is much suitable for large organisations where there is ample scope for specialisation. Once harmony and proper coordination among different functions is achieved, it could lead to sure success for an organisation.

LINE AND STAFF ORGANISATION

It is a combination of line and functional structures. In this organisation a structure, the authority flows in a vertical line and get the help of staff specialist who are in advisory. When the line executives need advice, information about any specific area, these staff specialists are consulted.

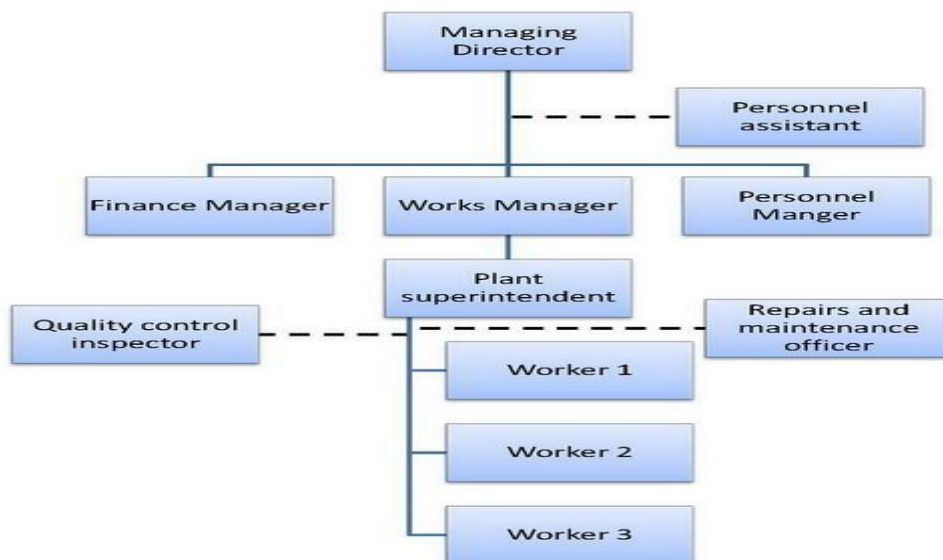
For example Chief accountant has command authority over accountants and clerks in the accounts departments but he has only advisory relationship with other departments like production or sales.

Advantages

1. Line managers are provided by expert advice by these specialists.
2. Staff managers provide specialist advice which can improve quality of decisions in various departments.

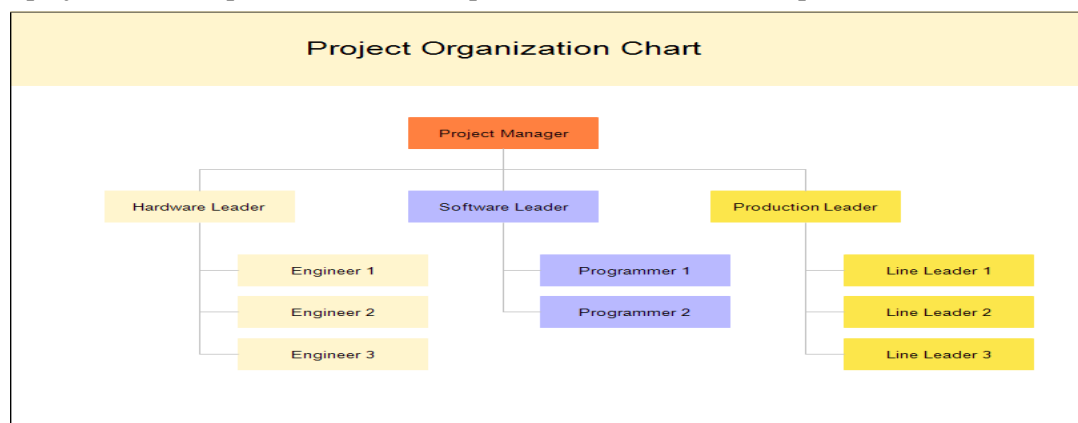
Disadvantages

1. Line managers and staff managers might have conflicts on particular issues.
2. Line and staff managers might not be clear as to what the actual area of operations is and what is expected of them. Co-ordination may be a problem.
3. Staff personnel are not accountable for the results and thus may not take tasks seriously. However, Line and staff organisation is very suitable for large organisation.



PROJECT ORGANISATION

The project structure consists of a number of horizontal organisational units to complete projects of a long duration. A team of specialists from different areas is created for each project. Usually this team is managed by the project manager. The project staff is separate from and independent of the functional departments.



Advantages

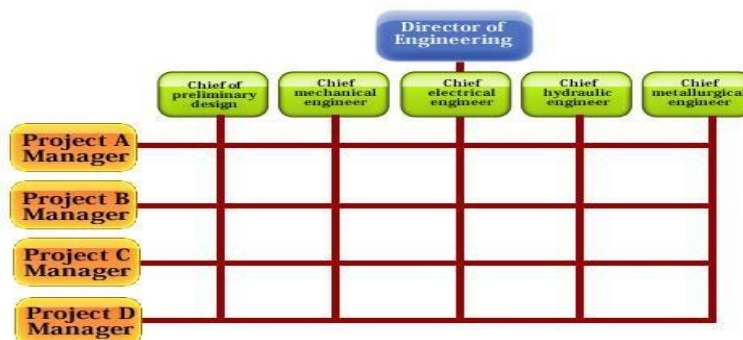
1. Special attention can be provided to meet the complex demand of the project.
2. It allows maximum use of specialist knowledge thus chances of failure are very less.
3. Project staff works as a team towards common goal which results in high motivation level for its members.

Disadvantages

As the project staff consists of personnel from diverse fields, it might be quite challenging for the project manager to coordinate among them.

MATRIX ORGANISATION

1. Matrix organisation combines two structures – functional departmentation and project structure.
2. Functional department is a permanent feature of the matrix structure and retains authority for overall operation of the functional units.
3. Project teams are created whenever specific projects require a high degree of technical skill and other resources for a temporary period.
4. Project team form the horizontal chain and functional departments create a vertical chain of command.
5. Members of a particular team are drawn from the functional departments and are placed under the direction of a project manager who has the overall responsibility of a particular project.



Matrix Organisation Structure

Advantage

1. Is oriented towards end results.
2. Professional identification is maintained
3. Pinpoints product-profit responsibility

Disadvantages

1. Conflict in organisation authority exists.
2. Possibility of disunity of command exists
3. Requires manager effective in human relations

9. EXPLAIN THE CHARACTERISTICS AND IMPORTANCE AND FEATURES OF PLANNING

(i) Planning is goal-oriented: All plans arise from objectives. Objectives provide the basic guide for planning activities. Planning has no meaning unless it contributes some positive achievement of predetermined goals.

(ii) **Planning is a primary function:** Planning is the foundation of management. It is a parent exercise in management process. It is a preface to business activities. According to **Koontz**, "Planning provides the basic foundation from which all future management functions arise". The idea of primacy of planning emphasizes the fact that planning takes precedence over other managerial functions like organizing, directing and controlling because none of these functions can come into being until there is a plan.

(iii) **Planning is all-pervasive:** Planning is a function of all managers. It is needed and practiced at all managerial levels. Planning is inherent in everything a manager does. Managers have to plan before launching a new business. They have to plan whenever things change.

(iv) **Planning is a mental exercise:** Planning is a mental process involving imagination, foresight and sound judgement. Planning compels managers to abandon guesswork and wishful thinking. It makes them think in a logical and systematic manner. Plans are based on a careful study of internal and external factors influencing business activities.

(v) **Planning is a continuous process:** Planning is continuous. It is a never-ending activity. Once plans for a specific period are prepared, they are translated into action. At the end of that period, there is a need for a new plan to be drawn based on new situations and conditions. Planning is thus, an ongoing process of adjustment to change. There is always need for a new plan to be drawn on the basis of new demands and changes in the circumstances.

(vi) **Planning involves choice:** Planning essentially involves choice among various alternative courses of action. If there is one way of doing something, there is no need for planning. The need for planning arises only when alternatives are available. Planning presupposes the existence of alternatives. From out of these alternatives, a manager would select the best alternative, after careful analysis and evaluation.

(vii) **Planning is forward looking:** Planning means looking ahead and preparing for the future. It means peeping into the future, analyzing it and preparing for it. Managers plan today with a view to flourish tomorrow. Without planning, business becomes random in nature and decisions would become meaningless, adhoc choices.

(viii) **Planning is flexible:** Planning is based on a forecast of future events. Since future is uncertain, plans should be reasonably flexible. The onset of colour television sets forced many a manufacturer in the West to abandon production of black and white television sets long back. When market conditions change, planners have to make necessary changes in the existing plans.

10. EXPLAIN THE BENEFITS AND DEMERITS OF PLANNING.

Benefits of planning:

(i) **Focuses Attention on Objectives.** Since all planning is directed towards achieving enterprise objectives, the very act of planning focuses attention on these objectives. Laying down the objectives is the first step in planning. If the objectives are clearly laid down, the execution of plans will also be directed towards these objectives.

(ii) **Ensures Economical Operation.** Planning involves a lot of mental exercise, which is directed towards achieving efficient operation in the enterprise. It substitutes joint directed effort for uncoordinated piecemeal activity, even flow of work for uneven flow, and deliberate decisions for snap judgements. This helps in better utilization of resources and thus minimizing costs.

(iii) **Reduces Uncertainty.** Planning helps in reducing uncertainties of future because it involves anticipation of future events. Effective planning is the result of deliberate thinking based on facts and figures. It involves forecasting also. Planning gives an opportunity to a business manager to foresee various uncertainties, which may be caused by changes in technology, taste and fashion of the people, etc. Sufficient provision is made in the plans to offset these uncertainties.

(iv) **Facilitates Control.** Planning helps the managers in performing their function of control. Planning and control are inseparable in the sense that unplanned action cannot be controlled because control involves keeping activities on the predetermined course by rectifying deviations from plans. Planning helps control by furnishing standards of control. It lays down objectives and standards of performance, which are essential for the performance of control function.

(v) **Encourages Innovation and Creativity.** Planning is basically the deciding function of management. It helps innovative and creative thinking among the managers because many new ideas come to the mind of a manager when he is planning. It creates a forward-looking attitude among the managers.

(vi) **Improves Motivation.** A good planning system ensures participation of all managers, which improves their motivation. It improves the motivation of workers also because they know clearly what is expected of them. Moreover, planning serves as a good training device for future managers.

(vii) **Improves Competitive Strength.** Effective planning gives a competitive edge to the enterprise over other enterprises that do not have planning or have ineffective planning. This is because planning may involve expansion of capacity, changes in work methods, changes in quality, anticipation tastes and fashion of people and technological changes, etc.

(viii) Achieves Better Coordination. Planning secures unity of direction towards the organizational objectives. All the activities are directed towards the common goals. There is an integrated effort throughout the organization.

Limitations Of Planning

Sometimes, planning fails to achieve the expected results. There are many causes of failure of planning in practice. These are discussed below:

- 1. Lack of reliable data.** There may be lack of reliable facts and figures over which plans may be based. Planning loses its value if reliable information is not available or if the planner fails to utilize the reliable information. In order to make planning successful, the planner must determine the reliability of facts and figures and must base his plans on reliable information only.
- 2. Lack of initiative.** Planning is a forward-looking process. If a manager has a tendency to follow rather than lead, he will not be able to make good plans. Therefore, the planner must take the required initiative. He should be an active planner and should take adequate follow up measures to see that plans are understood and implemented properly.
- 3. Costly process.** Planning is time consuming and expensive process. This may delay action in certain cases. But it is also true that if sufficient time is not given to the planning process, the plans so produced may prove to be unrealistic. Similarly, planning involves costs of gathering and analyzing information and evaluation of various alternatives. If the management is not willing to spend on planning, the results may not be good.
- 4. Rigidity in organizational working.** Internal inflexibility in the organization may compel the planners to make rigid plans. This may deter the managers from taking initiative and doing innovative thinking. So the planners must have sufficient discretion and flexibility in the enterprise. They should not always be required to follow the procedures rigidly.
- 5. Non-acceptability of change.** Resistance to change is another factor, which puts limits on planning. It is a commonly experienced phenomenon in the business world. Sometimes, planners themselves do not like change and on other occasions they do not think it desirable to bring change as it makes the planning process ineffective.
- 6. External limitations.** The effectiveness of planning is sometimes limited because of external factors, which are beyond the control of the planners. External stringencies are very difficult to predict. Sudden break-out of war, government control, natural havocs and many other factors are beyond the control of management. This makes the execution of plans very difficult.
- 7. Psychological barriers.** Psychological factors also limit the scope of planning. Some people consider present more important than future because present is certain. Such persons are psychologically opposed to planning. But it should not be forgotten that dynamic managers always look ahead. Long-range well-being of the enterprise cannot be achieved unless proper planning is done for future

11. EXPLAIN THE STRATEGIES AND MEASURES TO OVERCOME LIMITATIONS OF PLANNING.

- 1. Setting Clear-cut Objectives.** The existence of clear-cut objectives is necessary for efficient planning. Objectives should not only be understandable but rational also. The overall objectives of the enterprise must be the guiding pillars for determining the objectives of various departments. This would help in having coordinated planning in the enterprise.
- 2. Management Information System.** An efficient system of management information should be installed so that all relevant facts and figures are made available to the managers before they perform the planning function. Availability of right type of information will help in overcoming the problems of complete understanding of the objectives and resistance to change on the part of the subordinates.
- 3. Careful Premising.** The planning premises constitute a framework within which planning is done. They are the assumptions of what is likely to happen in future. Planning always requires some assumptions to be made regarding future happenings. In other words, it is a pre-requisite to determine future settings such as marketing, pricing, Government policy, tax structure, business cycle, etc. before giving the final shape to the overall business plan. The planning premises should be set up very carefully. Due weightage should be given to the relevant factors at the time of premising. It may be pointed out that the premises which may be of strategic significance to one enterprise may not be of equal significance to another because of size, nature of business, nature of market, etc.

4. Business Forecasting. Business is greatly influenced by economic, social, political and international environment. The management must have a mechanism of forecasting changes in such environment. Good forecasts will contribute to the effectiveness of planning.

5. Dynamic Managers. The persons concerned with the task of planning should be dynamic in outlook.. A manager should always keep in mind that planning is looking ahead and he is making plans for future, which is highly uncertain. They must take the required initiative to make business forecasts and develop planning premises.

6. Flexibility. Some element of flexibility must be introduced in the planning process because modern business operates in an environment, which keeps on changing. For achieving effective results, there should always be a scope to make necessary addition, deletion, or alteration in the plans as is demanded by the circumstances.

7. Availability of Resources. Determination and evaluation of alternatives should be done in the light of resources available to the management. Alternatives are always present in any, decision making problem. But their relative plus and minus points are to be evaluated in the light of the resources available. The alternative which is chosen should not only be concerned with the objectives of the enterprise, but also capable of being accomplished with the help of the given resources.

8. Cost-Benefit Analysis. The planners must undertake cost-benefit analysis to ensure that the benefits of planning are more than the cost involved in it. This necessarily calls, for establishing measurable goals, clear insight to the alternative courses of action available, premising reasonably and formulation of derivative plans keeping in view the fact that environment is fast-changing

12. EXPLAIN THE STEPS OR PROCESS INVOLVED IN PLANNING (OR PROCESS OR HOW TO MAKE A PLAN?)

1. Being watchful:

1. It could be referred to as a pre-step in planning or a desirable pre-condition for making a successful plan.
2. The management must, accordingly, initiate the planning process at the most opportune moments expecting gains through the adage „well-begun is half done“.

2. Awareness of opportunities and problems:

1. The first step in planning is the awareness of the unexploited business opportunities or the problem to be provided for in future.

3. Collecting and analyzing information:

2. The next step is to gather adequate information and data relating to the planning to be made and analyze it to find out the cause-effect relationship between the various factors.

4. Setting objectives:

3. Analysis and interpretation of data facilitate in determining the enterprise objectives.
1. Objectives must be specific and clear and should indicate the end result of planning activity.

5. Determining planning premises and constraints:

2. Before plans are prepared the assumptions and condition underlying them must be clearly defined.
3. These assumptions are called planning premises and they can be identified through accurate forecasting of likely future events.

6. Finding out the alternative course of action:

1. After establishing the objectives and the planning premises, the alternative plans are developed.
2. For every plan there are a number of alternative and hence, all possible alternatives to work out a plan for achieving the desired objectives should be found out for their evaluation.
3. Cost, risk and resources associated with different alternatives should also be considered. Imagination and foresight are required to generate and evaluated policy alternatives.

7. Evaluation of alternatives and selection:

1. A critical evaluation of alternatives involves going into the plus and minus points of each alternative; and to find out the net worth of each alternative-in terms of its contribution to the objectives of the plan.
2. It is to evaluate all possible alternatives with reference to cost, speed, quality, etc., and select the best course of action.

8. Selection of the „best“ alternatives:

1. The management while selecting the best alternative might base decision on one or more of the following bases:
 - a) *Experience*: the management might base its final selection of the best alternative, on its experience. In fact, experienced manager knows what types of alternatives he adopted in the past; and with what implications and consequences.
 - b) *Experimentation*: in terms, of experiments with the „best“ alternative; and analyses the outcome of the experiment, before finalizing the decision.

9. Formulation of derivative plans:

2. A major plan, usually calls for a number of derivative plans; plans derived from the main plan. Derivative plans might also be called –supporting or minor or secondary plans.
3. A plan e.g relating to the installation of a new plant for manufacturing a new product might call for the following derivative plans:-
 1. a plan for „design“ and manufacturing of the new product.
 2. Plans of recruitment, selection and training of personnel for operating the plant.
 3. A plan for the repairs and maintenance of the plant.
 4. A plan for advertising the product to be produced by the plant, etc.

10. Implementation of the plan:

The step, which gives a finishing touch to the planning process, is concerned with the implementation of the plan, which implies „putting the plan into action“.

11. Follow-up action:

5. Though the planning process comes to a close with the implementation of the plan; yet a desirable step, which yet remains to be taken, relates to the follow-up action on the implementation of the plan.
6. „Follow-up action“ implies watching the consequences (both good and bad)- economic, social psychological etc.

13. EXPLAIN THE FUNCTIONS OF STAFFING :

1. Employment. The responsibility for employment consists of appointing the best possible talents suitable to the requirements of the enterprise. This function includes various activities like job analysis, manpower demand analysis, recruitment, selection and placement. Before appointing the people, manpower requirements are estimated both in terms of number and quality. The employment function is complete when the workers join the organization and are placed on the right jobs.

2. Training and Development. Training and development of personnel is a follow up of selection. It is a duty of management to train each employee and also to develop him for the higher jobs in the organization. Proper development of personnel is necessary to increase their skills in doing their jobs and in satisfying their growth need. For this purpose, the personnel department will devise appropriate training programmes. there are several on the job and off the job methods available for training purposes.

3. Compensation. This function is concerned with the determination of adequate and equitable remuneration of the employees in the organization for their contribution to the organizational goals. The personnel can be compensated both in terms of monetary as well as non-monetary rewards. Factors which

must be borne in mind while fixing the remuneration of personnel are their basic needs, requirements of jobs, legal provisions regarding minimum wage levels afforded by competitors, etc. For fixing the wage levels, the personnel department can make use of certain techniques like job evaluation and performance evaluation.

4. Integration. This function aims to achieve a reasonable reconciliation of the interests of the personnel with those of the organization. The important problem related to integration is communication. The personnel manager must provide an efficient system of communication to ensure two-way traffic of personnel programmes and policies because many a time industrial disputes arise because of poor communication. The personnel manager should always keep himself in contact with the trade unions to understand their grievances and remove the same so that harmony is maintained in the organization.

5. Working Conditions. Mere appointment and training of employees is not sufficient, they must be provided with good working conditions so that they may like their work and work-place and maintain their efficiency. Working conditions certainly influence the motivation and morale of the employees. These include the measures to be taken for health and safety of the employees.

6. Welfare Services. The department provides for various welfare services, which relate to the physical and social well-being of the employees. They may include provision for cafeterias, rest-rooms, counseling, group insurance, education of children of employees, recreational facilities, etc.

7. Personnel Records. The HR department maintains the personal records of the employees working in the enterprise. It keeps full records about their training, achievements, transfer, promotion, etc. It also preserves many other records relating to the behavior of personnel like absenteeism and labor turnover and the personnel programme and policies of organization.

8. Industrial Relations. These days, the personnel managers mainly discharge the responsibility of industrial relations. Personnel managers help in collective bargaining, joint consultation and settlement of disputes, if they arise. This is because personnel manager is in possession of full information relating to personnel and he possesses the working knowledge of various labor enactments.

14. EXPLAIN THE STEPS OR FLOW OR PROCESS OF CONTROLLING OR CONTROL.

(Arpil“2012)

Establishment of standards- Standards are the plans or the targets which have to be achieved in the course of business function. They can also be called as the criterions for judging the performance. Standards generally are classified into two-

Measurable or tangible - Those standards which can be measured and expressed are called as measurable standards. They can be in form of cost, output, expenditure, time, profit, etc.

Non-measurable or intangible- There are standards which cannot be measured monetarily. For example- performance of a manager, deviation of workers, their attitudes towards a concern. These are called as intangible standards.

Controlling becomes easy through establishment of these standards because controlling is exercised on the basis of these standards.

Measurement of performance- The second major step in controlling is to measure the performance. Finding out deviations becomes easy through measuring the actual performance. Performance levels are sometimes easy to measure and sometimes difficult. Measurement of tangible standards is easy as it can be expressed in units, cost, money terms, etc. Quantitative measurement becomes difficult when performance of manager has to be measured. Performance of a manager cannot be measured in quantities. It can be measured only by-

1. Attitude of the workers,
2. Their morale to work,
3. The development in the attitudes regarding the physical environment, and

4. Their communication with the superiors.

It is also sometimes done through various reports like weekly, monthly, quarterly, yearly reports.

Comparison of actual and standard performance- Comparison of actual performance with the planned targets is very important. Deviation can be defined as the gap between actual performance and the planned targets. The manager has to find out two things here- extent of deviation and cause of deviation. Extent of deviation means that the manager has to find out whether the deviation is positive or negative or whether the actual performance is in conformity with the planned performance. The managers have to exercise control by exception. He has to find out those deviations which are critical and important for business. Minor deviations have to be ignored. Major deviations like replacement of machinery, appointment of workers, quality of raw material, rate of profits, etc. should be looked upon consciously. Therefore it is said, "If a manager controls everything, he ends up controlling nothing." For example, if stationery charges increase by a minor 5 to 10%, it can be called as a minor deviation. On the other hand, if monthly production decreases continuously, it is called as major deviation.

Once the deviation is identified, a manager has to think about various cause which has led to deviation. The causes can be-

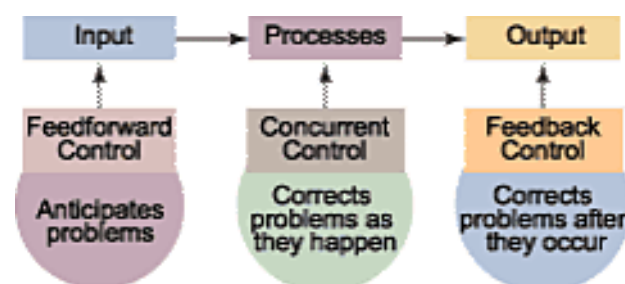
1. Erroneous planning,
2. Co-ordination loosens,
3. Implementation of plans is defective, and
4. Supervision and communication is ineffective, etc.

Taking remedial actions- Once the causes and extent of deviations are known, the manager has to detect those errors and take remedial measures for it. There are two alternatives here-

1. Taking corrective measures for deviations which have occurred; and
2. After taking the corrective measures, if the actual performance is not in conformity with plans, the manager can revise the targets. It is here the controlling process comes to an end. Follow up is an important step because it is only through taking corrective measures, a manager can exercise controlling.

15. EXPLAIN THE TYPES OF CONTROL

Management can implement controls before an activity commences, while the activity is going on, or after the activity has been completed. The three respective types of control based on timing are feedforward, concurrent, and feedback.



FEEDFORWARD CONTROL: Feed forward control focuses on the regulation of inputs (human, material, and financial resources that flow into the organization) to ensure that they meet the standards necessary for the transformation process.

Feed forward controls are desirable because they allow management to prevent problems rather than having to cure them later. Unfortunately, these control require timely and accurate information that is often difficult to develop. Feed forward control also is sometimes called **preliminary control**, **precontrol**, **preventive control**, or **steering control**.

However, some authors use term "*steering control*" as separate types of control. This types of controls are designed to detect deviation some standard or goal to allow correction to be made before a particular sequence of actions is completed.

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CONCURRENT CONTROL: Concurrent control takes place while an activity is in progress. It involves the regulation of ongoing activities that are part of transformation process to ensure that they conform to organizational standards. Concurrent control is designed to ensure that employee work activities produce the correct results.

Since concurrent control involves regulating ongoing tasks, it requires a through understanding of the specific tasks involved and their relationship to the desired and product.

Concurrent control sometimes is called screening or yes-no control, because it often involves checkpoints at which determinations are made about whether to continue progress, take corrective action, or stop work altogether on products or services.

16. EXPLAIN THE SCOPE OF CONTROL

1. **Control over policies:** The success of any business organisation to a large extent, depends upon, how far its policies are implemented. Hence the need of control over policies is self-evident. In many enterprises, policies are controlled through policy manuals.

2. **Control over organisation:** Control over organisation is accomplished through the development of organisation chart and organisation manual. Organisation manual attempts at solving organisational problems and conflicts, making long-range organisation planning possible, enabling rationalisation of organisation structure, helping in proper designing of organisation and department.

3. **Control over personnel:** The statement that „Management is getting the work done through people“ underlines sufficiently the importance of control of personnel. All employees working at different levels must perform their assigned duties well and direct their efforts in controlling their behaviour. Personal Director or Personnel Manager prepares control plan for having control over personnel.

4. **Control over wages and salaries:** Such type of control is done by having programme of job evaluation and wage and salary analysis. This work is done either by personnel department or industrial engineering department. Often a wage and salary committee is constituted to help these departments in the task of controlling wages and salaries.

5. **Control over costs:** Cost control is exercised by the cost accountant, by setting cost standards for material, labour and overheads and making comparison of actual cost data with standard cost. Cost control is supplemented by budgetary control systems.

6. **Control over methods:** Control over methods is accomplished by conducting periodic analysis of activities of each department. The functions performed, methods adopted and time devoted by every employee is studied with a view to eliminate non-essential motions, functions and methods.

7. **Control over capital expenditures:** It is exercised through a system of evaluation of projects, ranking of projects in terms of their rank power and appropriate capital to various projects. A capital budget is prepared for the whole firm. A capital budgeting committee reviews the project proposes and approves the projects of advantages to the firm. Capital budgeting, project analysis, break-even analysis, study of cost of capital, etc. are some popular techniques of control over capital expenditure.

17. EXPLAIN LEADERSHIP QUALITIES

Vision: Great leaders have vision. They can see into the future. They have a clear, exciting idea of where they are going and what they are trying to accomplish and are excellent at strategic planning.

This quality separates them from managers. Having a clear vision turns the individual into a special type of person. This quality of vision changes a „„transactional manager““ into a „„transformational leader.““ While a manager gets the job done, great leaders tap into the emotions of their employees.

Courage: „„Courage is rightly considered the foremost of the virtues, for upon it, all others depend.““ (Winston Churchill)

The quality of courage means that you are willing to take risks in the achievement of your goals with no assurance of success. Because there is no certainty in life or business, every commitment you make and every action you take entails a risk of some kind. Among the seven **leadership qualities**, courage is the most identifiable outward trait.

Integrity: In every strategic planning session that I have conducted for large and small corporations, the first value that all the gathered executives agree upon for their company is integrity. They all agree on the importance of complete honesty in everything they do, both internally and externally.

The core of integrity is truthfulness. Integrity requires that you always tell the truth, to all people, in every situation. Truthfulness is the foundation quality of the trust that is necessary for the success of any business.

Humility: Great leaders are those who are strong and decisive but also humble. Humility doesn't mean that you're weak or unsure of yourself. It means that you have the self-confidence and self awareness to recognize the value of others without feeling threatened. It means that you are willing to admit you could be wrong, that you recognize you may not have all the answers. And it means that you give credit where credit is due.

Strategic Planning: Great leaders are outstanding at **strategic planning**. They have the ability to look ahead, to anticipate with some accuracy where the industry and the markets are going.

Leaders have the ability to anticipate trends, well in advance of their competitors. They continually ask, „„Based on what is happening today, where is the market going? Where is it likely to be in three months, six months, one year, and two years?““ through thoughtful strategic planning.

Because of increasing competitiveness, only the leaders and organizations that can accurately anticipate future markets can possibly survive. Only leaders with foresight can gain the „„first mover advantage.““

Focus: Leaders always focus on the needs of the company and the situation. Leaders focus on results, on what must be achieved by themselves, by others, and by the company. Great leaders focus on strengths, in themselves and in others. They focus on the strengths of the organization, on the things that the company does best in satisfying demanding customers in a competitive marketplace.

Your ability as a leader to call the shots and make sure that everyone is focused and concentrated on the most valuable use of their time is essential to the excellent performance of the enterprise.

Cooperation: Your ability to get everyone working and pulling together is essential to your success.

Leadership is the ability to get people to work for you because they want to.

The 80/20 rule applies here. Twenty percent of your people contribute 80 percent of your results. Your ability to select these people and then to work well with them on a daily basis is essential to the smooth functioning of the organization.

Gain the cooperation of others by making a commitment to get along well with each key person every single day. You always have a choice when it comes to a task: You can do it yourself, or you can get someone else to do it for you. Which is it going to be?

Inspiration: Quite often, employees need someone to look up to for direction, guidance, and motivation. The entrepreneur needs to be that person. Hopefully, Human Resources has hired self-motivated individuals. Nevertheless, there are times, when many employees need the boss to inspire them by word or action. Employees need someone to look up to, admire, and follow. Even when the production or delivery of

services looks like "it is all going well," the leader may at times need to step in personally to offer a suggestion or encouragement to ensure that employees perform their jobs in an optimal manner.

Ambition: Resting on your laurels is bad for employee morale and entrepreneurial credibility. Employees need to be constantly striving for improvement and success; and they need to see the same and more in their leaders. When the boss is seen as someone who works to attain increasingly higher goals, employees will be impressed and more willing to mirror that behavior. It's a win-win for everyone.

18. EXPLAIN THE CHARACTERISTICS OF A GOOD LEADER

Empathy: Creating a legitimate rapport with your staff makes it less likely that personal issues and resentment can creep in and derail the group. When your team knows that you are empathetic to their concerns, they will be more likely to work with you and share in your vision, rather than foster negative feelings.

Consistency: Being a consistent leader will gain you respect and credibility, which is essential to getting buy-in from the group. By setting an example of fairness and credibility, the team will want to act the same way.

Honesty: Another characteristic of leadership that lends itself to credibility. Those who are honest, especially about concerns, make it far more likely that obstacles will be addressed rather than avoided. Honesty also allows for better assessment and growth.

Direction: Having the vision to break out of the norm and aim for great things --then the wherewithal to set the steps necessary to get there-- is an essential characteristic of good leadership. By seeing what can be and managing the goals on how to get there, a good leader can create impressive change.

Communication: Effective communication helps keep the team working on the right projects with the right attitude. If you communicate effectively about expectations, issues and advice, your staff will be more likely to react and meet your goals.

Flexibility: Not every problem demands the same solution. By being flexible to new ideas and open-minded enough to consider them, you increase the likelihood that you will find the best possible answer. You will set a good example for your team and reward good ideas.

Conviction: A strong vision and the willingness to see it through is one of the most important characterizes of leadership. The leader who believes in the mission and works toward it will be an inspiration and a resource to their followers.

Proactive vs. Reactive: The exceptional leader is always thinking three steps ahead. Working to master his/her own environment with the goal of avoiding problems before they arise. Flexible/Adaptable: How do you handle yourself in unexpected or uncomfortable situations? An effective leader will adapt to new surroundings and situations, doing his/her best to adjust.

A Good Communicator: As a leader, one must listen...a lot! You must be willing to work to understand the needs and desires of others. A good leader asks many questions, considers all options, and leads in the right direction.

Respectful: Treating others with respect will ultimately earn respect.

Quiet Confidence: Be sure of yourself with humble intentions. Enthusiastic; Excitement is contagious. When a leader is motivated and excited about the cause people will be more inclined to follow

Open-Minded: Work to consider all options when making decisions. A strong leader will evaluate the input from all interested parties and work for the betterment of the whole.

Resourceful: Utilize the resources available to you. If you don't know the answer to something find out by asking questions. A leader must create access to information.

Rewarding: An exceptional leader will recognize the efforts of others and reinforce those actions. We all enjoy being recognized for our actions!

Well Educated: Knowledge is power. Work to be well educated on community policies, procedures, organizational norms, etc. Further, your knowledge of issues and information will only increase your success in leading others.

19. EXPLAIN VARIOUS TYPES OF LEADERSHIP THEORIES.

1. "Great Man" Theories:

Have you ever heard someone described as "born to lead?" According to this point of view, great leaders are simply born with the necessary internal characteristics such as charisma, confidence, intelligence, and social skills that make them natural-born leaders.

Great man theories assume that the capacity for leadership is inherent – that great leaders are born, not made. These theories often portray great leaders as heroic, mythic and destined to rise to leadership when needed. The term "Great Man" was used because, at the time, leadership was thought of primarily as a male quality, especially in terms of military leadership.

		Approach	
		Universal	Contingent
Focus	Focus On Traits	Leader Traits Theory	Fiedler's Contingency Theory
	Focus On Behaviors	Early Behavioral Theory	The Path-Goal Theory

2. Trait Theories:

Similar in some ways to Great Man theories, trait theories assume that people inherit certain qualities and traits that make them better suited to leadership. Trait theories often identify particular personality or behavioral characteristics shared by leaders. For example, traits like extraversion, self-confidence, and courage are all traits that could potentially be linked to great leaders.

If particular traits are key features of leadership, then how do we explain people who possess those qualities but are not leaders? This question is one of the difficulties in using trait theories to explain leadership. There are plenty of people who possess the personality traits associated with leadership, yet many of these people never seek out positions of leadership.

3. Contingency Theories:

Contingency theories of leadership focus on particular variables related to the environment that might determine which particular style of leadership is best suited for the situation. According to this theory, no leadership style is best in all situations. Success depends upon a number of variables, including the leadership style, qualities of the followers and aspects of the situation.

4. Situational Theories:

Situational theories propose that leaders choose the best course of action based upon situational variables. Different styles of leadership may be more appropriate for certain types of decision-making. For example, in a situation where the leader is the most knowledgeable and experienced member of a group, an authoritarian style might be most appropriate. In other instances where group members are skilled experts, a democratic style would be more effective.

5. Behavioral Theories:

Behavioral theories of leadership are based upon the belief that great leaders are made, not born. Consider it the flip-side of the Great Man theories. Rooted in behaviorism, this leadership theory focuses on the actions of leaders not on mental qualities or internal states. According to this theory, people can *learn* to become leaders through teaching and observation.

6. Participative Theories:

Participative leadership theories suggest that the ideal leadership style is one that takes the input of others into account. These leaders encourage participation and contributions from group members and help group members feel more relevant and committed to the decision-making process. In participative theories, however, the leader retains the right to allow the input of others.

7. Management Theories:

Management theories, also known as transactional theories, focus on the role of supervision, organization and group performance. These theories base leadership on a system of rewards and punishments. Managerial theories are often used in business; when employees are successful, they are rewarded; when they fail, they are reprimanded or punished. Learn more about theories of transactional leadership.

8. Relationship Theories:

Relationship theories, also known as transformational theories, focus upon the connections formed between leaders and followers. Transformational leaders motivate and inspire people by helping group members see the importance and higher good of the task. These leaders are focused on the performance of group members, but also want each person to fulfill his or her potential. Leaders with this style often have high ethical and moral standards.

20. EXPLAIN THE TYPES OF LEADERSHIP STYLES OR LEADERS (April"2012)

The following are main types of leadership styles:

- (1) Autocratic Leadership Style
- (2) Democratic Leadership Style
- (3) Laissez-faire Leadership Style

AUTOCRATIC LEADERSHIP STYLE: This style is also known as the leader-centred style. Under this style, the leader keeps all the authority centred in his hands and the employees have to perform the work exactly as per his orders. If any employee is careless in his work performance, he is punished.

The leader does not decentralise his authority for the fear of losing his importance. Consequently, the responsibility of the success or failure of management remains with the manager.

CHARACTERISTICS OF AUTOCRATIC STYLE

Following are the characteristics of the autocratic leadership style:

- (i) **Centralised Authority:** In this style, a manager is not prepared to share his authority and responsibility with others. Consequently, all the authority of work performance remains centralised.
- (ii) **Single-man Decisions:** In this style of leadership, the manager himself takes all the decisions. He takes it for granted that he does not need any other individual.
- (iii) **Wrong Belief regarding Employees:** The manager is a victim of the thinking that the employees do not work when motivated by love and they require hard control. Impelled by this thought, managers take the help of the centralised leadership style.
- (iv) **Only Downward Communication:** The thinking and suggestions of the employees are meaningless in this style of leadership. Therefore, the communication is only downward which means that the managers only tell them their ideas but do not listen to the employees' ideas.

ADVANTAGES

The autocratic leadership style has the following advantages:

- (i) **Quick and Clear Decisions:** Because of the centralised authority all the decisions are taken by a single individual and hence there is no unnecessary delay and the decisions are comparatively clear.
- (ii) **Satisfactory Work:** Since the work performance of the employees is under strict control, the quantity and quality of the work happen to be satisfactory.
- (iii) **Necessary for Less Educated Employees:** This style is very useful for the less educated and persons of less understanding. They have no capability of taking decisions because of little education. The employees of this category can only work and not take decisions.

DISADVANTAGES

This style has the following disadvantages:

(i) Lack of Motivation: This style does motivate the managers but it lowers the morale of the employees. This is natural because working in an environment of fear does lower their morale.

(ii) Agitation by Employees: Since the employees are not given any participation in taking decisions, they are turned into machines working like machines incapable of doing anything of their own. Similarly, managers can make the employees do as they wish. The employees consider such a leadership style as uninteresting and oppose it.

(iii) Possibility of Partiality: Since all the authority is centralised in a single individual, he tries to please his favourites and flatterers by giving them work of less laborious nature. Such a partiality creates a feeling of bitterness and anger among the employees.

DEMOCRATIC LEADERSHIP STYLE

This style is also known as group-centered leadership style. These days this leadership style is very much in vogue. Under this style, decisions regarding different works are not taken by the manager alone but they are taken in consultation with the employees.

This leadership style is based on decentralisation. The manager respects the suggestions made by his subordinates, and also makes efforts to fulfill their necessities.

CHARACTERISTICS

Following are the characteristics of democratic leadership style:

(i) Cooperative Relations:

The chief characteristic of this style is the existence of cooperative relations among the managers and the employees. Participation in the management decisions gives the employees a feeling of self-respect, as a result of which the employees are always ready to be cooperative in every way.

(ii) Belief in Employees:

The managers inherently believe that the employees by nature want to work, do their work with interest, accept their responsibility and try to perform their work in a good manner. This faith of the managers in the employees increases their morale.

(iii) Open Communication:

This style encourages open communication among the managers and the employees. Open communication means both ways communication, meaning thereby that apart from saying their own thoughts the managers receive the suggestions of the employees with pleasure.

ADVANTAGES

Democratic leadership style has the following advantages:

(i) High Morale:

Under this style, the enthusiasm of the managers and the employees is sky-high. Both consider each other their well-wishers.

(ii) Creation of More Efficiency and Productivity:

Since the employees are participants in the decision making, they give full cooperation in implementing them. In this way their efficiency increases.

(iii) Availability of Sufficient Time for Constructive Work:

Under this leadership style, the workload of the managers gets decreased. By using their spare time constructively they make the development and expansion of the enterprise possible.

DISADVANTAGES

Following are the disadvantages of the democratic leadership style:

(i) Requirement of Educated Subordinates:

The chief characteristic of this leadership style is that the subordinates are made partners in taking decisions, so much so that some little affairs are left to them. Such cooperation can be expected only from the educated employees.

(ii) Delay in Decisions:

It is clear that while taking decisions the subordinates are always consulted. This makes it a long process.

(iii) Lack of Responsibility in Managers:

Sometimes the managers try to evade responsibility by observing that the decisions were taken by the subordinates because they were made partners in taking some important decisions. Thus, they must be held responsible.

LAISSEZ-FAIRE OR FREE-REIN LEADERSHIP STYLE OR DELEGATIVE STYLE

This leadership style is also described as Individual- centered style. In this style, the manager or the leader takes little interest in managerial functions and the subordinates are left on their own. It refers to that leadership style in which the leader gives his subordinates complete freedom to make decisions.

Overall objectives help the subordinates in determining their own objectives. Apart from this, they provide resources for work performance and, if need be, they also advise the employees. This style is absolutely different from the autocratic leadership style.

CHARACTERISTICS

Following are the characteristics of the free-rein leadership style:

(i) Full Faith in Subordinates:

A prominent characteristic of this style is that the managers consider their subordinates capable, active and responsible individuals and have full faith in them.

(ii) Independent Decision-making System:

In this style, the management-related decisions are taken by the subordinates instead of the managers. They can, however, consult the managers.

(iii) Decentralisation of Authority:

This style is based on the principle of decentralisation. It means that the managers widely distribute their authority to enable every individual to determine his objective and make his plans accordingly. The managers only perform the function of coordination, direction and general control.

(iv) Self-directed, Supervisory and Controlled:

After having once explained the objectives, the only job of the manager is to interfere only in adverse situations. The supervision and control is done by the employees themselves.

ADVANTAGES

Free-rein leadership style has the following advantages:

(i) Development of Self-confidence in Subordinates:

When all the authority in their work performance is given to the employees, they become habituated in taking decisions which creates self-confidence in them. They start doing better work in future.

(ii) High-level Motivation:

When the manager gives the subordinates all the authority by showing full confidence in them they start considering themselves an important part of the concern.

In this way they start feeling that they are not a part of the enterprise but are the enterprise itself. With the onset of this feeling there is nothing left in their motivation.

(iii) Helpful in Development and Extension of the Enterprise:

The development and extension of an enterprise where this leadership style is adopted is at its climax. The reason for this is the time available with the managers to find out the possibilities of development and extension.

DISADVANTAGES

This leadership style has the following disadvantages:

(i) Difficulty in Cooperation:

Since there is no close supervision and control by the managers everybody starts functioning independently. Some employees with opposite point of view become a hurdle in the attainment of objectives of other people.

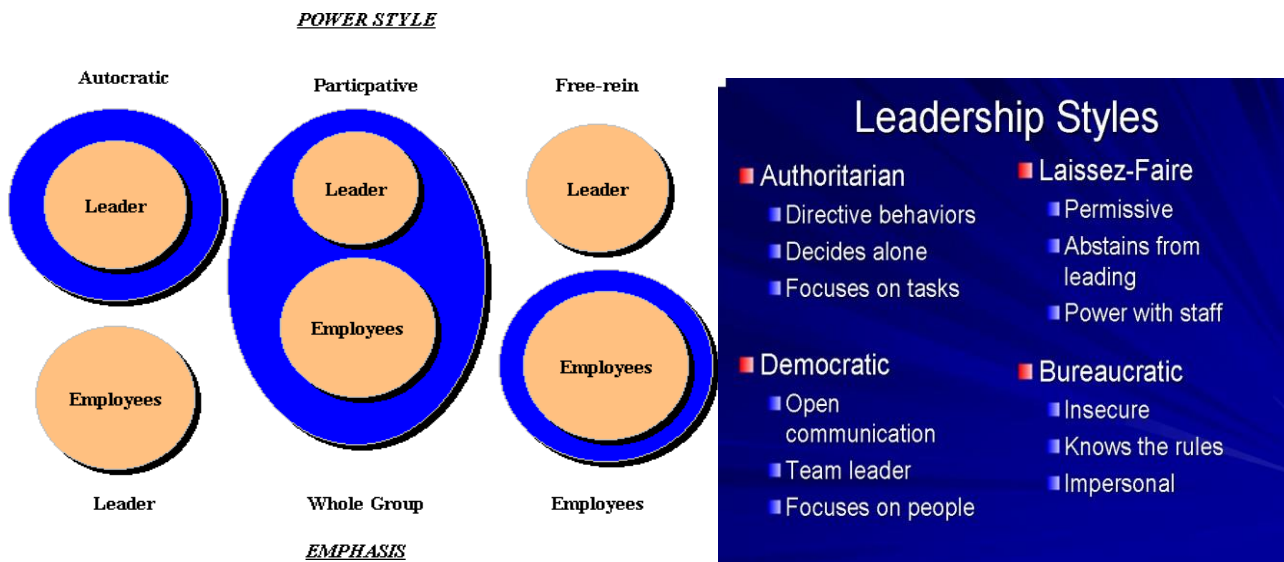
Such people do not work themselves, nor can they see others work. It becomes difficult for the manager to establish coordination among such employees.

(ii) Lack of Importance of Managerial Post:

In this leadership style, the post of a manager is rendered less important because he does not make any plan, or take any decision or exercise any control.

(iii) Suitable only for Highly Educated Employees:

This style is useful only when every employee is fully educated so that the work can be assigned to him with full confidence. This leadership style is not suitable for leading uneducated or semi-educated people.



Bureaucratic Leadership: Bureaucratic leaders "work by the book", ensuring that their staff follow procedures exactly. This is a very appropriate style for work involving serious safety risks (such as working with machinery, with toxic substances or at heights) or where large sums of money are involved (such as cash-handling).

In other situations, the inflexibility and high levels of control exerted can demoralize staff, and can diminish the organizations ability to react to changing external circumstances.

Charismatic Leadership: A charismatic leadership style can appear similar to a transformational leadership style, in that the leader injects huge doses of enthusiasm into his or her team, and is very energetic in driving others forward.

However, a charismatic leader can tend to believe more in him or herself than in their team. This can create a risk that a project, or even an entire organization, might collapse if the leader were to leave: In the eyes of their followers, success is tied up with the presence of the charismatic leader. As such, charismatic leadership carries great responsibility, and needs long-term commitment from the leader.

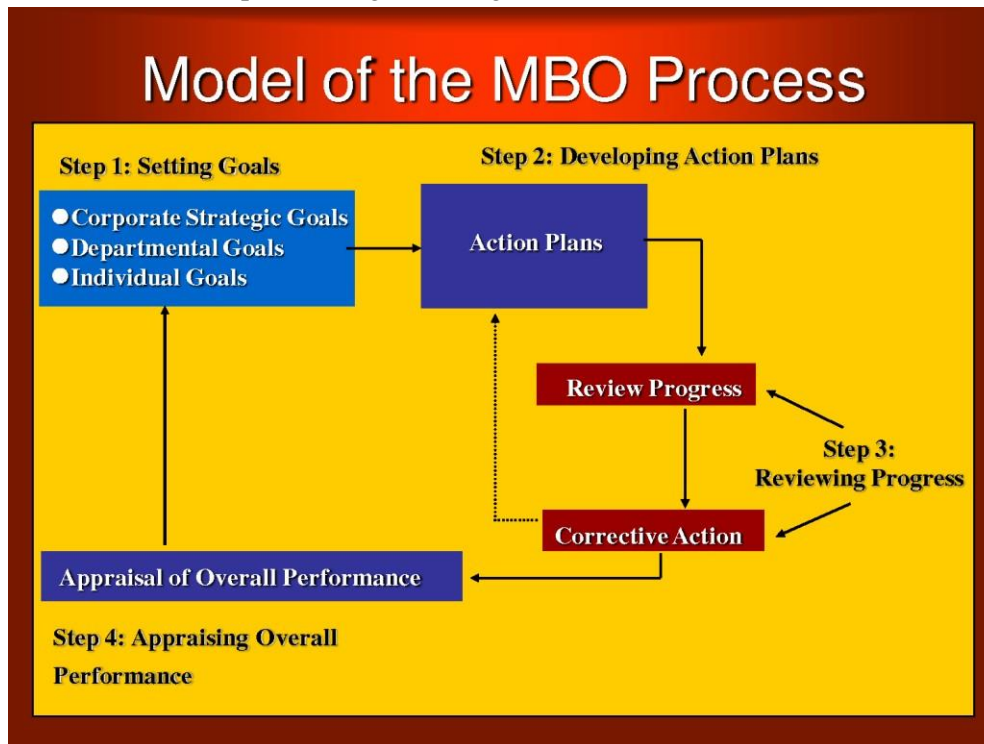
People-Oriented Leadership or Relations-Oriented Leadership: This style of leadership is the opposite of task-oriented leadership: the leader is totally focused on organizing, supporting and developing the people in the leader's team. A participative style, it tends to lead to good teamwork and creative collaboration. However, taken to extremes, it can lead to failure to achieve the team's goals. In practice, most leaders use both task-oriented and people-oriented styles of leadership.

Task-Oriented Leadership: A highly task-oriented leader focuses only on getting the job done, and can be quite autocratic. He or she will actively define the work and the roles required, put structures in place, plan, organize and monitor. However, as task-oriented leaders spare little thought for the well-being of their teams, this approach can suffer many of the flaws of autocratic leadership, with difficulties in motivating and retaining staff. Task-oriented leaders can benefit from an understanding of the Blake-Mouton Managerial Grid, which can help them identify specific areas for development that will help them involve people more.

21. EXPLAIN THE STEPS OR PROCESS IN MANAGEMENT BY OBJECTIVES

1. Central goal setting: defining and verifying organizational objectives is the first step in MBO process. Generally these objectives are set by central management of the organization but it does so after consulting other managers. Before setting of these objectives, an extensive assessment of the available resources is made by the central management. It also conducts market service and research along with making a forecast. Through this elaborate analysis, the desired long run and short run objectives of the organization are highlighted. The central management tries to make these objectives realistic and specific. After setting these goals it is the responsibility of the management that these are known to all members and are also understood by them.

2. Development and individual goal setting : After organization objectives are established by the central management, the next step is to establish the department goals. The top management needs to discuss these objectives with the heads of the departments so that mutually agreed upon objectives are established. Long range and short range goals are set by each department in consultation with the top management. After the department goals are established, the employees work with their managers to establish their own individual goals which relate with the organization goals. These participative goals are very important because It has been seen that employees become highly motivated to achieve the objectives established by them. These objectives for individuals should be specific and short range. These should indicate the capability of the unit of the individual. Through this process all the members of the organization become involved in the process of goal setting.



3. Revision of job description : In the process of MBO resetting individual goals involves a revision of job description of different positions in the organization which in turn requires the revision of the entire structure of the organization. The organization manuals and charts may also have to be modified to portray the changes that have been introduced by the process of MBO. The job description has to define the objectives, authority and responsibility of different jobs. The connection of one job with all other jobs of the organization also needs to be established clearly.

4. Matching goals : The establishment of objectives can not be fruitful unless the resources and means required to achieve these objectives are provided. Therefore the subordinates should be provided required tools and materials which enables them to achieve the objectives efficiently and effectively. Resource requirements can be measured precisely if the goals are set precisely. This makes the process of resource allocation relatively easy. Resource allocation should be made after consulting the subordinates.

5. Freedom implementation: The task team of manager and his subordinates should be given freedom in deciding the way to utilize their resources and the way to achieve their objectives. There should be very little or no interference by the seniors as long as the team is working with in the framework of organization policies.

6. Establishing check points: The process of MBO requires regularly meetings between the managers and their subordinates to discuss the progress achieve in the accomplishment of the objective established for the subordinates. For this purpose the managers need to establish the standards of performance or check points to evaluate the progress of their subordinates. These standards need to be specified as far as possible quantitatively and it should also be ensured that these are completely understood by the subordinates. This practices needs to be followed by all managers and these should lead to an analysis of key results has the targets are represented in terms of the results. The analysis of key results should be recorded in writing and it generally contains information regarding :

- (i) The overall objectives related with the job of subordinates.
- (ii) The key results which must be achieved by the subordinate to fulfill his objectives.
- (iii) The long term and short term priorities, a subordinate needs to adhere to.

- (iv.) The extent and scope of assistance expected by a subordinate from his superior and other departmental managers and also the assistance, the subordinates is required to extend to other departments of his organizations.
- (v.) Nature of information and the reports receive by the subordinate to carry out self evaluation.
- (vi.) The standards use to evaluate the performance of the subordinate.

7. Performance appraisal : An informal performance appraisal is generally conducted in routine by the manager, a periodic review of performance of the subordinates should also be conducted. Periodic reviews are required as the priorities and conditions change constantly and need to be monitored constantly. These reviews help the managers as well as the subordinates to modify the objectives or the methods whenever require. This significantly increases the chances of achieving the goals and also ensures that no surprises are found at the time of final appraisal. Periodic performance appraisal needs to be based on measurable and fair standards so that these are completely understood by the subordinates and there are also aware of the degree of performance required at each step.

8. Counseling : Periodic performance review helps the subordinates in improving his future performance.

- **Goal setting:** The first phase in the MBO process is to define the organizational objectives. These are determined by the top management and usually in consultation with other managers. Once these goals are established, they should be made known to all the members. In setting objectives, it is necessary to identify "Key-Result Areas' (KRA).
- **Manager-Subordinate involvement:** After the organizational goals are defined, the subordinates work with the managers to determine their individual goals. In this way, everyone gets involved in the goal setting.
- **Matching goals and resources:** Management must ensure that the subordinates are provided with necessary tools and materials to achieve these goals. Allocation of resources should also be done in consultation with the subordinates.
- **Implementation of plan:** After objectives are established and resources are allocated, the subordinates can implement the plan. If any guidance or clarification is required, they can contact their superiors.
- **Review and appraisal of performance:** This step involves periodic review of progress between manager and the subordinates. Such reviews would determine if the progress is satisfactory or the subordinate is facing some problems. Performance appraisal at these reviews should be conducted, based on fair and measurable standards.

22. EXPLAIN THE ADVANTAGES AND DISADVANTAGES AND OVERCOME STRATEGIES OF MANAGEMENT BY OBJECTIVES MBO

ADVANTAGES OF MBO:

Develops result-oriented philosophy: MBO is a result-oriented philosophy. It does not favor management by crisis. Managers are expected to develop specific individual and group goals, develop appropriate action plans, properly allocate resources and establish control standards. It provides opportunities and motivation to staff to develop and make positive contribution in achieving the goals of an Organisation.

1. **Formulation of dearer goals:** Goal-setting is typically an annual feature. MBO produces goals that identify desired/expected results. Goals are made verifiable and measurable which encourage high level of performance. They highlight problem areas and are limited in number. The meeting is of minds between the superior and the subordinates. Participation encourages commitment. This facilitates rapid progress of an Organisation. In brief, formulation of realistic objectives is me benefit of M[BO.
2. **Facilitates objective appraisal:** NIBO provides a basis for evaluating a person's performance since goals are jointly set by superior and subordinates. The individual is given adequate freedom to appraise his own activities. Individuals are trained to exercise discipline and self control. Management by self-control replaces management by domination in the MBO process. Appraisal becomes more objective and impartial.

3. **Raises employee morale:** Participative decision-making and two-way communication encourage the subordinate to communicate freely and honestly. Participation, clearer goals and improved communication will go a long way in improving morale of employees.
4. **Facilitates effective planning:** MBO programmes sharpen the planning process in an Organisation. It compels managers to think of planning by results. Developing action plans, providing resources for goal attainment and discussing and removing obstacles demand careful planning. In brief, MBO provides better management and better results.
5. **Acts as motivational force:** MBO gives an individual or group, opportunity to use imagination and creativity to accomplish the mission. Managers devote time for planning results. Both appraiser and appraisee are committed to the same objective. Since MBO aims at providing clear targets and their order of priority, employees are motivated.
6. **Facilitates effective control:** Continuous monitoring is an essential feature of MBO. This is useful for achieving better results. Actual performance can be measured against the standards laid down for measurement of performance and deviations are corrected in time. A clear set of verifiable goals provides an outstanding guarantee for exercising better control.
7. **Facilitates personal leadership:** MBO helps individual manager to develop personal leadership and skills useful for efficient management of activities of a business unit. Such a manager enjoys better chances to climb promotional ladder than a non-MBO type.

LIMITATIONS OF MANAGEMENT BY OBJECTIVES MBO :-

Time-consuming: MBO is time-consuming process. Objectives, at all levels of the Organisation, are set carefully after considering pros and cons which consumes lot of time. The superiors are required to hold frequent meetings in order to acquaint subordinates with the new system. The formal, periodic progress and final review sessions also consume time.

Reward-punishment approach: MBO is pressure-oriented programme. It is based on reward-punishment psychology. It tries to indiscriminately force improvement on all employees. At times, it may penalize the people whose performance remains below the goal. This puts mental pressure on staff. Reward is provided only for superior performance.

Increases paper-work: MBO programmes introduce ocean of paper-work such as training manuals, newsletters, instruction booklets, questionnaires, performance data and report into the Organisation. Managers need information feedback, in order to know what is exactly going on in the Organisation. The employees are expected to fill in a number of forms thus increasing paper-work. In the words of Howell, "MBO effectiveness is inversely related to the number of MBO forms.

Creates organizational problems: MBO is far from a panacea for all organizational problems. Often MBO creates more problems than it can solve. An incident of tug-of-war is not uncommon. The subordinates try to set the lowest possible targets and superior the highest. When objectives cannot be restricted in number, it leads to obscure priorities and creates a sense of fear among subordinates. Added to this, the programme is used as a 'whip' to control employee performance.

Develops conflicting objectives: Sometimes, an individual's goal may come in conflict with those of another e.g., marketing manager's goal for high sales turnover may find no support from the production manager's goal for production with least cost. Under such circumstances, individuals follow paths that are best in their own interest but which are detrimental to the company.

Problem of co-ordination: Considerable difficulties may be encountered while coordinating objectives of the Organisation with those of the individual and the department. Managers may face problems of measuring objectives when the objectives are not clear and realistic.

Lacks durability: The first few go-around of MBO are motivating. Later it tends to become old hat. The marginal benefits often decrease with each cycle. Moreover, the programme is deceptively simple. New opportunities are lost because individuals adhere too rigidly to established goals.

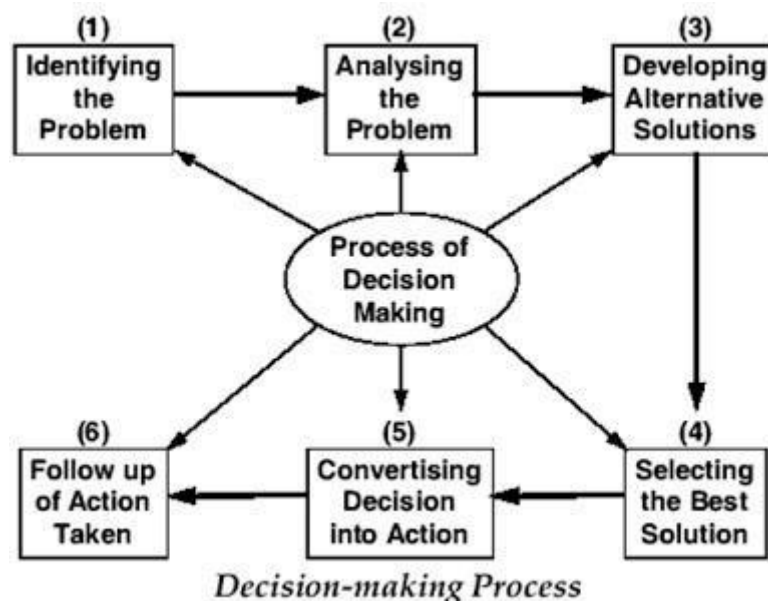
Problems related to goal-setting: MBO can function successfully provided measurable objectives are jointly set and it is agreed upon by all. Problems arise when: (a) verifiable goals are difficult to set (b) goals are inflexible and rigid (c) goals tend to take precedence over the people who use it (d) greater emphasis on quantifiable and easily measurable results instead of important results and (e) over-emphasis on short-term goals at the cost of long-term goals.

Lack of appreciation: Lack of appreciation of MBO is observed at different levels of the Organisation. This may be due to the failure of the top management to communicate the philosophy of MBO to entire staff and all departments. Similarly, managers may not delegate adequately to their subordinates or managers may not motivate their subordinates properly. This creates new difficulties in the execution of MBO programme.

23. EXPLAIN THE ELEMENTS OR STEPS OR PROCESS INVOLVED IN DECISION MAKING PROCESS. (April*2010)

1. Defining / Identifying the managerial problem,
2. Analyzing the problem,
3. Developing alternative solutions,
4. Selecting the best solution out of the available alternatives,
5. Converting the decision into action, and
6. Ensuring feedback for follow-up.

The figure given below suggests the steps in the decision-making process:-



Identifying the Problem: Identification of the real problem before a business enterprise is the first step in the process of decision-making. It is rightly said that a problem well-defined is a problem half-solved. Information relevant to the problem should be gathered so that critical analysis of the problem is possible. This is how the problem can be diagnosed. Clear distinction should be made between the problem and the symptoms which may cloud the real issue. In brief, the manager should search the 'critical factor' at work. It is the point at which the choice applies. Similarly, while diagnosing the real problem the manager should consider causes and find out whether they are controllable or uncontrollable.

Analyzing the Problem: After defining the problem, the next step in the decision-making process is to analyze the problem in depth. This is necessary to classify the problem in order to know who must take the decision and who must be informed about the decision taken. Here, the following four factors should be kept in mind:

Futurity of the decision,
The scope of its impact,
Number of qualitative considerations involved, and
Uniqueness of the decision.

Collecting Relevant Data: After defining the problem and analyzing its nature, the next step is to obtain the relevant information/ data about it. There is information flood in the business world due to new developments in the field of information technology. All available information should be utilised fully for analysis of the problem. This brings clarity to all aspects of the problem.

Developing Alternative Solutions: After the problem has been defined, diagnosed on the basis of relevant information, the manager has to determine available alternative courses of action that could be used to solve the problem at hand. Only realistic alternatives should be considered. It is equally important to take into account time and cost constraints and psychological barriers that will restrict that number of alternatives. If necessary, group participation techniques may be used while developing alternative solutions as depending on one solution is undesirable.

Selecting the Best Solution: After preparing alternative solutions, the next step in the decision-making process is to select an alternative that seems to be most rational for solving the problem. The alternative thus selected must be communicated to those who are likely to be affected by it. Acceptance of the decision by group members is always desirable and useful for its effective implementation.

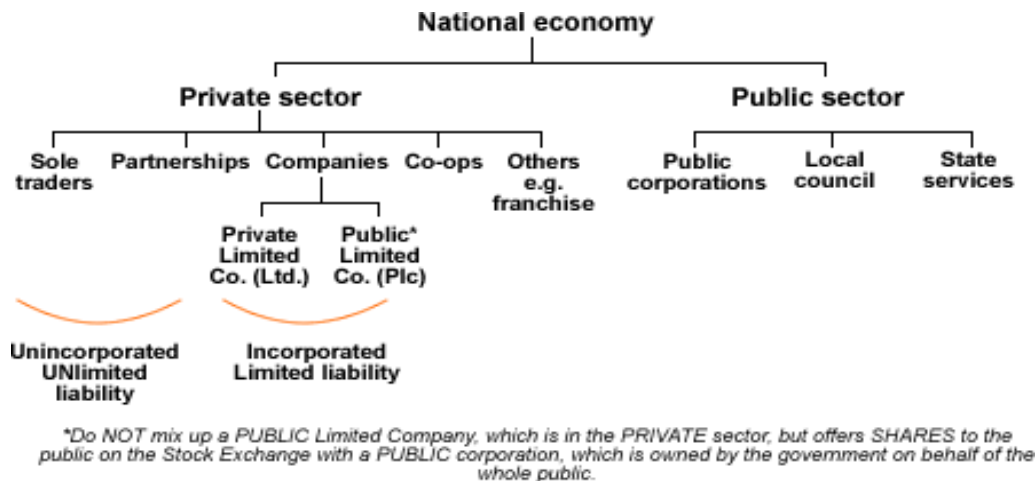
Converting Decision into Action: After the selection of the best decision, the next step is to convert the selected decision into an effective action. Without such action, the decision will remain merely a declaration of good intentions. Here, the manager has to convert 'his decision into 'their decision' through his leadership. For this, the subordinates should be taken in confidence and they should be convinced about the correctness of the decision. Thereafter, the manager has to take follow-up steps for the execution of decision taken.

Ensuring Feedback: Feedback is the last step in the decision-making process. Here, the manager has to make built-in arrangements to ensure feedback for continuously testing actual developments against the expectations. It is like checking the effectiveness of follow-up measures. Feedback is possible in the form of organised information, reports and personal observations. Feed back is necessary to decide whether the decision already taken should be continued or be modified in the light of changed conditions.

For accurate/rational decision-making attention should be given to the following points:

- Identification of a wide range of alternative courses of action i.e., decisions. This provides wide choice for the selection of suitable decision for follow-up actions.
- A careful consideration of the costs and risks of both positive and negative consequences that could follow from each alternation.
- Efforts should be made to search for new information relevant to further evaluation of the alternatives. This is necessary as the quality of decision depends on the quality of information used in the decision-making process.
- Re-examination of the positive and negative effects of all known alternatives before making a final selection.
- Arrangements should be made for implementing the chosen course of action including contingency plans in the event that various known risks were actually to occur.
- Efforts should be made to introduce creativity and rationality in the final decision taken.

24. EXPLAIN THE TYPES OF INDUSTRIAL OWNERSHIP



SOLE TRADER OR SOLE PROPRIETOR FORM OF BUSINESS

Definitions of Sole Proprietorship:

Sole proprietorship is a form of business organization in which an entrepreneur has to carry out a business and invests his own capital, uses his own skill and intelligence in the management of its affairs and is solely responsible for the results of its operations.

J. L. Hanson defines it as "a type of business unit where one person is solely responsible for providing the capital, for bearing the risk of the enterprise and for the management of business."

In the words of L. H. Haney, it is "the form of business organization on the head of which stands an individual as the one who is responsible, who directs its operations, who alone runs the risk of failure."

A sole proprietor may do business with a trade name other than his or her legal name. In some jurisdictions, for example the United States, the sole proprietor is required to register the trade name or "Doing Business As" with a government agency. This also allows the proprietor to open a business account with banking institutions.

Advantages to a Sole Proprietor

- An entrepreneur may opt for the sole proprietorship legal structure because no additional work must be done to start the business. In most cases, there are **no legal formalities** to forming or dissolving a business.
- Furthermore, in most jurisdictions, a sole proprietorship files simpler tax returns to report its business activity. Typically a sole proprietorship reports its income and deductions on the individual's personal tax return. In comparison, an identical small business operating as a corporation or partnership would be required to prepare and submit a separate tax return.
- A sole proprietorship often has the advantage of the least government regulation.
- A sole proprietor has complete control and decision-making power over the business.
- Sale or transfer can take place at the discretion of the sole proprietor.
- No corporate tax payments.
- Minimal legal costs to forming a sole proprietorship.
- Few formal business requirements.

Disadvantages to a Sole Proprietor

- A business organized as a sole trader will likely have a hard time raising capital since shares of the business cannot be sold, and there is a smaller sense of legitimacy relative to a business organized as a corporation or limited liability company.
- It can also sometimes be more difficult to raise bank finance, as sole proprietorships cannot grant a floating charge which in many jurisdictions is required for bank financing.

- Hiring employees may also be difficult.
- Another disadvantage of a sole proprietorship is that as a business becomes successful, the risks accompanying the business tend to grow. To minimize those risks, a sole proprietor has the option of forming a corporation. In the United States, a sole proprietor could also form a limited liability company, or LLC, which would give the protection of limited liability but would still be treated as a sole proprietorship for income tax purposes.
- Sole proprietorship has limited capital
- Sole proprietor only uses his ideas and innovation capacity. So there is limited managerial ability
- Sole proprietor must work more to earn more profit .higher profit generation is important. So, there is dull and monotonous wok.
- Death of sole proprietor causes death of sole proprietorship.
- There is no specialization in decision taking. So there can be chances of taking wrong decisions
- There is low investment resulting in limited areas of operation.

PARTNERSHIP

DEFINE PARTNERSHIP FIRM? EXPLAIN ITS MERITS AND DEMERITS?

Meaning: - Partnership is a voluntary association of two or more people who contributes skill and time for carrying on a lawful business for their benefits. It is the second stage in the evaluation of commercial organization. It comes into existence under the partnership act 1932. The liability of the partner is joint several and unlimited.

MERITS OF PARTNERSHIP

1. **Easy formation:** -The formation of a Partnership is quite easy, less expensive and does not involve any legal formalities. An oral or written agreement is sufficient to start partnership.
2. **Business Secrecy:** -Business Secrecy can be maintained because the annual accounts are not required to be published. Business secrets are known to partners only. Hence, there is a chance of maintaining maximum business secrecy.
3. **Limited Government control:** -Partnership is based on mutual trust, confidence and co-operation, registration is not compulsory. There fore interference from government in partnership business is limited.
4. **Large capital:** -Partnership is an association of several persons. Large amount of capital can be raised through large number of partners; as compared to sole trader the partners can collect or generate huge funds from their savings and borrowings from their friends, relatives and also by the way of loans from banks.
5. **Flexibility in operation:** -The working of a partnership firm is flexible there are no statutory restrictions on the management of business. Partners are allowed to bring about change this brings about operational flexibility.
6. **Easy dissolution:** -Like formation dissolution of partnership is also easy. Events like death, insolvency and insanity of a partner are some of the reason for dissolution.
7. **Effort-Reward Relationship:** -There is often a direct relationship between efforts and rewards. Each and every partner puts in best efforts and the rewards are shared among themselves. The active partners may get a higher share in profits as compared to dormant partners.

DEMERITS OF PARTNERSHIP

1. **Limited Membership:** -There is a limit to the number of partners in a partnership firm. A maximum of 10members can run a banking business and a maximum of 20 members are permitted in case of an ordinary partnership.
2. **Unlimited Liability:** -The liability of the partners is joint, several and unlimited. It means partners will be held responsible to pay off debts and obligations of the firm even out of their private estate.

3. **Lack of Stability:** -A partnership firm lacks stability. The life of partnership is affected by events like retirement, death and insolvency of the partners.
4. **Problem of Continued Existence:** -There is a problem of continued existence. Initially partners are united and the relations are friendly but with the passage of time, conflicts, misunderstanding, are commonly affected which lead to dissolution of partnership firm.
5. **Lack of Public Confidence:** -A partnership firm is not required to publish final accounts, sales returns etc. due to this; public confidence is limited towards this type of partnership firm. As such, public may not lend money to partnership firm
6. **Difficulty in admitting new partner:** -There is often a difficulty in admitting new partners. This is because, some of the partners may object to such admission. Secondly, because of the restriction on the maximum number of partners, imposed by the Indian partnership Act, 1932.
7. **Difficulty in Transfer of shares:** -The Partners cannot easily transfer share or interest to an outside party. Prior consent is required to be obtained from all other partners. Often the other partners do not allow for such transfer of interest to an outside party.

DIFFERENCE BETWEEN SOLE PROPRIETORSHIP AND PARTNERSHIP

Membership:

Partnership is owned by two or more persons subject to the limit ten in banking business and twenty in case of other business. Sole proprietorship is owned by one and only one person.

Formation:

It is formed through an agreement which may be oral or in writing, is formed quite easily as it is the outcome of a single person's decision without any legal administrative approval.

Registration:

The registration is not compulsory. It needs no registration excepting some compliance.

Regulating law:

It is governed by the rules contained under the Indian Partnership Act, 1932. There is no specific statutory law to govern the functioning of sole proprietors' business.

Capital:

There is more scope for raising a larger amount of capital as there < more than one person. It has a limited financial capability. Hence, the scope for rising capital is naturally least.

Management:

Every partner has the right to take active part in the management the affairs of the business. Each partner also enjoys the authority to bind the firm and other partners for his acts in the ordinary course of business. The sole proprietorship is self-managed one and few employees may support him. However, the decision of the proprietor is final and binding.

Risk:

The risk connected with the business is comparatively less as it is shared all ,the partners. The risk of the sole proprietor is greater than that of partnership form business.

Duration:

It continues as long as the partners desire. Even though legally it co to an end on the death, insolvency or retirement of any of the partners, the business i continue with the remaining partners. It comes to an end with the death, insolvency incapacity of the proprietor. Thus, there is uncertainty of duration of sole proprietorship

Quickness in decision-making:

Decision-making in partnership is corporately delayed as the partners arrive at decision after the consultation with one another. The decision of the sole proprietor is prompt as he need not consult anyone.

Maintenance of secrecy:

Maintenance of absolute secrecy is not possible in of partnership as business secrets are accessible to more than one partners. The sole proprietor need not share his business secrets with anybody.

PUBLIC LIMITED COMPANY

Public Limited company

Limited companies which can sell share on the stock exchange are Public Limited companies. These companies usually write PLC after their names.

According to companies Act, 1956, every company both private and public limited company has to be compulsorily registered. Public limited company is a voluntary association of members which is incorporated and, therefore has a separate legal existence and the liability of whose members is limited. Its main features are :-

- The company has a separate legal existence apart from its members who compose it.
- Its formation, working and its winding up, in fact, all its activities are strictly governed by laws, rules and regulations. The Indian Companies Act, 1956 contains the provisions regarding the legal formalities for setting up of a public limited company. Registrars of Companies (ROC) appointed under the Companies Act covering the various States and Union Territories are vested with the primary duty of registering companies floated in the respective states and the Union Territories.
- A company must have a minimum of seven members but there is no limit as regards the maximum number.
- The company collects its capital by the sale of its shares and those who buy the shares are called the members. The amount so collected is called the share capital.
- The shares of a company are freely transferable and that too without the prior consent of other shareholders or without subsequent notice to the company.
- The liability of a member of a company is limited to the face value of the shares he owns. Once he has paid the whole of the face value, he has no obligation to contribute anything to pay off the creditors of the company.
- The shareholders of a company do not have the right to participate in the day-to-day management of the business of a company. This ensures separation of ownership from management. The power of decision making in a company is vested in the Board of Directors, and all policy decisions are taken at the Board level by the majority rule. This ensures a unity of direction in management.
- As a company is an independent legal person, its existence is not affected by the death, retirement or insolvency of any of its shareholders.

Minimum requirements:

- Minimum 7 Shareholders
- Minimum 3 Directors
- The directors and shareholders can be same person
- Minimum Share Capital shall be Rs. 500,000 (INR Five Lac)
- DIN (Director Identification Number) for all the Directors
- DSC (Digital Signature Certificate) for one of the Directors

Advantages

- Continuity of existence
- Larger amount of capital
- Unity of direction
- Efficient management

- Limited liability

Disadvantages

- Scope for promotional frauds
- Undemocratic control
- Scope for directors for personal profit
- Subjected to strict regulations
- There are lot of **legal formalities** required for forming a public limited company. It is costly and time consuming.
- In order to protect the interest of the ordinary investor there are **strict controls and regulations** to comply. These companies have to publish their accounts.
- The original owners may **lose control**.
- Public Limited companies are huge in size and may face **management problems** such as slow decision making and industrial relations problems.

PRIVATE LIMITED COMPANIES

These are closely held businesses usually by family, friends and relatives.

Private companies may issue stock and have shareholders. However, their shares do not trade on public exchanges and are not issued through an initial public offering.

Shareholders may not be able to sell their shares without the agreement of the other shareholders.

A private limited company is a voluntary association of not less than two and not more than fifty members, whose liability is limited, the transfer of whose shares is limited to its members and who is not allowed to invite the general public to subscribe to its shares or debentures. Its main features are :-

- It has an independent legal existence. The Indian Companies Act, 1956 contains the provisions regarding the legal formalities for setting up of a private limited company. Registrars of Companies (ROC) appointed under the Companies Act covering the various States and Union Territories are vested with the primary duty of registering companies floated in the respective states and the Union Territories.
- It is relatively less cumbersome to organise and operate it as it has been exempted from many regulations and restrictions to which a public limited company is subjected to. Some of them are :-
 - it need not file a prospectus with the Registrar.
 - it need not obtain the Certificate for Commencement of business.
 - it need not hold the statutory general meeting nor need it file the statutory report.
 - restrictions placed on the directors of the public limited company do not apply to its directors.
- The liability of its members is limited.
- The shares allotted to it's members are also not freely transferable between them. These companies are not allowed to invite public to subscribe to its shares and debentures.
- It enjoys continuity of existence i.e. it continues to exist even if all its members die or desert it.

Hence, a private company is preferred by those who wish to take the advantage of limited liability but at the same time desire to keep control over the business within a limited circle and maintain the privacy of their business.

Minimum requirements:

- Minimum 2 Shareholders
- Minimum 2 Directors
- The directors and shareholders can be same person
- Minimum Share Capital shall be Rs. 100,000 (INR One Lac)
- DIN (Director Identification Number) for all the Directors
- DSC (Digital Signature Certificate) for one of the Directors

Advantages

- **Limited Liability:** It means that if the company experience financial distress because of normal business activity, the personal assets of shareholders will not be at risk of being seized by creditors.
- **Continuity of existence:** business not affected by the status of the owner.
- **Minimum number of shareholders** need to start the business are only 2.
- **More capital** can be raised as the maximum number of shareholders allowed is 50.
- **Scope of expansion** is higher because easy to raise capital from financial institutions and the advantage of limited liability.

Disadvantages

- **Growth** may be limited because maximum shareholders allowed are only 50.
- **The shares** in a private limited company cannot be sold or transferred to anyone else without the agreement of other shareholders

DIFFERENCE BETWEEN PRIVATE AND PUBLIC LIMITED COMPANY

1. Minimum number of members

The minimum number of person required to form a public company is seven, whereas in a private company their number is only two.

2. Maximum number of members

There is no limit on the maximum number of member of a public company, but a private company cannot have more than fifty members excluding past and present employees.

3. Commencement of Business

A private company can commence its business as soon as it is incorporated. But a public company shall not commence its business immediately unless it has been granted the certificate of commencement of business.

4. Invitation to public

A public company by issuing a prospectus may invite public to subscribe to its shares whereas a private company cannot extend such invitation to the public.

5. Transferability of shares

There is no restriction on the transfer of share In the case of public company whereas a private company by its articles must restrict the right of members to transfer the share.

6. Number of Directors

A public company must have at least three directors whereas a private company may have two directors.

7. Statutory Meeting

A public company must hold a statutory meeting and file with the register a statutory report. But in a private company there are no such obligations.

8. Restrictions on the appointment of Directors

A director of a public company shall file with the register a consent to act as such. He shall sign the memorandum and enter into a contract for qualification shares. He cannot vote or take part in the discussion on a contract in which he is interested. Two-thirds of the directors of a public company must retire by rotation. These restrictions do not apply to a private company.

9. Managerial Remuneration

Total managerial remuneration in the case of public company cannot exceed 11% of net profits, but in the case of inadequacy of profit a minimum of Rs. 50, 000 can be paid. These restrictions do not apply to a private company.

10. Further Issue of Capital

A public company proposing further issue of shares must offer them to the existing members. A private company is free to allot new issue to outsiders.

11. Name

A private company has to use words „private limited“ at the end of its name. But a public company has to use only the word „Limited“ at the end of its name.

THE ADVANTAGES OF HAVING A COMPANY FORM OF BUSINESS ORGANIZATION

A Private/Public limited company has many advantages over proprietorships and partnerships, as elaborated below.

1. Limited Liability

First and foremost benefit of doing business via company is the limited liability conferred upon the company's directors and shareholders. As a sole trader or partnership business, personal assets of the proprietor or partners can be at risk in the event of a failure of the business, but this is not the case for a Company. The unfortunate events like business failures are not always under an entrepreneur's control; hence it is pivotal to secure the personal assets of the businessman in the event of crises.

Unlike proprietorship and partnership, if a Company becomes insolvent and is wound up, only the assets of the company are used to clear its debts. The Directors or Shareholders of the company have no personal liabilities and are not made bankrupt and are free to carry on business.

2. Legal Entity/Status or Recognition

A private limited company is a legal entity, a juristic person established under the Act. It has its existence separate from its directors and members.

Private limited company status enables you to be taken more seriously than a proprietorship/partnership status does.

Operating as a private limited company often gives suppliers and customers a sense of confidence in a business. Larger organisations in particular will prefer in dealing with private limited companies than proprietorship/partnership organisations.

Easy to attract quality workforce and achieve strategic motivation of employees by using flexible and wide range of management designations.

3. Perpetual Succession

Another important characteristic of a private limited company is perpetual succession. It is a popular saying that the directors may come and go the members may come and go, but the existence of a company remains forever. A company once incorporated remains alive unless and until it is wound up by complying with the provisions of Law. The death, disability or retirement of any of its members does not affect the continuity of the company, irrespective of change in its membership.

There is no obligation for a Private limited company to commence business/trading within any set time period after its incorporation.

4. Project Cost and Risk Factors

For entrepreneurs going for hi-tech or high capital outlay projects it is always advantageous to go in for a company form of organisation. Where the financial stake involved is high, it is found that banks and financial institutions while sanctioning financial assistance, insist on having a private limited company.

5. Easy Transferability

Where it is proposed to sell the business as a going concern, all that is required is to transfer the entire shareholding to the purchaser and thus facilitate easy change in management and ownership. This will save time and money of the Promoters. Huge amount of stamp duty is saved.

6. Dual Relationship

In the company form of organisation it is possible for a company to make a valid effective contract with any of its shareholders/directors. It is also possible for a person to be in control of a company and at the same time be in its employment. Thus, a person can at the same time be a shareholder, director, creditor and employee of the company.

For eg:

- A) As a director he can receive remuneration.
- B) As a shareholder he can receive dividend.
- C) As a lessor he can receive lease rent.
- D) As a creditor he can lend money and earn interest.
- E) As a supplier he can supply goods from his/his family business.

7. Borrowing Capacity

A company enjoys better avenues for borrowing of funds. It can issue debentures, secured as well as unsecured, accept deposits from the public, etc. Even banking and financial institutions prefer to render large financial assistance to the company rather than partnership firms or proprietary concerns.

8. Taxation

Sole traders and partnerships pay income tax. Companies pay Corporation tax on their taxable profits. There is a wider range of allowances and tax deductible costs that can be offset against a company's profits.

9. Raising Money from Public

Public Limited Companies can raise large amount of capital from the general public by issue of shares and public deposits.

Private Limited Companies can raise capital only by private placement of shares and deposits.

Workers Co-operatives: This is a truly egalitarian form of business that is formed to meet the mutual needs of the workers. Each person – from the managing director to the shop floor assistant – is equally important. All decisions are taken democratically and any profits are shared equally or ploughed back into the business.

Co-operatives follow seven guiding principles:

- Voluntary and open membership
- Democratic control
- Member economic participation (financial interest)
- Autonomy and independence
- Education, training and information
- Co-operation among co-operatives
- Concern for the community

11 MARKS UNIVERSITY QUESTIONS

1. Explain the importance of management. . (Dec"2012) (Refer P.No: 23, Q.No: 1)
2. Explain the steps in selection of employees. . (Dec"2012) (Refer P.No: 89, Q.No:44)
3. Explain planning process. . (April"2011) (Refer P.No: 48, Q.No:14)
4. Explain organization types with diagram. . (April"2011) (Refer P.No:41, Q.No:10)
5. Explain leadership styles with its merits and demerits. . (April"2012) (Refer P.No:70, Q.No:32)
6. Explain control process with neat diagram. . (April"2012) (Refer P.No:59, Q.No:22)
7. Explain the importance of management and contribution of henry fayol's towards management. . (April"2010) (Refer P.No: 23 & 32, Q.No: 1 & 6)
8. Explain the elements of decision making and planning process. (April"2010) (Refer P.No:85 & 48, Q.No: 42 & 14)



UNIT – V

Financial management: Sources of finance (Internal and External)-Types of capital-Working capital-Types of investment-Preparation of Trading, Profit and Loss Account and Balance Sheet- Types of Accounting and significance of each types

ACCOUNTING

1. WHAT IS THE MEANING OF ACCOUNTING?

Accounting is the process of identifying, measuring, recording and communicating the economic events (business transactions) of an organization.

2. DEFINE ACCOUNTING?

Accounting has been defined by **American Institute of Certified Public Accountants (AICPA)** as under "*Accounting is the art of recording, classifying, and summarizing in a significant manner and in terms of money, the transactions and events which are in part at least of a financial character, and interpreting the results thereof.*"

The above definition can be analysed as under:

- i. *Accounting is the art of recording*
- ii. *Accounting is the art of classifying*
- iii. *Accounting is the art of summarising the business transactions and events of financial characters in terms of money and nonfinancial and non-monetary transactions are excluded.*
- iv. *Interpreting the results, this may be calculation of profit or loss of the business for a period and determining the financial position for the same period.*

3. WHAT ARE THE OBJECTIVES OF ACCOUNTING?

The following are the various objectives of accounting.

1. Maintenance of records of business.
2. Finding out the results of business activities during a period by preparing profit and loss account.
3. Knowing the financial position of the business as on a particular date by preparing the balance sheet.
4. Maintaining control over the assets.
5. Supplying information to the government agencies and tax authorities.
6. Deciding future plans in respect of cash by preparing cash budgets.

4. WHAT IS MANAGEMENT ACCOUNTING?

Management accounting is the procedure to develop management reports and accounts that present precise and timely financial and statistical information required by managers to make day-to-day and short-term decisions. Management accounting can be seen as accounting associated with management. Basically it is deep study of managerial characteristic of financial accounting, "accounting in relation to management function". It demonstrates how the accounting function can be re-oriented so as to fit it within the structure of management activity. The prime task of management accounting is to reform the whole accounting system so that it may serve the operational needs of organization.

Alleyne,P. and Weekes-Marshal, D, (2011) explained management accounting practices as array of methods considered for businesses so as to support the organisation's infrastructure and management accounting processes. It is associated with tax accounting, financial accounting, managerial accounting and internal auditing.

5. WHAT IS THE SIGNIFICANCE OF MANAGEMENT ACCOUNTING?

In complex business, it is imperative to perform systematic management planning. Delegation of authority and decentralization of decision-making process has become important to conduct business. The functions of management are no longer private. A system of information is required to assist the management to investigate, evaluate and verify the functioning of each division or unit for decision-making to accomplish the goals of the business. Management Accounting has great importance to fulfil the needs of the management. Management Accounting measures and reports appropriate information to the management and facilitates in accomplishing corporate objectives. It is significant that the information given to the management should be pertinent and issue based to facilitate the management to focus on the real issue to reach at a specific conclusion. Management accounting on the basis of the information available decide its goal and tries to realize the way through which it can reach the objective.

Need of management accounting: Management accounting is required to recognize the financial situation of the business, it reports to those inside the organisation for planning, directing, motivating, and controlling and performance evaluation. It gives special emphasis on decision affecting the future. It is needed to prepare plan.

6. WHAT IS COST ACCOUNTING?

A method of accounting in which all costs incurred in carrying out an activity or accomplishing a purpose are collected, classified, and recorded. This data is then summarized and analyzed to arrive at a selling price, or to determine where savings are possible. In contrast to financial accounting (which considers money as the measure of economic performance) cost accounting considers money as the economic factor of production.

7. WHAT IS THE SIGNIFICANCE OF COST ACCOUNTING?

Management of business concerns expects from Cost Accounting a detailed cost information in respect of its operations to equip their executives with relevant information required for planning, scheduling, controlling and decision making. To be more specific, management expects from cost accounting - information and reports to help them in the discharge of the following functions :

(a) Control of material cost: Cost of material usually constitute a substantial portion of the total cost of a product. Therefore, it is necessary to control it as far as possible. Such a control may be exercised by (i) Ensuring un-interrupted supply of material and spares for production. (ii) By avoiding excessive locking up of funds/capital in stocks of materials and stores. (iii) Also by the use of techniques like value analysis, standardization etc. to control material cost.

(b) Control of labour cost: It can be controlled if workers complete their work within the standard time limit. Reduction of labour turnover and idle time too help us, to control labour cost.

(c) Control of overheads: Overheads consists of indirect expenses which are incurred in the factory, office and sales department ; they are part of production and sales cost. Such expenses may be controlled by keeping a strict check over them.

(d) Measuring efficiency: For measuring efficiency, Cost Accounting department should provide information about standards and actual performance of the concerned activity.

(e) Budgeting: Now-a-days detailed estimates in terms of quantities and amounts At* drawn up before the start of each activity. This is done to ensured that a practicable course of action can be chalked out and the actual performance corresponds with the estimated or budgeted performance. The preparation of the budget is the function of Costing Department.

(f) Price determination: Cost accounts should provide information, which enables the management to fix remunerative selling prices for various items of products and services in different circumstances.

(g) Curtailment of loss during the off-season: Cost Accounting can also provide information, which may enable reduction of overhead, by utilizing idle capacity during the off-season or by lengthening the season.

(h) Expansion: Cost Accounts may provide estimates of production of various levels on the basis of which the management may be able to formulate its approach to expansion.

(i) Arriving at decisions: Most of the decisions in a business undertaking involve correct statements of the likely effect on profits. Cost Accounts are of vital help in this respect. In fact, without proper cost accounting, decision would be like taking a jump in the dark, such as when production of a product is stopped.

8. WHAT IS THE MEANING OF FINANCIAL MANAGEMENT

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

Scope/Elements

1. **Investment decisions** includes investment in fixed assets (called as capital budgeting). Investment in current assets are also a part of investment decisions called as working capital decisions.
2. **Financial decisions** - They relate to the raising of finance from various resources which will depend upon decision on type of source, period of financing, cost of financing and the returns thereby.
3. **Dividend decision** - The finance manager has to take decision with regards to the net profit distribution. Net profits are generally divided into two:
 - a. Dividend for shareholders- Dividend and the rate of it has to be decided.
 - b. Retained profits- Amount of retained profits has to be finalized which will depend upon expansion and diversification plans of the enterprise.

9. WHAT IS FIXED CAPITAL?

Assets or capital investments that are needed to start up and conduct business, even at a minimal stage. These assets are considered fixed in that they are not used up in the actual production of a good or service, but have a reusable value. Fixed-capital investments are typically depreciated on the company's accounting statements over a long period of time, up to 20 years or more.

Examples include factories, office buildings, computer servers, insurance policies, legal contracts and manufacturing equipment – anything that is not continually purchased in the course of production of a good or service.

10. WHAT ARE THE TYPES OF CAPITAL (ON THE BASIS OF TIME PERIODS)

It is associated with the methods and sources of capital are:

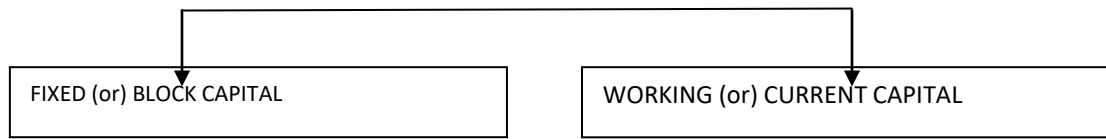
- Permanent and long term
- Medium term
- Short term

PERMANENT: Finance that is not expected to be repaid as long as the business operates. Repaid over period of 5 years or longer. Example: land & buildings, factory & machinery, fixtures & fittings.

MEDIUM: Finance to be repaid in more than one but less than 5 years. Example: fixed assets, movable and mobile, furniture, motor vehicles.

SHORT TERM: Repayment is less than one year. Example: current expenses, direct & indirect production expenses, current assets, raw material, work in progress, stock.

TYPES OF CAPITAL (LIQUIDITY)



11. WHAT IS WORKING CAPITAL?

Definition: Working capital refers to a firm's investment in short term assets-cash, short term securities, accounts receivable & inventories.

In its simplest form working capital represents the excess of current assets over current liabilities. Working capital management decisions involve managing relationship between a firm's short-term assets, i.e., current assets and its short-term liabilities, i.e., current liabilities. The objective is to ensure that firm's operations continue unhindered and that it has sufficient cash flow to meet both maturing short-term debt and upcoming operational expenses.

Working capital management entails short term decisions. Short-term decisions mean decisions relating to the next one year period. These decisions are not taken the way capital investment decisions are made. These decisions are based on cash flows and/or profitability (Return on capital). In brief, working capital management involves following three things:

- (i) Determining the need for working capital (cash, inventory, debtors, and short-term financing)
- (ii) Determining optimum (neither under nor over) level of working capital; and
- (iii) Determining working capital policies (Liquidity and profitability).

12. WHAT IS AN INVESTMENT?

MEANING: Investment can be defined as an act of commit capital or money to an endeavor with the expectation of getting an extra profit over and above the deposited amount. There are a number of people who have become rich by investing their money properly. However, it is not as easy as it sounds to be. It is a prerequisite to take control over finances in order to make profit through investment.

There are different types of investment strategies available to you and you need to choose the option/options that suit/suits you the best. You can have a look at the following lines that deals with different types of investment strategy.

13. WHAT ARE THE PROBLEMS FOR WORKING CAPITAL?

- Poor control of inventories (stocks)
- Poor control of receivables (trade debtors)
- Ineffective use of payables (trade creditors)
- Poor cash flow forecasting
- Unexpected events

11 MARKS

1. EXPLAIN THE FUNCTIONS OF FINANCIAL MANAGEMENT.

1. **Estimation of capital requirements:** A finance manager has to make estimation with regards to capital requirements of the company. This will depend upon expected costs and profits and future programmes and policies of a concern. Estimations have to be made in an adequate manner which increases earning capacity of enterprise.
2. **Determination of capital composition:** Once the estimation have been made, the capital structure have to be decided. This involves short- term and long- term debt equity analysis. This will depend upon the

proportion of equity capital a company is possessing and additional funds which have to be raised from outside parties.

3. **Choice of sources of funds:** For additional funds to be procured, a company has many choices like-
 - a. Issue of shares and debentures
 - b. Loans to be taken from banks and financial institutions
 - c. Public deposits to be drawn like in form of bonds.

Choice of factor will depend on relative merits and demerits of each source and period of financing.
4. **Investment of funds:** The finance manager has to decide to allocate funds into profitable ventures so that there is safety on investment and regular returns is possible.
5. **Disposal of surplus:** The net profits decision have to be made by the finance manager. This can be done in two ways:
 - a. Dividend declaration - It includes identifying the rate of dividends and other benefits like bonus.
 - b. Retained profits - The volume has to be decided which will depend upon expansional, innovational, diversification plans of the company.
6. **Management of cash:** Finance manager has to make decisions with regards to cash management. Cash is required for many purposes like payment of wages and salaries, payment of electricity and water bills, payment to creditors, meeting current liabilities, maintainance of enough stock, purchase of raw materials, etc.
7. **Financial controls:** The finance manager has not only to plan, procure and utilize the funds but he also has to exercise control over finances. This can be done through many techniques like ratio analysis, financial forecasting, cost and profit control, etc.

(B) Incidental or Routine Functions:

In this group, the functions of routine nature are included. They are performed by low level assistants like accounts, account assistants etc.

They include:

- Record keeping and reporting.
- Preparation of various financial statements.
- Cash planning and its supervision.
- Credit management.
- Custody and safe guarding the different financial securities etc.
- Providing top management with information on current and prospective financial conditions of the business as a basis for policy decisions on purchases, marketing and pricing.

2. EXPLAIN THE OBJECTIVES OF FINANCIAL MANAGEMENT.

1. To ensure regular and adequate supply of funds to the concern.
2. To ensure adequate returns to the shareholders which will depend upon the earning capacity, market price of the share, expectations of the shareholders.
3. To ensure optimum funds utilization. Once the funds are procured, they should be utilized in maximum possible way at least cost.
4. To ensure safety on investment, i.e, funds should be invested in safe ventures so that adequate rate of return can be achieved.
5. To plan a sound capital structure-There should be sound and fair composition of capital so that a balance is maintained between debt and equity capital.

Objectives of Financial Management may be broadly divided into two parts such as :

- 1. Profit maximization**
- 2. Wealth maximization**

Profit Maximization

Main aim of any kind of economic activity is earning profit. A business concern is also functioning mainly for the purpose of earning profit. Profit is the measuring techniques to understand the business efficiency of the concern. Profit maximization is also the traditional and narrow approach, which aims at, maximizes the profit of the concern. Profit maximization consists of the following important features.

- Profit maximization is also called as cashing per share maximization. It leads to maximize the business operation for profit maximization.
- Ultimate aim of the business concern is earning profit, hence, it considers all the possible ways to increase the profitability of the concern.
- Profit is the parameter of measuring the efficiency of the business concern. So it shows the entire position of the business concern.
- Profit maximization objectives help to reduce the risk of the business.

Favourable Arguments for Profit Maximization

The following important points are in support of the profit maximization objectives of the business concern:

- Main aim is earning profit.
- Profit is the parameter of the business operation.
- Profit reduces risk of the business concern.
- Profit is the main source of finance.
- Profitability meets the social needs also.

Unfavourable Arguments for Profit Maximization

The following important points are against the objectives of profit maximization:

- Profit maximization leads to exploiting workers and consumers.
- Profit maximization creates immoral practices such as corrupt practice, unfair trade practice, etc.
- Profit maximization objectives leads to inequalities among the sake holders such as customers, suppliers, public shareholders, etc.

Drawbacks of Profit Maximization

Profit maximization objective consists of certain drawback also:

- It is vague: In this objective, profit is not defined precisely or correctly. It creates some unnecessary opinion regarding earning habits of the business concern.
- It ignores the time value of money: Profit maximization does not consider the time value of money or the net present value of the cash inflow. It leads certain differences between the actual cash inflow and net present cash flow during a particular period.
- It ignores risk: Profit maximization does not consider risk of the business concern. Risks may be internal or external which will affect the overall operation of the business concern.

Wealth Maximization

Wealth maximization is one of the modern approaches, which involves latest innovations and improvements in the field of the business concern. The term wealth means shareholder wealth or the wealth of the persons those who are involved in the business concern. Wealth maximization is also known as value maximization or net present worth maximization. This objective is an universally accepted concept in the field of business.

Favourable Arguments for Wealth Maximization

- Wealth maximization is superior to the profit maximization because the main aim of the business concern under this concept is to improve the value or wealth of the shareholders.
- Wealth maximization considers the comparison of the value to cost associated with the business concern. Total value detected from the total cost incurred for the business operation. It provides extract value of the business concern.
- Wealth maximization considers both time and risk of the business concern.

- Wealth maximization provides efficient allocation of resources.
- It ensures the economic interest of the society.

Unfavourable Arguments for Wealth Maximization

- Wealth maximization leads to prescriptive idea of the business concern but it may not be suitable to present day business activities.
- Wealth maximization is nothing, it is also profit maximization, it is the indirect name of the profit maximization.
- Wealth maximization creates ownership-management controversy.
- Management alone enjoy certain benefits.
- The ultimate aim of the wealth maximization objectives is to maximize the profit.
- Wealth maximization can be activated only with the help of the profitable position of the business concern.

3. EXPLAIN THE IMPORTANCE OF FINANCIAL MANAGEMENT.

Financial Planning: Financial management helps to determine the financial requirement of the business concern and leads to take financial planning of the concern. Financial planning is an important part of the business concern, which helps to promotion of an enterprise.

Acquisition of Funds: Financial management involves the acquisition of required finance to the business concern. Acquiring needed funds play a major part of the financial management, which involve possible source of finance at minimum cost

Proper Use of Funds: Proper use and allocation of funds leads to improve the operational efficiency of the business concern. When the finance manager uses the funds properly, they can reduce the cost of capital and increase the value of the firm.

Financial Decision: Financial management helps to take sound financial decision in the business concern. Financial decision will affect the entire business operation of the concern. Because there is a direct relationship with various department functions such as marketing, production personnel, etc.

Improve Profitability: Profitability of the concern purely depends on the effectiveness and proper utilization of funds by the business concern. Financial management helps to improve the profitability position of the concern with the help of strong financial control devices such as budgetary control, ratio analysis and cost volume profit analysis.

Increase the Value of the Firm: Financial management is very important in the field of increasing the wealth of the investors and the business concern. Ultimate aim of any business concern will achieve the maximum profit and higher profitability leads to maximize the wealth of the investors as well as the nation.

Promoting Savings: Savings are possible only when the business concern earns higher profitability and maximizing wealth. Effective financial management helps to promoting and mobilizing individual and corporate savings. Nowadays financial management is also popularly known as business finance or corporate finances. The business concern or corporate sectors cannot function without the importance of the financial management

4. DESCRIBE THE FUNCTIONS AND ROLES OF A FINANCE MANAGER?

The main objective of the Finance Manager is to manage funds in such a way so as to ensure their optimum utilization and their procurement in a manner that the risk, cost and control considerations are properly balanced in a given situation. *To achieve the objective the Finance Manager performs the following functions in the following areas:-*

Forecasting and Planning

- The need to estimate/forecast the **requirement of funds** for both the short term(working capital requirements) and the long term purpose(capital investments).
- Forecasting the requirements of funds involves the use of budgetary control and long-range planning

Financing Decision

- Helps to decide what type of **Capital structure** the company needs to have re: whether these funds would be raised re: from loans/borrowings or from internal source(share capital)
- To raise sufficient long term funds to finance fixed assets and other long term investments and to provide for the needs of working capital.

Raising of Funds

- In order to meet the obligation of the business it is important to have enough cash and liquidity. A firm can raise funds by the way of equity and debt. It is the responsibility of a financial manager to decide the ratio between debt and equity. It is important to maintain a good balance between equity and debt.

Allocation of Funds

Once the funds are raised through different channels the next important function is to allocate the funds. The funds should be allocated in such a manner that they are optimally used. In order to allocate funds in the best possible manner the following point must be considered

- The size of the firm and its growth capability
- Status of assets whether they are long term or short tem
- Mode by which the funds are raised.

These financial decisions directly and indirectly influence other managerial activities. Hence formation of a good asset mix and proper allocation of funds is one of the most important activity

Investment Decision

- In projects using the various capital budgeting tools like Payback method, accounting rate of return, internal rate of return, net present value.
- Assets management policies are to be laid down regarding the various items of current assets like accounts receivable by coordinating with the sales personnel, inventory with production

Profit Planning

Profit earning is important for survival and sustenance of any organization. Profit planning refers to proper usage of the profit generated by the firm. Profit arises due to many factors such as pricing, industry competition, state of the economy, mechanism of demand and supply, cost and output. A healthy mix of variable and fixed factors of production can lead to an increase in the profitability of the firm

Dividend Decision

- Taking into consideration, earnings trend, share market price trend, fund requirement for future growth, cash flow situation and others.

Financial negotiation

- Plays a very important role in carrying out negotiations with the various financial institutions, banks and public depositors for raising funds on favourable terms

Cash Management

- The finance manager needs to ensure the supply of adequate, timely and cheap fund to the various parts of the organization
- That there is no excessive cash idling around

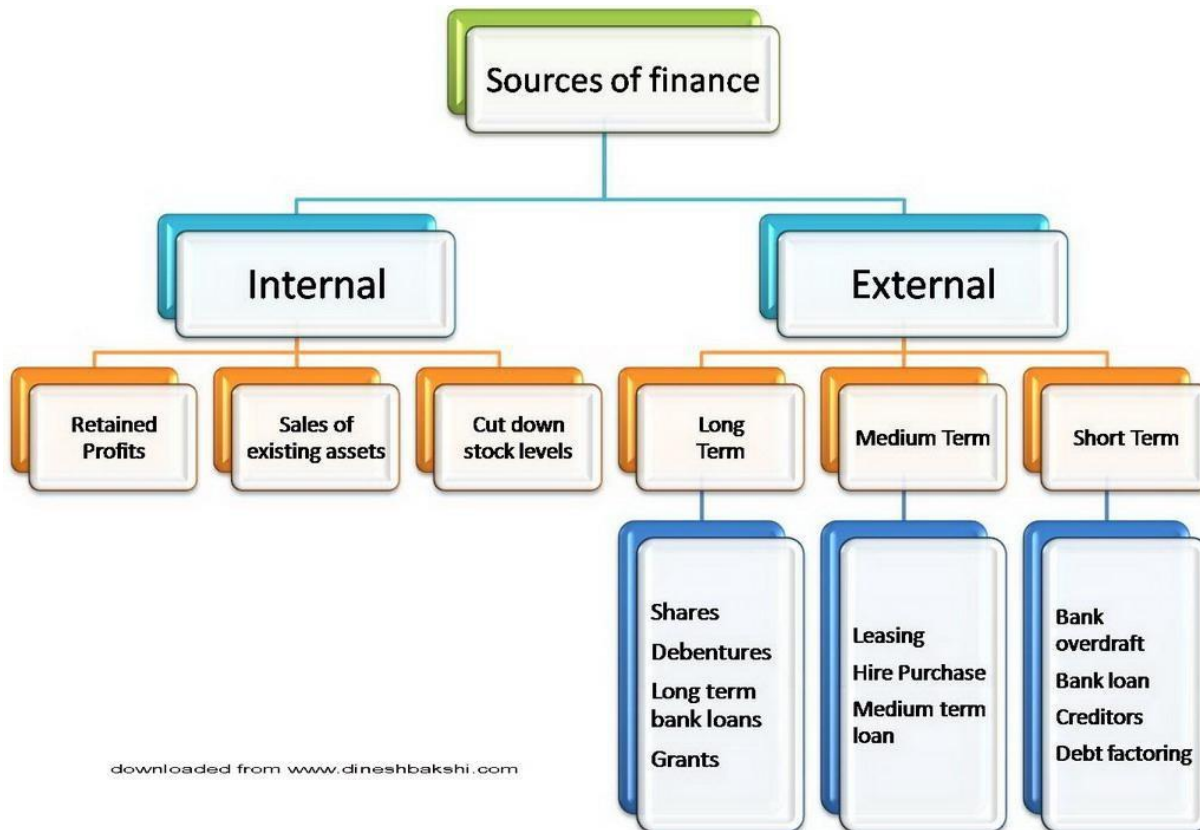
Evaluating financial performance

- To need to constantly review the financial performance of the various units of organization generally in terms of ROI(return on investment. Such review assists management in seeing the funds have been utilized in the various divisions and what can be done to improve it.

Dealing with relevant parties in the Financial Markets

- Where the company is a listed entity, the need to interact with the Stock Exchange
- To deal with money markets and capital markets for financing or investment of idling funds
- To foster relationships with bankers, investors, underwriters of equity and bond issuances and other government regulatory bodies.

5. EXPLAIN THE SOURCES OF FINANCE.



Internal finance comes from the trading of the business. Internal finance tends to be the cheapest form of finance since a business does not need to pay interest on the money. However it may not be able to generate the sums of money the business is looking for, especially for larger uses of finance.

Examples of internal finance are:

- Day to day cash from sales to customers.
- Money loaned from trade suppliers through extended credit.
- Reductions in the amount of stock held by the business.
- Disposal (sale) of any surplus assets no longer needed (e.g. selling a company car).

External finance comes from individuals or organisations that do not trade directly with the business e.g. banks.

Examples of external finance are:

- An overdraft from the bank.
- A loan from a bank or building society.

- The sale of new shares through a share issue.

CLASSIFICATION OF SOURCE OF FUNDS.

A. Period Basis.

On the basis of period, the different sources of funds can be categorized into three parts. These are long-term sources, medium-term sources and short-term sources.

- The **long-term sources** fulfill the financial requirements of an enterprise for a period exceeding 5 years and include sources such as shares and debentures, long-term borrowings and loans from financial institutions. Such financing is generally required for the acquisition of fixed assets such as equipment, plant, etc.
- **Medium term funds:** Where the funds are required for a period of more than one year but less than five years, medium-term sources of finance are used. These sources include borrowings from commercial banks, public deposits, lease financing and loans from financial institutions.
- **Short-term funds** are those which are required for a period not exceeding one year. Trade credit, loans from commercial banks and commercial papers are some of the examples of the sources that provide funds for short duration. Short-term financing is most common for financing of current assets such as accounts receivable and inventories.

LONG TERM FUNDS

Retained Earnings:

A company generally does not distribute all its earnings amongst the shareholders as dividends. A portion of the net earnings may be retained in the business for use in the future. This is known as retained earnings. It is a source of internal financing or self-financing or ‘ploughing back of profits’.

Trade Credit.

Trade credit is the credit extended by one trader to another for the purchase of goods and services. Trade credit facilitates the purchase of supplies without immediate payment. Such credit appears in the records of the buyer of goods as ‘sundry creditors’ or ‘accounts payable’. Trade credit is commonly used by business organisations as a source of short-term financing. It is granted to those customers who have reasonable amount of financial standing and goodwill.

Factoring.

Factoring is a financial service under which the ‘factor’ renders various services which includes: (a) Discounting of bills (with or without recourse) and collection of the client’s debts. Under this, the receivables on account of sale of goods or services are sold to the factor at a certain discount. The factor becomes responsible for all credit control and debt collection from the buyer and provides protection against any bad debt losses to the firm. There are two methods of factoring —recourse and non-recourse.

Lease Financing.

A lease is a contractual agreement whereby one party i.e., the owner of an asset grants the other party the right to use the asset in return for a periodic payment. In other words it is a renting of an asset for some specified period. The owner of the assets is called the ‘lessor’ while the party that uses the assets is known as the ‘lessee’. The lessee pays a fixed periodic amount called lease rental to the lessor for the use of the asset. The terms and conditions regulating the lease arrangements are given in the lease contract. At the end of the lease period, the asset goes back to the lessor.

Public Deposits.

The deposits that are raised by organisations directly from the public are known as public deposits. Rates of interest offered on public deposits are usually higher than that offered on bank deposits. Any person who is interested in depositing money in an organisation can do so by filling up a prescribed form. The organisation in return issues a deposit receipt as acknowledgment of the debt. Public deposits can take care of both medium and

short-term financial requirements of a business. The deposits are beneficial to both the depositor as well as to the organisation. While the depositors get higher interest rate than that offered by banks, the cost of deposits to the company is less than the cost of borrowings from banks. Companies generally invite public deposits for a period up to three years. The acceptance of public deposits is regulated by the Reserve Bank of India.

Commercial Paper (CP).

Commercial Paper emerged as a source of short term finance in our country in the early nineties.

Commercial paper is an unsecured promissory note issued by a firm to raise funds for a short period, varying from 90 days to 364 days. It is issued by one firm to other business firms, insurance companies, pension funds and banks. The amount raised by CP is generally very large. As the debt is totally unsecured, the firms having good credit rating can issue the CP. Its regulation comes under the purview of the Reserve Bank of India. \

Issue of Shares.

The capital obtained by issue of shares is known as share capital. The capital of a company is divided into small units called shares. Each share has its nominal value. For example, a company can issue 1,00,000 shares of Rs. 10 each for a total value of Rs. 10,00,000. The person holding the share is known as shareholder. There are two types of shares normally issued by a company. These are equity shares and preference shares. The money raised by issue of equity shares is called equity share capital, while the money raised by issue of preference shares is called preference share capital.

Equity Shares.

Equity shares is the most important source of raising long term capital by a company. Equity shares represent the ownership of a company and thus the capital raised by issue of such shares is known as ownership capital or owner's funds. Equity share capital is a prerequisite to the creation of a company. Equity shareholders do not get a fixed dividend but are paid on the basis of earnings by the company. They are referred to as residual owners since they receive what is left after all other claims on the company's income and assets have been settled. They enjoy the reward as well as bear the risk of ownership. Their liability, however, is limited to the extent of capital contributed by them in the company. Further, through their right to vote, these shareholders have a right to participate in the management of the company.

Preference Shares.

The capital raised by issue of preference shares is called preference share capital. The preference shareholders enjoy a preferential position over equity shareholders in two ways: (i) receiving a fixed rate of dividend, out of the net profits of the company, before any dividend is declared for equity shareholders; and (ii) receiving their capital after the claims of the company's creditors have been settled, at the time of liquidation. In other words, as compared to the equity shareholders, the preference shareholders have a preferential claim over dividend and repayment of capital.

Debentures.

Debentures are an important instrument for raising long term debt capital. A company can raise funds through issue of debentures, which bear a fixed rate of interest. The debenture issued by a company is an acknowledgment that the company has borrowed a certain amount of money, which it promises to repay at a future date. Debenture holders are, therefore, termed as creditors of the company. Debenture holders are paid a fixed stated amount of interest at specified intervals. Public issue of debentures requires that the issue be rated by a credit rating agency like CRISIL (Credit Rating and Information Services of India Ltd.) on aspects like track record of the company, its profitability, debt servicing capacity, credit worthiness and the perceived risk of lending.

Commercial Banks.

Commercial banks occupy a vital position as they provide funds for different purposes as well as for different time periods. Banks extend loans to firms of all sizes and in many ways, like, cash credits, overdrafts,

term loans, purchase/discounting of bills, and issue of letter of credit. The rate of interest charged by banks depends on various factors such as the characteristics of the firm and the level of interest rates in the economy. The loan is repaid either in lump sum or in installments. Bank credit is not a permanent source of funds. Though banks have started extending loans for longer periods, generally such loans are used for medium to short periods. The borrower is required to provide some security or create a charge on the assets of the firm before a loan is sanctioned by a commercial bank.

SHORT TERM FUNDS.

1. Trade Credit.

Trade credit refers to credit granted to manufactures and traders by the suppliers of raw material, finished goods, components, etc. Usually business enterprises buy supplies on a 30 to 90 days credit. This means that the goods are delivered but payments are not made until the expiry of period of credit. This type of credit does not make the funds available in cash but it facilitates purchases without making immediate payment. This is quite a popular source of finance.

2. Bank Credit.

Commercial banks grant short-term finance to business firms which is known as bank credit. When bank credit is granted, the borrower gets a right to draw the amount of credit at one time or in installments as and when needed. Bank credit may be granted by way of loans, cash credit, overdraft and discounted bills.

(i) Loans

When a certain amount is advanced by a bank repayable after a specified period, it is known as bank loan. Such advance is credited to a separate loan account and the borrower has to pay interest on the whole amount of loan irrespective of the amount of loan actually drawn. Usually loans are granted against security of assets.

(ii) Cash Credit

It is an arrangement whereby banks allow the borrower to withdraw money upto a specified limit. This limit is known as cash credit limit. Initially this limit is granted for one year. This limit can be extended after review for another year. However, if the borrower still desires to continue the limit, it must be renewed after three years. Rate of interest varies depending upon the amount of limit. Banks ask for collateral security for the grant of cash credit. In this arrangement, the borrower can draw, repay and again draw the amount within the sanctioned limit. Interest is charged only on the amount actually withdrawn and not on the amount of entire limit.

(iii) Overdraft

When a bank allows its depositors or account holders to withdraw money in excess of the balance in his account upto a specified limit, it is known as overdraft facility. This limit is granted purely on the basis of credit-worthiness of the borrower. Banks generally give the limit upto Rs.20,000. In this system, the borrower has to show a positive balance in his account on the last friday of every month. Interest is charged only on the overdrawn money. Rate of interest in case of overdraft is less than the rate charged under cash credit.

(iv) Discounting of Bill

Banks also advance money by discounting bills of exchange and promissory notes.. When these documents are presented before the bank for discounting, banks credit the amount to customer's account after deducting discount. The amount of discount is equal to the amount of interest for the period of bill.

3. Customers' Advances.

Sometimes businessmen insist on their customers to make some advance payment. It is generally asked when the value of order is quite large or things ordered are very costly. Customers' advance represents a part of the payment towards price on the product which will be delivered at a later date. Customers generally agree to

make advances when such goods are not easily available in the market or there is an urgent need of goods. A firm can meet its short-term requirements with the help of customers' advances.

4. Loans from Co-operative Banks

Co-operative banks are a good source to procure short-term finance. Such banks have been established at local, district and state levels. District Cooperative Banks are the federation of primary credit societies. The State Cooperative Bank finances and controls the District Cooperative Banks in the state. They are also governed by Reserve Bank of India regulations. Some of these banks like the Vaish Co-operative Bank was initially established as a co-operative society and later converted into a bank. These banks grant loans for personal as well as business purposes. Membership is the primary condition for securing loan. The functions of these banks are largely comparable to the functions of commercial banks.

5. Indigenous Bankers.

They are private individuals engaged in the business of financing small and local business units. They provide short term and medium term loans. However they charge very high rates of interest and are, therefore, considered only as a last resort of finance.

6. DESCRIBE THE SOURCES AND USES OF WORKING CAPITAL?

1. Loans from Commercial Banks:

- Small-scale enterprises can raise loans from the commercial banks with or without security. This method of financing does not require any legal formality except that of creating a mortgage on the assets. Loan can be paid in lump sum or in parts. The short-term loans can also be obtained from banks on the personal security of the directors of a country.
- Such loans are known as clean advances. Bank finance is made available to small-scale enterprises at concessional rate of interest. Hence, it is generally a cheaper source of financing working capital requirements of enterprise. However, this method of raising funds for working capital is a time-consuming process.

2. Public Deposits:

- Often companies find it easy and convenient to raise short-term funds by inviting shareholders, employees and the general public to deposit their savings with the company. It is a simple method of raising funds from public for which the company has only to advertise and inform the public that it is authorised by the Companies Act 1956, to accept public deposits.
- Public deposits can be invited by offering a higher rate of interest than the interest allowed on bank deposits. However, the companies can raise funds through public deposits subject to a maximum of 25% of their paid up capital and free reserves.

3. Trade Credit:

- Just as the companies sell goods on credit, they also buy raw materials, components and other goods on credit from their suppliers. Thus, outstanding amounts payable to the suppliers i.e., trade creditors for credit purchases are regarded as sources of finance. Generally, suppliers grant credit to their clients for a period of 3 to 6 months.
- Thus, they provide, in a way, short-term finance to the purchasing company. As a matter of fact, availability of this type of finance largely depends upon the volume of business. More the volume of business more will be the availability of this type of finance and vice versa.

4. Factoring:

- Factoring is a financial service designed to help firms in managing their book debts and receivables in a better manner. The book debts and receivables are assigned to a bank called the 'factor' and cash is realised in advance from the bank. For rendering these services, the fee or commission charged is usually a percentage of the value of the book debts/receivables factored.

- This is a method of raising short-term capital and known as 'factoring'. On the one hand, it helps the supplier companies to secure finance against their book debts and receivables, and on the other, it also helps in saving the effort of collecting the book debts.

5. Discounting Bills of Exchange:

- When goods are sold on credit, bills of exchange are generally drawn for acceptance by the buyers of goods. The bills are generally drawn for a period of 3 to 6 months. In practice, the writer of the bill, instead of holding the bill till the date of maturity, prefers to discount them with commercial banks on payment of a charge known as discount.
- The term 'discounting of bills' is used in case of time bills whereas the term, 'purchasing of bills' is used in respect of demand bills. The rate of discount to be charged by the bank is prescribed by the Reserve Bank of India (RBI) from time to time. It generally amounts to the interest for the period from the date of discounting to the date of maturity of bills.

6. Bank Overdraft and Cash Credit:

- Overdraft is a facility extended by the banks to their current account holders for a short-period generally a week. A current account holder is allowed to withdraw from its current deposit account upto a certain limit over the balance with the bank. The interest is charged only on the amount actually overdrawn. The overdraft facility is also granted against securities.
- Cash credit is an arrangement whereby the commercial banks allow borrowing money up to a specified-limit known as 'cash credit limit.' The cash credit facility is allowed against the security. The cash credit limit can be revised from time to time according to the value of securities. The money so drawn can be repaid as and when possible.

7. Advances from Customers:

- One way of raising funds for short-term requirement is to demand for advance from one's own customers. Examples of advances from the customers are advance paid at the time of booking a car, a telephone connection, a flat, etc. This has become an increasingly popular source of short-term finance among the small business enterprises mainly due to two reasons.
- First, the enterprises do not pay any interest on advances from their customers. Second, if any company pays interest on advances, that too at a nominal rate. Thus, advances from customers become one of the cheapest sources of raising funds for meeting working capital requirements of companies.

8. Accrual Accounts:

- Generally, there is a certain amount of time gap between incomes is earned and is actually received or expenditure becomes due and is actually paid. Salaries, wages and taxes, for example, become due at the end of the month but are usually paid in the first week of the next month. Thus, the outstanding salaries and wages as expenses for a week help the enterprise in meeting their working capital requirements. This source of raising funds does not involve any cost.

Uses of working capital:

1. Loss from business operations would decrease the working capital.
2. The purchase of non-current assets generally causes a decrease in current assets, therefore it should appear as the use of funds.
3. Retirement of long-term liabilities such as payment to preference shareholders & debenture holders involves the use of cash.
4. Dividend to shareholders.
5. Interest to Lenders.

Gross working capital: To the firm's total investment in capital assets.

Net working capital: current assets – current liabilities.

7. EXPLAIN THE FACTORS TO BE CONSIDERED WHILE SELECTING WORKING CAPITAL MANAGEMENT

The working capital needs of a firm are influenced by numerous factors. The important ones are:

(1) Nature of Business: The requirement of working capital depends on the nature of business. The nature of business is usually of two types: Manufacturing Business and Trading Business. In the case of manufacturing business it takes a lot of time in converting raw material into finished goods. Therefore, capital remains invested for a long time in raw material, semi-finished goods and the stocking of the finished goods.

Consequently, more working capital is required. On the contrary, in case of trading business the goods are sold immediately after purchasing or sometimes the sale is affected even before the purchase itself. Therefore, very little working capital is required. Moreover, in case of service businesses, the working capital is almost nil since there is nothing in stock.

(2) Scale of Operations: There is a direct link between the working capital and the scale of operations. In other words, more working capital is required in case of big organisations while less working capital is needed in case of small organisations.

(3) Business Cycle: The need for the working capital is affected by various stages of the business cycle. During the boom period, the demand of a product increases and sales also increase. Therefore, more working capital is needed. On the contrary, during the period of depression, the demand declines and it affects both the production and sales of goods. Therefore, in such a situation less working capital is required.

(4) Seasonal Factors: Some goods are demanded throughout the year while others have seasonal demand. Goods which have uniform demand the whole year their production and sale are continuous. Consequently, such enterprises need little working capital.

On the other hand, some goods have seasonal demand but the same are produced almost the whole year so that their supply is available readily when demanded.

Such enterprises have to maintain large stocks of raw material and finished products and so they need large amount of working capital for this purpose. Woolen mills are a good example of it.

(5) Production Cycle: Production cycle means the time involved in converting raw material into finished product. The longer this period, the more will be the time for which the capital remains blocked in raw material and semi-manufactured products.

Thus, more working capital will be needed. On the contrary, where period of production cycle is little, less working capital will be needed.

(6) Credit Allowed: Those enterprises which sell goods on cash payment basis need little working capital but those who provide credit facilities to the customers need more working capital.

(7) Credit Availed: If raw material and other inputs are easily available on credit, less working capital is needed. On the contrary, if these things are not available on credit then to make cash payment quickly large amount of working capital will be needed.

(8) Operating Efficiency: Operating efficiency means efficiently completing the various business operations. Operating efficiency of every organisation happens to be different.

Some such examples are: (i) converting raw material into finished goods at the earliest, (ii) selling the finished goods quickly, and (iii) quickly getting payments from the debtors. A company which has a better operating efficiency has to invest less in stock and the debtors.

Therefore, it requires less working capital, while the case is different in respect of companies with less operating efficiency.

(9) Availability of Raw Material: Availability of raw material also influences the amount of working capital. If the enterprise makes use of such raw material which is available easily throughout the year, then less working capital will be required, because there will be no need to stock it in large quantity.

On the contrary, if the enterprise makes use of such raw material which is available only in some particular months of the year whereas for continuous production it is needed all the year round, then large quantity of it will be stocked. Under the circumstances, more working capital will be required.

(10) Growth Prospects: Growth means the development of the scale of business operations (production, sales, etc.). The organisations which have sufficient possibilities of growth require more working capital, while the case is different in respect of companies with less growth prospects.

(11) Level of Competition: High level of competition increases the need for more working capital. In order to face competition, more stock is required for quick delivery and credit facility for a long period has to be made available.

(12) Inflation: Inflation means rise in prices. In such a situation more capital is required than before in order to maintain the previous scale of production and sales. Therefore, with the increasing rate of inflation, there is a corresponding increase in the working capital.

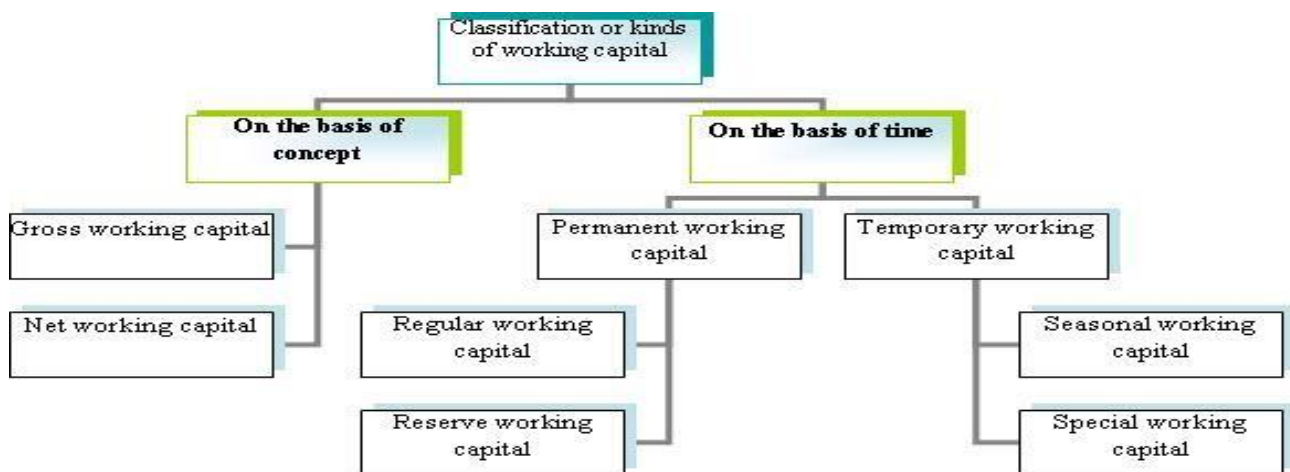
8. EXPLAIN THE TYPES OR CLASSIFICATION OF WORKING CAPITAL.

1. **Gross working capital:** Total or gross working capital is that working capital which is used for all the current assets. Total value of current assets will equal to gross working capital. In simple words, it is total cash and cash equivalent on hand. But remember, we do not account of current liabilities in gross working capital.

2. **Net Working Capital:** Net working capital is the excess of current assets over current liabilities.

Net Working Capital = Total Current Assets – Total Current Liabilities

This amount shows that if we deduct total current liabilities from total current assets, then balance amount can be used for repayment of long term debts at any time. It also measure of both a company's efficiency and its short-term financial health.



On the basis of Balance Sheet View, types of working capital are described below:

- **Gross Working Capital (GWC):** Current assets in the balance sheet of a company are known as gross working capital. Current assets are those short term assets which can be converted into cash within a period of one year. The grey area in the management of current assets or gross working capital is its unpredictability i.e. it is very difficult to ascertain the exact time of conversion of such assets. Why such a nature is problematic? It is because the liabilities occur at their time and do not wait for our current asset to realize. This mismatch or the gap creates a need for arranging [working capital financing](#).
- **Net Working Capital (NWC):** Net working capital is a very frequently used term. There are two ways to understand net working capital. First one says it is simply the difference of current assets and the current liabilities in the balance sheet of a business. The other understanding discloses little deeper or hidden meaning of the term. As per that, NWC is that part of current assets which are indirectly financed by long

term assets. Compared to gross working capital, net working capital is considered more relevant for effective working capital financing and management.

On the basis of Operating Cycle View, types of working capital are as below:

1. Permanent Working Capital

There is always a minimum amount of working capital which is continuously required by the enterprise to carry out its normal business operations. This is usually called as permanent or fixed working capital. Thus, fixed working capital is the minimum amount of working capital required to ensure effective use of fixed assets and support the normal business operation. It is that part of capital which is permanently blocked in current assets.

Permanent working capital is divided into two-initial working capital and regular working capital.

(a) Initial or reserve working capital:

The working capital which is needed in the initial stage of project is called initial working capital. It is the capital with which the project is started.

(b) Regular Working Capital:

It is the amount needed for continuous operation of the project. It is the amount of working capital required after the project has been established as a going concern. It is the minimum amount of the liquid capital to keep up the circulating capital from cash to inventories, to receivables and back again to cash.

2. Variable or temporary Working Capital

It is the working capital which varies with volume of business. This is the additional capital needed to meet seasonal and special needs. Variable working capital is divided into seasonal working capital and special working capital.

- ***Seasonal Working Capital:*** Seasonal working capital is that temporary increase in working capital which is caused due to some relevant season for the business. It is applicable to businesses having impact of seasons for example, manufacturer of sweaters for whom relevant season is the winters. Normally, their working capital requirement would increase in that season due to higher sales in that period and then go down as collection from debtors is more than sales.
- ***Special Working Capital:*** Special working capital is that rise in temporary working capital which occurs due to a special event which otherwise normally does not take place. It has no basis to forecast and has rare occurrence normally. For example, country where Olympic Games are held, all the business require extra working capital due to sudden rise in business activity.

9. EXPLAIN THE TYPES OF INVESTMENT

Investing in stocks or shares: When you invest in shares or stocks, you actually buy a portion of a company's ownership and its equity. Apart from earning profit, buying shares may also entitle you to vote at the shareholder's meeting. The profits that you earn are referred to as dividends. However, prices of shares fluctuate on a daily basis. The only way you can make money is when the shares increase in value. Therefore, you need to be very careful while investing in stocks.

Cash investment: Cash investment is one of the most popular techniques of earning profit. It comprises of certificates of deposit, savings bank accounts and treasury bills. This type of investment pays low rate of interest and they are highly risky in times of inflation.

Investing in bonds: By purchasing a bond, you actually lend your money to a company government, which in turn give you interest on your amount along with paying bank your principal amount. One of the major advantages of investing in bonds is that it is comparatively safe in comparison to other types of investment. However, the return of investment is comparatively lower than some other forms of investment.

Mutual fund investment: A mutual fund can be described as a company that brings together a group of people and invest the total amount in stocks, bonds or other securities. Mutual funds actually profit by selling ownership shares of stock. It is an ideal option for small investors as they can get access to professionally managed diverse portfolio of bonds, which is otherwise quite impossible to create with a small capital.

Investing in forex: A number of people invest in foreign exchange, it being the largest liquid financial market in present times. This is one of those investment options which have been popularized by the advent of internet technology. Forex trading involves buying or selling a currency at a given time. However, it is advisable that you enroll yourself in a forex trading course before investing your money in foreign exchange as otherwise you may lose huge amount of money if you don't have the required knowledge.

Investing in secured debt: Debt securities provide you with returns in the form of fixed periodic payments and the capital appreciation upon maturity. It is one of the safest types of investments; however, returns are also lower than some other securities. Sometimes, you may need to take help of lawsuit to recover your invested amount if the borrower defaults on loan repayment.

Real estate investment: Real estate investment involves quite a long term commitment of funds. Profit is generated through lease or rental income along with capital appreciation. However, you can expect profit by investing both in commercial and residential real estates.

10. EXPLAIN THE TYPES OF EVALUATION OF INVESTMENT / CAPITAL BUDGETING [OR] EVALUATION OF INVESTMENT DECISIONS [OR] APPRAISING PROJECT / REPLACEMENT METHODS/METHODS OF ASCERTAINING INVESTMENT DECISION

- I. Pay-back period method
- II. Average rate of return method (or) Accounting rate of return method
- III. Discounted cash flow methods
 - a. Net present value method
 - b. Internal rate of return method
 - c. Profitability index method

The following table highlights the differences among the four models:

	Method	Information Used	Time Period Covered
1.	Accounting Rate of Return	Accrual Accounting Amounts	Average of All Years or a Specific Year
2.	Payback	Cash Flows – Not Discounted	Until Cash is Recovered
3.	Net Present Value	Discounted Cash Flows	Entire Life of Project
4.	Internal Rate of Return	Discounted Cash Flows	Entire Life of Project

PAY-BACK PERIOD METHOD

It represents the period in which the total investment in a project is reserved by way of return (cash flow) from the project.

- a. When annual cash flows are even:

$$\text{Pay back period} = \frac{\text{original investment}}{\text{annual cash flows}}$$

b. When annual cash flows are uneven:

- i. Calculate annual cash inflows – earnings after tax before depreciation.
- ii. Find the cumulative values of the annual cash inflows.
- iii. Locate from the cumulative values the pay-back period.

ACCEPT (or) REJECT RULE:

- For accepting (or) rejecting a project under this method, first consider the cut-off period.
- The cut-off period is the period within which the management would like to get back the original investment.
- A project whose actual pay-back period is more than the cut-off period, the project will be straight away rejected.
- The project having the shortest pay-back period will be preferred.

ADVANTAGES OF PAYBACK PERIOD ARE:

1. Payback period is very simple to calculate.
2. It can be a measure of risk inherent in a project. Since cash flows that occur later in a project's life are considered more uncertain, payback period provides an indication of how certain the project cash inflows are.
3. For companies facing liquidity problems, it provides a good ranking of projects that would return money early.

DISADVANTAGES:

1. It does not take into account the cash inflows earned after the pay-back period.
2. Does not consider time value of money.
3. Difficult to determine the minimum acceptable pay-back period.
4. Full life of the asset is not considered under the pay-back period.

AVERAGE RATE OF RETURN METHOD (ARR):

Average profits after tax and after depreciation are calculated & then it is divided by the total original investment (or) average investment of the project.

$$\text{ARR} = \frac{\text{average profits (after depreciation \& taxes)}}{\text{original investment X 100 (or) average investment}}$$

Average investment may be calculated by the following formula,

$$\text{Average investment} = \frac{\text{value of investment in beginning} + \text{value of investment at end}}{2}$$

The value of investment at the end of the project life is '0' we take $\frac{1}{2}$ of original investment as average investment.

ACCEPT (or) REJECT CRITERION:

- Minimum rate of return is fixed by the management.
- Any project below this rate will be straight away rejected.
- Highest rate will be accepted.

ADVANTAGES:

- It is very simple to understand & easy to calculate.
- It uses the entire earning of a project.
- This method is based upon the well known concept of profit.

DISADVANTAGES:

- It ignores time value of money (interest factor).
- It does not take consideration real cash flows of the project.

- This method cannot be applied to a situation where investment in project is to be made in parts.

DISCOUNTED CASH FLOW METHODS:

The discounted cash flow methods take into account the profitability by way of cash inflows & the time value of money.

- Net present value method
- Internal rate of return method
- Profitability index method.

a) NET PRESENT VALUE METHOD:

Determine the cut-off rate (or) the rate that should be selected as minimum required rate of return.

Normally for this purpose, the cost of capital is considered to be minimum required rate of return. This rate is called discounting rate.

The difference between the total present value of the future cash inflows & the cost of investment is net present value (or) excess present value.

NPV (or) EPV = total present value of the future cash inflows – cost of original investment

$$T_{1r} = \frac{A_1}{1+r} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \dots + \frac{A_n}{(1+r)^n}$$

ACCEPT (or) REJECT RULE:

- If the NPV (or) EPV is positive, the project may be considered.
- If the NPV is negative the project is straightway rejected.

ADVANTAGES:

- It will give the correct decision advice assuming a perfect capital market. It will also give correct ranking for mutually exclusive projects.
- NPV gives an absolute value.
- NPV allows for the time value of the cash flows.

DISADVANTAGES:

- It is very difficult to identify the correct discount rate.
- NPV as method of investment appraisal requires the decision criteria to be specified before the appraisal can be undertaken.

b) INTERNAL RATE OF RETURN (IRR):

IRR is the rate at which the sum of discounted cash inflow equals the sum of discounted cash flows.

$$\frac{\text{present value of cash inflows}}{\text{cash outflows (o.investment)}} = 1$$

ACCEPT (or) REJECT RULE:

- If the calculated IRR is less than the cost of capital, the project is straightway rejected.
- If the IRR is greater than the cost of capital, the project may be considered.
- The project having highest of IRR will be accepted.

ADVANTAGES OF INTERNAL RATE OF RETURN :

1. Perfect Use of Time Value of Money Theory: Time value of money means interest and it should high because we are sacrifice of money for specific time. IRR is nothing but shows high interest rate which we expect from our investment. So, we can say, IRR is the perfect use of time value of money theory.

2. All Cash Flows are Equally Important: It is good method of capital budgeting in which we give equal importance to all the cash flows not earlier or later. We just create its relation with different rate and want to know where is present value of cash inflow is equal to present value of cash outflow.

- 3. Uniform Ranking:** There is no base for selecting any particular rate in internal rate of return.
- 4. Maximum profitability of Shareholder:** If there is only project which we have to select, if we check its IRR and it is higher than its cut off rate, then it will give maximum profitability to shareholder
- 5. Not Need to Calculate Cost of Capital:** In this method, we need not to calculate cost of capital because without calculating cost of capital, we can check the profitability capability of any project.

DISADVANTAGES OF INTERNAL RATE OF RETURN:

- 1. To understand IRR is difficult:** It is difficult to understand it because many student can not understand why are calculating different rate in it and it becomes more difficult when real value of IRR will be two experimental rate because of not equalize present value of cash inflow with present value of cash outflow.
- 2. Unrealistic Assumption:** For calculating IRR we create one assumption. We think that if we invest out money on this IRR, after receiving profit, we can easily reinvest our investments profit on same IRR. We seem to be unrealistic assumption.
- 3. Not Helpful for comparing two mutually exclusive investment**

c) PROFITABILITY INDEX:

Profitability index is the ratio of total present value of future cash inflows to original investment.

$$\text{Profitability index} = \frac{\text{total present value of future cash inflows}}{\text{cost of original investment}}$$

ACCEPT (or) REJECT RULE:

- If the profitability index of a project is less than one the project is straightway rejected.
- If the profitability index of a project is greater than one the project may be considered.

ADVANTAGES:

- They recognize the time value of money.
- They consider the cash inflows of the project then the net profits.
- They consider the cash inflows over the entire life of the project.
- They take into consideration the objective of maximum profitability.

DISADVANTAGES:

- More difficult to understand & operate.
- It is not easy to determine an appropriate discount rate
- Not give good results while comparing projects with unequal investments of funds.

11. EXPLAIN TRADING ACCOUNT.

The aim of preparing trading account is to find out gross profit or gross loss while that of second section is to find out net profit or net loss.

Preparation of Trading Account

Trading account is prepared mainly to know the profitability of the goods bought (or manufactured) sold by the businessman. The difference between selling price and cost of goods sold is the earning of the businessman. Thus in order to calculate the gross earning, it is necessary to know:

- (a) cost of goods sold.
- (b) sales.

Total sales can be ascertained from the sales ledger. The cost of goods sold is, however, calculated. In order to calculate the cost of sales it is necessary to know its meaning. The 'cost of goods' includes the purchase price of the goods plus expenses relating to purchase of goods and bringing the goods to the place of business. In order to

calculate the cost of goods || we should deduct from the total cost of goods purchased the cost of goods in hand. We can study this phenomenon with the help of following formula:

$$\text{Opening stock} + \text{cost of purchases} - \text{closing stock} = \text{cost of sales}$$

It can be described as excess of amount of ‘Sales’ over ‘Cost of Sales’. This definition can be explained in terms of following equation:

$$\text{Gross Profit} = \text{Sales} - \text{Cost of goods sold or (Sales + Closing Stock) - (Stock in the beginning + Purchases + Direct Expenses)}$$

USUAL ITEMS IN A TRADING ACCOUNT:

A) Debit Side

1. Opening Stock. It is the stock which remained unsold at the end of previous year. It must have been brought into books with the help of opening entry; so it always appears inside the trial balance. Generally, it is shown as first item at the debit side of trading account. Of course, in the first year of a business there will be no opening stock.

2. Purchases. It is normally second item on the debit side of trading account. ‘Purchases’ mean total purchases i.e. cash plus credit purchases. Any return outwards (purchases return) should be deducted out of purchases to find out the net purchases. Sometimes goods are received before the relevant invoice from the supplier. In such a situation, on the date of preparing final accounts an entry should be passed to debit the purchases account and to credit the suppliers’ account with the cost of goods.

3. Buying Expenses. All expenses relating to purchase of goods are also debited in the trading account. These include-wages, carriage inwards freight, duty, clearing charges, dock charges, excise duty, octroi and import duty etc.

4. Manufacturing Expenses. Such expenses are incurred by businessmen to manufacture or to render the goods in saleable condition viz., motive power, gas fuel, stores, royalties, factory expenses, foreman and supervisor’s salary etc.

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To work-in-process (opening)		By Closing stock	
To Raw material consumed:		Raw materials	
Opening stock		Work-in-process	
Add: Purchase of raw material		By Cost of production	
Less: Closing stock of Raw material		transferred to	
To Direct or productive wages		Profit & Loss	
To Factory overhead:		account	
Power and Fuel			
Factory rent			
Carriage inwards			
Octroi. etc			
TOTAL		TOTAL	

1.9.4 Format of Trading account

Trading account of ABC. Ltd for the year ending.....

PARTICULARS	AMOUNT	PARTICULARS	AMOUNT
To Opening stock		By Closing stock	
To Purchases		By Sales	
To Direct or productive wages		By Gross Loss	
To wages and salaries		transferred to Profit &	
To Power and Fuel		Loss account	
To Factory rent			
To Carriage inwards			
To Octroi. etc			
To Gross profit transferred to Profit & Loss account			
TOTAL		TOTAL	

(B) Credit Side

1. Sales. Sales mean total sales i.e. cash plus credit sales. If there are any sales returns, these should be deducted from sales. So net sales are credited to trading account. If an asset of the firm has been sold, it should not be included in the sales.

2. Closing Stock. It is the value of stock lying unsold in the godown or shop on the last date of accounting period. Normally closing stock is given outside the trial balance in that case it is shown on the credit side of trading account. But if it is given inside the trial balance, it is not to be shown on the credit side of trading account but appears only in the balance sheet as asset. Closing stock should be valued at cost or market price whichever is less.

Valuation of Closing Stock

To ascertain the value of closing stock it is necessary to make a complete inventory or list of all the items in the godown together with quantities. On the basis of physical observation the stock lists are prepared and the value of total stock is calculated on the basis of unit value. Thus, it is clear that stock-taking entails (i) inventorying, (ii) pricing. Each item is priced at cost, unless the market price is lower. Pricing an inventory at cost is easy if cost remains fixed. But prices remain fluctuating; so the valuation of stock is done on the basis of one of many valuation methods.

ADVANTAGES OF TRADING ACCOUNT

1. A trader can find out the gross profit and thereby can ascertain the percentage of profit he has earned on the cost of goods sold. This percentage of gross profit may serve as his ready guide for the adjustment of future sale price.
2. A trading account help a trader to compare his stock at open with that at the close. He can further find out whether the purchases he has made during the period of account have been judicious.

3. Once can compare the figure of sales with similar figure of the previous year and can find out whether business is improving or declining.
4. If the gross profit disclosed by the trading account is less than expected, an enquiry can be made into the cause responsible for the decline. And if the gross profit is more than was expected, steps can be taken to maintain it.

12. EXPLAIN PROFIT & LOSS ACCOUNT.

The account through which annual net profit or loss of a business is ascertained, is called **profit and loss account**.

Gross profit or loss of a business is ascertained through trading account and net profit is determined by deducting all indirect expenses (business operating expenses) from the gross profit through profit and loss account. Thus profit and loss account starts with the result provided by trading account.

The particulars required for the *preparation of profit and loss account* are available from the trial balance. Only indirect expenses and indirect revenues are considered in it. This account starts from the result of trading account (gross profit or gross loss).

DEFINITION OF PROFIT AND LOSS ACCOUNT

Profit and loss account is that part of **final account** is made for calculating the **net profit** or net loss. In the debit side of this account, we show all indirect loss and expenses and in the credit side of this account, we show all indirect incomes. After matching debit and credit side of profit and loss account, we can find net profit or loss of business. If organisation is company, we transfer this balance to profit and loss appropriation account, otherwise, we transfer this balance to capital account.

EXPLANATION OF PROFIT AND LOSS ACCOUNT

A) Debit Side of Profit and loss account

1. Gross loss transferred from **trading account**
2. All indirect expenses like sale expenses, office expenses and legal expenses
3. If credit side is more than debit side, we show net profit in debit side

B) Credit Side of Profit and Loss account

1. Gross profit transferred from trading account
2. Indirect Incomes like rent, commission, discount received
3. If debit side is more than credit side, we show net loss in credit side.

ITEMS COMES UNDER PROFIT AND LOSS ACCOUNT

➤ *Sequence of Expenses in Profit and Loss Account:*

There is no hard and fast rule as to the order in which the items of expenses are shown in profit and loss account. Generally, the items of expenses are shown in the following sequence:

➤ **Office and Administration Expenses:**

These are the expenses with the management of the business e.g. salaries of manager, accountant and office clerks, office rent, office stationary, office electric charges, office telephone etc.

➤ **Selling and Distribution Expenses:**

These are the expenses which are directly or indirectly connected with the sale of goods. These expenses vary with the sales i.e. they increase or decrease with the increase or decrease of sale of goods. Examples

are advertisements, carriage outward, salesmen's salaries and commission, discount allowed, traveling expenses, bad debts, packaging expenses, warehouse rent etc.

➤ **Financial and Other Expenses:**

All other expenses excepting those mentioned above are considered under this class.

Features of Profit and Loss Account:

1. This account is prepared on the last day of an account year in order to determine the net result of the business.
2. It is second stage of the final accounts.
3. Only indirect expenses and indirect revenues are shown in this account.
4. It starts with the closing balance of the trading account i.e. gross profit or gross loss.
5. All items of revenue concerning current year - whether received in cash or not - and all items of expenses - whether paid in cash or not - are considered in this account. But no item relating to past or next year is included in it.

The following is a specimen of profit and loss account

Name of Business		Profit and Loss Account for the year ended	
DEBIT		CREDIT	
	\$		\$
Trading A/C		Trading A/C	
Gross loss (transferred)	-----	Gross profit (transferred)	-----
Office and Administration Expenses:	-----	Interest received	-----
Salaries	-----	Rent received	-----
Rent, rates, taxes	-----	Discount received	-----
Postage & telegrams	-----	Dividend received	-----
Office electric charges	-----	Bad debts recovered	-----
Telephone charges	-----	Provision for discount on creditors	-----
Printing and stationary	-----	Miscellaneous revenue	-----
Selling and Distribution Expenses:		Net loss - transferred to capital A/C	-----
Carriage outward	-----		
Advertisement	-----		
Salesmen's salaries	-----		
Commission	-----		
Insurance	-----		
Traveling expenses	-----		
Bad debts	-----		
Packing expenses	-----		
Financial and Other Expenses:			
Depreciation	-----		
Repair	-----		
Audit fee	-----		
Interest paid	-----		

Commission paid	-----	
Bank charges	-----	
Legal charges	-----	
Net profit - transferred to capital A/C	-----	

If credit side exceeds the debit side = Net profit

If debit side exceeds the credit side = Net loss

USES OF THE PROFIT AND LOSS ACCOUNT:

- 1) The main use is to monitor and measure profit. This assumes that the information recording is accurate. Significant problems can arise if the information is inaccurate, either through incompetence or deliberate fraud.
- 2) Once the profit (loss) has been accurately calculated, this can then be used for comparison or judging how well the business is doing compared to itself in the past, compared to the managers' plans and compared to other businesses.

13. EXPLAIN THE PREPARATION OF BALANCE SHEETS.

Balance sheet is a list of the accounts having debit balance or credit balance in the ledger. On one side it shows the accounts that have a debit balance and on the other side the accounts that have a credit balance. The purpose of a balance sheet is to show a true and fair financial position of a business at a particular date. Every business prepares a balance sheet at the end of the account year. A balance sheet may be defined as:

1. "It is a statement of assets, liabilities and owner's equity (capital) on a particular date".
2. "It is a statement of what a business concern owns and what it owes on a particular date". What is owned are called assets and what it owes are called liabilities.
3. "It is a statement which discloses total assets, total liabilities and total capital (owner's equity) of a concern on a particular date".
4. "It is a statement where all the ledger account balances which remain open after the preparation of trading and profit and loss account, find place".

Balance sheet is so called because it is prepared with the closing balance of ledger accounts at the end of the year. It has two sides - assets side or left hand side and liabilities side or right hand side. The accounts having a debit balance are shown on the asset side and those having a credit balance are shown on the liabilities side and the total of the two sides will agree.

ASSETS means all the things and properties under the ownership of the business i.e. building, plant, furniture, machinery, stock, cash etc. Assets also include anything against which money or service will be received i.e. creditors accrued income, prepaid expenses etc. The assets are purchased to increase the value of a business firm or welfare the firm's functioning's. You will be able to think of an asset as something that can render cash flow (run), no matter of whether it is a company's constructing equipment or a person lease flat.

TYPES OF ASSETS

A. Current assets:

- It can be converted into cash within a short time frame (ie., 1 year or less).

- E.g., cash in hand, cash in bank, notes receivable, investment, Debtors, accounts receivable, funds in checking accounts.

B. Fixed assets:

- Fixed assets have relatively existence & are not readily converted into cash.
- Fixed assets are held for the purpose of earning income & they are not sold in the cause of trading.
- E.g., land, building, equipment & machinery, furniture.

C. Other assets:

- Do not fall under either current assets or fixed assets
- E.g., patents, copyrights, franchises, goodwill, investment in bond sinking funds.

LIABILITIES means our dues to others or anything against which we are to pay money or render service, i.e. creditors, outstanding expenses, amount payable to the owner of the business (capital) etc.

TYPES OF LIABILITIES

- **Fixed liability:** The liability which is to be paid of at the time of dissolution of firm is called fixed liability. Examples are Capital, Reserve and Surplus.
- **Long-term liability:** The liability which is not payable within the next accounting period is called long-term liability. Examples are Debentures of a company, Mortgage Loan etc.
- **Current liability:** The liability which is to be paid of in the next accounting period is current liability.. Examples: Sundry, creditors, Bills Payable and Bank overdraft etc.
- **Trade liability:** Liability which is incurred for goods and services supplied or expenses incurred is called trade liability. Example; Bill payable and Sundry period.
- **Financial liability:** Liability which is incurred for financial purposes is called financial liability. Example: Bank overdraft, load taken for a short period.
- **Contingent liability:** A contingent liability is one which is not an actual liability but which will become an actual one on the happening of some event which is uncertain. Examples: Bills discounted before maturity, Liability of a case pending in the court.

Asset side of the balance sheet indicates the different types of assets owned by a concern, while liabilities side discloses the various sources through which funds have been obtained in order to acquire those assets. Balance sheet reveals the financial position of the firm on a particular date at a point of time, so it is also called "**position statement**". It is prepared on the last day of the accounting year and discloses concern for the whole year cannot be determined through the balance sheet because financial position is ever changing.

PRO-FORMA OF A BALANCE SHEET IS AS FOLLOWS:
BALANCE SHEET OF ABC LTD AS ON 31ST DECEMBER 2005

Excel Balance Sheet Template Software

Create Template!

Balance Sheet

Date:

Assets	Amount	Liabilities	Amount
Current Assets		Current Liabilities	
Cash	\$0.00	Accounts payable	\$0.00
Accounts receivable	\$0.00	Short-term notes	\$0.00
(less doubtful accounts)	\$0.00	Current portion of long-term notes	\$0.00
Inventory	\$0.00	Interest payable	\$0.00
Temporary investment	\$0.00	Taxes payable	\$0.00
Prepaid expenses	\$0.00	Accrued payroll	\$0.00
Fixed Assets		Long-term Liabilities	
Long-term investments	\$0.00	Mortgage	\$0.00
Land	\$0.00	Other long-term liabilities	\$0.00
Buildings	\$0.00	Shareholders' Equity	
(less accumulated depreciation)	\$0.00	Capital stock	\$0.00
Plant and equipment	\$0.00	Retained earnings	\$0.00
(less accumulated depreciation)	\$0.00		
Furniture and fixtures	\$0.00		
(less accumulated depreciation)	\$0.00		

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FEATURES OF BALANCE SHEET:

Balance sheet has the following features:

1. It is the last stage of final accounts
2. It is prepared on the last day of an accounting year.
3. It is not an account under the double entry system - it is a statement only.
4. It has two sides - left hand side known as asset side and right hand side known as liabilities side.
5. The total of both sides are always equal.
6. The balances of all asset accounts and liability accounts are shown in it. No expense accounts and revenue accounts are shown here.
7. It discloses the financial position and solvency of the business.
8. It is prepared after the preparation of trading and profit and loss account because the net profit or net loss of a concern is included in it through capital account.

COSTS

Introduction:-

Generally, the term cost of production refers to the 'money expenses' incurred in the production of a commodity. But money expenses are not the only expenses incurred on the production of a commodity. But there are number of services and inputs such as entrepreneurship, land, capital etc. which are offered by an entrepreneur without changing any price or receiving any payment for them. While computing the total cost of production, allowance should be made for such expenses. It is therefore essential to have clean understanding for the different types of cost.

There are several types of costs that a firm may consider relevant under various circumstances. Such costs include future costs, accounting costs, opportunity costs, implicit costs, fixed costs, variable costs, semi variable costs, private costs, social costs, common costs, etc.

For the purposes of decision-making, it is essential to know the fundamental difference between the main cost concepts along with the conditions of their use in decision-making.

TYPES OF COSTS

1. Actual (or, Acquisition or, Outlay) Costs: *Actual costs are the costs which the firm incurs while producing or acquiring a good or a service like the cost on raw material, labor, rent, interest, etc. .* The actual costs are also called the *outlay costs* or *acquisition costs* or *absolute costs*.

2. Opportunity (or, Alternative) Costs: *On the other hand; opportunity costs or alternative costs are the return from the second-best use of the firm's resources which the firm forgoes in order to avail of - the return from the best use of the resources.*

Suppose that a businessman can buy either a lathe machine or a paper pressing machine with his limited resources and he can earn annually Rs.50,000 and Rs.70,000 respectively from the two alternatives. A rational businessman will certainly buy a paper-pressing machine which gives him a higher return. But in the process of earning Rs.70,000, he has forgone the opportunity to earn Rs.50,000 annually from the lathe machine. Thus, Rs.50,000 is his opportunity cost or *alternative cost*.

3. Outlay Costs: The *outlay costs* mean the actual expenditure incurred for producing or acquiring a good or service. These actual expenditures are recorded in the books of account of the business unit, e.g., wage bill. These costs are also known as actual costs or absolute costs.

4. Sunk Costs: *Sunk costs* are the costs that are not altered by a change in quantity and cannot be recovered; e.g., depreciation. Sunk costs are a part of the outlay costs. However, most business decisions require cost estimates that are essentially incremental and not sunk in nature.

5. Explicit (or, Paid-out) Costs : *Explicit costs are those expenses which are actually paid by the firm (paid-out costs).* These costs appear in the accounting records of the firm.

6. Implicit (or, Imputed) Costs: *Implicit or imputed costs* are theoretical costs in the sense that they go unrecognized by the accounting system. These costs may be defined as *the earnings of those employed resources which belong to -the owner himself:*

For example, the interest payment on borrowed funds is an explicit cost and enters the accounting record,-but the amount of interest which the employer could have earned (and which he forgoes when he uses his own capital in his firm) is his implicit cost.

Similarly, the amount of rent, wages, utility expenses, etc. which are paid out are the explicit costs of the firm, while wages, rent, etc. which are due to the entrepreneur for employing his own resources in the firm are all implicit costs. The explicit costs are important for calculation of profit and loss account, but for economic decision-making the firm takes into account both the explicit as well as the implicit costs.

7. Incremental (or, Avoidable or, Escapable or, Differential) Costs: *The incremental costs are the additions to costs resulting from a change in the nature and level of business activity, e.g., change in product line or output level, adding or replacing a machine, changing distribution channels, etc.* Since these costs can be avoided by *not* bringing about any change in the activity, the incremental costs are also called *avoidable costs* or *escapable costs*. Moreover, incremental costs may also be regarded as the difference in total costs resulting from a contemplated change, so they are also called *differential costs*.

8. Sunk (or, Non-avoidable or, Non-escapable) Costs: *Sunk costs are those that do not change by varying the nature or the level of business activity.* For example; all the past costs are considered sunk costs because any change in the activity and the resulting incremental costs will have to take these preceding costs as given.

9. Out-of-pocket Costs: *Out-of-pocket costs are those expenses which are current cash payments to outsiders.* All the explicit costs like payment of rent, wages, salaries, interest, transport charges, etc., fall in the category of out-of-pocket costs.

10. Book Costs: *Book costs are those business costs which do not involve any cash payments but for them a provision is made in the books of account to include them in profit and loss accounts and take tax advantages,* like the provisions for depreciation and for unpaid amount of the interest on the owner's capital employed in the firm.

11. Economic Costs: *Economic costs relate to future.* They are in the nature of the incremental costs-the imputed and the explicit costs as well as the opportunity costs. Since the only costs that matter for business decisions are the future costs, i.e., the economic costs.

12. Private Costs and Social Costs: Economic costs can be calculated at two levels: micro-level and macro-level. The micro-level economic costs relate to functioning of a *firm'* as a production unit, while the macro-level economic costs are the ones that are generated by the decisions of the firm but are paid by the *society* and not the firm.

For example, if the decision of a firm to expand its output leads to increase in its costs, this cost will be known as *private costs*.

Whereas, *if it also leads to certain costs to the society,* (may be in the nature of greater pollution, greater congestion, etc.) these costs which are external to the firm are *social costs* from society's point of view.

Thus, *private costs are those which are actually incurred or provided for by an individual or a firm for its business activity.* *Social costs,* on the other hand, *are the total costs to the society on account of production of a good.* Thus, the economic costs include both the private and social costs. However, the *net social cost* is the total social cost minus the private cost.

13. Direct (or, Traceable or, Assignable) Costs and Indirect (or Non-traceable or, Non-assignable or, Common) Costs : The *direct or traceable or assignable* costs are the ones that have direct relationship with a unit of operation like a product, a process or a department of the firm. In other words, the costs which are directly and definitely identifiable are the direct costs.

On the other hand, the *indirect or no traceable or common or non-assignable* costs are those whose course cannot be easily and definitely traced to a plant, a product, a process or a department. For example, in operating railway services the cost of station, track, equipment, staff, etc., cannot be assigned to either passenger or goods transportation; these are common costs.

14. Controllable Costs vs. Non-controllable Costs: Controllable costs are those which are capable of being controlled or regulated by executive vigilance and, therefore, can be used for assessing executive efficiency.

Non-controllable costs are those which cannot be subjected to administrative control and supervision. Most of the costs are controllable, except, of course, those due to obsolescence and depreciation.

15. Replacement Costs and Original (or, Historical) Costs: The basis of distinction between historical and replacement costs is the way in which the assets are carried on in the balance sheet and the manner in which the amount of cost is determined.

Historical cost of an asset states the cost of plant, equipment and materials at the price paid originally for them, while the replacement cost states the cost that the firm would have to incur if it wants to replace or acquire the same assets now.

The differences between the historical and replacement costs result from price changes over time. Suppose a machine was acquired for Rs. 10,000 in 1999 and the same machine can be acquired for Rs. 14,000 in 2010. Here, Rs. 10,000 is the historical or original cost of the machine and Rs. 14,000 is its replacement cost. The difference of Rs. 4,000 between the two costs has resulted because of the price change of the machine

during this period. In the conventional financial accounts the value of assets is shown at their historical costs. But for decision-making, firms should try to adjust historical costs to reflect price level changes.

16. Shutdown Costs: *Shutdown costs* are those which the firm incurs if it temporarily stops its operations. These costs could be saved if the operations are allowed to continue. Shutdown costs include, besides the fixed costs, the cost of sheltering plant and equipment, lay-off expenses, employment and training of workers when the plant is restarted, and above all loss of the market.

17. Abandonment Costs: Abandonment costs are the costs of retiring altogether a fixed asset from use. For example, the plant installed during war time may be so improvised that it may not be required during peace time. Abandonment costs; thus, involve the problem of the disposal of assets.

18. Urgent Costs and Postponable Costs: Urgent costs are those that must be incurred so that the operations of the firm continue, like the costs on material, labour, fuel, etc.

Those costs whose postponement does not affect (at least for some time) the operational efficiency of the firm, are: known as postponable costs, e.g., the maintenance of building, machinery, etc.

19. Business Costs and Full Costs: Business costs are relevant for the firm's profit and loss accounts and for legal and tax purposes. It includes all the payments and contractual obligations made by the firm together with the bank.

The full costs are the sum of opportunity cost and normal profit. Opportunity cost is the expected earnings from the next best use of the firm's resources like capital, land, buildings and entrepreneur's effort and time. In order that the firm continues to produce, it must earn a necessary minimum return, called the normal profit.

20. Total cost, Average cost and Marginal cost: Total cost represents the money value of the total resources for production of goods and services by the firm. Average cost is the cost per unit of output, assuming that production of each unit of output incurs the same cost. That is,

$$\text{Average cost} = \text{Total cost} / \text{Number of units}$$

Marginal costs are the incremental or additional costs incurred when there is addition to the existing output of goods and services. Eg. If the total cost increases from Rs. 2000 to Rs. 2100 when production increases from 10 units to 11 units, the marginal cost of 11th unit is: Rs. 2100 - Rs. 2000 = Rs. 100.

Thus, marginal cost of n th unit (MC_n) is the difference between the total costs of n th unit (TC_n) and total costs of $(n-1)$ th unit (TC_{n-1}), i.e., $MC_n = (TC_n - TC_{n-1})$

21. Fixed Costs and Variable Costs: Economists often divide costs into the two main groups: fixed cost and variable costs.

Fixed (or, constant) costs are that part of the total cost of the firm which does not vary with output, e.g. expenditures on depreciation, rent of land and buildings, property taxes, etc. If the period under consideration is long enough to allow the necessary adjustments in the capacity of the firm, the fixed costs no longer remain fixed. These can then be varied.

Variable costs, on the other hand, are directly dependent on the volume of output or service. Variable costs (for example, expenditure on labour, raw material, etc.) increase but not necessarily in the same proportion as the increase in output. The degree of proportionality between the variable cost and output depends upon the utilisation of fixed facilities and resources during the process of production.

22. Short-run Costs and Long-run Costs: The short-run is defined as a period in which the supply of at least one of the inputs cannot be changed by the firm. For example certain inputs like machinery, buildings, etc., cannot be changed by the firm whenever it so desires. It takes time to replace, add or dismantle them.

The long-run, on the other hand, is defined as a period in which all inputs can be varied as desired: In other words, it is that time-span in which all adjustments and changes are possible to realise. Thus, in the short-

run; some inputs are fixed (like installed capacity) while others are variable (like the level of capacity utilization). While in the long-run all inputs, including the size of the plant, are variable.

23. Incremental Cost and Marginal Cost: Incremental cost and marginal cost are closely related. Similarity and difference between these two must be well understood. In some applications the marginal cost is more efficient, while in others the incremental cost is more suitable.

(i) Marginal cost deals with unit-by-unit changes in output, whereas incremental cost is not restricted to a unit change.

Marginal cost is the amount added to total cost by a unit increase in output. Incremental cost is related to change in any number of units of output or even change in its quality.

(ii) Marginal cost as a concept is particularly superior to incremental cost when dealing with decisions like :

- selecting optimum level of inputs
- when the input-output relationship reveals diminishing returns
- selecting least cost combination of inputs (where inputs reveal the tendency of diminishing marginal rate of substitution)
- selecting optimum cost combination of inputs (where the products substitute at decreasing rates)
- selecting optimum maturity of productive assets, where assets gain value at decreasing rates over time;
- analysis of curvilinear cost functions. In case of a linear function, marginal cost changes at a uniform rate with change in output, but in case of curvilinear function the marginal cost is different for every additional unit of output.
- For a profit-maximising firm (which compares marginal revenue with marginal cost) a unit-by-unit comparison of marginal cost with marginal revenue (as output is increased) is essential.

(iii) Incremental costs are superior to marginal costs in the following cases :

- If discrete alternatives are to be compared, only the incremental cost can be used, as marginal cost exists only for continuous alternatives. For example, we can compare two technical processes (though giving the same level of output) through incremental cost and not marginal cost.

- Incremental cost is particularly useful in case of linear cost functions, as in such functions only the end points of a range need to be compared.

The choice among these concepts must be done on the basis of the problem at hand.

BREAK EVEN POINT OR BREAK EVEN ANALYSIS

DEFINITION

In simple words, the **break-even point** can be defined as a point where total costs (expenses) and total sales (revenue) are equal. Break-even point can be described as a point where there is no net profit or loss. The firm just —breaks even.¶

Any company which wants to make abnormal profit, desires to have a break-even point. Graphically, it is the point where the total cost and the total revenue curves meet.

The break-even point is the point at which the income from sales will cover all costs with no profits. The business owner or manager usually considers several factors when studying break-even analysis:

1. The capital structure of the company.
2. Fixed expenses such as rent, insurance, heat, and light.
3. Setup of the organization.
4. Variable expenses.
5. The inventory, personnel, and space required to operate properly.
- 6.

Profit

Sales > Variable Expenses + Fixed Expenses

Break-even Point

Sales = Variable Expenses + Fixed Expenses

Loss

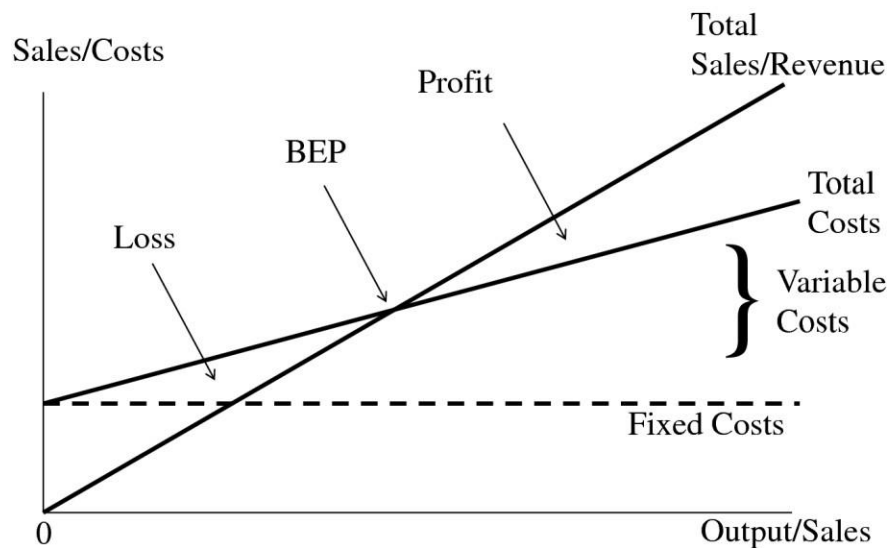
Sales < Variable Expenses + Fixed Expenses

CALCULATION (FORMULA) FOR BEP

- Break-even point is the number of units (N) produced which make zero profit.
- Revenue – Total costs = 0
- Total costs = Variable costs * N + Fixed costs
- Revenue = Price per unit * N
- Price per unit * N – (Variable costs * N + Fixed costs) = 0
- So, break-even point (N) is equal

$$N = \text{Fixed costs} / (\text{Price per unit} - \text{Variable costs})$$

The Break-Even Point (BEP)

**ADVANTAGES OF BREAK-EVEN ANALYSIS**

- 1) It is simple to conduct and understand.
- 2) It shows profit and loss at different levels of output.
- 3) It can cope with changing circumstances. e.g. the following changes in the business environment can be shown in a break even chart.

Factor	Cause	Effect
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Internal	Employing extra sales staff	Fixed costs rise, so total costs rise and break-even point rises.
	Price increase	Revenue rises more steeply, break-even point falls.
	Automation replaces direct labour	Fixed costs rise while direct costs fall, effect on break-even point unclear.
External	Recession cuts demand	Break-even point unaffected, though safety margin is reduced.
	Price war forces price cut	Revenue line rises less steeply, break-even point rises.
	Inflation pushes up direct costs.	Direct and total cost line rise more steeply, break-even point rises.

DISADVANTAGES OF BREAK-EVEN ANALYSIS

1. It assumes that all output is sold at the given price (this may well be untrue) .
2. Although it can cope with changes in circumstances, these factors change regularly reducing its usefulness as a forecasting tool.
3. The model assumes that costs increase constantly and do not benefit from economies of scale. If the firm obtains purchasing economies of scale then its total cost line will no longer be straight.
4. Break-even analysis is only as good as the data upon which it is based. Poor quality data will lead to inaccurate conclusions being drawn.

Fixed Costs:

Fixed costs are the costs associated with the product that have to be paid regardless of the volume you sell. No matter how much you sell or don't sell, you have to pay your fixed costs.

An example of a fixed cost is overhead. Overhead may include rent for the space your company occupies such as your office space. It may also include your weekly payroll. Another fixed expense may be the depreciation you incur on your equipment. Those are just a few examples of expenses you have to pay no matter what your sales volume is.

Variable Costs: Variable costs are directly related to sales. In fact, variable costs change with sales. As sales go up, so do variable costs. As sales go down, variable costs go down. Variable costs are costs of labor or materials that change with sales. One way for a company to save money is to reduce its variable costs. Sometimes, calculating variable costs is as simple as looking at your costs of goods sold on your income statement.

Examples of variable costs are the raw materials that go into creating the company's product and the labor the company uses. Other examples are costs of goods sold, sales commissions, delivery charges, shipping charges, wages and numbers of temporary or part-time employees, and bonuses to employees.

If sales decline, all of these variable costs can decline and probably will decline.

Semi-variable costs: Some costs have components that are fixed and some that are variable. One example is wages for your sales force. A portion of the wage for a salesperson may be a fixed salary and the rest may be sales commission. When calculating your fixed and variable costs, you should allocate the fixed portion to fixed costs and the variable portion to variable costs.

Costs, Sales Volume, and Profit

A change in any of your costs can drastically affect your net profit. A change in sales volume can also affect your net profit. Another variable that is important is the price of your product which interacts with volume and costs. Breakeven analysis shows the relationship between the price of the product you sell, the volume of the product you sell, and your costs or expenses. One of the variables you use in breakeven analysis, price, can be determined by further dividing up fixed and variable costs in direct and indirect costs