

# CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18ME51

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021

## Management and Economics

Time: 3 hrs.

Max. Marks: 100

- Note:** 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Use of Interest factor table is permitted.

### Module-1

- 1 a. Define meaning of management and explain characteristics of management. (06 Marks)
- b. Discuss different levels of management. (06 Marks)
- c. Briefly explain the early management approaches. (08 Marks)

OR

- 2 a. Discuss the importance and purpose of planning process. (10 Marks)
- b. With the help of block diagram, explain hierarchy of plans. (10 Marks)
- c.

### Module-2

- 3 a. List and explain in brief the principles of organization. (14 Marks)
- b. Discuss the need of committees in an organization with classification. (06 Marks)

OR

- 4 a. Explain in brief different leadership styles. (10 Marks)
- b. Explain the essentials of a good sound control system. (10 Marks)

### Module-3

- 5 a. Engineers are now expected not only to generate novel technological solutions but also to make skillful financial analysis of the effects of implementation. Discuss. (06 Marks)
- b. State and explain the law of supply is demand mentioning the factors influencing it. (08 Marks)
- c. Find the effective rate of interest for an actual rate of interest of 10% when compounded:  
(i) yearly (ii) biannually (iii) quarterly  
(iv) monthly (v) daily (vi) hourly (06 Marks)

OR

- 6 a. Explain time value of money assuming amount of your choice and draw the cash flow diagram. (08 Marks)
- b. A 45 year old person is planning for his retired life. He plans to direct Rs.30,000 from his bonus as investment every year for the next 15 years. The bank gives 12% interest rate compounded annually. Find the maturity value of his account when he is 60 years. (04 Marks)
- c. A person wants to gift a car to his daughter when she would turn 18 years, six years from now. He decides to put away money in her name during her next six birthdays. He wants to deposit Rs.25,000 in the year to go on increasing it by Rs.5000 every year for the next 6 years. If he estimates that a car would cost Rs. 5 lakhs when he wants to buy one, how much more money should be added to the maturity amount that he receives from the bank if it assumed at 11.5% compounded annually. (08 Marks)



#### Module-4

- 7 a. Two holiday cottages are under consideration. Compare the present worth of the cost of 24 year service, at an interest rate of 5% when neither cottage has a realizable cottage value.

	Cottage 1	Cottage 2
First cost	Rs.4500	Rs.10,000
Estimate life	12 years	24 years
Annual maintenance cost	Rs.1000	Rs.720

(10 Marks)

- b. An investor can make three end of the year payments of Rs.15000 which are expected to generate receipts of Rs.10,000 at the end of the year 4 that will increase annually by Rs.2500 for the following 5 years. If the investor can earn a rate of return of 10% on the other 8 year investments in this alternative attractive?

(10 Marks)

**OR**

- 8 a. Define the following terms: (i) MARR (ii) IRR (iii) ERR. What are the clues of IRR calculations? (10 Marks)
- b. Rs.10 crores was generated by the management of an engineering college for the construction of its new mechanical science block. Annual maintenance of the block is estimated to be Rs.10 lakh. In addition Rs.12 lakh will be needed every 10 years for painting and Hoyer repairs. If the budget granted has to take care of perpetual maintenance, how much of the amount can be used for initial construction costs? Deposited funds can earn 6% rate of interest compounded annually. Assume that taxes and inflation do not come into picture. (10 Marks)

#### Module-5

- 9 a. List and explain five methods of depreciation. (10 Marks)
- b. Discuss the various causes of depreciation. (05 Marks)
- c. A high-tech bus was initially bought for Rs.50 lakhs. Its salvage value after 5 years of service would be 10 lakh. In its life time it can be driven for a distance of 10 lakhs kms in its 5<sup>th</sup> year of operation. If it has already traveled a total distance of 8 lakh kms, find the depreciation of the bus at the point. (05 Marks)

**OR**

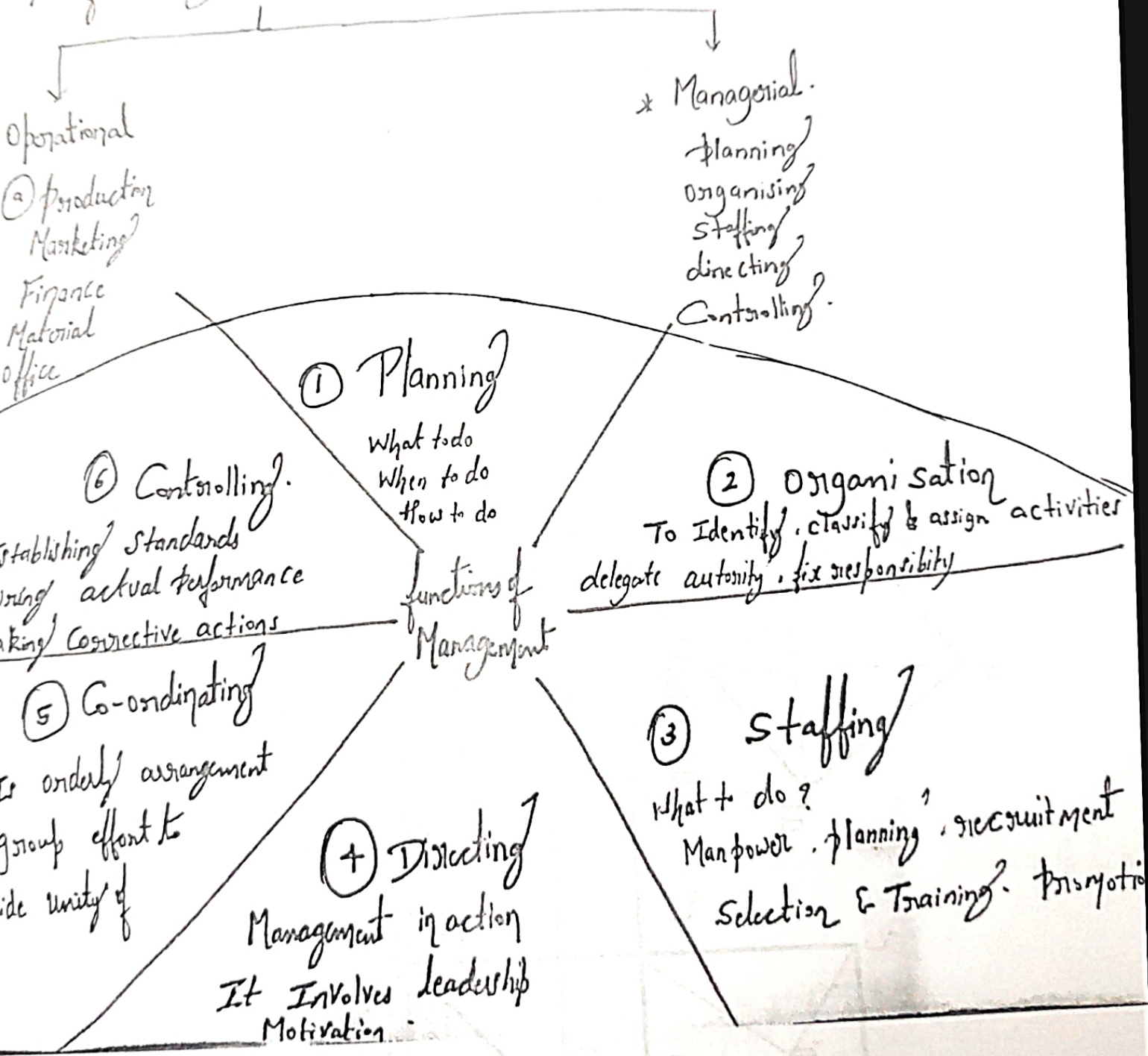
- 10 a. Explain how selling price is determined for product with a block diagram. (06 Marks)
- b. Computers purchased by a public utility cost Rs.7000 each, past records indicate that they have useful life of 5 years, after which they will be disposed off, with no salvage value. The company currently has capital of 7%. Determine the following by using straight line method.
- Depreciation charges per year
  - Depreciation reserve accumulated at the end of 3<sup>rd</sup> year.
  - Book value at the end of third year. (06 Marks)
- c. The original assets of the company are Rs.5,80,000. The life of the plant is 9 years. If the scrap value of the time is expected to be 80,000. Calculate the depreciation at the end of each year by sum of the year method. (08 Marks)

\* \* \* \* \*



work efficiency.

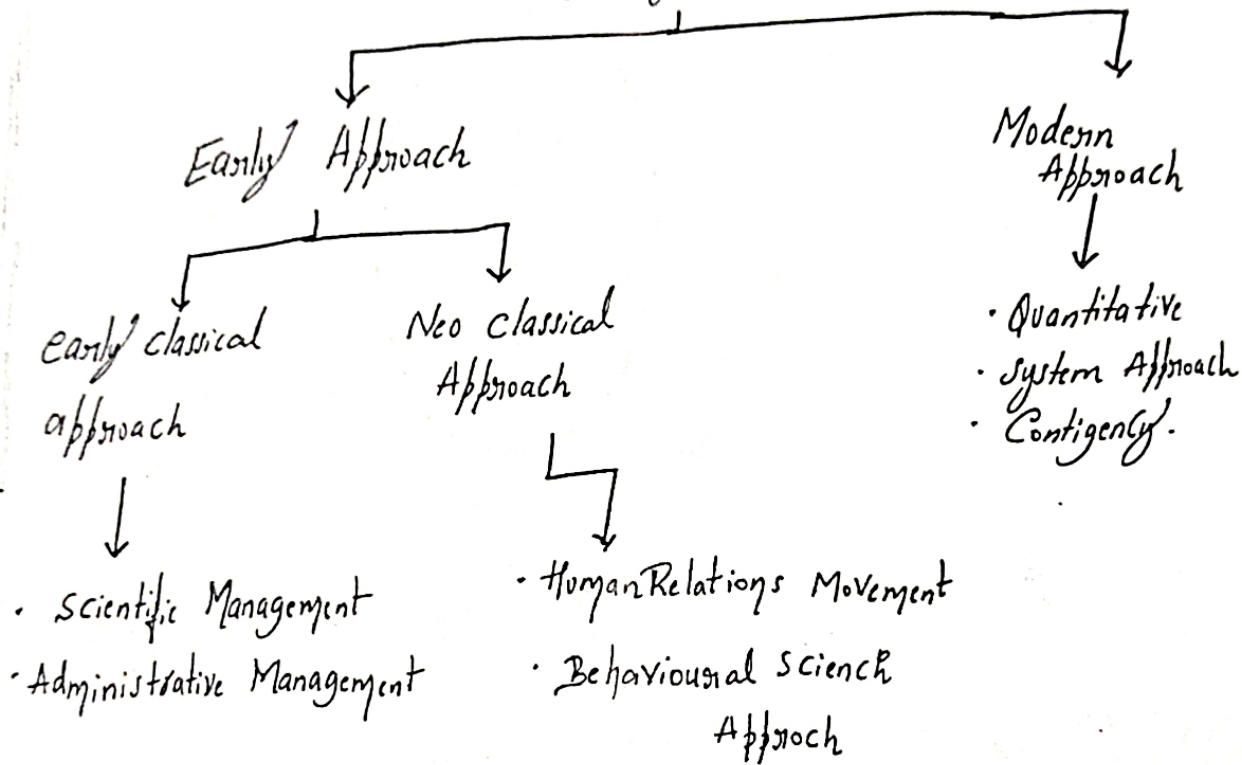
# Types of Management:-



# Evolution of Management through early Management Approach

1 (b)

## Evolution of Management.



## Early Management Approach:-

Fredrick W. Taylor (1856 - 1915) is father of Management

was working as manager, Middle steel Works in Philadelphia.

He has profound 4 principles of Management.



1) Scientifically study each element of an individual task and develop best method for performing task. This replaces old thumb rule method.

2) Carefully select workers, train them to ensure they use proper method.

3) Co-operate fully with workers to ensure they use proper method.

4) Divide work and responsibility so that Management is responsible for planning work methods using scientific principles and workers are responsible for executing accordingly.

To realize these principles Taylor and his association Henry Gantt, Frank, Lillian Gilbreth suggested following techniques.

(a) Scientific work planning.

(b) Introduction of functional foremanship

(c) Work study

(d) Taylor's scheme of Differential wage payment.

(e) Standardization.

(f) Mental revolution.

(g) Training



## 2(a) Importance of Planning

Planning is of immense importance for organizational success. It has assumed great importance in all types of organizations. Planning serves as guide to all management functions. The importance of planning can be inferred on the basis of the following points:

- (a) Planning focuses attention on objectives and results. It directs attention for achieving these organizational objectives. It charts the course of action for organizational success. It serves as a blue print for achieving goal and results.
- (b) Planning off-sets future uncertainty and change. The environment in which the business operates is dynamic and is uncertain. Planning enables organizations to cope this uncertainty and change. Planning helps to minimize risk while taking advantage of opportunities.
- (c) Planning provides sense of direction to the employees of the organization as awareness of goals, acts as a motivating factor.
- (d) Planning tackles increasing complexity in modern business. Business is becoming complex day-by-day due to factors like specialization, mechanization, globalization, liberalization, etc. As planning lays down important criteria like what is to be done, when it is to be done, where it is to be done, how it is to be done and who has to do it, tackling complexity becomes increasingly efficient.
- (e) Planning encourages creativity and innovation as planning is process of looking forward. It enables organizations not only to cope with technological developments but also forecast the future trends.
- (f) Planning helps in coordination. The coordination is achieved through well defined objectives, policies, programmes and procedures. According to Koontz and O'Donnell, "plans are selected courses along which the management desires to coordinate group action."
- (g) Planning enables efficiency in operations as it facilitates optimum utilization of the available resources, thus increasing economy by reducing costs. This improves the



## 2(b). Planning Process/Steps in Planning

Planning process is a vital managerial function and consumes lot of time and efforts of the planners. It is to be done in a systematic way and it contains the following steps.

- (a) *Opportunity Awareness:* Environment affects any organizational activity. Before embarking on actual planning one must weigh the opportunities that exist for its performance. This kind of awareness on business environment and social factors is very important in planning process. It is the starting point of planning.
- (b) *Establishing Objectives:* This is the first step in the planning process. In this step the organization goals are identified and the external as well as internal factors that affect organization are thoroughly examined. These objectives set the pattern and decide the course of action that should be taken. The companies future aspiration are clearly spelt out in quantifiable terms with time relevance i.e., what is to be accomplished by the company, when and how, etc.
- (c) *Planning Premises:* Various factors that affect planning are called planning premises. Factors like political factors, legal factors, govt. policies and controls, demand and price of the products, availability of raw materials, labour, technology, etc., have a significant effect on the planning process. The information must be collected as accurately as possible with regard to the above and analyzed to make certain forecast about future course of action that is to be undertaken.



- (d) *Identifying Alternative Courses of Action:* Various available alternatives are examined in the light of planning premises. These alternatives are subject to evaluation. More the number of alternatives, more chances of formulating a optimally successful plan. According to Koontz and O'Donnell, "There is seldom a plan made for which reasonable alternatives do not exist. Moreover, before weighing alternatives and reaching a decision, one is wise to search for alternatives that may not be immediately apparent. Quite often an alternative does not immediately prove to be the most profitable way of undertaking a plan."
- (e) *Evaluating Alternative Courses of Action:* The various alternatives are evaluated as to their suitability to that particular organization on one hand and the effect of planning premises on the other. The alternatives weighed to determine the best alternative.
- (f) *Selecting the Best Course:* After evaluating the various alternatives, the most viable one is selected. Some times more than one alternative may be equally good from the organization point of view and a combination of alternatives are considered in such an eventuality.
- (g) *Formulating Derivative Plans:* After selecting the best course of action, the next step is to formulate secondary plans to support the basic plan. The derivative plans are detailed plans derived from various departments, units, and activities. The derivative plans indicate the time schedule and sequence of various activities.
- (h) *Securing Cooperation and Participation:* The successful execution of any plan depends upon the extent of participation of employees. So, the management should involve employees in planning through communication, consultation and participation
- (i) *Providing for Follow up:* There should be a system of follow-up. The management should watch how the planning is being done. The shortcomings of planning can be identified through a follow-up action and rectified then and there. The continuous evaluation of planning is also necessary. It means that the actual performance is compared with the planning and then corrective action is taken if there is any deviation.



### 3(a). Principles of Organization

The following of the basic principles of organization decide the success or otherwise of any organization. The principles of organizations are as follows:

- (a) **Unity of objective:** Every part of the organization and the organization as a whole should be geared to the basic objective determined for the enterprise.
- (b) **Efficiency:** The organization should be able to attain the predetermined goals and objectives at the minimum costs. If it does so, it will satisfy the test of efficiency. From the point of view of an individual, a good organization should provide the maximum work satisfaction. Similarly, from the social point of view, an organization will be efficient when it contributes the maximum towards the welfare of the society.



- (c) **Span of Control:** It refers to the number of employees a manager can supervise directly. There is no correct number for the span of control but with normally narrower at the top of the organization than at the bottom. Generally, the more complex a subordinate's job the fewer such subordinates report to a manager. The more routine the work the greater the number to be supervised.
- (d) **Division of Labour:** A good organization should consist of departments established to reflect the most efficient breakdown of enterprise activities. Proper departmentalization is an important principle of sound organization.
- (e) **Clear Definitions of Functional Authority:** The duties and the authority relationships in a good organization must be properly and clearly defined, so that there is no confusion or overlapping.
- (f) **Chain of Command:** The unbroken line of reporting relationship from the bottom to the top of the organization is called chain of command. It defines the formal decision making structure and provides for orderly progression up and down the hierarchy for both decision making and communication.
- (g) **Management by Exception:** A good organization is so arranged that only exceptionally complex problems are referred to the higher levels of management and the routine matters are dealt with by executives at lower levels. This is called as exception principle or management by exception.
- (h) **Unity of Command:** Each person within the organization takes orders and reports to only one person. It should guide any attempt to develop operating relationships.
- (i) **Unity of Direction:** A principle of organizing that calls for the establishment one authority figure for each designated task of the organization is called as unity of direction. This principle has the authority to coordinate all plans concerning that task.
- (j) **Responsibility:** It is the obligation to carryout one's assigned duties to the best of one's abilities. Responsibility cannot be delegated to an employee rather the employee's acceptance of an assignment creates an obligation to do his or her best. Responsibility is a step in the delegation process.
- (k) **Authority and Responsibility:** The authority and responsibility must be coexisting in an organization. If it is not so, the subordinates cannot discharge their responsibility for want of necessary power to proceed with the task assigned.
- (l) **Balance:** Some matters may be left to be disposed off by the subordinates at the lower or the lowest level while some other must be centralized and a balance between centralization and decentralization should thus be achieved. Management determines where authority resides in an organization – either to concentrate authority for decision



# MANAGEMENT BY OBJECTIVES (MBO)

## 3(b). Definition

According to George S. Odiorne (1956), "MBO is a process whereby the managers and subordinates of an enterprise jointly identify its common goals, define each individual's major area of responsibilities in terms of results expected of time, use these measures as guides for operating the unit, and assessing the contribution of each individual."

MBO aims at describing a definite scope of goals and suggest directions to achieve the goals.

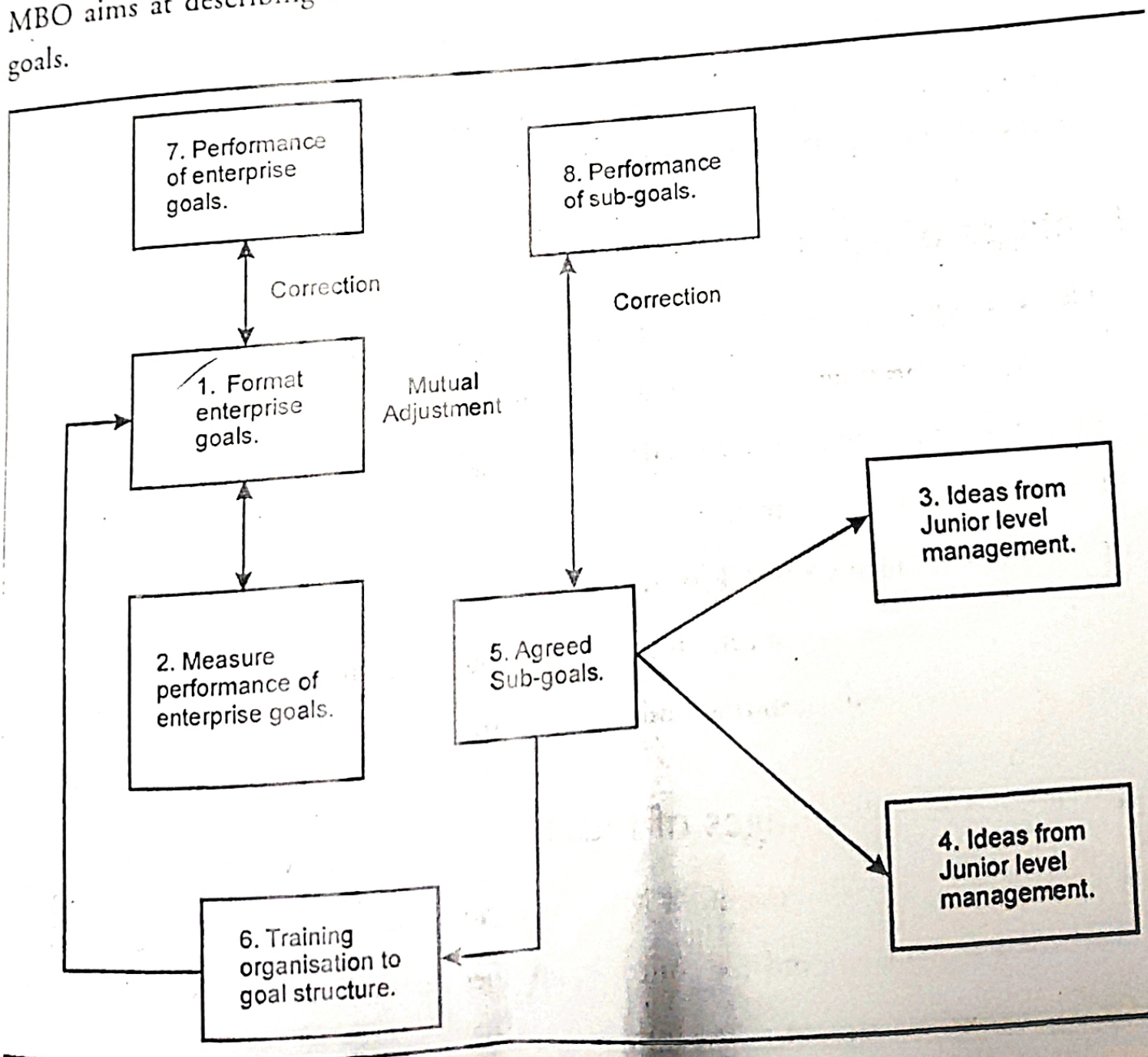


Figure 3.4: MBO Process

## Advantages of MBO

- Helps in gaining mutual commitment and higher productivity.
- MBO gives meaning, purpose and direction to the people and organization.
- Aids in coordination between various departments.
- Provides motivation to people.
- Facilitates management think of the future.
- Helps organization to concentrate on critical success factors.
- It fosters better understanding and relationship amongst workers.

## Limitations/Disadvantages of MBO

- Though the benefits are manifold MBO adoption process is slow.
- The leadership quality and his contribution does not find a central place.
- The goal conflicts are not taken into account.
- One of the prerequisite of successful MBO is good reporting system which is absent in many organization.



4(a)  
Maslow's Theory of Motivation (1943)

This theory divides human need into 5 levels. He profounded (postulated) that people have needs and the needs can influence behaviour. The needs of a person are prioritized as per their importance. The person goes to next level of need once his basic need is fulfilled to some extent.

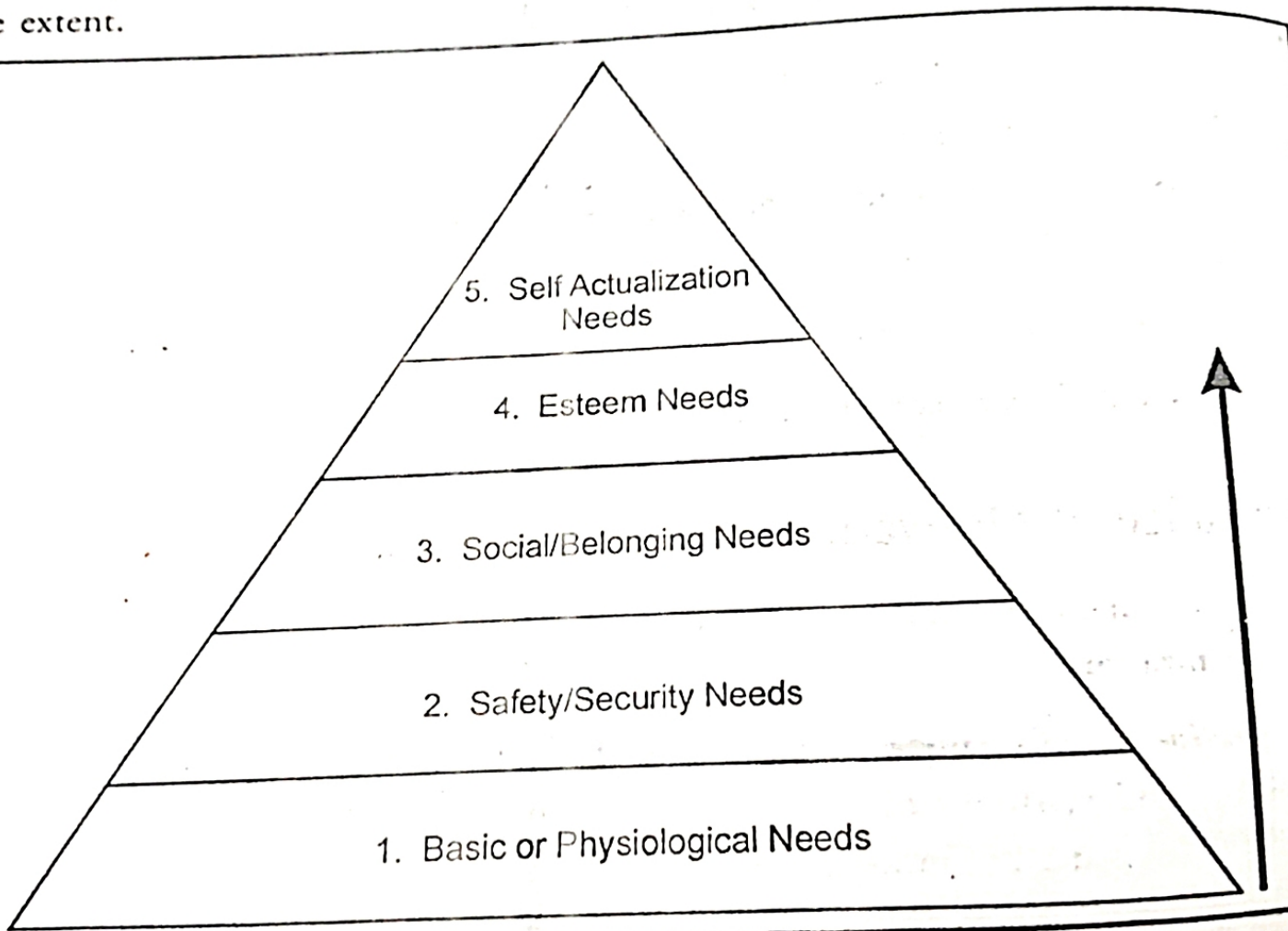


Figure 4.3: Maslow Theory of Motivation

The person scales from basic to advance needs higher up in the hierarchy of needs.

) **Basic Needs or Physiological Needs:** Most basic powerful and obvious needs include: need for food, oxygen, sleep, water, protection from climate (shelter), etc. In organizational context basic needs are represented by salary, working conditions

- (ii) **Safety Needs:** Once the basic needs are satisfied people start longing for safety. E.g. shelter. In the organization job security, safe working conditions, unions, lobbying for protective legislation scheme like PF, pension, insurance, gratuity, seniority for layoff, etc.
- (iii) **Belonging Needs or Affiliation Needs:** Belonging needs include: mutual respect, mutual admiration, trust, affiliation, group membership, etc. In the organization teamwork belonging to the group (group identification), etc.
- (iv) **Esteem Needs:** Commanding respect and esteem from others. In the organization esteems needs are concerned with job title, merit pay increase, responsibility, recognition for good work, challenging work.
- (v) **Self-actualization Needs:** When all the four earlier level needs are satisfied self-actualization come to the forefront – striving to reach the peak of one's potential. In the organization context excelling in one's job, successfully managing a unit, etc.

#### *Merits of Maslow's Theory*

- This is the first theory to give an insight for the managers to think about motivating their subordinates.
- This theory tends to answer certain intricate questions like: individual differences, etc., that had puzzled the managers.
- Need hierarchy model is dynamic and presents motivation as a constantly changing force.
- This theory has qualities like simplicity, common sense, human approach and innovative in nature.

#### *Demerits of Maslow's Theory*

- Work motivation has not been that well defined by the theory.
- Hierarchy of needs does not exist in the same order but different needs act at the same time.
- The needs get prioritised.
- People from different countries/background have different hierarchy of needs.



## 4(b). COORDINATION

Coordination is the orderly arrangement of group effort to provide unity of action in the pursuit of a common objective. Coordination is the process of integrating the activities of different department in order to realize organizational goals.

### Definition

G.R. Terry, "Coordination deals with the task of blending efforts in order to ensure the successful attainment of an objective. It is accomplished by means of planning organizing, actuating and controlling."

E.F.L. Breach, "Coordination is balancing and keeping the teams together by ensuring a suitable allocation of working activities to the various members and seeing that these are performed with due harmony among the members themselves."

In the words of Koontz and O'Donnell, "It seems more accurate to regard coordination as the essence of managership for achievement of harmony of individual efforts towards the accomplishment of group goals as the purpose of management. Each of the manager's functions is an exercise in coordination".

## Importance of Coordination

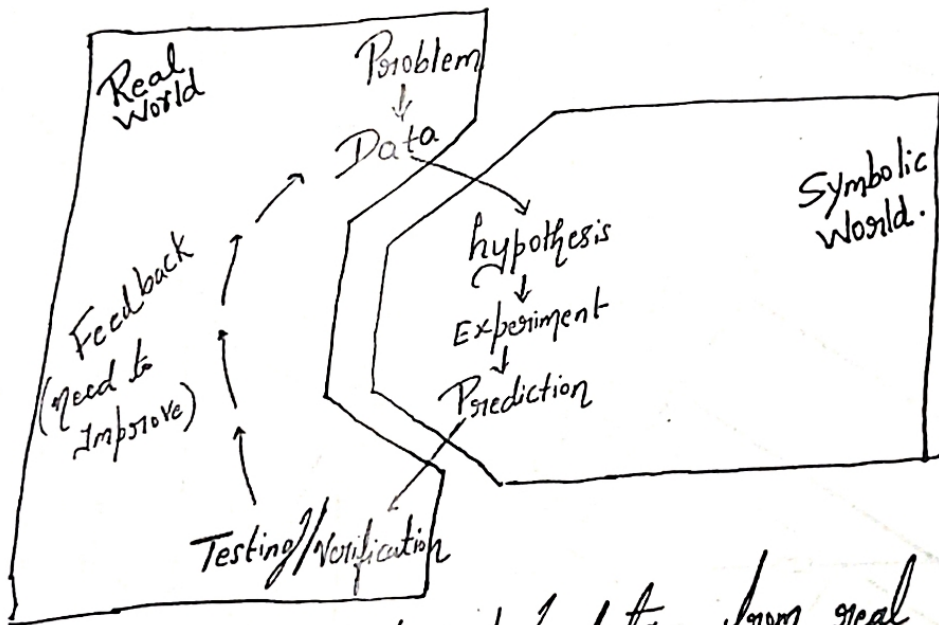
Coordination is the essence of management. It is the key to other functions of management like planning, organization and control. Coordination makes planning more purposeful, organization more well-knit and control more regulative.

- (i) The activities carried on by individuals and departments in an enterprise are of varied and diverse nature. They lack unity of direction. Hence, they need coordination.
- (ii) There is always some conflict between individual goals and organizational goals. Such conflict may lead to confusion and chaos in the organization. Therefore, it is necessary to reconcile or integrate individual goals through the process of coordination. In other words, coordination is necessary to bring unity of action in the organization.
- (iii) In modern industrial world, there is a high degree of specialization. Hence, some mechanism is required to coordinate the efforts of specialists in an organization.
- (iv) Coordination helps to improve the economy and efficiency of operations.
- (v) In big organizations, some conflict is bound to be there between line and staff personnel. Coordination is needed to prevent conflicts and promote good human relations between line and staff personnel.
- (vi) Functions of an organization are frequently divided into departments, divisions, sections and the like. Each department performs a different job. Therefore, coordination is necessary to have a link between these various functions and assure their designed contribution to the total results.
- (vii) Good coordination gives job satisfaction to the employees which keeps their morale high and paves way for their retention.
- (viii) In a large organization, a number of individuals are appointed. The operations become multiple and complex. Personal contacts between executives are few. Hence, formal methods of coordination become essential.



5(a)

## Problem solving and decision making:-



• Problems originate in real world of economic planning & management & Control

• Problem is defined and clarified by data from real world.  
• This information is subjected to analysis based on scientific principles to formulate a hypothesis in symbolic terms.

5(b) Data:-

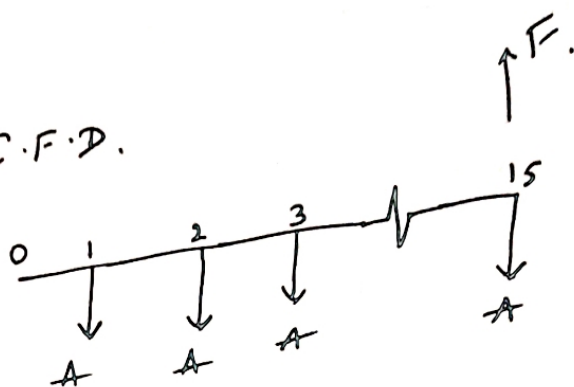
$$A = 30,000$$

$$N = 15 \text{ yrs.}$$

$$i = 12\%$$

$$F = ?$$

C.F.D.



$$F = A \cdot (F/A \ i\% \ N)$$

$$F = 30,000 (F/A \ 12\% \ 15) \rightarrow \text{from table.}$$

$$F = 30,000 (37.27)$$

$$F = ₹ 11,18,100/-$$

Maturity amount is ₹ 11,18,100/- @  $i = 12\%$ .

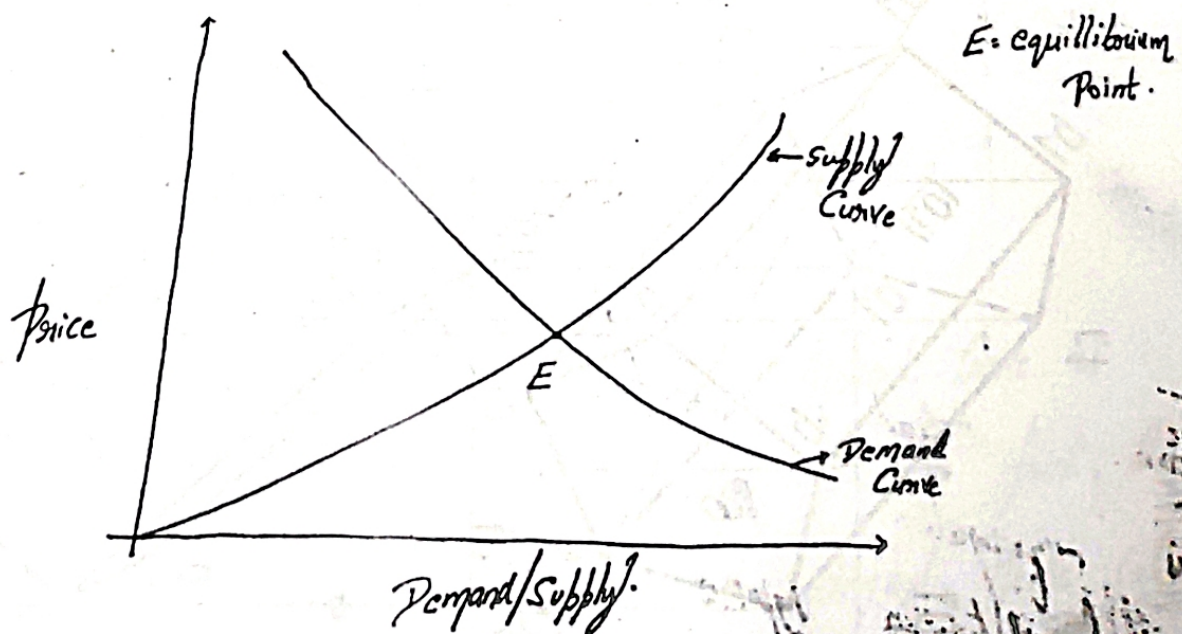


• By Manipulating & Experimenting, an analyst can simulate and project reality in multiple Configuration so as to understand all out Coms (CAD Software to alter designs).

• From these activities usually, a prediction (Forecast) emerges. This can be considered as possible solution to decision problem.

• This prediction is subjected to Verification in real world for its practical usage. It gives desired result, then problem is solved.

### 6(a) > LAW OF DEMAND & SUPPLY:-



> Demand and Supply of a product are dependent of each other and are sensitive to price of the product.

• Law of demand states that "demand for a commodity increases when price decreases and vice versa", all other things remain same. When we observe demand curve it is clear as price decreases demand increases.

Demand is Inversely proportional to price.

• LAW OF SUPPLY:-

"Supply of a commodity increases when its price increases and vice versa", all other things remain same.

Supply is directly proportional to price.

• As price increases, supply increases - vice versa.

> The point of intersection where supply and demand curve is Equilibrium Point (E). At the price corresponding to this point, the quantity of supply is equal to quantity of demand. Hence called Equilibrium Point.

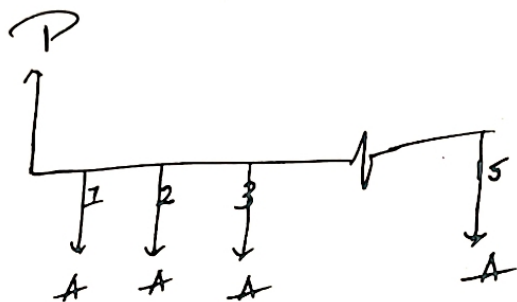


$$5(b) \quad P = 30,00,000$$

$$i = 7.5\%$$

$$N = 15 \text{ yrs.}$$

$$A = ?$$



$$A = P \cdot \left( \frac{A}{P} \text{ } 7.5\% \text{ } 15 \right) \text{ — from table.}$$

$$A = 30,00,000 (0.1133)$$

$$A = 3,39,900/-$$

The Annual equivalent amount for  $P = 30L$  is ₹ 3,39,900 for 15 years.

7(a)

#### 4.2.1 CONDITIONS FOR PRESENT WORTH COMPARISON

- (i) Estimate the interest rate that the firm wishes to earn on its investment.
- (ii) Determine the service life of the project.
- (iii) Determine the cash inflows over each service life.
- (iv) Determine the cash overflows over each service period.
- (v) Estimate the net cash flows (inflows – outflows).

If there is single investment proposal, whether a project will be selected or rejected that can be made accordingly.

If  $PW > 0$ , select the proposal. A positive NPW means the equivalent worth of the inflows is greater than the equivalent worth of outflows. So, the project makes profit.

If  $PW < 0$ , reject the investment project. A negative NPW means the equivalent worth of the inflows is less than the equivalent worth of outflows.

If  $PW = 0$ , remain indifferent to the investment.



7(b) Machine Cost ₹ 16,00,000/- by down Payment.

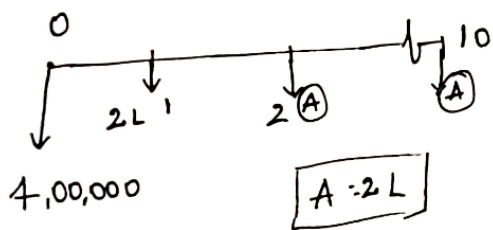
$$i = 18\%$$

$$N = 10 \text{ yrs.}$$

25% of 16,00,000 under installment (i.e) 4,00,000  
Remaining in 10 yrs.

$$A = 2,00,000/-$$

Solving by Pw method.



$$P_w = 4,00,000 + A \cdot (P/A \text{ } i\% \text{ } 10)$$

$$4,00,000 + 2,00,000 (4.49)$$

$$4,00,000 + 8,98,000$$

$$P_w \text{ (Inst)} = 12,98,000/-$$

From Pw Analysis we can see installment is a better option.

Compared to full Purchase Payment.



## RATES OF RETURN METHOD

The rate of return technique is one of the methods used in selecting an alternative for a project. In this method, the interest rate per interest period is determined, which equates the equivalent worth (either present worth, future worth or annual worth) of cash outflows (i.e. costs or expenditures) to that of cash inflows (i.e. incomes or revenues) of an alternative

Three rates of return appear frequently in engineering economy studies:

- **The minimum acceptable rate of return (MARR):** It is the rate set by an organization to designate the lowest level of return that makes an investment acceptable.
- **The internal rate of return (IRR) :** It is the rate on the unrecovered balance of the investment in a situation where the terminal balance is zero. It is a discount rate at which  $NPV = 0$ .
- **The external rate of return (ERR) :** It is the rate of return that is possible to obtain for an investment under current economic conditions.

### MINIMUM ACCEPTABLE RATE OF RETURN

The minimum acceptable rate of return, also known as the minimum attractive rate of return, is a lower limit for investment acceptability set by organizations or individuals. It is a device designed to make the best possible use of a limited resource, i.e., money. Rates vary widely according to the type of organization, and they vary even within the organization. Historically, government agencies and regulated public utilities have utilized lower required rates of return than have 'competitive industrial enterprises. Within a given enterprise, the required rate may be different for various divisions or activities. These variations usually reflect the risk involved. For instance, the rate of return required for cost reduction proposals may be lower than that required for research and development projects in which there is less certainty about prospective cash flows.

### INTERNAL RATE OF RETURN

The IRR is the best-known and most widely used rate-of-return method. It is also known as the true rate-of-return method and the discounted cash flow method. The internal rate of return, represented by  $i$  in the traditional interpretation of interest rates, is the rate of interest earned by an alternative investment on the unrecovered balance of an investment.

The internal rate of return can be calculated by equating the annual, present, or future worth of cash flow to zero and solving for the interest rate (IRR) that allows the equality, it should be added that solving for the interest rate in this manner results in a polynomial equation that is a function of  $i$ , which may result in multiple roots of the equation. In such cases the IRR may or may not be one of the equation roots. Although both the EAW and FW approaches are legitimate, the rate of return is often defined in terms of present worth, under the constraints of possible  $i^*$  roots, where the IRR is

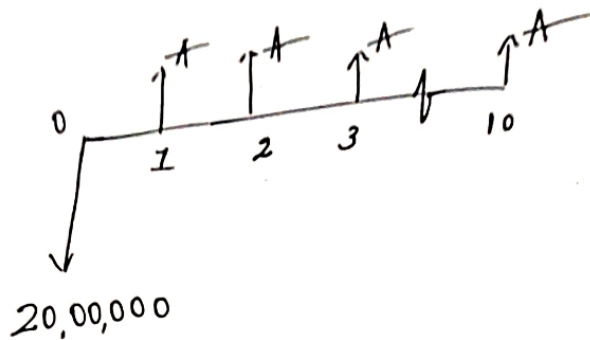


8(b) Initial outlay is ₹ 20,00,000

Revenue = 3,50,000 = A

N = 10 yrs.

i = ?



①  $i = 10\%$

by PW method :-  $PW_{i=10\%} = 20,00,000 - A \cdot (P/A \text{ } 10\% \cdot 10)$

$$20,00,000 - 3,50,000 (6.446)$$
$$20,00,000 - 21,50,610$$
$$= -1,50,610 \text{ (-)ve value}$$

When  $i = 11\%$  ✓  $PW_{i=11\%} = 20,00,000 - 3,50,000 (P/A \text{ } 11\% \cdot 10)$

$$20,00,000 - 3,50,000 (6.0148)$$
$$= 20,00,000 - 21,04,900$$
$$= -1,04,900 \text{ (-)ve value}$$

✓ When  $i = 12\%$  ✓  $= 20,00,000 - 19,77,570$

$$= 22,430$$

by Iteration we find  $i = 11.65\%$  when value is IRR is 0.

## 9(a) 5.2 ELEMENTS OF COST:

Cost of production/manufacturing consists of various expenses incurred on production/manufacturing of goods or services. These are the elements of cost which can be divided into three groups : Material, Labour and Expenses as shown in fig 5.1.

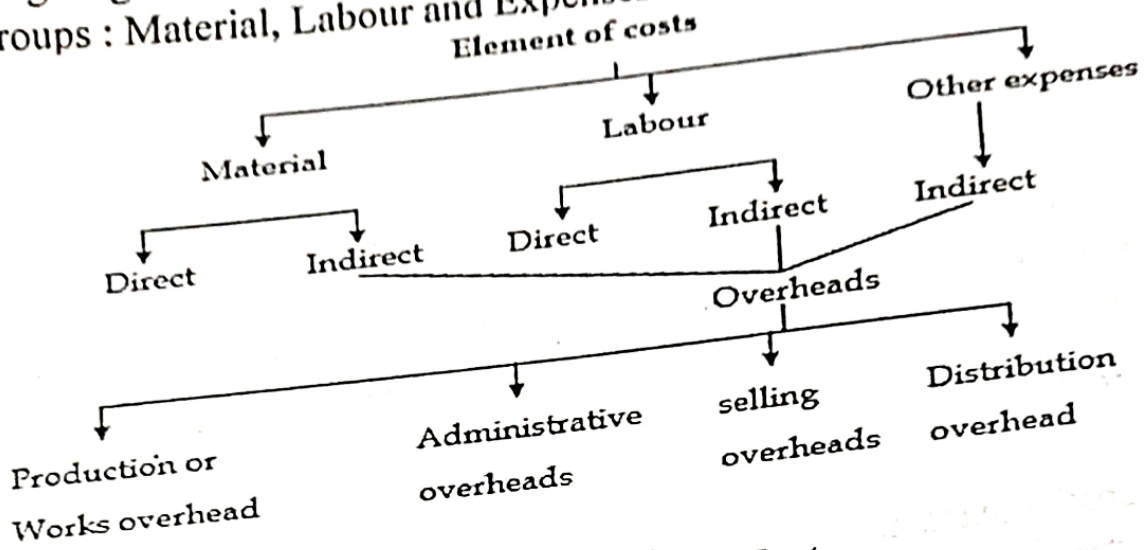


Fig 5.1 Elements of Cost

### (1) MATERIAL :

To produce or manufacture material is required. For example to manufacture shirts cloth is required and to produce flour wheat is required. All material which becomes an integral part of finished product and which can be conveniently assigned to specific physical unit is termed as "Direct Material". It is also described as raw material, process material, prime material, production material, stores material, etc. The substance from which the product made is known as material. It may be in a raw or manufactured state. Material is classified into two categories:

- Direct Material
- Indirect Material

a) **Direct material:** Direct Material is that material which can be easily identified and related with specific product, job, and process. Timber is a raw material for making furniture, cloth for making garments, sugarcane for making sugar, and Gold/ silver for making jewel etc are some examples of direct material.

b) **Indirect material :** Indirect Material is that material which cannot be easily conveniently identified and related with a particular product, job, process, and activity. Consumable stores, oil and waste, printing and stationery etc, are some examples of indirect material. Indirect materials are used in the factory, the office, or the selling and distribution department.



**(2) LABOUR :** Labour is the main factor of production. For conversion of raw material into finished goods, human resource is needed, and such human resource is termed as labour. Labour cost is the main element of cost in a product or service. Labour can be classified into two categories:

- Direct Labour
- Indirect labour

a) **Direct labour:** Labour which takes active and direct part in the production of a commodity. Direct labour is that labour which can be easily identified and related with specific product, job, process, and activity. Direct labour cost is easily traceable to specific products. Direct labour costs are specially and conveniently traceable to specific products. Direct labour varies directly with the volume of output. Direct labour is also known as process labour, productive labour, operating labour, direct wages, manufacturing wages, etc. Cost of wages paid to carpenter for making furniture, cost of a tailor in producing ready made garments, cost of washer in dry cleaning unit are some examples of direct labour.

b) **Indirect labour:** Indirect labour is that labour which can not be easily identified and related with specific product, job, process, and activity. It includes all labour not directly engaged in converting raw material into finished product. It may or may not vary directly with the volume of output. Labour employed for the purpose of carrying out tasks incidental to goods or services provided is indirect labour. Indirect labour is used in the factory, the office, or the selling and distribution department. Wages of store-keepers, time-keepers, salary of works manager, salary of salesmen, etc, are all examples of indirect labour cost.

### 3) EXPENSES :

All cost incurred in the production of finished goods other than material cost and labour cost are termed as expenses. Expenses are classified into two categories:

- Direct expenses
- Indirect expenses (An item of overheads)

a) **Direct expenses :** These are expenses which are directly, easily, and wholly allocated to specific cost centre or cost units. All direct cost other than direct material and direct labour are termed as direct expenses. Direct expenses are also termed as chargeable expenses. Some examples of the direct expenses are hire of special machinery, cost of special designs, moulds or patterns, fees paid to architects, surveyors and other consultants, inward carriage and freight charges on special material, Cost of patents and royalties.

b) **Indirect expenses :** These expenses cannot be directly, easily, and wholly allocated to specific cost center or cost units. All indirect costs other than indirect material and indirect labour are termed as indirect expenses. Thus,



Bosch Produces 500 spark Plugs:-

$$D.M.C = 40,000$$

$$D.L.C = 35,000$$

$$F.OH = 10,000$$

Profit is 15% of S.P

Selling OH = 30% of Factory Cost

SP of each spark plug = ?

$$\text{Solution: Prime Cost} = 40,000 + 35,000 = 75,000/-$$

$$\begin{aligned} \text{Factory Cost} &= P.C + F.OH \\ &= 75,000 + 10,000 = 85,000/- \end{aligned}$$

$$\begin{aligned} \text{Total Cost} &= \text{Factory Cost} + \text{Total Cost Selling OH} \\ &= 85,000 + (0.3 \times 85,000) \\ &= 1,10,500. \end{aligned}$$

$$\begin{aligned} S.p &= \text{Total Cost} + \text{Profit} \\ &= 1,10,500 + 0.15 S.p \\ 0.85 S.p &= \text{Total Cost} \end{aligned}$$



## 5.9 DEPRECIATION

(a) Depreciation is the decrease in value of physical properties with the passage of time and use. Most assets are worthless as they age. Production equipment gradually becomes less valuable through wear and tear. This lessening in value is recognised in accounting practices as an operating expense. Instead of charging the full purchase price of a new asset as one time expense, the outlay is spread over the life of the asset in the accounting records. Annual depreciation deductions are intended to match the yearly fraction of value used by an asset in the production of income over the asset's actual economic life. The actual amount of depreciation can never be established until the asset is retired from service.

Depreciation can be defined in three senses like

- Physical depreciation, which is caused due to physical decay.
- Economic depreciation is the loss of value of an asset due to outdated technology
- Accounting sense depreciation is the estimated value of fall in the worth of an asset.

### 5.9.1 CAUSES OF DEPRECIATION:

Assets depreciate its value for several reasons.

1. **Physical depreciation:** Depreciation resulting in physical impairment of an asset is known as physical depreciation. This type of depreciation results in the lowering of the ability of a physical asset to render its intended service. The primary causes of physical depreciation are
  - (a) deterioration due to action of the elements including the corrosion of pipe, the rotting of timbers, chemical decomposition and so on.
  - (b) Wear and tear charges
  - (c) Physical decay
  - (d) Time factors etc.
2. **Functional depreciation:** Functional depreciation results a change in the demand for the services it can render. The demand for the services of an asset may change
  - it is more profitable to use a more efficient unit
  - there is no longer work for the asset to do,
  - the work to done exceeds the capacity of the asset.
3. **Technological depreciation :** Due to advancement of new technology, the old technology becomes outdated, so it loses its value. Obsolescence resulting from the discovery of another asset that is sufficiently superior to make it uneconomical to continue using the original asset. Assets also become obsolete when they are no longer needed.
4. Depreciation due to accident Sometimes due to accident or sudden failure the asset loses its technological characteristic inherent in it.