

JNAN CHANDRA GHOSH POLYTECHNIC, KOL.-23.

Subject : INDUSTRIAL MANAGEMENT , DETCE/S6

Subject Teacher: UTTAM KUMAR PODDER.

GROUP-B, CHAPTER-4, TOPIC: Human Resource Management.



4.0 Human Resource Management

Human resources is used to describe both the people who work for a company or organization and the department responsible for managing resources related to employees. The term *human resources* was first coined in the 1960s when the value of labor relations began to garner attention and when notions such as motivation, organizational behavior, and selection assessments began to take shape..

Human resource management is a contemporary, umbrella term used to describe the management and development of employees in an organization. Also called personnel or talent management (although these terms are a bit antiquated), human resource management involves overseeing all things related to managing an organization's human capital.

Human resource management is therefore focused on a number of major areas, including:

- Recruiting and staffing
- Compensation and benefits
- Training and learning
- Labor and employee relations •
- Organization development

Due to the many areas of human resource management, it is typical for professionals in this field to possess specific expertise in one or more areas. Just a few of the related career titles for HR professionals include:

- Training development specialist •
- HR manager
- Benefits specialist
- Human resource generalist
- Employment services manager
- Compensation and job analysis specialist
- Training and development manager
- Recruiter
- Benefits counselor •
- Personnel analyst

4.1 Personnel Management: Definition, Objectives, Functions:

Definition of Personnel Management: C.H. Northcott defines Personnel Management as follows: "Personnel Management is an extension of general management, that of prompting and stimulating every employee to make his fullest contribution to the purpose of business."

According to Dale Yoder "The management of human resources is viewed as a system in which participants seek to attain both individual and group goals."

Objectives of Personnel Management:

These are classified into two: (a)

General Objectives:

These reveal the basic philosophy of top management towards the labour force engaged on the work and its deep underlying conviction as to the importance of the people in the organisation. The following are the most important objectives.

(i) Maximum individual development:

The employer should always be careful in developing the personality of each individual. Each individual differs in nature and therefore management should recognise their individual ability and make use of such ability in an effective and make use of such ability in an effective manner.

(ii) Desirable working relationship between employer and employees:

It is the main objective of personnel management to have a desirable working relationship between employee and employees so that they may co-operate the management.

(iii) Effective molding of human resources as contrasted with physical resources: Man is the only active factor of production, which engages the other factors of production to work.

(b) Specific objectives: Following are some of the important

activities: (i) Selection of right type and number of persons required to the organisation.

(ii) Proper orientation and introduction of new employees to the organisation and their jobs.

(iii) Suitable training facilities for better job performance and to prepare the man to accept the challenge of higher job. (iv) Provision of better working conditions and other facilities such as medical facilities.

(v) To give a good impression to the man who is leaving the

organisation. (vi) Maintaining good relations with the employees.

Functions of Personnel Management:

Personnel management involves two categories of functions—managerial and operative. **Basic Managerial Functions:**

Planning, organising, motivating and controlling—are common to all managers including personnel managers and are performed by all of them. That is why it is said that general management and personnel management are one and the same.

Operative functions:

The planning function of a personnel manager pertains to the steps taken in determining a course of action. This involves developing a personnel programme and specifying what and how operative personnel functions are to be performed.

After plans have been developed, the personnel manager must establish an organisation to carry them out. This function, therefore, calls for groupings of personnel activities, assignment of different group of activities to different individuals, delegation of authority to carry them out and provision for coordination of authority relationships horizontally and vertically in the organisation structure.

Motivation involves guiding and supervising the personnel. Personnel manager must inculcate in the workers a keen appreciation of the enterprise policies. He must guide them towards improved performance and motivate them to work with zeal and confidence.

Control involves measuring performance, correcting negative deviations and assuring the accomplishment of plans. Through direct observation, direct supervision, as well as reports, records and audit, personnel management assures itself that its activities are being carried out in accordance with the plans.

4.2 Staffing , Introduction to HR Planning, Recruitment Procedure

Staffing:



In the process of organising, a manager establishes positions and decides which duties and responsibilities to be entrusted to different individuals. In staffing, he attempts to place the right person for the right job.

Efficient staffing(HR Planning) involves the following activities or steps:

1. Manpower Planning – This is the first step in the process of staffing. It is concerned with determining the number and types of staff required for the organisation.
2. Employment of Personnel – It involves recruitment and selection of personnel as needed in the organisation. Recruitment refers to identification of the sources of manpower availability and making of efforts to secure applicants for the various job positions in the organisation. Selection is the process of choosing and appointing the right candidates for various jobs in the organisation. It includes receiving and screening of applications, employment tests, interview and medical examination of candidates.
3. Placement – When a new employee reports for duty, he is to be placed on the job for which he is best suited. Placement is a very important process as it can ensure 'right person doing the right job'. If a new employee is not able to adjust on his job, he may be given some training or transferred to some other job.
4. Induction – Induction is concerned with the process of introducing or orienting a new employee to the organisation. The new employees are familiarised with their units, supervisors and fellow employees. They are also to be informed about the working hours, tea or coffee breaks, lunch period, procedure for availing leaves, safety precautions, medical facilities, transport facilities, etc.
5. Training – Systematic training helps in increasing the skills and knowledge of employees in doing their job. Various methods of training can be used to enhance the knowledge and skills of the employees. On-the-job methods are more useful for the operative employees and off-the-job methods can also be employed for the supervisory personnel.
6. Compensation – Remuneration of workers involves fixation of their wages and salaries depending upon their level, nature of work, degree of risk involved, etc.
7. Performance Appraisal – It is concerned with the rating or evaluation of the performance of the employees. Transfer and promotion of the staff are based on performance appraisal.

Recruitment Process: 5 Steps Involved in Recruitment Proces

The five steps involved in recruitment process are as follows: (i) Recruitment Planning (ii) Strategy Development (iii) Searching (iv) Screening (v) Evaluation and Control.

1. Recruitment Planning:

The first step involved in the recruitment process is planning. Here, planning involves to draft a comprehensive job specification for the vacant position, outlining its major and minor responsibilities; the skills, experience and qualifications needed; grade and level of pay; starting date; whether temporary or permanent; and mention of special conditions, if any, attached to the job to be filled "

2. Strategy Development:

Once it is known how many with what qualifications of candidates are required, the next step involved in this regard is to devise a suitable strategy for recruiting the candidates in the organisation.

The strategic considerations to be considered may include issues like whether to prepare the required candidates themselves or hire it from outside, what type of recruitment method to be used, what geographical area be considered for searching the candidates, which source of recruitment to be practiced, and what sequence of activities to be followed in recruiting candidates in the organisation.

3. Searching:

This step involves attracting job seekers to the organisation. There are broadly two sources used to attract candidate. **These are:**

1. Internal Sources, and 2.



External Sources

These have been just discussed, in detail, under 6.3 Sources of Recruitment. **4. Screening:**

Though some view screening as the starting point of selection, we have considered it as an integral part of recruitment. The reason being the selection process starts only after the applications have been screened and shortlisted. Let it be exemplified with an example.

In the Universities, applications are invited for filling the post of Professors. Applications received in response to invitation, i.e., advertisement are screened and shortlisted on the basis of eligibility and suitability. Then, only the screened applicants are invited for seminar presentation and personal interview. The selection process starts from here, i.e., seminar presentation or interview.

Job specification is invaluable in screening. Applications are screened against the qualification, knowledge, skills, abilities, interest and experience mentioned in the job specification. Those who do not qualify are straightway eliminated from the selection process.

The techniques used for screening candidates vary depending on the source of supply and method used for recruiting. Preliminary applications, de-selection tests and screening interviews are common techniques used for screening the candidates.

5. Evaluation and Control:

Given the considerable cost involved in the recruitment process, its evaluation and control is, therefore, imperative.

4.3 Personnel– Training & Development ,Types of training ,Induction, Skill Enhancement

Training & Development:

Training constitutes a basic concept in human resource development. It is concerned with developing a particular skill to a desired standard by instruction and practice. Training is a highly useful tool that can bring an employee into a position where they can do their job correctly, effectively, and conscientiously.

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

Need for Training:

Every organization should provide training to all the employees irrespective of their qualifications and skills. **Specifically the need for training arises because of following reasons:**

1. Environmental changes:

Mechanization, computerization, and automation have resulted in many changes that require trained staff possessing enough skills. The organization should train the employees to enrich them with the latest technology and knowledge.

2. Organizational complexity:

With modern inventions, technological upgradation, and diversification most of the organizations have become very complex. This has aggravated the problems of coordination. So, in order to cope up with the complexities, training has become mandatory.

3. Human relations:

Every management has to maintain very good human relations, and this has made training as one of the basic conditions to deal with human problems.

4. To match employee specifications with the job requirements and organizational needs:

An employee's specification may not exactly suit to the requirements of the job and the organization, irrespective of past experience and skills. There is always a gap between an employee's present specifications and the organization's requirements. For filling this gap training is required.

5. Change in the job assignment:

Training is also necessary when the existing employee is promoted to the higher level or transferred to another department. Training is also required to equip the old employees with new techniques and technologies.

Types of Training:



Various types of training can be given to the employees such as induction training, refresher training, on the job training, vestibule training, and training for promotions.

Some of the commonly used training programs are listed below:

1. Induction training:
Also known as orientation training given for the new recruits in order to make them familiarize with the internal environment of an organization. It helps the employees to understand the procedures, code of conduct, policies existing in that organization.

2. Job instruction training:

This training provides an overview about the job and experienced trainers demonstrates the entire job. Addition training is offered to employees after evaluating their performance if necessary.

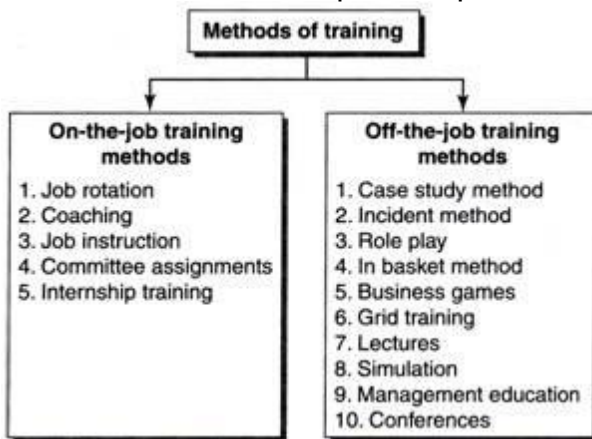
3. Vestibule training:

It is the training on actual work to be done by an employee but conducted away from the work place.

4. Refresher training:
This type of training is offered in order to incorporate the latest development in a particular field. This training is imparted to upgrade the skills of employees. This training can also be used for promoting an employee.

5. Apprenticeship training:

Apprentice is a worker who spends a prescribed period of time under a supervisor.



4.4 Grievance handling

A grievance is any dissatisfaction or feeling of injustice having connection with one's employment situation which is brought to the attention of management. Speaking broadly, a grievance is any dissatisfaction that adversely affects organizational relations and productivity. To understand what a grievance is, it is necessary to distinguish between dissatisfaction, complaint, and grievance.

Causes of Grievances:

Grievances may occur due to a number of reasons:

1. Economic:

Employees may demand for individual wage adjustments. They may feel that they are paid less when compared to others. For example, late bonus, payments, adjustments to overtime pay, perceived inequalities in treatment, claims for equal pay, and appeals against performance-related pay awards.

2. Work environment:

It may be undesirable or unsatisfactory conditions of work. For example, light, space, heat, or poor physical conditions of workplace, defective tools and equipment, poor quality of material, unfair rules, and lack of recognition.

3. Supervision:

It may be objections to the general methods of supervision related to the attitudes of the supervisor towards the employee such as perceived notions of bias, favouritism, nepotism, caste affiliations and regional feelings.

4. Organizational change:

Any change in the organizational policies can result in grievances. For example, the implementation of revised company policies or new working practices.

5. Employee relations:

Employees are unable to adjust with their colleagues, suffer from feelings of neglect and victimization and become an object of ridicule and humiliation, or other inter-employee disputes.

6. Miscellaneous:

These may be issues relating to certain violations in respect of promotions, safety methods, transfer, disciplinary rules, fines, granting leaves, medical facilities, etc.

Effects of Grievance:

Grievances, if not identified and redressed, may adversely affect workers, managers, and the organization. **The effects are the following:**

1. On the production:

- a. Low quality of production
- b. Low productivity
- c. Increase in the wastage of material, spoilage/leakage of machinery
- d. Increase in the cost of production per unit

2. On the employees:

- a. Increase in the rate of absenteeism and turnover
- b. Reduction in the level of commitment, sincerity and punctuality
- c. Increase in the incidence of accidents
- d. Reduction in the level of employee morale.

3. On the managers:

- a. Strained superior-subordinate relations.
- b. Increase in the degree of supervision and control.
- c. Increase in indiscipline cases
- d. Increase in unrest and thereby machinery to maintain industrial peace

Need for a Formal Procedure to Handle Grievances:

A grievance handling system serves as an outlet for employee frustrations, discontents, and gripes like a pressure release valve on a steam boiler. Employees do not have to keep their frustrations bottled up until eventually discontent causes explosion.

The existence of an effective grievance procedure reduces the need of arbitrary action by supervisors because supervisors know that the employees are able to protect such behavior and make protests to be heard by higher management. The very fact that employees have a right to be heard and are actually heard helps to improve morale. In view of all these, every organization should have a clear-cut procedure for grievance handling.

4.5 Leadership & Motivation ,Maslow's Theory of Motivation

Leadership

Leaders and their leadership skills play an important role in the growth of any organization. Leadership refers to the process of influencing the behaviour of people in a manner that they strive willingly and enthusiastically towards the achievement of group objectives.

A leader should have the ability to maintain good interpersonal relations with the followers or subordinates and motivate them to help in achieving the organizational objectives.

Qualities of a Leader

- *Personality:* A pleasing personality always attracts people. A leader should also be friendly and yet authoritative so that he inspires people to work hard like him.
- *Knowledge:* A subordinate looks up to his leader for any suggestion that he needs. A good leader should thus possess adequate knowledge and competence in order to influence the subordinates.
- *Integrity:* A leader needs to possess a high level of integrity and honesty. He should have a fair outlook and should base his judgment on the facts and logic. He should be objective and not biased.



- *Initiative:* A good leader takes initiative to grab the opportunities and not wait for them and use them to the advantage of the organization.
- *Communication skills:* A leader needs to be a good communicator so that he can explain his ideas, policies, and procedures clearly to the people. He not only needs to be a good speaker but also a good listener, counsellor, and persuader.
- *Motivation skills:* A leader needs to be an effective motivator who understands the needs of the people and motivates them by satisfying those needs.
- *Self-confidence and Will Power:* A leader needs to have a high level of self-confidence and immense will-power and should not lose it even in the worst situations, else employees will not believe in him.
- *Intelligence:* A leader needs to be intelligent enough to analyze the pros and cons of a situation and take a decision accordingly. He also needs to have a vision and fore-sightedness so that he can predict the future impact of the decisions taken by him.
 - *Decisiveness:* A leader has to be decisive in managing his work and should be firm on the decisions are taken by him.
 - *Social skills:* A leader should possess empathy towards others. He should also be a humanist who also helps the people with their personal problems. He also needs to possess a sense of responsibility and accountability because with great authority comes great responsibility.

Types of Leadership

Autocratic Leadership:

Autocratic leadership allows autocratic leader to take the ultimate control of taking decisions without consulting others. An autocratic leader possess high level of power and authority and imposes its will on its employees. This type of leadership proves to be useful where close level of supervision is required. Creative employees morale goes down because their output is not given importance and is often detest by employees. Since they are unable to take any part in decision making, this results in job satisfaction and staff turnover.

Bureaucratic Leadership

Under *bureaucratic leadership*, a leader believes in structured procedures and ensure that his or her employees follow procedures exactly. This type of leadership leaves no space to explore new ways to solve issues and in fact work by book. This type of leadership is normally followed in hospitals, universities, banks (where large amount of money is involved) and government organizations to reduce corruption and increase security. Self motivated individuals who are highly energetic often feel frustrated due to because of organization inability to adapt to changing environment.

Laissez-Faire Leadership

Under this type of leadership, a laissez-faire leader do not exercise control on its employees directly. Since employees are highly experienced and need little supervision, a laissez-faire leader fails to provide continuous feedback to employees under his or her supervision. This type of leadership is also associated with leaders that do not supervise their team members, failed to provide continuous feedback resulting in high costs, bad service, failure to meet deadlines, lack of control and poor production.

Charismatic Leadership

The charismatic leader is visionary and works by infusing high amount of energy and enthusiasm in his team. He sets as role model for his team and drive others to show high level of performance. This type of leader is committed to the organization and believes more in him rather than his team. The presence of charismatic leader works as a boost for rest of the employees and therefore such type of leader should be committed to the organization for the long run.

A charismatic leadership may pose as a risk to the company if he decided to leave to explore new opportunities and it might take lot of time and hard work by the company to win the confidence of its employees.

Participative Leadership

Also known as democratic leadership style, participative leadership consults employees and seriously considers their ideas when making decisions. When a company makes changes within the organization,

the participative leadership style helps employees accept changes easily because they had given a big role in the process. Participative Leadership may be required for tasks that are non routine or unstructured, where relationships are non-authoritarian and the subordinate's locus of control is internal.

Directive Leadership

Directive Leadership provides guidance about what should be done and how to do it, scheduling work, and maintaining standards of performance. Thus, it may be inferred that directive leadership is effective as the subordinator has an external locus of Control, lacks experience, has a high need for clarity or a low need of achievement. Also, when the task is unstructured, or there is conflict between work groups, a more directive style would be useful.

Supportive Leadership

Supportive Leadership show concern for the needs of the employees, leader is friendly and approachable. Supportive Leadership would be more suitable for highly structured tasks, under bureaucratic and formal authority relationship. In supportive Leadership, leader support to their subordinates officially and some time personally also. Leader always try to fulfill their requirements, it boost employees moral also.

Achievement Oriented Leadership

Achievement oriented Leadership encourage employees to perform at their highest level by setting challenging goals, emphasizing excellence and demonstrating confidence in employees abilities. Achievement Oriented Leadership is largely suitable for unstructured tasks, where the subordinate need for achievement is high. **What is Motivation ?**

Motivation is the word derived from the word 'motive' which means needs, desires, wants or drives within the individuals. It is the process of stimulating people to actions to accomplish the goals. In the work goal context the psychological factors stimulating the people's behaviour can be -

- desire for money •
- success
- recognition
- job-satisfaction •
- team work, etc

One of the most important functions of management is to create willingness amongst the employees to perform in the best of their abilities. Therefore the role of a leader is to arouse interest in performance of employees in their jobs. The process of motivation consists of three stages:-

1. A felt need or drive
2. A stimulus in which needs have to be aroused
3. When needs are satisfied, the satisfaction or accomplishment of goals.

Therefore, we can say that motivation is a psychological phenomenon which means needs and wants of the individuals have to be tackled by framing an incentive plan.

Maslow's Need Hierarchy Model

Human behavior is goal-directed. Motivation cause goal-directed behaviour. It is through motivation that needs can be handled and tackled purposely. This can be understood by understanding the hierarchy of needs by manager. The needs of individual serves as a driving force in human behaviour. Therefore, a manager must understand the "hierarchy of needs". Maslow has proposed "The Need Hierarchy Model".





FIGURE - Maslow's Need Hierarchy Model The needs have been classified into the following in order:

1. **Physiological needs**- These are the basic needs of an individual which includes food, clothing, shelter, air, water, etc. These needs relate to the survival and maintenance of human life.
2. **Safety needs**- These needs are also important for human beings. Everybody wants job security, protection against danger, safety of property, etc.
3. **Social needs**- These needs emerge from society. Man is a social animal. These needs become important. For example- love, affection, belongingness, friendship, conversation, etc.
4. **Esteem needs**- These needs relate to desire for self-respect, recognition and respect from others.
5. **Self-actualization needs**- These are the needs of the highest order and these needs are found in those person whose previous four needs are satisfied. This will include need for social service, meditation.

4.6 Safety Management , Causes of accident ,Safety precautions
(Discussed in chapter 7)

4.7 Introduction to – ,Factory Act, ESI Act ,Workmen Compensation Act, Industrial Dispute Act

Factory Act:

The **Factories Act, 1948** (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987), serves to assist in formulating national policies in India with respect to occupational safety and health in factories and docks in India. It deals with various problems concerning safety, health, efficiency and well-being of the persons at work places.

The Act is administered by the Ministry of Labour and Employment in India through its Directorate General Factory Advice Service & Labour Institutes (DGFASLI) and by the State Governments through their factory inspectorates. DGFASLI advises the Central and State Governments on administration of the Factories Act and coordinating the factory inspection services in the States.

The Act is applicable to any factory using power & employing 10 or more workers and if not using power, employing 20 or more workers on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on; but this does not include a mine, or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant.

ESI Act:

Employees' State Insurance (abbreviated as ESI) is a self-financing social security and health insurance scheme for Indian workers. The fund is managed by the Employees' State Insurance Corporation (ESIC) according to rules and regulations stipulated in the ESI Act 1948. ESIC is a **Statutory Body** and Administrative Ministry is Ministry of Labour and Employment, Government of India.

Employees' State Insurance Corporation (ESIC), established by ESI Act, is an autonomous corporation

under Ministry of Labour and Employment, Government of India. The corporation can set up hospitals either independently or in collaboration with state government or other private entities, but most of the dispensaries and hospitals are run by concerned state governments.

For all employees earning ₹21,000 (US\$290) or less per month as wages, the employer contributes 3.25% and the employee contributes 0.75%, total share 4%. This fund is managed by the ESI Corporation (ESIC) according to rules and regulations stipulated there in the ESI Act 1948, which oversees the provision of medical and cash benefits to the employees and their family. ESI scheme is a type of social security scheme for employees in the organised sector.

The employees registered under the scheme are entitled to medical treatment for themselves and their dependents, unemployment cash benefit in certain contingencies and maternity benefit in case of women employees. In case of employment-related disablement or death, there is provision for a disablement benefit and a family pension respectively. Outpatient medical facilities are available in 1418 ESI dispensaries and through 1,678 registered medical practitioners. Inpatient care is available in 145 ESI hospitals and 42 hospital annexes with a total of 19,387 beds. In addition, several state government hospitals also have beds for the exclusive use of ESI Beneficiaries. Cash benefits can be availed in any of 830 ESI centres throughout India.



Workmen Compensation Act:

Workmen's Compensation under The Workmen's Compensation Act ,1923

The Workmen's Compensation Act, aims to provide workmen and/or their dependents some relief in case of accidents arising out of and in the course of employment and causing either death or disablement of workmen.

It provides for payment by certain classes of employers to their workmen compensation for injury by accident.

Every employee (including those employed through a contractor but excluding casual employees), who is engaged for the purposes of employer's business and who suffers an injury in any accident arising out of and in the course of his employment, shall be entitled for compensation under the Act.

Employer's Liability For Compensation

The employer of any establishment covered under this Act, is required to compensate an employee:

1. Who has suffered an accident arising out of and in the course of his employment, resulting into (i) death, (ii) permanent total disablement, (iii) permanent partial disablement, or (iv) temporary disablement whether total or partial, or
2. Who has contracted an occupational disease.

Industrial Dispute Act:

The **Industrial Disputes Act, 1947** extends to the whole of India and regulates Indian labour law so far as that concerns trade unions as well as Individual workman employed in any Industry

within the territory of Indian mainland. Enacted on 11th March 1947 and It came into force 1 April 1947

Objectives:

An act to make provision for the investigation and settlement of industrial disputes, and for certain other purposes. The objective of the Industrial Disputes Act is to secure industrial peace and harmony by providing mechanism and procedure for the investigation and settlement of industrial disputes by conciliation, arbitration and adjudication which is provided under the statute. The main and ultimate objective of this act is "Maintenance of Peaceful work culture in the Industry in India" which is clearly provided under the Statement of Objects & Reasons of the statute.

The laws apply only to the organised sector. Chapter V talks about the most important and often in news topic of 'Strikes and Lockouts'. It talks about the Regulation of strikes and lockouts and the proper procedure which is to be followed to make it a Legal instrument of 'Economic Coercion' either by the Employer or by the Workmen. Chapter V-B, introduced by an amendment in 1976, requires firms employing 300 or more workers to obtain government permission for layoffs, retrenchments and closures. A further amendment in 1982 (which took effect in 1984) expanded its ambit by reducing the threshold to 100 workers.

The Act also lays down:

1. The provision for payment of compensation to the workman on account of closure or lay off or retrenchment.
2. The procedure for prior permission of appropriate Government for laying off or retrenching the workers or closing down industrial establishments
3. Unfair labour practices on part of an employer or a trade union or workers.





GROUP-C CHAPTER -5 Topic: Financial Management

5.0 Financial Management

5.1. Financial Management- Objectives & Functions

Meaning of Financial Management

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

Scope/Elements

1. Investment decisions includes investment in fixed assets (called as capital budgeting). Investment in current assets are also a part of investment decisions called as working capital decisions.
2. Financial decisions - They relate to the raising of finance from various resources which will depend upon decision on type of source, period of financing, cost of financing and the returns thereby.
3. Dividend decision - The finance manager has to take decision with regards to the net profit distribution. Net profits are generally divided into two:
 - a. Dividend for shareholders- Dividend and the rate of it has to be decided.
 - b. Retained profits- Amount of retained profits has to be finalized which will depend upon expansion and diversification plans of the enterprise.

Objectives of Financial Management

The financial management is generally concerned with procurement, allocation and control of financial resources of a concern. The objectives can be-

1. To ensure regular and adequate supply of funds to the concern.
2. To ensure adequate returns to the shareholders which will depend upon the earning capacity, market price of the share, expectations of the shareholders.
3. To ensure optimum funds utilization. Once the funds are procured, they should be utilized in maximum possible way at least cost.
4. To ensure safety on investment, i.e, funds should be invested in safe ventures so that adequate rate of return can be achieved.
5. To plan a sound capital structure-There should be sound and fair composition of capital so that a balance is maintained between debt and equity capital.

Functions of Financial Management

1. **Estimation of capital requirements:** A finance manager has to make estimation with regards to capital requirements of the company. This will depend upon expected costs and profits and future programmes and policies of a concern. Estimations have to be made in an adequate manner which increases earning capacity of enterprise.
2. **Determination of capital composition:** Once the estimation have been made, the capital structure have to be decided. This involves short- term and long- term debt equity analysis. This will depend upon the proportion of equity capital a company is possessing and additional funds which have to be raised from outside parties.
3. **Choice of sources of funds:** For additional funds to be procured, a company has many choices like-
 - a. Issue of shares and debentures
 - b. Loans to be taken from banks and financial institutions
 - c. Public deposits to be drawn like in form of bonds.

Choice of factor will depend on relative merits and demerits of each source and period of financing.

4. **Investment of funds:** The finance manager has to decide to allocate funds into profitable ventures so that there is safety on investment and regular returns is possible.
5. **Disposal of surplus:** The net profits decision have to be made by the finance manager. This can be done in two ways:
 - a. Dividend declaration - It includes identifying the rate of dividends and other benefits like bonus.
 - b. Retained profits - The volume has to be decided which will depend upon expansion, innovational, diversification plans of the company.
6. **Management of cash:** Finance manager has to make decisions with regards to cash management. Cash is required for many purposes like payment of wages and salaries, payment of electricity and water bills, payment to creditors, meeting current liabilities, maintenance of enough stock, purchase of raw materials, etc.
7. **Financial controls:** The finance manager has not only to plan, procure and utilize the funds but he also has to exercise control over finances. This can be done through many techniques like ratio analysis, financial forecasting, cost and profit control, etc.

5.2. Capital Generation & Management

The term "capital" can refer to a number of different concepts in the business world. While most people think of financial capital, or the money a company uses to fund operations, human capital and social capital are both important contributors to a company's overall financial health.

Types of Capitals

The following are different examples of types of capital:

1. Financial (Economic) Capital

Financial capital is necessary in order to get a business off the ground. This type of capital comes from two sources: debt and equity. Debt capital refers to borrowed funds that must be repaid at a later date, usually with interest.

Common types of debt capital are:

- bank loans
- personal loans
- overdraft agreements
- credit card debt



Equity capital refers to funds generated by the sale of stock, either common or preferred shares. While these funds need not be repaid, investors expect a certain rate of return.

Economic capital may also take the form of cash or other assets like real estate, commodities, equipment, vehicles, and so forth which may be disposed of for cash in the market.

2. Human Capital

Human capital is a much less tangible concept, but its contribution to a company's success is no less important. Human capital refers to the skills and abilities a company's employees bring to the operation.

Though it's hard to quantify human capital in dollars, most companies know that employee performance can be greatly enhanced by continuing education classes, professional development seminars and healthy-living programs. Many businesses choose to invest in the happiness and well-being of their employees because this investment indirectly benefits the bottom line by cultivating a happier, more efficient workforce.

3. Social Capital

Social capital is an even more intangible asset, referring to the relationships people have to each other, and the desire they have to do things for and with others within their social networks. People tend to do things to help and encourage those in their same social network, creating a cycle of mutually beneficial reciprocity. In an individual's social network, social capital is the value of the content of the relational ties between people and not a product of the members of the network in and of itself. For instance, if you have a wealthy uncle in your network, knowing he could lend you money in a pinch would be to leverage that relationship's social capital.

In business, a person with high social capital knows many influential people within his industry and may have more opportunities for advancement and development than someone whose social circle is small. People with high social capital may also have an easier time accomplishing things, both personally and professionally, because they can draw on the strengths and resources of others within their networks.

Related to social capital are other types that have been identified by sociologists and anthropologists such as: symbolic capital - for instance, the honor and status earned through credentialing or promotion; and cultural capital - for instance, the capacity to recognize and appreciate high-class items like art or fine food and distinguish that from more middle-brow consumption.

Sources of raising Capital

Many entrepreneurs do not know where to acquire funding when starting out or expanding. If you know where to look, you'll find that there are many different sources for entrepreneurs to raise capital.

However, not every source of capital is suitable for every business. An entrepreneur should choose one which meets the capital structure that best fits their business. A business' capital structure is the way that it is funded, either through debt (loans) or equity (shares sold to investors) financing. Financial backing usually includes loans, grants, or investor funding. Some of the top ways to raise capital are through angel investors, venture capitalists, government grants, and small business loans. There are other methods for financing such as credit cards or invoice financing, but these should be used only if you need cash quickly and know the risks involved.

Angel Investors:

Angel investors are generally individuals or groups who provide capital from their personal assets to assist you with starting your business. These types of investors are looking for startups that have good potential for earnings.

Since they are investors, you'll be expected to present them with a portfolio that is favorable. This differs from venture capitalists, who are more interested in organizations that are already doing well but need more sources of capital.

Venture Capitalists:

Venture capitalists (VCs) are usually groups of individuals that provide capital through an organization they have established. Generally, VCs like to fund companies that are already somewhat established, and in need of more finances. However, VCs have been known to sponsor startups that show significant promise.

VCs are looking for high returns on their investments (your business). This is not unusual for investors, but some VCs may want to be involved in your business decisions after they grant you some funding.

In the past, VCs have wanted to make decisions for the businesses they have funded to protect their investments. However, many VCs have moved to more of a mentor role, assisting you with business decisions and offering guidance as a protective measure. Ensure you enquire about the role a VC would like to have before you accept any funds.

If you do not find any suitable VCs, a small business loan may be the next option.

Small Business Loans:

The Small Business Administration (SBA) has been established to assist business owners with their businesses. A small business loan through SBA partner lenders, while competitive, are guaranteed by the SBA and come with generally lower rates than traditional loans.

Small business loans are not the only form of government assistance. A source of capital often overlooked by entrepreneurs is government grants.

Government Grants:

The government offers grants through the SBA to entrepreneurs who have research-related businesses. The most attractive benefit of a grant is that it is free and you won't need to repay the government.

Crowdfunding:

Crowdfunding is a method of raising funds from individuals, using an internet-based platform. This method depends upon the generosity of people, and upon the exposure your crowdfunding campaign receives.

To have a successful crowdsourcing endeavor, you must be able to win the crowd's support. They'll want to know why you need the money and may want a reason to contribute. Create a reasonable monetary goal, and decide on a reward for the crowd that assists you. This could be public recognition for donations or letting them be the first ones to receive your product.

Microloans:

These are small loans designed for small businesses and startups. What makes these loans attractive is that they are short-term loans with low-interest rates compared to traditional small business loans.

Invoice Factoring :

Sometimes referred to as invoice advances, invoice factoring is a process where an entrepreneur agrees with a lender to sell their invoices due, and let the lender collect future payment by the customers.

This works by a lender purchasing your open invoices from you for a reduced amount, then collecting the amount that is due. For example, if you had a sale with receivables pending for \$11,000 you could sell it to a lender who might buy it for \$9,000. You receive cash, and the lender receives the \$11,000 when it is paid.

This is a source of capital you might use if you were very much in need of capital, as you would lose \$2,000 in the transaction.

Credit Cards:

Many companies use personal and business credit cards to finance immediate expenses. Credit cards are convenient when you don't have the cash to make purchases at the moment.

If you do not have the means to make your monthly payments, credit cards can exponentially increase your debt with high annual percentage rates.

5.3. Budgets and accounts:

Types of Budgets:

Budget is defined as a plan, financial in nature, for a predefined period usually for a period of one year. For example, a sum of money allocated for a period of one year. It is an integral part of almost everything be it government, organizations, small businesses, or even a household.

The budget makes its presence everywhere and ensures proper adherence to it since the crossing of the budget is not a good sign but the underutilizing budget is the aim. Overspending of the budget shows a lack of planning and managing costs and income. An ideal budget should cover all the expenses and leave a little surplus for additional and unforeseen expenses.

Following are 10 different types of Budget. These are commonly used in almost every organization but various businesses may require different budgets depending on their nature of the business and their specific requirements.

Here are the 10 Types of Budgets that Businesses can use 1)

Cash flow budget

Predicting when and how the cash will flow in or out of the business is called a cash flow budget. The cash flow budget is usually specified for a specific time, for example, a year. Cash flow budget is useful for the organization to manage its cash and it also considers factors such as accounts receivable accounts payable to determine whether a company has sufficient cash flow in hands for continuing its operations. Cash flow is also important in determining major investment decisions of the company. A Pharmaceutical company, for example, may use its cash flow budget to predict whether it can start investing in a new product or not. Many organizations invest the additional cash flow generated after taking care of all expenses into social and charitable work which falls under corporate social responsibility.

2) Operating Budget

A forecast of projected income and expenses along with its analysis over the course of a specific period of time is called the operating budget. Operating budget must include factors such as production, labour cost, etc. to provide a clear picture for the company.

The specific time period for operating budget is weekly, monthly, quarterly, half yearly or yearly depending on the convenience of the organization. A regular month on month or quarter on quarter analysis of these reports helps in the determination of overspending of budgets.

3) Financial budget

The company strategy for managing its assets income and expenses and other financial aspects are present in the financial budget. The financial budget helps to paint the overall picture of the financial health of the company and an overview of its spending in accordance with its revenues from core operations.

A financial budget is a very strong determinant of stability of the company and a positive financial budget means good business and healthy organization why the negative financial budget indicates probable issues.

4) Sales Budget

This type of budget gives some expected sales revenue and expenses and selling for the organization for a specific period of time. It is the backbone of the organization or it is also known as the nerve centre since it is the initiation on which all deposits are also based. Sales forecasting plays a very important role and determination of sales budget is both should be proper for further things to fall in place.

Forecasting of sales can be done either in quantity or value depending on the organization. In case of heavy equipment's, it can be mentioned in quantity wise in case of FMCG products business value may be mentioned. Proper forecasting is essential for sales budget since a forecast misses the sales budget might go of which would mean that the operations and availability of materials would be affected.

5) Production budget

Sales budget forms the basis for the preparation of the production budget. Stock levels are also taken into consideration along with the manufacturing program of the organization. The production budget is very useful in determining the cost of production which in turn will decide the price of the product. Every organization has a different type of production budget.

Usually, the budget is divided into production per article per month and the likely demand generated from the market. If the Sales and demand go higher or lower it would be the responsibility of the organization to adjust their production budgets accordingly.

6) Overheads Budget

Overheads Budget is the type of Budget which involves all the costs and expenses needed for a specified period of time of production. This includes but is not limited to indirect labor, direct and indirect factory expenses, and other related expenses.

A collection of all the overheads of the factory, admin, distribution etc. is included under Overheads Budget. Usually, the budget is prepared department wise for efficient control over the costs. The manufacturing expenses are further divided into Fixed, semi-variable and variable costs.

7) Personnel Budget

Personnel Budget is one of the crucial types of the budget which covers the manpower budget for the specific period. Labor hours, workers grade, costs etc. Since it takes care of all the personnel, and efficient working of an organization depends on the payment of the employees, this is one of the important types of budget.

8) Marketing Budget

The budget allocated to the Marketing department is known as the Marketing Budget. This type of Budget takes care of all the marketing and promotional activities of the company for the customers. The ultimate aim of marketing is to assist the sales team to generate more business.

The marketing budget for the year decides the number of activities to be done in one financial year. The activities involve a combination of events, promotions, and advertising in order to promote the product to the customer.

9) Static Budget

Static Budget is similar to Fixed costs. These are the expenses which are static and remain unchanged over a long period of time and it could be plumbing supply costs, warehouse cost, factory maintenance etc. It is not influenced by the sales volume or any other changes in the organization.

10) Master Budget

A combination of all the individual budgets of the company, which gives a complete picture of the overall financial picture of the organization is called as Master Budget. All the departmental budgets like Sales, Marketing, Overheads etc budgets are combined to prepare Master Budget. Establishing relation in all the departments is essential and master budget takes care of that. The larger the organization, the useful is master budget since gives one view over all the departments.

The above were all the different types of Budget that exists and the use of these budgets may vary from business to business.

Production Budget (including Variance Report)

Sales budget forms the basis for the preparation of the production budget. Stock levels are also taken into consideration along with the manufacturing program of the organization. The production budget is very useful in determining the cost of production which in turn will decide the price of the product. Every organization has a different type of production budget.

Usually, the budget is divided into production per article per month and the likely demand generated from the market. If the Sales and demand go higher or lower it would be the responsibility of the organization to adjust their production budgets accordingly.

What Does Variance Report Mean?

A budget is an estimation of certain variables. It is a tool most frequently employed in finance to forecast probable results of certain business activity. The deviations between a budget and the actual results obtained have to be recognized and dealt with in order to evaluate the business' results to improve the assumptions and guidelines of future budgets and to make timely decisions.

A variance report is a written document, often presented in an excel sheet or a power point presentation, where the difference between the budget and the actual results (normally provided in a financial statement) are illustrated. These deviations are presented in absolute terms (numbers) and relative terms (percents). Since the budget normally includes many rows with different income and expense's categories, like rent, office supplies and others, these variations should also be calculated on a per-row basis.

A negative variation means that actual results underperformed the budget and a positive variation means that the budget was exceeded. These reports are normally presented to business owners and executives for them to have enough information to adjust the course of actions accordingly.

Sheets Co. is a company that provides office supplies for businesses and individuals across the country through its 250 store locations. The Board of Directors is currently reviewing the last quarter's variance report, drafted by the Finance Department.

Example

The budget drafted for the last quarter stated expected revenues as \$96,590,000, gross income as \$29,420,000 and operating income as \$12,592,000. The actual results were revenues of \$102,212,000 (a 5,622,00 positive difference or 6% more than expected), gross income was 28,214,000 (a 1,206,000 negative difference or 4% less than expected) and operating income was 15,218,000 (a 2,626,000 positive difference or 21% more than expected).

This report will help the Board make decisions about the course of the business to increase results over time.

Labour Budget:



A type of budget created by a business, company or organization for the complete number of employees that are employed in labor created, accounted, recorded and apportioned accurately.

Every business, company or organization that employs people has a monthly labor budget.

Different financial ratios:

Ratio—the term is enough to curl one's hair, conjuring up those complex problems we encountered in high school math that left many of us babbling and frustrated. But when it comes to investing, that need not be the case. In fact, there are ratios that, properly understood and applied, can help make you a more informed investor.

1. Working Capital Ratio

Assessing the health of a company in which you want to invest involves understanding its liquidity—how easily that company can turn assets into cash to pay short-term obligations. The working capital ratio is calculated by dividing current assets by current liabilities.

So, if XYZ Corp. has current assets of \$8 million, and current liabilities of \$4 million, that's a 2:1 ratio—pretty sound. But if two similar companies each had 2:1 ratios, but one had more cash among its current assets, that firm would be better able to pay off its debts quicker than the other.

2. Quick Ratio

Also called the acid test, this ratio subtracts inventories from current assets, before dividing that figure into liabilities.² The idea is to show how well current liabilities are covered by cash and by items with a ready cash value. Inventory, on the other hand, takes time to sell and convert into liquid assets. If XYZ has \$8 million in current assets minus \$2 million in inventories over \$4 million in current liabilities, that's a 1.5:1 ratio. Companies like to have at least a 1:1 ratio here, but firms with less than that may be okay because it means they turn their inventories over quickly.

3. Earnings per Share

When buying a stock, you participate in the future earnings (or risk of loss) of the company. Earnings per share (EPS) measures net income earned on each share of a company's common stock. The company's analysts divide its net income by the weighted average number of common shares outstanding during the year.

4. Price-Earnings Ratio

Called P/E for short, this ratio reflects investors' assessments of those future earnings. You determine the share price of the company's stock and divide it by EPS to obtain the P/E ratio.

If, for example, a company closed trading at \$46.51 a share and EPS for the past 12 months averaged \$4.90, then the P/E ratio would be 9.49. Investors would have to spend \$9.49 for every generated dollar of annual earnings.

Even so, investors have been willing to pay more than 20 times the EPS for certain stocks if hunch that future growth in earnings will give them an adequate return on their investment.

5. Debt-Equity Ratio

What if your prospective investment target is borrowing too much? This can reduce the safety margins behind what it owes, jack up its fixed charges, reduce earnings available for dividends for folks like you and even cause a financial crisis.

The debt-to-equity is calculated by adding outstanding long and short-term debt, and dividing it by the book value of shareholders' equity. Let's say XYZ has about \$3.1 million worth of loans and had shareholders' equity of \$13.3 million. That works out to a modest ratio of 0.23, which is acceptable under most circumstances. However, like all other ratios, the metric has to be analyzed in terms of industry norms and company-specific requirements.

6. Return on Equity

Common shareholders want to know how profitable their capital is in the businesses they invest in. Return on equity is calculated by taking the firm's net earnings (after taxes), subtracting preferred dividends, and dividing the result by common equity dollars in the company.

Let's say net earnings are \$1.3 million and preferred dividends are \$300,000. Take that and divide it by the \$8 million in common equity. That gives a ROE of 12.5%. The higher the ROE, the better the company is at generating profits.



Introduction to Profit & Loss Account (only concepts) :

Trading and Profit and Loss Account

In order to arrive at the balance sheet of a business, one needs to prepare the trading account and profit and loss account first. This account is prepared to arrive at the figure of revenue earned or loss incurred during a period.

What is a Trading Account?

A trading account helps in determining the gross profit or gross loss of a business concern, made strictly out of trading activities. Trading involves buying and selling activities. In the trading account, the cost of goods sold is subtracted from net sales for the period to calculate gross profit. Only direct revenue and direct expenses are considered in it. Trading account is prepared mainly to know the profitability of the goods bought by the businessman.

Learn about Balance Sheet and Opening Entry here in detail.

The difference between selling price and cost of goods sold is the earning for the businessman, which is also known as gross profit. Whereas, net profit means all revenues minus all expenses including the cost of goods sold, the selling, general and administrative expenses, and the non-operating expenses. Thus in order to calculate the gross earning, it is necessary to know the cost of goods sold and sales figures. Also, $\text{Gross Profit} = \text{Sales} - \text{COGS} (\text{Sales} + \text{Closing Stock}) - (\text{Stock in the beginning} + \text{Purchases} + \text{Direct Expenses})$

Items included on the debit side are opening stock, purchases, and direct expenses and on the credit side are sales and closing stock. The resultant figure is either gross profit or gross loss. understand the trading account and profit and loss account in detail.

5.4 Introduction to-

Excise Tax:



Excise duty is a form of tax imposed on goods for their production, licensing and sale. An indirect tax paid to the Government of India by producers of goods, excise duty is the opposite of Customs duty in that it applies to goods manufactured domestically in the country, while Customs is levied on those coming from outside of the country.

At the central level, excise duty earlier used to be levied as Central Excise Duty, Additional Excise Duty, etc. However, the Goods and Services Tax (GST), introduction in July 2017, subsumed many types of excise duty. Today, excise duty applies only on petroleum and liquor.

Excise duty was levied on manufactured goods and levied at the time of removal of goods, while GST is levied on the supply of goods and services.

Alcohol does not come under the purview of GST as an exclusion mandated by constitutional provision. States levy taxes on alcohol according to the same practice as was prevalent before the rollout of GST.

After GST was introduced, excise duty was replaced by central GST because excise was levied by the central government. The revenue generated from CGST goes to the central government.

Service tax:

Definition: Service tax is a tax levied by the government on service providers on certain service transactions, but is actually borne by the customers. It is categorized under Indirect Tax and came into existence under the Finance Act, 1994.

Description: In this case, the service provider pays the tax and recovers it from the customer. Service Tax was earlier levied on a specified list of services, but in the 2012 budget, its scope was increased. Services provided by air-conditioned restaurants and short term accommodation provided by hotels, inns, etc. were also included in the list of services.

It is charged to the individual service providers on cash basis, and to companies on accrual basis. This tax is payable only when the value of services provided in a financial year is more than Rs 10 lakh. This tax is not applicable in the state of Jammu & Kashmir.

Income tax:

What Is an Income Tax?

An income tax is a tax that governments impose on income generated by businesses and individuals within their jurisdiction. By law, taxpayers must file an income tax return annually to determine their tax obligations. Income taxes are a source of revenue for governments. They are used to fund public services, pay government obligations, and provide goods for citizens. Certain investments, like housing authority bonds, tend to be exempt from income taxes.

VAT :

What Is a Value-Added Tax (VAT)?

A value-added tax (VAT) is a consumption tax placed on a product whenever value is added at each stage of the supply chain, from production to the point of sale. The amount of VAT that the user pays is on the cost of the product, less any of the costs of materials used in the product that have already been taxed.

Value-added taxation is based on taxpayers' consumption rather than their income. In contrast to a progressive income tax, which levies greater taxes on higher-level earners, VAT applies equally to every purchase.

Custom Duty:

Customs duty refers to the tax imposed on goods when they are transported across international borders. In simple terms, it is the tax that is levied on import and export of goods. The government uses this duty to raise its revenues, safeguard domestic industries, and regulate movement of goods.

The rate of Customs duty varies depending on where the goods were made and what they were made of.

Custom duty in India is defined under the Customs Act, 1962, and all matters related to it fall under the Central Board of Excise & Customs (CBEC).



GROUP-C , CHAPTER -6,Materials Management

6.1. Inventory Management (No Numerical)

Meaning of Materials Management:

Materials management is a balancing act. The objective is to be able to deliver what customers want, when and where they want it, and do so at minimum cost.

To achieve this objective, materials management must make trade-offs between the level of customer service and the cost of providing that service.

As a rule, costs rise as the service level increases, and materials management must find that combination of inputs to maximise service and minimise cost. For example, customer service can be improved by establishing warehouses in major markets. However, that means extra cost in operating the warehouse and in the extra inventory carried. To some extent, these costs will be offset by potential savings in transportation costs if lower cost transportation can be used.

By grouping all those activities involved in the movement and storage of goods into one department, the firm is in a better position to provide maximum service at minimum cost and increase profit. The overall concern of materials management is the balance between priority and capacity. The marketplace sets demand. Materials management must plan the firm's priorities (what goods to make and when) to meet that demand.

Capacity is the ability of the system to produce or deliver goods. Priority and capacity must be planned and controlled to meet customer demand at minimum cost. Materials management is responsible for doing this.

Materials management concerns itself not merely with the cost of materials but pays equal attention to the cost we incur on materials which, in most cases, are usually hidden. Even a rupee saved on these costs adds to the profits made by a manufacturing unit.

Materials management is a coordinating function responsible for planning and controlling materials flow.

Objectives:

Its objectives are:

1. Maximise the use of the firm's resources.
2. Provide the required level of customer service.

Manufacturing creates wealth by adding value to goods. To improve productivity and wealth, a company must first design efficient and effective systems for manufacturing. It must then manage these systems to make the best use of labour, capital and material. One of the most effective ways of doing this is through the planning and control of the flow of materials into, through, and out of manufacturing.

There are three elements to a material flow system: supply, manufacturing planning and control and physical distribution. They are connected what happens in one system affects the others.

Traditionally, there are conflicts in the objectives of a company and in the objectives of marketing, finance and production. The role of materials management is to balance these conflicting objectives by coordinating the flow of materials, so customer service is maintained and the resources of the company are properly used.

Materials management is a body of knowledge which helps the production/operations manager to improve the productivity of capital by reducing the materials cost. About two-thirds of any company's sales turnover are spent to purchase materials. It is, therefore, of considerable importance to reduce this materials bill as much as possible, since any such reduction will result in greater profit.

Materials management refers to management of materials. It broadly covers purchases of materials purchased or acquired from outside sources, transporting the materials to its place to use, keeping the materials in stock, maintaining an optimum level of inventory of materials, issuing the materials as and when required and, finally, keeping an overall account of the materials whether in process or in stores.

Purchasing, store-keeping, inventory control, transportation, etc. are different aspects of materials



management.

Functions of Materials Management:

All activities concerned form the materials part of the materials management function. **These functions are:**

1. Purchasing:

Purchasing is one of the basic functions of materials management. **The objectives of industrial purchasing are the following:**

- (a) To maintain continuity of production.
- (b) To buy for the best ultimate value, not necessarily always at the lowest price.
- (c) To increase profits.

Effective functioning of the purchasing function is vital to the smooth operation of many other departments. **2. Inventory Control:**

The word 'inventory' is defined as the 'materials lying in storage or idle materials'.

Inventory control is the technique of maintaining all classes of inventory at optimum levels, with the minimum investment of capital. In other words, inventory control means balancing the two opposite forces, i.e., overstocking with all financial hazards and under stocking leading to operational bottlenecks.

3. Stores Management:

Proper receipts, inspection, storage and preservations, safety and issue of materials with efficient documentation assist in good house-keeping of materials in a warehouse. This avoids shortage and surplus during annual or continuous stock taking and prevents loss or deterioration of materials in hand.

4. Disposal of Surplus/Scrap/Obsolete Materials:

Another important area where materials management can play an effective role is in the disposal of surplus/obsolete materials. Over a period of time manufacturing units accumulate large amounts of obsolete and surplus materials. Since the materials department is in constant touch with the market, the disposal of such materials is always to the advantage of the materials department.

Not only is the materials departments in touch with the market, it is also aware of the consumption of materials in the various divisions of the company and also in similar units in the industry. By virtue of this knowledge, the materials department is in a position to sell the surplus materials to advantage or dispose it off as per the company's policy. **Objectives of Materials Management:**

"The objectives of materials management department are: A. Primary Objectives:

1. Low price.
2. High inventory turnover (Inventory turnover = $\frac{\text{Sale}}{\text{Average Inventory}}$)
3. Low cost of acquisition and possession.
4. Continuity of supply.
5. Consistency of quality.
6. Low payroll (wage) cost.
7. Favourable supplier relations.
8. Development of personnel.
9. Maintenance of regular records.

These objectives may now be briefly described: Low price:

This is one of the most important objectives of materials management. It means that the materials or services as received by the company should be purchased at the lowest possible cost.

High inventory turnover:



This means that the average inventory locked up is low compared to the sales volume. Inventory means idle money and, therefore, the lower it is, the higher will be the profit. Storage and carrying cost of inventory will, therefore, also be lower if the volume is small. Low cost acquisition and possession

This means that the materials are acquired and kept in stores at a low cost. **Continuity of supplies:**

One of the main objectives of proper (scientific) materials management is to ensure that there is no disruption in supply which might hamper the smooth flow of production. Continuity of supply is necessary to ensure uninterrupted production.



Consistency of quality:

Materials of the right quality have to be bought. Otherwise the quality of the end-product may suffer. Hence, the quality will have to be good and consistent.

Low payroll cost:

Like any other department, the materials department should be run at the lowest possible cost. **Favourable supplier relations:**

As the name signifies, in order to ensure continuity of supply and consistency of quality, it is necessary to have a favourable supplier/buyer relation.

Development of personnel:

Regular developments are taking place in the materials management field. It is necessary that the persons dealing with materials management are appraised of the latest ideas and trends. Hence, the development and training of personnel engaged in materials functions is absolutely essential.

Maintenance of regular records:

For any efficiently run department it is necessary to have good, updated and easily accessible records. **B. Secondary Objectives:**

1. Favourable reciprocal relations.
2. New materials and products.
3. Make or buy decision.
4. Standardisation.
5. Product improvement.
6. Inter-departmental harmony.
7. Forecast.

Favourable reciprocal relations:

It sometimes pays to buy materials from the companies to whom the end products are sold. This is called reciprocal relationship. A good materials management department should encourage such reciprocal relationships with other companies.

New materials and products:

The materials manager is always in touch with the outside world. He acts as an information centre for the management and informs the management, not only about the materials and products which his company requires, but also about the development of new products produced by its competitors.

Make or buy decision:

The decision as to whether an item should be made from within the company, i.e., with its own resources, or purchased from outside (external) sources is a very important one.

The materials department, along with the help of the engineering department, by taking the pros and cons of making or buying, should buy from outside sources only if it is economical to do so.

Standardisation:

Materials required by the company and bought from outside should be standardised so as to have a fewer number of materials. This will reduce total inventory.

Product improvement:

The materials department should also help the company in improving the quality of the end product by suggesting various alternative methods.

Inter-departmental harmony:

The materials department should have a good relationship with the other departments inside the company. **Forecast:**

The materials department has to prepare the materials budget and forecast of payments. The department will also forecast the prices of materials to be purchased.



6.2 ABC Analysis

ABC Analysis – Method of Inventory Control and Management

ABC method of inventory control involves a system that controls inventory and is used for materials and throughout the distribution management. It is also known as selective inventory control or SIC.

Let's understand in detail about ABC method of inventory control.

1. What is ABC Method of Inventory Control?
2. Why the need for prioritizing inventory?
3. What are the policies governing the ABC method of inventory management?
4. What are the uses of ABC Analysis?
5. What are the advantages of implementing the ABC method of inventory control?
6. What are the disadvantages of using the ABC analysis?



1. What is ABC Method of Inventory Control?

It has become an indispensable part of a business and the ABC analysis is widely used for unfinished good, manufactured products, spare parts, components, finished items and assembly items.

This method of management divides the items into three categories A, B and C; where A is the most important item and C the least valuable.

2. Why the need for prioritizing inventory? **Item A:**

In the ABC model of inventory control, items categorized under A are goods that register the highest value in terms of annual consumption. It is interesting to note that the top 70 to 80 percent of the yearly consumption value of the company comes from only about 10 to 20 percent of the total inventory items. Hence, it is crucial to prioritize these items.

Item B:

These are items that have a medium consumption value. These amount to about 30 percent of the total inventory in a company which accounts for about 15 to 20 percent of annual consumption value.

Item C:

The items placed in this category have the lowest consumption value and account for less than 5 percent of the annual consumption value that comes from about 50 percent of the total inventory items.

Note: The annual consumption value is calculated by the formula: **(Annual demand) × (item cost per unit)**

3. What are the policies governing the ABC method of inventory management?

The idea behind using the ABC analysis is to leverage the imbalances of sales. This means that each item must be given the appropriate amount of weight depending on their class:

Item A:

- a) These are subjected to strict inventory control and are given highly secured areas in terms of storage
- b) These goods have a better forecast for sales
- c) These are also the items that require frequent reorders on a daily or a weekly basis
- d) They are kept as a priority item and efforts are made to avoid unavailability or stock-out of these items

Item B:

- a) These items are not as important as items under section A or as trivial as items categorized under C
- b) The important thing to note is that since these items lie in between A and C, they are monitored for potential inclusion towards category A or in a contrary situation towards category C

Item C:

- a) These items are manufactured less often and follow the policy of having only one of its item on hand or in some cases they are reordered when a purchase is actually made
- b) Since these are low demand goods with a comparatively higher risk of cost in terms of excessive inventory, it is an ideal situation for these items to stock-out after each purchase
- c) The questions managers find themselves dealing with when it comes to items in category C is not how many units to keep in stock but rather whether it is even needed to have these items in store at all

4. What are the uses of ABC Analysis?

The ABC analysis is widely used in supply chain management and stock checking and inventory system and is implemented as a cycle counting system. It is most important for companies that seek to bring down their working capital and carrying costs.

This done by analysing the inventory that is in excess stock and those that are obsolete by making way for items that are readily sold. This helps avoid keeping the working capital available for use rather than keeping it tied up in unhealthy inventory.

When a company is better able to check its stock and maintain control over the high-value goods it helps them to keep track of the value of the assets that are being held at a time. It also brings order to the reordering process and ensures that those items are in stock to meet the demands.

The items that fall under the C category are those that slow-moving and need not be re-ordered with the same frequency as item A or item B. When you put the goods into these three categories, it is helpful for both the wholesalers and the distributors to identify the items that need to be stocked and those that can be replaced.

5. What are the advantages of implementing the ABC method of inventory control?

- i) This method helps businesses to maintain control over the costly items which have large amounts of capital invested in them
- ii) It provides a method to the madness of keeping track of all the inventory. Not only does it reduce unnecessary staff expenses but more importantly it ensures optimum levels of stock is maintained at all times
- iii) The ABC method makes sure that the stock turnover ratio is maintained at a comparatively higher level through a systematic control of inventories
- iv) The storage expenses are cut down considerably with this tool
- v) There is provision to have enough C category stocks to be maintained without compromising on the more important items

6. What are the disadvantages of using the ABC analysis?

- i) For this method to work and render successful results, there must be proper standardization in place for materials in the store
- ii) It requires a good system of coding of materials already in operation for this analysis to work
- iii) Since this analysis takes into consideration the monetary value of the items, it ignores other factors that may be more important for your business. Hence, this distinction is vital

Conclusion

The ABC model works in a manner as to get prime attention to the important items or the critical few and not have unnecessary attention be spent on the not so important items or

the trivial many. Each category has a differing management control in place.

This prioritization of attention and focus is vital to keep the costs in check and under control in the supply chain system. To get the best results it is important that items that involve a lot of costs are given the due management attention.

6.3 Economic Order Quantity(EOQ)

What is Economic Order Quantity?

Economic order quantity (EOQ), refers to the optimum amount of an item that should be ordered at any given point in time, such that the total annual cost of carrying and ordering that item is minimized.

EOQ is also sometimes known as the optimum lot size. Simply put – how much product should you purchase to maintain a cost-efficient supply chain?

Why is the EOQ important?

The EOQ helps companies minimize the cost of ordering and holding inventory. As explained by the economic concept known as economies of scale, the cost per unit of ordering a product falls, the larger the total quantity of the order. However, the larger the total quantity of an order, the higher the cost to hold and carry your inventory.

EOQ formula

Determine the **demand** in units

Determine the **order cost** (incremental cost to process and order)

Determine the **holding cost** (incremental cost to hold one unit

in inventory) Multiply the **demand** by 2, then multiply the result by the **order cost**.

Divide the result by the **holding cost**.

Calculate the square root of the result to obtain EOQ.

In short: $EOQ = \text{square root of } (2 \times D \times S/H) \text{ or } \sqrt{(2DS / H)}$

Where:

D represents demand, or how many units of product you need to buy. S represents setup cost.

H represents the holding fee or storage cost per unit of product. **Example of calculating EOQ**

Meet Matt. Matt runs a men's clothing line. Matt needs to buy 12,000 shirts per year to fulfill demand (D). He incurs a setup cost of \$100 (S) and a holding fee (H) of \$16 per shirt. He needs to know his EOQ.

Plugging those numbers into the EOQ formula,

you get: $EOQ = \sqrt{2 \times 12,000 \times 100/16}$

$EOQ = \sqrt{\$3,456,000 /$

$\$16} EOQ = \sqrt{216,000}$

$EOQ = 465 \text{ units (rounded up to the nearest whole unit)}$

The EOQ is usually used to set the **reorder point** within your inventory management workflows. Together, these metrics tell you when to place an order (reorder point) and how much order to place (EOQ formula). This prevents you from carrying too much deadstock or facing stockouts.

6.4 Stores function:

The stores function is important for many organisations and industrial concerns. The primary and secondary functions of store are discussed in this article.

Functions of a Store # 1. Primary Functions:



The main objective of the store is to provide necessary inputs to the production/operations departments at a minimum cost.

To ensure this the following activities are to be performed:

(i) To make available a balanced flow of raw materials, components, tools, equipment and other stores required for operation.

(ii) To provide maintenance materials, spare parts and general stores as required. (iii) To receive and issue materials after physical inspection and proper identification. (iv) To store and preserve materials.

(v) To ensure safety and security of materials.

(vi) To arrange for collection, acceptance of scrap and other discarded materials for disposal. **Functions of a Store # 2. Secondary Functions:**

The secondary activities related to the stores

functions are: 1. Collection, inspection and acceptance

2. Stores

accounting. 3.

Stock control

4. Feedback information to materials control section

5. Help in standardisation and variety

reduction **6. Service information such**

as:

(a) Demand for materials and parts giving specification, quantities and deliveries required (b) Notification when stocks are running low

(c) Details of deliveries rejected on inspection

(d) Certification of invoices for quantity and

quality (e) Particulars of anticipated

changes in consumption

(f) Procurement of items urgently required in case of

breakdowns (g) Listing of obsolete, surplus and scrap materials for disposal.



Stores system:

A typical Stores has a process and a space within, to receive the incoming materials (Receiving Bay), keep them for as long as they are required for use (Custody) and then to move them out of stores for use (Issue). In a manufacturing firm this process forms a cycle to maintain and run the activities of Stores.

The basic responsibilities of stores are to act as custodian and controlling agent for parts, supplies, and materials, and to provide service to users of those goods. Well-designed systems provide flexibility to absorb the shock demand variation,

and enable purchasing to plan ahead, practice forward buying, and so forth.

Thus, the terms Stores, Storehouse, or warehouse all of them refer to a building or room or place where materials are kept.

An organization usually has different types of stores like which it refers by different names **on the basis of material nature** such as:

Raw Materials Store

Processed or Semi-Finishing Materials Store

Finished Goods Store

Yard Store

BIN card:

What is a BIN card?

A bin card is a common element in a perpetual inventory system. "Perpetual" simply means the inventory is always in flux. A bin card is particularly common in a retail stockroom. The card includes a number of data points about a particular product, but its most important function is to show how many units of a particular product are in stock.

Materials issue request(MIR):

A Material Request is a simple document identifying a requirement of a set of Items (products or services) for a particular reason.

A Material Request can be of the following types:

Purchase: If the material being requested is to be purchased.

Material Transfer: If the material being requested is to be shifted from one Warehouse to another.

Material Issue: If the material being requested is to be Issued for some purpose like manufacturing.

Manufacture: If the material being requested is to be produced.



Customer Provided: If the material being requested is to be provided by Customer.

Pricing of materials:

There are various methods which are in use for pricing issues of materials or stores. They are (1) Replacement Cost Method, (2) Fixed Price Method, (3) Standard Price Method, (4) Inflated Price Method, (5) Highest in First Out (HIFO) Method, (6) Next-in-First Out (NIFO) Method, (7) Moving Average Method and (8) Base Stock Method.

1. Replacement Cost or Market Price on the Date of Issue:

ere cost of the materials in hand is not considered. When an issue is made the market price is ascertained and the issue is priced at that price. It is claimed that where quotations have to be made, this is the best method since it would reflect the latest competitive condition. But this confuses estimating, with costing.

We should certainly take into account the ruling prices of materials if we are preparing to make a tender but to find out the cost of doing a job is quite different. For this purpose, the cost of materials and not their prevailing price should be used.

It is also claimed for this method that it would automatically disclose efficiency or inefficiency in buying. The Stores Ledger will use cost for receipts and the market price for issues. Higher rate for issues than for receipts will disclose efficiency in buying (and vice versa). This will leave a proportionately small amount for the quantity in hand. There may even be a negative amount for a positive quantity balance.

It is, however, submitted that this would unnecessarily complicate costing books, and, in any case, costing has nothing to do with profits or losses as such. This method introduces an element of profit or loss in the cost itself because of the use of market price rather than the cost for issue of materials. It is better to avoid the use of the method even though the market price would naturally be taken into consideration at the time of sending tenders or fixing prices.

The method is also called Replacement Cost Method since the market price on the date of issue means the price at which present stock could be replaced by new stock. The term "Replacement Price" has been defined by the Institute of Cost and Management Accountants of England as:

"The price at which there could be purchase of an asset identical to that which is being replaced or revalued."

2. Fixed Price:

Under this method, the issue price is fixed for a whole period. The rate is used for costing the issues irrespective of the purchase price. It is clear that such a method will introduce an element of profit or loss in the value of material used.

For example, if the purchase price is 5 and the issue price has been fixed at 6 per unit, every time an issue is made a profit of RS. 1 per unit will be created. Thus, the Store Ledger will be complicated. Even the advantages of the market price method are not available under this method simply because the fixed price will be different from the market price.

3. Standard Price:

"Standard Price is predetermined price fixed on the basis of a specification of all the factors affecting that price." Firms which follow standard costing will record all the receipts and issues of materials at the standard price which will be fixed in advance. In this case, both the receipts and issues will be costed at a standard rate.

In case the purchase price is more or less than the standard price, the difference is charged to an

account which is known as the standard price, the difference is charged to an account which is known as "Price Variance Account". For example, if the standard price is 5 per unit and the actual price is Rs. 5.50, then the Stores Ledger will be debited at the rate of Rs. 5 and Price Variance Account with 50 paise per unit. Issues are all costed at the standard price. It serves to measure efficiency in use of materials, also it saves clerical labour.

4. Inflated Price:

Where materials are subject to natural wastage the cost may be inflated to account for the wastage. Thus, if 100 units of materials are bought for Rs. 150 and if, out of this, only 90 units can be normally used (the other ten going to waste), the issues may be costed not at 1.50 per unit but at Rs.1.67 per unit, i.e. 150 ÷ 90. With the actual issue of 90 units the amount will be exhausted and so will the actual quantity. Both in the stores ledger a quantity balance of 10 units will remain; it should be written off.

Illustration 1: (Issue of Standard Price)

Prepare Stores Ledger Account from the following purchases and issue of materials, when issues are priced at standard rate of Rs. 20 per unit:

Purchases	400 units @ ₹. 20 per unit
"	350 units @ ₹. 18 per unit
Issues	300 units
"	400 units
Purchases	400 units @ ₹. 20 per unit
"	250 units @ ₹. 25 per unit
Issues	500 units



Solution:

Stores Ledger Account

Date	Receipts			Issues			Balance		
	Qty.	Rate ₹	Amt. ₹	Qty.	Rate ₹	Amt. ₹	Qty.	Rate ₹	Amt. ₹
	400	20	8,000	—	—	—	400	—	8,000
	350	18	6,300	—	—	—	750	—	14,300
	—	—	—	300	20	6,000	450	—	8,300
	—	—	—	400	20	8,000	50	—	300
	400	20	8,000	—	—	—	450	—	8,300
	250	25	6,250	—	—	—	700	—	14,550
	—	—	—	500	20	10,000	200	—	4,550

5. Highest in First Out (HIFO) Method:

By this method quantities of materials are issued at the highest price of materials on hand. When the quantity having the highest price is exhausted, the next highest price is used in valuing issue. When this method is used in, production becomes highest, so that the profit is reduced. During a period of increasing price level, the method is equivalent to LIFO method and in a period of decreasing price level, the method is identical with FIFO method. HIFO method is of theoretical interest only as it has not received wide acceptance.

6. Next-in-First out (NIFO) Method:

Under the NIFO Method, the price of material which is to be next received is used in valuing issued materials. It is based on the assumption that the price of the next consignment is known before it is received. If by the time the materials are received, the production is completed, the production cost of materials shows the value of most current purchases. This method is almost similar to LIFO method but is more forward looking and under this method, cost of production reflects the current prices of materials.

7. Moving Average Method:

By this method, the issue rate for a certain month is established by taking the average of the periodic weighted average cost prevailing during that month and a number of months proceeding it. It may be moving average on the basis of six months, twelve months etc.

For example, if six months moving average is taken for the month of June, the moving average will be simple average of the rates prevailing for six months from January to June and for the month of July, it will be simple average of rates for February to July.

8. Base Stock Method:

Under this method, a minimum quantity of stock is always to be held in stores as fixed asset. The minimum stock is known as base stock and it should not be issued unless there is an emergency. The stock in excess of base stock would be issued in accordance with one of the methods of pricing of issue e.g. LIFO, FIFO, Average, etc. Thus it is not an independent method in itself.

Illustration 2: (Base Stock Method)

During the month of October, 2000 the following receipts and issues of the materials took place in the stock of ABC Ltd.:

	Receipts		Issues
	Units	Rate ₹.	
Oct. 1 Balance	100	2.00	—
7	80	1.50	—
9	60	2.00	—
11	—	—	140
13	—	—	20
15	40	2.50	—
24	—	—	40
25	—	—	20
28	80	1.50	—



On 31st October a shortage of 10 units was found. Record the above in the Stores Ledger assuming that the Company maintains its ledger on the *LIFO* method with a Base Stock of 80 units.

Stores Ledger Account (LIFO Method Base Stock 80 units)

Date 2000	Receipts			Issues			Balance		
	Qty.	Rate	Amt.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Oct. 1	100	2.00	2.00	—	—	—	100	2.00	200
" 7	80	1.50	120	—	—	—	100 80	2.00 1.50	200 120
" 9	60	2.00	120	—	—	—	100 80 60	2.00 1.50 2.00	200 120 120
" 11	—	—	—	60 80	2.00 1.50	120 120	100	2.00	200
" 13	—	—	—	20	2.00	40	80	2.00	160
" 15	40	2.50	100	—	—	—	80 40	2.00 2.50	160 100
" 24	—	—	—	40	2.50	100	80	2.00	160
" 25	—	—	—	—	—	—	80	2.00	160
" 28	80	1.50	120	—	—	—	80 80	2.00 1.50	160 120
" 28	—	—	—	20	1.50	30	80	2.00	160



6.4 Purchase Procedure:

Objects of Purchasing

Purchasing is the first phase of Materials Management. Purchasing means procurement of goods and services from some external agencies. The object of purchase department is to arrange the supply of materials, spare parts and services or semi-finished goods, required by the organisation to produce the desired product, from some agency or source outside the organisation.

The purchased items should be of specified quality in desired quantity available at the prescribed time at a competitive price. In the words of Alford and Beatty, "Purchasing is the procuring of materials, supplies, machines, tools and services required for equipment, maintenance, and operation of a manufacturing plant".

Functions of Purchase Dept.

Importance of Purchasing:

1. Purchasing function provides materials to the factory without which wheels of machines cannot move.
2. A one percent saving in materials cost is equivalent to a 10 percent increase in turnover. Efficient buying can achieve this.
3. Purchasing manager is the custodian of his firm's purse as he spends more than 50 per cent of his company's earnings on purchases.
4. Increasing proportion of one's requirements are now bought instead of being made as was the practice in the earlier days. Buying, therefore, assumes significance.
5. Purchasing can contribute to import substitution and save foreign exchange.
6. Purchasing is the main factor in timely execution of industrial projects.
7. Materials management organisations that exist now have evolved out of purchasing departments. . Other factors like:
 - (i) Post-war shortages,
 - (ii) Cyclical swings of surpluses and shortages and the fast rising materials costs,
 - (iii) heavy competition, and
 - (iv) Growing worldwide markets have contributed to the importance of purchasing.

Objectives of Purchasing:

The purchasing objective is sometimes understood as buying materials of the right quality, in the right quantity, at the right time, at the right price, and from the right source. This is a broad generalisation, indicating the scope of purchasing function, which involves policy decisions and analysis of various alternative possibilities prior to their act of purchase.

The specific objectives of purchasing are:

1. To pay reasonably low prices for the best values obtainable, negotiating and executing all company commitments.
2. To keep inventories as low as is consistent with maintaining production.
3. To develop satisfactory sources of supply and maintain good relations with them.
4. To secure good vendor performance including prompt deliveries and acceptable quality.
5. To locate new materials or products as required.
6. To develop good procedures, together with adequate controls and purchasing policy.
7. To implement such programmes as value analysis, cost analysis, and make-or-buy to reduce cost of purchases.
8. To secure high caliber personnel and allow each to develop to his maximum ability.
9. To maintain as economical a department as is possible, commensurate with good performance.

10. To keep top management informed of material development which could affect company profit or performance. 11. To achieve a high degree of co-operation and co-ordination with other departments in the organisation.

Steps in Purchasing:

. Steps in a Standard Procurement Cycle

1. The Need

You need to identify that there is a need to update the inventory or stock. You may also need a business service or ad hoc product.

2. Specify

Now you need to decide how much and when you want the products or services delivered.

3. Requisition or Order

This is when you write the purchase order or requisition order.

4. Financial Authority

Before the order can be placed, it usually requires some kind of authority for its purchase.

With some purchase orders, this is reasonably automatic. With a large order that will be put out to tender it could be multi staged.

5. Research Suppliers

Repetitive orders usually have set suppliers, although it does no harm to review the options sometimes. Other orders will either need to go out to tender or there will be a choice of suppliers.

6. Choose Supplier

The supplier is now

chosen.

7. Establish Price and Terms

In a large company, many suppliers will be contracted with a Master Agreement where prices and terms are set for a defined period. For other orders, now is the time to negotiate terms and prices.

8. Place Order

At this stage in the purchasing cycle, the order is placed and this becomes a contract between the business and the supplier.

9. Order Received and Inspected

The goods are delivered, checked in the warehouse and entered into the **inventory**.

Shortages and breakages are reported to the supplier for the appropriate credits to be supplied.

10. Approval And Payment

Usually within 30 days, the invoices are received and paid.

11. Update Of Records

The purchasing ledger and stock records are updated. This is automatically done by many purchasing computer systems.

6.5 Modern Techniques of Material Management

Introductory treatment to JIT / SAP / ERP

Just In Time Method

The just in time method (JIT) of inventory management involves companies planning to receive items as they are needed instead of maintaining high levels of inventory. One benefit of this inventory management method is that companies do not have a great deal of money tied up in inventory levels; they reduce storage and insurance costs and the cost of liquidating unused inventory. Another benefit of the just in time method is that companies reduce waste.

Challenges of the just in time method of inventory management come into play when manufacturers and retailers have to work together to monitor the availability of manufacturing resources and consumer demand. Just in time inventory management also is considered risky because companies take a gamble with being unable to fill orders; being out of stock reduces revenue and may harm customer relations.

SAP : SAP MM is known as **SAP Material Management**

SAP Materials Management (MM) is a part of Logistics area and helps to manage the procurement activity of an organization from procurement.

It supports all aspects of material management (planning, control etc).

It is the backbone of the Logistics area which incorporates modules like **Sales and Distribution, Production Planning, Plant Maintenance, Project Systems, Warehouse Management** which are extremely obsessed on Materials Management module.

ERP:

An ERP software has over the years proved to be an extremely beneficial and effective tool when it comes to handling different functions and departments within a manufacturing business. Majority of such businesses, irrespective of their size, use an ERP system to manage their processes, streamline their operations, and enhance their profitability. An ERP software gives them access to real-time accurate data, and helps them monitor the effectiveness of employees working on the shop floor, so that they can make much-informed and timely decisions, increase company output, and make the organization more efficient at the same time.

An ERP software also takes care of another vital area of any manufacturing business – supply-chain management. It oversees and manages the flow of raw materials, the inventory in use, or the final product from the point of origin to the point of consumption. A smooth supply chain is the lifeline of a manufacturing business, and quite naturally, any hurdle in the supply chain can affect the business adversely. For example- non-availability of raw materials, which either run out or are not replenished in a timely manner, can hamper the production process. That's where material management, a subpart of the supply-chain, gains significance.



GROUP-C , CHAPTER -7: Safety Engineering :

Definition - What does *Safety Engineering* mean?

Safety engineering is a field of engineering that deals with accident prevention, reducing the risks associated with human error, and deriving safety benefits from engineered systems and designs.

It is associated with industrial engineering and system engineering and applied to manufacturing, public works and product designs to make safety an integral part of operations.

The purpose of safety engineering is to control risk by reducing or completely eliminating it. It also aims to reduce the rate of failures and if failure does occur, it is not life threatening. Safety engineering usually begins during the design of a system or product development.

Safety engineers often make use of computer models, prototypes, or recreations of a situations to assess the hazards and risks. Safety engineers consider a number of factors that may affect the safety of a situation or product, including design, technical safety, material reliability, legislation, and human factors.

7.1 Accidents-causes of accidents

According to safety experts, there are three basic causes/factors that contribute to accidents in organisations. They are chance occurrences, unsafe conditions and unsafe acts on the part of employees.

1. **Unsafe Conditions (Work-Related Causes):**

These, of one sort or another, are the biggest cause of accidents. Such causes are associated with defective plants, equipment, tools, materials, buildings etc. These can be termed 'technical causes. They arise when there are improper or inadequate safety guards on machines; when machines break down; when improper personal protection equipment is installed; when mechanical or construction designs are defective and unsafe; and when control devices, which have been installed to make the operation of machines safe and accident free are lacking or defective; or when there is an absence of proper maintenance and supervision of these devices.

Thus, unsafe conditions

include: i. Improperly guarded

equipment. ii. Defective

equipment.

iii. Hazardous arrangement or procedure in and or around, machines or equipment. iv. Unsafe storage; congestion, overloading.

v. Inadequate safety devices.

vi. Wrong and faulty lay-out, and bad location.

- vii. Improper illumination – glare, insufficient light.
- viii. Improper ventilation – insufficient air charge, impure air source.
- ix. Poor house-keeping.

The other work related causes of accidents are:

(a) The job itself- Some jobs are inherently more dangerous than others, such as the job of crane-man in comparison to that of the foreman. Similarly, work in some departments (like personnel) is inherently safer than the work in others (like production department).

(b) Work schedules, accidents increase late in the day. They do not usually occur during the early hours of the work day. They are more frequent during the night shift. This is due partly to fatigue and partly to the fact that night is the period when one requires rest.

(c) Psychological climate of the work place also affects the accident rate. Psychological, mental and emotional imbalances are at the root of several accidents.

2. Unsafe Acts:

These acts may be the result of lack of knowledge or skill on the part of the employee, certain physical defects and wrong attitudes.

These acts include acts

like: i. Operating without authority.

ii. Failing to secure equipment or warning other employees of possible danger. iii. Failing to use safe attire or personal protective equipment.

iv. Throwing materials on the floor carelessly.

v. Operating or working at unsafe levels of speed, either too fast or too slow.

vi. Making safety devices inoperative by removing, adjusting, disconnecting them. vii. Using unsafe equipment or using equipment unsafely.

viii. Using unsafe procedures in loading, placing, mixing, combining. ix. Taking unsafe positions, under suspended loads.

x. Lifting improperly.

xi. Cleaning, adjusting, oiling, repairing, etc. or moving a dangerous equipment. xii. Distracting, teasing, abusing, startling, quarreling, day-dreaming, horseplay.

Personal Characteristics also influence accident behaviours of individuals. For example, characteristics like personality and motivation serve as a basis for certain behaviour tendencies – such as tendencies to take risks and undesirable attitudes.

3. Other Causes:

These causes arise out of unsafe situational and climate conditions and variations – such as bad working conditions, rough and slippery floors, excessive glare, heat, humidity, dust and fume-laden atmosphere; very long hours of work; unsatisfactory behaviour of domineering supervisors; excessive noise and carelessness in the handling of such inflammable materials such as gasoline, solvents, oil and grease, explosives etc.

Welfare measures.

Top 15 Welfare Measures for Workers

This article throws light upon the top fifteen welfare measures for workers. Some of the measures are: 1. Hours of Work and Adequate Wages 2. To Avoid Industrial Fatigue and Rest Pauses 3. To Avoid Accident and Safety Precautions 4. Fire Protection 5. Lighting and Ventilation 6. Labour Discontent 7. Industrial Housing 8. Transport 9. Education 10. Lunch Rooms and Cafeteria 11. Rest Rooms and Others.

Welfare Measure # 1. Hours of Work and Adequate Wages:

Some conflicts can arise between the employer and the workers in connection with reduction of working hours. It is true that long working hours affect the period of rest and sleep and results in exhaustion, physical and mental strain, which lead to illness. Therefore, the working hours should be reasonable.

Shorter hours of working increase the productive efficiency of the workers. But reduction of working hours cannot be encouraged below the limit where the total output is affected. The employer will pay wages in relation to the total output. Reduced output means lower wages and lower standard of living for workers.

Works committees and the welfare department can serve, as a happy medium for solution of such problems by mutual discussions.

Welfare Measure # 2. To Avoid Industrial Fatigue and Rest Pauses:

Fatigue injures health of workers and causes inefficiency and reduction in output. If not relieved by timely rest pauses, it would cause loss of concentration, reduce in muscular control and adversely affect the functioning of the eyes and ears and thus result in greater chances of accidents.

Rest pauses serve the most useful purpose of avoiding harmful effect to strain and fatigue. Therefore, adequate rest pauses must be introduced for the factory workers at the proper intervals.

Welfare Measure # 3. To Avoid Accident and Safety Precautions:

Safety measures to prevent accident are necessary in the interest of workers as well as employers.

Some of the safety measures are:

- (i) At places of dangers, mechanical safeguards and safety devices should be provided.
- (ii) Protective clothing should be supplied to the workers to avoid accidents due to loose dresses.
- (iii) Many accidents take place due to over-crowding of working space. Therefore, there should be reasonable and safe distance between the machines.
- (iv) The safety devices should be checked from time to time and defects in them should be removed before the actual failure. These will greatly help in avoiding accidents.

Welfare Measure # 4. Fire Protection:

For protection against fire, the factory building should be fire proof. Fire alarms and fire extinguishers should be installed at proper places and regular fire drills should be held, so that, in case of emergency, every person in the factory must know what to do. Special exits and stairs should be provided in case of fire.

Welfare Measure # 5. Lighting and Ventilation:

Bad lighting can cause accidents and affect the performance of workers. Therefore, the lighting systems in the factory should be carefully designed.

Good ventilation will result in the supply of constant fresh air and maintain even and bearable temperature in the workshops. Artificial cooling of hot air during summer providing 'Khas Parda' or desert cooler can go a long way in increasing the efficiency and output of the workers.

Welfare Measure # 6. Labour Discontent:

To eliminate labour discontent, following points may be noted:

The workers should be allowed to have a free expression of their grievances. Their complaints should be given due consideration, underground discontentment results a spirit of re-volt and it becomes more difficult to solve the problem at a delayed stage. Once the grievances are known, these should be settled in just and fair manner.

Welfare Measure # 7. Industrial Housing:

Over-crowding of labour in unhealthy and insanitary surrounding is considered as one of the evils of the factory system, which affects health and efficiency of workers.

Industrialists should try to construct their own cottages in the vicinity of the works and rent these to their workers. The sanitation and supervision of such colonies should be the re-sponsibility of the employer. This will greatly improve the relations between the employer and the workers.

Welfare Measure # 8. Transport:

Where the workers live far away from working sites and ordinary means of transport are not available at cheap rates, the employers should provide buses to carry the workers, who have to walk for long distance in order to reach their factory. The unnecessary strain on walking reflects on the efficiency of his work and output.

Welfare Measure # 9. Education:

The welfare department should include among their activities, the education of adults, and the children of workers. The workers must be encouraged to attend these classes and to send their children to schools, run by the employer. Some major industrial concerns have provided these facilities.

Welfare Measure # 10. Lunch Rooms and Cafeteria:

Where the housing accommodation is far away from the works, and the workers cannot go home and return in time during recess hours, they should be provided mess facilities inside the factory area for supply of cheap wholesome and well-cooked mid-day meals to workers.

The food should be provided at actual cost and the activities should be controlled and managed by the works committee under the guidance of welfare workers. Some concerns provide meals etc., at subsidised rates.

Welfare Measure # 11. Rest Rooms:

Properly equipped rest rooms should be provided away from the noise and dirty atmosphere of the factory for providing an opportunity to the workers to relax and restore their energy during the rest time. These rooms should be well ventilated, bright and provided with adequate sanitation.

Welfare Measure # 12. Medical Service:

Good health of workers would mean better output and more profits for the employer. It is, therefore, considered as the responsibility of the employer both from business and humanitarian point of view. The medical service is considered as the activity of the welfare department.

Free medical aid should be provided to the sick workers. It would be desirable to maintain a hospital with a few beds in the charge of a fully qualified medical officer and to provide a well-equipped dispensary, and first-aid appliances. A fulltime nurse can be very helpful in cases of accidents and other things, where the patients are admitted in the hospital.

Welfare Measure # 13. Sport and Games:

Games and sports ensure robust health and feeling of brother-hood among the workers. Provision of rest rooms and indoor games can be enjoyed by the workers during mid-day intervals. Subordinate and higher officials can come in contact with the workers. This develops cooperation and cordial relations amongst them and reduces the industrial disputes. They will learn to respect each other.

Welfare Measure # 14. Financial Assistance:

As the workers often need money for discharging their family obligations and them generally do not have a reserve to fall back upon at such emergency.

Hence following welfare schemes should be made to help the workers to improve their economic securities to protect them from continued financial worries:

(i) Savings Deposits. (ii) Co-operative Savings and Loan assistance. (iii) Mutual Benefit Schemes.

(iv) Pension

Fund. (v)

Provident Fund.

(vi) Home Ownership

Scheme. (vii) Group

Insurance.

(viii) Employer's Co-operative Stores.

These schemes can serve in the interest of the workers to a large extent and bind them with loyalty to the employer.

Welfare Measure # 15. Other Activities:

Among other activities of the welfare department, a few more can be added, such as: (i) Training and care of young recruits.

(ii) Work Library.

(iii) Work

Magazines. (iv)





Annual outings.

(v) Sports competition.

(vi) Relief fund for families of workers in difficulties. (vii) Conduct of enquiries into wrongful dismissals.

(viii) Special facilities for women and young person are working in the factory. (ix) Sickness and accident insurance.

Example:

An example of better welfare facilities provided by a big industrial concern is as follows:

Meals and snacks are served to the employees at subsidised rates.

Free medical aid available to all employees, their families and dependent parents at the modern hospital and dispensaries located in different parts of the township of the concern.

Spread over a big area with 2200 residential houses, the township is equipped with all modern amenities including schools for nursery to higher secondary, shopping centres, community centres, play grounds, clubs, post and telegraph office, banks, auditorium, cinema hall etc.

7.2 NEED OF SAFETY

Workplace safety is very important for each and every employee in the industry because all the workers desire to work in a safe and protected atmosphere. Health and safety is the key factor for all the industries in order to promote the wellness of both employees and employers. It is a duty and moral responsibility of the company to look after the employee's protection.

Each and every person who leaves his home for his work in the morning should come back to his home in evening in good health. Have you ever imagined that your loved one will never be returning home? Or you get a call that he/she is in the hospital due to some incident occurred? These thoughts only get us goose bumps. This is the only reason that why it is important to create a safe working environment. These days, workplace health and safety procedures are important for the well-being of both employees and employers because human loss is immeasurable and intolerable. As, such loss or injuries can employ major loss to the families.

All the industries do have safety risks but the management should devote their time to think and strategize the things that what safety precautions are required in their company to make sure that their workers are safe enough for all the time. Also, the management should confirm with all the workers related to their daily work and comfort. So, that the management can take the same step according to the desired aspects of workers. This helps them in improving the productivity and quality of the products and lot more.

1. Aware about the surroundings: There are many employees who doesn't bother about their surrounding hazards. But, it is important to observe your co-employees working circumstances. Once you get to know about the particular hazards that occur at your workplace, then it will help you in reducing the risk and allow you to take the precautionary steps.

2. Reduce workplace stress: Most of the employees are not fit and healthy because of their busy schedule, which includes long working hours, work-pressure and conflicts occur with co-workers or with the boss of the organization. And, all

these can lead to some illness or depression to the employees. Also, this not only affects their professional life but also creates the nuisance in their personal lives too. So, instead of waiting to get unfit, it is better that you start take care of your health, by taking regular breaks, sit in an appropriate posture with appropriate diet. It will be better for you to schedule your work accordingly and manage the things to reduce your workplace stress.

3. Use tools appropriately: Take appropriate precautions while using machinery or any other tool, instead of taking any shortcuts. Taking shortcuts is one of the biggest reason behind workplace loss. It's a biggest safety risk to use scaffolding as a ladder or one tool instead of another for a particular job. So, it is always recommended to use the correct tools and reduce the opportunity of workplace injury.

4. Keep crisis exits which are easily accessible: In case there is an emergency, you will need quick access to the exits. It is also advised to keep clear usage of equipment shutoffs which might stop you from performing at emergency.

5. Update Your Supervisor about the unsafe conditions: It is important that you keep updating your supervisor about the hazards or risks occur at workplace. They should be legally obligated to ensure that their employees are working a safe environment or not. And, in case, if the employees are not working in safe conditions, then it is the responsibility of the supervisor to listen and understand their condition and create safe working environment for employees.

6. Use mechanical assistance: Whenever, you want to carry or lift up some heavy equipment's then you should use a conveyor belt, crank or forklift. There are lot of risks involved, if you try to lift something which is heavier, it can affect your weighing capability and can lead to some muscle displacement. So, make sure that use the appropriate tools for not harming yourself.

7. Stay Alert: There are many employees who usually compromise or ignore the alerts of advance warning and due to this, a number of workplace injuries or fatalities occur.

8. Reduce Workplace Environment Stress: Stress to any employee or to any co-worker, can lead into depression and into concentration problems. And the main reason includes, extended working hours, excess of work, insecurity of job and issues which occur at co-workers or professionals. So, instead of taking stress on your shoulders, you should discuss it with your supervisor and ask him/her to look after your problems which you are facing in the organization.

9. Wear the right safety equipment's: It is essential that you wear the right protection equipment tools during your work. And, the equipment's can be in any form like, earplugs, earmuffs, hard hats, gloves, full-face masks, safety gloves and any other equipment which is required to wear while working. These tools will prevent the workers from the incidents that occur at workplace.

10. Sit in a proper posture: If have a sitting job, then it is essential than keep your

posture correct, while working on a desk. You need to keep your shoulders in line and straight back to avoid any spine problem. Try to ignore stooping and twisting regularly and if possible, then try to use the comfort designed furniture and the safety equipment's, so that the desired things will be in your reach.

Safety is one of the biggest issue and it is completely the responsibility of the mangers and the business owners to make sure that their employees are working in safe environment or not. The management should make sure that they keep on motivating and boosting the employees to make them active in the working process.

There should be an appropriate discussions done about the work and the culture of the office on regular intervals, so that the management remain aware that how they simplify the things for the employee's comfort. Also, to motivate the workers, management should provide rewards as an appreciation towards their work. Thus, these only steps will make your workplace very secure and safe for the employees to work.

7.3 ORGANISATION FOR SAFETY

National Safety Council (India)

National Safety Council is a premier, non-profit, self-financing and tripartite apex body at the national level in India. It is an autonomous body, which was set up by the Government of India, Ministry of Labour and Employment on 4 March 1966 to generate, develop and sustain a voluntary movement on Safety, Health and Environment (SHE) at the national level. It was registered as a Society under the Societies Registration Act, 1860 and subsequently, as a Public Trust under the Bombay Public Trust Act, 1950.

Activities:

- Conducting specialised training Courses, Conferences, Seminars & Workshops all over the Nation
- Conducting consultancy studies such as Safety Audits, Hazard Evaluation, Emergency Management Planning & Risk Assessment
- Designing and developing HSE promotional materials & publications
- Facilitating organisations in celebrating various campaigns e.g. Road safety week, Safety Day, Fire Service Week, World Environment Day
- Organised many national and international conferences e.g. XIII World Congress (1993) and XI APOSHO Conference (1995) and implemented many a prestigious project

7.4 SAFETY COMMITTEE

Roles of Health and Safety Committees:

A health and safety committee can be an important way to improve conditions on the job. The committee provides a forum for employees and management to work together to solve health and safety problems. An effective committee can help prevent injury and illness on the job; increase awareness of health and safety issues among workers, supervisors, and managers; and develop strategies to make the work environment safe and healthy. The following is a list of some possible roles of a health and safety committee.

Hazard Identification, Evaluation, and Control:

- Review injury data, accident reports, and workers' compensation records.



- Conduct regular walkaround inspections to identify potential health and safety hazards. • Conduct safety and health job analyses to identify problems.
- *Design and conduct health and safety surveys.
- Collect and review Material Safety Data Sheets (MSDSs).
- Propose and evaluate various ways to improve safety conditions. • Get recommendations acted upon.
- Review and evaluate corrective actions taken by management.
- Temporarily “shut down” unsafe operations until a hazard is corrected.
- Collect and review information on new chemicals, procedures, and processes before they are introduced.
- Participate in studies conducted by outside researchers or consultants.
- Establish or improve procedures for employees to report safety hazards or suggest improvements without fear of reprisal.

Information and Education:

- *Respond to concerns raised by workers, supervisors and managers.
- Recommend training for new employees, supervisors, and managers and refresher training on health and safety practices, procedures and emergency response.
- Plan and organize training programs.
- Establish or improve procedures for employees to report health symptoms without fear of reprisal. • Keep workers, supervisors, and managers informed about the committee’s activities

7.5 SAFETY PROGRAM and SAFETY MEASURES

As Per Attachment.

Tutorial Material for Mandatory Basic Safety Training Course (Construction Work)

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(This Part collected from
Occupational Safety and Health
Branch Labour
Department)

3

1. General Safety



No.	Key Learning Points
1	The purpose of stipulating the Occupational Safety and Health Ordinance is to protect the safety and health of employees at work.
2	Employers should contribute to safety and health by ensuring the safety and health of the employees during work. Employees should contribute to safety and health by taking care of the safety and health of himself and others at the workplace.
3	According to the "General Duties" provisions, proprietors shall

provide employees with a safe and health working environment and necessary safety information, instruction, training and supervision, and safe access to and egress from a workplace.

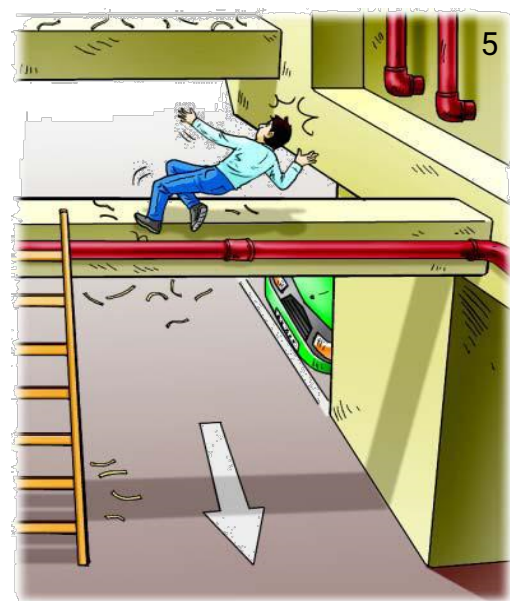
- 4 body The main pathways for chemical substances to enter a worker's body are swallowing, skin contact and inhalation.
- 5 Studying the label content outside a container is the proper way for identifying the name, classification, risks and precautions of the chemical in the container. The compulsory information of a chemical label includes the chemical name, classification, particular risks and safety precautions.
- 6 The following terms are used to classify the properties of chemicals: explosive, oxidizing, flammable, toxic, harmful, corrosive and irritant. In handling chemicals, an employee should properly use the protective clothing and equipment provided by the employer. 7 Safety practices on construction sites:
- ✧ Store loose substances and construction materials properly at designated and secure locations.
 - ✧ Place materials far from a floor opening.

No.	Key Learning Points
	<ul style="list-style-type: none"> ✧ Don't throw materials from height. ✧ Don't work near a floor edge or a floor opening without guardrails. ✧ Don't place materials on passageways. ✧ Timber with projecting nails should be flattened or extracted immediately. ✧ Wear approved eye protectors when conducting welding work. ✧ Never work under goods in suspension.
8	<p>A construction site with 5 workers or more employed shall be provided with a first aid box. The number of first aid facilities required depends on the number of workers employed. Wording of "first aid" shall be clearly marked on the first aid box. The booklet "Hints on First Aid" published by the Labour Department and the substances required statutorily shall be placed in the first aid box.</p>

- 9 A construction site with 30-99 workers employed shall have a person trained in first aid.
- 10 The principal contractor of a construction site with 100 or more workers employed shall employ a full-time registered safety officer.
- 11 An employer shall provide his employees with potable water.
- 12 An employer shall report a dangerous occurrence happened in a workplace to the Labour Department with 24 hours.
- 13 "Mandatory Safety Training" courses shall be recognized by the Commissioner for Labour.



2. Work at Height



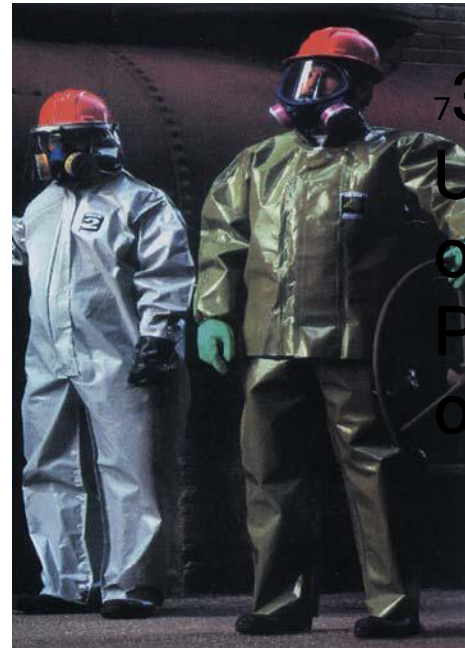
No.	Key Learning Points
1	Most fatal accidents in the construction industry are imputed to

- working at height. Adopting working platforms should be of the first priority while working at height.
- 2 Scaffolds (including working platforms) should be erected by trained scaffolding workmen. A competent person should inspect a scaffold and issue a Form 5 to state the scaffold is in safe condition within 14 days before the scaffold is used and at least every 2 weeks.
 - 3 A working platform's safety design includes guardrails and toeboards. The main function of guardrails at a working platform is to prevent fall of workers. The main function of toeboards is to prevent fall of persons, objects and tools.
 - 4 The minimum width of a working platform is 400mm. The height of the top guardrail on the working platform shall be 900-1150mm. The height of toeboards on the working platform shall not be less than 200mm. The boards forming working platform should not be less than 200mm in width and not less than 25mm in thickness or not be less than 150mm in width and not less than 50mm in thickness.
 - 5 Before using a safety harness, whether any suitable anchorage, independent lifeline and fall arresting device is available should be considered. When it is required to use a safety harness as a fall preventive measure, the harness should be attached to a secure anchorage or an independent lifeline.



No.	Key Learning Points
6	When a worker conducts scaffold maintenance work at an external wall, the most suitable safety harness anchorage is an independent lifeline. The most appropriate safety harness anchoring method is to anchor it at a level higher than the user's waist.
7	At least 3 anchor bolts should be used to fix each metal bracket of a truss-out scaffold onto the external wall of a building.
8	When a ladder is used for access or egress, it should be ensured that the ladder is stable and resting on an even and solid ground. Never joint short ladders to form a long one for use. The top of a ladder should protrude the landing platform at least 1.0 metre as a handrail.
9	Workers working at a gondola shall wear safety belts anchored to independent lifelines.
10	The minimum depth of a cage or receptacle used for carrying persons is 900mm.
11	When somebody has fallen from height, inform the first aider immediately and look after the injured person. Do not move the injured person.
12	A scaffold with suitable working platform and safe means of access and egress should be provided to workers to ensure the cleaning work at height can be conducted safely.
13	Ladders should be regularly inspected and maintained
14	A suitable working platform with guardrails and toe-boards should be used while installing electrical conduits on ceiling at height.





3. Use of Personal

Protective Equipment

No.	Key Learning Points
1	Use of personal protective equipment is the last resort when controlling the sources of accident is ineffective.
2	Personal protective equipment is provided by employers. Whether proper protection can be provided should be considered first when selecting personal protective equipment. Employees should understand the matters of "selection, use, maintenance and fit for the work" related to personal protective equipment. Replace unfit or damaged personal protective equipment immediately.
3	A safety helmet is used for protecting a worker's head from direct hit by falling objects. A worker working in a construction site shall wear a safety helmet at all times regardless he is working inside a building or required to work for a few minutes only. One of the basic requirements of safety helmets is bearing

a safety marking such as the European Standard number.

4 The following are the safety practices regarding safety helmets:

- ✧ A sufficient clearance should be maintained between the head and the shell of a safety helmet.
- ✧ Regularly check if there is any damage.
- ✧ Regularly clean a safety helmet but not with an organic solvent.
- ✧ Regularly check the expiry date.
- ✧ Don't remove the helmet harness.
- ✧ Don't pierce holes on a safety helmet to enhance ventilation.

8



No.	Key Learning Points
	✧ Don't place a straw hat inside a safety helmet for shading sunlight.
5	Steel toe caps, steel soles and slip-proof characteristics are the basic requirements for safety shoes.
6	In comparison with a general purpose of safety belt, the use of a full body harness can effectively reduce the extent of injury to the waist of
	the user during falling .
7	Appropriate aprons, safety shoes, gloves and face shields should be worn while handling chemicals. Gloves specific for handling the
8	chemical should be used. The user of a respirator should note the closeness between the respirator and the user's face. After using a respirator, the user should clean and wipe the respirator thoroughly. Appropriate dust filters should be used for protecting the respiratory system of workers engaged in grinding work. Appropriate masks and eye protectors
9	should be used by workers entering dusty workplaces. Prolonged exposure to high levels of noise can lead to hearing damage. Ear muffs have generally the best performance for hearing protection. Only ear protectors including ear muffs with their brands and models approved by the Labour Department can be used. Piling work would generate high levels of noise.
10	Workers working in the noise affected area shall wear approved ear protectors appropriately. Wet drilling method and dust removal equipment should be adopted as safety measures for drilling holes in a tunnel.
11	When operating a machine with revolving parts, workers should not wear cotton gloves so as to avoid causing injury to hands due to entangling of cotton gloves with the revolving parts of
1	the machine.
2	It is inappropriate to wear working uniforms stained with inflammable liquid, sandals and slippers at work.
3	Silicosis is caused by prolonged inhalation of silica dust. Hand-dug caisson workers are most likely to suffer from this disease.

4. Fire Safety



No.	Key Learning Points
1	Most fatal cases in fire are caused by inhalation of smoke.
2	The essential conditions for burning are fuel, heat and oxygen. Therefore, isolating the fuel, cooling and cutting off the oxygen supply are fire fighting methods.
3	Rubber floor tiles laying work with the use of adhesive is a high fire risk construction process.
4	Fire is likely caused by spraying of flammable liquid (e.g. paint spraying).
5	Burning of paper, cloth, timber, plastic, rubbish and miscellaneous articles is classified as the first category of
fire. 6	<p>The following are fire prevention measures:</p> <ul style="list-style-type: none"> ✧ Check the fire fighting equipment regularly. ✧ Keep the exit doorway free from obstruction. ✧ Keep the workplace clean and tidy. ✧ Keep the smoke doors closed. ✧ Carefully use the machines and tools that would generate sparks and heat. ✧ Confirm the location for assembly after fire evacuation. ✧ Flammable substances should be stored in metal cabinets. ✧ Don't store large quantities of flammable substance in the workshop. ✧ Don't stack miscellaneous articles to block the fire fighting equipment.
	✧ Used rags soaked with flammable liquid should be placed in covered metal containers.

No.	Key Learning Points
	✧ Workers should not smoke within a “No Smoking Area” so as to prevent ignition of the inflammable substances nearby.
7	A water type fire extinguisher is suitable for putting out a timber fire but not for a fire caused by a flammable liquid, e.g. petrol.
8	A foam type fire extinguisher is not suitable for a fire caused by failure of electrical appliances.
9	When using a dry powder type fire extinguisher, one should note that the discharged dry powder may cause disorientation.
10	Carbon dioxide type fire extinguisher is most appropriate for putting out an electrical fire.



5. Machine Safety



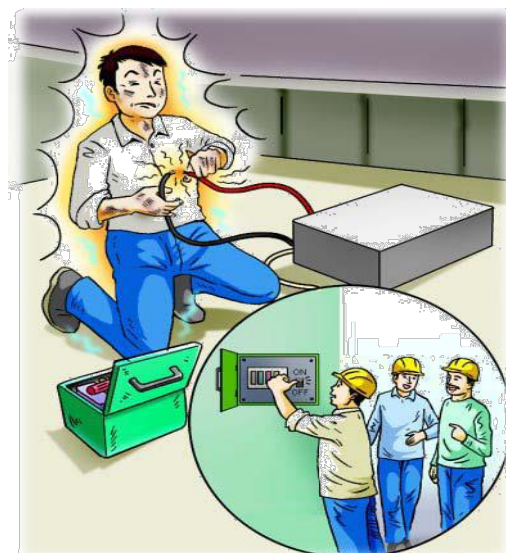
No.	Key Learning Points
1	A contractor should mark the platform or cage of a material hoist with the safe working load. Carriage of persons by a material hoist is prohibited. The operation of a material hoist is forbidden when any hoistway gate is not closed. A competent examiner is responsible for carrying out the testing and thorough examination for a material hoist.
2	A gondola should be operated by a worker who holds a valid gondola operation certificate. A gondola should be checked by a competent person every week and issued with an approved form stating that it is in safe condition.
3	Factors contributing to accidents of lifting appliances (such as jib crane or tower crane): ✧ Overload causing the crane to overturn or the jib to break. ✧ Insufficient training of the crane operator. ✧ Workers working within the lifting operation area.
4	✧ Misunderstanding between the crane operator and the signaller. A lifting appliance (such as jib crane or tower crane) should undergo a thorough examination by a registered professional engineer once every 12 months. A competent person should be responsible for the weekly
5	inspection of a lifting appliance.
6	A crane operator shall attain 18 years old and hold a valid relevant certificate. Also, an excavator operator shall attain 18 years old and hold a valid relevant certificate.
6	If a crane is equipped with outriggers, they should be fully extended and supported on rigid timber blocks. When operating a telescopic jib crane near an overhead cable, one should use “goal posts” to restrict the working zone of the jib.

No.	Key Learning Points
7	Every piece of lifting gear (e.g. wire sling) shall be marked with its safe working load.
8	Lifting gear (e.g. a sling) should undergo a test and thorough examination by a registered professional
9	engineer. Accidents in operating machinery are commonly caused by failure of the machine guarding.
10	Safety precautions for repairing the revolving parts of a machine: <ul style="list-style-type: none"> ✧ Prevent personnel not responsible for the repairing work from coming near. ✧ Shut off (isolate) the power supply before starting the repairing work. ✧ Post notices regarding the repairing at the switches of the machine and also lock up the switches. ✧ Keep the machine guarding in place for testing and cleaning the machine. ✧ Install back the removed protective guards before re-starting the machine.
11	Safety precautions for using an abrasive wheel: <ul style="list-style-type: none"> ✧ The safety guard shall be provided and kept in position while the abrasive wheel is in motion. ✧ Affix a notice which specifies the highest permissible speed and the safety rules of using the abrasive wheel. ✧ Replacement of the abrasive wheel can be conducted only by a person authorized by the proprietor in writing. ✧ Select an appropriate abrasive wheel for use.



6. Electricity

Safety



No.	Key Learning Points
1	Electrocution is mainly due to serious injury of the heart.
2	Before using an electrical appliance, one should check if the tool is functioning properly. An portable electrical tool should be earthed unless it is of double-insulated construction. Earthing of an electrical tool can reduce the risk of electric shock. The marking of “回” on a portable electrical tool means it is of double -insulated construction. Double-insulation of electrical tools can avoid current leakage.
3	An electrical appliance should be repaired after the power supply has been completely isolated. A failed electrical appliance should be repaired by a competent electrician.
4	Improper repairing of an electrical appliance may cause explosion, burnt or electric shock. Practices/situations leading to electrical accidents: ✧ Repair electrical tools by an unqualified person. ✧ Unauthorized modification of electrical tools. ✧ Allow live parts of electric wires to expose. ✧ Directly connect wires to power supply without using an electric plug. ✧ Conduct arc welding in a humid environment.
5	Practices/situations to avoid electrical accidents: ✧ Repair electrical tools by a competent electrician. ✧ Regularly inspect electrical tools.



- ✧ Adopt “permit-to-work” for repairing electrical appliances.
- ✧ Use an appropriate plug to connect power supply.
- ✧ Stand on an insulated mat.



No.

Key Learning Points

✧ Adopt water-proof facilities for outdoor electric wires connection. ✧ Use water-proof electrical appliances in a humid environment.



7. Safety of Confined Spaces Operations



No.	Key Learning Points
1	A “confined space” is defined to mean any place in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk, and includes any chamber, tank, vat, pit, well, sewer, tunnel, pipe, flue, boiler, pressure receiver, hatch, caisson, shaft or silo in which such risk arises. The specified risks include a fire or explosion, an increase in body temperature, lack of oxygen, an increase in the level of liquid and entrapment by a free flowing solid.
2	All workers entering a confined space (e.g. water tank of a building) shall be certified workers defined by Factories and Industrial Undertakings (Confined Spaces) Regulation. A certified worker shall attain the age of 18. Before certified workers enter a confined space, a work permit (certificate) should be obtained first. Certified workers should leave the confined space at once when the safe period of the work permit expires.
3	Prior to commencement of work in a confined space, the proprietor shall appoint a competent person specified by the Factories and Industrial Undertakings (Confined Spaces) Regulation to conduct a risk assessment to the confined space. Before entering the confined space, the recommendations of the risk assessment should have been completed.
4	The duty of the person stationed outside a confined space is to communicate with workers inside the confined space.
5	Nobody is allowed to enter a confined space when a detection of the

gas inside the confined space has not been performed.

No.	Key Learning Points
6	A worker should wear a self-contained respirator when entering a confined space for rescue.
7	Providing an effective forced ventilation is a mandatory precaution before workers enter a confined space.
8	Using a portable generator at the bottom of a lift shaft may cause carbon monoxide poisoning.



8. Manual Handling Operations



No.	Key Learning Points
1	The proper method of manual handling operations is holding the object close to the body, lifting with the legs by slowly straightening them and keeping the lower back straight. The most common injury suffered by workers engaged in lifting heavy goods is strain and sprain. Lifting of heavy objects by bending the waist will likely cause injury to the waist. Doing warm-up exercises before transporting goods can render the muscles and cardiopulmonary system more adaptable to the change so as to reduce chance of getting injured.
2	When using a trolley to transport goods, one should note whether the structure of the trolley is good or not, any potential hazards in the pathway and whether the floor is even or not.
3	Before transporting curtain wall glass panels, the responsible person is required to make assessment of the risks.
4	Proper practices of manual handling operations: ✧ Adopt a proper posture (i.e. keep the back straight). ✧ Use the power of thigh muscles to lift goods. ✧ Provide sufficient manpower to conduct a manual handling operation.
5	✧ Use mechanical tools (e.g. trolleys) to transport goods. ✧ Reduce the weight of the goods to be carried. Improper practices of manual handling operations: ✧ Suddenly increase the movement speed. ✧ Make jerky motions. ✧ Frequent and prolonged repetitive movements. ✧ Only twist the upper body

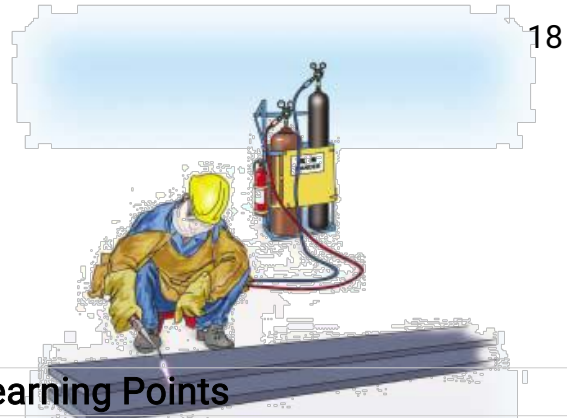


trunk.

✧ Slippery floor.



9. Welding Safety



No.	Key Learning Points
1	Workers performing gas welding or flame cutting shall attain 18 years old and hold valid relevant certificates.
2	Safe practices of gas welding: ✧ The gas cylinders should be equipped with flashback arresters. ✧ Use screen to avoid the sparks from injuring others. ✧ Keep the gas cylinders upright.
3	Before performing flame cutting of an old pipe, one should purge the residue inside the pipe.
4	The common colour of oxygen cylinders used in gas welding is black and that of acetylene cylinders is maroon.
5	An acetylene cylinder should not be laid flat on ground so as to avoid
6	leakage of flammable liquid from the cylinder. Common hazards of arc welding include electric shock, arc radiation and inhalation of harmful gases. Prolonged inhalation of excessive metal dust can cause damage to welder's lung tissue. The ultraviolet radiation generated in arc welding would cause damage to the eyes of
7	a welder. Personal protective equipment for arc welding includes eye shield, gloves and insulated shoes.
8	Workplaces for welding work should be: ✧ Provided with adequate lighting. ✧ Equipped with appropriate fire extinguishers. ✧ Well-ventilated.

9 In a poorly ventilated environment, performing welding work may cause oxygen deficiency.



10. Safety of Excavation Work



10. Safety of Excavation Work.

No.	Key Learning Points
1	The most important excavation safety measure is to obtain the actual locations of the underground pipes, cables and other public facilities.
2	During the excavation work, the excavation including the related pit and slope should be thoroughly examined by a competent person at least once every 7 days. A competent person should fill in Form 4 after a weekly examination of the excavation.
3	The most dangerous outcome of excavation work is collapse of soil. Therefore, debris and heavy machines should be stacked far away from a pit to prevent the occurrence of vibration and overload which cause the pit collapse. The purpose of providing suitable support and
4	shoring at the edge of an excavation is to avoid collapse of the pit. During excavation, if the floor of the pit cracks and the support is broken or loosened, stop the work immediately, leave the pit and report to the superiors.
5	When a worker discovers unidentified underground pipes and

electric

cables during piling works, he should stop the work immediately and inform the supervisor.

6 Measures for maintaining a good ventilation system for a tunnel work:

- ✧ Regularly test and inspect the air quality.
- ✧ Avoid accumulating the exhaust gases inside the tunnel.
- ✧ Ensure the fresh air ducts extend to all locations of the workplace.



Items

No.	Key Learning Points
1	The Government, employers and workers are responsible for preventing industrial accidents. Workers should be responsible for their own unsafe acts. The consequences of industrial accidents are death, injury and occupational disease.
2	Good housekeeping at a workplace can provide a safe and effective working environment. Stacking materials arbitrarily on a passageway can cause accidents. Segregating the pedestrians from the moving vehicles is an effective measure to prevent traffic incidents in a construction site.

- 3 Contingency plans should be devised and drilled regularly so as to allow workers to familiarize with the procedures of the contingency plans. An emergency contingency plan for fire accidents can minimize the loss caused by fire.
- 4 In a hot and humid environment, workers are more likely to sustain heat stroke. Thirst and nausea are common symptoms of heat stroke. Measures for preventing heat stroke:
 - ✧ Avoid working under direct sunlight.
 - ✧ Setting up temporary sunshade.
 - ✧ Rescheduling work to cooler periods in the daytime and cooler places.
 - ✧ Providing cool potable water.
 - ✧ Wearing light-coloured and loose-fitting clothing.
 - ✧ Taking regular rest.
- 5 The main purpose of implementing the mandatory basic safety



No.	Key Learning Points
	training (green card) is to enhance workers' safety awareness. The validity of "Green Card" is 3 years.
6	When asbestos is discovered during building demolition work, workers should stop the demolition work and report to the management.
7	To ensure work safety, workers should not drink alcohol during lunch time.
8	The purpose of a permit-to-work system is to ensure that all safety measures have been implemented before the work starts.
9	An employer should report a fatal accident to the Labour Department within 24 hours after the time when the accident occurred.

