

Industrial Management
Dept. of CSE
Course No: Hum307

** What is management?*

Ans: The word management is derived from the word *manaeggiare* which means to train up the horses or to handle. Management involves getting things done through and with people. The functions of management are planning, organizing, supervising, directing, controlling and coordinating. As regard functions, Management is the sum total of planning, organizing, staffing, coordinating, directing and controlling.

Management is what a manager does. A manager is to lead, guide and direct the organization to train the desired objectives. According to father of modern management Henry Fayol,

“Management is to manage, is to forecast and plan, to organize, to command, to co-ordinate and to control.”

So it can be said that, management is the art or technique of doing things by others.

** What is organization?*

Ans: According to professor Haney,

“Organization is the harmonious adjustment of specialized parts for the accomplishment of some common purposes”

According to Professor Newman,

“Organization is grouping of activities into some administrative units necessary to carry out the plan and defining relationship among the executives and workers in such units.”

According to professor Koontz,

“The primary state of organizing must involve the grouping of activities necessary to accomplish goals and plan, the assignment of these activities to appropriate departments and provision for authority delegation and co-ordination.”

*** *What is administration?***

Ans: According to Professor W.H. Newman,
“Administration is the guidance, leadership and control of the efforts of the group of individual towards some common goals.”

According to J. W. Schulze
“Administration is the force which lays down the object for which an organization and its management are to strive the broad principles under which they are to operate.”

*** *What are the differences between management and administration?***

Ans: Management is the art of technique of doing things by others.
According to Henry Fayol,

“Management is to manage, is to forecast and plan, to organize, to command, to co-ordinate and to control.”

On the other hand, according to Professor W.H. Newman,
“Administration is the guidance, leadership and control of the efforts of the group of individual towards some common goals.”

Some use these two terms in the same sense. Some others differ between these two. The differences between these two are -

Subjects	Administration	Management
1. Scope of function :	1. Administration involves formulation of policies, determination of goals and objectives, organizing, direction and controlling.	1. Management involves planning, organizing, supervision, co-ordination and controlling with a view to attaining goals, and perspectives determined by administration.
2. Types of work:	2. Administration determines objectives, formulates policies and long term plans.	2. Management takes measure to attain goals and objectives and policies and lay down by administration.
3. Difference in level:	3. Administration is the top level management.	3. Management is related to middle and lower level.

4. Nature of function:	4. Administration directs management.	4. A manager directs the subordinates.
5. Nature of position:	5. Those who work in administrative or top level are known as executives.	5. Those who are related to management are known as managers.
6. Difference in power:	6. Administration is the head of supreme authority.	6. Management cannot use supreme power.
7. Scope of responsibility:	7. Top executives or administrators are responsible for overall activities.	7. Managers are responsible for the activities within their authority.
8. Accountability:	8. Administrators have accountability to the board of directors.	8. Managers have accountability direct to administrators.
9. Subordination:	9. Administration is not under management.	9. Management is under the control of administration.
10. Diversity of labors:	10. Administration involves thinking or mental functions.	10. Management is related to physical and mental labour i.e. doing functions.
11. Numbers of executives:	11. The numbers of top level executives in any organization are limited.	11. The numbers of managers are many.

**** Discuss the functions or continuous process of management?***

Ans: Management involves in many functions. They are-

1. Forecasting
2. Planning
3. Organizing
4. Staffing
5. Direction
6. Co-ordination

7. Motivation

8. Controlling

They are discussed below:

Forecasting: Forecasting involves estimation and then considering alternative courses of action. Where forecasting ends, planning begins. It achieves planning. It is preliminary to planning.

Planning: Planning is a very important function of management. Planning is deciding in advance what is to be done; i.e. a plan is a projected course of action. It involves selecting among alternatives.

Organizing: Organizing means grouping of activities into some administrative units necessary to carry out the plan and defining the relationship among the executives in such units.

Staffing: Staffing involves manning and keeping manned, the positions provided for by the organization structure. It includes employment of man power, promotion, transfer etc.

Direction: Direction is issuing instructions as to what is to be done. Direction is concerned with the way an executive issues instruction to his subordinates and otherwise indicates what should be done. According to Newman,

“It helps to execute planning. It involves guiding and supervising”

Co-ordination: It involves synchronization and unification of actions of a group of people. It removes indiscipline and maladjustment of activities in the organization. It brings harmony and balancing.

Motivation: Motivation is the process to stimulating workers and employees so that they work spontaneously and effectively. “Motivation is the act of stimulating someone or oneself to take a desired course of action.” The employees or workers can be motivated financially and non-financially.

Controlling: According to Henry Fayol, “In an undertaking control consists in verifying whether everything occurs in conformity with the plan adopted.” There should be planning, setting of standard, comparison of actual results with standards, reporting if there are any deviations and taking corrective actions.

This are called the continuous process of management.

** Discuss the cyclic process of management?*

Ans: The cyclic processes of management are-

1. Planning
2. Organizing
3. Direction
4. Co-ordination
5. Controlling

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** Discuss the relationship between authority and responsibility?*

Ans: Authority: The term authority is used in various ways by management experts. Generally authority is “legal or rightful power, a right to command or to act.” In management, authority means the power to command others to act or not to act. It is the right to give orders and the power to exact obedience. Terry and Franchlin say,

“Authority is the legal right to command action by others and to enforce compliance.”

It is the power of decision making. Where superior subordinates relationship exists, authority responsibility relation is there.

Power and authority: Though they are used in the same sense, there are some differences. According to Wayrich and koontz,

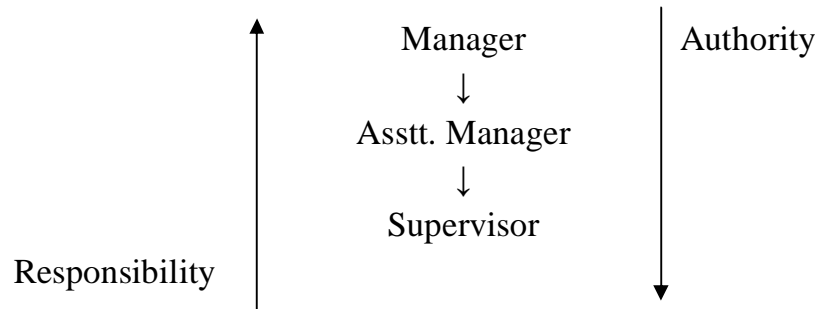
“Power, a much broader concept than authority, is the ability of individual or group to induce or influence the beliefs or actions of others persons or group.”

When power is related to managerial position, it is termed as authority.

Responsibility: Responsibility is variously used to mean duty. Activity or authority with respect to the enterprise. Responsibility may be defined as the obligation of subordinates to whom a duty had been assigned, to perform the duty. It is the obligation. It is applied to person but not to a machine, a building, or an animal. It arises from the superior subordinate relationship.

Authority flows from the superior to the subordinate managers when duties are assigned and a responsibility is the obligation simultaneously flows from the subordinate for the accomplishment these duties. Authority flows downward and responsibility flows upwards. For example-

In a firm the follows of authority and responsibility



Responsibility cannot be delegated, but authority can be delegated by the manager to a subordinate. Responsibility being an obligation, it owed to one's superior. No subordinate can reduce his responsibility by re-delegating it to another. No manager can shift responsibility to his subordinate.

**** Discuss the delegation of authority? How authority is delegated?***

Ans: Delegation of authority: It is a process of conferring authority from one executive or organizational unit to another in order to accomplish particular assignment. It means to give someone permission to do certain things.

How authority is delegated: Authority is delegated when organizational power is vested in a subordinate by a superior. Clearly, no superior can delegate authority; he does not have whether he is a board member, the president, or a foreman. Equally clear, a superior cannot delegate all his authority without passing on his position to his subordinate.

The entire process of delegation involves the assignment of tasks, the delegation of authority for accomplishing the tasks and the exaction of responsibility for their accomplishment. In practice it is impossible to spill these processes, since an assignment of a task without the authority to accomplish it is meaningless as is the delegation of authority with a definition of the area over which the power is to be used. Moreover, since responsibility cannot be delegated, the delegant has no practical alternative but to exact responsibility from his subordinate for accomplishing the assignment.

** What are the principles of delegation of authority?*

Ans: The following principles are guidelines to delegation of authority. They are-

1) Defining authority and responsibility: What should be done and how much to be done should be well defined. The subordinate should have clear knowledge of his duty and authority.

2) Principles of delegation by results expected: The manager or superior should make it understood what results he expect from the subordinates while he delegates authority. The object of delegation of authority should be well defined.

3) Avoiding dual subordination (unity of command): Command should come from one superior. Two or more masters cannot be served equally. The authority-responsibility relationship should be created in such a way that a subordinate is not to report to more than one superior. One subordinate should have one superior who will command. Dual subordination should be avoided.

4) Responsibility cannot be delegated: Authority can be delegated but responsibility can by no means be delegated. Delegation of authority does not mean delegation of responsibility. The superior cannot avoid responsibility by delegating authority. Moreover, a subordinate is to report to the superior for his responsibility. There is responsibility and there will have responsibility. It cannot be shifted or reduced.

5) Scalar principles: It refers to the chain of direct authority relationship from superior to subordinate in the organization. The authority is delegated by the superior executive to the lower level subordinate. Every subordinate must know who delegates to him and to whom he is responsible.

6) Parity of authority and responsibility: Authority is the right to do an act and responsibility is an obligation to do the act. So authority and responsibility should be equal and co-extensive. The subordinate to whom responsibility or duty is assigned, he should equally be given authority to

perform the duty. Otherwise, it will not be possible for the subordinate to perform the same.

7) Authority level decision-making: The manager of different levels of the organization will make such decisions which are within their authority i.e, the subordinates should make decisions within the limit of their authority and decision making which not within their authority should be avoided. The manager should never go beyond their authority.

** What are the elements of delegation of authority?*

Ans: Delegation of authority means assignment of duties and vesting some powers to someone else to do certain things or acts. It is created through effective performance of duties of organization. The following elements are found in the process of delegation of authority:

1) Assignment of tasks: The first element of the process of delegation of authority is the assignment of tasks to a subordinate. The executive will decide what should be done by a subordinate.

2) Granting of authority: Authority is to be granted for the performance of duties for attaining objectives. Nothing can be done only by assigning duties, authority should also be granted to the subordinate. Assignment of task without authority is meaningless.

3) Creation of the sense of responsibility: It means the creation of obligation to perform the duty by someone else in an enterprise. The executive must make an effort to create the sense of responsibility in every subordinate. Creation of responsibility among the executives is also essential for the purpose of making the process of delegation of authority effective.

4) Accountability: Accountability means responsibilities. Accountability is created to the source from where the superior receives authority. Accountability is considered to be an essential element in an organization. The superior delegate's authority to a subordinate for making decisions and the subordinate on the other hand has accountability to his superior for his duty.

** What is scientific management?*

Ans: Generally management based on a science may be termed scientific management. Science is an organized knowledge associates with some universally accepted basic principle. So when science method, technique, principles, formula are applied in management of an organization, it is called scientific management.

Father of scientific management F.W. Taylor defines,
“Scientific management as-Science, not rule of thumb, harmony, not discord, co-operation, not individualism, maximum output in place of restricted output the development of each employee to his greatest efficiency.”

According to Bartol and Martin,
“Scientific management is an approach within classical management theory that emphasis the scientific study of work methods in order to improve worker efficiency.”

** Discuss the principles of scientific management?*

Ans: There are four principles of scientific management. They are-

1) Application of science in place of traditional system: The first and main principle of scientific management is the Application of science in place of traditional system i.e. a standard task, time and method of work is to be determined. According to Taylor,

“Scientifically study each part of a task and develop the best method for performing the task”

2) Selection, training and development of workers through scientific method: Another principle is the selection, training and development of workers through scientific way. According to Taylor,

“Carefully select workers and train them to perform the tasks by using the scientifically developed method.”

3) Establishment of cordial relationship among management and workers: Establishment of cordial relationship among management and workers for the total benefit of the organization is the first principle. Management should give required co-operation to the workers so that they do their work efficiently. Taylor says,

“Co-operate fully with workers to ensure that they use the proper method.”

4) Proper distribution of responsibility and duties among management and workers: It is not that the workers alone will do all the work of organization. The work should be properly distributed among workers and executives. According to Taylor,

“Divide work and responsibility using scientific principles and workers are responsible for executing the work accordingly.”

** Distinguish between scientific management and traditional management?*

Ans:

Subject	Traditional Management	Scientific Management
1. Works method	1. The workers do their work according to rule of thumb principle.	1. Workers do their work following the planned and scientific principles of management.
2. Specification of work	2. Under this management workers duty or task is not fixed before.	2. Here the task or duty of workers is fixed earlier and they can know it earlier.
3. Outlook	3. Here the worker tries to get more profit through deceiving the workers.	3. The workers try to get maximum profit through maximum production and giving co-operation to the workers.

4. Recruitment, selection and training	4. The workers are recruited and selected through unscientific method and not importance is given to training.	4. Selection and training is done scientifically.
5. Quality of product	5. No standard of machine method and raw materials are fixed. So product may be low quality.	5. Here an attempt of improving the quality of product is made through establishing standard of machines, raw materials etc.
6. Responsibility and duty	6. Here almost duties and responsibilities are shifted in the workers.	6. Work load is properly distributed among workers and executives.
7. Motivation	7. There is absence of incentive method of payment of wages to workers.	7. Incentive methods of payment of wages of workers are introduced.
8. Specialization	8. There is absence of advantages of specialization as work is not well distributed.	8. Due to proper distribution of work, the advantages of specialization can be had.
9. Performance of evaluation	9. The work of the workers is not evaluated.	9. There is evaluation of work of each worker through efficient supervision.

**** Discuss the span of supervision/ span of management/ span of authority/ span of control?***

Ans: Span of supervision means the number of subordinates under the supervision or manager. It refers to the number of subordinates a manager can effectively supervise. If a manager can effectively supervise the function of six foremen, the span of control will be six. According to Terry and Franklin,

“Span of control refers to the number of immediate subordinates who report to a manager.”

According to Stonaer & others,

“The span of management or control refers to the number of people and department that report directly to a particular manager.”

According to Trewatha and Newport,
“The span of management which refers to the number of subordinates reporting to one superior. The span of management also refers to as the span of supervision, span of authority and span of control.”

**** Discuss the considerable factors for determining optimum span of control or supervision?***

Ans: Span of control comes down to the decision of how many people or manager can effectively oversee i.e. will the organization be more effective if the manager's span of control is effectively large or small. Span of control will be big or small, depends on the following factors:

1. Nature of supervisory work
2. Time available for supervision
3. Capacity of supervisor
4. Quality of subordinates
5. Attitude of subordinates
6. Location of subordinates
7. Types of control system
8. Use of standing plan
9. Degree of decentralization and delegation
10. Opportunity of using staff assistants
11. Nature of communicative system
12. Relative importance of supervisory payroll

Nature of supervisory work: If the nature of the work is simple, easy and repetitive in that case control, co-ordination, motivation and direction is comparatively easier and the span of supervision will be large there. But where the work is complex and changeable, the span of control will be small.

Time available for supervision: The executive is to do many other functions other than supervision, span of control depends on how much time the executive can devote. Managers who must perform many non-supervisory activities have less time to devote to employees, so their span should be narrower and if they have much time the span will be wider.

Capacity of supervisor: If the supervisor is more efficient in supervision, the span will be wider and if he is less efficient the span will be small. A manager who is competent and well trained can supervise more people than one who is not.

Quality of subordinates: Span of control depends also on the quality of subordinates. If the subordinates are efficient, experienced and well trained, the task of supervision is easier. In that case the span should be wider. But if the subordinates are incompetent and untrained, the manager is in difficulty in supervision, so the span is narrower.

Attitude of subordinates: Even if the efficient and competent employees are not willing to work, supervision will be difficult for the supervisor. In that case the span will be narrower. But if the employees are willing to work, supervision will be easier and the span will be wider.

Location of subordinates: If all the people to be assigned to a manager are located in one area and within eyesight the manager can supervise relatively more people than one whose people are dispersed throughout the plant or countryside at location.

Types of control system: If the control system is rapid and easy the span will be wider. But if the control system is difficult and time consuming, the span will be narrower.

Use of standing Plan: Understanding plan, the employees are well known to their responsibility, so the manager can supervise with minimum effort. In that case the span will be wider. But if the plan is changeable frequently, the manager is not in a position to supervise the activities of a large number. So the span will be narrower.

Degree of decentralization and delegation: When an executive finds he can decentralized authority to make decision, he eases his supervisory burden substantially. In that case the span may be wider. But if the executive cannot rely the subordinates as regard performance of duty, the span is narrower.

Opportunity of using staff assistants: Managers who have secretaries and assistants to help can generally manage more employees than managers who have less support.

Nature of communicative system: The both direct an easy communication is with the subordinates, the more capability of executive to supervise will be. Here, the span will be wider.

Relative importance of supervisory payroll: In highly competitive industry if payroll is a large part of cost this expense expects of supervision should be given particularly carefully consideration. So the span of supervision is to be wider.

*** *What is recruitment?***

Ans: Recruitment is a step to fill up the vacant course in an organization according to manpower planning. E.B Flippo defines,

“Recruitment is the process of searching for prospective employees and stimulating them to apply for jobs in the organization.”

Dale Yoder and others said,

“Recruitment is a process to discover the sources of manpower to meet the recruitment of staffing schedule and to employ effective measures for attracting that manpower in adequate numbers to facilitate effective selection of an efficient work in force.”

Indeed, recruitment is a process through which brilliant encourages and prospective candidates are discovered and estimated to have employment.

*** *What is selection?***

Ans: It is a process of choosing candidates for employment. R.M Hodgetts defines,

“Selection is a process in which an enterprise chooses the applicants who best meet the criteria for the available position.”

Dale Yoder defines,

“Selection is a process in which candidate for employments are divided into two classes those whose are to be offered employment and those who are not.”

Selection refers to the process through which capable and prospective candidates/applicants are chosen for employment.

*** What are differences between recruitment and selection?**

Ans:

Subject	Recruitment	Selection
1. Definition	1. Recruitment is the process of searching for prospective candidates and stimulating them to apply for jobs.	1. Selection is the process of choosing the capable and prospective candidates from the recruited list for employment.
2. List of candidates	2. Under recruitment process the primary list of candidates to be selected for employment is prepared.	2. Under selection process a secondary list of suitable candidates to be chosen for appointment is prepared.
3. Steps in the process	3. It is a first or previous step in the employment process.	3. It is a final or next step in the employment process.
4. Continuous process	4. It may not be a continuous process. It is only one side of selection.	4. Selection is a wider process than recruitment. It may be continuous.
5. Complex/simple process	5. Recruitment is more relatively more complex and indefinite process. How many candidates of what quality is required for a department are not known ahead?	5. Selection is relatively more easy and definite process. The number of quality of candidates can be known ahead.
6. Sources	6. Sources of recruitment may be two kinds internal and external outside sources.	6. Determination of sources is not under the selection of process.

7. Obligation of the organization	7. There is no moral, financial obligation except for procurement of candidates in an organization under the process.	7. There is organizational obligation financial or moral in the selection process.
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*** Briefly discuss the methods of selection?**

Ans: Selection is a continuous process in an undertaking. Different methods of selection are followed in different organizations. It depends on the size and types of organizations and other factors. Usually the following methods are followed in an enterprise in Bangladesh.

1) Receiving departmental requisition: First, the personnel department is to know the number and qualification of candidates, number of posts etc. It is also to know the time and date of recruiting candidates.

2) Determination of source and serving notice: Then the source internal or external from where candidates to be recruited are determined. Advertisements are published. Different Medias such as newspaper, walls, hand bills etc. are used for advertisement. The advertisement contains the terms and condition of selection.

3) Obtaining letter applications and sorting out: The probable candidates submit application with reference to the advertisement. The application will contain the name and father's name of the candidate, his present and permanent address, name of post, his educational qualification, experience, religious status, nationality etc. After sorting the application and interview card is issued in favor of the candidates. Applications not full-filling the require conditions are rejected.

4) Written test: Where candidates are large in number, a written test is taken. An attempt to test the knowledge of language, the knowledge of Bengali, English, Math or general knowledge affairs and the related subjects are measured through written test.

5) Taking interview: On the basis of the result of written test, qualifications and experiences a brief list of candidates is prepared. The candidates of the list are called for interview. The candidates are tested face to face through interview.

6) Psychological test: Those who are found eligible in the interview are to appear at various psychological tests. The tests are:

a. Aptitude test: The candidate's aptitude or tendency or willingness to particular work is measured through aptitude test. An unwilling candidate is dropped.

b. Intelligence test: Candidates depths of thinking knowledge, adaptability to different situations or circumstance, mental capacity, present weakness etc. are measured through intelligence test.

c. Proficiency test: Whether the knowledge, skills and experience of the candidate are up to the mark are tested through proficiency test.

d. Personality test: The candidates liking and disliking of habits, test etc. are measured by personality test. His capacity of leadership is also measured.

7) Medical test: Medical or physical test are taken before final selection. The object of medical test is to be sure that the candidate is physically fit. An unfit candidate as regards physical fitness is dropped.

8) The enquiry of personal history: The candidate's personal data and data relating to family history are collected. As regards government service, police verification is done.

9) Primary selection: On the basis of above data, the candidates are given primary selection. Sometimes, this primary selection is the final. In some cases, the primary selection is sent to higher authority for approved. Some candidates are dropped from list.

10) Issuing appointment letter: After full-filling the require terms and conditions, decision is made to appoint candidate on temporary basis. Nature of

appointment is issued in favor of the selected candidate. He is asked to join in specified time and date.

11) Receiving joining report: On having the letter of appointment, the particular candidate then join the work. After receiving the joining report, the selection process is ended.

** What is training?*

Ans: According to Flippo,

“Training is the act of increasing knowledge and skill of an employee for doing a particular job.”

R.M Hodgetts define,

“Training is the process of altering employees, behavior and attitude in a way that increases the probability of goal alternatives.”

M.J Jucious defines,

“Training is used to indicate any process by which the aptitudes, skills and abilities of employees to perform specific jobs are increased.”

** Discuss the methods of training?*

Ans: Various methods of training of employees and executives of different levels are used in different organizations. The following methods are important.

A) On-the-job training method: On-the-job training is an approach to training employee at work through such methods as job rotation, internship apprenticeship. It is a method where the employee gets opportunity of training hand to hand remaining under the superior boss. On the job training is of following types:

1. Apprenticeship: Under the method, a man gets training as an apprenticeship employing for a fixed period of time and after a successful training, he is to serve the organization for a fixed term during the apprenticeship training an employee is given a small or no element of pay.

2. Job rotation: Under this method, an employee or executive is transferred from one job to another work from one place to another to enable him efficient in various works. Such training method is found in different banks and ministries.

3. Internship: Under this method, a trainee is given hand to hand training where the employee or executive remains under the supervision of a superior boss. The employee receives practical experience about the work. The doctors are given training to this method our country.

4. Coaching: Under this method, a supervisor or manager gives training to a fixed member of employees. The supervisor tells the training which is to be done and how is to be done and observes his work. Such method is found in game and sports in our country.

5. Under study or observation method: It is almost as the apprenticeship method. But here a small number of apprentice trainees are kept under a superior executive. Under this method, the trainees observe the work of the executives. The trainees see how the different problems are solved by the executive while performing activities.

B) Off-the- job training method: Off-the-job training is an approach to training that takes place outside the work place but attempts to stimulate actual working condition. The object is to avoid on the job pressure that might interfere with the learning process. Off-the-job training methods are:

1. Lecture method: It is a traditional method of training for giving theoretical knowledge. Under this method, the trainees come together in a fixed place. An expert superior or an experienced person delivers lectures on related methods. The trainees have opportunity to appear knowledge through asking question.

2. Discussion method: Employees can also be given training through discussion on a particular subject. During the formulation of implementation of plans and policies, the subordinate may be consulted. The subordinate may be

give suggestion is to what and how is to be done the plans. This is a sort of training.

3. Seminar: Seminar consisting a number of sessions can be arranged on a particular object. An expert presents a recent article in the seminar in a particular session. Then discussion exchange of ideas and thinking goes from between the trainees and experts. This is a theoretical method of training.

4. Case/Incidental method: It is a method through which practical knowledge how knowledge can be approved. Under this method, a particular case or incident is presented to the trainees and they are asked to write each individual decision for solving a particular problem. Then the director's decision is described to them. Reasons of difference in decisions are also described.

5. Conference: A large number of trainees can participate in such a method of training. Under this method, the trainees participate in discussion on particular subject. The trainees make different question and find out the way to solve the questions themselves. A superior executive directs the course of action or conference. The method is particularly useful to the training of supervisors and middle level manager.

6. Workshop: It is useful especially to the training of lower level executives. Under the method the trainer presents a subject to the trainees. The trainees dividing in small groups discuss the subject and try to determine what is to be done.

7. Sensitivity training: Practically no trainer is here. The superior executives of different organization participate for some long time. They are asked to present a particular problem and opinion on human behavior. Every trainee co-operate with each other. The method removes the superiority complex of the executives.

8. Role playing method: According to this method someone is asked to play a role in a character. He presents a managerial problem skillfully and efficiently. Others observe the role. The supervisor tries to solve a problem in the light of role playing.

9. Training by course outline: The trainees can gather knowledge in colleges and universities through courses of studies. There is B.B.A and M.B.A course in the institutes of Business administration.

10. Professional diploma course: The trainees can also increase their knowledge through getting themselves admitted in to diploma courses in different technical and specialized institutions.

** What is wages?*

Ans: One of the most important requirements for a man in an adequate wages or salary. The remuneration paid to the workers engaged in production functions of their manual labor is called wages. According to professor Benham,

“The remuneration which the employer pays to the workers for labor as per agreement, are wages.”

Dan and Bachel defines,

“The reward which the workers receive per hour, day, week or month is called wage.”

In fact, wages is the reward or price paid to workers for his manual labor.

** What are the differences between wages and salary?*

Ans: Wages and salary are both remuneration and reward for service. But there are some differences between wages and salaries. The differences are:

Subject	Wage	Salary
1. Definition	1. The price of labor given to the workers directly related to production is called wage.	1. The remuneration which is given to the employees indirectly related to production is called salary.
2. Basis of payment	2. Wages are paid in hourly, daily, weekly or bi-weekly basis.	2. Salary is paid in monthly or annual basis.

3. Types	3. Wages may be time based, production or price based and incentive based.	3. Salary may be a definite period based such as monthly or yearly.
4. Additional price	4. The workers get extra wages for their additional labor.	4. The salaried employees do not get extra salary for additional work.
5. Types of work	5. Manual workers, factory workers, machine operator get wages.	5. Administrative and clerical employees get salaries.
6. Nature of workers	6. The wages receivers are generally uneducated or half educated.	6. The salary earners are generally educated and trained.

**** Discuss the methods of wage payment?***

Ans: There are two basic systems or methods of payment of wages to workers:

1. Time rate system
2. Piece rate system

Other systems are divided methods of this two basic system. There are also some incentive methods of wage payment. The different systems are described below:

Time rate system: Definition: Time rate are wages calculated by reference to the number of hours worked. Time is the basis of wage determination. The rate of wages may be per hour, per day, per week or per month. For example, A worker is paid at an hourly rate of taka 5,8,10 for eight hours a day. The factory workers get a fixed weekly rate of wages for 44 hours worked a week.

Application of time rate system:

1. When high quality work is required, time rate system is used there.
2. When still rather than speed is made consideration time rate system are appropriate.

3. When the work is difficult to measure in units or standard hour's time rate is applicable.
4. When an individual has little or no control over output a time rate is usually paid.
5. When the production or output rate is determined by the speed of machines, time rate is applicable.
6. When a worker cannot be granted a steady flow of work then he cannot really be expected to be paid on the basis of work done.
7. When the work requires very effective supervision time rate is applicable.
8. When the work must be temporarily stopped for unavoidable reason, time rate is suitable there.

Advantages of time rate system:

1. Time rate system is a very easy and simple method.
2. The workers feel secure and remove mental anxiously.
3. It improves quality of products.
4. The earnings of workers whose efficiency is reduced are not decreased.
5. It does not create difference among workers.
6. There is a guarantee of wages at a definite period of time.
7. Calculation of wages is easy.
8. Trade union thinks it is a better method of payment.

Disadvantages of time rate system:

1. Efficient and inefficient workers get equal rate of wages. So the efficient workers are discouraged.
2. Quality of output is reduced.
3. Supervision cost increased.
4. Speed of work reduces. As a result production decreases and cost of production increases.
5. Efficient workers cannot produce more if they wish.
6. It gives rise to indiscipline and labor turn over.

Piece rate system: Definition: A piece rate system rewards a worker according to the number of pieces he produces. The piece may be a single unit, a length of material (for example, inch or feet), a number of components, added

to a unit or some other measure. If a carpenter gets taka.100/- as wages for making a piece of table, he will get taka. 200/- for two pieces, he will get taka 300/- for three pieces. Under the system, a worker gets per unit he produces.

Application of piece rate system: The system of payment of wages is suitable.

1. Where the standard work is easy to determine.
2. Where the unit of production can be easily measured.
3. Where the quantity rather than quality is important.
4. Where the relation of work quantity is direct and clear
5. Where the supervisor cannot give sufficient attention on the performance of work.
6. Where the work runs approximately at the same speed.
7. Where the fixed cost are more in an industry.
8. Where the production process is divided into various stages.

Advantages of piece rate system:

1. It is a simple system to understand and operate.
2. Workers get fare wages.
3. Efficient workers get more wages. So they are induced to work more.
4. Workers devote their full effort to get more wages.
5. Production increases the cost of production decreases.
6. This is a fare wage system.
7. Cost of supervision reduces

Disadvantages of piece rate system:

1. Under piece rate system the wastage of raw materials and misuses of machines is increased.
2. Workers give to important to quality rather than quality of product.
3. There is no grantee of wages; wages may be higher or lower.
4. The workers work hard to earn more and more. As a result they are helped deteriorates.
5. Labor dispute may arise if production is hampered due to technical disturbance or any other reason.
6. There is a change of labor retrenchment.
7. Due to the difference in the earning of workers, zealousness among the workers may arise and unity may be spoilt.

Task wages system: Task wages system has been introduced to remove the defect of time rate and piece rate system. It is a combination of the two systems. Under the system, a determine task is to be performed in the determine time. The workers can know how much work to be done within a specified time. But he does not get extra wages for performing extra work. One of the advantages of the system is that the honour of work can know how much wages are to be paid or received for a specify tasks.

** Discuss the different system of wages?*

Ans: Incentive wages plan: The wages plan which gives the worker incentive to work more is called incentive plan. It induces the workers to have the highest production capacity. The incentive wages plans are mainly two types:

1. Halsey premium plan
2. Rowan premium plan

Halsey premium plan: According to the plan a standard time is fixed for doing a particular work. If a workers can perform the task before the standard time, he is paid wages for their taken for the task at the predetermine time rate. Besides, he is entitled a bonus share for the time saved on the standard time. Usually the worker is paid 50% bonus on the time save. Example,

Standard time for jobs = 8 hours

Time rate per hour = Tk.- 10/-

Actual time taken = 6 hours

Time saved (8-6) = 2 hours

The workers will get wages of taka 60/- for 6 hours. He will get a bonus of $(2 \times \frac{50}{100}) = 1$ hours.

Therefore, he will get a total wages of $(6+1) = 7$ hours i.e; $7 \times 10 =$ Tk.-70/-
The employer and workers are benefitted 50:50 by the Halsey premium plan.

Advantages

1. Halsey method rewards efficiency. The workers are induced to increase their efficiency.

2. Both skilled and unskilled workers are satisfied.
3. Profit increases as the cost of production per unit decreases.
4. The method emphasizes the saving of time.

Disadvantages

1. The workers may be deprived if the standard time, standard productions are not fair.
2. Calculation of wages is complex to some extent.
3. The rate of bonus decreases and the efficiency of workers increase. So the workers are not encouraged to work.
4. The method regards the workers as needy animal, they are social and mental needs are overlooked.

Rowan premium plan: James Rowan the famous producer of Great Britain is the inventor of Rowan premium plan. Under the Rowan premium plan the amount of wages increases according to the ratio of the standard time and the time saved. A standard time is fixed to perform a task. The workers get a time rate wage though he cannot complete the task within the standard time. He will get a premium (bonus) plus the time rate wage on the basis of the ratio of the standard time and the time saved.

Example:

$$\text{Premium or Bonus} = \frac{\text{Time saved}}{\text{Standard time}} \times \text{actual time} \times \text{hourly rate of wages}$$

Where, Standard time = 8 hours

Hourly rate of wages = Tk. 10/-

Actual time = 6 hours

Time saved = (8-6) = 2 hours

$$\text{Percentage of standard time and time saved} = \frac{2}{8} = \frac{1}{4} = 25\%$$

Therefore, wages = 6 hours × 10 Tk. = Tk. 60/-

Premium or Bonus = 25% of Tk.60/-

$$= \frac{25 \times 60}{100}$$

$$= \text{Tk.15/-}$$

Therefore, the workers can earn more by working last 2 hours.

Advantages of Rowan premium plan:

1. The plan helps to increase the efficiency of workers.
2. The efficient or skilled workers have opportunity to earn more.
3. Direct labor cost decrease.
4. Indirect cost per unit reduces.

Disadvantages of Rowan premium plan:

1. It is a complex system. The calculation of wages requires a lot of time.
2. The rate of bonus reduces as the efficiency of workers increases.
3. Due to the differences to the labor cost the amount of the cost of wages is difficult to determine.
4. As a result of working first to save time, the quality to product deteriorates and wastages of raw material and machineries.

Difference between Halsey and Rowan premium plan:

Under Halsey premium plan the bonus is determine on the basis of the agreement between the worker and the owner. But under Rowan premium plan the bonus is determine by the ratio of standard time and the time saved.

*** What is EOQ (Economic Order Quantity)?**

Ans: EOQ is an ancient or old technique of inventory control. F.W. Harris invented first the EOQ model in 1915. Since then, it has been largely used. EOQ is the quantity of goods which incurs minimum inventory cost. According to H.N. Broom,

“The order size associated with such minimize cost is called an Economic Order Quantity.”

According to Laufer,

“The economic lot size is that quantity of an item which can be ordered to replenish the inventory at the minimum total cost.”

EOQ is used in procuring goods. It determines the order quantity of goods which encourage minimum cost.

Determination of EOQ mathematically: We can determine EOQ mathematically in the following way:

$$\text{EOQ or } Q = \sqrt{\frac{2 \times AO}{IC}}$$

Where,

A = Annual demand

O = Ordering or Procuring cost

IC = Inventory carrying cost or Holding cost

Example:

1. The annual demand for an item is 40000 units, ordering cost is 125 and holding cost is 0.50 per unit. What is the EOQ?

Solution: $\text{EOQ} = \sqrt{\frac{2 \times AO}{IC}}$

Where,

$$= \sqrt{\frac{2 \times 40000 \times 125}{0.50}}$$

$$A = 40000/-$$

$$O = 125/-$$

$$IC = 0.50/-$$

$$= 4472 \text{ units.}$$

2. If the requirement for a particular inventory item is 10000 unit per year, ordering cost taka 4 and carrying cost taka 2. Determine

- What is the EOQ?
- Find out the optimum number of order per year?
- What is the total inventory cost of the year?

Solution:

a. $\text{EOQ} = \sqrt{\frac{2 \times AO}{IC}}$

Where,

$$= \sqrt{\frac{2 \times 10000 \times 4}{2}}$$

$$A = 10000/-$$

$$O = 4/-$$

$$IC = 2/-$$

$$= 200 \text{ units.}$$

$$\text{b. Optimum number of order per year} = \frac{A}{EOQ}$$

$$= \frac{10000}{200}$$

$$= 50 \text{ orders}$$

Therefore, the enterprise should order 50 times per year.

$$\text{c. Total inventory cost (TC)} = \frac{A}{Q} \times (O) + \frac{Q}{2} \times (IC)$$

$$= \frac{10000}{200} \times (4) + \frac{200}{2} \times (2)$$

$$= 400 \text{ Tk.}$$

Reorder point or Maximum-Minimum system: A firm determines Reorder quantity and minimum inventory after analyzing the relevant matters. For example, a firm desires to maintain always 400 units of inventory i.e. the minimum inventory is 200 units and re-orders quantity is 800 units. But at what point the firm will reorder for 800 units of goods? It requires some information such as procurement time and rate of use of the inventory. Let us, suppose that procurement of 800 units of goods will require one month time and the rate of use of inventory for a month is 300 units. Now we can determine the reorder point.

$$\begin{aligned} \text{Re-order point} &= \text{Minimum inventory} + (\text{Procurement time} \times \text{rate of use}) \\ &= 200 + (1 \times 300) \\ &= 500 \text{ units.} \end{aligned}$$

*** What is production control?**

Ans: Where the product is being manufactured, the production must be controlled to ensure that the program output is constantly maintained. This function is known as production control.

According to H.N. Broom,

“Production control is concerned with planning and time scheduling production and with efficient coordinating of manufacturing activities, so the production flows through the plant on schedule.”

R. R. Mayer defines,

“Production control involves the development and implementation of a plan which is capable of yielding the desired results.”

In any production organization, production control involves the process of seeing that production goes in the right quantity and at the right time.

*** *Discuss the functions of production control?***

Ans: Functions or steps of production control are given below:

1. Production planning: The first function of production control is production planning. The term planning is used to indicate all the issues concerned with deciding how the production should be carried out. Sometimes it is referred to as programming, acknowledging the fact that detailed schedules and programs have to be prepared. In fact production planning is deciding in advance what should be produced and how it is to be produced. When a product is to be manufactured, the production must be carefully planned in order that the manufacturing departments are efficiently and within their capacities. This function is known as production planning.

2. Routing: Routing determines what processes are to be done and where and how the processes are to be done to produce a particular product. Routing describes the sequences of operation and processes to be done. According to Alfred and Betty,

“The specification of the flow or sequence of operations and process to be followed in producing a particular manufacturing lot.”

The main objective of routing is to maintain the continuity and economic functions.

3. Scheduling: It is another important function or step of production control. Scheduling is the next step after routing. Scheduling determines when to start and finish a work. According to Carsion and others,

“Scheduling is defined most simply as the portion of the production control. Functions that determines when each operation to start and finish.”

The scheduling process covers all aspects of the time tabling of production. Precisely when each operation or process has to be carried out is determined.

4. Dispatching: After routing and scheduling the next step of production control is dispatching. Dispatching deals with all aspects of giving the necessary authority to start the work and to obtain tools, materials and other requirements. According to Alfred and Betty,

“The routing of setting productive activities in motion through the release of orders and instructions in accordance with previously planned times and sequences embodied in root sheets and schedule starts.”

In fact, dispatching is given the workman orders to start their work according to routing.

5. Follow-up: It is the last step or function of production control. It sees the progress of raw-materials and semi finished product processing. Follow is that function of production control which sees that production work is done according to the plan. It ensures that the work is carried out as planned, the time table prepared by the scheduling section has to be complied with that is the plant dates have to be met if there is any deviation, corrective measure is taken.

*** What is plant layout?**

Ans: Plant layout is the effective arrangement of machines and services for production purposes. It is concern with the physical placements of departments and arrangement of the equipment within them in a plant or service facility. According to E.S Buffer,

“Plant layout is the integrating phase of the designing of a production system.”

Sansonnetti and Mallick define,

“Plant layout as, (a) Placing the right equipment, (b) Coupled with the right method, (c) In the right place, (d) To permit the processing of a product unit in the most effective manners, (e) Through the shortest possible distance and (f) In the shortest possible time.”

*** What is lead time?**

Ans: The interim period of making the order for goods and receiving the order there of is called lead time. Procurement of goods always takes sometimes after making order of the same. This procurement time is the lead time. For example, an order is played for some goods on 1st March and it is received on 15th March. The procurement time is 15 days. These 15 days is the lead time. Lead time must be considered in determining in re-order point.

Example:

3. Find (a) The Economic Order Quantity

(b) The re-order point

(c) The total cost. Given the following data:

Annual demands 1000 units. Average daily demand 1000/365 ordering cost taka 5 per order, holding cost Tk. 1.25 per unit per year. Lead time 5 days and cost per unit 12.50 taka.

Solution:

$$\text{a. EOQ} = \sqrt{\frac{2 \times AO}{IC}}$$

Where,

$$= \sqrt{\frac{2 \times 1000 \times 5}{1.25}}$$

$$= 89.4 \text{ units}$$

$$= 89 \text{ units.}$$

$$A = 1000/-$$

$$O = 5/-$$

$$IC = 1.25/-$$

b. Re-order point = Minimum inventory + (Procurement time \times rate of use)

There is no indication about minimum inventory. So, minimum inventory is 0.

Therefore, Re-order point = $0 + (5 \times 1000/365)$

$$= 5000/365$$

$$= 14 \text{ units.}$$

That is re-order should be made with 14 units of goods is stock.

c. Total inventory cost (TIC) = $\frac{A}{Q} \times (O) + \frac{Q}{2} \times (IC)$

$$= \frac{1000}{89} \times (5) + \frac{89}{2} \times (1.25)$$

$$= 56.17 + 55.62$$

$$= 111.80 \text{ Tk.}$$

4. Annual demand 20000 units, price per unit Tk.5. Annual inventory cost 10% price per unit. Ordering cost Tk. 25. Determine

a. Economic Order Quantity

b. Optimum number of order

c. Total inventory cost

Solution:

As information annual demand $A = 20000$ units

Price per unit $P = \text{Tk.}5$

Carrying or Inventory cost $IC = 5 \times \frac{10}{100} = 0.50/-$

Ordering cost $O = \text{Tk.}25$

$$\begin{aligned}
 \text{a. EOQ} &= \sqrt{\frac{2 \times AO}{IC}} \\
 &= \sqrt{\frac{2 \times 20000 \times 25}{0.50}} \\
 &= 1414.2 \text{ units} \\
 &= 1414 \text{ units.}
 \end{aligned}$$

$$\begin{aligned}
 \text{b. Optimum number of order per year} &= \frac{A}{EOQ} \\
 &= \frac{20000}{1414} \\
 &= 14.14 \text{ orders}
 \end{aligned}$$

$$\begin{aligned}
 \text{c. Total inventory cost (TIC)} &= \frac{A}{Q} \times (O) + \frac{Q}{2} \times (IC) \\
 &= \frac{20000}{1414} \times (25) + \frac{1414}{2} \times (0.50) \\
 &= 353 + 353 \\
 &= 706 \text{ Tk.}
 \end{aligned}$$

Prepared By
Monir
CSE-07
RUET

