

# **Management & Information System**



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## **ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING**

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self-instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this. Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self-instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure student's performance (continuous assessment).



## **PREFACE**

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect.

All the best for your studies from our team!



# Management & Information System

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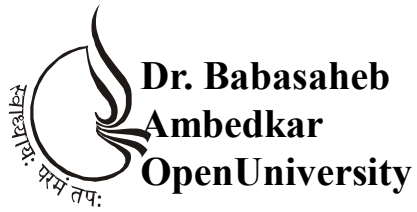
### **Unit 3 : Working with Internet**

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### **Unit 4 : Management Issues in MIS**

Introduction, Concept of MIS, Information Security and Control, Quality Assurance, Ethical and Social Dimensions, Intellectual Property Rights as Related to IT Services/IT Products, Managing Global Information Systems





**BBAR-303**

# **Management & Information System**

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## **BLOCK-1 INTRODUCTION TO MANAGEMENT INFORMATION SYSTEM**

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### **UNIT 1**

MANAGEMENT INFORMATION SYSTEM : BASIC CONCEPTS

### **UNIT 2**

MIS APPLICATIONS IN ORGANISATION

### **UNIT 3**

MIS ISSUES AND CHALLENGES

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## **BLOCK 1 : INTRODUCTION TO MANAGEMENT INFORMATION SYSTEM**

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### **Block Introduction**

In this block you will learn about management, overview, functions and level of management. You will also learn about system, information system, need for information system, role and use of information system.

We will learn about information for management, computer-based management system, and management information system in which we will learn about the objectives, characteristics and role of management information system.

The combination of human and computer-based resources that results in the collection, storage, retrieval, communication and use of data for the purpose of efficient management of operations and for business planning.

Management Information System (MIS) is basically concerned with processing data into information, which is then communicated to various departments in an organization for appropriate decision-making. Data collection involves the use of Information Technology (IT) comprising computers and telecommunications networks (E-Mail, Voice Mail, Internet, Telephone, etc.). Computers are important for more quantitative, than qualitative, data collection, storage and retrieval. Special features are speed, accuracy and storage of large amounts of data.

## **Block Objectives**

**After learning this block, you will be able to :**

- Overview, Functions and Levels of Management
- System, components and types of system
- Information system
- Need, uses and role of information system
- Computer based information system
- Management information system
- Benefits and limitations of MIS
- MIS security and ethical issues

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**Block Structure**

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Unit 1 : Management Information System : Basic Concepts

Unit 2 : MIS Applications in Organisation

Unit 3 : MIS Issues and Challenges



## MANAGEMENT INFORMATION SYSTEM : BASIC CONCEPTS

### UNIT STRUCTURE :

- 1.0 Learning Objectives**
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- 1.3 Overview of Management Concepts**
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- 1.14 Glossary**
- 1.15 Assignment**
- 1.16 Activities**
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- 1.18 Further Readings**

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### **1.0 Learning Objectives :**

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**After going through this unit you should be able to :**

- Know the fundamental management concepts
- Understand the basic concepts of Information Systems
- Understand and apply core knowledge in Information Systems
- Identify and analyze requirements for information systems

## **Management & Information System**

- Understand and apply design principles in Information Systems.
- Identify the basic components of Management Information Systems.
- Conceptualize information systems as combinations of hardware and software technologies.
- Know the applications of information systems in various levels of Management.

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### **1.1 Introduction :**

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Management Information System (MIS) is a study of people, technology, organizations, and the relationships among them in a broader sense. However in precise terms MIS is a software system that focuses on the management of information technology to provide efficiency and effectiveness or strategy decision making. The term is often used in the academic study of businesses and has connections with other areas, such as information systems, information technology, informatics, e-commerce and computer science. In this unit, we will discuss the basic concepts in Management Information System.

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### **1.2 Basic Concepts :**

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Management Information System is an accumulation of 3 different terms as explained below.

**Management :** We can define management in many ways like, "Manage Man Tactfully" or Management is an art of getting things done by others. However, for the purpose of Management Information System, management comprises the process and activity that a manager does in the operation of their organization, i.e., to plan, organize, direct and control operations.

**Information :** Information simply means processed data or in the layman language, data which can be converted into meaningful and useful form for a specific user.

**System :** The system can be explained in a following ways:

- System can be defined as a set of elements joined together for a common objective.
- A group of interrelated or interacting elements forming a unified whole e.g., business organization as systems.
- A group of interrelated components working together towards a common goal by accepting input and producing output in an organized transformation process.

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### **1.3 Overview of Management Concepts :**

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Every business unit has some objectives of its own. These objectives can be achieved with the coordinated efforts of several personnel. The works of a number of persons are properly co-ordinated to achieve the objectives through the process of management.

Management is a vital aspect of the economic life of man, which is an organised group activity. It is considered as the indispensable institution in the modern social organization marked by scientific thought and technological innovations. One or the other form of management is essential wherever human efforts are to be undertaken collectively to satisfy wants through some productive activity, occupation or profession.

It is management that regulates man's productive activities through coordinated use of material resources. Without the leadership provided by management, the resources of production remain resources and never become production.

Management is the integrating force in all organized activity. Whenever two or more people work together, to attain a common objective, they have to coordinate their activities. They also have to organize and utilize their resources in such a way as to optimize the results.

Management is usually defined as planning, directing and controlling the business operations. Management is the process of allocating and organizations input including human and economic resources by planning, organizing, directing and controlling for the purpose of producing goods or services desired by customers so that organizational objectives are accomplished.

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#### **1.4 Functions of Management :**

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Management has been defined as a process of getting things done through others. This process is identified in a set of functions performed by managers to accomplish the goals. A manager is thus someone who defines, plans, guides, helps out, and assesses the work of others, frequently people for whom the manager is accountable in an organization. The following mentioned management functions will involve creative problem solving.

**Planning :** According to Terry and Franklin, "planning is selecting information and making assumptions concerning the future to put together the activities necessary to achieve organizational objectives." Planning includes both the broadest view of the organization, e.g., its mission, and the narrowest, e.g., a tactic for accomplishing a specific goal.

**Organizing :** Organizing is the classification and categorization of requisite objectives, the grouping of activities needed to accomplish objectives, the assignment of each grouping to a manager with the authority necessary to supervise it, and the provisions for coordination horizontally and vertically in the organization structure. The focus is on separation, coordination, and control of tasks and the flow of information inside the organization. It is in this function that managers allocate authority to job holders.

**Directing :** Direction is telling people what to accomplish and seeing that they do it to the finest of their capability. It includes making

assignments, corresponding procedures, seeing that mistakes are corrected, providing on the job instruction and, of course, issuing orders." The purpose of directing is to control the behaviour of all personnel to accomplish the organization's mission and objectives while simultaneously helping them accomplish their own career objectives.

**Staffing :** Staffing function requires recognition of human resource needs, filling the organizational structure and keeping it filled with competent people. This function includes recruiting, training; evaluating and compensating are the specific activities.

**Controlling :** "Control is the course of action that measures present performance and guides it towards some predetermined goal. The quintessence of control lies in checking existing actions against some desired results determined in the planning process."

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### **1.5 Levels of Management :**

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According to the expert there are three types of level of management :

- (i) Top Level Management
- (ii) Middle Level Management
- (iii) Low Level or Operative Management

#### **1.5.1 Top Level Management :**

Top level management consists of board of directors, managing directors or executive committee members.

**Objectives of Top Level Management include the following.**

- Setting key objectives, policies and identifying factors essential for the development of the organization.
- Making appointments to the top position of the organization such as managers department heads etc.
- Reviewing the work of different personnel in various levels.

#### **1.5.2 Middle Level Management :**

Middle level management consists of managers of various departments such as productions, sales, marketing, resource, finance etc.

**Objectives of Middle Level Management include the following.**

- Follow the rules and policies formulated by the top level management.
- Motivating personnel for higher productivity.
- Collecting detail analysis reports from the various departments.
- Mutual understanding with other departments in the organization.
- Recommendations to the top level management.

#### **1.5.3 Low Level Management :**

Low level management consist of supervisors, daily workers etc. Follow the rules and guidelines made out by the top level authentic of the organization.



Some of the functions of Lower Level Management include the following.

- To issue orders and instructions to the workers and to supervise and control their work
- To classify and assign jobs to the workers
- To direct and guide the workers about work procedure
- To arrange for the necessary tools, equipment, materials etc., for the worker
- To solve the problems of workers
- To inform the management about the problems of workers which are not solved at this level?
- To maintain discipline among the workers and to develop in them the right approach to work.
- To maintain good human relations.
- To build a high group morale among the workers.

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## **1.6 Concept of a System :**

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A System is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

### **1.6.1 System Concepts :**

The concepts of a system are Technology, Application, Development and Management.

- a. **Technology** : Computer networks are systems of information processing components that are a variety of hardware, software and telecommunication technology.
- b. **Application** : That electronic business and commerce application involves interconnected business information system
- c. **Development** : That developing way to use IT in business includes designing the basic component of information system.
- d. **Management** : Managing IT emphasize the quality, strategic business value and security of an organization in information system.

### **1.6.2 Components of a System :**

There are three basic components of a system, they are

- (a) Input
  - (b) Processing and
  - (c) Output
- (a) **Input** : Input involves capturing and assembling elements that enter to the system to be processed. Some of the inputs are raw materials, energy, data etc.

- (b) **Processing** : It involves transformation process that converts input to output.
- (c) **Output** : It involves transforming element that has been produced by a transformation process to their ultimate destination.

### **1.6.3 Types of System :**

- (a) **Dynamic System** : When the interrelated component of the system interacts with each other and this controlled by management then it is known as Dynamic System.
- (b) **Cybernative System** : Dynamic System implementing the concept of feedback and control is known as Cyber native System.
- (c) **Open System** : A system got interacts with other system in its environment by exchanging input and output with its environment
- (d) **Adoptive System** : A System having the ability to change itself and its environment in order to survive is called an Adoptive System.

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### **1.7 Data and information :**

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By data we mean the facts or figures representing an object, place or the events occurring in the organization. It is not enough to have data (such as statistics on the economy). Data themselves are fairly useless, but when these data are interpreted and processed to determine its true meaning, they become useful.

#### **Characteristics of Data :**

- They are facts obtained by reading, observation, counting, measuring and weighing etc. which are then recorded
- Data are derived from external and internal sources (activities with firm).
- Data may be produced as an automatic by-product of some routine but essential operation such as the production of an invoice or alternative a special counting or measuring procedure must be introduced and the result recorded.
- The source of data need be given considerable attention because if the sources of the data flawed, any resulting information will be worthless.

#### **Data Processing :**

Data or processing systems perform the essential role of collecting and processing the daily transactions of the organizations. Data processing is necessary to ensure that the day-to-day activities of the organization are processed, recorded and acted upon. Files are maintained which provide both the current data for transaction, for example the amount invoiced and cash received during the month for statement preparation, and which also serve as a basis for operational and tactical control and for answering enquiries.

By **information**, we mean that the data have been shaped into a meaningful form, which may be useful for human beings.

So, when **data** are processed, interpreted, organized, structured or presented so as to make them meaningful or useful, they are called **information**. Information provides context for data.

Information is created from organized structured and processed data in a particular context, "information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system that can interpret the information. Conceptually, information is the message (utterance or expression) being conveyed. Therefore, in a general sense, information is 'knowledge communicated or received concerning a particular fact or circumstance'".

#### **Characteristics of Good Information :**

Good information is that which is used and which create value. Experience and research shows that good information has numerous qualities which are :

1. **Relevance** : Information must be relevant to the problem being considered. Too often reports, messages, tabulations etc. contain irrelevant parts which most prevent the user of the information to get the actual meaning of what the sender wants.
2. **Accuracy** : Information should be sufficiently accurate for it to be relied upon by the manager and for the purpose for which it is intended.
3. **Completeness** : Ideally, all the information required for a decision should be available. However, in practice, this is not often obtainable. What is required is that the information is complete in respect of the key elements of the problem. This suggests that there should be interaction between information provides and users to ensure that the key factors are identified.
4. **Confidence in the Source** : For information to have value it must be used. For it to be used managers must have confidence in the source. Confidence is enhanced:  
Data Processes Output
  - a. The source has been reliable in the past
  - b. There is good communication between the information producer and the manager.
5. **Communication to the Right Person** : All persons have a defined sphere of activity and responsibility and should receive information to help them carry out their designated tasks. In practice this is not always as easy as it sounds. It is quite common for information to be supplied to the wrong level in the organization. a superior may not pass it on the person who needs it whilst subordinates may hold onto information in an attempt to make themselves seem indispensable.

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### Functions of Information :

- (a) **Reduction of Uncertainty :** Uncertainty exist where there is less than perfect knowledge. Rarely, if ever is there perfect knowledge but relevant information help to reduce the unknown.
- (b) **An aid to Monitoring and Control :** By providing information about performance and the extent of deviations from planned level of performance, management are better able to control operation.
- (c) **As a Means of Communication :** Managers need to know about developments, plans, forecasts, impending changes and so on.
- (d) **As a Memory Supplement :** By having historical information about performance, transactions, results of past actions and decisions available for reference, personal memories are supplemented.
- (e) **As Aid to Simplification :** By reducing uncertainty and enhancing understanding, problems and situations are simplified and become more manageable.

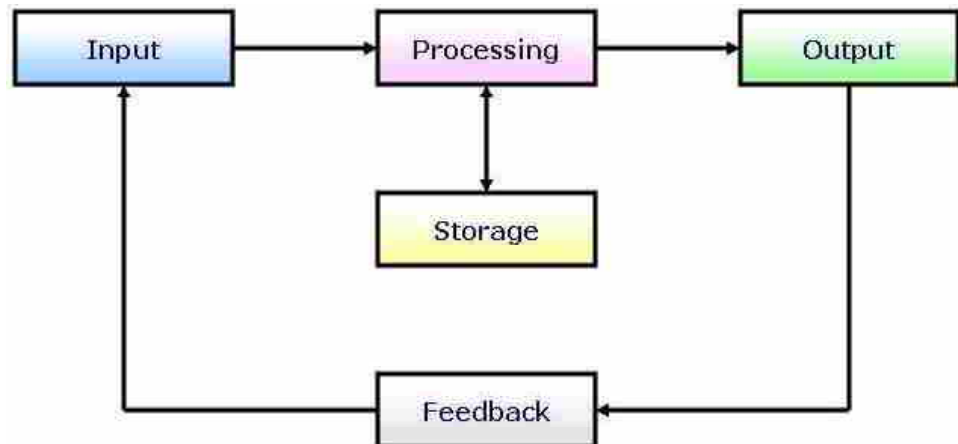
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### 1.8 Information System :

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**Meaning :** An information system can be any organized combination of people, hardware, software, communication software and data resource that collects transformation or screening the information in an organization.

**Definition :** An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization.



### Examples of Information System :

A business is an example of an organizational system to an economic resource (input) is transformed by various business processes into goods and services (output).

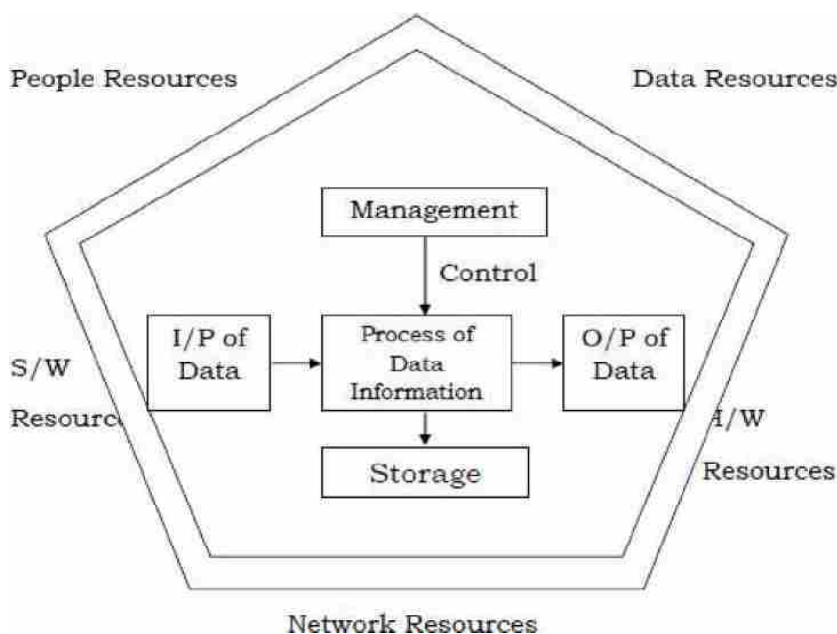
Information system provides information on the operation of the system to management for the direction and maintenance of the system as it exchanges inputs and output with its environment.

Some examples of information systems include the following.

- Airline reservations (seat, booking, payment, schedules, boarding list, special needs, etc.).
  - Bank operations (deposit, transfer, withdrawal) electronically with a distinguish payment gateways.
  - Integration of department with the help of contemporary software's like ERP.
  - Logistics management application to streamline the transportation system.
- a. **Feedback and Control** : A system with feedback and control components is sometimes known as cybernetic system that is a self monitoring or self regulating system.
- b. **Feedback** : Feedback is a data about the performance of a system.
- c. **Control** : Control involves monitoring and evolving feedback determines whether a system is moving towards the achievement of its goals. The control function makes necessary adjustments to a system input and possessing components to ensure that to produce proper output.

**Components of Information System :**

- a. **People Resources** :
- People are required for the operation of all information system.
  - People Resources divided into two types
- (i) **End-Users** : These are the people who use an information system or the information it produce. Ex: Accounts, Sales Persons, Customers and Managers.
- (ii) **Information System Specialist** : These are the people who develop and also operate Information system. Ex: System Managers, Programmers, Computer Operation.



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### b. Data Resources :

Data resources of an Information system are typically organized in two parts :

- (i) **Database** : Database holds processed and organized data.
- (ii) **Knowledge Base** : It holds knowledge in a variety of forms such as facts, rules, and case examples.

### c. Software Resources :

It includes all sets of information processing instruction. It is also two types :

- (i) **Program** : Set of operating instructions the direct and computer hardware.
- (ii) **Procedure** : Set of Information processing instructions needed by people.

Ex : Operating System, Spreadsheet Programs, and Word processor Programs.

### d. Hardware Resources :

Include all physical devices and materials used in information processing.

It has also two types

#### (i) Machines :

Ex : Computer, Video Monitor, Scanner.

#### (ii) Media :

Hardware in computer based Information system.

Ex : Floppy Disk, Magnetic Tape and Optical Disk. **Computer**

### System

Ex : Microcomputers, Midrange Computers System, Large Mainframe

### Computer Peripheral:

Ex : Mouse, Key Board.

### e. Network Resources :

These are the fundamental resource components of all information Systems. It has also two types:

#### (i) Communication Media :

Ex : Co-axial Cable, Twisted Paired Wire, Fibre Optics Cable, Microwave System and Communication Satellite System.

#### (ii) Network Support :

Generally used for the operation and use of a communication network.

Ex : Modems, Internet Browser and Communication Control Software.

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### **1.9 Need for Information Systems :**

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The information system is very important for the internet technology and the traditional business concerns and is really the latest phase in the ongoing evolution of business. All the companies need to update their business, infrastructure and change way they work to respond more immediately to customer need.

A first step in designing and developing an MIS is to assess the information needs for decision making of management at different hierarchical levels, so that the requisite information can be made available in both timely and usable form to the people who need it. Such assessment of information needs is usually based on personality, positions, levels and functions of management.

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### **1.10 Uses of Information System :**

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Information system and technology including E-business and E-commerce technology and application has become vital component of successful business and organization.

It is a study of business administration and management. For a manager or a business professional it is just as important to have basic understanding of information system and any other functional area in business.

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### **1.11 Roles of Information Systems in Business :**

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An Information system supports the business Organizations in the following ways.

- (a) **Support the Business Process :** Treats inputs as a request from the customer and outputs as services to customer. Supports current operations and use the system to influence further way of working.
- (b) **Support Operation of a Business Organization :** An IS supports operations of a business organization by giving timely information, maintenance and enhancement which provides flexibility in the operation of organizations.
- (c) **Support Decision Making :** An IS supports the decision making by employee in their daily operations. It also supports managers in decision making to meet the goals and objectives of the organization. Different mathematical models and IT tools are used for the purpose evolving strategies to meet competitive needs.
- (d) **Strategies for an Organization :** Today each business is running in a competitive market. An IS supports the organization to evolve appropriate strategies for the business to assent in a competitive environment

**Management &  
Information System**

**Check Your Progress :**

1. What are different management functions ?  
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2. Define a system ? What do you mean by system concepts ?  
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3. What are various types of systems ?  
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4. What is an Information system ? Why information systems are needed ?  
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5. Explain how an Information System supports business Organizations.  
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6. MIS stands for \_\_\_\_\_.
  - a. Management Information System
  - b. Management Instruction System
  - c. Management Introduction System
  - d. Management Industrial System
7. \_\_\_\_\_ means "Manage Man Tactfully".
  - a. Information
  - b. System
  - c. Management
  - d. All of Above



8. \_\_\_\_\_ means processed data.
  - a. System
  - b. Information
  - c. Data
  - d. None of these
9. \_\_\_\_\_ is telling people what to accomplish and seeing that they do it to the finest of their capability.
  - a. Planning
  - b. Organizing
  - c. Staffing
  - d. Directing
10. \_\_\_\_\_ is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.
  - a. System
  - b. Technology
  - c. Application
  - d. Development
11. \_\_\_\_\_ involves transformation process that converts input to output.
  - a. Input
  - b. Processing
  - c. Output
  - d. All of Above

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### **1.12 Let Us Sum Up :**

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In this unit we have, have discussed some basic concepts relevant to management information system such as the fundamental concepts of management, levels of management, systems concepts, types of systems, components, information and types of information systems and examples of information systems. Management Information System is seen as a way of evaluating, analyzing and processing an organization data to produce meaningful and useful information from which the management can take decision to ensure future growth and development of the organization.

In the next unit we will discuss different types of Information systems and their support to different levels of management in an organization.

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### **1.13 Answers for Check Your Progress :**

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1. The following mentioned management functions will involve creative problem solving.
  - (a) **Planning** : selecting information and making assumptions concerning the future to put together the activities necessary to achieve organizational objectives.
  - (b) **Organizing** : Organizing is the classification and categorization of requisite objectives, the grouping of activities needed to accomplish objectives.
  - (c) **Directing** : Direction is telling people what to accomplish and seeing that they do it to the finest of their capability
  - (d) **Staffing** : This function includes recruiting, training; evaluating and compensating are the specific activities.
  - (e) **Controlling** : Control is the course of action that measures present performance and guides it towards some predetermined goal.

## Management & Information System

2. A System is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

The concepts of a system are Technology, Application, Development and Management.

- a. **Technology** : Computer networks are systems of information processing components that are a variety of hardware, software and telecommunication technology.
  - b. **Application** : That electronic business and commerce application involves interconnected business information system
  - c. **Development** : That developing way to use IT in business includes designing the basic component of information system.
  - d. **Management** : Managing IT emphasize the quality, strategic business value and security of an organization in information system
3. Systems can be categorised in to the following types.
    - a. **Dynamic System** : When the interrelated component of the system interacts with each other and this controlled by management then it is known as Dynamic System.
    - b. **Cyber Native System** : Dynamic System implementing the concept of feedback and control is known as Cyber native System.
    - c. **Open System** : A system got interacts with other system in its environment by exchanging input and output with its environment
    - d. **Adoptive System** : A System having the ability to change itself and its environment in order to survive is called an Adoptive System.
  4. An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization

An information system can be any organized combination of people, hardware, software, communication software and data resource that collects transformation or screening the information in an organization.

The information system is very important for the internet technology and the traditional business concerns. All the companies need to update their business, infrastructure and change way they work to respond more immediately to customer need.

5. The strategic role of an Information System involves using it to develop products, services, and capabilities that provide a company major advantages over competitive forces it faces in the global marketplace.

We need an Information System flexible enough to deal with changing information needs of the organization. The designing of such a system is a complex task. It can be achieved only if the information system is planned.

We understand this planning and implementation is a management development process.

Precisely, an Information System provides –

- Supports to business processes and operations.
- Supports decision making by its employees and managers.
- Support of its strategies for competitive advantage.

6. a            7. c            8. b  
9. d            10. a            11. b

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#### 1.14 Glossary :

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1. **Management** : We can define management in many ways like, "Manage Man Tactfully", or Management is an art of getting things done by others.
2. **Planning** : Planning is selecting information and making assumptions concerning the future to put together the activities necessary to achieve organizational objectives.
3. **Directing** : Direction is telling people what to accomplish and seeing that they do it to the finest of their capability.
4. **Controlling** : Control is the course of action that measures present performance and guides it towards some predetermined goal.
5. **Input** : Input involves capturing and assembling elements that enter to the system to be processed.
6. **Output** : It involves transforming element that has been produced by a transformation process to their ultimate destination.
7. **Information System** : An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization.
8. **Feedback** : Feedback is a data about the performance of a system.
9. **End-Users** : These are the people who use an information system or the information it produces.

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#### 1.15 Assignment :

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1. What are three levels of management and outline the objectives each level of management.
2. Differentiate between data and information. What are the characteristics of good information?
3. What is an Information system? Discuss about each component of an Information System.

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**1.16 Activities :**

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1. Discuss the role of Information System in today's competitive business environment.
- 

**1.17 Case Study :**

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1. Explain component of information system.
  2. What is Data and Information ? Explain it with proper example.
- 

**1.18 Further Readings :**

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## MIS APPLICATIONS IN ORGANISATION

### : UNIT STRUCTURE :

- 2.0 Learning Objectives**
- 2.1 Introduction**
- 2.2 Information Concept**
- 2.3 Need for Information Systems**
- 2.4 Information for Management**
  - 2.4.1 Production Management**
  - 2.4.2 Marketing Management**
  - 2.4.3 Material Management**
  - 2.4.4 Finance Management**
  - 2.4.5 Human Resource Management**
- 2.5 Computer Based Information Systems**
  - 2.5.1 Transaction Processing Systems**
  - 2.5.2 Management Information Systems**
  - 2.5.3 Decision Support Systems**
  - 2.5.4 Office Automation Systems**
- 2.6 Management Information Systems (MIS)**
  - 2.6.1 Definition**
  - 2.6.2 Objectives of MIS**
  - 2.6.3 Characteristics of MIS**
  - 2.6.4 Role of MIS in an Organization**
- 2.7 Let Us Sum Up**
- 2.8 Answers for Check Your Progress**
- 2.9 Glossary**
- 2.10 Assignment**
- 2.11 Activities**
- 2.12 Case Study**
- 2.13 Further Readings**

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### **2.0 Learning Objectives :**

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**After going through this unit you should be able to :**

- Define the term Information
- Explain the concepts of Information and its types.
- Understand the need for information at various levels of management.

## Management & Information System

- Types of Information Systems
- Define MIS
- Identify the objectives of MIS
- Know the applications of MIS in an organization.

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### 2.1 Introduction :

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Large number of jobs today for computer professionals is in creating information systems for managing organizations. Students should know what information is and how it is different from data, should know nature of organizations and their structure to design appropriate information system, should know management structure and needs of each level of management and should know functional areas of management and information needs for each area.

The management professionals also should identify different type of information that is needed at various levels of management and how Information systems can provide the information each levels of management.

In this unit we will explain different types of information needed at various levels of management and the applications of management information systems in the organization.

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### 2.2 Information Concepts :

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Data is a raw material for information systems. Collecting data costs money and hence one must collect necessary and sufficient data. Data is generally input to the information systems for processing. Data size is also growing but is useless unless it is processed to create information.

Information is processed data, used by managers to initiate actions and to run the organization efficiently. The data processed by machines gives information

#### Types of Information :

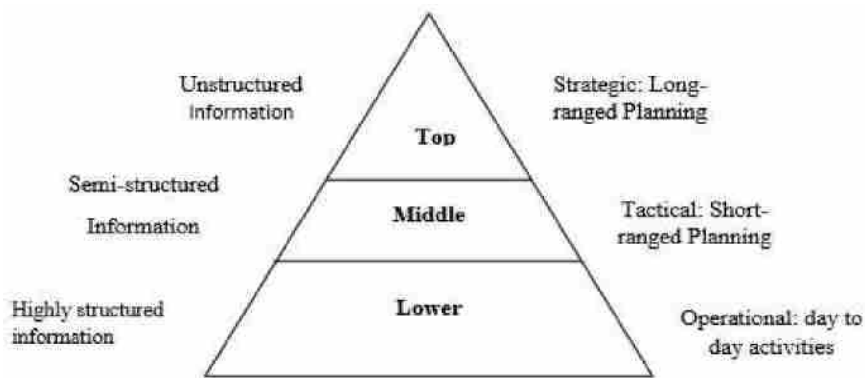
- **Strategic** : Needed for long range planning and directions. This is less structured.
- **Tactical** : Needed to take short range decisions to improve profitability and performance.
- **Operational** : Needed for day to day operations of the organization. Eg: Daily Sales, Billing.
- **Statutory** : Needed by law to send to government authorities. Eg: Sales tax return.

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### 2.3 Need for Information Systems :

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Information systems are needed when timely processing for fast action is needed; same data has to be processed in different ways and when organizations require innovative processing.



*Fig: Management hierarchy and information needs*

**Functional areas of management are as follows**

- A. Production
- B. Marketing
- C. Materials - purchase, stores
- D. Finance -accounts
- E. Human Resource Development (HRD)
- F. Research and Development (R&D)

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## **2.4 Information for Management :**

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Different types of information required for various departments of an enterprise can be categorized as follows.

### **2.4.1 Production Management :**

The following type of information is needed in production management:

#### **Strategic Information :**

- (1) Yearly and monthly production quotas and alternate schedules
- (2) Policies on machine replacement, augmentation and modernization.
- (3) Identifying best product mix.

#### **Tactical Information :**

- (1) Identifying and controlling areas of high cost.
- (2) Identifying critical bottlenecks in production.
- (3) Identifying alternate production schedules based on tools, machines etc.
- (4) Performance measures of machines to decide replacement.

#### **Operational Information :**

- (1) Monitoring up to date production information by examining assemblies, detecting likely shortages and giving early warning.
- (2) Scheduling better production dynamically.
- (3) Preventive maintenance schedules.
- (4) Monitoring tool, machine and personnel availability

#### **2.4.2 Marketing Management :**

The following type of information is needed in Marketing Management :

##### **Strategic Information :**

- (1) Search for new markets and marketing strategies.
- (2) Analysis of competitor's strategy
- (3) Technology and demographic forecasts and product changes

##### **Tactical Information :**

- (1) Advertising techniques and analysis of their impact.
- (2) Customer preference surveys.
- (3) Correlation of prices and sales.
- (4) Sales force deployment and targets.
- (5) Exploring alternate marketing channels.
- (6) Timing of special sales campaigns.

##### **Operational Information :**

- (1) Sales analysis by regions, customer class, sales person.
- (2) Sales target versus achievement.
- (3) Market share and trends.
- (4) Seasonal variations.
- (5) Effect of model changes.
- (6) Performance of sales outlets
- (7) Costs of campaigns and benefit.

#### **2.4.3 Material Management :**

The following type of information is needed in Materials Management:

##### **Strategic Information :**

- (1) Developing vendors for critical items
- (2) Determining optimal levels of inventory
- (3) Determining proportion of material needed
- (4) Reducing varieties of inventory

##### **Tactical Information :**

- (1) Developing vendor performance measures.
- (2) Determining optimal reorder levels.
- (3) Determining issues of items to shops versus
- (4) Standard needs.
- (5) Controlling high value of inventory.
- (6) Determining impact on material cost and



- (7) Procurement with design changes and new
- (8) Product introduction.

**Operational Information :**

- (1) List of excess & deficient items received.
- (2) List of items rejected.
- (3) Critical items received.
- (4) Stores in transit and in inspection.
- (5) Value of inventory in hand.
- (6) Goods received, rejected and issued.

**2.4.4 Finance Management :**

The following type of information is needed in Finance Management :

**Strategic Information :**

- (1) Methods of financing.
- (2) Pricing policies
- (3) Tax planning.

**Tactical Information :**

- (1) Variations between budget and expenses.
- (2) Large outstanding payments/Receipts.
- (3) Credit and payment status.
- (4) Cost increases and pricing.
- (5) Impact of taxation on pricing

**Operational Information :**

- (1) Periodic financial report.
- (2) Budget status to all functional managers.
- (3) Tax returns.
- (4) Share transfers.
- (5) Profit and loss account.
- (6) Payments and receipts.
- (7) Payroll, provident fund accounts

**2.4.5 Human Resource Management :**

The following type of information is needed in Human Resources Management: Strategic Information :

- (1) Long range human resource requirements at different levels.
- (2) Policies on human resource development and training
- (3) Policies on personnel welfare and facilities

## **Management & Information System**

### **Tactical Information :**

- (1) Performance appraisal.
- (2) Demographic make-up of personnel and its impact on retirement.
- (3) Production incentives.
- (4) Morale of personnel.
- (5) Absentee reduction.
- (6) Leave and overtime policies.
- (7) Personnel deployment policies.

### **Operational Information :**

- (1) Routine assessment.
- (2) Skills inventory.
- (3) Loan/advances and recoveries.
- (4) Leave record.

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## **2.5 Computer Based Information Systems :**

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A computer-based information system, or CBIS, uses computers to collect, process, store, analyze and distribute information for a specific purpose, such as meeting a business objective. The main components of a CBIS include hardware, software, data, procedures and people.

Computer Based Information System (CBIS) depends mainly on the computer for handling business application. System analysis develops different types of information system to meet variety of business needs.

There is a class of systems known collectively as computer based information systems. A few of them are as follows:

- i. Transaction Processing System (TPS)
- ii. Management Information System (MIS)
- iii. Decision Support System (DSS)
- iv. Office Automation Systems (OASs)

**Transaction Processing Systems :** Transaction processing systems handle routine information items, more often than not manipulating data in some constructive way as it enters or leaves the firm's databases. An order entry program is an example of a TPS. Reasons for TP are recording, classification, sorting, calculation, summarization, storage and exhibit of results.

**Management Information Systems :** Management Information systems make available a focused vision of information flow as it develops during the course of business activities. This information is constructive in managing the business. We will discuss all the aspects of MIS in the coming heads in an elaborate manner.

**Decision Support Systems :** Decision Support systems are methodical models used to progress managerial or professional decision

making by bringing significant data to a manager's notice. In many cases, these systems use the identical data as management information systems, but DSS purify the data to make it more functional to managers. It support with exceptional and nonrecurring decisions, which are moderately unstructured. Mainly what factors to reflect on and what information are needed.

**Office Automation Systems :** Office automation systems endow with electronic mail, word processing, electronic filing, scheduling, calendaring, and other kinds of support to office workers. First introduced with personal computers, these "groupware" applications became essential with the extensive use of personal digital assistants. It combines word processing, telecommunications and data processing to computerize office information, draws on stored data as a result of data processing and comprise handling of correspondence, reports and documents.

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## **2.6 Management Information Systems (MIS) :**

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### **2.6.1 Definition :**

G.B. Davis defined a Management Information System (MIS) is "an integrated man/machine system for providing information to hold up the operations, management and decision making functions in an organization." Here the system

utilizes hardware and software, manual procedures, management decision model and data base.

An MIS need not be wholly computer based; it is however inevitable that the information deriving from the high volume of data in basic operational processes is computerized; what is still not so certain is whether the once off "high level" information also needed in an MIS, is best obtained using a computer.

Apart from this there are many other thoughts over and above to this definition are as follows:

- A management information system aims at meeting the information needs of managers, predominantly with regard to the current and past operations of the enterprise.
- Management information system is a system which provides precise, timely and meaningful data for management planning, analysis and control to optimize the growth of the organization.
- Thus from the above definition it had been extracted that "Management Information System" (M.I.S.) is vitally concerned with processing data into information. Which is then communicated to the different departments in an organization for appropriate decision making?
- The MIS is a system which provides information support for decision making in the organization.

## Management & Information System

- The MIS is an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.
- The MIS is a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.
- The MIS is a Computer based Information System.

Though there are a number of definitions, all of them converge on one single point, i.e., the MIS is a system to support the decision making function in the organization. The difference lies in defining the elements of the MIS. However, in today's world MIS a computerized business processing system generating information for the people in the organization to meet the information needs decision making to achieve the corporate objective of the organization. In any organization, small or big, a major portion of the time goes in data collection, processing, documenting it to the people.

In order to get a better grip on the activity of information processing, it is necessary to have a formal system which should take care of the following points:

- Handling of a voluminous data.
- Confirmation of the validity of data and transaction.
- Complex processing of data and multidimensional analysis.
- Quick search and retrieval.
- Mass storage.
- Communication of the information system to the user on time.
- Fulfilling the changing needs of the information.

The management information system uses computers and communication technology to deal with these points of supreme importance.

### 2.6.2 Objectives of MIS :

1. **Data Capturing** : MIS capture data from various internal and external sources of organization. Data capturing may be manual or through computer terminals.
2. **Processing of Data** : The captured data is processed to convert into required information. Processing of data is done by such activities as calculating, sorting, classifying, and summarizing.
3. **Storage of Information** : MIS stores the processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organization record, for later use.
4. **Retrieval of Information** : MIS retrieves information from its stores as and when required by various users.

5. **Dissemination of Information** : Information, which is a finished product of MIS, is disseminated to the users in the organization. It is periodic or online through computer terminal.

### 2.6.3 Characteristics of MIS :

1. **Systems Approach** : The information system follows a systems approach. Systems approach means taking a comprehensive view or a complete look at the interlocking sub-systems that operate within an organization.
2. **Management Oriented** : Management oriented characteristic of MIS implies that the management actively directs the system development efforts. For planning of MIS, top-down approach should be followed. Top down approach suggests that the system development starts from the determination of management's needs and overall business objective. To ensure that the implementation of systems polices meet the specification of the system, continued review and participation of the manager is necessary.
3. **Need Based** : MIS design should be as per the information needs of managers at different levels.
4. **Exception Based** : MIS should be developed on the exception based also, which means that in an abnormal situation, there should be immediate reporting about the exceptional situation to the decision-makers at the required level.
5. **Future Oriented** : MIS should not merely provide past of historical information; rather it should provide information, on the basis of future projections on the actions to be initiated.
6. **Integrated** : Integration is significant because of its ability to produce more meaningful information. Integration means taking a comprehensive view or looking at the complete picture of the interlocking subsystems that operate within the company.
7. **Common Data Flow** : Common data flow includes avoiding duplication, combining similar functions and simplifying operations wherever possible. The development of common data flow is an economically sound and logical concept, but it must be viewed from a practical angle.
8. **Long Term Planning** : MIS is developed over relatively long periods. A heavy element of planning should be involved.
9. **Sub System Concept** : The MIS should be viewed as a single entity, but it must be broken down into digestible sub-systems which are more meaningful.
10. **Central Database** : In the MIS there should be common data base for whole system

**2.6.4 Role of MIS in an Organization :**

The role of the MIS in an organization can be compared to the role of heart in the body. The information is the blood and MIS is the heart. In the body the heart plays the role of supplying pure blood to all the elements of the body including the brain. The heart works faster and supplies more blood when needed. It regulates and controls the incoming impure blood, processes it and sends it to the destination in the quantity needed. It fulfils the needs of blood supply to human body in normal course and also in crisis. The MIS plays exactly the same role in the organization.

1. The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfil the information needs of an individual, a group of individuals, the management functionaries: the managers and the top management.
2. The MIS satisfies the diverse needs through a variety of systems such as Query Systems, Analysis Systems, Modelling Systems and Decision Support Systems the MIS helps in Strategic Planning, Management Control, Operational Control and Transaction Processing.
3. The MIS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents. The MIS helps the junior management personnel by providing the operational data for planning, scheduling and control, and helps them further in decision making at the operations level to correct an out of control situation.
4. The MIS helps the middle management in short term planning, target setting and controlling the business functions. It is supported by the use of the management tools of planning and control. The MIS helps the top management in goal setting, strategic planning and evolving the business plans and their implementation.
5. The MIS plays the role of information generation, communication, problem identification and helps in the process of decision making. The MIS, therefore, plays a vital role in the management, administration and operations of an organization.

**Check Your Progress :**

1. Name the types of information generated by an information system.  
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2. What are the types of information is needed in Human Resources Management department ?

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3. What are different types of computer based information systems supporting to different levels of management ?

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4. Define MIS. What is its nature ?

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5. What are the main Objectives of MIS ?

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6. What are the typical characteristics of an MIS ?

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.....  
.....  
.....

7. \_\_\_\_\_ is raw material for information systems.

- a. Data
- b. Information
- c. Instruction
- d. All of Above

8. HRD stands for \_\_\_\_\_.

- a. Human Resource Design
- b. Human Resource Development
- c. Human Resource Discipline
- d. Human Resource Definition

9. CBIS stands for \_\_\_\_\_.
  - a. Computer Based Instruction System
  - b. Computer Based Information Structure
  - c. Computer Based Information System
  - d. Computer Based Introduction Structure
10. \_\_\_\_\_ is data from various internal and external source of organization.
  - a. Processing of Data
  - b. Storage of Information
  - c. Retrieval of Information
  - d. Data Capturing
11. OASs stands for \_\_\_\_\_.
  - a. Office Automation Systems
  - b. Office Automation Structures
  - c. Office Automation Services
  - d. Office Automation Securities

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**2.7 Let Us Sum Up :**

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To facilitate the management decision making at all levels of company, the MIS must be integrated. MIS units are companywide. MIS is available for the Top management. The top management of company should play an active role in designing, modifying and maintenance of the total organization wide management information system. Information system and Information technology have become a vital component of any successful business and are regarded as major functional areas just like any other functional area of a business organization like marketing, finance, production and HR. Thus it is important to understand the area of information system just like any other functional area in the business. MIS is important because all businesses have a need for information about the tasks which are to be performed. Information and technology is used as a tool for solving problems and providing opportunities for increasing productivity and quality. Information has always been important but it has never been so available, so current and so overwhelming. Efforts have been made for collection and retrieval of information, however, challenges still remain in the selection analysis and interpretation of the information that will further improve decision making and productivity.

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**2.8 Answers for Check Your Progress :**

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1. Information is processed data, used by managers to initiate actions and to run the organization efficiently. The data processed by machines support to produce different types of information to take right decision at right times.



**Types of Information generated by Information systems are as follows.**

- **Strategic** : Needed for long range planning and directions. This is less structured.
- **Tactical** : Needed to take short range decisions to improve profitability and performance.
- **Operational** : Needed for day to day operations of the organization. Eg : Daily Sales, Billing.
- **Statutory** : Needed by law to send to government authorities. Eg : Sales tax return.

2. The following are three types of information is needed in Human Resources Management with examples.

**Strategic Information :**

- Long range human resource requirements at different levels.
- Policies on human resource development and training
- Policies on personnel welfare and facilities

**Tactical Information :**

- Performance appraisal.
- Demographic make-up of personnel and its impact on retirement.
- Production incentives.
- Morale of personnel
- Absentee reduction.
- Leave and overtime policies.
- HR deployment policies.

**Operational Information :**

- Routine assessment.
- Skills inventory.
- Loan/advances and recoveries.
- Leave record.

3. Computer Based Information System (CBIS) depends mainly on the computer for handling business application. System analysis develops different types of information system to meet variety of business needs.

There is a class of systems known collectively as computer based information systems. A few of them are as follows :

## **Management & Information System**

1. Transaction Processing System (TPS)
2. Management Information System (MIS)
3. Decision Support System (DSS)
4. Office Automation Systems (OASs)
5. Define MIS. What is its nature?
4. Management Information System (MIS) is defined as "an integrated man/machine system for providing information to hold up the operations, management and decision making functions in an organization."

### **Nature of MIS :**

A management information system aims at meeting the information needs of managers,

- Management information system is a system which provides precise, timely and meaningful data for management planning, analysis and control to optimize the growth of the organization.
  - M.I.S is vitally concerned with processing data into information.
  - The MIS is a system which provides information support for decision making in the organization.
  - The MIS is a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.
5. The main objectives of MIS include the following.
    - MIS captures data from various internal and external sources of organization.
    - Processes the captured data to convert into required information. Processing of data is done by such activities as calculating, sorting, classifying, and summarizing etc.
    - Stores the processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organization record, for later use.
    - MIS retrieves information from its stores as and when required by various users.
    - Information, which is a finished product of MIS, is disseminated to the users in the organization. It is periodic or online through computer terminal.

6. Some of the common characteristics of MIS are as follows.
- MIS follows a systems approach to problem solving.
  - MIS is Management Oriented.
  - MIS design should be as per the information needs of managers at different levels.
  - MIS should provide information, on the basis of future projections on the actions to be initiated.
  - It is an integrated man machine system which has ability to produce more meaningful information
  - MIS is developed over relatively long periods. A heavy element of planning should be involved.
  - The MIS should be viewed as a single entity, but it must be broken down into digestible sub-systems which are more meaningful.
  - In the MIS there should be common data base for whole system

7. a

8. b

9. c

10. d

11. a

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## **2.9 Glossary :**

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1. **MIS :** An integrated man/machine system for providing information to hold up the operations, management and decision-making functions in an organization.

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## **2.10 Assignment :**

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1. What are different types of Information needed by various levels of management ? Discuss.
2. Outline the different types of information required for various departments of an enterprise.
4. Define MIS. Write its objectives and characteristics.

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## **2.11 Activities :**

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1. Discuss the role of MIS in a business organization.

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## **2.12 Case Study :**

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1. Explain functions of management hierarchy with proper example.

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## **2.13 Further Readings :**

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1. Sadagopan, Management Information System, 2007, Prentice Hall of India.
2. McLeod, R. and George P Schell (2008). Management information systems (10th Ed.). Pearson education India

**Management &  
Information System**

3. C. W. Frenzel and J. C. Frenzel, 2004. "Management of Information Technology", 4th edition Thomson course technology, Cengage Learning.
4. Laudon, K. C. & Laudon, J. P. Management Information Systems: Managing the Digital Firm. 10th ed. Prentice Hall and Pearson Education, 2006.
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## MANAGEMENT INFORMATION SYSTEM : BASIC CONCEPTS

### UNIT STRUCTURE :

#### **3.0 Learning Objectives**

#### **3.1 Introduction**

#### **3.2 Characteristics of Computerized MIS**

#### **3.3 Functions of a Management Information System**

#### **3.4 The Role of Management Information Systems**

#### **3.5 Role of MIS in Improving Decision Making**

#### **3.6 The Benefits of Management Information Systems**

##### **3.6.1 Tangible Benefits**

##### **3.6.2 Intangible Benefits**

#### **3.7 Limitations of MIS**

#### **3.8 The Challenges of Management Information Systems**

#### **3.9 MIS Security & Ethical Issues**

#### **3.10 Information Systems and Ethics**

#### **3.11 The IEEE Code of Ethics and Professional Conduct**

#### **3.12 Uses of MIS**

#### **3.13 Let Us Sum Up**

#### **3.14 Answers for Check Your Progress**

#### **3.15 Glossary**

#### **3.16 Assignment**

#### **3.17 Activities**

#### **3.18 Case Study**

#### **3.19 Further Readings**

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#### **3.0 Learning Objectives :**

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**At the end of this unit you should be able to :**

- Know the Functions of a Management Information System
- The Role of Management Information Systems
- Role of MIS in improving decision making
- The benefits of management information systems
- The challenges of management information systems

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### **3.1 Introduction :**

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Management Information System (MIS) is all about collecting and processing of raw data into useful information and its dissemination to the users at various levels of management in the required format. It produces information, which impacts managements to understand the business situation of the organization and take decisions accordingly. In fact a full MIS consists of all the systems that the institution uses too generate the information that guide management's decisions and actions. However, it is tough identifying the needs of different types of strategic, tactical and operational information required at top level, middle level and low level management, collect data from the users, processing them to generate information and disseminate to all the levels of the management. In this unit we will discuss some issues in collecting, processing and creating information by a Management Information System.

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### **3.2 Characteristics of Computerized MIS :**

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Following are the characteristics of a well-designed computerized MIS :

- It should be able to process data accurately and with high speed, using various techniques like operations research, simulation, heuristics, etc.
- It should be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.
- It should provide real time information on ongoing events without any delay.
- It should support various output formats and follow latest rules and regulations in practice.
- It should provide organized and relevant information for all levels of management: strategic, operational, and tactical.
- It should aim at extreme flexibility in data storage and retrieval

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### **3.3 Functions of a Management Information System :**

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The management information system is an integrated, computerized and machine user system providing the required information to support the operation and decision making. The main functions of a management system are the following.

1. **Data Capturing :** MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through computer terminals. End users, typically record data about transactions on some physical medium such as paper form or enter it directly into a computer system.

2. **Processing of Data :** The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing.
3. **Storage of Information :** MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases.
4. **Retrieval of Information :** MIS retrieves information from its stores as and when required by various users. As per the requirements of the management users, the retrieved information is either disseminated as such or it is processed again to meet the exact demands.
5. **Dissemination of MI :** Management information, which is a finished product of MIS, is disseminated to the users in the organization. It could be periodic, through reports or on-line through computer terminals.

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#### **3.4 The Role of Management Information Systems :**

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Management information system (MIS) has become very necessary due to emergence of high complexity in business organization. It is all to know that without information no Organization can take even one step properly regarding the decision making process. Because it is matter of fact that in an organization decision plays an essential role for the achievement of its objectives and we know that every decision is based upon information. If gathered information are irrelevant than decision will also incorrect and organization may face big loss & lots of difficulties in surviving as well.

Two main roles are played by the decision making of the managers. First it helps the managers to take decision based on the information being prepared. Second when the decision making and decisions are fixed and only the input data change, it is as a suitable repeating to support different types of manager's decisions.

- **Helps in Decision Making :** Management Information System (MIS) plays a significant Role in Decision making Process of any Organization. Because in Any organization decision is made on the basis of relevant Information and relevant information can only be Retrieving from the MIS.
- **Helps in Coordination Among the Department :** Management information System is also help in establishing a sound Relationship among the every persons of department to department through proper exchanging of Information's.
- **Helps in Finding out Problems :** As we know that MIS provides relevant information about the every aspect of activities. Hence, if

any mistake is made by the management then Management Information Systems (MIS) Information helps in Finding out the Solution of that Problem.

- **Helps in Comparison of Business Performance :** MIS store all Past Data and information in its Database. That why management information system is very useful to compare Business organization Performance. With the help of Management information system (MIS) Organization can analyze his Performance means whatever they do last year or Previous Years and whatever business performance in this year and also measures organization Development and Growth.

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### **3.5 Role of MIS in Improving Decision Making :**

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Preliminarily, it is inherent to state that decision making is an integral part of any business. This is because a majority of operations in an organization revolve around decisions made by the management and other key stakeholders in the organization. In order to take right decision, it is vital to have a good information system since decisions are based on the information available.

The quality of managerial decision-making depends directly on the quality of available information" and the managers should therefore cultivate an environment that encourages the growth and viable sprouting of quality information.

More importantly, the capacity to guide decision-making facilitates progress and improvement of the operations in a company.

Principally, the record keeping and data-basing tool of MIS definitely ensures that decisions are made viably while businesses run smoothly.

Over the recent years, there has also been an increased usage of automated Management Information Systems. To a large extent, these automated systems have hugely revolutionized the decision-making process in a positive way.

For instance, by using automated MIS, companies no longer have to rely on 24-hour services from workers. Instead, the machines are able to be programmed to do things on our behalf.

Crucially, this ensures that decisions made in a business are orderly and well- planned which, in effect, encourages objectivity during decision making. As a result, businesses and the decision making process are improved through its systematic and orderly formula of operating.

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### **3.6 The Benefits of Management Information Systems :**

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The management information system helps by two major ways in problem solving: An information source is provided in organization area and helps the identification of the problem. The benefit of management information system with this aim is to state the problem possibility for the managers.



Current business era is an era where information flow is very vital role than the flow of goods. As great as any of a businessman and monopolize the flow of goods, it does not mean anything if he does not have accurate, current, easily accessible and controllable in the mastering its distribution. Therefore it is one of the company assets of modern business is highly valuable information system that has a high response rate and focus on its users from all aspects.

Information systems are built well and correctly, among others, can increase productivity, reduce the stock of material production, eliminating activities that do not have the benefit (value added), improve service and customer satisfaction, coordinating every part in the enterprise and improve the quality of management policies.

While in general the benefits of management information systems can be categorized as tangible benefits and intangible benefits.

### **3.6.1 Tangible Benefits :**

An information system is built and maintained properly will provide tangible benefits could be seen that in fact achieved its movement through the income and expenses incurred by the company.

Indicators of success / benefits that have an impact on revenue enhancement is the increased sales in existing markets and expansion into new markets.

A good information system can be used not only for the storage of electronic data alone but must be able to support the analysis required by management. So with the support of good information system can be obtained then the information is accurate, reliable, current and easily accessible on the condition of the company's sales.

With the report presented by the rapid and can be accessed at any time that the decisions taken can be faster and precise on the existing market dynamics. In terms of cost reduction can be done on reducing the amount of factual analysis of the human resources involved in the business, reducing operational costs such as supplies and overhead, the reduction of goods / material in warehouse stock, reduction of maintenance costs and providing equipment that is not too expensive.

Some examples of reduction of the number of human resources are in the process of recording financial transactions. If previously in the accounting process should be managed by five people with the implementation of the good accounting information system is done by one person enough. This is due to the Accounting Information System which is integrated so any bookkeeping process can be processed directly from each of the relevant sections without having to go through the process of refilling the data. Stacking material supply problems during the production is often burden of the company assets, with the implementation of supply chain management module in information systems developed greatly help solve the problem.

With the support of supply chain management then the stacking stocks of material production can be reduced to a minimum. Where, the company simply ordered to suppliers only when the inventory reaches the minimum limit.

### **3.6.2 Intangible Benefits :**

Often the intangible benefits of system information management are the critical point in the course of business of a company's wheel. Because it is intangible, the following aspects are often overlooked or not detected.

- 1. Increased Customer Satisfaction :** Good management information system will speed up the process so that, the time required to serve a customer can be faster.
- 2. Improved Quantity and Quality of Information :** Information is an important component of business today. Who controls the information would act more responsive to changes and trends in the future. Application of good information system will certainly generate reports compilation of data that is managed by qualified and comprehensive database. This can be achieved for each of the reporting process is executed automatically by computer machines.
- 3. Improved Quality and Quantity Management Decisions :** It is inevitable that any decision-making relies heavily on information that supports the policy to be taken. It can only be realized if information systems can provide information that is relevant, accurate, current and can be retrieved at any time.
- 4. Improved Quality and Responsiveness Number of the Competitors' Condition :** Aspects of business intelligence is very important since a long time with a variety of formats and needs. To reach the point of rapid and appropriate response on the dynamics of the competition will require information systems that can collect, analyze and compile the information needed by decision makers in the company.
- 5. Improved Operational Efficiency and Flexibility :** All business owners would want these. The more efficient and flexibly an operational then this indicate the low cost to run it. This can be achieved due to cut the bureaucracy in the company after the implementation of good information systems.
- 6. Improved Quality of Internal and External Communications :** A good information system must be supported by electronic data communication network systems that are reliable as well. With the application of good information systems, each party both inside and outside the company can exchange information more effectively and efficiently.
- 7. Improved Quality of Planning :** Planning is an essential process for businesses. However, any plan that will be made then of course

needed the support of adequate information into practice. If not then the plan may be disoriented and did not reach its target because of mistake information into its base.

- 8. Improved Quality Control and Supervision :** With the information system is built and maintained properly then any activity within the business environment can be constantly monitored. Monitoring is certainly an impact on improving control over every procedure and activities occurring within the company.

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### **3.7 Limitations of MIS :**

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Even though MIS has many benefits it has its limitations. MIS is sometimes considered a solution for every bane within an organization. While MIS may solve some critical problems but it is not a solution to all problems of an organization.

It cannot meet the special demands of each person. Mostly, the management information system doesn't provide exact information and the concept of decision support system was created in response to such need.

The limitations of MIS may be stated as, The MIS is as good as its design- MIS if designed in an improper manner does not serve the management and hence is of little relevance.

The MIS is as good as its users-if the users do not know how to leverage the information available from MIS then MIS is of little use.

The MIS is no good if the basic data is obsolete and outdated (for example, MIS will only facilitate garbage with information and in about garbage-out- process)

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### **3.8 The Challenges of Management Information Systems :**

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If all the existing barriers are divided into humanistic, organizational and environmental factors, the major drawbacks and the reasons of failure and using MIS in public organizations are as following :

**Humanistic Factors :**

- The lack of information of the managers and users as they don't know exactly what they want and what their information needs are.
- The lack of understanding of the needs of the users by designers (the lack of correct definition of the needs and their analysis)
- The lack of information of the managers and users about the collaboration method with the designer team.
- The lack of participation of the managers and users in system design.
- The lack of understanding of the managers of software and information systems.
- The lack of information of most of the analysts and programmers (designers) with new system work environment.

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- The lack of acceptance of the system executers and resistance against the change.
- The lack of accuracy in the data collected

### **Organizational Factors :**

- The lack of good conditions for participation and collaboration of the managers, users and system directors
- The lack of consistency and complexity of the existing manual systems.
- The lack of existing systems and methods analysis before the system design
- The lack of evaluation of the existing power
- Bad condition of educating the specialized forces
- The lack of human resources with management and computer fields and other required specializations (the problems of absorbing human resources)
- Inadequate education of the users
- Inadequate and incomplete documentation
- Unsuitable implementation of the system

### **Environmental Factors :**

- The lack of suitable consultants for designing the system and software
- The lack of procedures and methodology and stages of creating the system
- The lack of evaluation of environmental aspects in management information systems
- The lack of suitable use of mass media to develop the culture of using computer and information systems.
- The lack of holding suitable MA training courses in the universities and the lack of suitable education of human resources in this regard.
- The lack of ratification of the suitable rules in Islamic council parliament and government board and the considerable problem in this regard.
- The lack of serious consideration and adequate investment in this regard.

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## **3.9 MIS Security & Ethical Issues :**

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### **Security of an Information System :**

Information system security refers to the way the system is defended against unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction.

There are two major aspects of information system security :

- Security of the information technology used - securing the system from malicious cyber-attacks that tend to break into the system and to access critical private information or gain control of the internal systems.
- Security of data - ensuring the integrity of data when critical issues, arise such as natural disasters, computer/server malfunction, physical theft etc. Generally an off-site backup of data is kept for such problems.

Guaranteeing effective information security has the following key aspects :

- Preventing the unauthorized individuals or systems from accessing the information.
- Maintaining and assuring the accuracy and consistency of data over its entire life-cycle.
- Ensuring that the computing systems, the security controls used to protect it and the communication channels used to access it, functioning correctly all the time, thus making information available in all situations.
- Ensuring that the data, transactions, communications or documents are genuine.
- Ensuring the integrity of a transaction by validating that both parties involved are genuine, by incorporating authentication features such as "digital signatures".
- Ensuring that once a transaction takes place, none of the parties can deny it, either having received a transaction, or having sent a transaction. This is called 'non-repudiation'.
- Safeguarding data and communications stored and shared in network systems.

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### **3.10 Information Systems and Ethics :**

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Information systems bring about immense social changes, threatening the existing distributions of power, money, rights, and obligations. It also raises new kinds of crimes, like cyber-crimes.

**Following organizations promote ethical issues :**

- The Association of Information Technology Professionals (AITP)
- The Association of Computing Machinery (ACM)
- The Institute of Electrical and Electronics Engineers (IEEE)
- Computer Professionals for Social Responsibility (CPSR)

**The ACM Code of Ethics and Professional Conduct :**

- Strive to achieve the highest quality, effectiveness, and dignity in both the process and products of professional work.

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- Acquire and maintain professional competence.
- Know and respect existing laws pertaining to professional work.
- Accept and provide appropriate professional review.
- Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis and possible risks.
- Honour contracts, agreements, and assigned responsibilities.
- Improve public understanding of computing and its consequences.
- Access computing and communication resources only when authorized to do so.

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### **3.11 The IEEE Code of Ethics and Professional Conduct :**

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IEEE code of ethics demands that every professional vouch to commit themselves to the highest ethical and professional conduct and agree :

- To accept responsibility in making decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
- To avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
- To be honest and realistic in stating claims or estimates based on available data;
- To reject bribery in all its forms;
- To improve the understanding of technology, its appropriate application, and potential consequences;
- To maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
- To seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
- To treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
- To avoid injuring others, their property, reputation, or employment by false or malicious action;
- To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

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### **3.12 Uses of MIS :**

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- Since it can be programmed to follow business rules uniformly, MIS reinforces discipline in accounting and portfolio tracking.
- Computers can link all data pertaining to a customer or customer group hence MIS can provide a consolidated view of each customer or group.

- MIS allow for single entry of data that can then be used by many people. Data once entered can be accessed, manipulated and used by all users.
- Thus MIS reduces duplication of effort and increases speed of work.
- MIS integrates information and process.
- MIS supports workflow and procedures for users.
- MIS can be ported to remote areas via laptop or palm technology.
- MIS application can be customized or enhanced to support new products and institutional growth.

**Check Your Progress :**

1. Outline the Characteristics of a Computerized MIS.

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2. Highlight the benefits of management information systems.

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3. Point out the limitations of MIS.

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4. How can you ensure security of an information system?

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5. \_\_\_\_\_ is processed to convert the captured data into the required management information.

- a. Storage of Information
- b. Processing of Data
- c. Data Capturing
- d. All of Above

## Management & Information System

6. MIS helps in \_\_\_\_\_.
  - a. Decision Making
  - b. Finding out Problems
  - c. Comparison of Business Performance
  - d. All of Above
7. \_\_\_\_\_ refers to the way the system is defended against unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction.
  - a. Security
  - b. Organizational Factor
  - c. Humanistic Factor
  - d. None of Above
8. IEEE stands for \_\_\_\_\_.
  - a. The Institute of Electrical and Electronics Engineers
  - b. The Institute of Electrical and Electronics Energy
  - c. The Institute of Energy and Electronics Engineers
  - d. The Institute of Energy and Energetic Energy
9. The challenges of management information systems include \_\_\_\_\_.
  - a. Humanistic Factors
  - b. Organizational Factors
  - c. Environmental Factors
  - d. All of Above

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### 3.13 Let us Sum Up :

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Management Information System is essential for business development. There are many benefits that can be obtained from the business owner application of information systems. To be able to keep compete with competitors will require a good and reliable management information systems.

In this unit we have discussed about the benefits of MIS, its Challenges and limitations. We have also discussed some of the issues including the security issues in MIS.

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### 3.14 Answers for Check Your Progress :

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1. Following are the characteristics of a well-designed computerized MIS :
  - It should be able to process data accurately and with high speed, using various techniques like operations research, simulation, heuristics, etc.
  - It should be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.



- It should provide real time information on ongoing events without any delay.
  - It should support various output formats and follow latest rules and regulations in practice.
  - It should provide organized and relevant information for all levels of management: strategic, operational, and tactical.
  - It should aim at extreme flexibility in data storage and retrieval
2. A good information system can be used not only for the storage of electronic data alone but must be able to support the analysis required by management. So with the support of good information system can be obtained then the information is accurate, reliable, current and easily accessible on the condition of the company's sales.

The following are some of the benefits of a good MIS.

- Increased customer satisfaction
- Improved quantity and quality of information:
- Improved quality and quantity management decisions:
- Improved quality and responsiveness number of the competitors' condition

**Improved operational efficiency and flexibility :**

- Improved quality of internal and external communications:
- Improved quality of planning:
- Improved quality control and supervision

3. Even though MIS has many benefits it has its limitations.

- While MIS may solve some critical problems but it is not a solution to all problems of an organization.
- It cannot meet the special demands of each person.
- MIS if designed in an improper manner does not serve the management and hence is of little relevance.
- The MIS is as good as its users-if the users do not know how to leverage the information available from MIS then MIS is of little use.
- The MIS is not good if the basic data is obsolete and outdated (for example, MIS will only facilitate garbage with information and in about garbage-out-process)

4. Ensuring effective information security has the following key aspects :

- Preventing the unauthorized individuals or systems from accessing the information.
- Maintaining and assuring the accuracy and consistency of data over its entire life-cycle.

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- Ensuring that the computing systems, the security controls used to protect it and the communication channels used to access it, functioning correctly all the time, thus making information available in all situations.
- Ensuring that the data, transactions, communications or documents are genuine.
- Ensuring the integrity of a transaction by validating that both parties involved are genuine, by incorporating authentication features such as "digital signatures".
- Ensuring that once a transaction takes place, none of the parties can deny it, either having received a transaction, or having sent a transaction. This is called 'nonrepudiation'.
- Safeguarding data and communications stored and shared in network systems.

5. b

6. d

7. a

8. a

9. d

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### 3.15 Glossary :

1. **Tangible Benefits** : Tangible benefits could be seen that in fact achieved its movement through the income and expenses incurred by the company.
2. **Intangible Benefits** : Intangible benefits are difficult to measure in rupees but the intangible benefits of system information management are the critical point in the course of business of a company's wheel.

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### 3.16 Assignment :

1. The Role of Management Information Systems in decision making in organizations.
2. Discuss the benefits of implementing MIS in an organization.
3. Discuss the security and ethical issues of MIS.

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### 3.17 Activities :

1. Explain the challenges faced in deploying MIS in an organization

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### 3.18 Case Study :

1. Discuss role of MIS and role of MIS in improving decision making.

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### 3.19 Further Readings :

1. Sadagopan, Management Information System, 2007, Prentice Hall of India.
2. McLeod, R. and George P Schell (2008). Management information systems (10th ed.). Pearson education India

3. C. W. Frenzel and J. C. Frenzel, 2004. "Management of Information Technology", 4th edition Thomson course technology, Cengage Learning.
4. Laudon, K. C. & Laudon, J. P. Management Information Systems: Managing the Digital Firm. 10th ed. Prentice Hall and Pearson Education, 2006.
5. Management Information System, Study Material of Indira Gandhi National Open University.
6. <http://ocw.mit.edu>
7. [https://www.tutorialspoint.com/management\\_information\\_system/](https://www.tutorialspoint.com/management_information_system/)

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**BLOCK SUMMARY**

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While studying this block, the user got knowledge and understanding about management and different level of management like how top level, middle level and bottom level is interacting and what are the data and information produced from all these levels. The block has given concept of system and components of system like input, processing and output. Also learnt about information system as well as need, uses and roles of information system.

The block has given detail idea on the production management, marketing management, material management, finance management and human resource management. Also learnt about how computer-based information system are used in different area like transaction processing, decision support system and office automation system.

The block has given the knowledge about functions of management information system, characteristics of computerized MIS, Role of MIS, Role of MIS in decision support system, Advantages and disadvantage of MIS.

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## **BLOCK ASSIGNMENT**

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### **Short Answer Questions :**

1. Discuss the types of system.
2. What is the need for Information System.
3. Characteristics of a Computerized MIS
4. Limitations of MIS

### **Long Question :**

1. Discuss the concept and components of a system.
2. What is a computer-based information system ? Discuss different categories of computer-based information system ?

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❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	1	2	3
No. of Hrs.			

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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# **Management & Information System**

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## **BLOCK-2 COMPUTER FUNDAMENTALS AND WORD PROCESSING TOOLS**

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### **UNIT 1**

BASICS OF COMPUTER

### **UNIT 2**

DATA STORAGE TECHNIQUES

### **UNIT 3**

SOFTWARE AND MULTIMEDIA

### **UNIT 4**

MS WORD – I

### **UNIT 5**

MS WORD – II

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## **BLOCK 2 : COMPUTER FUNDAMENTALS AND WORD PROCESSING TOOLS**

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### **Block Introduction**

In this block you will learn about computer which accepts input, process input and generate meaningful output for future use. You will learn about input unit and output unit which is consider as component of the computer. As well as different generation and classification of the computer. You will also learn about the application of computer.

You will come to know about the number system as there are positional and non-positional system are available. As per part of number system you will learn about the conversion of the Binary, Decimal, Octal and Hexadecimal System.

In this block you will learn about the Microsoft office word which is basically use for document creation and you will learn about the different kind of formatting available like bold, italic, underline, font, font color and so on. As well you will learn about the page setup and detail of the mail-merge facility that is going to be use to send mail to multiple persons.



## **Block Objectives**

**After learning this block, you will be able to :**

- What is Computer ?
- Evolution, component, generation, classification, and application of computer
- Detail of Binary Number System
- Detail of Computer Memory
- Idea about computer software
- System software and Application software
- Idea about MS-Word
- Formatting of document, Page setup
- Detail of Mail Merge

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**Block Structure**

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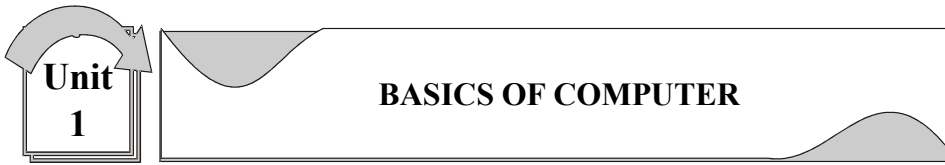
Unit 1 : Basics of Computer

Unit 2 : Data Storage Techniques

Unit 3 : Software and Multimedia

Unit 4 : MS Word – I

Unit 5 : MS Word – II



**: UNIT STRUCTURE :**

- 1.0 Learning Objectives**
- 1.1 Introduction**
- 1.2 Computer Definition**
- 1.3 Components of a Computer**
- 1.4 Evolution of Computer**
- 1.5 Generation of Computers**
- 1.6 Classification of Computer**
- 1.7 Applications of Computer**
- 1.8 Let Us Sum Up**
- 1.9 Answers for Check Your Progress**
- 1.10 Glossary**
- 1.11 Assignment**
- 1.12 Activities**
- 1.13 Case Study**
- 1.14 Further Readings**

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**1.0 Learning Objectives :**

**After going through this unit, you will be able to :**

- define the term Computer
- describe the key characteristics of a Computer
- trace the evolution of Computers
- describe the generations of Computers
- identify the types of Computers
- describe the applications of Computer.

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**1.1 Introduction :**

Computer is the most powerful tool man has ever created. Computers have made a great impact on our everyday life. Today, computer technology has permeated every sphere of existence of modern human being. With the growing information needs the computer has become one of the vital components for the survival of the business houses. Their presence is felt almost every working place from the bus and railway ticket reservation to satellite launching, from retail stores to medical diagnosis and from home use to research and design organization - everywhere, we witness the elegance, sophistication and efficiency possible only with the help of computers.

In this unit, we will introduce you to the computer fundamentals including its various components and functionality. In this unit, we shall discuss the characteristics of computers including its evolution and generations. We will also discuss the categories of computers along with its application in the various fields of the modern world.

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## **1.2 Computer Definition :**

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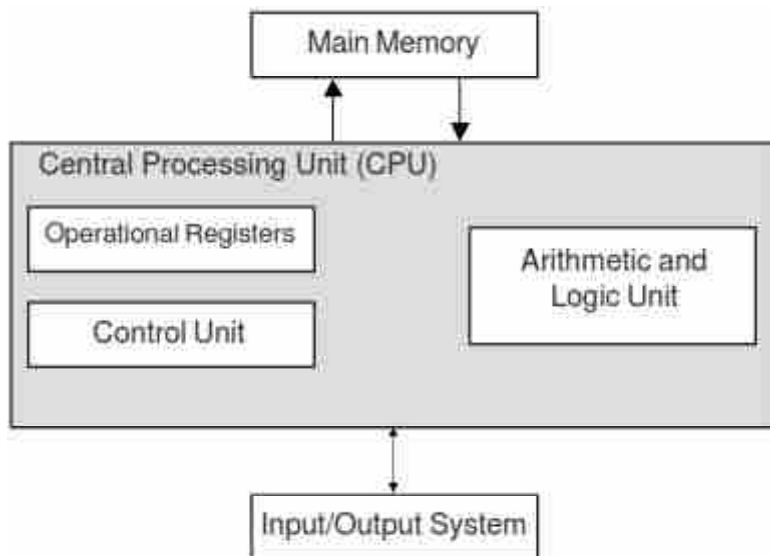
The term *computer* is derived from the word *compute*, which means *to calculate*. In the simplest form a computer can be defined as a *programmable machine*. In a more formal way it can be defined as an *Electronic machine* capable of performing calculations and other manipulations of various types of data, under the control of a stored set of instructions. A computer accepts data from an input device and processes it into useful information which it displays on its output devices. Actually, a computer is a collection of *hardware* and *software* components that help you accomplish many different tasks. The machine itself is the hardware; and the instructions are the program or software.

Most of today's computer designs are based on the concepts developed by *John Von Neumann* referred to as the "*Von Neumann architecture*". According to this structure a computer must have two units- a processing unit and a single separate storage unit. The term "*storedprogram computer*" is generally used to mean a computer of this design. The processing unit is termed as *central processing unit (CPU)* which mainly comprises with another two unit namely Arithmetic and Logic Unit (**ALU**) and Control Unit (**CU**). The ALU performs the arithmetic operations on data such as addition, subtraction, multiplication and division, and the logical operations such as  $>$ ,  $<$ ,  $>=$ ,  $<=$  etc. The control unit directs the ALU to perform specific arithmetic and logical functions on the data.

The storage unit is used to store instructions and data temporarily. This component is referred to as memory. The memory unit stores all the information in a group of memory cells, also called memory locations, as binary digits (bits). Each memory location has a unique address and can be addressed independently.

The instruction and data can be put into the computer with the help of the input module. Similarly, it needs another component that will report the results in proper format and form. This component is called output module.

The following figure shows the basic structure of a conventional Von Neumann machine :



**Fig. 1.1 : Von Neumann Architecture**

**NOTE :** All the arithmetic and logical operations are performed in the CPU in special storage areas called registers. The size of the register is one of the important considerations in determining the processing capabilities of the CPU. Register size refers to the amount of information that can be held in a register at a time for processing. The larger the register size, the faster may be the speed of processing CPU processing power is measured in Million Instruction Per Second (MIPS).

### 1.3 Components of a Computer :

All general-purpose computer requires the following hardware components :

**Input Unit :** This is the unit through which data and instructions are entered into a computer. Usually a keyboard and mouse are the common input devices. The other input devices are light pen, joy stick, scanner, touch screen, magnetic ink character reader (MICR), optical mark reader (OMR) and bar code reader etc.

A group of input devices are shown in the following figure :



**Joy Stick**



**Scanner**

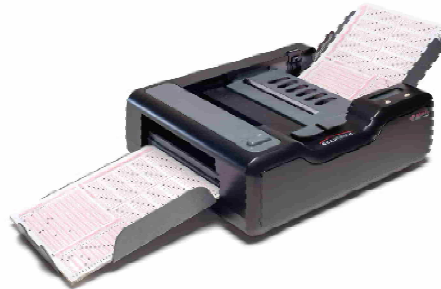
# Management & Information System



**Bar Code Reader**



**Touch Screen**



**Optical Mark Reader**



**Mouse**



**Keyboard**

**Fig. 1.2 : Input Devices**

**Output Unit :** This unit communicates the results to the user. A display screen or monitor, printers are the common device that lets you see what the computer has accomplished. The following figures shows the common output devices :



**Monitor**



**Printer**



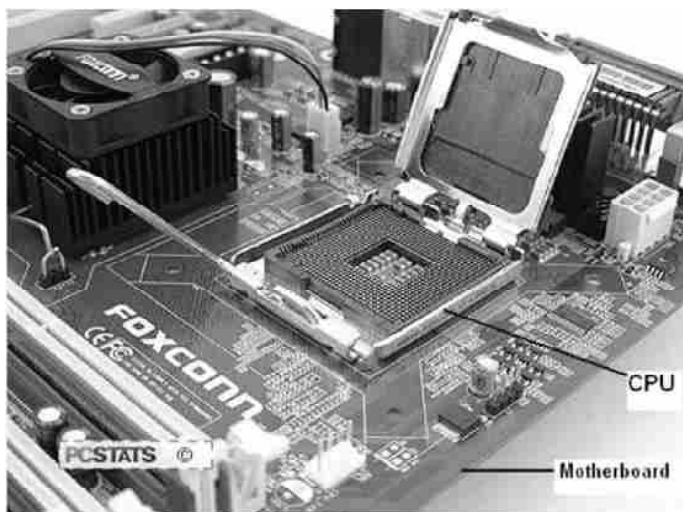
**Plotter**

**Output Devices :**

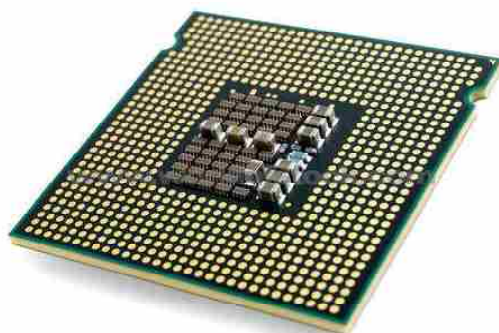
**Central Processing Unit (CPU) :** The CPU is the brain of the computer which is responsible for carrying out arithmetic and logic functions as well as execution of instructions. Modern CPU's are what are called 'integrated chips'. The idea of an integrated chip is that several processing components are integrated into a single piece of silicon. Without the CPU, you have no computer. The CPU is composed of millions of transistors. A complete central processing unit (CPU) contained on a single silicon chip is also called a microprocessor. We have already mentioned that the CPU consists of two major components - ALU and CU.

The arithmetic and logic unit (ALU) is the part where actual computations take place. It consists of circuits which perform arithmetic operations e.g. addition, subtraction, multiplication, division, over data received from memory and capable to compare numbers. The control unit of a CPU controls the entire operation of the computer. It controls all other devices such as memory, input and output devices connected to the CPU. It gives order to the ALU what operation are to be performed. It generates timing and control signals, and provides them for all operations. It controls the data flow between CPU and peripherals (including memory).

The physical image of a central processing unit which is attached to a motherboard shown below :



**(a) A Processor on the Motherboard**



**(b) Processor**

Fig. 1.4 : Central Processing Unit (CPU)

**Memory :** The memory enables a computer to store the data and programs temporarily. The term memory identifies data storage that comes in the form of chips, and the word storage is used for memory that exists on tapes or disks. Every computer comes with a certain amount of physical memory, usually referred to as main memory or RAM (Random Access Memory)

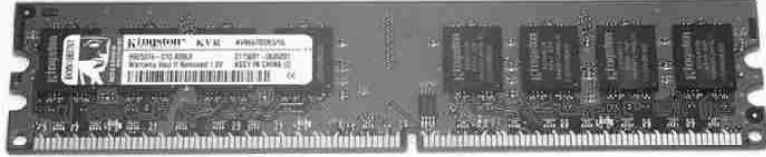


Fig. 1.5 : A RAM Chip

From the above discussion, we have come to know that, a computer system is consisting with various components like input unit, output unit, the CPU and the memory. Now, if we depict the block diagram of a computer system it will look like the following :

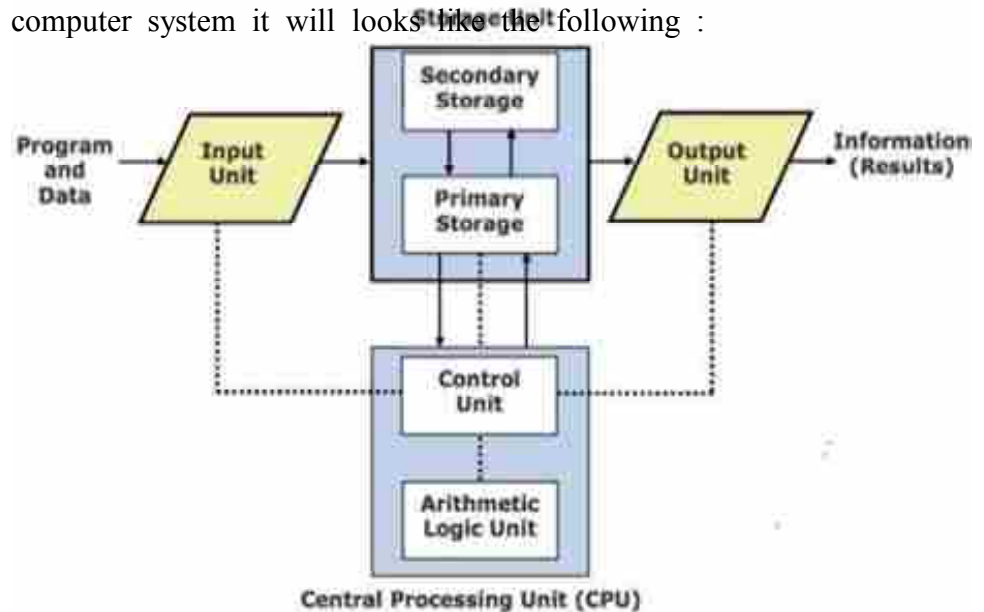


Fig. 1.6 : Block Diagram of a Computer

**Characteristics of Computer :** Some of the main characteristics of computers that make them an essential part of every emerging technology and a desirable tool in human development can be cited as follows :

- **Speed :** In a few seconds a computer can perform such a huge amount of task that a normal human being may take days or even years to complete. At present, a powerful computer can perform billions of operations in just one second.
- **Accuracy :** The computers are very accurate. The level of accuracy depends on the instructions and the type of machine used.
- **Deligence :** Being a machine, computers do not suffer from tiredness and lack of concentration even if the same job has to be done



repeatedly unlike we human beings. It can perform even millions of calculations all with the same accuracy and speed.

- **Reliability** : Computers are reliable, because at the machinery level, they do not require any human intervention between its processing operations. Computers also have built-in diagnostic capabilities, which help in continuous monitoring of the system.
- **Storage Capacity** : Computers can store large amounts of data and can recall the required information almost instantaneously.
- **Versatility** : Computers can perform multiple tasks simultaneously.
- **Resource Sharing** : With the tremendous growth in computer technologies resource sharing is easily possible.
- **Lack of Intelligence** : A computer can only perform what it is programmed to do. It cannot take any decision. This is the main limitation of a computer.

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#### 1.4 Evolution of Computer :

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The ABACUS can be considered the ancestor of today's computer. It was built by the people of Asia Minor almost 2000 years ago. It was simply a wooden rack holding parallel wires on which beads were strung. When these beads were moved along the wire according to some rules that the user must memorize, all ordinary arithmetic operations could be performed.

An English mathematics professor, named **Charles Babbage**, in the early 1800s designed a machine to perform differential equations, called *Difference Engine*. It was a steam powered machine as large as a locomotive and had a stored program and could perform calculations and print results automatically.

After Babbage, between 1850 and 1900, many of the new advances in mathematics and physics took place which involved complex calculations and formulas that were very time consuming for human calculation. Then people started rethinking of the development of a device to help complex calculations.

In the 1890's census of the United States, a machine developed by **Herman Hollerith** was used. Hollerith developed a new punched-card system that could automatically read information on cards without human intervention.

In 1942, John P Eckert, John W. Mauchley, and their associates at the University of Pennsylvania built a high-speed electronic computer to do the job known as **ENIAC (Electrical Numerical Integrator And Calculator)**. It could multiply two numbers at the rate of 300 products per second, by finding the value of each product from a multiplication table stored in its memory. ENIAC was about 1,000 times faster than the previous generation of Computers. ENIAC used vacuum tubes to

make the internal parts of the computer and electricity to run. It used punched-card input and output.

In 1945 **John Von Neumann** undertook a theoretical study of computation that demonstrated that a computer could have a very simple architecture and yet be able to execute any kind of computation effectively by means of proper programmed control without the need for any changes in hardware. Von Neumann came up with incredible ideas which came to be referred to as the **stored-program technique**, that became fundamental for future generations of high-speed digital computers and were universally adopted.

The first wave of modern programmed electronic computers to take the advantage of these improvements came the first group of modern programmed electronic computers. This group included computers using random access memory (RAM), which is a memory designed to give almost constant access to any particular piece of information. This group of machines included **EDVAC**, **EDSAC** (Electronic Delay Storage Automatic Calculator) and **UNIVAC**, the first commercially available computers. The UNIVAC was developed by John W. Mauchley and John Eckert, Jr. in the 1950s.

In the 1960s efforts to design and develop the fastest possible computers with the greatest capacity reached a turning point with the completion of the **LARC** machine for **Livermore Radiation Laboratories** by the Sperry-Rand Corporation, and the Stretch computer by IBM. During this time the major computer manufacturers began to offer a range of computer capabilities, as well as various computer-related equipment. Input means such as consoles and card feeders; output means such as page printers, cathode-ray-tube displays, and graphing devices; and optional magnetic-tape and magnetic-disk file storage.

In the 1970s entire assemblies, such as adders, shifting registers, and counters, became available on tiny chips of silicon. In 1971 Marcian E. Hoff, Jr., an engineer at the Intel Corporation, invented the microprocessor and another stage in the development of the computer began.

A new revolution in computer hardware was now well under way, involving miniaturization of computer-logic circuitry and of component manufacture by what are called **large-scale integration techniques**. **In the 1980s very large scale integration (VLSI)**, in which hundreds of thousands of transistors are placed on a single chip, became increasingly common. The trend of reduction in size led to the introduction of Personal Computers (PCs), which are programmable machines small enough and inexpensive enough to be purchased and used by individuals. By the late 1980s some PCs were run by microprocessors, a processor on a single **integrated circuit (IC)** chip. The trend continued leading to the development of smaller and smaller microprocessors with a proportionate increase in processing powers.

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## **1.5 Generation of Computers :**

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The history of computer development is often considered with reference to the different generations of computing device. Each generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful and more efficient and reliable devices. There are five generations of computers as follows :

**First Generation (1945-1955) :** Examples of computers of this generation are :

ENIAC- Electronic Numerical Integrator And Calculator EDSAC- Electronic Delay Storage Automatic Calculator EDVAC- Electronic Discrete Variable Automatic Computer UNIVAC- Universal Automatic Computer IBM 701

**Characteristics of First Generation Computers :**

- Vacuum tubes were used- basic arithmetic operations took few milliseconds
- Bulky i.e. very large in size
- Consume more power with limited performance
- High cost
- Uses assembly language- to prepare programs. These were translated into machine level language for execution.
- Mercury delay line memories and Electrostatic memories were used
- Punched cards and paper tape were invented to feed programs and data and to get results.
- Magnetic tape / magnetic drum were used as secondary memory
- Mainly used for scientific computations.

**Second Generation (1955-1965) :** Examples of computers of this generation are- IBM 7030, Digital Data Corporation's PDP 1/5/8 Honeywell 400.

**Characteristics of Second Generation Computers :**

- Transistors were used in place of vacuum tubes
- Small in size
- Lesser power consumption and better performance
- Lower cost
- Magnetic ferrite core memories were used as main memory which is a random-access nonvolatile memory
- Magnetic tapes and magnetic disks were used as secondary memory
- High level languages such as FORTRAN, COBOL etc were used
- Separate input-output processors were developed that could operate

in parallel with CPU.

- Punched cards continued during this period also.
- Increasingly used in business, industry and commercial organizations for preparation of payroll, inventory control, marketing, production planning, research, scientific & engineering analysis and design etc.

**Third Generation (1965-1975) :** Examples of computers of this generation are-360 Mainframe from IBM, PDP-8 Mini Computer from Digital Equipment corporation).

**Characteristics of Third Generation Computers :**

- ICs were used
- Small Scale Integration and Medium Scale Integration technology were implemented in CPU, I/O processors etc.
- Smaller & better performance
- Comparatively lesser cost
- Faster processors
- In the beginning magnetic core memories were used. Later they were replaced by semiconductor memories (RAM & ROM)
- Introduced microprogramming
- Operating system software were introduced
- Cache and virtual memories were introduced (Cache memory makes the main memory appear faster than it really is. Virtual memory makes it appear larger)
- Database management, multi-user application, online systems like closed loop process control, airline reservation, interactive query systems, automatic industrial control etc. emerged during this period.

**Fourth Generation (1975-1989) :** Examples of computers of this generation are- Intel's 8088, 80286, 80386, 80486 ..., Motorola's 68000, 68030, 68040, Apple II, CRAY I/2/X/MP etc)

**Characteristics of Fourth Generation Computers :**

- Microprocessors were introduced as CPU- Complete processors and large section of main memory could be implemented in a single chip
- Tens of thousands of transistors can be placed in a single chip (VLSI design implemented)
- CRT screen, laser & ink jet printers, scanners etc were developed.
- Semiconductor memory chips were used as the main memory.
- Secondary memory was composed of hard disks - Floppy disks & magnetic tapes were used for backup memory
- Parallelism, pipelining cache memory and virtual memory were applied in a better way

- Local Area Networks (LAN) and Wide Area Networks (WAN) were developed
- Introduced C language and Unix OS
- Introduced Graphical User Interface (GUI)

**Fifth Generation (1989 to present) :** Examples of computers of this generation are- IBM notebooks, Pentium PCs-Pentium 1/2/3/4/Dual core/ Quad core. SUN work stations, Origin 2000, PARAM 10000, IBM SP/2).

#### **Characteristics of Fifth Generation Computers :**

- Computers based on artificial intelligence are available.
- Computers use extensive parallel processing, multiple pipelines, multiple processors etc.
- Massive parallel machines and extensively distributed system connected by communication networks fall in this category.
- Introduced ULSI (Ultra Large Scale Integration) technology - Intel's Pentium 4 microprocessor contains 55 million transistors millions of components on a single IC chip.
- Superscalar processors, Vector processors, SIMD processors, 32 bit micro controllers and embedded processors, Digital Signal Processors (DSP) etc. have been developed.
- Memory chips up to 1 GB, hard disk drives up to 180 GB and optical disks up to 27 GB are available (still the capacity is increasing).
- Object oriented language like JAVA suitable for internet programming has been developed.
- Portable note book computers introduced.
- Storage technology advanced - large main memory and disk storage available.
- Introduced World Wide Web. (and other existing applications like email, e-Commerce, Virtual libraries/Classrooms, multimedia applications etc.)
- New operating systems developed - Windows 95/98/XP/..., LINUX, etc.
- The recent development in the application of internet is the Grid technology which is still in its upcoming stage.
- Quantum mechanism and nanotechnology will radically change the phase of computers.

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#### **1.6 Classification of Computer :**

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Computers can be classified according to their size and power as follows :

- Micro computer
- Mainframe
- Mini computer
- Supercomputer

**Micro Computers :**

- A microcomputer uses a microprocessor as its central Processing Unit. Microcomputers are tiny computers that can vary in size from a single chip to the size of a desktop model.
- They are designed to be used by only one person at a time.
- Small to medium data storage capacities 500MB - 2GB or more  
The common examples of microcomputers are chips used in washing machines, TVs, Cars and Note book/Personal computers.  
E.g. : IBM PC, PS/2 and Apple Macintosh

**Applications :** Used in the field of desktop publishing, accounting, statistical analysis, graphic designing, investment analysis, project management, teaching, entertainment etc. The different models of microcomputers are given below :

- (a) **Personal Computers :** The name PC was given by the IBM for its microcomputers. PCs are used for word processing, spreadsheet calculations, database management etc.
- (b) **Note Book or Lap Top :** Very small in terms of size- can be folded and carried around- Monitor is made up of LCD and the keyboard and system units are contained in a single box. Got all the facilities of a personal computer (HDD, CDD, Sound card, N/W card, Modem etc.) and a special connection to connect to the desktop PC which can be used to transfer data.
- (c) **Palm Top :** Smaller model of the microcomputer- size is similar to that of a calculator - pocket size. It has a processor and memory and a special connection to connect to the desktop PC which can be used to transfer data.
- (d) **Wrist PC :** Smallest type of microcomputer - can be worn on our wrist like a watch. It has a processor and memory and a wireless





(c) Laptop Computer and Palmtop Computer



(e) PDA (Personal Digital Assistant)

Fig. 1.7 : Micro Computer

**Mini Computers :**

- Perform better than micros.
- Large in size and costlier than micros.
- Designed to support more than one user at a time.
- Posses large storage capacities and operates at higher speed.
- Support faster peripheral devices like high speed printers.
- Can also communicate with main frames.

**Applications :**

- These computers are used when the volume of processing is large for e.g. Data processing for a medium sized organization
- Used to control and monitor production processes
- To analyze results of experiments in laboratories
- Used as servers in LANs (Local Area Networks)



**Fig. 1.8 : Mini Computer**

Main Frame Computers :

- Able to process large amount of data at very high speed.
- Supports multi-user facility.
- Number of processors varies from one to six.
- Cost: 3500 to many million dollars.
- Kept in air conditioned room to keep them cool.
- Supports many I/O and auxiliary storage devices.
- Supports network of terminals.

**Applications :**

- Used to process large amount of data at very high speed such as in the case of Banks/ Insurance Companies/ Hospitals/ Railways etc. which need online processing of large number of transactions and requires massive data storage and processing capabilities.
- Used as controlling nodes in WANs (Wide Area Networks).
- Used to manage large centralized databases.

Examples of main frame computers are- IBM 370, IBM 3081, IBM





**Fig. 1.9 : Mainframe Computer**

**Super Computer :** Supercomputer is a broad term for one of the fastest computers currently available. The main characteristics of a super computer are :

- Most powerful Computer system - needs a large room
- Minimum word length is 64 bits
- CPU speed : 100 MIPS (Million instruction per second)
- Equivalent to 4000 computers
- High cost: 4-5 millions
- Able to handle large amount of data
- High power consumption
- High precision

**Applications :**

- In petroleum industry - to analyze volumes of seismic data which are gathered during oil seeking explorations to identify areas where there is possibility of getting petroleum products inside the earth
- In Aerospace industry - to simulate airflow around an aircraft at different speeds and altitude. This helps in producing an effective aerodynamic design for superior performance
- In Automobile industry - to do crash simulation of the design of



**Fig. 1.10 : PARAM 1000 Series Super Computer**

- In structural mechanics - to solve complex structural engineering problems to ensure safety, reliability and cost effectiveness. Eg. Designer of a large bridge has to ensure that the bridge must be proper in various atmospheric conditions and pressures from wind, velocity etc and under load conditions.
- Meteorological centers use super computers for weather forecasting
- In Biomedical research- atomic nuclear and plasma analysis- to study the structure of viruses such as that causing AIDS
- For weapons research and development, sending rockets to space etc.

Examples of supercomputers are : Cray-1 (1976), Cray-2 (1985), Cray T3D (1993), NEC's SX-S/44 (1991), Fujitsu VP 2600/10 (1991), Hitachi 820/80 (1987), C-DAC's PARAM Series of supercomputers etc. A PARAM 10000 series super computer of IIT Guwahati is shown in the above figure.

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### **1.7 Applications of Computer :**

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Now a days, computer is being used almost in every aspects of life. Every company, small or large, government offices, educational institutions are now directly or indirectly dependent on computers mainly for information processing. Computer based railway and airway reservation system is a common example of computer application. Computer system is helping in the efficient management of the banking sector, hospital

records, payroll records and so on. Some of the areas where computers are being used mostly can be listed as below :

- **Science** : Scientists are using computers to carryout their research works based on complex computations because of computer's fast speed and the accuracy.
- **Education** : In schools and colleges, to make education much more interesting, computers are used now a days. Computer Aided Education (CAE) and Computer Based Training (CBT) packages are making learning much more interactive.
- **Health and Medicine** : Starting from diagnosing the illness to monitoring a patient's status during a surgery, in pathological analysis, in CAT scans or MRI scans etc., doctors are using computers. Some special purpose computers are available which can even be operated within the human body.
- **Engineering** : Engineers and architects are using computers in designing machineries, drawing design layouts. Architects can object that can be viewed from all the three dimensions by using techniques like virtual reality. In manufacturing industries, using computerized robotic arms hazardous jobs can be performed. The packages like Computer Aided Designing (CAD), Computer Aided Manufacturing (CAM) and so on are used in designing the product, ordering the parts and planning production.
- **Entertainment** : With the use of multimedia facilities , computers are now greatly used in entertainment industry. Computers are used to control and bring special effects on image and sound.
- **Communication** : Computer network and finally the Internet has brought a drastic change in communication system. Through Email or Electronic mail, it is possible to send messages and reports very fast from one person to another or a group of persons with the aid of computers and telephone lines.
- **Business and Banking** : Computer network and finally the Internet has brought a drastic change in communication system. Through E-mail or Electronic mail, it is possible to send messages and reports very fast from one person to another or a group of persons with the aid of computers and telephone lines.

In order to deposit or withdraw cash from bank, people can use ATM (Automated Teller Machine) services 24 hours of the day. Through the computer networks among different branches of a bank, inter branch transactions can be carried out without delay.

Apart from the above mentioned applications, there are many other applications of computers that can be seen in our day to day activities.

### **Check Your Progress :**

1. State True or False :

- (i) PARAM is a super computer.
- (ii) A laptop is a portable computer.
- (iii) Vacuum tubes were part of the second generation computers.
- (iv) Micro computers are more powerful than mini computers.
- (v) EDSAC is an example of a second generation computer

2. Fill in the blanks :

- (i) Physical components of a computer are called .....
- (ii) The basic components of first generation computers was .....
- (iii) PDA stands for .....
- (iv) ..... is a very small computer that can be held in the palm of the hand.
- (v) Analytical Engine was developed by .....

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### **1.8 Let Us Sum Up :**

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- Computer is an electronic device that is used to perform diverse operations with the help of instructions to process the data in order to produce desired results.
- Speed, accuracy, reliability, versatility, diligence, lack of intelligence are the characteristics of computers.
- Computer development is divided into five generations.
- The first generation of computers used **vacuum tubes** for circuitry and **magnetic drums** for memory, and were often enormous, taking up entire rooms.
- In the second generation of computers, **transistors** replaced vacuum tubes.
- The **integrated circuits** were used in the third generation of computers.
- The fourth generation of computers are based on **micro processors**.
- Fifth generation computers are based on **artificial intelligence**.
- Micro computer is a small, low cost digital computer and include desktop, laptop, PDA.
- A mini computer is a small digital computer more powerful than a micro computer.

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### **1.9 Answers for Check Your Progress :**

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- 1. (i) True, (ii) True, (iii) False, (iv) False, (v) False
- 2. (i) Hardware, (ii) Vacuum tubes, (iii) Personal Digital Assistant, (iv) Palmtop, (v) Charles Babbage.

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### **1.10 Glossary :**

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1. **Computer** : it can be defined as an electronic machine capable of performing calculations and other manipulations of various types of data, under the control of a stored set of instructions. A computer accepts data from an input device and processes it into useful information which it displays on its output devices.
2. **Memory** : Memory enables a computer to store the data and programs temporarily.

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**1.11 Assignment :**

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1. Who invented the concept of stored program ? Why is this concept so important ?
2. List the key hardware technologies used in building computer of each of the five generations.
3. What is an IC ? How it helps in reducing the size of computers
4. Discuss the important features of various generations of computers. Give some examples of the computers of each generation.
5. How computers are categorized into different categories ?

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**1.12 Activities :**

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1. What are the advantages of transistors over vacuum tubes ?

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**1.13 Case Study :**

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1. Explain components of computer.
2. Discuss generation of computer.
3. Explain applications of computer.

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**1.14 Further Readings :**

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1. Parameswaram, R. (2010), 'Computer Applications in Business'. S. Chand & Company.
2. Rajaraman, V. (2013), 'Fundamentals of computer', Practice Hall

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**Unit  
2**

**DATA STORAGE TECHNIQUES**

India Learning Private Ltd.

3. Saxena, Sanjay & Chopra, P. (2006), 'Computer Application in Management', Vikash Publication House Pvt. Ltd.

- 2.0 Learning Objectives**
- 2.1 Introduction**
- 2.2 Storing Data in Computer**
- 2.3 Binary Number System**
  - 2.3.1 Binary to Decimal Conversion**
  - 2.3.2 Decimal to Binary Conversion**
- 2.4 Computer Memory**
  - 2.4.1 Random Access Memory**
  - 2.4.2 Read Only Memory**
  - 2.4.3 Cache Memory and Virtual Memory**
  - 2.4.4 Secondary Memory**
- 2.5 Let Us Sum Up**
- 2.6 Answers for Check Your Progress**
- 2.7 Glossary**
- 2.8 Assignment**
- 2.9 Activities**
- 2.10 Case Study**
- 2.11 Further Readings**

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**2.0 Learning Objectives :**

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After going through this unit, you will be able to :

- learn how the computer stores data
  - know about the binary number system
  - describe the computer memory.
- 

**2.1 Introduction :**

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In the earlier unit, we obtained a fairly good insight into the concept of computer, about various components and application of computer etc. Data storage techniques refers to the techniques used in computers for storing data and the use of possible data storage devices. Now in this unit, we will discuss the technique of storing data in computer. We will also introduce you to binary number system and various types of computer memories.

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**2.3 Storing Data in Computer :**

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To better understand how a computer stores information and to also understand why information is lost if the power goes off, let's take a closer look. Your computer is made of millions of tiny electric circuits. For every circuit in a computer chip, there are two possibilities :

- (1) an electric current flows through the circuit or
- (2) an electric current does not flow through the circuit.

When an electric current flows through a circuit, the circuit is on. When no electricity flows, the circuit is off. An "on" circuit is represented by the number one (1) and an off circuit is represented by the number zero (0). The two numbers 1 and 0 are called bits. The word bit comes from "binary digit". Each time a computer reads an instruction, it translates that instruction into a series of bits, 1's and 0's. On most computers every character from the keyboard is translated into eight bits, a combination of eight 1's and 0's. Each group of eight bits is called a byte. Each group of four bits is called a nibble.

Thus, 8 bits = 1 byte and 4 bits = 1 nibble

Since computers can handle such large numbers of characters at one time, metric prefixes are combined with the word byte to give some common multiples you will encounter in computer literature. These are mentioned below :

1 kilobyte (KB) = 1,024 byte =  $2^{10}$  byte = 8,192 bit

1 megabyte (MB) = 1,024 KB =  $2^{10}$  KB =  $2^{20}$  byte

1 gigabyte (GB) = 1,024 MB =  $2^{10}$  MB =  $2^{20}$  KB =  $2^{30}$  byte

1 terabyte = 1,024 GB =  $2^{10}$  GB =  $2^{20}$  MB =  $2^{30}$  KB =  $2^{40}$  byte

1 petabyte = 1,024 terabyte =  $2^{10}$  terabyte =  $2^{20}$  GB =  $2^{30}$  MB  
=  $2^{40}$  KB = 250 byte

Commercially, however, bytes might be counted as decimal.

1 byte = 8 bits

1 kilobyte (KB) = 1,000 bytes

1 megabyte (MB) = 1,000,000 bytes

1 gigabyte (GB) = 1,000,000,000 bytes

1 terabyte (TB) = 1,000,000,000,000 bytes

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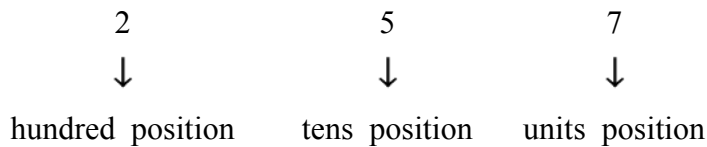
## **2.4 Binary Number System :**

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We are familiar with the decimal number system which is used in our day-to-day work. Ten digits are used to form decimal number. To represent these decimal digits, ten separate symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are used. So, the **base** or **radix** of such system is **10**. But a digital computer stores, understands and manipulates information composed of only zeros and ones. So, each decimal digits, letters, symbols etc. written by a user are converted to binary codes in the form of 0's and 1's within the computer. The knowledge of the number system is essential to understand the operation of a computer.



In decimal system, the successive position to the left of the decimal point represent units, tens, hundreds, thousands etc. For example, if we consider a decimal number 257, then the digit representations are :



The weight of each digit of a number depends on its relative position within the number.

So, the number can be represented as :

$$257 = 2 \times 10^2 + 5 \times 10^1 + 7 \times 10^0$$

The weight of each digits of the number from right hand side are-

Weight of 1st digit =  $7 \times 10^0$

Weight of 2nd digit =  $5 \times 10^1$

Weight of 3rd digit =  $2 \times 10^2$

The above expressions can be written in general forms as the weight of nth digit of the number from the right hand side

$$= n^{\text{th}} \text{ digit} \times 10^{n-1}$$

$$= n^{\text{th}} \text{ digit} \times (\text{base})^{n-1}$$

The number system in which the weight of each digit depends on its relative position within the number is called a positional number system.

In binary number system, two digits 0 and 1 are used to represent binary numbers. So the base or radix of binary system is two (2). The digits 0 and 1 are called bits (Binary Digits). In this number system the value of the digit will be two times greater than its predecessor. Thus the value of the places are-

$$\leftarrow \leftarrow 32 \leftarrow 16 \leftarrow 8 \leftarrow 4 \leftarrow 2 \leftarrow 1$$

The weight of each binary bit depends on its relative position within the number. It is explained by the following example-

**Example 1.2 :** The weight of bits of the binary number 10110 is-

$$= 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$$

$$= 16 + 0 + 4 + 2 + 0 = 22 \text{ (decimal number)}$$

The weight of each bit of a binary number depends on its relative position within the number and are explained from right hand side

Weight of 1<sup>st</sup> bit = 1<sup>st</sup> bit  $\times 2^0$

Weight of 2<sup>nd</sup> bit = 2<sup>nd</sup> bit  $\times 2^1$

.....

.....

and so on.

The weight of the  $n$ th bit of the number from right hand side  
 $= n^{\text{th}} \text{ bit} \times 2^{n-1}$   
 $= n^{\text{th}} \text{ bit} \times (\text{Base})^{n-1}$

It is seen that, this rule for a binary number is same as that for a decimal number system. The above rule holds good for any other positioned number system. The weight of a digit in any positioned number system depends on its relative position within the number and the base of the number system.

### 2.3.1 Binary to Decimal Conversion :

To convert a binary number to its decimal equivalent we use the following expression. The weight of the  $n^{\text{th}}$  bit of the number from right hand side  $= n^{\text{th}} \text{ bit} \times 2^{n-1}$

First, we mark the bit position and then we give the weight of each bit of the number depending on its position. The sum of the weight of all bits gives the equivalent number.

**Example :** Convert binary  $(110100)_2$  to its decimal equivalent.

**Solution :**

$$\begin{aligned} (110100)_2 &= 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 \\ &\qquad\qquad\qquad + 0 \times 2^0 \\ &= 32 + 16 + 0 + 4 + 0 + 0 \\ &= (52)_{10} \end{aligned}$$

**Example :** Converting binary fraction  $(111011.101)_2$  to its equivalent decimal fraction.

**Solution :**

$$\begin{aligned} (111011.101)_2 &= (1 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 \\ &\quad + 1 \times 2^0) + (1 \times 2^{-1} + 0 \times 2^{-2} + 1 \times 2^{-3}) \\ &= (32 + 16 + 8 + 0 + 2 + 1) + (0.5 + 0 + 0.125) \\ &= (59.625)_{10} \end{aligned}$$

$$(111011.101)_2 = (59.625)_{10}$$

### 2.3.2 Decimal to Binary Conversion :

There are different methods used to convert decimal number to binary numbers. The most common method is, repeatedly divide the decimal number to binary number by 2, then the remainders 0's and 1's obtained after division is read in reverse order to obtain the binary equivalent of the decimal number.

**Example :** Convert  $(75)_{10}$  to its binary equivalent.

<u>2 75</u>	Remainder	
<u>2 37</u>	1	
<u>2 18</u>	0	
<u>2 9</u>	1	Read in

$2 \overline{)4}$	1	reverse order
$2 \overline{)2}$	0	
1	0	

So,  $(75)_{10} = (1001011)_2$

The method to convert the fraction decimal number to its binary equivalent, is repeatedly multiply the fraction part by 2 until it becomes zero and count the most significant bits (MSB) in the order they appear. In a binary number, the extreme left bit is called a most significant bit and the extreme right bit is called least significant bit (LSB). In some cases the fractional part may not becomes zero, and the process will continue. For such a case an approximation is made.

**Example :** Convert decimal fraction  $(12.75)_{10}$  to its equivalent binary fraction.

$2 \overline{)12}$	Remainder	.75	MSB
$2 \overline{)6}$	0	$\times 2$	
$2 \overline{)3}$	0	1.50	1
1	1	.50	
		$\times 2$	
		1.00	1

Here, the fractional part becomes zero

So,  $(12)_{10} = (1100)_2$  and  $(.75)_{10} = (.11)_2$

Now,  $(12.75)_{10} = (1100.11)_2$

**Check Your Progress – 1 :**

1. Converts the following :
  - (a) 32 bytes = ..... bits
  - (b) 128 bits = ..... bytes
  - (c) 64 bits = ..... nibbles
  - (d) 16 KB = ..... bytes = ..... bits
  - (e) 64 MB = ..... KB = ..... bytes
  - (f) 4 GB = ..... MB = ..... KB
2. Convert the following decimal number into binary :
  - (a) 120,
  - (b) 32.25
3. Convert the following binary number into decimal number :
  - (a) 1001101,
  - (b) 11.1010

**2.4 Computer Memory :**

The term *memory* usually refers to a form of semiconductor storage

and sometimes other forms of fast but temporary storage. Similarly, today the term *storage* more commonly refers to mass storage such as optical discs, forms of magnetic storage like hard disks and other types. All these are slower than memory, but of a more permanent nature. Generally, the computer memory is divided into two category : *primary memory* and *secondary memory*. The term primary memory is used to represent the *memory* and the term secondary memory is used to represent the *storage*.

*Primary memory* is directly accessible to the CPU. The CPU continuously reads instructions stored there and executes them. Any data actively operated on is also stored there in uniform manner. It is a form of semiconductor storage known as random access memory (**RAM**) and sometimes other forms of fast but temporary storage. It is small-sized, light, but quite expensive. This type of memory is divided into the following two types :

- (a) RAM (Random Access Memory)
- (b) ROM (Read Only Memory)

#### **2.4.1 Random Access Memory (RAM) :**

A machine's main memory is often referred to as RAM - an area in the computer system unit that temporarily holds user data, operating system instructions and program instructions. Every time we turn on our computer, a set of operating system instructions is copied from hard disk into RAM. These instructions, which help control basic computer functions, remain in RAM until we turn the computer off.

##### **RAM features :**

- (a) Data that needs to be processed and the instructions which are used for processing are held in the RAM.
- (b) RAM is a cluster of semi-conductor devices. The elements of RAM change with the proper application (changes) of the electric current.
- (c) Each element of RAM is a memory location in which data can be stored. Each location has a unique address. Using this address data can be directly retrieved and stored.
- (d) Since RAM must hold both the data to be processed and the instructions for processing, its size or capacity is one of the measure of power of the computer.
- (e) The contents of RAM need to be stored periodically onto a secondary memory since power failure will erase the contents of RAM because of which this memory is also called volatile memory.

There are generally two broad categories of random access memory :

- (i) **DRAM** memories (*Dynamic Random Access Memory*)
- (ii) **SRAM** memories (*Static Random Access Memory*)

#### **2.4.2 Read Only Memory :**

One major type of memory that is used in PCs is called *read-only*

*memory*, or *ROM* for short. ROM is a type of memory that normally can only be read, as opposed to RAM which can be both read and write. The instructions in ROM are permanent whether the power is on or off. We have no way to change them, unless we remove the ROM chips from the main board and replace them with another set.

Read-only memory is most commonly used to store system-level programs that we want to have available to the PC at all times. The most common example is the ROM-BIOS (ROM basic input and output services) program, which is used to boot up the system. The term boot is used to describe the initial loading of an operating system or of some other program into a computer. The word "boot" comes from the term "bootstrap".

The following are the different types of ROMs with a description of their relative modifiability :

- **Programmable ROM (PROM)** : This is a type of ROM that can be programmed using special equipment; it can be written to, but only once.
- **Erasable Programmable ROM (EPROM)** : An EPROM is a ROM that can be erased and reprogrammed. Ultraviolet light of a specific frequency is used for erasing the EPROM and allow it to be reprogrammed again.
- **Electrically Erasable Programmable ROM (EEPROM)** : The next level of erasability is the *EEPROM*, which can be erased under software control. This is the most flexible type of ROM, and is now commonly used for holding BIOS programs.

#### 2.4.3 Cache Memory and Virtual Memory :

Another two types of memory used in a computers are - cache memory and virtual memory.

- **Cache Memory** : Cache memory is a special type of RAM which is the faster memory used in a computer system in between the CPU and main memory. It means that the accessing speed from the cache memory is faster than the main memory used in computer. So, the use of the cache memory reduces the average access time and helps the processor for fast processing. The Cache memory stores the instructions and data that are frequently needed by the processor for execution. Cache memory chip is a static memory chip It is much expensive than the main memory. Cache size varies from 32 MB to 128MB or 512MB etc.
- **Virtual Memory** : An operating system technique that uses swapping techniques to increase the apparent size of actual memory. Virtual Memory is the ability of a computer to use disk storage to simulate RAM. Virtual Memory allows computers without enough RAM to run large programs, manipulate large data files, and run more than one program at a time. One disadvantage of virtual memory is

reduced performance. With most of today's operating systems the computer uses space on our computer's hard disk drive as an extension of RAM. It takes longer to retrieve data from virtual memory than from RAM because the disk is a mechanical device so access time is slower.

#### **2.4.4 Secondary Memory :**

Secondary memory or storage provides the facility of storing information and programs permanently. It differs from primary memory in that it is not directly accessible by the CPU. The computer usually uses its input/output channels to access secondary storage and transfers desired data using intermediate area in primary memory. Secondary storage does not lose the data when the device is powered down; it is non-volatile. It is less expensive than primary memory.

In modern computers, hard disks are usually used as secondary storage. The time taken to access a given byte of information stored on a hard disk is order of few milliseconds. By contrast, the time taken to access a given byte of information stored in random access memory is measured in nanoseconds. Some other examples of secondary storage devices are :

**optical disk, floppy disks, magnetic tape, Paper tape, Punch Cards, standalone RAM disks, flash memory ( e.g. USB sticks or keys), and Zip drives.**

The **characteristics** that are used for the classification of various types of storage are :

- **Storage Capacity :** It is a representative of the size of the memory. The capacity of internal memory and main memory can be expressed in terms of number of words or bytes. The storage capacity of external memory is normally measured in terms of bytes.
- **Access Modes :** A memory is considered to consists of various memory locations. The information from these memory locations can be accessed in the following ways :
- **Random Access :** It is the mode in which memory locations can be accessed in any order in the same amount of time.
- **Sequential Access :** Sequential access also known as **serial** access where the device must read or move through all information up to the point it is attempting to read or write. A tape drive is an example of a sequential access drive, where the drive must move the tape forward or backwards until it reaches its destination.
- **Direct Access :** A direct access storage device is one in which any location in the device may be selected at random, access to the information stored is direct i.e. no need of scanning a series of records and approximately equal access time is required for each location. Hard disk, optical disk are the examples of direct access

storage device.

- **Access Time :** The access time is the time required between the request made for a read or write operation till the time the data is made available or written at the requested location.

**Check Your Progress – 2 :**

1. State True or False :
  - (i) The secondary memory is faster than the main memory and has limited capacity.
  - (ii) In random access memory memory locations can be accessed sequentially.
  - (iii) Cache memory is faster than main memory.
  - (iv) Flash memory is one kind of RAM.
  - (v) High speed memories are needed to bridge the gap of speed between CPU and main memory.
  - (vi) Virtual memory is technique of an operating system.
  - (vii) Semiconductor memories are random access memory.

**2.5 Let Us Sum Up :**

- Data in side a computer is stored in form of 0s and 1s. These 0 and 1s are called bit. 4 bit constitute a nibble and 8 b it constitute a byte.
- Decimal number system has base 10 and binary number system has base 2.
- The *memory* usually refers to a form of semiconductor storage i.e. primary memory and *storage* refers to mass storag i.e. secondary memory.
- Random access memories are the semiconductor memory. They are volatile in nature. RAMs are of two types - dynamic RAM and static RAM.
- ROMs are also the semiconductor memory. The instructions in ROMs are permanent whether the power is on or off. PROM, EPROM, EEPROM are the types of ROMs.
- Cache memory is a special type of RAM which is the faster memory used in a computer system in between the CPU and main memory.
- Virtual memory is an operating system technique that uses swapping techniques to increase the apparent size of actual memory.
- Secondary memory also called secondary storage stores information and programs permanently. In personal computer, secondary memory typically consists of hard disk or any removable media, if present, such as a CD or DVD etc.

**2.6 Answers for Check Your Progress :**

**Check Your Progress – 1 :**

1. (a) 256 (b) 16 (c) 16 (d) 16384, 16777216  
(e) 65536, 67108864 (f) 4096, 4194304

2. (a)

$2 \overline{)120}$	Remainder
$2 \overline{)60}$	0
$2 \overline{)30}$	0
$2 \overline{)15}$	0
$2 \overline{)7}$	1
$2 \overline{)3}$	1
1	1

Arranging in reverse order we will get - 1111000

So,  $(75)_{10} = (1111000)_2$

(b)

$2 \overline{)32}$	Remainder
$2 \overline{)16}$	0
$2 \overline{)8}$	0
$2 \overline{)4}$	0
$2 \overline{)2}$	0
1	0

$(32)_2 = 100000$

MSB

For the fractional part

.25

$\times 2$

0 50

.50

$\times 2$

1 1.00

Here, the fractional part becomes zero

So,  $32.25 = (100000.01)_2$

3. The decimal equivalent of the binary number

(a)  $1001101 = 1 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$   
 $= 64 + 8 + 4 + 1 = 77$

(b)  $11.1010 = 1 \times 2^1 + 1 \times 2^0 + 1 \times 2^{-1} + 0 \times 2^{-2} + 1 \times 2^{-3} + 0 \times 2^{-4}$   
 $= 2 + 1 + 0.5 + 0 + 0.125 + 0 = 3.625$

**Check Your Progress – 2 :**

1. (i) False, (ii) False, (iii) True, (iv) False,  
(v) True, (vi) True, (vii) True

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**2.7 Glossary :**

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1. **RAM** : A machine's main memory is often referred to as RAM - an area in the computer system unit that temporarily holds user data, operating system instructions and program instructions.
2. **Cache Memory** : Cache memory is a special type of RAM which is the faster memory used in a computer system in between the CPU and main memory.
3. **Storage** : Storage provides the facility of storing information and programs permanently.

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**2.8 Assignment :**

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1. Discuss how the data are stored in computer.
2. What are the differences in :  
(a) Volatile versus Non-volatile memory
3. What is a RAM ? What are its two types ? Differentiate between them.
4. What is a ROM ? Why is it called so ? Write about a few typical use of ROM.
5. What is a cache memory ? How is it different from a primary memory?
6. Differentiate between PROM and EPROM.

---

**2.9 Activities :**

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1. Convert the following Decimal number to Binary  
(a) 125            (b) 55.75            (c) 0.875            (d) 120.25
2. Convert the following Binary number to Decimal  
(a) 011011            (b) 00010101            (c) 110101.01101

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**2.10 Case Study :**

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1. Discuss the difference between Primary Memory and Secondary Memory with its example.

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**2.11 Further Readings :**

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1. Parameswaram, R. (2010), 'Computer Applications in Business'. S. Chand & Company.
2. Rajaraman, V. (2013), 'Fundamentals of computer', Practice Hall India Learning Private Ltd.
3. Saxena, Sanjay & Chopra, P. (2006), 'Computer Application in Management', Vikash Publication House Pvt. Ltd.

- 3.0 Learning Objectives**
- 3.1 Introduction**
- 3.2 Computer Software Basics**
- 3.3 System Software**
- 3.4 Application Software**
- 3.5 Integrated Software**
- 3.6 Multimedia Computing**
- 3.7 Legal Restriction on Software**
- 3.8 Let Us Sum Up**
- 3.9 Answers for Check Your Progress**
- 3.10 Glossary**
- 3.11 Assignment**
- 3.12 Activities**
- 3.13 Case Study**
- 3.14 Further Readings**

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**3.0 Learning Objectives :**

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**After going through this unit, you will be able to :**

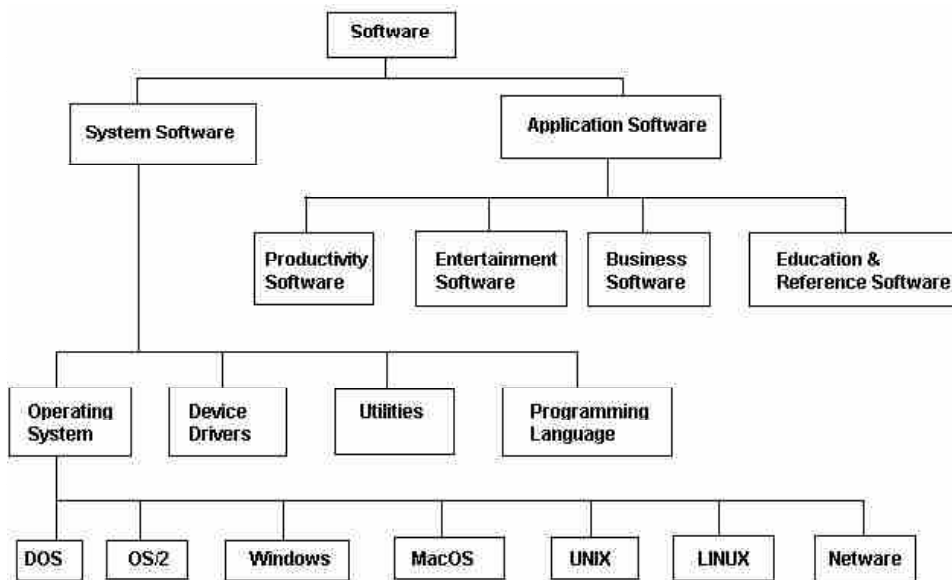
- know about the computer software
- differentiate system software and application software
- explain different types of system and application software
- discuss multimedia computing
- outline software licenses and copyright agreements.

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**3.1 Introduction :**

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In this unit, we are going to discuss about computer software and its applications. The computer is the most successful and versatile machine in history. A computer's versatility is possible because of software. The software is an interpreter which translates the user's command into the understandable machine language codes which can be executed by the central processing unit. There are two major categories of software. They



high resolution monitor and a CD-ROM drive.

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### 3.2 Computer Software Basics :

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Computer software determines what a computer can do; and in a sense, it transforms a computer from one kind of machine to another from a drafting station to a type setting machine, from a flight simulator to a calculator, from a filing system to a music radio and so on. The distinction between software, programs, and data is important.

**Computer Program :** A computer program is a set of detailed, step by step instructions that tell a computer how to solve a problem or carryout a task. The steps in a computer program are written in a language that the computer can interpret or "understand".

**Data :** Data are the words, numbers and graphics that describe people, events, things, and ideas. Data can be included in the software, like the data for a dictionary in a word processing program, and you can create data such as number you provide for a graph.

**Software :** We define software as instructions and associated data, stored in electronic format, that direct the computer to accomplish a task. Under this definition, computer software may include more than one computer program, if these programs wash together to carryout a task. Also under this definition, software can include data, but data alone is not a software. For example, word processing software might include the data for a dictionary, but the data you create using a word processor is not referred to as software.

Two major categories of software : System Software and Application Software with their strategies are displayed in the following figure 3.1.

**Fig. 3.1 : Classification of Software**

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### **3.3 System Software :**

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These are software designed for the satisfactory operation of the computer system. The major categories of system software are :

- (1) Operating System
- (2) Utilities Software
- (3) Device Drive Software
- (4) Programming language.

**(1) Operating System :** An Operating System is an important component of a computer system. The primary objectives of an operating system is to make computer system convenient to use and utilise computer hardware and various resources in an efficient manner.

An operating system is a large set of software which is also an interface between users and computer systems. It is also a system software. Operating system also manages computer resources of the computer system, such as memory, processor, file system and input/output devices.

Operating system can be classified into various categories as follows :

- Single User OS
  - Multi User OS
  - Single Tasking OS
  - Multitasking OS
  - Multiprogramming OS
  - Real Time OS
- **Single User OS :** The simplest operating system which allows only one user to work on a computer at a time is known as single user operating system. For example MS-DOS, Windows 98 ect.
  - **Multiuser OS :** This type of operating system which is running on a computer will manage the work of all different users, without letting them know that they all are actually working on a single computer. For example UNIX, Linux, Windows Xp ect.

- **Single Tasking OS :** It is one type of operating system which can execute a single job at a time is known as Single-tasking operating system. For example, MS-DOS operating system.
- **Multitasking OS :** Multitasking operating system allows the user to perform more than job at the same time on a computer. For example, UNIX, LINUX, OS/2 etc. are multitasking operating system.
- **Multiprogramming OS :** In multiprogramming OS, the CPU runs several programs at the same time. Multiprogramming is implemented in such a way that many programs are being executed concurrently. Mltiprogramming keeps the CPU busy.
- **Real Time OS :** Real-time operating systems work towards providing immediate processing and also responding to user's commands in a very short period of time. This type of operating system is more commonly used in chemical industries for process control and scientific processing like airplane control and space vehicle control operations etc. For example, HP-RT and VTWorks etc.

**Functions of Operating System :** The functions of the Operating System are as follows :

- To control input/output operations i.e. use of keyboard, display screen and printer so that people can easily enter data and receive output.
- To control movement of data in the primary storage.
- To locate and load programs from secondary storage.
- To manage a large task in a smaller primary memory by using the technique of virtual memory.
- Management of I/O devices.
- Management of memory.

**Some Popular Operating System :** The names of the most popular micro computer operating system are DOS, Microsoft Windows, OS/2, MacOS, UNIX, VMS and MVS. Operating systems for micro, mini and mainframe computers perform many similar tasks.

- **DOS :** DOS which stands for Disk Operating System, is marketed under the trade names PC-DOS and MS-DOS. Both PC-DOS and MS-DOS were developed primarily by Microsoft Corporation and are essentially the same operating system.
- **Windows :** Microsoft took a more graphical approach to operating systems when it designed windows. Different versions of windows such as Windows 3.1, Windows 95, Window 98 etc. are developed. But the most sophisticated and developed operating system designed by Microsoft Corporation are *Windows XP & Windows Vista*.
- **Windows NT :** The network version of the Windows operating system is Windows NT. With Windows NT you can connect your

## Management & Information System

computer to other computers to share software programs and data.

- **OS/2** : This operating system was designed jointly by Microsoft and IBM. If your computer uses OS/2, you can use most DOS and Windows software, as well as software designed specifically for OS/2.
  - **UNIX** : UNIX is an operating system that was developed by AT & T's Bell Laboratories in 1969 and is now used as one of the foundation technologies on the information superhighway. UNIX was originally designed for minicomputers, but is now available for microcomputer and mainframe. Many versions of UNIX exist, such as AIX from IBM, XENIX from Microsoft, and ULTRIX from Digital Equipment Corporation.
- (2) **Utilities Software** : Utilities are system software designed to augment the basic capabilities of your computer's operating system. Utilities provide a computer user with a way to control the allocation and use of hardware resources. Some utilities that are included with the operating system perform tasks such as preparing disks to hold data, providing information about the files on a disk, and copying data from one disk to another. For example, Norton Utilities published by *Symantec* is a very popular collection of utilities software.
- (3) **Device Drivers** : are system software that helps the computer control a peripheral device. When you purchase a new peripheral device, the installation instructions that come with the device usually tell you how to install both the device (hardware) and necessary device drivers (software). In order for your computer to use a device driver, you must install it according to the instructions. Once the device driver is installed correctly, the computer uses it to communicate with the device.
- (4) **Programming Language** : Programming language is a system of communication in the software technology. As such all the types of programming languages such as machine language, assembly language and procedure and object oriented language - high level languages are considered to be system software.

### Check Your Progress :

1. Fill in the blanks with appropriate words :
  - (i) ..... system is the software that controls the computer hardware functions.
  - (ii) Computer based satellite control is an example of ..... software.
  - (iii) ..... is a communication facility within a city.
  - (iv) The network version of the windows operating system is .....
  - (v) ..... is an operating system developed by AT & T's Bell Laboratories.

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### 3.4 Application Software :

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These are softwares developed for the specific area of application of the user. Application software helps you to produce documents, perform calculations, manage financial resources, create graphics, compose music, play games, maintain files of information and so on. We can classify the application software using the following categories :

- (1) productivity software
- (2) education and reference software
- (3) entertainment software
- (4) business software

The following figure shows you an expanded view of the application software branch of the software hierarchy chart.

- (1) **Productivity Software** : Productivity software helps you work more effectively. The classification of this software are : (a) Word Processing, (b) Spread sheets, (c) Database Management, (d) Electronic Mail, (e) Graphics, (f) Desktop Publishing
  - (a) **Word processing software** helps you to produce documents such as reports, letters, papers and manuscripts. Word processing is the most popular type of application software.
  - (b) **Spreadsheet Software** helps you work with number. The software displays a grid of rows and columns on the screen. Each box formed by this grid is called a cell. Each cell show an address that indicates its row and column position. Spreadsheets are frequently used by financial analysis to examine investment opportunities, by managers to create budgets, by entrepreneurs to create business plans, and even by the educators to keep track of student grades.
  - (c) **Database Management Software** helps you work with facts and figures, such as the customer names and addresses you might store on file cards. It also helps hospitals and doctors to keep track of patient records and the phone company to keep track of names, addresses, and phone numbers etc.
  - (d) **Electronic mail software** provides you with a computerized mail box that collects documents or "mail" you receive electronically from other computers users. You can send electronic mail messages, you can read you electronic mail on your computer screen, you can save or throw away your electronic mail after you read it or you can compose electronic reply's to the mail you receive.
  - (e) **Graphics Software** helps you draw pictures, 3-D images and animations. Presentation graphics software helps you represent information using screen-based slide shows of bulleted lists, graphics and charts.

- (f) **Desktop Publishing Software** provides you with computerized tools for page payout and design that combine text and graphics. Although many desktop publishing features are available in today's sophisticated word processing software, desktop publishing software provide additional features to help you produce professional looking, quality output for newspaper, newsletters, and brochures.
- (2) **Education and Reference Software** : Educational software is designed to help you learn more about a particular topic. One sub category of educational software is called CAI or tutorial software. CAI stands for "Computer Aided Instruction".
- Reference software, such as electronic encyclopedia, helps you look up facts on any topic.
- (3) **Entertainment Software** : It is no surprise that entertainment software is designed to entertain you. With entertainment software, you can play different types of games, battle monsters or explore new world. For example, the "Paper Planes" software is entertaining while showing you how to construct several types of paper airplanes.
- (4) **Business Software** : Business Software is divided into two categories : horizontal market software and vertical market software.
- (a) **Horizontal Market Software** : A "horizontal market" is a group of different types of business that, despite their difference, have some of the same software needs. Horizontal market software refers to generic software packages that can be used for many different kinds of business. Productivity software, such as word processing, spreadsheet, or database management applications, can be considered horizontal market software because they can be used in virtually any business. Accounting and payroll applications are also good examples of horizontal market software.
- (b) **Vertical Market Software** : A "vertical market" is a group of a similar business - travel agencies, for example - that need specialised software. Vertical market software is designed for specialized tasks in a specific market or business.

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### **3.5 Integrated Software :**

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A software publisher sometimes combines several productivity software into a single package called integrated software. Typically integrated software include word processing, spreadsheet, database, and presentation graphics applications. Electronic mail is also included in some integrated software. Integrated software is often called a suite, office or works. Some popular integrated software package include Microsoft works, Claris works Lotus SmartSuite, Novell Perfect Office, and Microsoft Office.



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### 3.6 Multimedia Computing :

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Multimedia computing refers to the integrated use of multiple media, such as slides, video tapes, audio tapes, records, CD-ROMs and photos. Computer technology is replacing or controlling many of technologies and media that were previously used for multi-media presentations. Advances in computer technology have made it possible to combine text, photo image, speech, music, animated sequences, and video into a single interactive computer presentation.

- **Multimedia** is defined as an integrated collection of computer-based text, graphics, sound, animation, photo images and video.
- **Multimedia Applications** : One examples of a multimedia application is a multimedia encyclopedia. A multimedia encyclopedia provides you with a rich selection of text, graphics, sound, animation, and video.
- **Hypertext** is a key element of many multimedia products, and has been used effectively in non-multimedia products as well. You are lively to use hypertext with many computer application. The term hypertext was coined by Ted Nelson in 1965 to describe the idea of documents that could be linked to each other. Linked documents make it possible for a reader to jump from a passage in another document.
- **Hypermedia** : The links in today's applications often involve graphics, sound and video, as well as text. This type of multimedia hypertext is referred to as hypermedia. Hypertext and hypermedia are important computer-based tools because they help you easily follow a path that makes sense to you through a large selection of text, graphical, audio and video information.

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### 3.7 Legal Restriction on Software :

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Like books and movies, most computer software is protected by a copyright. In addition to copyright protection, computer software is often protected by the terms of a software license. Some of the major aspects for legal restrictions on software are as follows –

- (a) **Copyright Material** : A copyright is a form of legal protection that grants certain exclusive rights to the author of a program or the owner of the copyright. The owner of the copyright has the exclusive right to copy the software, to distribute or sell the software and to modify the software. If you are not the owner of the copyright, it is illegal to copy, distribute, or sell the software unless you obtain permission from the copyright owner.
- (b) **Copyright Act** : The copyright act states under what circumstances you can and cannot legally copy copyright software. When you purchase copyright software, you do not become the owner of the copyright. Instead, you own only a copy of the software.

- (c) **Copyright Symbol :** Copyrighted materials, such as software, display a copyright notice that contains the word "Copyright" (or the (c) symbol), the year of publication, and the name of the copyright holder.
- (d) **Licensed Software :** A software license is a legal contract that defines the ways in which you may use a computer program.
- (e) **Public Domain Software** is owned by the public rather than by the author. The program is available to everyone for use without restriction. Public domain software may be freely copied, distributed, and even sold.
- (f) **Shareware** is copyright software marketed under a "try before you buy" policy. Shareware usually includes a license that allows you to use the software for a trial period. If you want to continue to use it, you must become a registered user by sending a registration fee.

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### **3.8 Let Us Sum Up :**

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- There are two types of software :
  - (i) application software, ii) system software
- System software helps the computer to carry out its basic operating tasks. System software is also divided into subcategories such as Operating system, device drivers, utilities etc.
- Application software helps the human user to carry out a task. Application software are further divided into sub categories such as productivity software, entertainment software, business software, education and reference software etc.
- Operating system acts as an interface between the user and computer. There are different types of operating system like Single User OS, Multi User OS, Single Tasking OS, Multitasking OS, Multiprogramming OS, Real Time OS.
- Application software is utilized with different categories to accomplish different specific tasks using the computer. Different categories are developed for different purposes.
- Multimedia means being able to communicate in more than one way for better communication. The executive of text, sound graphics and animation simultaneously is called as Multimedia.
- Computer software is protected by a copyright which is a form of legal protection that grants legal rights to the author of a program or the owner of the copyright.

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**3.9 Answers for Check Your Progress :**

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**Check Your Progress :**

1. (i) Operating, (ii) real time processing, (iii) Metropolitan area network, (iv) Windows NT, (v) UNIX.

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**3.10 Glossary :**

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1. **Computer Program :** A computer program is a set of detailed, step by step instructions that tell a computer how to solve a problem or carryout a task.
2. **Data :** Data are the words, numbers and graphics that describe people, events, things, and ideas.
3. **Software :** We define software as instructions and associated data, stored in electronic format, that direct the computer to accomplish a task.

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**3.11 Assignment :**

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1. What is a Software ? Discuss the importance of software in a computer system.
2. Differentiate between system software and application software.
3. What is an application software ? Explain why application software is so important to the computer user.
4. What is multimedia ? Discuss the application of Multimedia with examples.

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**3.12 Activities :**

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1. What are the legal restrictions on software

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**3.13 Case Study :**

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1. Discuss the difference between System Software and Application Software with suitable example.
2. Explain legal restrictions on Software.

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**3.14 Further Readings :**

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1. Parameswaram, R. (2010), 'Computer Applications in Business'. S. Chand & Company.
2. Rajaraman, V. (2013), 'Fundamentals of computer', Practice Hall India Learning Private Ltd.

**Management &  
Information System**

3. Saxena, Sanjay & Chopra, P. (2006), 'Computer Application in Management', Vikash Publication House Pvt. Ltd.

- 4.0 Learning Objective**
- 4.1 Introduction**
- 4.2 Starting MS–WORD**
- 4.3 Basic Components of MS Word**
- 4.4 Entering and Saving Text in a Document**
- 4.5 Closing the MS-Word Document and MS–Word Program**
- 4.6 Opening of an Existing Document**
- 4.7 Copy and Cut (Move)**
- 4.8 Formatting the Document**
- 4.9 Find a Particular Pattern**
- 4.10 Insertion**
- 4.11 Implementing Formula on Table Contents**
- 4.12 Headers and Footers**
- 4.13 Page Setup**
- 4.14 Indents**
- 4.15 Tabs**
- 4.16 Columns**
- 4.17 Change Case**
- 4.18 Let Us Sum Up**
- 4.19 Answers for Check Your Progress**
- 4.20 Glossary**
- 4.21 Assignment**
- 4.22 Activities**
- 4.23 Case Study**
- 4.24 Further Readings**

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**1.0 Learning Objectives :**

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After going through this unit, you will be able to :

- learn steps to start Microsoft Word
- discuss basic units of Microsoft Word
- learn the creation of a document and saving of the document
- learn to open an existing document and formatting of a document
- learn to edit a document
- insert symbols, pictures in the document
- learn to print a document.

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## **4.2 Introduction :**

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In the earlier units, we discussed on the basic concepts in computer, about data storage technology, the software and multimedia applications. Now, in this unit we will discuss **MS-Word**, which is very important to any manager.

In an organization lot of documents to be prepared, for example letters to be written to suppliers, customers, banks, authority. Similar letters may have to be written again and again. For all these, the letter may be typed once and it can be stored in the computer. When the same or similar letter is needed then it can be retrieved and changes can be made to if needed. Thus lot of time is saved in typing and the efficiency is increased. So, Microsoft Word is such software which can be used to create, format, store, retrieve, edit and print the document.

**Microsoft Corporation** developed this software. It is a full-featured word processing program that allows us to create attractive and professional looking documents easily and quickly. This software is also used to edit, layout, save, print, mail-merge etc. a document.

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## **4.2 Starting MS–WORD :**

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Following steps are undertaken to start **Microsoft Word** :

- (1) Make sure the Windows desktop is open. Move the mouse pointer over the **Start** button present on the extreme left of the task bar and then click the left mouse button. A push up menu appears.
- (2) Place the mouse pointer over the program option inside the pushup menu. A second menu gets displayed immediately.
- (3) Move the mouse pointer over **Microsoft Word** option and click the left mouse button as shown in **Fig. 4.1**.

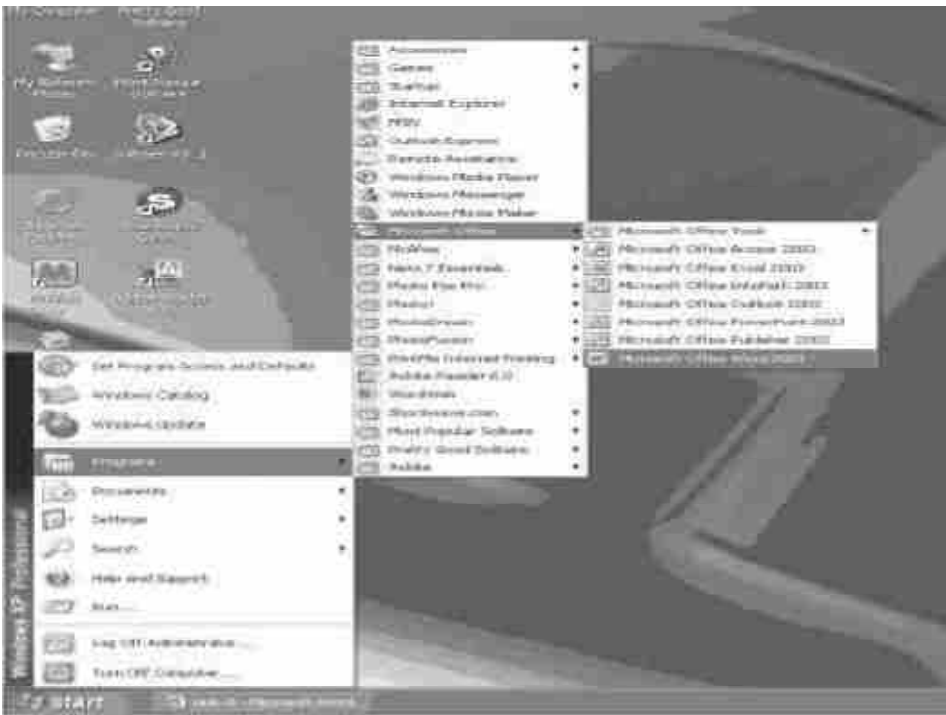


Fig. 4.1

A blank document file named **Documents** gets displayed on the screen instantly as shown in Fig. 4.2.

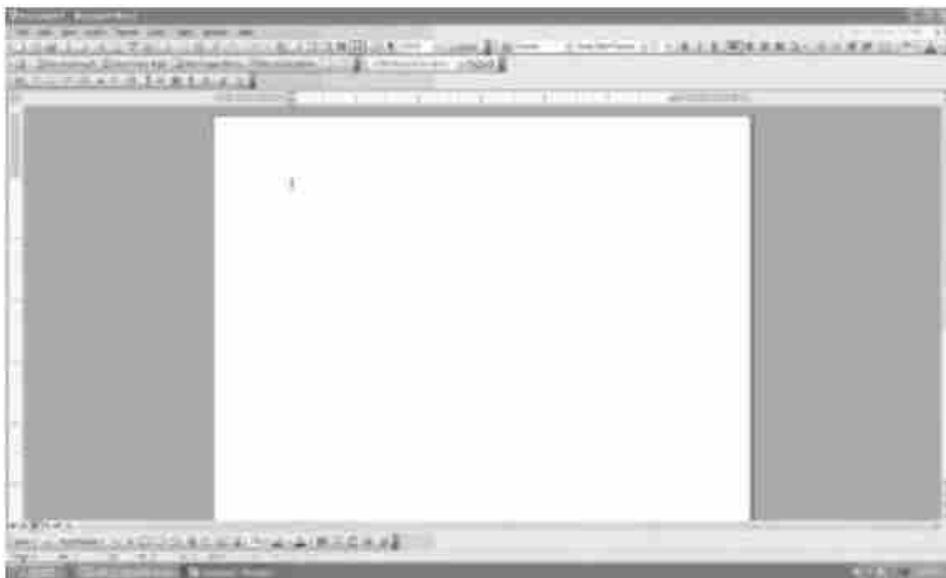


Fig. 4.2

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### 4.3 Basic Components of MS Word :

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- (1) Title Bar : It displays the name of the program and the document. Until we save the document and give it a name, the temporary name is Document 1.



Fig. 4.3

Title Bar also displays various window controls like minimize button, maximize button and close button.

- (a) **Minimize Button** : This is used for changing a window/document into a button.
  - (b) **Maximize Button** : This is used for enlarging window/document after it has been minimized or restored. When a document is maximized then, to bring it back to the original size, we use Restore button.
  - (c) **Close Button** : This is used to close a document/window.
- (2) **Menu Bar** : The menu bar lists the name of the menus. Clicking a menu name on the menu bar displays a list of commands from which we can choose.



Fig. 4.4

- (a) **File** : This helps in creating new file; opening an existing file; saving a file; printing a file; print preview of a file; setting up of print area; page-setup; sending the page to MS-Power Point, closing the document; existing **MS-WORD** etc.
  - (b) **Edit** : This helps in copying, cutting, deleting a range of text, pasting a text, which has been copied or cut from some other location, clearing the content at a particular location, finding the particular text and replacing it with a new text in the Document etc.
  - (c) **View** : This helps in enabling and disabling certain tools in the word window. This is also used to add **Header and Footer** to the document.
  - (d) **Insert** : This can be used to insert page numbers, page breaks, pictures etc.
  - (e) **Format** : This helps in changing the Front of the text.
  - (f) **Tools** : This helps with the spell checker, protection of documents by providing the pass-word. The document can be customized according to one's specification etc.
  - (g) **Table** : This is used to insert, delete, select and draw table.
  - (h) **Window** : This is used to hide/unhide the document window. To create new window, to split the frame etc are performed.
  - (i) **Help** : This can be used to get any help about **MS Word**.
- (3) **Standard Toolbar** : The Standard toolbar contains buttons for the most frequently used commands, such as the commands for opening,



saving and printing documents. This toolbar is one of the two default toolbars. Clicking buttons on a toolbar is often faster than using a menu bar.



**Fig. 4.5**

Whenever we bring the points of the mouse to the buttons each button indicates the command for which it stands.

- (4) **Formatting Toolbar** : The formatting toolbar allows the user to give commands related to formatting text/data like Bold, Underline, Font Style, Font size, Font color etc.



**Fig. 4.6**

- (5) **Editing Area** : Here we can type and edit the text.
- (6) **Scroll Bars** : Used to scroll through different parts of current document.
- (7) **Drawing Tool Bar** : This is used to draw different shapes, arrows etc.
- (8) **Status Bar** : The status bar displays the current page and section numbers, the total no. of pages and the position of the insertion point.

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#### 4.4 Entering and Saving Text in a Document :

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When we launch Word, the program opens a document window in which we can create a new document. We can begin by simply typing text at the insertion point. When we reach the end of a line as we type, word automation passes the insertion point to the next line. This feature is called **word-wrap**. To insert a new line or start a new paragraph simply press [**Enter**]. It is also a good idea to save our work shortly after writing our first paragraph and every **10** or **15** minutes and before printing.

Three methods are there to open a new document.

- (1) Use of "**New Blank Button**" on standard toolbar : Click the "**new**" button that is there on the Standard Toolbar and we will get a new document.
- (2) Use of "**File**" option button on Menu Bar :
  - (a) Click on the "**File**" option button of Menu Bar.
  - (b) Select "**New**" from drop down menu.
  - (c) We will get a screen as shown in **Fig. 4.7**
  - (d) Click "**OK**".



- (3) Press **Ctrl** and **N** key simultaneously we will get a blank document automatically generated.

After the completion of typing a document we need to save it. We can create any number of blank documents but recently created document is shown on the screen. All other documents are minimized and they are displayed on the Status Bar at the bottom of the screen and we can select any of them by clicking on the required document.

**Saving the Document :** Three methods are there to save a new document

- (1) Use of "**Save**" button on Standard Toolbar : Click the same button which is there on the Standard Toolbar and we will get the figure shown below. Here select the drive, folder and give the file name and then click on "**Save**" button.
- (2) Use of "**File**" option button of Menu Bar :
  - (a) Click on the "**File**" option button of Menu Bar.
  - (b) Select "**Save**" from drop-down menu.
  - (c) We will get a screen as shown in **Fig. 4.8**.



**Fig. 4.8**

Here select the drive, folder and give the file name and then click on "Save" button, as explained earlier.

- (3) Press **Ctrl** and **S** key simultaneously we will get a screen as shown in **Fig 4.8**. Now follow the Step (C).

**Note :** If we want to cancel the saving process, we can click on the "**Cancel**" button.

Once we have saved a document, next time if we want to save we can use any of three methods discussed above but we need not give the name of the file as it is already given when it was saved for the first time.

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#### **4.5 Closing the MS-Word Document and MS-Word Program :**

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- (A) **CLOSING MS-WORD DOCUMENT :** There are two ways in closing the Document

- (1) Closing the document without saving it.
- (2) Closing the document with saving it.

- (1) **Closing the document without saving it :** In this our work, the latest updates are not saved. So to do this follow the steps mentioned below:

- (i) Move the mouse pointer over the "**File**" option on Menu

Bar and click the left mouse button. A pull down menu gets displayed immediately.

- (ii) Inside the pull down menu, move the mouse pointer to the **"Close"** option and click the left mouse button. A message box gets displayed immediately asking us whether we want to save this sheet with the options **Yes, No** and **Cancel**.

Move the mouse pointer over **"No"** and click the left mouse button this will close the document without saving it.

If we want to save the sheet we can select **"Yes"** option by moving the mouse pointer over it and clicking the left button. A menu appears, here select the drive and folder in which we want to save. Then give the file name and select **"Save"** option.

If we do not want to save or close the document select **"Cancel"** option. This will take us back to the document.

- (2) **Closing the document with saving it :** In this our work the latest updates are saved. To close the document follow the steps mentioned below.

- (i) Move the mouse pointer over the **"File"** option on Menu Bar and click the left mouse button. A pull-down menu gets displayed immediately.
- (ii) Inside this pull-down menu move the mouse pointer to the **"Save"** option and click the left mouse button. A menu appears, here select the drive and folder in which we want to save. Then give this file name and select **"Save"** option.

We can even use the **"Close"** button, which is at the right hand corner of the Standard toolbar and follow the steps as explained above depending on our choice.

- (B) **CLOSING MS WORD PROGRAM :** We can use two methods to close the MS Word Program :

- (1) Using the **"Close"** button on the title bar :
  - Move the mouse pointer over the **"X"** button which is at the right hand corner of the Title bar.
  - Click the left button on the mouse.
- (2) Using the **"Exit"** option :
  - Move the mouse pointer over the **"File"** option on Menu bar and click the left mouse button. A pull-down menu gets displayed immediately.
  - Click on to the **"Exit"** option in that menu.

**Check Your Progress – 1 :**

1. What do you mean by Microsoft Word ?
2. What are the basic units of MS-Word ?
3. What are the three methods to open a new work book ?
4. What are the two methods to close MS-Word Program ?

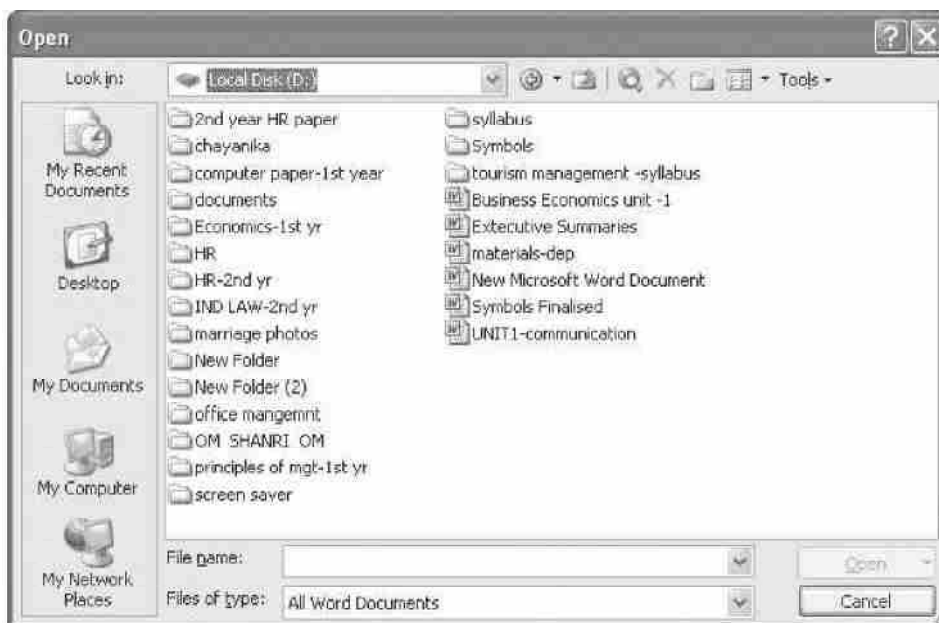
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#### 4.6 Opening of an Existing Document :

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Three methods are there to open an existing *Document*.

- (1) Use of "**File**" option button on Menu Bar.
  - (a) *Click* on the "**File**" option button Menu Bar.
  - (b) *Select* "**Open**" from drop down menu.
  - (c) We will get a screen as shown in *Fig. 4.9*.
  - (d) Select the drive and folder in which we have the file.



**Fig. 4.9**

- (e) Type the name of the file we want to open in the "**File name**" box.
  - (f) Click "**Open**".
- (2) Use of "**Open**" button on Standard toolbar :  
Click the "**Open**" button that is there on the Standard Toolbar we will get the screen as shown in **Fig. 4.9** then follow the steps **(d)**, **(e)**, and **(f)** as mentioned above.
  - (3) Press **Ctrl** and **O** key simultaneously we will get "**Open**" dialog box.

---

#### 4.7 Copy and Cut (Move) :

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- (A) **COPY** : To copy a part of the document to some other place, follow the steps given below:
  - (1) Make the block of document that we want to copy. Holding

the left mouse button down and dragging the mouse pointer over that document of which we want to make the block. **Fig. 4.10** shows the selection of block.

- (2) Click the right mouse button on the selected block we will get a pop up menu as shown in **Fig. 4.11**.



**Fig. 4.10**



Fig. 4.11

Now click on **"Copy"** option, this block is copied on to clipboard (a temporary location), or Click on to **"Edit"** option of menu bar from the drop down menu, click on to **"Copy"** button as shown in Fig 5.12. Now the selected block is copied on to the clipboard.



Fig. 4.12

Or click on to the "Copy" icon that is on the Standard Toolbar. This icon is activated when the block is created. Now the selected block is copied on to the clipboard.

- (3) Move the mouse pointer to the place where we want to copy this block and click the right mouse button and from the pop-up menu, select "Paste" option as shown in Fig. 4.13. The earlier selected block is copied to the new place shown in Fig. 4.15.



Fig. 4.13

Or move the mouse pointer to the place where we want to copy this block. Click on "Edit" option of Menu bar, from the drop-down menu, click on "Paste" option as shown in Fig. 4.14.





**Fig. 4.14**

Now the selected block is copied at the new place. Or move the mouse pointer to the place where we want to copy this block. Click on to the **"Paste"** icon that is on the Standard toolbar. This icon is activated when the block is created. Now the selected block is copied at the new place.

**Note :** The new place can be the same document or some other document.

**(B) CUT (MOVE) :** To move a part of the document to some other place from the existing location, follow the steps given below:

- (1) Select the block of document that we want to move.
- (2) Click the right mouse button on the selected block we will get a pop-up menu as shown in **Fig 4.11**. Now click on **"Cut"** option, this block is moved on to clipboard and the selected block will disappear from the existing location. Or Click on to **"Edit"** option of Menu bar, from the drop-down menu, click on **"Cut"** option as shown in **Fig 4.12**.

Now the selected block is moved on to clipboard and selected block will disappear from the existing location.

Or click on the **"Cut"** icon that is on the Standard Toolbar. This icon is activated when the block is created. Now the selected block is moved on to the clipboard and the selected block will disappear from the existing location.

- (3) Move the mouse pointer to the place where we want to move this block and click the right mouse button and from the pop-up menu, select **"Paste"** option shown in **Fig. 4.13**. The earlier selected block is moved to the new place as shown in **Fig 4.15**.



Fig. 4.15

Or move the mouse pointer to the place where we want to copy this block. Click on "Edit" option of Menu bar, from the dropdown menu, click on "Paste" option as shown in Fig. 4.14. Now the selected block is copied at the new place.

Or move the mouse pointer to the place where we want to copy this block. Click on the "Paste" icon that is on the Standard Toolbar. This icon is activated when the block is created. Now the selected block is copied at the new place.

**Note :** We can observe that the selected block is disappeared from the original place.

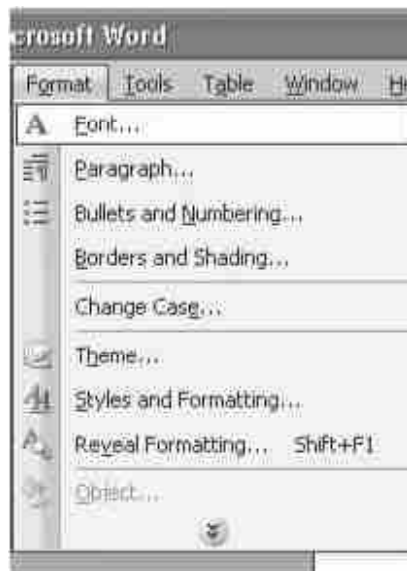
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#### 4.8 Formatting the Document :

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(a) **Font :** The style of the contents typed in the document can be changed. To do this follow the steps given below:

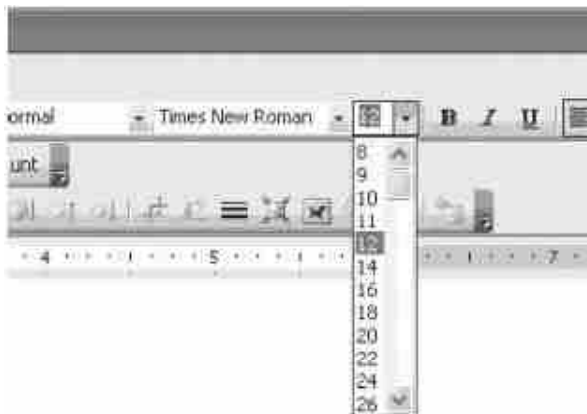
- (1) Select the block of the contents of which we want to change the Font.
- (2) Select the font from the list available as shown in Fig. 4.16.



**Fig. 4.16**

(b) **Font Size :** The size of the font in the selected block can be changed. Follow the steps given below to do this :

- (1) Select the block of the contents of which we want to change the font size.
- (2) Select the font size from the list available as shown in **Fig. 4.17**.



**Fig. 4.17**

For example select "20". **Fig 4.18** shows the changed font size in the selected block.



The contents of the document can be aligned to the left edge of the page. Follow the steps given

Fig. 4.18

- (c) **Bold** : To make the contents of the document look bold, follow the steps given below:
- (1) Select the block, which we want to make Bold.
  - (2) Click on "**Bold**" icon that is on the Standard Toolbar. The result is shown in Fig. 4.19.

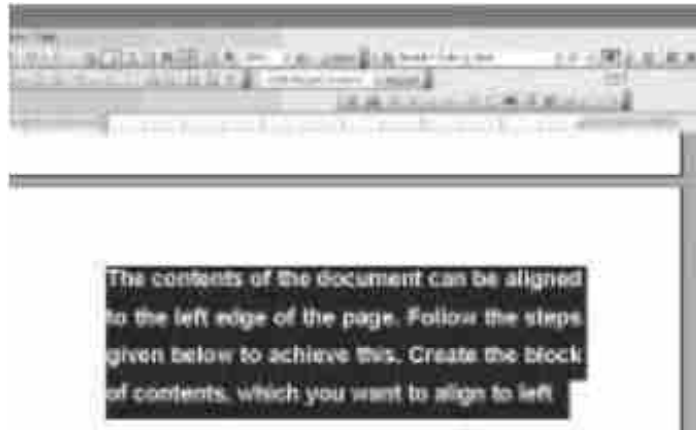


Fig. 4.19

**Note** : To remove the Bold; select the block of which we want to remove the Bold and click on to the "**Bold**" icon.

- (d) **Italic** : To make the contents of the document look slanted, follow the steps given below:
- (1) Select the block which we want to make italic.
  - (2) Click on to "**Italic**" icon that is on the Standard Toolbar. The result is shown in Fig. 4.20.



Fig. 27

The contents of the document can be aligned to the left edge of the page. Follow the steps given below to achieve this. Create the block of contents, which you want to align to left as shown in Fig. 27.

Fig. 4.20

- (e) **Underline** : To have underline to the contents of the document, follow the steps given below.
- (1) Select the block of contents, which we want underlined.
  - (2) Click on to "**Underline**" icon that is on the Standard toolbar. The result is shown in Fig. 4.21.



Fig. 4.21

- (f) **Align Left :** The contents of the document can be aligned to the left edge of the page. Follow the steps given below to achieve this:
- (1) Select the block of contents, which we want to align to left
  - (2) Click on to "**Align left**" icon that is on the Standard toolbar.
- We will get the aligned contents as shown in **Fig. 4.22**.

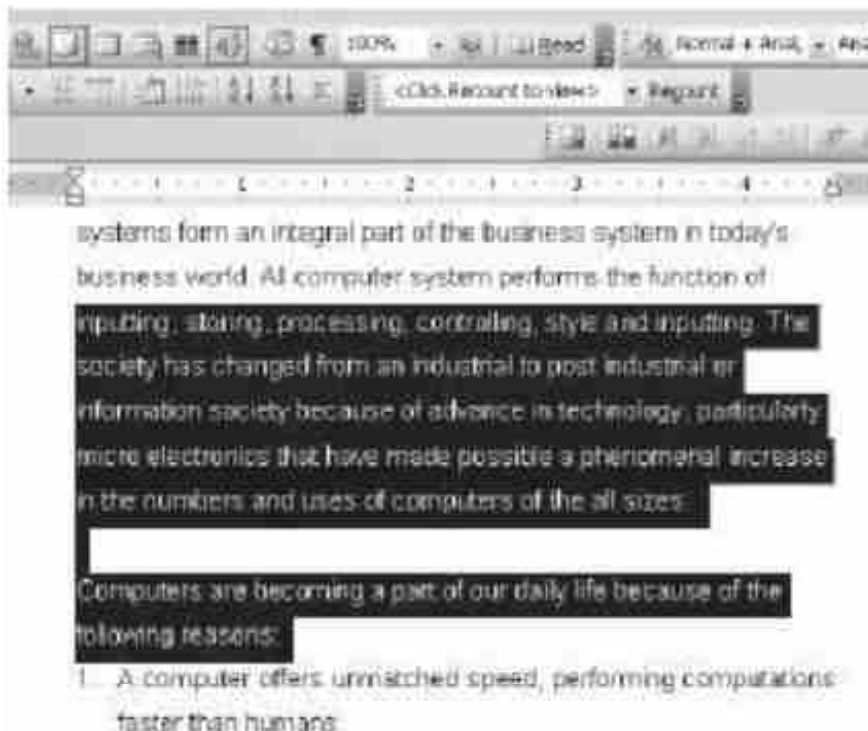
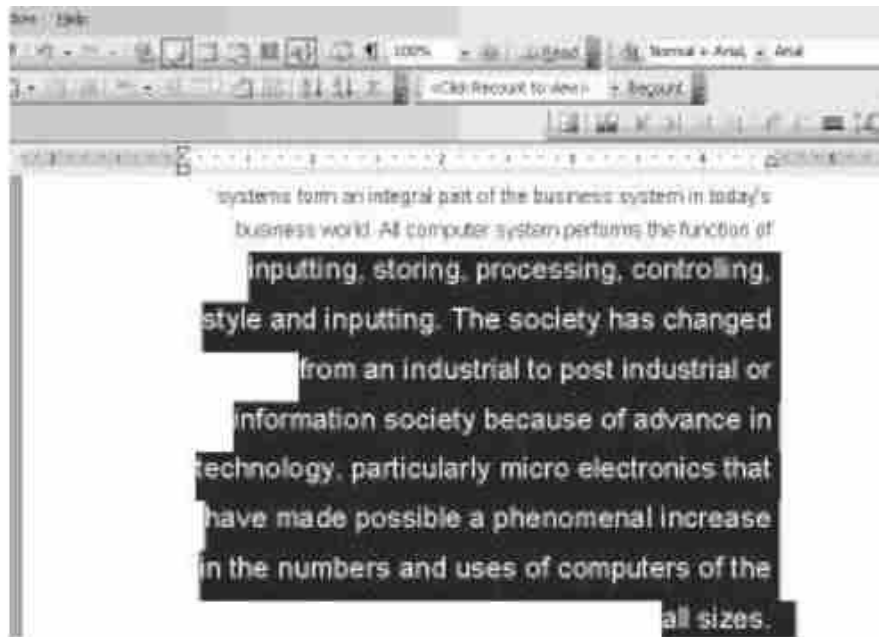


Fig. 4.22

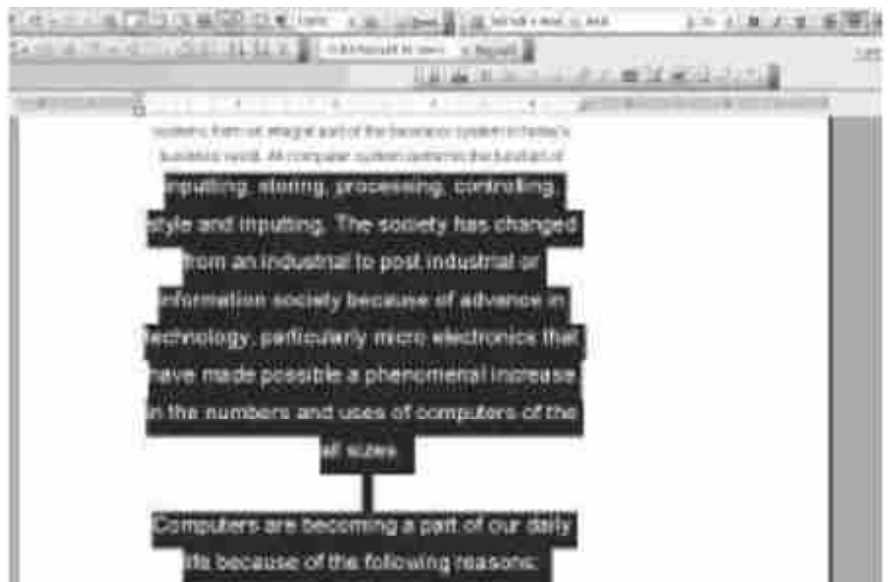
- (g) **Align Right :** The contents of the document can be aligned to the right edge of the page. Follow the steps given below to achieve this :
- (1) Select the block of contents, which we want to align to right.
  - (2) Click on to "**Align Right**" icon that is on the Standard

toolbar. We will get the aligned contents as shown in **Fig. 4.23**.



**Fig. 4.23**

- (h) **Center** : The contents of the document can be aligned to the center of the page. Follow the steps given below to achieve this:
  - (1) Select the block of contents, which we want to align to the center.
  - (2) Click on to "**Center**" icon that is on the Standard toolbar. We will get the aligned contents as shown in **Fig. 4.24**.



**Fig. 4.24**

- (i) **Justify** : The contents of the document can be aligned from the left edge to the right edge of the page. Follow the steps given below to achieve this:
  - (1) Select the block of contents, which we want to make justified.
  - (2) Click to "**Justify**" icon that is on the Standard toolbar which

is shown in Fig. 4.25.



Fig. 4.25

(j) **Numbering** : Automatic numbering can be generated when we want number certain points that we are typing. For example we want to type **MS-Word** line by line and if we want to number them as **1, 2, 3, 4** then we need not type the numbers manually. To generate the numbers automatically follow the steps given below :

- (1) Click on to "**Numbering**" icon available on Standard toolbar. First

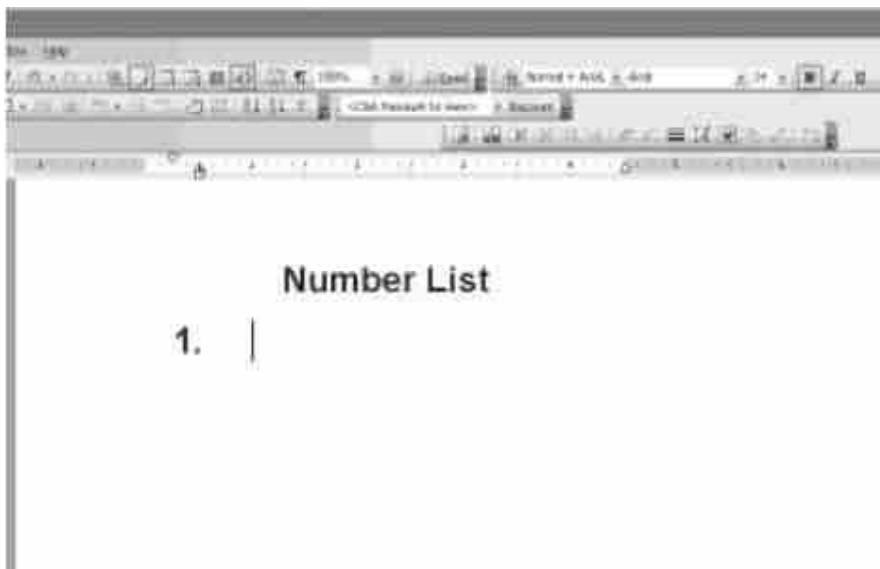


Fig. 4.26

- (2) Type the first line then press "**Enter**" key the second number is generated as shown in Fig. 4.27.
- (3) Thus we can type as many points as required.

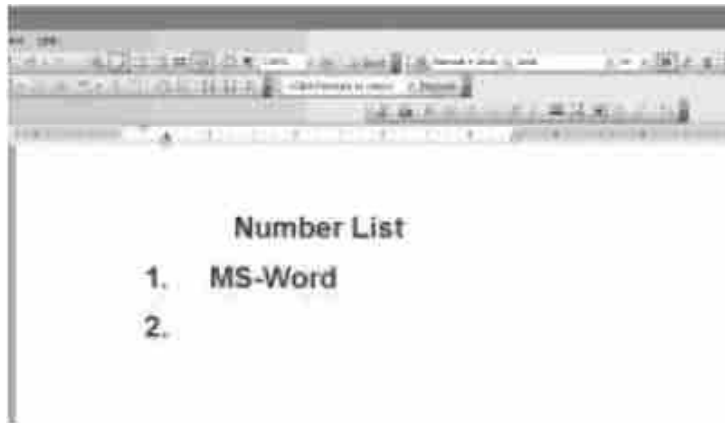


Fig. 4.27

**Note :** Once we finish typing, to deactivate the automatic number generation feature, click on "Numbering" icon again.



Fig. 4.28

**Changing the Format of Number Generation :** We can select different formats for the number generation. We can achieve this by following the steps given below :

Click on to "Format" option of menu bar. From the drop-down menu, click on the "Bullets and Numbering" option  
Fig. 4.29.



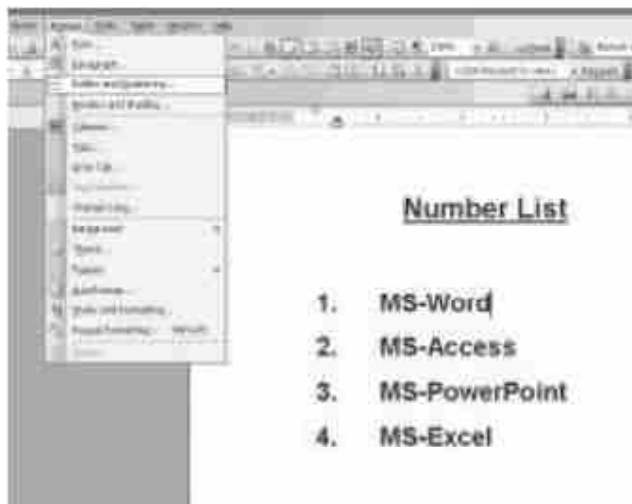


Fig. 4.29

We will get a menu as shown in Fig. 4.30. From the menu, we can select the required style.



Fig. 4.30

Now we can select radio button "Restart numbering" or "Continue previous list". If we select "Restart numbering", then whenever the numbering feature is selected in a document then the list start from the first number of the list as shown in Fig. 4.31.

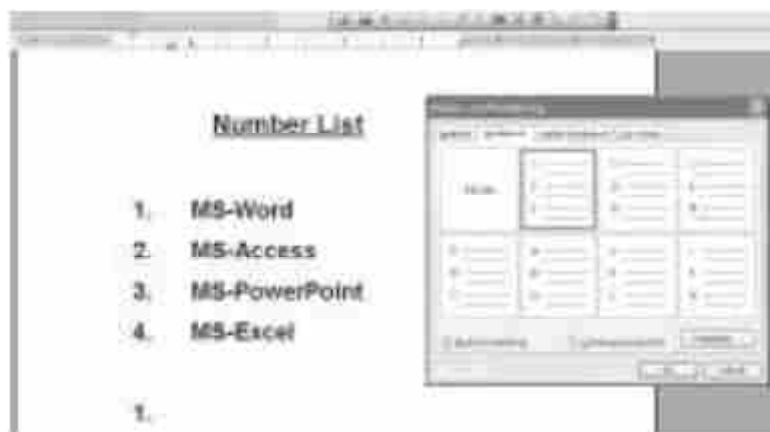
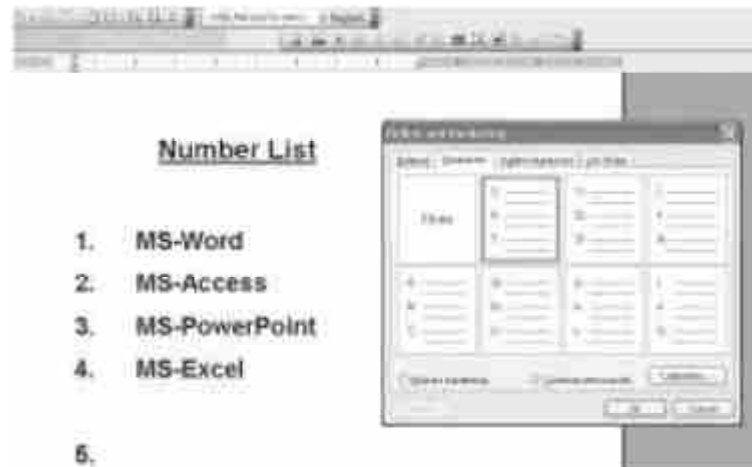


Fig. 4.31

If we select the radio button "**Continue from previous list**", whenever the numbering feature is selected then the numbering continues from previous list as shown in **Fig. 4.32**.



**Fig. 4.32**

We can also customize the Number format, Font, Number style, starting of the number list, place of the number list etc. by selecting the "**Customize**" option of the "**Bullets and Numbering**" menu (**Fig. 4.30**), we will get a menu as shown in **Fig. 4.33**.



**Fig. 4.33**

- (k) **Bullets** : Automatic bullets can be generated when we want to give bullets to certain points that we are typing. For example, if we want to type **MS-Word** line by line and if we want to have bullets in front of these, then we need not type the bullets manually. To generate the bullets automatically follow the steps given below:
- (1) Click on the "**Bullets**" icon available on Standard toolbar. First, bullet will be generated.
  - (2) Type the first line then press "**Enter**" key, the second bullet will be generated (**Fig. 4.34**).
  - (3) Thus we can type as many points as required.



## Number List

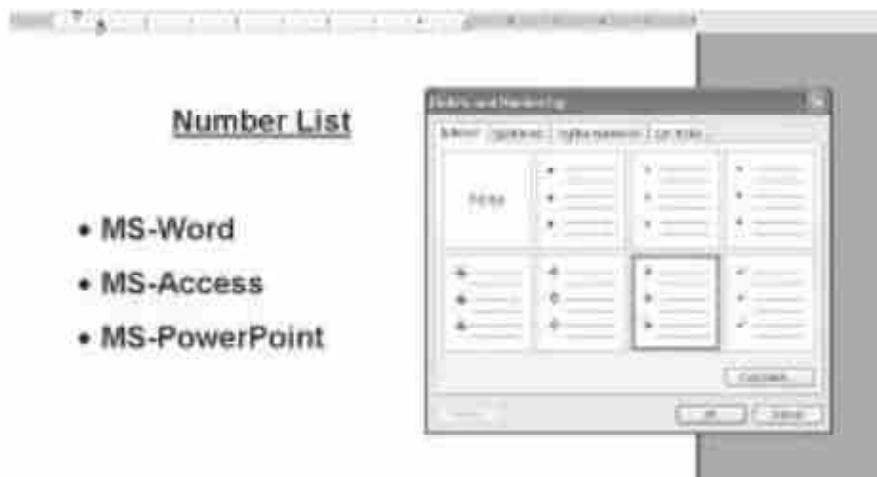
- MS-Word
- MS-Access |
- MS-PowerPoint

**Fig. 4.34**

**Note :** Once we finish typing, to deactivate the automatic bullet generation feature, click on to "Bullets" icon again.

**Changing the Format to Bullet generation :** The bullets can be formatted to suit our needs by following the steps given below:

- (1) Click on to "**Format**" option of Menu bar. From the drop-down menu, click on the "**Bullets and Numbering**" option (**Fig. 4.32**).
- (2) From the menu, select the kind of bullets, we want and click on to "**OK**" button (**Fig. 4.35**).



**Fig. 4.35**

We can select the required picture also as our bullet by clicking on to the "**Pictures**" option of menu. We will get a menu as shown in **Fig. 4.36**.



Fig. 4.36

We can customize our bullet, selecting the "Customize" option shown in Fig 4.35. We will get the menu as shown in Fig. 4.37.

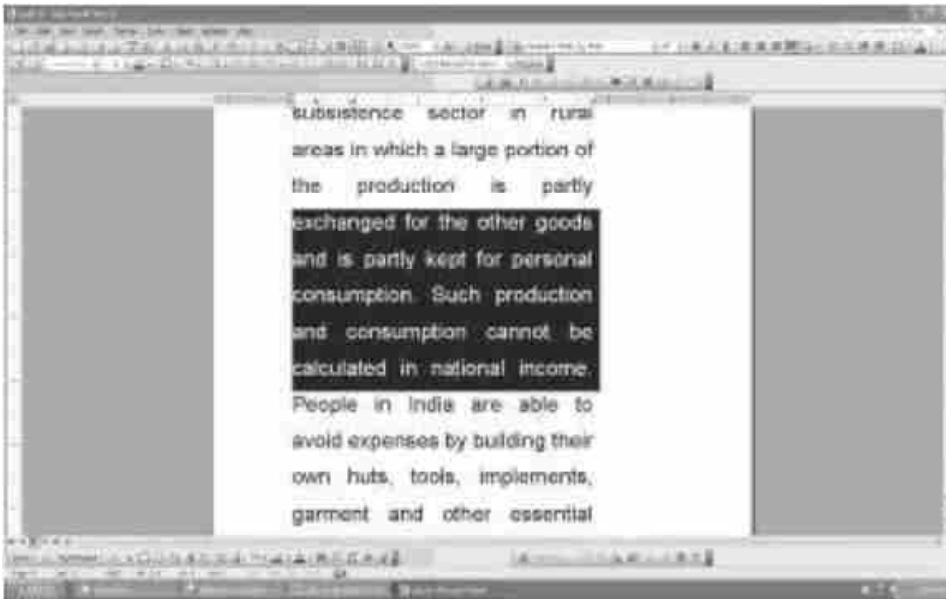


Fig. 4.37

- (I) **Font Color** : The color of the font can be changed to the required color by using "Font Color" icon available on Formatting Toolbar. To change the colors of the font to the required color follows the

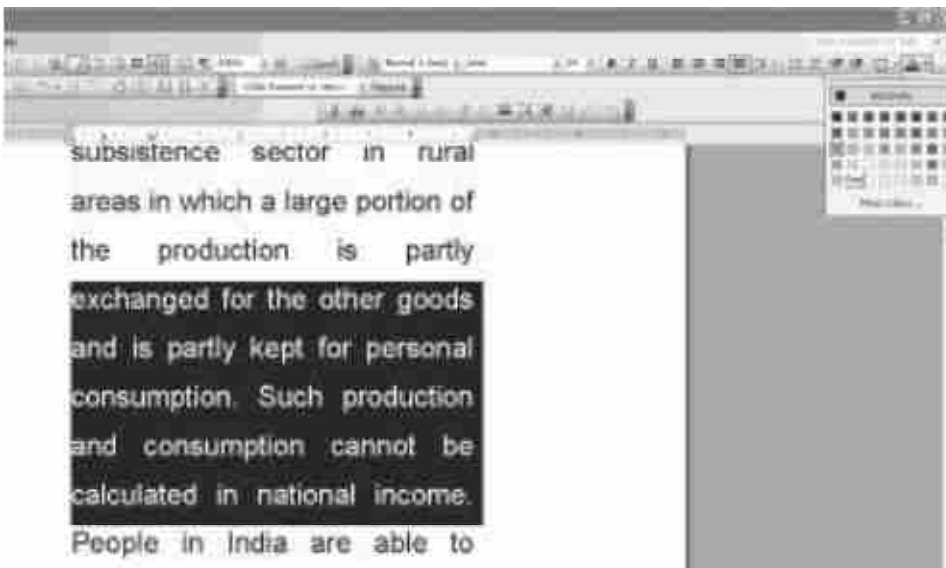
steps given below:

- (1) Select the text of which we want to change the color as shown in **Fig. 4.38**.



**Fig. 4.38**

- (2) Click on to the first arrow available on "**Font Color**" icon and select the required color as shown in **Fig. 4.39**.



**Fig. 4.39**

- (3) Click on to the required color and the color of the blocked text will change.

If we want to have better shade than the available one we can click on to "**More Colors...**" option available and we will get a menu as shown in **Fig. 4.40** and we can select the required shade from

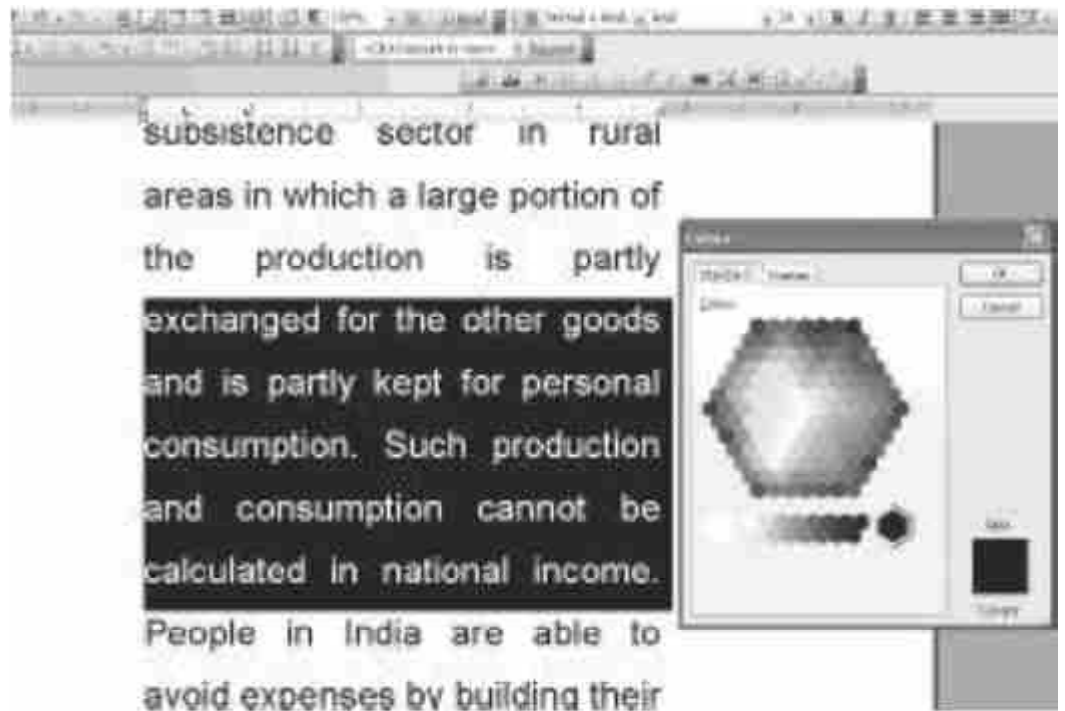


Fig. 4.40

- (m) **Highlight** : If we want to highlight a particular portion of the document by using the "**Highlight**" icon available on the Formatting toolbar. Follow the steps given below to achieve this.
- (1) Click on to the arrow available at the "**Highlight**" icon and select the color for highlighting.
  - (2) Drag the cursor on to the text and the text will be highlighted. Font color will not be changed **Fig. 4.41**.

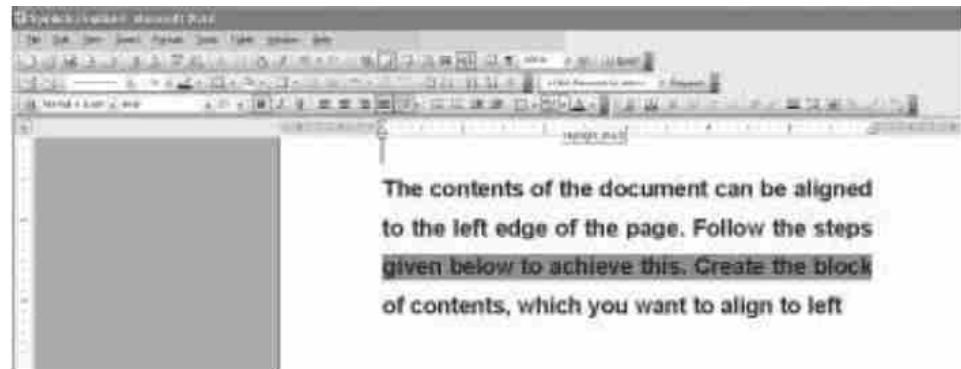


Fig. 4.41

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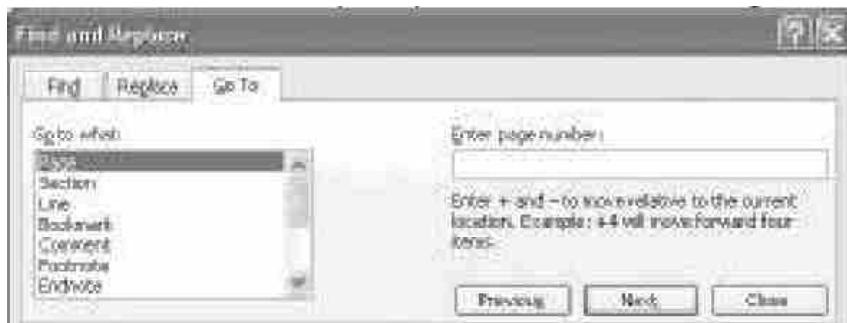
#### 4.9 Find a Particular Pattern :

---

The "**Find**" icon can be used to find a particular pattern in the document. This can also be used to find a pattern and replace that pattern with the required pattern. "**Find**" icon is available on Standard Toolbar.

Follow the steps given below to use the **"Find"** icon :

- (1) Position the cursor to the required position.
- (2) Click on **"Find"** icon, we will get a menu and type the pattern we want to search in the space provided as shown in **Fig. 4.42**.



**Fig. 4.42**

If we want to use the more search options, we can click on to **"More command"** button available in the menu and we will get the enhanced menu as shown in **Fig. 4.43**.



**Fig. 4.43**

We can select the required search options by selecting the check box against each of it.

For example, **"Match case"** option distinguishes between uppercase and lowercase characters. When **"Match case"** is selected, **Word** finds only those instances in which the capitalization matches the text we typed in the **"Find what"** box. When we use wildcards, this option appears dimmed.

To replace the pattern found with the required pattern, click on **"Replace"** tab, we will get an enhanced menu where we have a text box (**Replace with**) to type in the pattern we want to replace with (when is the replace pattern typed in) as shown in **Fig 4.44**.

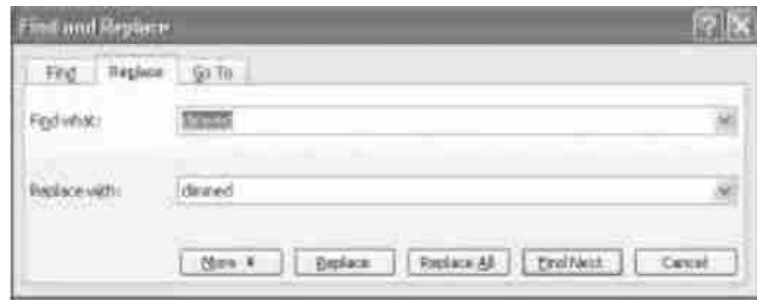


Fig. 4.44

We have different option tabs available in this menu and the explanations of each of are given below:

- **Replace** : Replace the selected instance of the search criteria, finds the next occurrence, and then stops.
- **Replace All** : Replaces all occurrences of the search criteria in our document.
- **Find next** : Finds and selects the next occurrence of the text or formatting specified in the "**Find what**" box.
- **Go to** : This is used to select the location where we want to search. Follow the steps given below to use this option. Click the type of location we want to move to. Then enter the item number in the "**Enter**" box and click "**Go To**" (Fig. 4.45).



Fig. 4.45

For example, if we want to find a pattern in page number say 21 then enter the page number in the available. "**Enter page number**" box as shown in Fig. 4.46.





Fig. 4.46

How do we find the grammatical and/or spelling mistakes in the text? When we get a green line below the text that means that there is some grammatical error and if there is red line below the text it means it is the spelling mistake. We can correct these mistakes by right clicking on the text which has either green or red underlining and opting for the correct text, which is suggested by the application.

Consider the following example : *Point the cursor on the word "Application" and right click on it and a suggestion for correct words is obtained as shown in Fig. 4.47, select the proper required word.*



Fig. 4.47

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#### 4.10 Insertion :

---

In some cases, we may require to have some mathematical symbols, special symbols or pictures to be present in our document. But we may not have keys for those symbols and pictures in the keyboard. In this kind of situation, the special symbols or pictures can be inserted without typing it or drawing it respectively.

**Inserting symbols :** To insert the special symbols follow the steps given below :

- (1) Point the cursor to the location where we want to insert the symbol and then click on "**Insert**" option available in the Menu bar, we will get a drop-down menu as shown in **Fig. 4.48**.

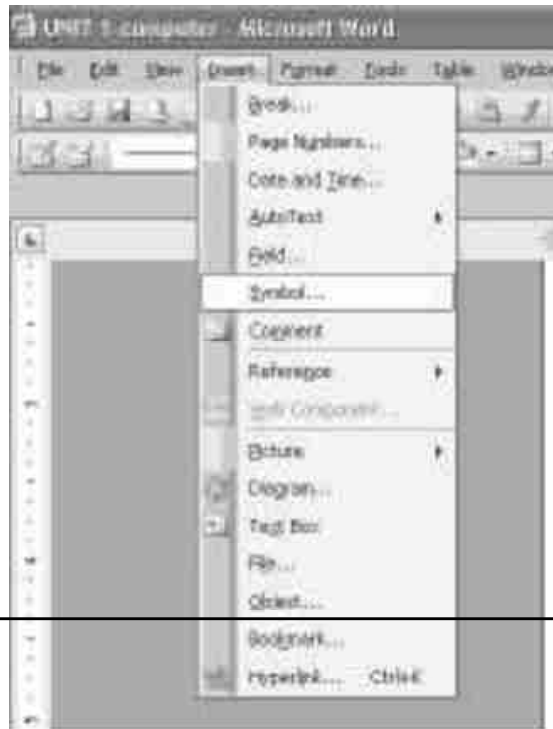


Fig. 4.48

- (2) Now click on "Symbol" option available and we will get a menu as shown in Fig. 4.49.

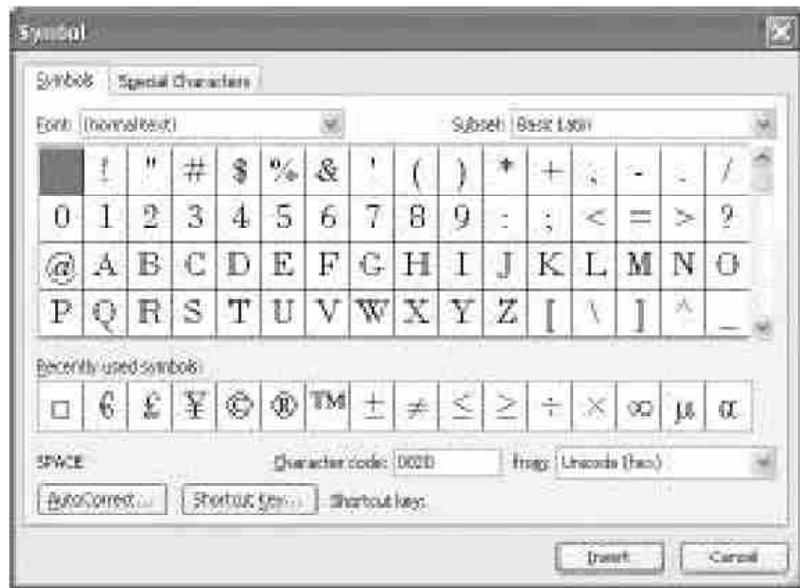


Fig. 4.49

- (3) We can select the required font and can also select the different subset of symbols.
- (4) Once we select the required symbol in subset (Fig.4.50), click on "Insert".



Fig. 4.50

**Inserting Picture** : To insert a picture follow the steps given below :

- (1) Point the cursor to the location where we want to insert the pictures and then click on "**Insert**" option available in the menu bar, we will get a drop-down menu as shown in **Fig. 4.51**.

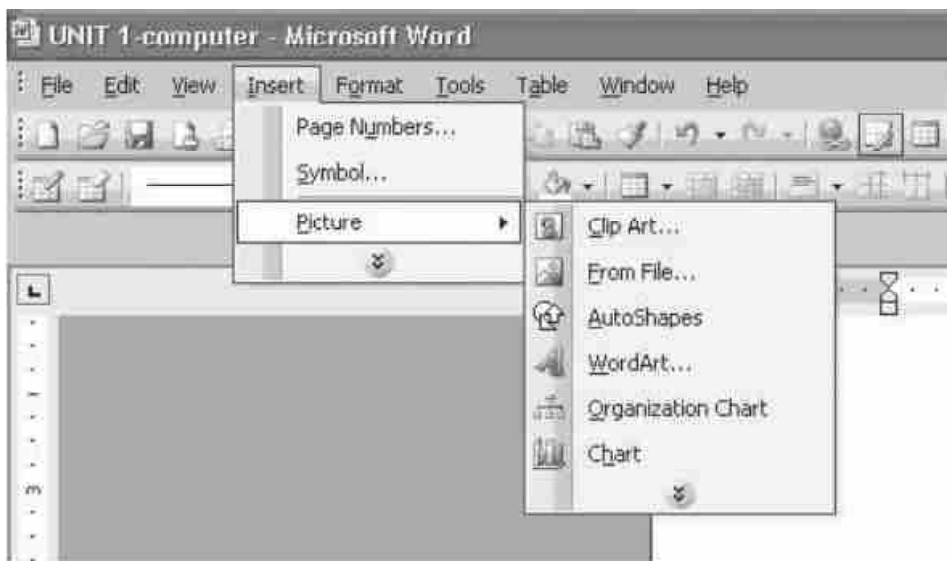


Fig. 4.51

- (2) Now we can insert a picture from the existing **MS-Word** repository or from a file where the users have stored pictures.

**Inserting Clip Art :** Click on "**Clip Art**", we will get a menu as shown in **Fig. 4.52**, which shows different categories of available pictures. Click on to required category, we will get another menu and here select the required pictures and insert it into location in our document.



**Fig. 4.52**

**Inserting Picture from a file :**

- (1) Point the cursor to the location where we want to insert the picture and then click on to "**Insert**" option available in the menu bar, we will get a drop-down menu as shown in **Fig. 4.51**.
- (2) Now click on to "**Picture**" option, we will get a sub-menu as shown in **Fig. 4.51**.
- (3) Click on "**From File**", give the path of the picture file, where the picture, we want to insert, is stored.

**Insert Word Art :** This option will allow us to insert our text in the which we have selected.

- (1) Point the cursor to the location where we want to insert the picture and then click on "**Insert**" option available in the Menu bar, we will get a drop-down menu as shown in **Fig. 4.51**.
- (2) Now click on "**Word Art**" we will get a menu as shown in **Fig. 4.53**.

- (3) Select the style we want and then click "OK", we will get a menu, which will allow us to type our required message. After typing our message, click "OK", we will get our typed text displayed in our document.

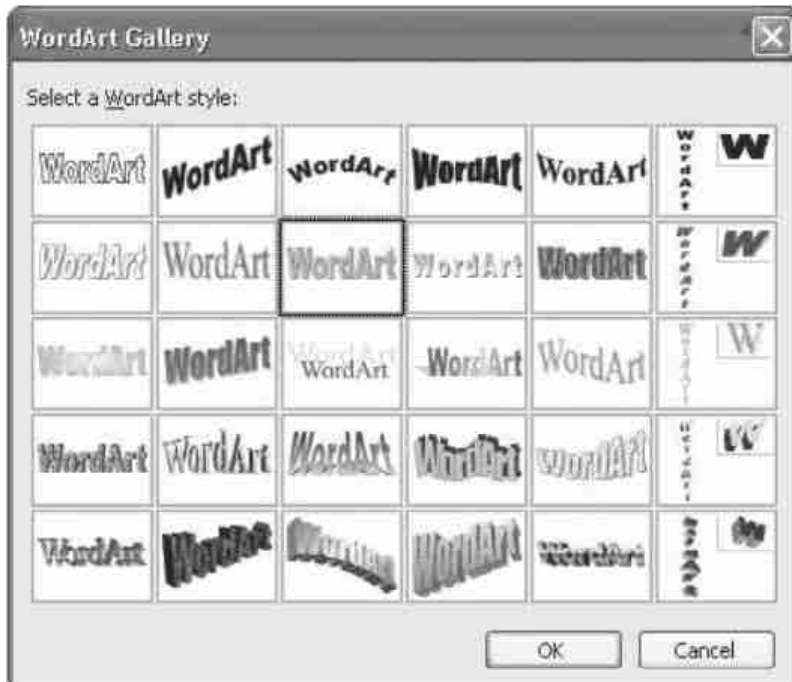


Fig. 4.53



Fig. 4.54



Fig. 4.55

**Inserting Charts :** Even the charts can be inserted in the **Word** document and the chart's properties can be modified.

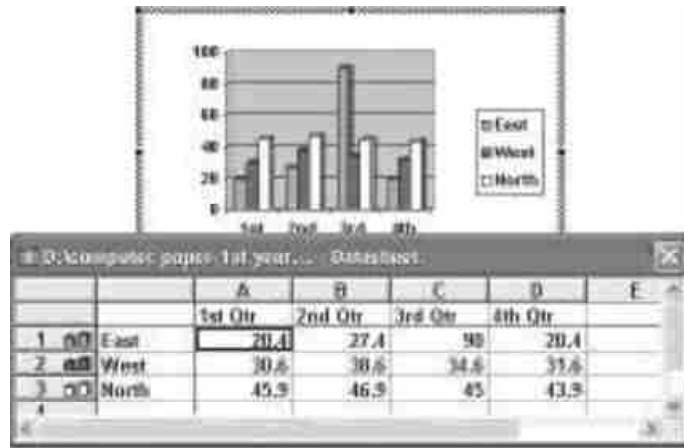


Fig. 4.56

To get the property sheet of the chart, right click on chart area and we will get a menu as shown in Fig. 4.57.

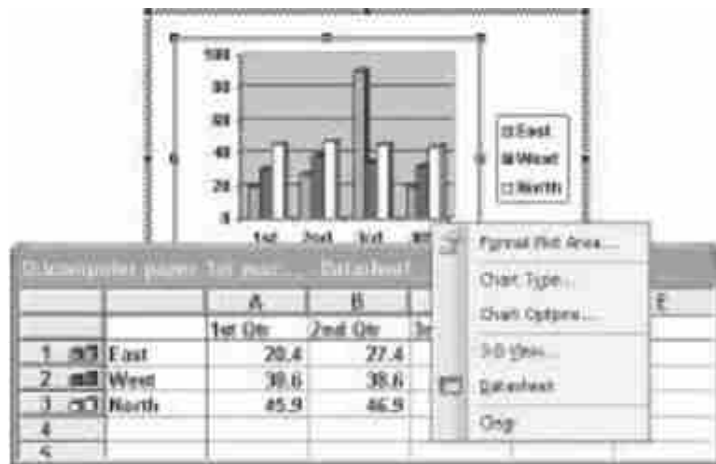


Fig. 4.57

**ACTIVITY 4.1**

Type 'COMPUTER' using Word Art and save the file.

.....

.....

.....

**Inserting Tables :** Table can be inserted in the document by following the steps given below :

- (1) Move the cursor at the location, where we want to insert the table and then click on "Table" menu and we will get a menu as shown in Fig. 4.58.

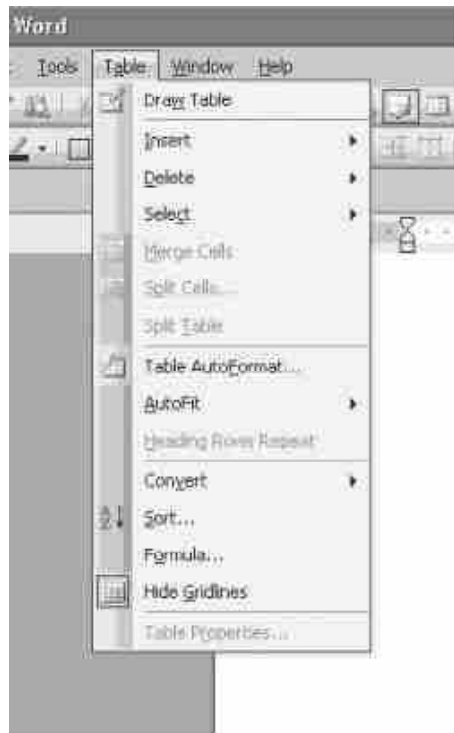


Fig. 4.58

- (2) Move the cursor on the **"Insert"**, we will get another menu where we have "Table" option and we will get a menu as shown in Fig. 4.59.

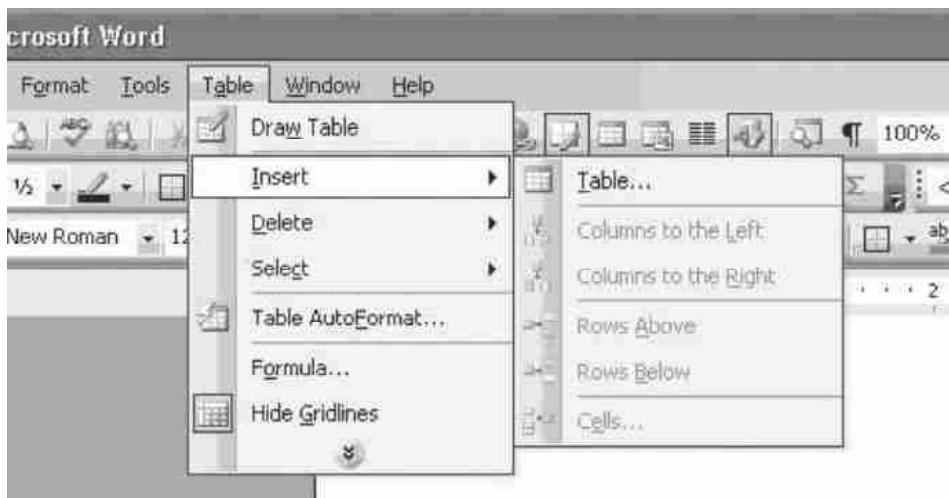
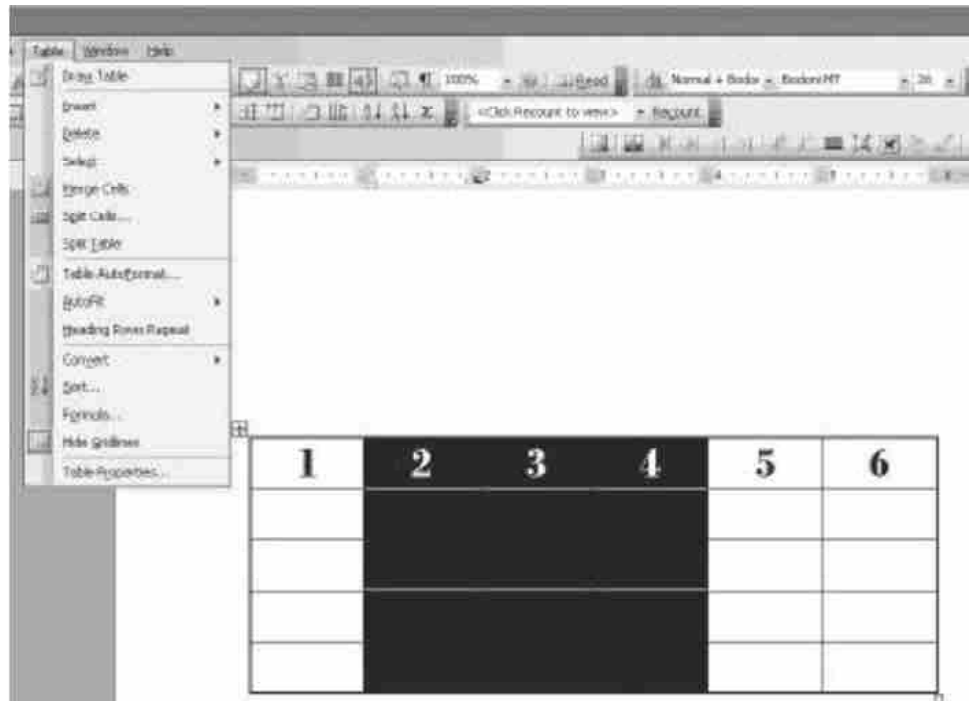


Fig. 4.59

- (3) Select the number of Rows and Columns we want in the table and click on **"OK"**. The table will be inserted at the location where we have pointed the cursor earlier.


**Fig. 4.60**

**Modifying the table properties :** The property of the table can be modified that is inserting/deleting the rows and columns, merging the cells, changing the shade of the border etc. To modify the property of the table, select the table by dragging the mouse on the table area and then click on "**Table**" menu available in the Menu bar. We will get a drop-down menu as shown in **Fig. 4.61**.



**Fig. 4.61**

**Note :** Black patches in **Fig. 4.61** shows the selection of columns in the table, which we want to modify. Different options available are :

- **Table :** By clicking on to "**Table**" option, a table inside the present table will be added with default number of Rows and Columns.
- **Columns to the Left :** This option will add the column to the left of the selected column. Column selection made in **Fig. 4.61**. Column added **Fig. 4.62**.



<b>1</b>	<b>2</b>		<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

**Fig. 4.62**

- **Columns to the Right** : This option will add the column to the right of the selected column. Column selection made in **Fig 4.61**. Column added **Fig. 4.63**.

<b>1</b>	<b>2</b>	<b>3</b>		<b>4</b>	<b>5</b>	<b>6</b>

**Fig. 4.63**

- **Rows Above** : This will add rows to the above the selection. **Fig. 4.64** shows the selection of the row and **Fig. 4.65** shows the insertion of the row.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

**Fig. 4.64**

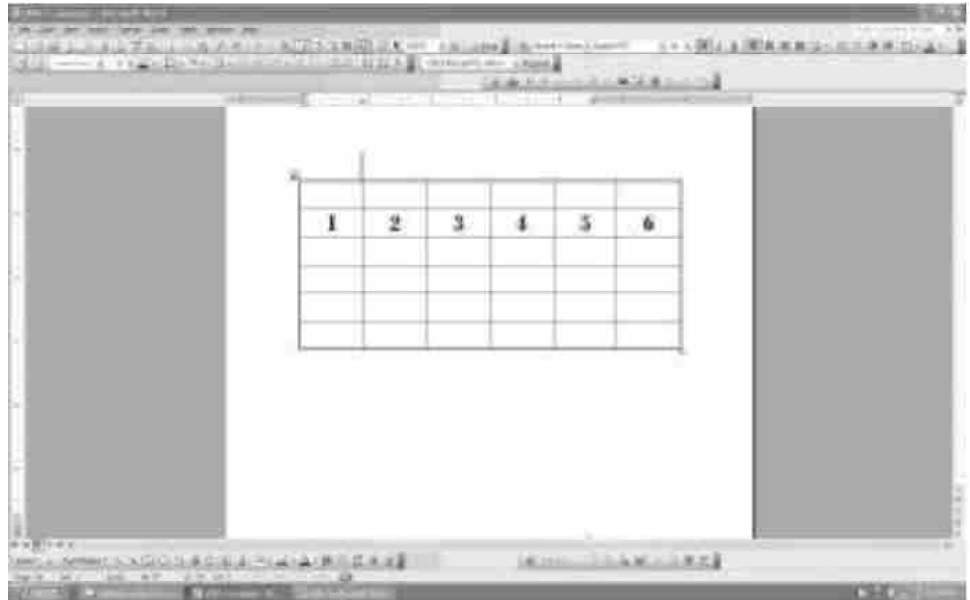


Fig. 4.65

- **Rows below** : This will add the rows below the selection. Fig. 4.66 shows selection of the row and Fig. 4.67 shows the insertion of the row below the selection.

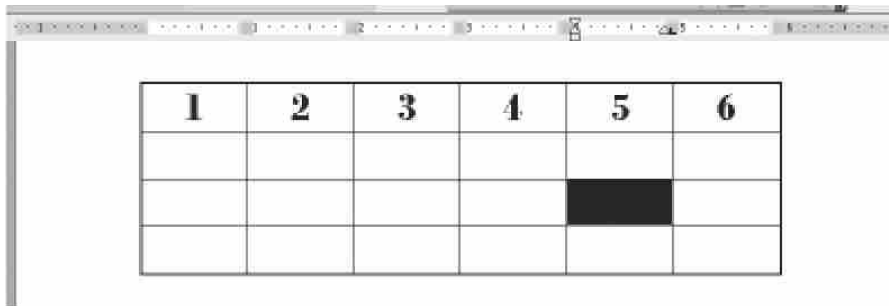
1	2	3	4	5	6

Fig. 4.66

1	2	3	4	5	6

Fig. 4.67

- **Cells** : After we make the selection of insertion by selecting a cell, this option will display a menu as shown in Fig. 4.68. Select the required option and click "OK". The explanations for all the options are given below :



1	2	3	4	5	6

Fig. 4.68

- **Shift Cells Down** : Inserts new cells above the selected cells.

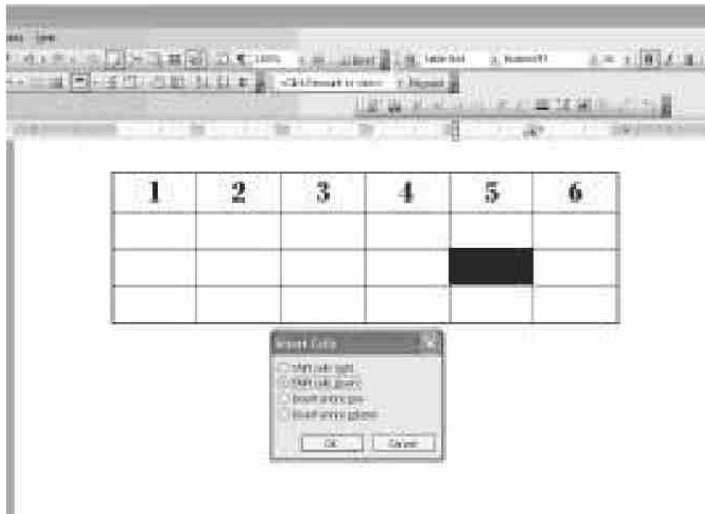
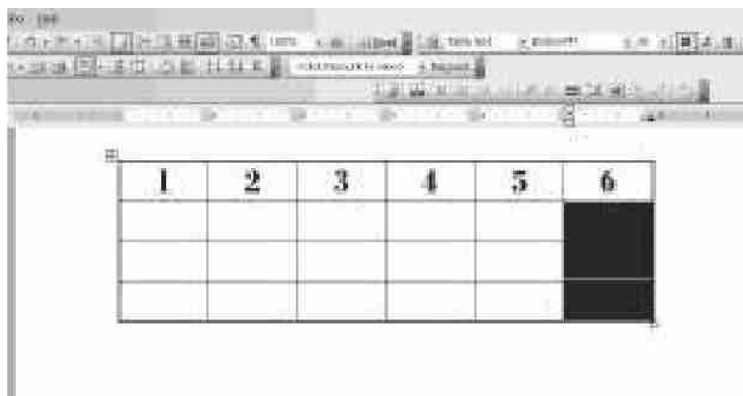


Fig. 4.69

- **Shift Cell Right** : Inserts new cells to the left of the selected cells.
- **Insert Entire Row** : Inserts an entire row above the row that contains the selection.
- **Insert Entire Column** : Inserts an entire column to the left of the column that contains the selection.
- **Merge Cells** : This option will merge the selected Table, Rows, Columns and Cells. **Fig. 4.70** shows the selection. **Fig. 4.71** shows the Delete menu and **Fig. 4.72** shows the merged cells.



1	2	3	4	5	6

Fig. 4.70

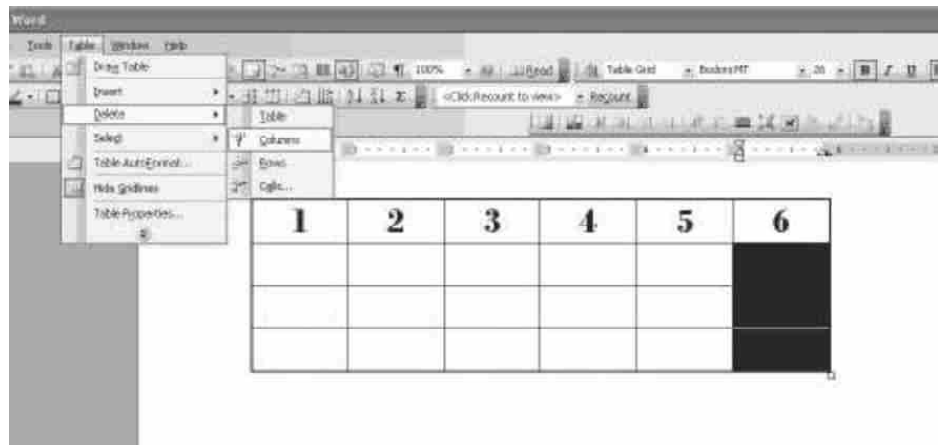


Fig. 4.71

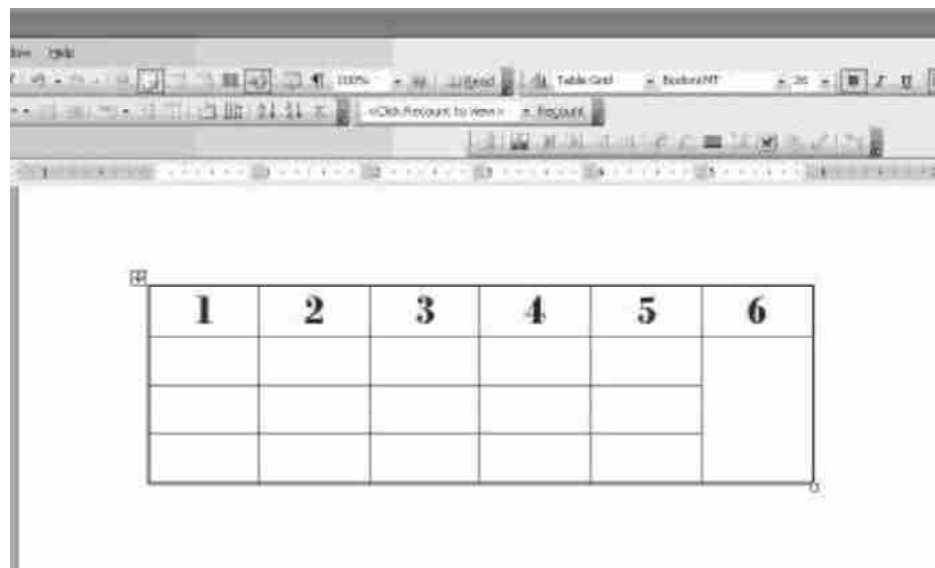


Fig. 4.72

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#### 4.11 Implementing Formula on Table Contents :

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Consider the following table. In that, consider last column and assume that we want to add the contents to find the total. To do that, follow the steps given below.

- (1) Point the cursor where we want to get the total.
- (2) Click on "**Table**" option of menu bar and from the resulting menu click on "**Formula**" option. We will get a menu as shown in **Fig 4.74**. Select the required function from the "**Paste**" function list box (**Fig. 4.74**). There are many functions available. In our case since we want to add the contents, we select the function **SUM( )** and type "**ABOVE**" inside the parenthesis to add the contents present above the cells where cursor was earlier pointing to. We can see the result in **Fig. 4.75**.

Serial	Item Name	Units	Price/Unit	Price
1	CD-ROM	20	14	280
2	Floppy	20	12	240
3	Cartridge	4	600	3000
4	Toner	2	3500	7000

Fig. 4.73

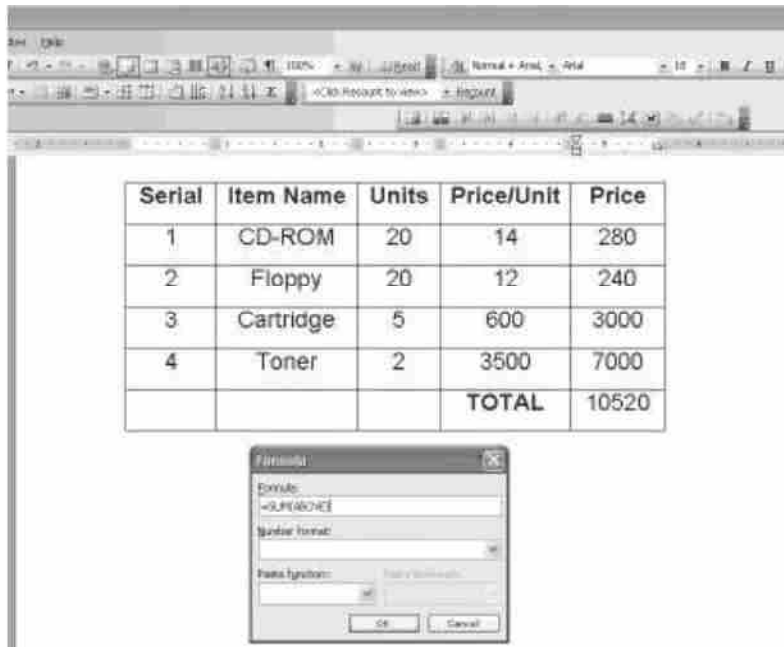
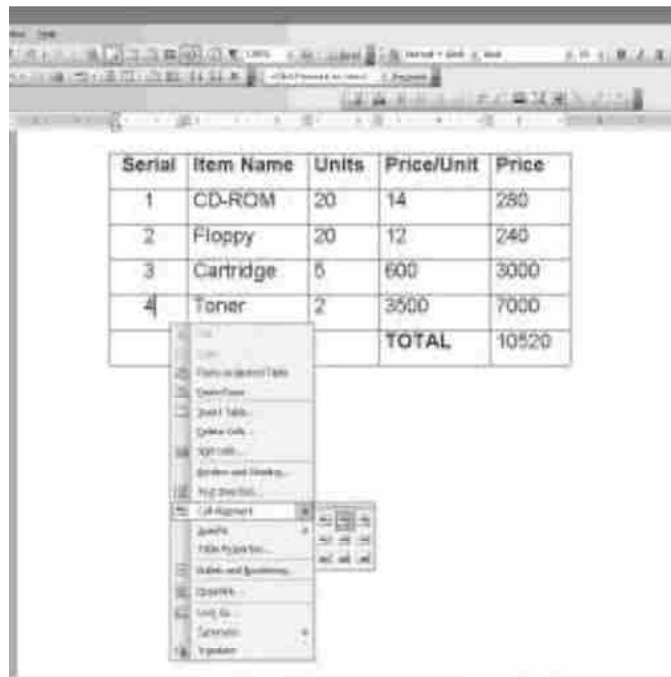


Fig. 4.74

Serial	Item Name	Units	Price/Unit	Price
1	CD-ROM	20	14	280
2	Floppy	20	12	240
3	Cartridge	5	600	3000
4	Toner	2	3500	7000
			<b>TOTAL</b>	10500

Fig. 4.75

**Formatting the Contents of the Table :** The contents of the table can be formatted according to our needs using the options available in the Formatting Toolbar. For example, if we want to have serial numbers to be at the center of first column then select the contents of the first column and click on "**Center**" alignment option available on the Formatting Toolbar and we will get the table as shown in Fig. 4.76.



Serial	Item Name	Units	Price/Unit	Price
1	CD-ROM	20	14	280
2	Floppy	20	12	240
3	Cartridge	5	600	3000
4	Toner	2	3500	7000
			<b>TOTAL</b>	10520

Fig. 4.76

Similarly we can have the different kinds of formatting according to our needs.

**Draw Table :** Using this option we can draw a table using the drawing tool. To use this option, click on the "Table" option available in the menu bar. From the resulting menu, click on "Draw table" option and we will get the drawing tool as shown in Fig. 4.77. Use this tool to draw the table of our requirement as shown in Fig. 4.78.

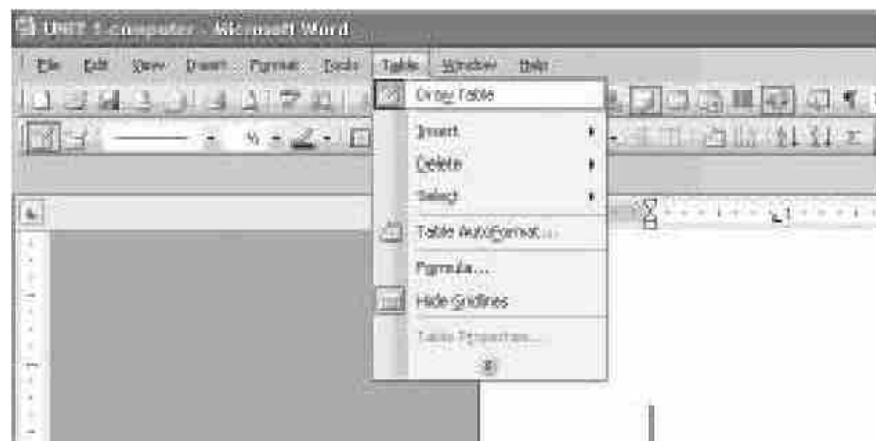
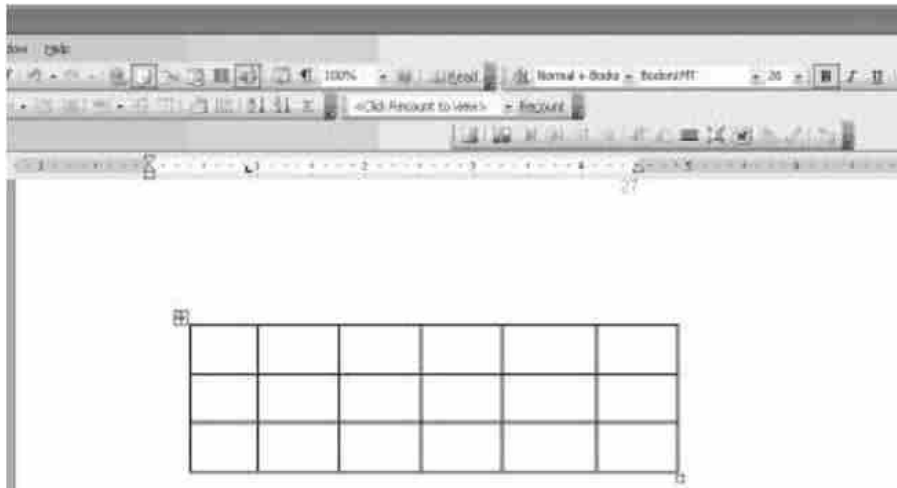


Fig. 4.77



**Fig. 4.78**

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#### **4.12 Headers and Footers :**

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Headers and Footers are typically used in printed documents. We can create headers and footers that include text or graphics - for example, page numbers, date, a company logo, the documents title or file name, or the author's name - that are usually printed at the top or bottom of each page in a document. A header is printed in the top-margin; footer is printed in the bottom-margin.

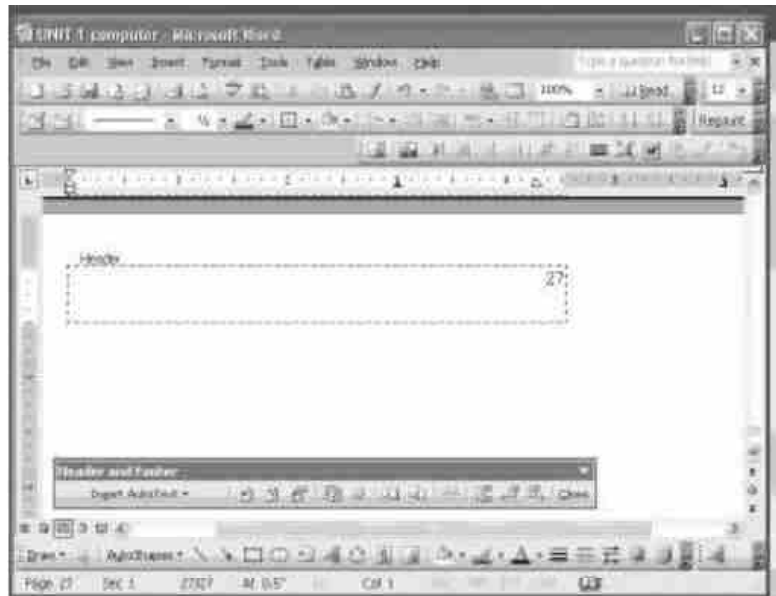
We can use the same header and footer throughout a document or change the header and footer for part of the document. For example, use a unique header or footer on the first page, or leave the header or footer off the first page. We can also use different headers and footers on odd and even pages or for part of a document.

Follow the steps given below to insert Headers and Footers.

- (1) Click on the "**View**" option available on menu bar, then click on "**Header and Footer**" available in the resulting menu, we will get a menu as shown in **Fig. 4.79**.
- (2) To create a header, enter text or graphics in the header area. Or click, button on the Header and Footer bar.

To insert	Click
Page numbers	Insert page number
The current data	Insert date
The current time	Insert time

- (3) To create footer, click switch between Header and Footer to move to the footer area. Then repeat step 2.
- (4) When we finish, click "Close".



**Fig. 4.79**

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### **4.13 Page Setup :**

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Page can be set up the way in which we want. Follow the steps given below to set up a page.

Click on to "File" option available on Menu bar. Click on to "Page Setup" available on the resulting menu and we will get a menu as shown in Fig. 4.80



**Fig. 4.80**

Page setup has four different tabs. They are **Margins**, **Paper size**, **Paper source** and **Layout**.



Options available in **Margins** tab are given below.

- **Top** : Enter the distance we want between the top of the page and the top of the first line on the page.
- **Bottom** : Enter the distance we want between the bottom of the page and the bottom of the last line on the page.
- **Left** : Enter the distance we want between the left edge of the page and the left edge of unindented lines.
- **Right** : Enter the distance we want between the right edge of the page and the right end of a line with no right indent.
- **Gutter** : Enter the amount of extra space we want to add to the margin for binding. **Word** adds the extra space to the left margin of all pages if we clear the "**Mirror margins**" check box, or to the "**Inside margin**" of all pages if we select the "**Mirror margins**" check box.
- **From Edge** : Enter the distance we want from the top edge of the page to the top edge of the header. If the Header setting is larger than the Top setting, **Word** prints the body text below the header.
- **Header** : Enter the distance we want from the top edge of the paper to the top edge of the header. If the Header setting is larger than the Top setting **Word** prints the body text below the header.
- **Footer** : Enter the distance we want from the bottom edge of the page to the bottom edge of the footer. If the footer setting is larger than the Bottom setting, **Word** stops printing the body text above the footer.
- **Mirror Margins** : Adjusts left and right margins so that when we print on both sides of the page, the inside margins of facing pages are the same width and the outside margins are the same width.
- **2 Pages per sheet** : Prints the second page of a document on the first page. This check box is used when the printed page is folded in half with two pages on the inside. The outer margins (gutter) of the page will be the same width, and the inner margins will be the same width.
- **Apply to** : Click the portion of the document we want to apply the current settings to in the "**Page Setup**" dialog box. We have two options here : **Whole document and This point onwards**.
- **Whole document** means the settings, which we are making, will apply to all the pages in the file of which we want to take print out. **This point onwards** means the settings will be applicable to all the pages starting from the page in which we are actually making the settings.
- **Gutter position** : We can set it either to the left or to the top of the page depending upon the radio button we will select.

Options available in "Paper Size" menu are given below (Fig. 4.81).

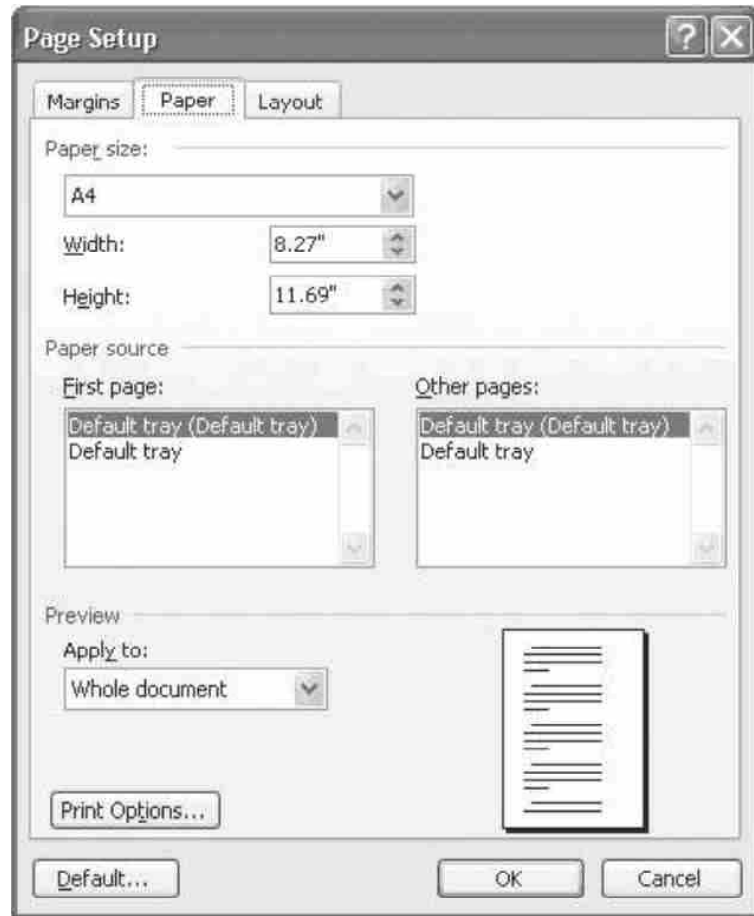


Fig. 4.81

- **Paper size** : Click one of the paper sizes supported by our printer, or click **custom size** and then enter the paper size dimensions in the width and height boxes.
- **Orientation** : Click a page orientation. When we change the page orientation, **Word** swaps the top and bottom margin settings with the Left and Right margin settings.
- **Review** : Shows how our document will look with the selected options.
- **Apply to** : Click the portion of the document we want to apply the current settings. We have two options here. **Whole document** and **This point onwards**. **Whole document** means the settings, which we are making, will apply to all the pages in the file of which we want to take print out. **This point onwards** means the settings will be applicable to all the pages starting from the page in which we are actually making the settings.

Options available in "Paper source" menu are given below :

- **First Page** : Click the printer tray from which we want to print the first page of each section. Word lists the feed available on our current printer.

- **Other Pages** : Click the printer tray from which we want to print the second and subsequent pages in each section. Word lists the feed options available on our current printer.

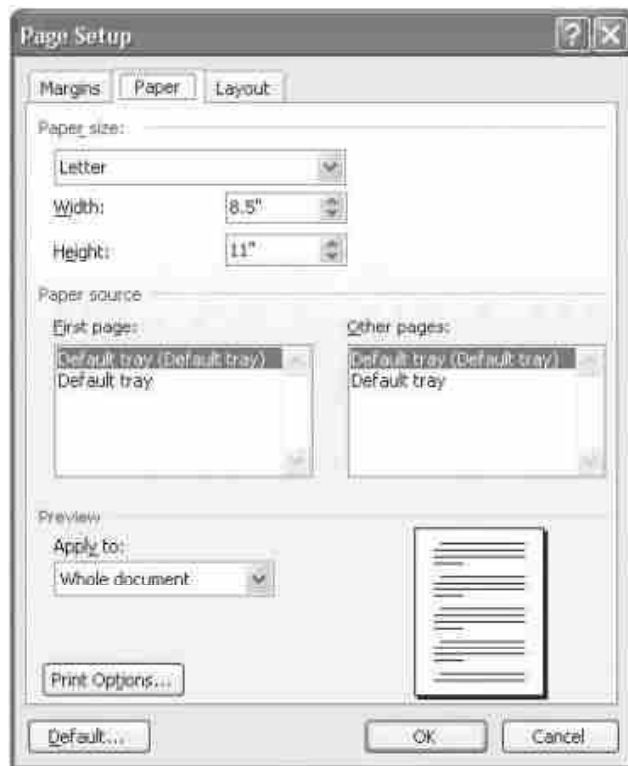


Fig. 4.82

- "Preview" and "Apply" options are same as explained above. Options available in "Layout" menu are given below (Fig. 4.83).

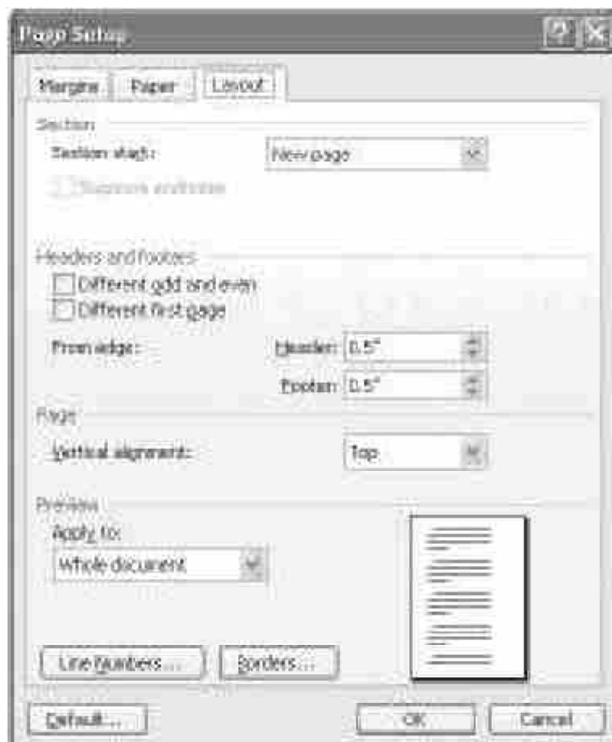


Fig. 4.83

- **Section Start** : Tells Word where we want the current section to start.

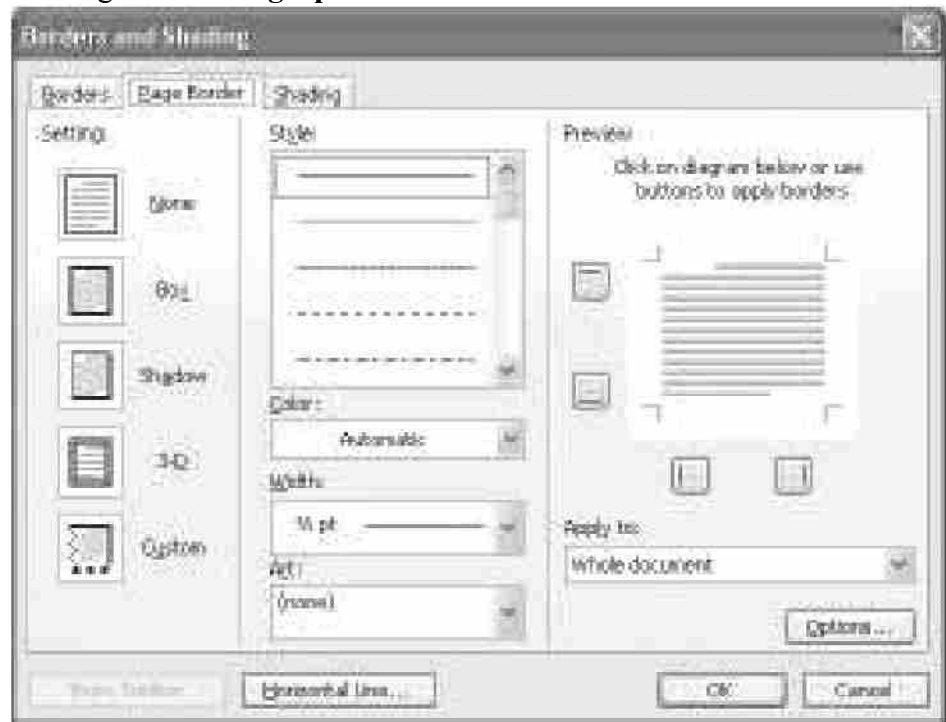
- **Headers and Footers** : Select the different odd and even check box to create one header or footer for even-numbered pages and a different header or footer for odd-numbered pages. Select the different first page check box to create a different header or footer for the first page of a section or document.
- **Vertical Alignment** : Click the way we want to align text vertically between the top and bottom margins. The justified setting affects only full pages; **Word** aligns pages with the top margin.
- **Line Numbers** : Adds or removes line numbering from the portion of the document currently selected in the **"Apply to"** box.
- **Borders** : Set options for applying a border around each page in the document.

---

#### **4.14 Indents :**

---

**Setting Indents and spacing** : Indents are used to set the position of text in relation to the left and right margins and spacing is used set the amount of space between the lines and paragraphs. We can do it by invoking the **"Paragraph"** menu.



**Fig. 4.84**

Clicking on **"Format"** option available in the menu bar and clicking

on the "Paragraph" option from the resulting menu can invoke "Paragraph" menu. "Paragraph" menu as shown in Fig. 4.85.

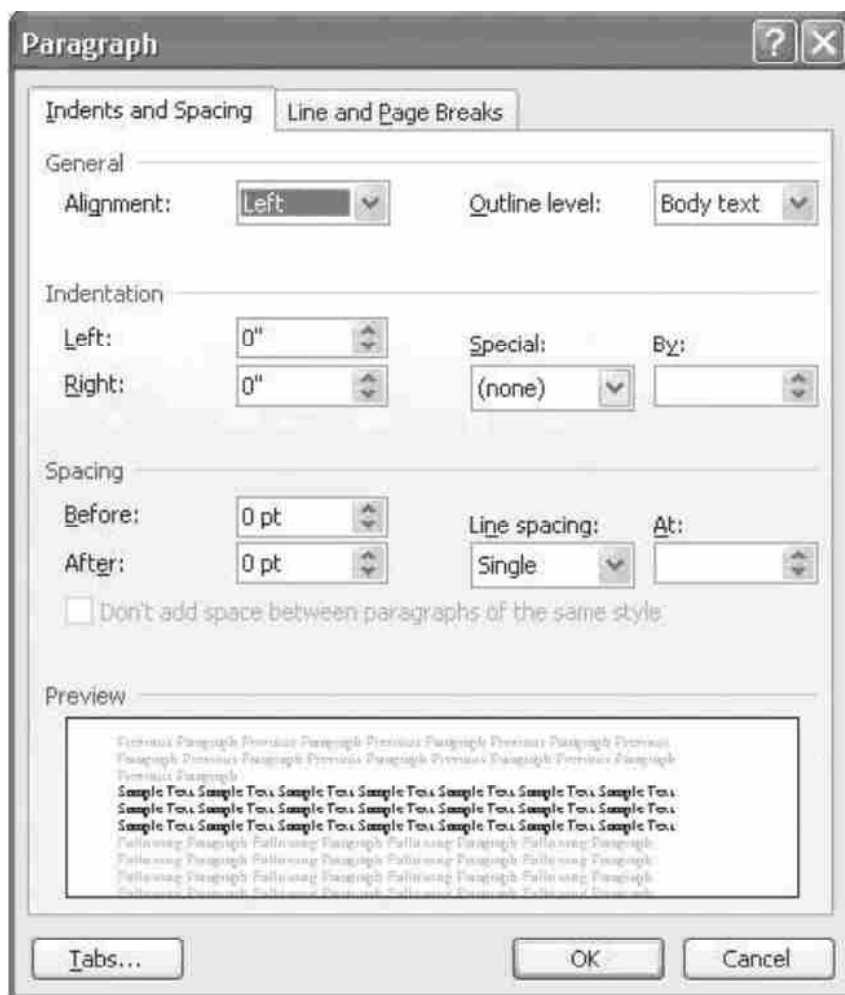


Fig. 4.85

Let us now discuss the different options available in this menu under "Indents and Spacing" tab.

- **Alignment** : Sets the position of selected paragraphs relative to the indents. To align text relative to the left and right margins, remove any indentation formatting.
- **Outline level** : Click the "Outline level", we want to assign to the selected paragraphs.
- **Indentation** : Sets the position of text in relation to the left and right margins.
- **Left** : Indents a paragraph from the right margin by the amount we enter in this box. If we want text to appear in the right margin, enter a negative number.
- **Special** : Click first line to indent only the first line of a paragraph. Click hanging to indent all but the first line of a paragraph. Click **(none)** to remove special indentation formatting.
- **By** : Enter the amount of indentation for a first line or hanging indent. Word clears this box if we click **(none)** in the special list.

- **Spacing** : Sets the amount of space between lines and between paragraphs.
- **Before** : Sets the amount of space above each selected paragraphs.
- **After** : Sets the amount of space below each selected paragraph.
- **Line Spacing** : Sets the amount of vertical space between lines of text. If we click "**At least**", "**Exactly**", or "**Multiple**", enter a value in the "**At**" box.
- **At** : Enter the amount of vertical space we want between lines of text. This setting is effective only if we click "**At least**", "**Exactly**", or "**Multiple**" in the "**Line Spacing**" box.

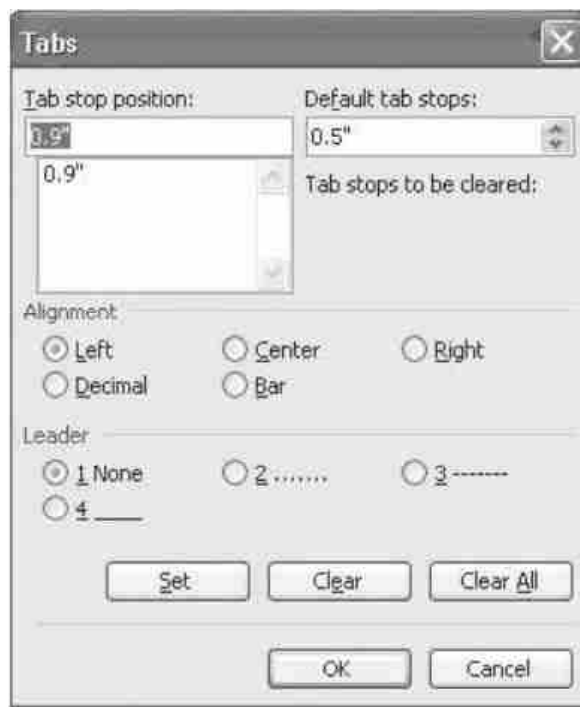
Students are advised to consider a text and make paragraph settings according to the **Fig. 4.84**.

---

#### 4.15 Tabs :

---

This is used to set or change the tab stop settings in a paragraph. Click on to "**Tabs**" option available in "**Paragraph**" menu, we will get the "**Tabs**" menu as shown in **Fig. 4.86**.



**Fig. 4.86**

- **Tab Stop Position** : Type the measurement for a new tab stop, or click an existing tab stop and then type a new measurement for it.
- **Default tab stops** : Sets the default spacing between tabs stop.
- **Alignment** : Click the way we want text to be aligned at the tab stop. To change the alignment for an existing tab stop, click it on the Tab stop positive box, and then click the non alignment option.
- **Left** : Extends text to the right from the tab stop.

- **Center** : Center text at the tab stop.
- **Right** : Extends text to the left from the tab stop. If text fills the space to the left of the tab stop, the text often extends to the right.
- **Decimal** : Aligns a decimal point at the tab stop. Text or numbers without a decimal point extends to the left of the tab stop.
- **Bar** : Inserts a vertical line at the tab stop.
- **Leader** : Click on the **dotted**, **dashed**, or **solid line** option to fill the empty space to the left of a tab stop.
- **Click** :
  - (1) **"None"** to leave the space blank or to remove a previously applied leader line.
  - (2) Fills the empty space to the left of a tab stop with a dotted leader line.
  - (3) Fills the empty space to the left of a tab stop with a dashed leader line.
  - (4) Fills the empty space to the left of a tab stop with a solid leader line.
- **Tab Stops to be Cleared** : Lists the tab stops that will be cleared



from the selected paragraphs when we click "OK". Word does not clear these tab stops if we click "Cancel".

- **Set** : Sets a tab stop using the current settings.
- **Clear** : Clears the tab stop that is selected in the "Tab stop position" box. Word lists the tab stops to be cleared at the bottom of the dialog box and actually clear them when we click "OK".
- **Clear All** : Clears all the custom tab stops listed in the Tab stop position list. Word lists the tab stops to be cleared at the bottom of the dialog box and actually clears them when we click "OK".

Fig. 4.87 shows the setting of default tab stop which shows 0.4 inches there onwards.

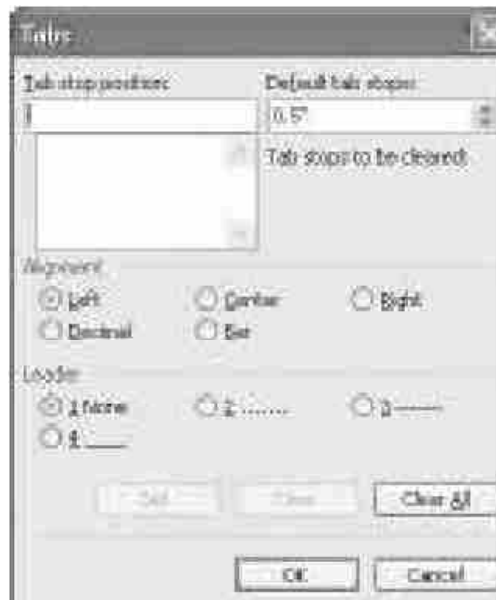


Fig. 4.87

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#### 4.16 Columns :

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This is used to create newspaper columns to continue a story in the next column on the same page.

Assume that we have typed a paragraph and we want to divide that into columns. To do these follow the steps given below :

- (1) Be in the page where we have typed the paragraphs and click on to "Format" option available on Menu bar.
- (2) From the drop-down menu, click on to Column option. We will get a menu as shown in Fig. 4.88.



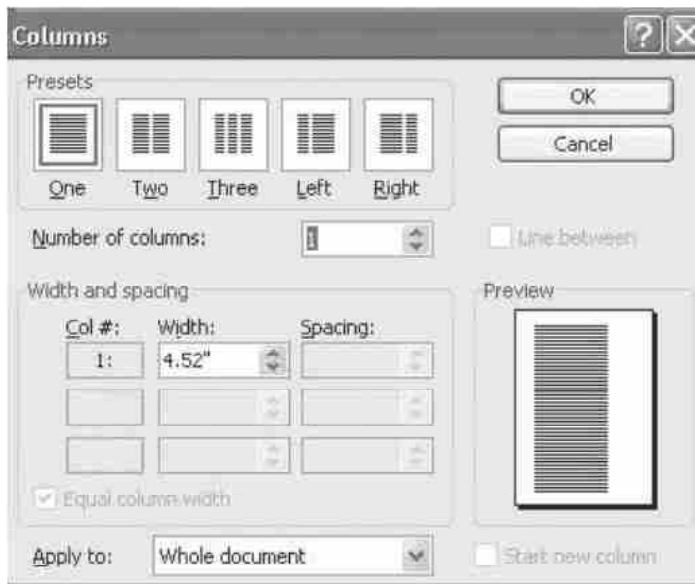


Fig. 4.88

Here, select the number of columns we want to have and other configurations and click "OK" to effect the change. The menu in Fig. 4.88 has different options, which are discussed below.

- (3) Fig. 4.89 shows the settings in "Column" menu and shows the columns of text from the paragraph we have typed.

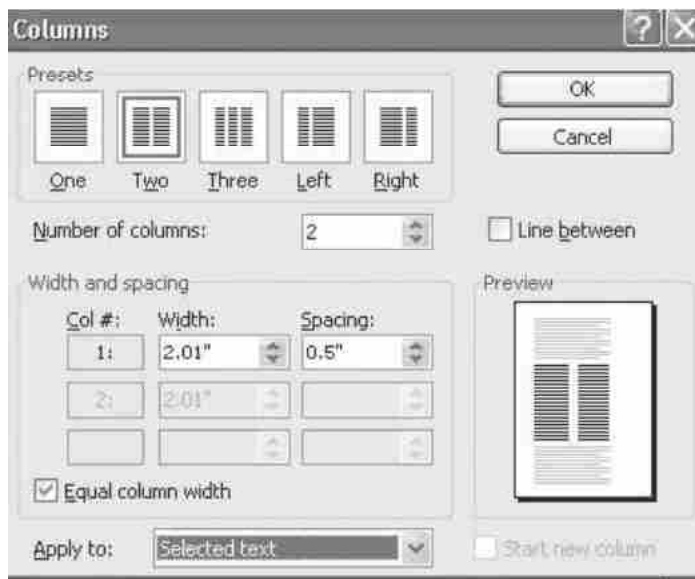


Fig. 4.89

#### Different Options Available in Columns Menu :

- **Presets** : Click one of these common preset column formats or enter our own custom settings.
- **One** : Inserts a single column.
- **Two** : Inserts two columns of equal width.
- **Three** : Inserts three columns of equal width.
- **Left** : Inserts two columns, of which the left column is half as

wide as the right.

- **Right** : Inserts two columns, of which the left column is half as wide as the left.
- **Number of Columns** : Enter the number of columns we want in a document or section of a document.
- **Width and Spacing** : Enter the width and spacing measurement for each column. If the "equal column width" check box is selected, the width and spacing settings for column apply to all the columns.
- **Line Between** : Adds vertical lines between columns.
- **Apply to** : Click the portion of the document to which we want to apply column formatting. Here we have got two options **Whole document** and **this point onwards**. **Whole documents** mean column format will be applied to the contents of entire document. **This point onwards** means column format will be applied to the document from the point we specify to the document from the point we specify or we can even select the paragraph to which we want to apply the column format.
- **Start new column** : Moves text following the insertion point to the top of the next column.

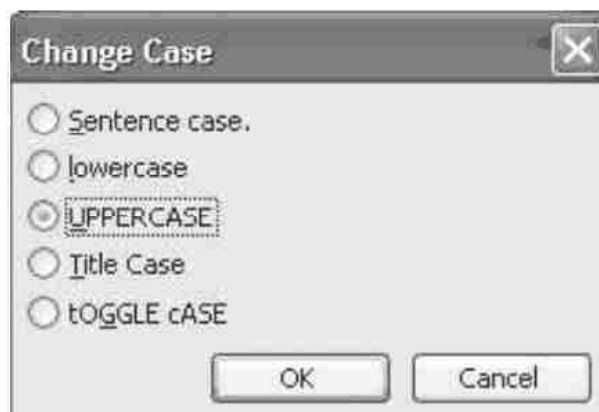
---

#### 4.17 Change Case :

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This menu provides us with the different options of cases that we can apply to the text.

First select the text to which we want to apply the required case and click on "**Format**" option available on Menu bar. From the drop-down menu, click on "**Change case**" option. We will get a menu as shown in **Fig. 4.90**.



**Fig. 4.90**

Here selected kind of case we want to have and click "**OK**" to effect the change.

The menu in **Fig. 4.90** has different options, which are discussed below :

- **Sentences Case** : Capitalizes the first letter of the first word in the selected sentence.
- **Lower Case** : Changes all selected text to lower case text.
- **Upper Case** : Changes all selected case to capital letters.
- **Title Case** : Capitalizes the first letter of each word in the selection.
- **Toggle Case** : Changes all upper case letters to lower case in the selection and vice-versa.

The options themselves are the example for different case which can be applied to.

#### **4.18 Let Us Sum Up :**

**Microsoft Word** is an Editor. The basic components of this software are **Title Bar, Menu Bar, Standard Toolbar** and **Formatting Toolbar**.

Using this software we can create a new documents, edit it, format it if needed. Documents can be formatted in terms of Font type, Font size etc. We can even make some part of the document highlighted. The document can be aligned according to our needs. The numbering can be provided to different points. Proper indentation also can be provided. Symbols, Pictures, Tables can also be inserted in the document. A particular word can be searched and it can be replaced with the new word if required. The printing of the document can be done with the help of this software. The default extension of a **Word** document is "**doc**".

#### **4.19 Answers for Check Your Progress :**

##### **Check Your Progress :**

1. Microsoft Word is such software which can be used to create, format, store, retrieve, edit and print the document.
2. Title Bar, Menu Bar, Standard Toolbar, Formatting toolbar, Editing area, Scroll Bars, Drawing Tool Bar, Status Bar.
3. Use of New Blank Button on standard tool bar  
Use of File option button on Menu Bar  
Press Ctrl and N key simultaneously.
4. Using the Exit option  
Using the Close button on the title bar.

#### **4.20 Glossary :**

1. **Title Bar** : It displays the name of the program and the document.
2. **Copy** : It copy a part of the document to some other place.
3. **Cut** : It move a part of the document to some other place from

the existing location.

---

#### **4.21 Assignment :**

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##### **1. Open MS-Word and type the following Paragraph :**

Computers have been called "mind tools" because they enhance our ability to perform tasks that require mental activity. Computers are adopting at performing activities such as making calculation quickly, sorting large units, and searching through vast information libraries. Humans can often accomplish them much faster and more accurately. Our ability to use a computer complements our mental capabilities and makes us more productive. The key to making effective use of the computer as a tool is to know what a computer does, how it works, and how we can use it.

**Now, follow the following points para & bold change**

- (a) Format the paragraph with Bold, Size = **20**, Font = **Arial**, Color = **Blue** and justified alignment and apply proper header and footer.
- (b) Convert the above paragraph into three columns with alignment justified and lines in between.
- (c) Convert the above paragraph into three columns with alignment justified and lines in between.
- (d) Insert picture using clip art and place it in middle of the paragraph.

---

#### **4.22 Activities :**

---

##### **1. Open New Word document and type the following paragraph :**

We can define a computer as a device that accepts input, processes data, stores data, and produces output. A computer is actually part of a computer system. Let us look more closely at the basic elements of a computer system.

Hardware includes the electric, electronic and mechanical device used in processing data.

A computer requires a set of instructions, called software or a computer program, which tells the computer how to perform a particular task.

**Now follow the following points (para change & bold)**

- (a) Set the first line indents of first paragraph to 2 inches.
- (b) Set double line spacing for the second paragraph.
- (c) Set **2 pt** space before and after all the paragraphs.

---

#### **4.23 Case Study :**

---

1. Discuss different options available for formatting document.
2. Explain Page Setup with its all options.

---

#### **4.24 Further Readings :**

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1. Parameswaram, R. (2010), 'Computer Applications in Business'. S. Chand & Company.
2. Rajaraman, V. (2013), 'Fundamentals of computer', Practice Hall India Learning Private Ltd.
3. Saxena, Sanjay & Chopra, P. (2006), 'Computer Application in Management', Vikash Publication House Pvt. Ltd.

- 5.0 Learning Objectives
- 5.1 Introduction
- 5.2 File Needed to Work with Mail Merge
- 5.3 Creating a Mail Merge Document
- 5.4 Inputting the Data
- 5.5 Printing the Merged Document
- 5.6 Modifying the Records in the Data Source
- 5.7 Let Us Sum Up
- 5.8 Answers for Check Your Progress
- 5.9 Glossary
- 5.10 Assignment
- 5.11 Activities
- 5.12 Case Study
- 5.13 Further Readings

---

**5.0 Learning Objectives :**

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**After going through this unit you will be to :**

- explain the steps involved in creating Mail Merge
- set up the main document
- combine or Merge the Main Document
- input the data
- explain Printing of the merged document
- explain Modifying the Records in the Data Source
- change the contents of existing record.

---

**5.1 Introduction :**

---

In the earlier unit, you have learnt about MS Word. In this unit we are going to discuss about another feature of MS WORD which is known as mail merge. Here, we will discuss about steps involved in mail merge, combining or merging the main document, inputting the data, printing of merged document, saving the main document, modifying the records etc.

Microsoft Word has a useful feature known as Mail Merge. It assists you to produce a personalized letter for each person in your mailing list.

Assume that you want to send an Invitation Letter to all of your friends. But typing the same letter for different friends of yours becomes

a tedious job. But using the Mail Merge features of MS-Word you can make the tedious job easier. Using this feature you can quickly create personalized letter for each and every friend of yours who are in your mailing list.

In this facility all data is stored in one document. The format of the letter is stored in another document with some special instructions. This document, consisting of special instructions, is called the Main document. During the Mail Merge pressed, the Main Document is combined with or merged with the document containing the data. MS-Word replaces special instructions in the Main Document with the data from other document.

Let us now discuss the concept of working of Mail Merge. In this, the address of all of your friends is saved in one document, and the format of the letter to be sent to them is stored in another document. Special instructions are to be given in the letter format to indicate the MS-Word as to where the address has to be inserted. When both these documents are mail merge, individual address from the first document replace the special instructions given in the table.

---

## 5.2 File Needed to Work with Mail Merge :

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Two files are needed to work with Mail Merge. They are Data Source and Main Document.

- **Date Source** : The file that contains the mailing list.
- **Main Document** : The file that contains the format of the letter to be sent simultaneously to many people is referred to as Main Document. This document contains special instructions for the data to be inserted from the data source.

Following are the steps involved with Mail Merge:

- (1) Creating of the Data Source
- (2) Setting up of the Main Document
- (3) Combining or Merging the Main Document and Data Source.

---

## 5.3 Creating a Mail Merge Document :

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First of all decide the type of document you want to create i.e. letter, labels, envelopes or catalogues.

Now let us consider the example of sending greetings to your friends. So let us assume that you will have the following fields in the address.

First name, Last name, Street name.

Following the steps given below to use Mail Merge.

- (1) So to use the mail merging you should be in MS-Word, then click on to Tools option and from the resulting drop down menu click on to Mail Merge option (**Fig. 5.1**), you will get a menu as shown in **Fig. 5.2**.

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**BLOCK SUMMARY**

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The block has given concept of the computer, evolution, generation, classification of the computer. Also learnt about the binary number system with different conversion such as binary, decimal, octal and hexadecimal.

While studying his block, the user got knowledge and understanding about how the MS-word is useful in creating the document with its different formatting option as well with its mail-merge wizard.



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## **BLOCK ASSIGNMENT**

---

### **Short Answer Questions :**

1. Write short note :
  - (a) Primary memory
  - (b) Secondary memory

### **Long Question :**

1. What is computer ? What are the characteristics of a Computer ? Do you think computers are superior to human being ?
2. Describe the evolution of computers
3. Discuss different types of Operating Systems

**Management & Information System**

❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	4	5	6	7	8
No. of Hrs.					

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

.....

.....

.....

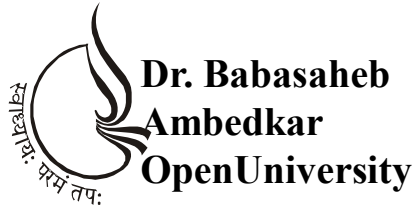
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**BBAR-303**

# **Management & Information System**

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## **BLOCK-3 FUNDAMENTAL OF SPREADSHEETS AND PRESENTATION TOOLS**

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### **UNIT 1**

MS EXCEL – I

### **UNIT 2**

MS EXCEL – II

### **UNIT 3**

MS POWERPOINT

---

## **BLOCK 3 : FUNDAMENTAL OF SPREADSHEETS AND PRESENTATION TOOLS**

---

### **Block Introduction**

In this block you will learn about MS-Excel with all parts of Excel window, Component of an Excel Work Book. You will learn about the basics like cell, column, row, table, insertion of data, manipulation on inserted data with the help of different available functions. You will learn use, syntax and examples of Excel function such as SUM(), MIN(), MAX(), AVG(), UPPER(), LOWER() and so on.

You will come to know about the MS-PowerPoint and parts of PowerPoint Window. You will learn about how to create slide and slide show, adding images, clip arts, sounds, timing of slide transition and adding effects to slides.

## **Block Objectives**

**After learning this block, you will be able to :**

- Idea about Excel and Parts of MS Excel Window
- Component of an Excel Work Book
- Saving and creating Work Book
- Detail about common excel functions
- Idea about database and chart
- Details of PowerPoint and its window parts
- Idea about creation of presentation
- Detail of slide transition

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**Block Structure**

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Unit 1 : MS Excel – I

Unit 2 : MS Excel – II

Unit 3 : MS PowerPoint



**: UNIT STRUCTURE :**

- 1.0 Learning Objectives**
- 1.1 Introduction**
- 1.2 Starting of Microsoft Excel**
- 1.3 Part of MS Excel Windows**
- 1.4 Components of an Excel Work Book**
- 1.5 Closing the Excel Work Book**
- 1.6 Worksheets within Work Book**
- 1.7 Enter an Edit Data**
- 1.8 Saving and Creating the Work Book**
- 1.9 Cell Contents**
- 1.10 Let Us Sum Up**
- 1.11 Answers for Check Your Progress**
- 1.12 Glossary**
- 1.13 Assignment**
- 1.14 Activities**
- 1.15 Case Study**
- 1.16 Further Readings**

---

**1.0 Learning Objectives :**

**After going through this unit you will be able to :**

- operate Microsoft Excel
- define different units of Excel
- explain Cells and Cell addresses
- explain Creation and Saving of a Worksheet and Workbook
- define the components of Work book
- explain the entering of formula.

---

**1.1 Introduction :**

MS Excel is a Windows based spreadsheet (Worksheet) package. When calculations are made on paper and certain data must be changed, then the entire work must be calculated and re-written. If a spreadsheet package is used then the recalculation is automatic. The details of bank passbook, tax inventory, purchase and sales can also be maintained using a spreadsheet package.

Lotus 123, MS Excel etc., are spreadsheet package.

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## **1.2 Starting of Microsoft Excel :**

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Following steps are undertaken to start Microsoft Excel :

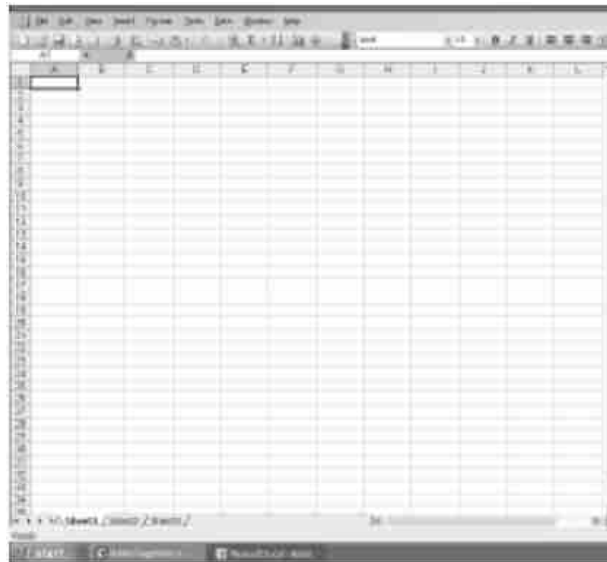
- (1) Move the mouse pointer over the Start button present on the extreme left of the task bar and then click the left mouse button. A push up menu appears.
- (2) Place the mouse pointer over the program option inside the push up menu. A second menu gets displayed immediately.
- (3) Move the mouse pointer over Microsoft Excel option and click the left mouse button. A blank document files gets displayed on the screen instantly. Now the data can be entered in the file Book 1 appeared and calculations can be made on entered data.

When MS Excel is loaded, the Excel Window will appear on the screen. Excel window appearance with its parts is given below :

---

## **1.3 Part of MS Excel Windows :**

---



**Fig. 1.1**

- (1) **Title Bar** : Displays the application name, file name and various window controls like minimize button, maximize button and close button.
- (2) **Menu Bar** : Different options for selection.
- (3) **Formatting Toolbar** : Allows the user to give commands related to formatting cells and cell contents like Bold, Underline, Font style, Font size, Color etc.
- (4) **Name Box** : Displays the address of the current cell.
- (5) **Formula Bar** : Displays the cell content.
- (6) **Current Bar** : Current cell will be the active cell.
- (7) **Row Headers** : There are 65536 rows (lines) numbered as 1, 2, 3...65536. First row number is 1 and last row number is 65536.



To go to cell in last row, press End and Down arrow key, to return to cell in the first row, press End and Up arrow key.

- (8) **Column Headers** : There are 256 columns numbered as AB, B, C, Z ..... AA & AB. AZ, BA, BB ..... IV. First column name is A and last column name is IV. To go to the cell in last column header press End and Right arrow key, to return to the cell in first column, press End and Left Arrow key.
- (9) **Scroll Bars** : used to scroll through different parts of current sheet.
- (10) **Sheet Tabs** : Displays the sheet names. Each worksheet is named as sheet 1, sheet 2 and sheet 3.
- (11) **Status Bar** : Displays on the left side various modes like Ready or Edit mode. The status of numlock, caps lock and scroll lock keys on the key board on the right side.

#### **Explanations :**

**Title Bar** : Display the application name, file name and various window controlled like minimize button maximize button and close button.

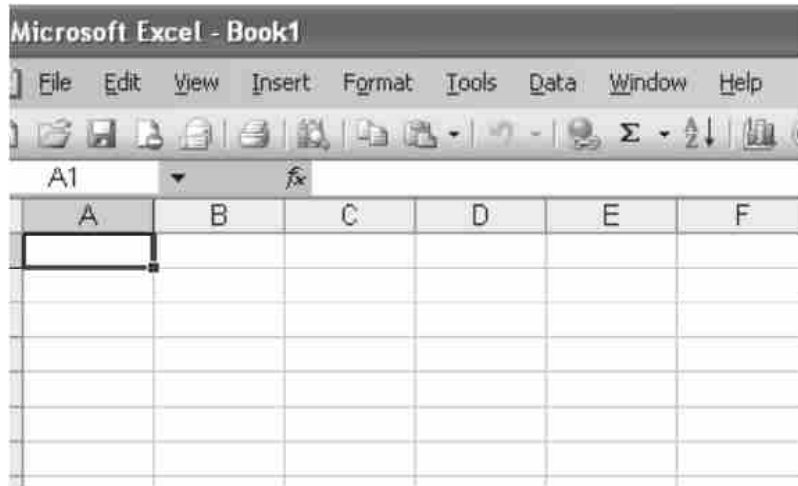
- **Minimize Button** : This used for changing a window/sheet into a button.
- **Maximize Button** : This is used for enlarging a window/sheet after it has been minimised or restored.
- **Close Button** : This is used to close a window/sheet.

**Menu Bar** : This has different options for solutions (which is discussed in detail below). In addition to minimize and close button (described above) it has restore button which is used for bringing a window/ sheet to its original size and adjusting the size of a window/ sheet.

- **File** : This helps in creating a new file; opening an existing file; saving a file; printing; print preview; setting up of print area; closing the worksheet; existing Excel etc.
- **Edit** : This helps in copying, cutting, deleting a range of text, pasting text which has been copied or cut from some other location, clearing the contents of cells, finding the particular text in the worksheet etc.
- **View** : This helps in enabling and disabling certain tools in Excel Worksheet.
- **Insert** : This can be used to insert cells, row, column in the worksheet.
- **Format** : This helps in formatting of the row, column, to increase/ decrease height and width etc.
- **Tools** : This helps with the spell checker, protection of worksheets/ workbooks by providing the password. The worksheet can be customized according to one's specification etc.

## Management & Information System

- **Data** : This is used to sort (ascending/descending), filter the list to obtain sub total etc.
- **Window** : This is used to hide/unhide the work book, to create new window, to split the frame etc.
- **Help** : This can be used to get any help about Excel.



**Fig. 1.2**

### Standard Tool Bar :

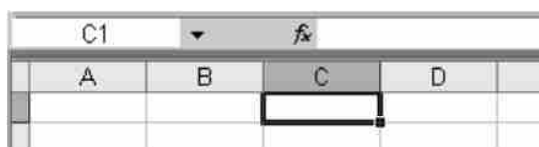
- **New** : This is used to create a new workbook.
- **Open** : This is used to open an existing file.
- **Save** : This is used to save a file.
- **Print** : This is used to take the print out of the file.
- **Preview** : This is used to see the printing document before printing.
- **Spelling Checker** : This is used to check the spelling and the grammatical errors in the file.
- **Cut** : This is used to move a selected block from one location to another.
- **Copy** : This is used to copy a selected block we want from one location to another.
- **Paste** : This is used to make appear the block selected during the copy or cut operation at a certain location.
- **Undo** : This is used to retain the and modifications made to a file.
- **Redo** : This is used to reverse the last undo action performed on the file.
- **Auto Sum Button** : This is used to add the numbers in a particular range.
- **Paste Function Button** : This is used to do different operations on a selected set of numbers, such as finding average or finding the minimum or maximum of set of numbers such as finding average or finding the minimum or maximum of set of numbers etc.

- **Sort Ascending** : This is used to arrange a set of numbers in ascending (increasing) order.
- **Sort Descending** : This is used to arrange a set of numbers in descending (decreasing) order.
- **Chart Wizard Button** : This is used in creating chart graphics for a set of numbers.
- **Drawing** : This is used to add the drawing tool bar just above the status bar of the window.
- **Zoom** : This is used to change the size of the worksheet or to display the selected block in great size.

#### **Formatting Tool Bar :**

- **Font** : This helps in changing the style of the text typed in the work sheets. You can select a required font from the available font list and change the style of the text which is inside the selected block.
- **Font Size** : This helps in changing the size of the text. You can select a required size for the font from the available list and change the size of the text which is inside the selected block.
- **Bold** : This helps to make the selected look bolder than the other text.
- **Italic** : This helps to make the text in the selected block look tilted or slanted.
- **Underline** : This helps in getting a underline to the selected text.
- **Align Left** : This helps in left justify the contents of cell which is inside the selected block.
- **Center** : This helps in center justify the contents of cell which is inside the selected block.
- **Align Right** : This helps in right justify the contents of cell which is inside the selected block.

**Formula Bar** : The Fig. 1.3 shows the address of the active cell and the contents of active cell. In the above example C1 is the address of the cell and 'sales' is content of that cell.



**Fig. 1.3**

**Status Bar** : The status bar is located at the bottom of the Microsoft Excel Window. It displays Ready, or Edit on the left hand side and NUM on the right hand side.

- **Ready** : This indicates that the work book is ready to accept data from the user.

- **Edit** : This indicates the workbook is in edit mode that means the contents of the cell being modified or a new content is being placed in the cell.
- **NUM** : This appears on the right hand side of the status bar and represents the status of Num Lock indicator on the key board. If Num Lock is enabled on the keyboard, NUM will disappear from the Status Bar.
- **Cell and Cell Address** : The intersection of a column and a row is called a cell. Each cell has a name and a cell address. The cell address consists of the column letter and row number. For example, the first cell is in the first column and first row. First column name is A and first row number is 1. Thereafter, the first cell address is A1. Similarly the address of last cell is IV65536 i.e. column IV and row number is 65536.

The total cells in a Worksheet are  $256 \times 65536$ .

---

#### **1.4 Components of an Excel Work Book :**

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- **Row Numbers** : The horizontal group of cell is termed as a row. Each row is assigned a number. The row number appear on the left side of the work book.
- **Column Number** : The vertical group of cells is termed as a column. Each column is assigned a number. The column number appears below the formula bar in the workbook.
- **Column Headings** : The name given to each column is termed as column heading. These appear just below the Formula Bar.
- **Vertical Scroll Bar** : The vertical scroll bar consists of two buttons up Arrow Scroll button and the Down Arrow Scroll button. Clicking of any of these buttons allows you to see those rows of a sheet which are not visible on the screen.
- **Select all Button** : This is the first place where the row numbers and column headings meet.
- **Sheet Tab** : Using this one can move from one sheet to other of the work book. By default an Excel workbook has three sheets and has its name displayed. The default name of these sheets are sheet 1, sheet 2 and sheet 3. These names can be changed and a new name can be assigned to it. This tab appears just above the Status Bar.

**Minimize, Maximize, Restore and Close Buttons** : There are two sets of Maximize, Minimize/Restore, and Close Buttons; one on the right hand corner of the title Bar which is corresponding to Excel Window and another set on the right hand corner of the Menu Bar which is corresponding to Excel workbook.

- **Minimize Button** : This is used for changing an Excel window/book into a button.

- **Maximize Button** : This is used for enlarging an Excel window/book after it has been minimised or Restored.
- **Restore Button** : This is used for changing an Excel window/book into its original size and adjusting the size of a window/book.
- **Close Button** : This is used to close the Excel window/book.

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### 1.5 Closing the Excel Work Book :

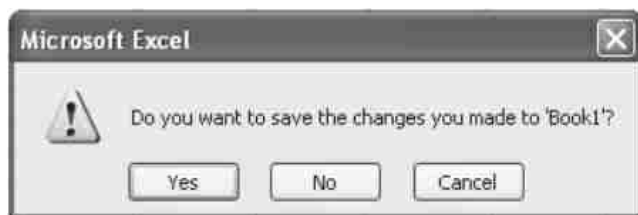
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There are two ways in closing the work book.

- (1) Closing the work book without saving it.
- (2) Closing the work book with saving it.

**(1) Closing the work book without saving it** : In this your work/latest update is not saved. To do this follow the steps mentioned.

- (i) Move the mouse pointer over the File option on Menu bar and click the left mouse button. A pull down menu gets displayed immediately.
- (ii) Inside this pull down menu move the mouse pointer to the close option and click the left mouse button. A message box gets displayed immediately asking you whether you want to save this sheet with three options Yes, No and Cancel. Move the mouse pointer over No and click the left mouse button this will close the sheet without saving it.



**Fig. 1.4**

**Note :**

- But at this point if you want to save the sheet you can select Yes option by moving the mouse pointer over it and clicking the left button. A menu appears, here select the drive and folder in which you want to save. Then give the file name and select Save option.
- If you don't want to save or close the sheet select Cancel option. This will take you back to the sheet.

**(2) Closing the work book with saving it** : In this your work/latest update is saved. To do this follow the steps mentioned below :

- (i) Move the mouse pointer over the file option on Menu bar and click the left mouse button. A pull down menu gets displayed immediately.
- (ii) Inside this pull down menu move the mouse pointer to the Save option and click the left mouse button. Then you will get a screen as shown in Fig. 1.5.

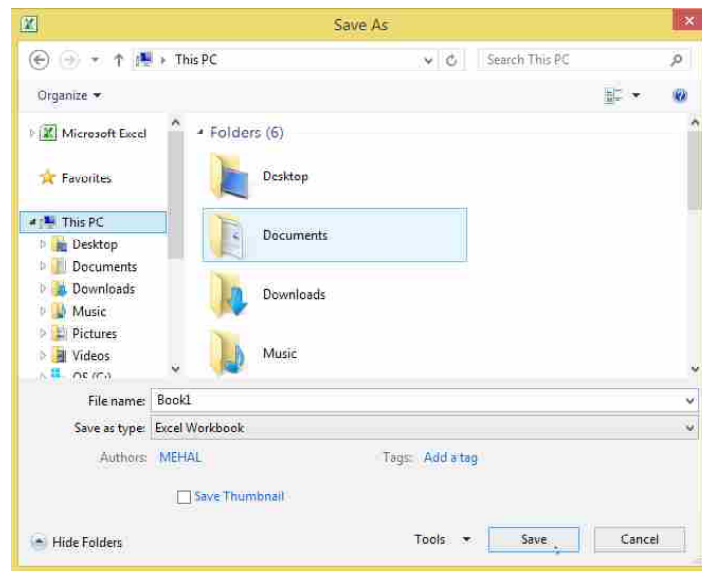


Fig. 1.5

here select the drive and folder in which you can see the file name and select Save option.

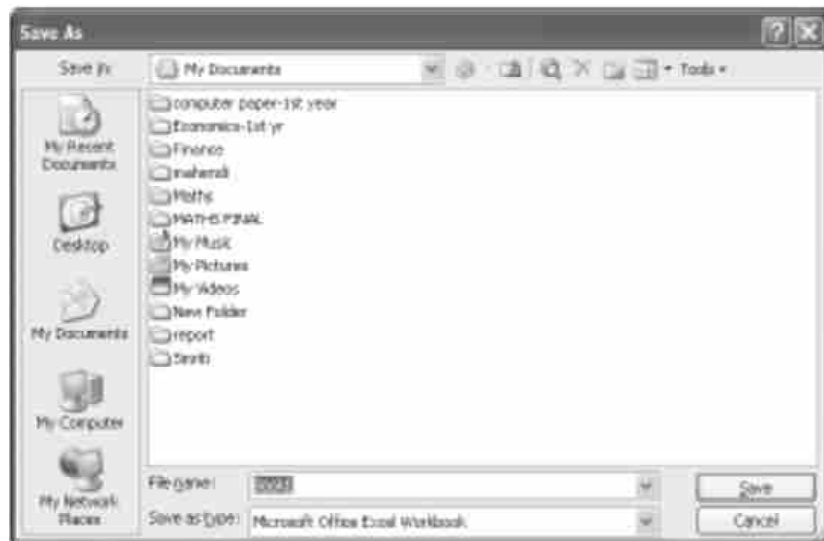


Fig. 1.6

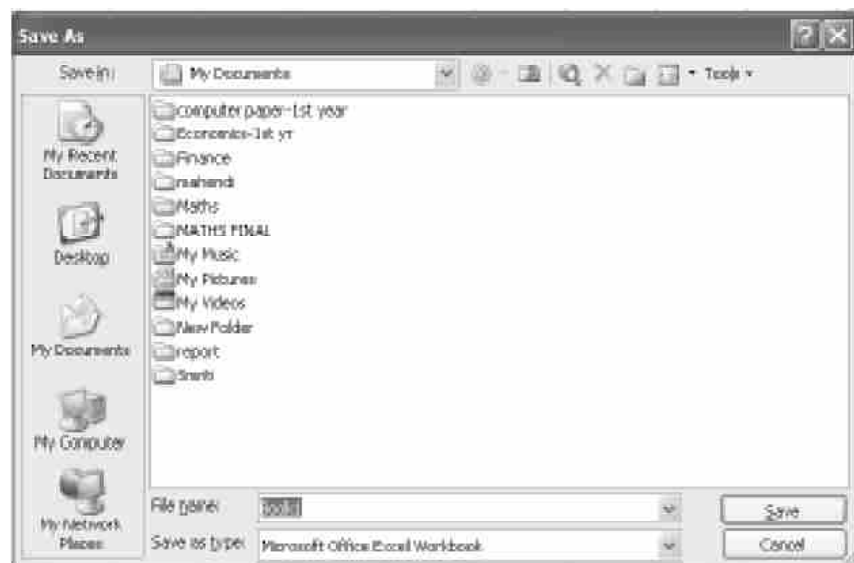


Fig. 1.7

**Note :** You can even use the Close button which is at the right hand corner of the Menu bar sheet to close the sheet. Again if the sheet is not saved earlier or latest update is not saved it will display the message as shown in **Fig. 1.4** and following the steps as explained above depending on your choice.

**Closing the Excel :** To close the Excel program following steps are required to follow:

- (i) Move the mouse pointer over the Close button which is at the right hand corner of the Title bar.
- (ii) Click the left button on the mouse.

## 1.6 Worksheets within Work Book :

Excel documents (files) are known as workbooks. Each workbook contains 3 Worksheets by default. Adding or deleting the sheets can change the number of sheets. Each sheet is named uniquely like Sheet 1, Sheet 2 etc. which is displayed in the sheet tab. A workbook can also contain chart sheets, which are named as Chart 1, Chart 2 etc. by default.

When Excel is loaded, it automatically opens a new workbook, named Book 1, (with an extension. XLS). This name is displayed on the title bar. The main part of Excel screen is the worksheet area – a grid of rows and columns. The worksheet contains 65536 rows and 256 columns.

**Navigate Worksheet :** To move any cell of any worksheet of an open workbook, the mouse can be used.

- (1) To scroll through different parts of the worksheet, drag the scroll box in the scroll bars or click on the arrow marks in the scroll bars.
- (2) To go to the different sheets in the workbook, click on the desired sheet name in the sheet tab.
- (3) To go to a desired cell, click inside the cell, a select Edit> go to type the desired cell address in the Reference box (for example D7) and click on OK OR
- (4) Click on the name box, type the desired cell address and press enter. To move from one cell to another, the key board can also be used.

## 1.7 Enter an Edit Data :

Any entry can be made in the active cell. Entries can be of 4 different types. They are :

- **Text :** Text in a cell can include any combination of letters, numbers and keyboard symbols. A cell can contain 3200 characters. If column with prevents a text string fitting visually in a cell, the

display extends over neighbouring cells. To store a number as a text entry, use apostrophe (?) as the first character.

- **Number** : Numbers include digits from 0 to 9 and some special characters like \$, %, +, -0, E etc. When a formatted number does not fit in a cell ##### is displayed.
- **Logical Values** : Logical values, TRUE or FALSE can be entered in the cells.
- **Formulas** : Formulas are entered into the cell to perform calculations. A formula begins with an equal sign (=) or plus symbol (+). After completing a formula entry, the result of formula will be displayed in the cell and the formula will be displayed in the formula bar.

**To make any Entry in the Cell :**

- Make the cell active (select the cell) on the cell or by pressing arrow key.
- Type the contents of the cell.
- Press enter or press the arrow keys or click on any other cell to complete the entry.

**To Edit the Cell Content :**

- Press F2 function key after selecting the cell of which you want to edit the contents or double click on that cell, correct the cell content and press enter.
- Click on the formula bar (whcih displays the active cell context), make the correction and Enter key.

**To Delete the Content of Cell :**

- Click on the cell which you want to delete and press delete key on the keyboard.

**Entering and Copying the Formula :** In the example (**Fig. 1.8**), you want to calculate the total price of each quantity and then the total price of all the quantity. That means calculate the total price of the pen you should have the quantity in cell address B<sub>2</sub>, C<sub>2</sub> to be multiplied and result to be placed in cell address D<sub>2</sub>. Similarly for the items pencial and pen box and the total of all the three items which will be placed at the cell address D<sub>5</sub>.



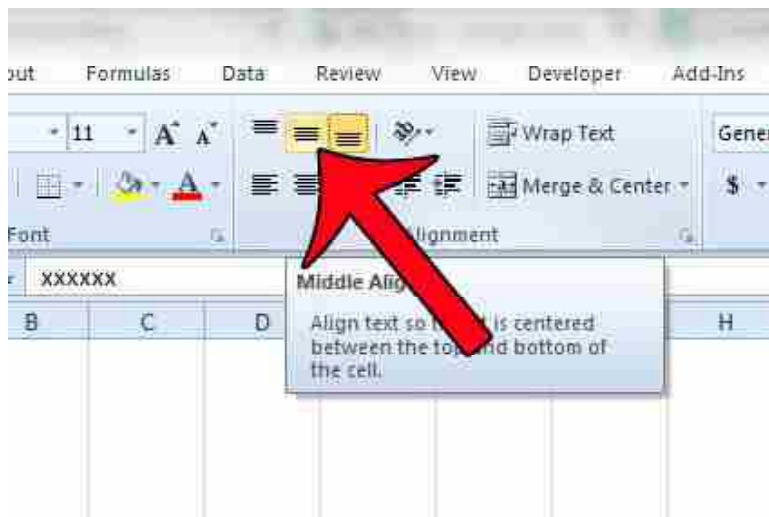


Fig. 1.8

A formula can also be entered by using the cell address. In the above example, the value is to be calculated by using the formula Quantity \* Rate.

To calculate the value of first item, pen, in the cell  $D_2$  type =  $B_2 * C_2$  or +  $B_2 * C_2$  (Can be small letters or capital letters). The screen looks as shown in Fig. 1.9.

	A	B	C	D	E
1	Item	Quantity	Price	Total	
2	Pen	50	12	=B2*C2	
3	Pencil	25	2		
4	Pen Box	50	5		
5	Total				

Fig. 1.9

Then press Enter key. The screen looks as shown in Fig. 1.10

	A	B	C	D	E
1	Item	Quantity	Price	Total	
2	Pen	50	12	600	
3	Pencil	25	2		
4	Pen Box	50	5		
5	Total				
6					

Fig. 1.10

**To Copy the Similar Formula :** If similar formula is to be entered for other cells, the formula can be copied. For example, if you want to calculate the total price of Pencil and Pen Box and want that to be appeared at cell address D<sub>3</sub> you should have B<sub>3</sub>\*C<sub>3</sub> and at cell address D<sub>4</sub> you should have B<sub>4</sub>\*C<sub>4</sub>. Thus instead of typing the formula in cell addresses D<sub>3</sub> and D<sub>4</sub>. To do this follow the steps given below:

- Move the mouse pointer to right hand below corner of the cell from which you want to copy the formula. In the above example at the right hand below corner of the cell D<sub>2</sub> you will get + (Fill Handle) symbol.
- Drag the symbol by keep pressing the left mouse button to the cell to which you want to copy the formula. In this case it is D<sub>3</sub> and D<sub>4</sub>. So drag the symbol down. Then release the left mouse button which you had kept down. The formula will be copied to the other cells with appropriate change in the cell address and the result will be displayed. In the above example in cell addresses D<sub>3</sub> and D<sub>4</sub>.
- Now click the mouse button you will get the result of the calculation. The figure is shown below :

	A	B	C	D	E
1	Item	Quantity	Price	Total	
2	Pen	50	12	600	
3	Pencil	25	2	50	
4	Pen Box	50	5	250	
5	Total				
6					

**Fig. 1.11**

Similarly to get the total price of all items and add the values at D<sub>2</sub>, D<sub>3</sub> and D<sub>4</sub>. If you want the result to be placed at cell address D<sub>5</sub> then move the mouse pointer to all addressed D<sub>5</sub> and click on the left mouse button. Now type = D<sub>2</sub> + D<sub>3</sub> + D<sub>4</sub> or + D<sub>2</sub> + D<sub>3</sub> + D<sub>4</sub> and press Enter key you will get the result shown on the screen, it is shown below :

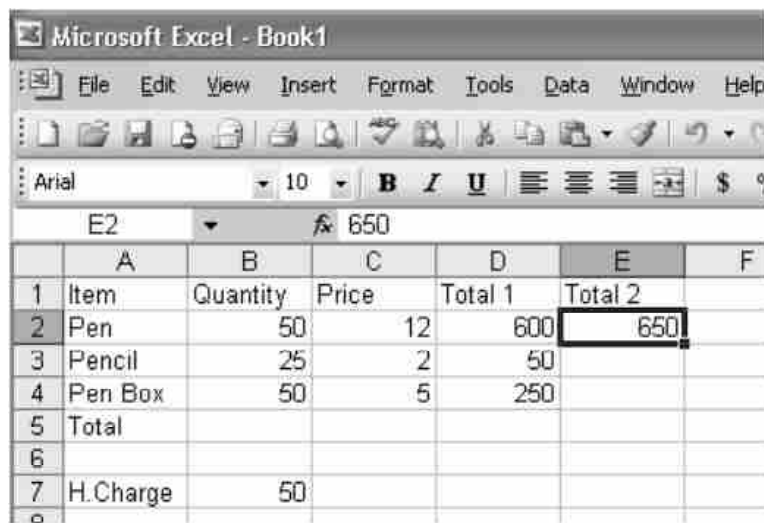
	A	B	C	D	E
1	Item	Quantity	Price	Total	
2	Pen	50	12	600	
3	Pencil	25	2	50	
4	Pen Box	50	5	250	
5	Total			900	
6					

**Fig. 1.12**

A formula can be edited the same way you edit the contents of the cell.

- **Formula Cell :** This is the cell which contains the formula. In the above example D2, D3, D4 and D5 are the formula cell.

**Relative (Reference) Cell Addressing :** If a formula with relative reference is copied, the cell references used in the formula will automatically change in the copied cell. For example, when the formula = B2\*C2 in the cell D2 is copied to D3 and D4. The formula will be = B3\*C3 in the cell D3 and = B4\*C4 in cell D4. Thus the calculations are done depending upon the relative position of the cell address from the formula cell.



	A	B	C	D	E	F
1	Item	Quantity	Price	Total 1	Total 2	
2	Pen	50	12	600	650	
3	Pencil	25	2	50		
4	Pen Box	50	5	250		
5	Total					
6						
7	H.Charge	50				

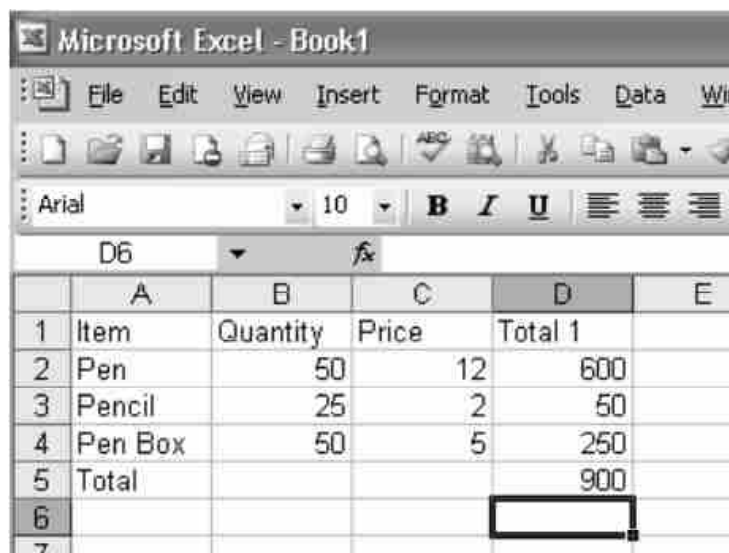
**Fig. 1.13**

Thus as shown in the above example the formula in D2 contains the multiplication of :

- The value at cell address B2 and C2 (two columns and one column before the formula cell).

Similarly the formula cell D3 contains the multiplication of :

- The value at cell address B3 and C3 (two columns and one column



	A	B	C	D	E
1	Item	Quantity	Price	Total 1	
2	Pen	50	12	600	
3	Pencil	25	2	50	
4	Pen Box	50	5	250	
5	Total			900	
6					
7					

**Fig. 1.14**

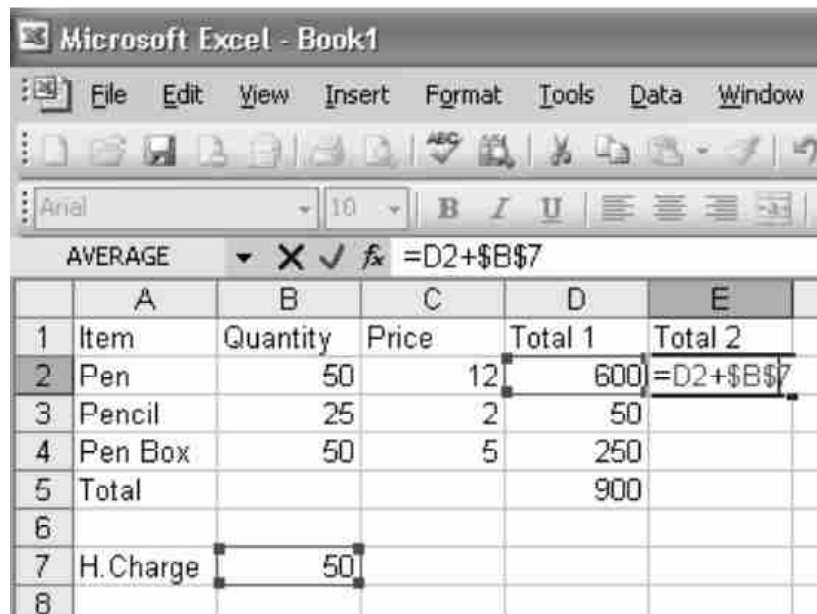
**Absolute Cell Addressing :** Consider the example shown below where if fixed value 50 as handling charges is required to be added to Total 1 and you will get Total 2. The formula in E2 as shown in Formula bar is = D2 + B7.

In cell E3 and E4 we want to have the similar formula as in E2 and if non the formula in formula cell E2 is copied to E3 and E4 as discussed earlier, E3 will have the formula as = D3 + B3 and E4 will have the formula as = D4 + B9 so we will get Total 2 corresponding to Pencil and Pen Box as shown below which is not correct. Since no value is present in cell B8 and B9 zero is added to the contents of cell D3 and D4.

To add the contents of cell B7 to the contents of D3 and D4 while copying the formula from the formula cell, you have to make an address constant or absolute so that regardless of wherever it is copied, it (B7) remains the same. This is called absolute addressing. It is done by typing a dollar sign (\$) before both the column name and row number in the formula cell as shown below.

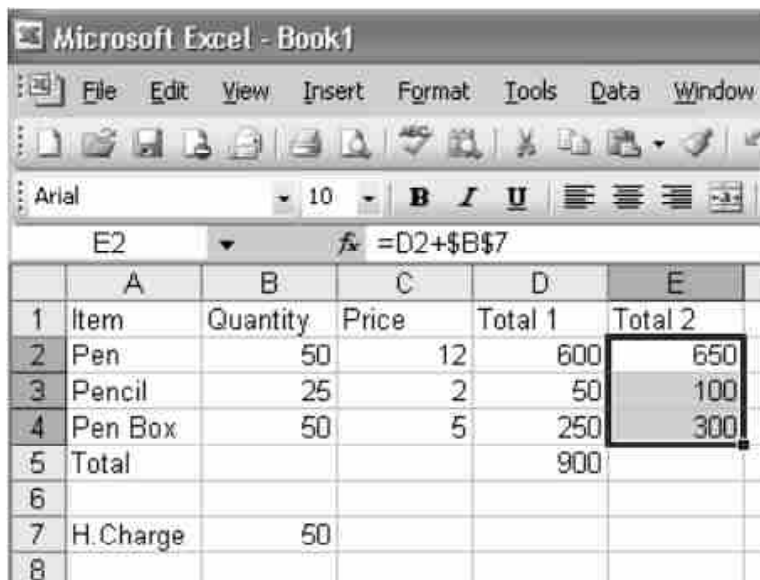
\$ Column name \$ Row number.

Thus to change the contents formula cell E2, double click at the cell address E2 and change the formula to D2 + \$B\$7, then copy the formula to cell E3 and E4. The **Fig. 1.15** shows the changed formula and the **Fig. 1.16** shows the result after copying the formula cell.



	A	B	C	D	E
1	Item	Quantity	Price	Total 1	Total 2
2	Pen	50	12	600	=D2+\$B\$7
3	Pencil	25	2	50	
4	Pen Box	50	5	250	
5	Total			900	
6					
7	H.Charge	50			
8					

**Fig. 1.15**



	A	B	C	D	E
1	Item	Quantity	Price	Total 1	Total 2
2	Pen	50	12	600	650
3	Pencil	25	2	50	100
4	Pen Box	50	5	250	300
5	Total			900	
6					
7	H.Charge	50			
8					

Fig. 1.16

## 1.8 Saving and Creating the Work Book :

**Saving the Workbook :** Three method are there to save a new work book.

- (1) **Use of Save Button on the Standard Tool Bar :** Click the Save button which is there on the Standard Tool Bar and you will get the figure shown below. Here select the drive, folder and give the file name and then click on Save button.
- (2) **Use of File Option button on Menu Bar :**
  - (a) Click on the File option button of Menu Bar.
  - (b) Select Save from drop down menu.
  - (c) You will get a screen as shown in **Fig. 1.17**. Here select the drive, folder and give the file name and then click on Save button.

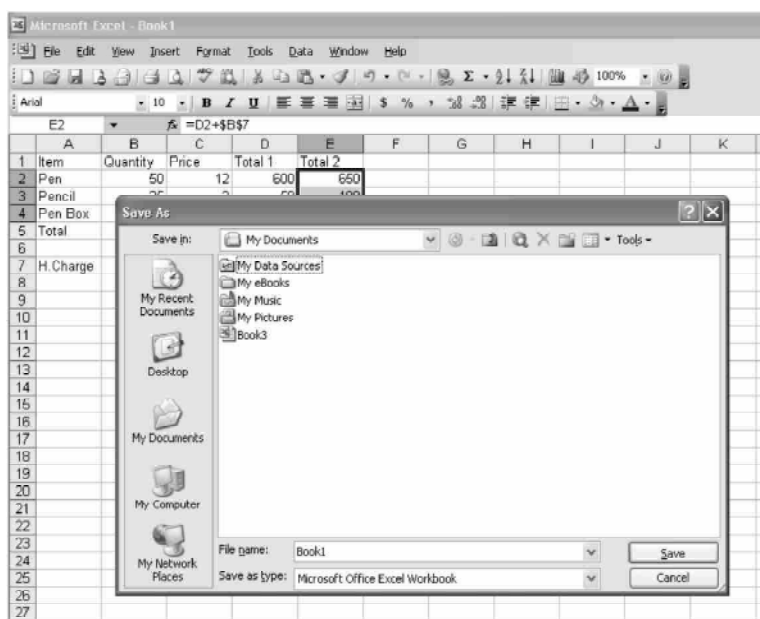


Fig. 1.17

**(3) Press Ctrl and S key Simultaneously. Now follow the step (c).**

**Note :** If you want to Cancel the saving process now you can click on the Cancel button.

Once you have saved a workbook, next time if you want to save you use any of the three methods discussed above but you need not give the name of the file as it is already given when it was saved for the first time.

Closing the workbook is discussed earlier. When workbook is saved all the three sheets of it also saved.

**Create a New Workbook :** Three methods are there to open a new workbook.

**(1) Use of New Button on Standard Tool Bar :** Click the New button which is there on the Standard Tool Bar and you will get the new workbook.

**(2) Use of File Option Button on Menu Bar :**

- (a) Click on the File option button of Menu Bar.
- (b) Select New from drop down menu.
- (c) You will get a screen
- (d) Click OK.

**(3) Press Ctrl and N Key simultaneously you will get a screen as shown in Fig. No. 1.18. Now follow the Steps (c) and (d).**

**Note :** If you don't want to open the new document at this stage click on the Cancel button so the new document will not be created.

**Opening of an Existing Workbook :** Three methods are there to open an existing workbook.

**(1) Use of Open Button on Standard Tool Bar :** Click the open button which is there on the Standard Tool Bar and you will get the new workbook.

**(2) Use of File Option Button on Menu Bar :**

- (a) Click on the File option button of Menu Bar.
- (b) Select Open from drop down menu.
- (c) You will get a screen as shown in Fig. 1.18.
- (d) Select the drive and folder in which you have the file.
- (e) Type the name of the file you want to open in the file name box.
- (f) Click open.

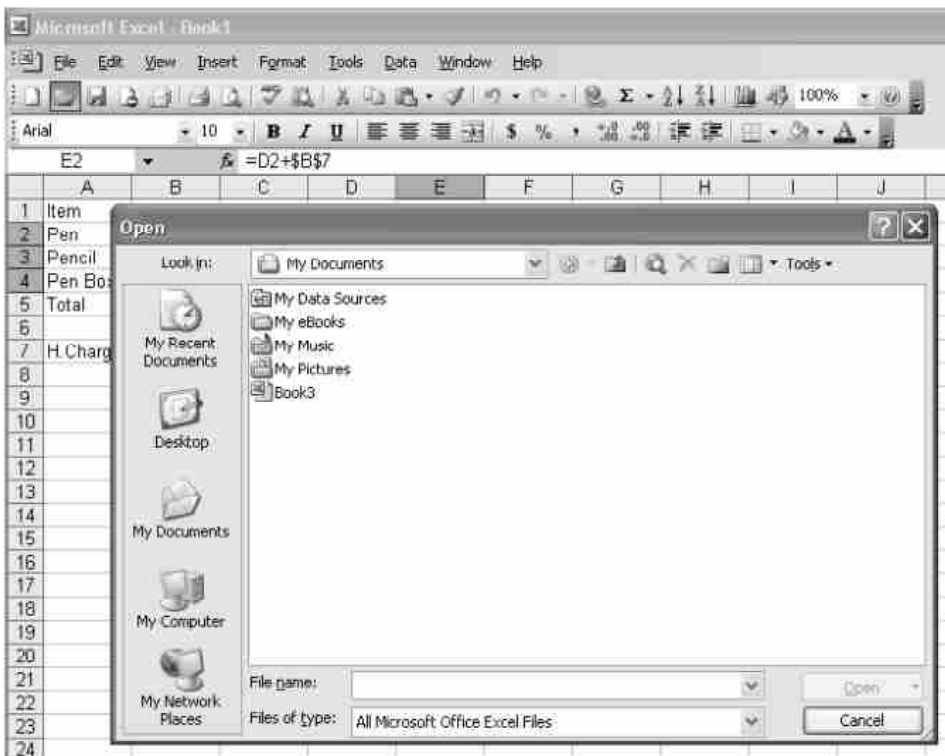


Fig. 1.18

- (3) Press Ctrl and O Key simultaneously you will get screen as shown in Fig. 1.19 then follow the steps (d), (e) and (f) as given above.

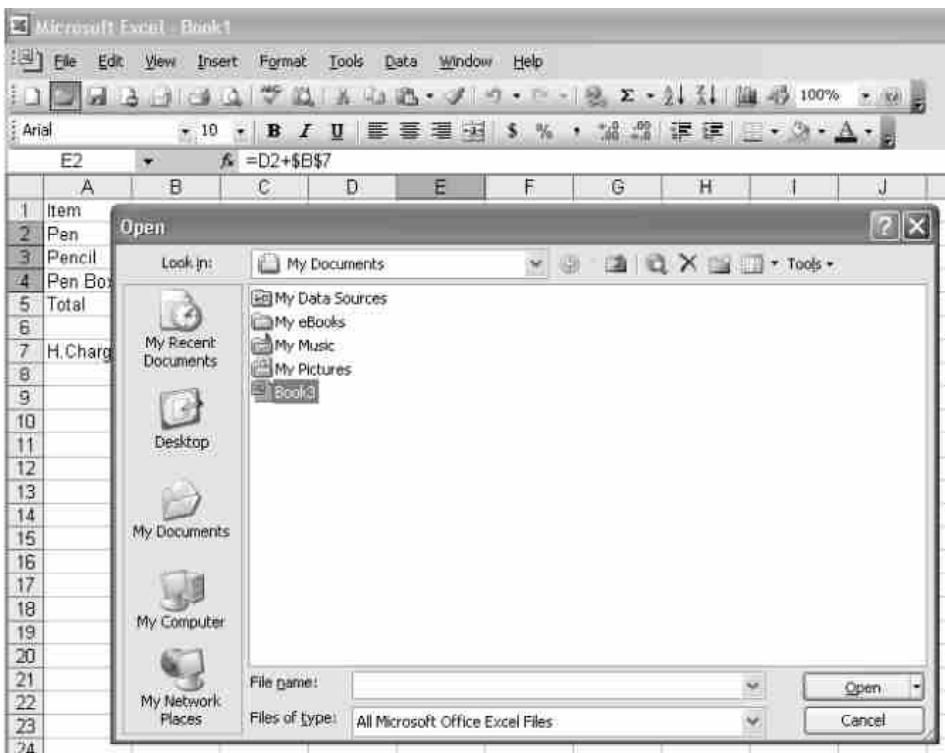


Fig. 1.19

The figure shows how to select the drive. It shows the selection of C drive. If you want to select any other drive move the mouse pointer over that drive and click the left mouse button.

Now to see the contents of selected drive you can double click left mouse button on the selected drive.

This figure shows the selection of the folder and the name of the file being typed in the file name box.

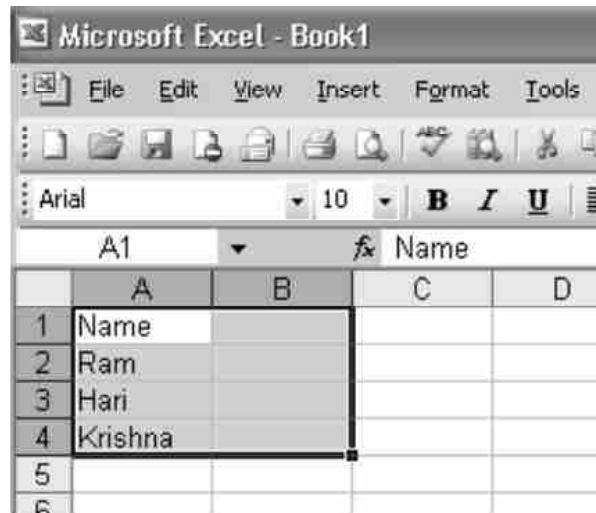
**Note :** If you don't want to open an existing document at this stage click on the Cancel button so the document will not opened.

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### **1.9 Cell Contents :**

---

**To Copy Cell Contents :** To copy the cell contents to other cells, select the range of cells you want to copy, by dragging the mouse by clicking the left mouse button down. The selection is shown in **Fig. 1.20**.



**Fig. 1.20**

To copy the contents to clip board (temporary location) you have following methods and select one among them.

- (1) Select Edit on the Menu bar then select copy.
- (2) Ctrl + C.
- (3) Click right mouse button, a menu pops up and select copy and click left mouse button.

Now move the mouse pointer to the position where you want to copy the contents of the selected cells and you can follow one of the following listed steps.

- (1) Select Edit from Menu Bar and click on Paste.
- (2) Press Ctrl and V key simultaneously.
- (3) Press right mouse button, a menu props and click on Paste option.

**Fig. 1.21** shows the copied cells.



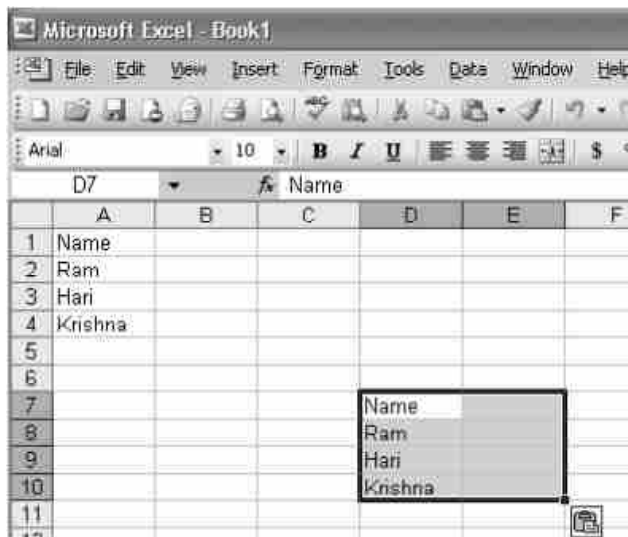


Fig. 1.21

Now to remove the highlighting of selected cells press Esc key.

**Moving the Cell Content :** To move the cell contents to other cells select the range of cells you want to move by dragging the mouse by clicking the left mouse button down. The selection is shown in Fig. 1.22.

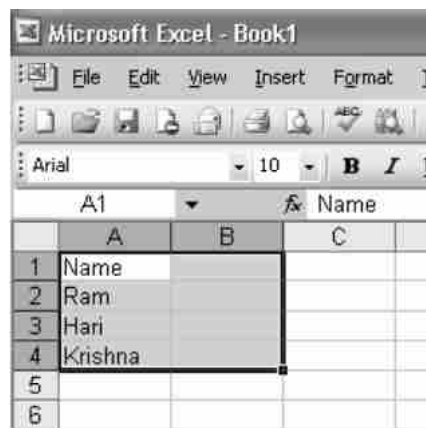


Fig. 1.22

To move the contents to clip board (temporary location) you have following methods and select one among them.

- (1) Select Edit on the Menu bar then select cut.
- (2) Ctrl + X
- (3) Click right mouse button, a menu pops up and select Cut and Click left mouse button.

**Fig. 1.22** shows the selected cell.

Now move the mouse pointer to the position where you want to move the contents of the selected cells and you can follow one of the following listed steps.

- (1) Select Edit from Menu Bar and Click on Paste.
- (2) Press Ctrl and V Key simultaneously.
- (3) Press right mouse button, a menu props and click on Paste button.

Following Fig. 1.23 shows the moved cells.

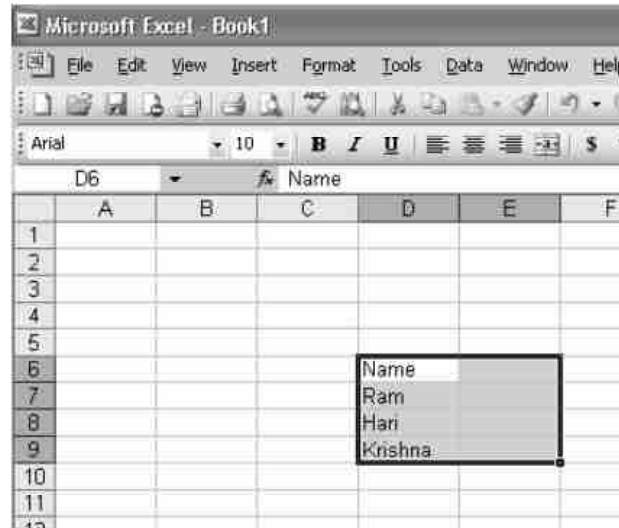


Fig. 1.23

The data is moved from the original position to the new position.

**Inserting Cells, Columns and Rows :** To insert cells, columns and rows, follow the steps mentioned below:

- (1) Click on the Insert button on the Menu bar then in the drop down menu click on cells. You will get a screen as shown in Fig. 1.24.

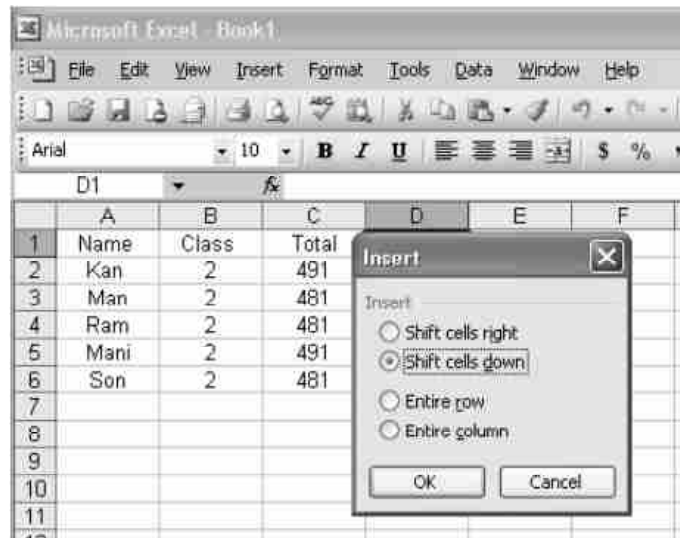


Fig. 1.24

- (2) In the pop up menu you will get four options. Depending on your requirement select the options.
  - (a) Shift cells right.
  - (b) Shift cells down.
  - (c) Entire row
  - (d) Entire column
- (a) **Shift Cells Right :** This will be a blank cell to the left of the selected cell. This is shown in Fig. 1.25.

The screenshot shows the Microsoft Excel interface with a table. The active cell is A2. The table data is as follows:

	A	B	C	D
1	Name	Class	Total	
2		Kan	2	491
3	Man	2	481	
4	Ram	2	481	
5	Mani	2	491	
6	Son	2	481	
7				
8				

Fig. 1.25

- (b) **Shift Cells Down** : This will add blank cell at the top of the selected cell. Considering the Fig. 1.24 and after executing this command you will get as shown in Fig. 1.26.

The screenshot shows the result of the 'Shift Cells Down' command. The data from row 3 of Fig. 1.25 has shifted down to row 4, and a blank cell has been added at the top of the selected cell (A2).

	A	B	C
1	Name	Class	Total
2		2	491
3	Kan	2	481
4	Man	2	481
5	Ram	2	491
6	Mani	2	481
7	Son		
8			

Fig. 1.26

- (c) **Entire Row** : This will add a blank row at the top of the selected row. Considering the Fig. 1.24 after executing the command you will get the figure as shown in Fig. 1.27.

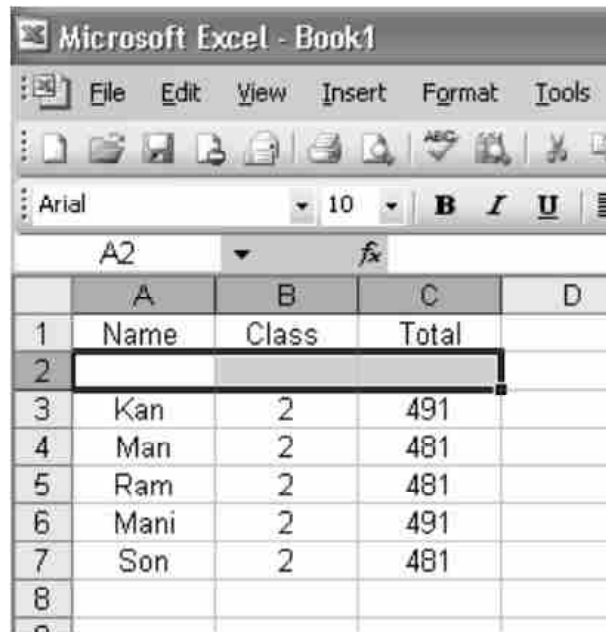


Fig. 1.27

- (d) **Entire Column** : This will add a blank column to the left of the selected column. Considering Fig. 1.24 after executing the command you will get the following Fig. 1.28.

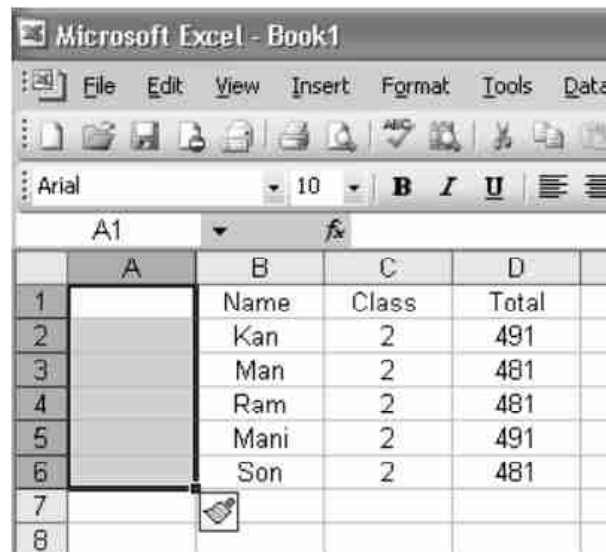


Fig. 1.28

**To insert one or more columns :**

- (a) **To insert one column** : Follow the steps listed below.
- Select the cell to left of which you want to insert the column.
  - Click on the insert button on the Menu bar.
  - Click on the column option from the drop down menu.
- (b) **To insert more than one columns** : Follow the steps listed below:
- Select the cell to left of which you want to insert the columns.
  - Block the number of columns to be inserted.
  - Click on the Insert Button on the Menu bar.
  - Click on the column option from the drop down menu.

**To insert one or more Rows :**

- (a) **To insert one row :** Follow the steps listed below :
- Select the cell to above which you want to insert the row.
  - Click on the Insert button on the Menu bar.
  - Click on the Row option from the drop down menu.
- (b) **To insert more than one Rows :** Follow the steps listed below :
- Select the cell to above which you want to insert the rows.
  - Block the number of rows to be inserted.
  - Click on the insert button on the Menu bar.
  - Click on the Row option from the drop down menu.

**Check Your Progress :**

1. Write true or false for the following statement
  - (i) MS Excel is a Windows based spreadsheet (Worksheet) package.
  - (ii) Name box – displays the cell content.
  - (iii) Formula Bar – Displays the address of the current cell.
  - (iv) Left Alignment helps in left justify the contents of cell which is inside the selected block.
  - (v) Insert tool can be used to insert cells, row, column in the worksheet.
2. Mention the function and example spreadsheet package.

**1.10 Let Us Sum Up :**

Excel document or files are known as workbook. Each workbook contain three worksheets by default. Adding or deleting the sheets can change the number of sheets. Each sheet is named uniquely as Sheet 1, Sheet 2 etc. A workbook can also contain chart sheets, which are named as Chart 1, Chart 2 etc. by default. When Excel is loaded, it automatically opens a new workbook named book 1. The Worksheet contains 65536 rows and 256 columns. The cell is a basic unit of the work sheet. Formulas are entered into the cell to perform calculations. A formula begins with an equal sign or a plus symbol. After completing a formula entry, the result will be displayed in the cell and the formula will be displayed in the formula bar. The default extension of an Excel workbook file is xls.

**1.11 Answers for Check Your Progress :**

1. (i) true, (ii) false, (iii) false, (iv) true, (v) true
2. The details of bank passbook, tax inventory, purchase and sales can also be maintained using a spreadsheet package. Lotus 123, MS Excel etc., are spreadsheet package.

---

**1.12 Glossary :**

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1. **Undo** : This is used to retain the and modifications made to a file.
2. **Redo** : This is used to reverse the last undo action performed on the file.
3. **Cell** : The intersection of a column and a row is called a cell.
4. **Row** : The horizontal group of cells is termed as a row.
5. **Column** : The vertical group of cells is termed as a column.

---

**1.13 Assignment :**

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1. What is a cell ? How the cell address is identified ?
2. Explain different components of MS Excel workbook. Discuss the concept of worksheets within a workbook.
3. Explain the different methods of saving the new Excel work book.

---

**1.14 Activities :**

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1. Create a worksheet with the following details Student Roll number, Student name, Student class, Student marks in 4 different subjects. Now calculate the total marks obtained by each student.

---

**1.15 Case Study :**

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1. Explain different parts of MS-Excel window.

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**1.16 Further Readings :**

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1. Parameswaram, R. (2010), 'Computer Applications in Business'. S. Chand & Company.
2. Rajaraman, V. (2013), 'Fundamentals of computer', Practice Hall India Learning Private Ltd.
3. Saxena, Sanjay & Chopra, P. (2006), 'Computer Application in Management', Vikash Publication House Pvt. Ltd.

**: UNIT STRUCTURE :**

- 2.0 Learning Objectives**
- 2.1 Introduction**
- 2.2 Ranges and Common Excel Functions**
- 2.3 Custom List**
- 2.4 Alignment**
- 2.5 Database**
- 2.6 Charts**
- 2.7 Let Us Sum Up**
- 2.8 Answers for Check Your Progress**
- 2.9 Glossary**
- 2.10 Assignment**
- 2.11 Activities**
- 2.12 Case Study**
- 2.13 Further Readings**

---

**2.0 Learning Objectives :**

**After going through this unit you will be able to :**

- learn the ranges and common excel functions
- discuss the Logical functions
- identify the Custom list
- learn Changing the Alignment, column width, height of the rows
- learn formatting the values in cells
- discuss Database, Filters, Validation
- discuss Pivot tables and Pivot Chart Report
- explain the process of making Charts

---

**2.1 Introduction :**

In the earlier examples of unit 6 (Block 1) we have seen that to multiply the values of three columns and then to add the values at three rows we have used the formulas. But it is fine if we want to do the calculations involving very less number of cells. But if we want to add the values of say 100 cells then writing the formula will be very lengthy. For example, we may have to write = C1 + C2 + C3 + .... + C100. Instead it will be easy to use functions to perform certain operations involving many cells. Functions are certain in built formulas and a

function begin with the = or + sign. Let us discuss the various concepts like ranges, custom list, charts etc. in the following sections.

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## **2.2 Ranges and Common Excel Functions :**

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**Ranges :** We have to make use of ranges for carrying at calculations through functions. So, a range is a sequence of cell addresses. It is specified in the following manner.

First cell address: Last cell address

or

First cell address ... Last cell address

### **Example for ranges :**

A1 : D1 means it includes cells A1, B1, C1, D1

B3 : D4 means it includes cells B3, B4, C3, C4, D3, D4.

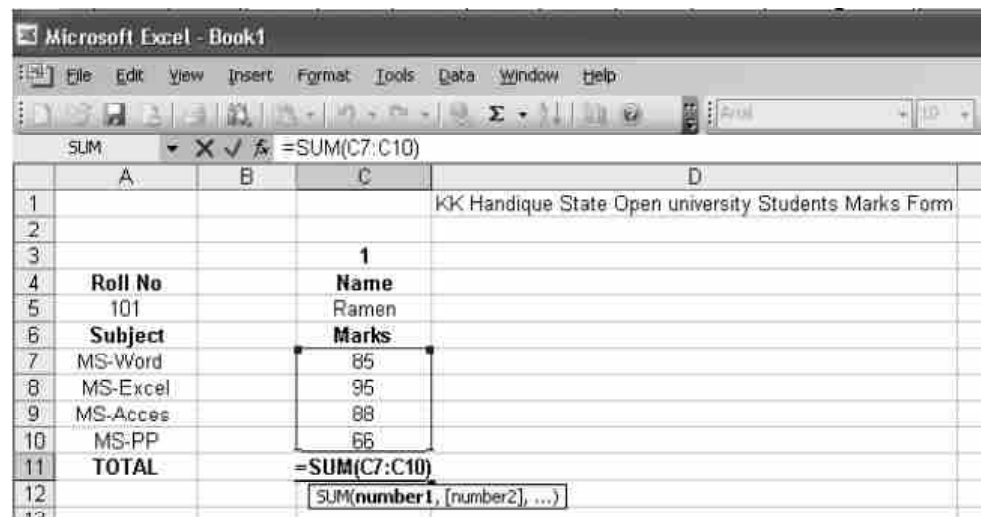
### **Common Excel Functions :**

- (1) **SUM ( ) :** It is a mathematical function used to add the numeric value in a range of cells. The format of the sum of function i.e. = SUM (Starting cell address : Ending cell address)

For example if we want to add the contents of cells C7, C8, C9 and C10 and store the result in cell C11, follow the steps given below.

- (i) Take the mouse pointer to cell addressed as C11
- (ii) Click the left mouse button (This is how we select cell).
- (iii) Now type = SUM (C7 : C10) and press enter.

Following figure shows the way in which we should enter the formula.



**Fig. 2.1**



Fig. 2.2 show the result of usage of SUM ( ) function.

	A	B	C	D
1				KK Handique State Open university Students Marks Form
2				
3			1	
4	<b>Roll No</b>		<b>Name</b>	
5	101		Ramen	
6	<b>Subject</b>		<b>Marks</b>	
7	MS-Word		85	
8	MS-Excel		95	
9	MS-Access		88	
10	MS-PP		66	
11	<b>TOTAL</b>		<b>334</b>	
12				
13				

Fig. 2.2

- (2) **Average ( )** : This function calculates and returns the average (arithmetic mean) of the numeric values in the given of cells. It is a statistical function.

For example, to calculate the average of the contents in cell C7 through C10 :

= AVERAGE (C7:C10) – Average of values in the range C7 through C10.

Steps mentioned to use the SUM ( ) function can be followed to use the average function :

AVERAGE ( ). Instead of SUM ( ) use AVERAGE ( ) and use the appropriate cell range.

Considering in Fig. 2.2, if this function is entered in the cell address and we will get the result as 83.5 in the cell address C12. It is the average of values 85, 95, 88, 66.

- (3) **Max ( )** : This function returns the largest value in the given range of cells. For example, to calculate the maximum value among the contents in cells C7 through C10.

= MAX (C7:C10) – Highest value in the range C7 to C10.

Steps mentioned to use the SUM ( ) function can be followed to use the AVERAGE ( ) function. Instead of SUM ( ) use MAX ( ) and use the appropriate cell range.

Considering the Fig. 2.2, if this function is entered in the cell address C13 and we will get maximum value of 85, 95, 88 and 66.

- (4) **Min ( )** : This function returns the lowest value in the given range of cells. For example to calculate the minimum value among the contents in cell C7. Through C10 = MIN (C7:C10) – lowest value in the range C7 to C10.

Steps mentioned to use the SUM ( ) function can be followed to use the MIN ( ) function. Instead of SUM ( ) use MIN ( ) and use the appropriate cell range.

Considering the **Fig. 2.3**, if this function is entered in the cell address C14 and we will get the result as 86 in cell address C14. It is the minimum of values 85, 95, 88 and 66.

	A	B	C	D
1				KK Handique State Open university Students Marks Form
2				
3			1	
4	Roll No		Name	
5	101		Ramen	
6	Subject		Marks	
7	MS-Word		85	
8	MS-Excel		95	
9	MS-Acces.		88	
10	MS-PP		66	
11	TOTAL		334	
12	Average		83.5	
13	Maximum		95	
14	Minimum		66	
15	Grade		A	
16	Count		8	
17				

**Fig. 2.3**

- (5) **Count ( )** : This function is used to count the number of cell adverse considering the data. It is statistical function.

= COUNT (range)

Steps mentioned to use the sum ( ) function can be followed to use the COUNT ( ) function. Instead of SUM ( ) use COUNT ( ) and use the appropriate cell range.

E.g.: = COUNT (C7: C15) Numeric cells in the range C7 to C15.

Considering the **Fig. 2.3**, if this function is entered in the cell address C16 and we will get the result as 8 in cell address C15. It is the number of cells in which we have numeric values. Consider the following **Fig. 2.3** in which the cell address is C15 we have A which is not numeral.

- (6) **Upper ( )** : This function is used to convert the text in a cell address to capital letters.

= UPPER (Cell address)

For example, to convert Name to NAME in the above shown example and to make appear this NAME in cell address D4 follow steps mentioned below:

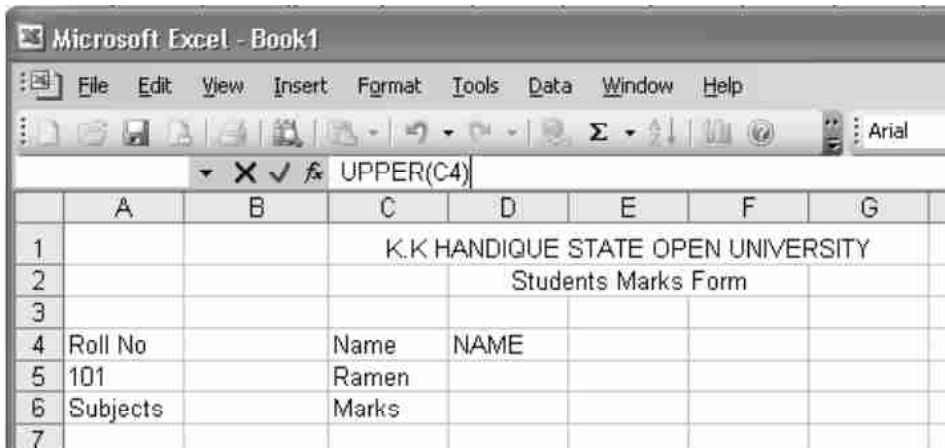
- (i) Move the mouse pointer to cell address where we want to get the converted text stay in D4 from C4.
- (ii) Click the left mouse button.

(iii) Type the function as given below

= UPPER (C4)

(iv) Press Enter key

As shown in the below **Fig. 2.3(A)** the text 'Name' is converted and shown as NAME.



**Fig. 2.3(A)**

(7) **Lower ( )** : This function is used to convert the text in a cell address to lower case letters.

= LOWER (Cell address)

For example, to convert 'NAME' to 'name' in the above shown example and to make appear.

This 'name' in cell address E5 follow steps mentioned below :

(i) Move the mouse pointer to cell address where we want to get the converted text say in E4 from D4.

(ii) Click the left mouse button.

(iii) Type the function as given below

= LOWER (E4)

(iv) Press Enter Key

(8) **Counts ( )** : Counts the number of cells that are not empty in the specified range.

(9) **Syntax** : = COUNT A (Range)

In this case, a value is any type of information, including empty text (" ") but not including empty cells.

For example in **Fig. 2.3** shown above if ,We have function = COUNT A (C3:C16) in cell C17 we will get the value as 13.

(10) **Count blank (c)** : Counts empty cells in a specified range of cells. Cells with zero values are not counted.

= COUNTBLANK (range)

For example, in fig. no. 31 shown above if we have function = COUNTBLANK (C3:C16) in cell C17 we will get the value as 1.

- (11) **Logication Functions** : Logical functions are used to see whether a condition is true or false or to check for multiple conditions.
- (12) **IF ( )** : The function is used to determine whether a condition is true or false. Value one is returned if the condition is true and different value is returned if the condition is false.

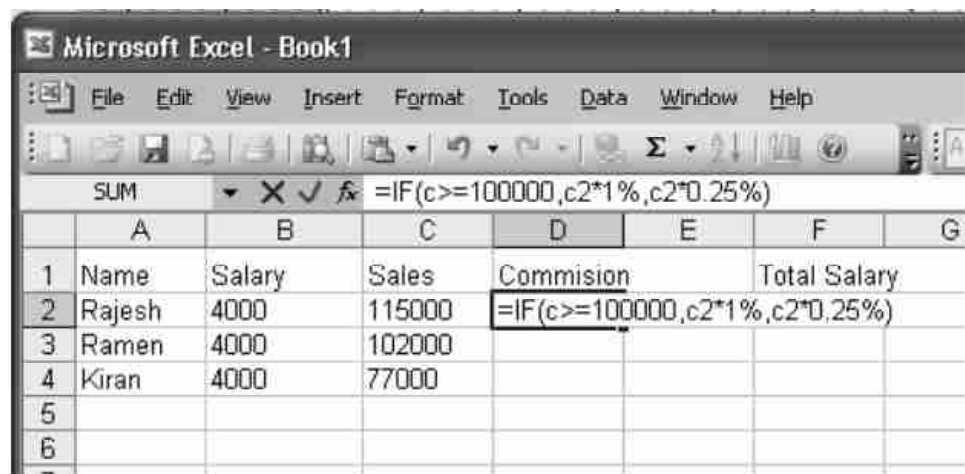
**Syntax** : = IF (Condition, true condition, false action) Consider an example in which the perks to the sales is given according to the following table :

If Sales >=1,00,000/ per month	1%
If Sales < 1,00,000/ per month	0.25%

Consider the following **Fig. 2.4** and commission is calculated and placed in cell D2 for employee Rajesh. Since commission is calculated according to the sales made by him and sales amount is stored in cell C2, type the IF ( ) function in D2 as shown below.  
 = IF (C2>=100000, C2\*1%, C2\*0.25%)

**The meaning of above IF ( )** : IF the value in cell C2 is greater than or equal to 100000 calculate the commission according to the formula C2 ((Value) \*1%).

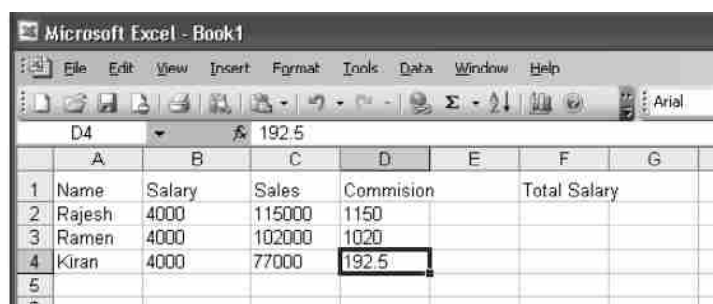
If the value in cell C2 is less than 100000 calculate the commission according to the formula C2 (Value) \*0.25%.



**Fig. 2.4**

**Fig. 2.5** shows the result after copying the IF ( ) to D3 and D4 cells, to calculate the commission for employees Ramesh and Kiran.

D4 = IF(C4>=100000, C4\*1%, C4\*0.25%)



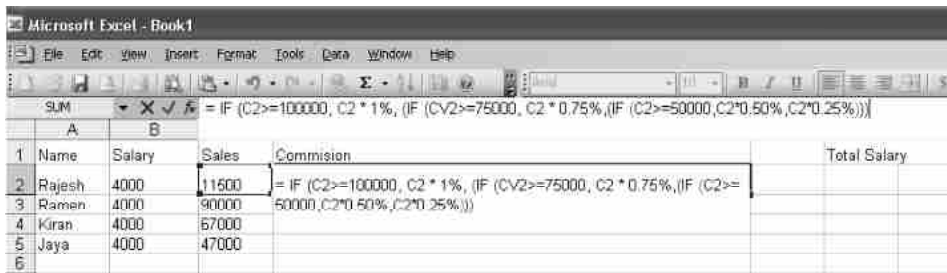
**Fig. 2.5**

Consider another example where the commission is calculated according to the following table

If Sales is $\geq 100000$	1%
If Sales $\geq 75000$ and if Sales $< 100000$	0.75%
If Sales $\geq 50000$ and if Sales $< 75000$	0.50%
If Sales $< 50000$	0.25%

The IF ( ) is written as shown below :

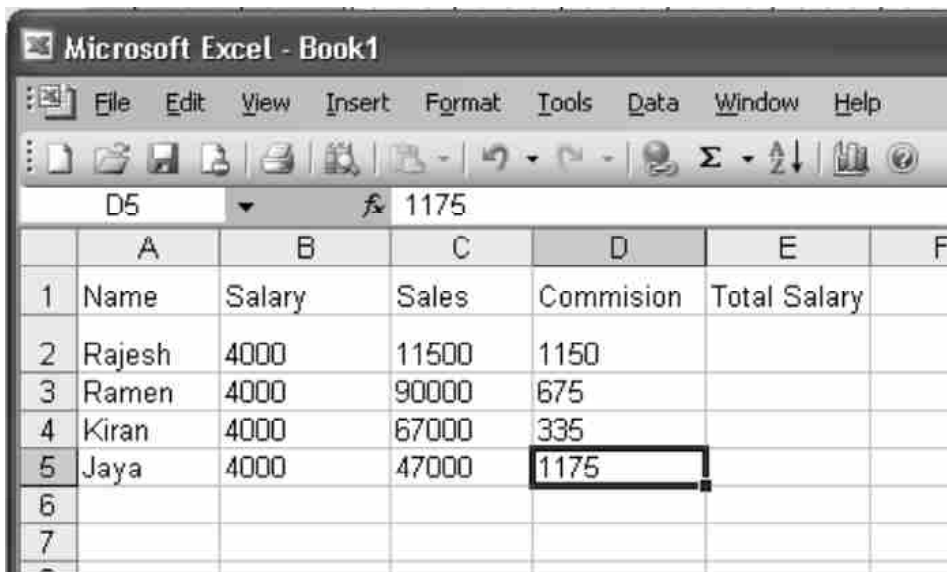
= IF (C2 $\geq$ 100000, C2 \* 1%, (IF (C2 $\geq$ 75000, C2 \* 0.75%, (IF (C2 $\geq$ 50000,C2\*0.50%,C2\*0.25%)))



	A	B	C	D	E
1	Name	Salary	Sales	Commision	Total Salary
2	Rajesh	4000	11500	= IF (C2 $\geq$ 100000, C2 * 1%, (IF (C2 $\geq$ 75000, C2 * 0.75%, (IF (C2 $\geq$ 50000,C2*0.50%,C2*0.25%)))	
3	Ramen	4000	90000		
4	Kiran	4000	67000		
5	Jaya	4000	47000		
6					

Fig. 2.6

After copying the formula to D3, D4 and D5 we will get the result as shown in Fig. 3.7.



	A	B	C	D	E	F
1	Name	Salary	Sales	Commision	Total Salary	
2	Rajesh	4000	11500	1150		
3	Ramen	4000	90000	675		
4	Kiran	4000	67000	335		
5	Jaya	4000	47000	1175		
6						
7						

Fig. 2.7

(13) **Sum if ( )** : SUMIF ( ) is used to total a range of numeric cells based on a condition.

**Syntax** : = SUMIF (range to check, criteria , range to total)

Range to check is the range of cells where the criteria is to be searched. Criteria are in the form of a number, expression, or text that defines the cells to be added. Range to total is a range of cells the number of which is to be added. The cells in range to total are summed only if their corresponding cells in range match the criteria.

Consider the following worksheet which gives the sales of different products for different months.

Following figure shows the calculation of total soap sales. In this, the range A2:A8 is checked to search for criteria "Soap" and the contents of E2:E8 is added when the criteria matched. So, criteria "Soap" matches for cells A1, A6 and A7 and the value in cells E2, E6 and E7 are added and the results is stored in cell E3.

	A	B	C	D	E	F
1	<b>Products</b>		<b>Month</b>		<b>Sales</b>	
2	Soap		March		15000	
3	Tooth Paste		February		10000	
4	Washing Powder		March		8000	
5	Chocolates		March		9000	
6	Soap		February		11000	
7	Soap		April		13000	
8	Tooth Paste		April		9000	
9						
10						
11						
12						
13	Soap Total					
14	Month Total					
15						
16						

**Fig. 2.8**

SUMIF =SUMIF(A2:A8,"Soap",E2:E8)

	A	B	C	D	E	F	G
1	<b>Products</b>		<b>Month</b>		<b>Sales</b>		
2	Soap						
3	Tooth Paste						
4	Washing Powder						
5	Chocolates						
6	Soap						
7	Soap						
8	Tooth Paste						
9							
10							
11							
12							
13	Soap						
14	Month						
15							
16							

**Function Arguments**

SUMIF

Range: A2:A8 = {"Soap";"Tooth Paste";"Washing Powder";"Chocolates";"Soap";"Soap";"Tooth Paste"}

Criteria: "Soap" = "Soap"

Sum\_range: E2:E8 = {15000;10000;8000;9000;11000;13000;9000}

= 39000

Adds the cells specified by a given condition or criteria.

Sum\_range are the actual cells to sum. If omitted, the cells in range are used.

Formula result = 39000

Help on this function

OK Cancel

**Fig. 2.9**

Fig. 2.10 shows the applying of SUMIF ( ) for total sales for the month of March.

	A	B	C	D	E	F	G
1	<b>Products</b>		<b>Month</b>		<b>Sales</b>		
2	Soap		March		15000		
3	Tooth Paste		February		10000		
4	Washing Powder		March		8000		
5	Chocolates		March		9000		
6	Soap		February		11000		
7	Soap		April		13000		
8	Tooth Paste		April		9000		
9							
10							
11							
12							
13	Soap Total				39000		
14	Month Total				=SUMIF(C2:8, "March", E2:E8)		
15							
16							

Fig. 2.10

Fig. 3.11 shows the addition sales which is above 9000.

	A	B	C	D	E	F	G
1	<b>Products</b>		<b>Months</b>		<b>Sales</b>		
2	Soap		March		15000		
3	Toothpaste		February		10000		
4	Washing powder		March		8000		
5	Chocolates		March		9000		
6	Soap		February		11000		
7	Soap		April		13000		
8	Toothpaste		April		9000		
9							
10							
11							
12							
13	Soap Total				39000		
14	Month Total						
15	SUM of Sales above 9000				=SUMIF(E2:E8, ">9000", E2:E8)		
16							

Fig. 2.11

Fig. 2.12 shows the result of all the SUMIF ( ) functions.

	A	B	C	D	E	F
1	<b>Products</b>		<b>Months</b>		<b>Sales</b>	
2	Soap		March		15000	
3	Toothpaste		February		10000	
4	Washing powder		March		8000	
5	Chocolates		March		9000	
6	Soap		February		11000	
7	Soap		April		13000	
8	Toothpaste		April		9000	
9						
10						
11						
12						
13	Soap Total				39000	
14	Month Total					
15	SUM of Sales above 9000				49000	
16						

Fig. 2.12

(14) **COUNT IF ( )** : This function gives the count of number of cells which satisfies the condition. All the above mentioned functions can be implemented with the help of Paste Function button which is on the Menu Bar.

Follow the steps mentioned below :

- (a) Select the cell in which we want to have the function.
- (b) Click the left mouse button on the Paste function button which is on the standard tool bar. We will get the screen as shown in Fig. 2.13.

	A	B	C	D	E	F
1			KK Handique State Open university			
2			Students Marks Form			
3						
4	<b>Roll No</b>		<b>Name</b>			
5	101		Ramen			
6	<b>Subject</b>		<b>Marks</b>			
7	MS-Word		85			
8	MS-Excel		95			
9	MS-Acces		88			
10	MS-PP		86			
11	<b>TOTAL</b>		<b>354</b>			
12	Average					
13	Maximum		95			
14	Minimum		85			
15	Grade		A+			
16	Count		7			
17						

Fig. 2.13



- (c) Select the function which we want to implement say Average ( )
- (d) We will get the screen as shown in Fig. 2.14. Here select the range of which we want to find the Average ( ) say C7:C10.

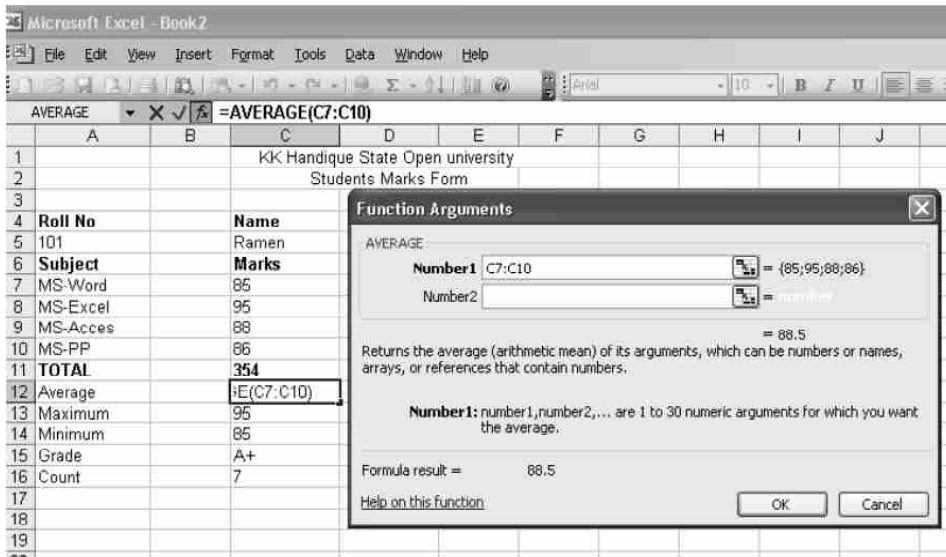


Fig. 2.14

- (15) **Auto SUM** : This is used to total a range of numeric cells. This icon is available in Standard tool bar. To use this icon, select the numeric cells of which we want to find the sum and click on the auto sum icon.

The screenshot shows a Microsoft Excel spreadsheet with the following data:

	A	B	C	D	E	F
1	<b>Products</b>		<b>Month</b>		<b>Sales</b>	
2	Soap		March		15000	
3	Tooth paste		February		10000	
4	Washing powder		March		8000	
5	Chocolate		March		9000	
6	Soap		February		11000	
7	Soap		April		13000	
8	Tooth paste		April		9000	
9						
10						
11						
12						
13	Soap total				39000	
14	Month total				49000	
15	SUM of Sales above 9000					
16						
17						
18						

Fig. 2.15

**(16) Auto Fill :** The auto fill feature of MS Excel will save data entry time by expanding series of numbers, days of week, different months, etc. from a given cell to adjacent ones. This is achieved using fill handle.

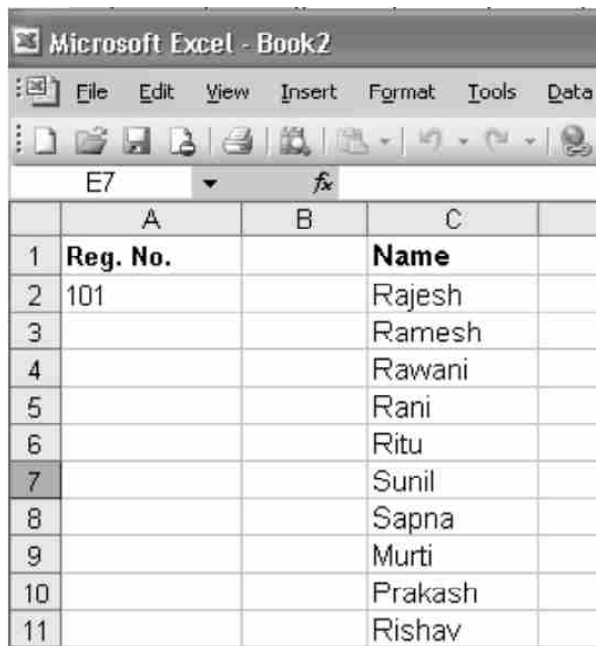
- (a) To generate the serial numbers 1, 2, 3, 4 with the increment 1, type 1 in any cell and Ctrl + Drag the fill handle down or right, this will increase the number by 1 in each cell and Ctrl + Drag the fill handle up or left will reduce the number by 1 in each cell. Instead of 1, any other starting number can also be entered. As we drag the fill handle, the number which will appear in the cell will be displayed near the fill handle for our reference.
- (b) To generate the serial numbers with the increment or decrement other than 1, type the first 2 numbers; block those 2 cells and the drag the fill handle. To generate 5, 10, 15, 20 one below the other, type 5 in any cell, in the next cell type 10, block those 2 cells and Drag the fill handle down. We can also generate the numbers in descending order by typing 100, 95 in different cells.
- (c) Text can be entered with the number. To generate F1, F2, F3 ... type F1 in any cell and drag the fill handle.
- (d) We can also generate the week day names like Sunday, Monday etc. and we can generate the month days from January to December.

If we are required to fill a range of cells with repeating values or sequence of values, it is possible to achieve this using Excel feature easily.

If the students are allotted the registered numbers and if the institution has say 800 students then instead of typing the registered number for each student it is easy to use auto fill features.

Consider the example given below in which the starting Reg. No. is 101 and the next should be 102, 103 and so on. So instead of typing the numbers to use the auto fill feature follow the steps given below :

- (a) Select the cells in which the numbers are required to be filled as shown in **Fig. 2.16**.



	A	B	C
1	<b>Reg. No.</b>		<b>Name</b>
2	101		Rajesh
3			Ramesh
4			Rawani
5			Rani
6			Ritu
7			Sunil
8			Sapna
9			Murti
10			Prakash
11			Rishav

Fig. 2.16

- (b) Click the left mouse button on the Edit option of Menu Bar, a drop down menu appears.
- (c) Select Fill from that menu, a sub menu appears. Select series option from it, a menu as shown below appear :

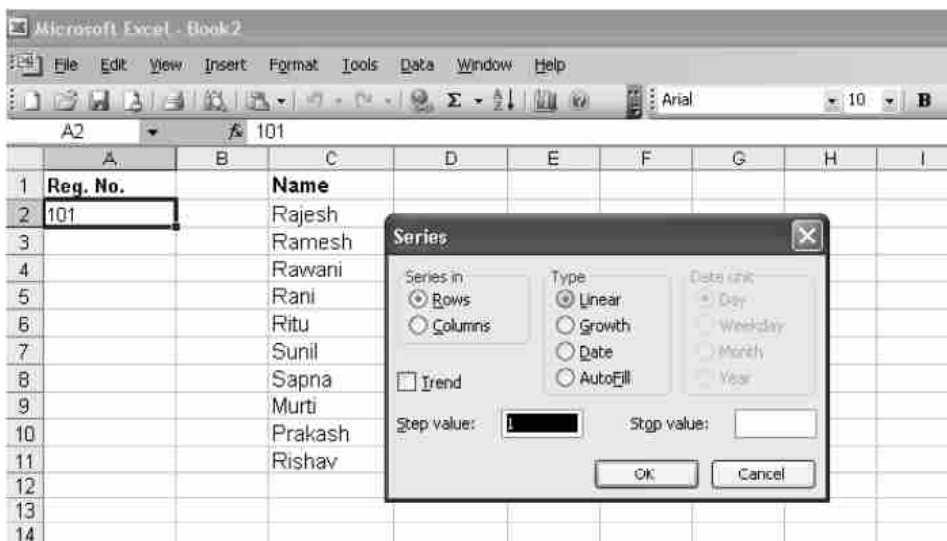


Fig. 2.17

- (d) Click on OK we will get this registered number filled against each name as shown in Fig. 2.18.

	A	B	C
1	<b>Reg. No.</b>		<b>Name</b>
2	101		Rajesh
3	102		Ramesh
4	103		Rawani
5	104		Rani
6	105		Ritu
7	106		Sunil
8	107		Sapna
9	108		Murti
10	109		Prakash
11	110		Rishav

**Fig. 2.18**

**Note following points regarding auto fill feature :**

- (1) To generate the serial number with the decrement use step equal to -1. If we want to generate the series as say 101, 99, 97... Then use the step value accordingly. In this case it is - 2.
- (2) To generate the serial numbers in increment order and as say 101, 104, 107 ... then use step as 3. We can use starting number as any value.
- (3) We can also generate the week day names like Sunday, Monday... etc. and we can generate the month days from January to December.

### **2.3 Custom List :**

A custom list is a collection of some commonly used words, which can be reproduced by dragging fill handle. For example, a company deals in different products and the names of this is used in many places in a worksheet or in different worksheets. This is used to some data entry time.

Consider the following example shown in Fig: 3.19. The list of the products is used in different worksheets. To do that, we have to create the custom list first.

	A	B	C	D	E	F
1	<b>Products</b>		<b>Month</b>		<b>Sales</b>	
2	Soap		March		15000	
3	Tooth paste		February		10000	
4	Washing powder		March		8000	
5	Chocolate		March		9000	
6						
7	Total				42000	
8						

**Fig. 2.19**

Follow the below mentioned steps to create the custom list.

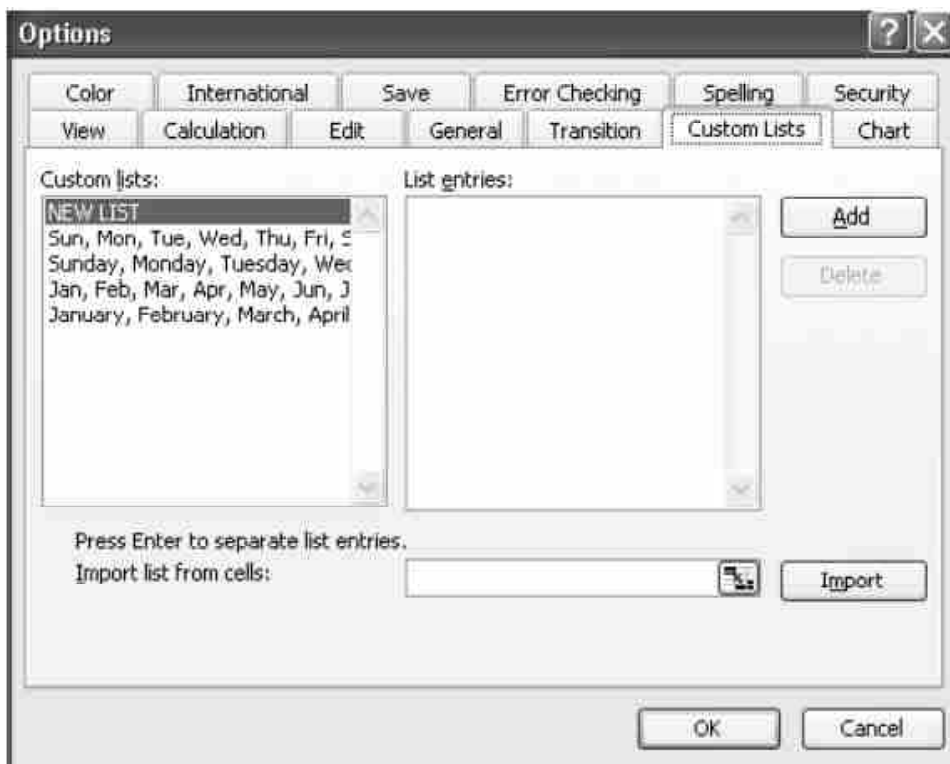
- (1) Select the list of which we want create the list as shown in **Fig. 2.20**.



	A	B	C	D	E
1	<b>Products</b>		<b>Month</b>		<b>Sales</b>
2	Soap		March		15000
3	Tooth paste		February		10000
4	Washing powder		March		8000
5	Chocolate		March		9000
6					
7	Total				42000
8					

**Fig. 2.20**

- (2) Click on to Tools option on the Menu Bar. From the drop down menu select options. We will get the menu as shown in **Fig. 2.21**.
- (3) Select custom list if it is not selected, in the **Fig. 2.21**, it is selected.
- (4) Click on Import option, it shows the cell address from where the list is to be imported. We can edit this list by clicking on to it. Now the list is brought to the custom lists. This is shown in **Fig. 2.22**.



**Fig. 2.21**

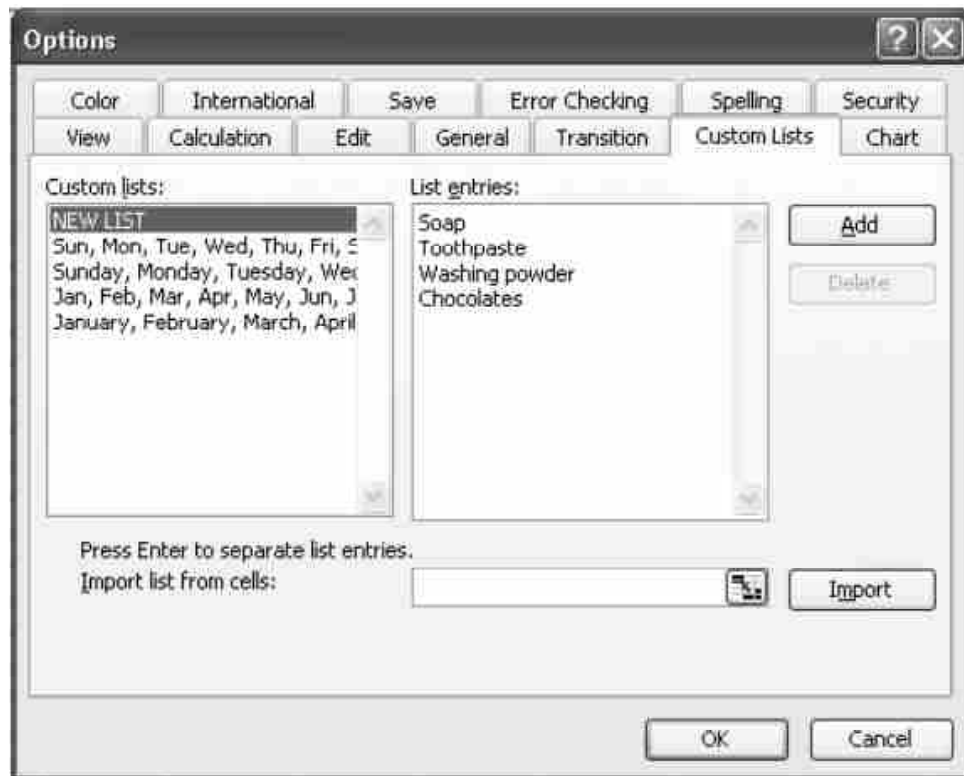


Fig. 2.22

- (5) Now click on to OK. Our list is added to the Custom list. We can edit this before clicking on to OK or later.

If we want to edit the list later, go to custom list menu and select the list we want to edit. We will get that list in the 'List entries' box, now click in that box and edit the entries as we like.

Now if we want to have this list in some other worksheet we can use it by following the steps given below :

- (1) Type the first value or any one of the values from the list into a cell.
- (2) Drag the fill handle.

**Sheet Layout :** Appearance of text or numbers in a cell can be changed to suit our requirement with the features provided by Excel.

---

## 2.4 Alignment :

---

The data at a particular cell can be aligned to Left or Right or Center of the cell. By default the text is aligned at the left hand side of the cell.

This can be achieved by following the steps given below :

- (1) Select a cell or group of cells of which we want to change the alignment of data in them.
- (2) Select the Alignment buttons which are available at the formatting tool bar depending on our requirement.

Three buttons are there to align the data :

- (a) **Align Right** : This will align the data in the selected cell to the right hand side of the cell.
- (b) **Align Left** : This will align the data in the selected cell to the left hand side of the cell.
- (c) **Align Center** : This will align the data in the selected cell to the center of the cell.

**Consider the following example** : To align the contents of the group of cells for left hand side of the cell:

- (1) Select the group of cells as shown below.
- (2) Then click to the left mouse button on Align Left button which is on the Formatting toolbar.
- (3) The contents in the selected cells aligned to left as shown in the **Fig. 2.23**. **Fig. 2.23(A)** shows the selection of cells of which the alignment is required to be made.

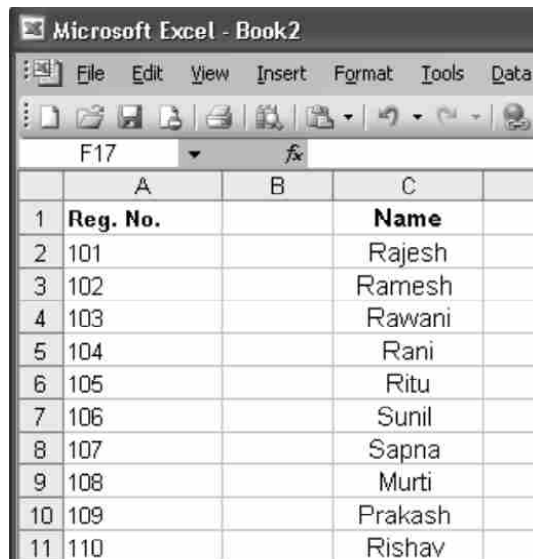
Following Figure shows the alignment of data in cells A2 to A11 to right hand side of the cell.

Similarly alignment can be made to the cells containing text. Let us consider an example in which cell containing text to be aligned to center.

Follow the steps given below :

- (1) Select the group of cells as shown below.
- (2) Then click the left mouse button on Align center button which is on the Formatting toolbar.
- (3) The contents of the selected cells aligned to center of the selected cells.

**Fig. 2.23**

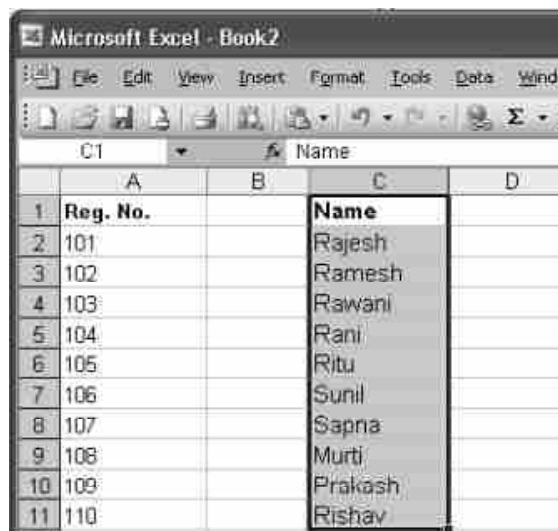


The screenshot shows a Microsoft Excel window titled 'Microsoft Excel - Book2'. The menu bar includes File, Edit, View, Insert, Format, Tools, and Data. The active cell is F17. The spreadsheet contains a table with the following data:

	A	B	C
1	<b>Reg. No.</b>		<b>Name</b>
2	101		Rajesh
3	102		Ramesh
4	103		Rawani
5	104		Rani
6	105		Ritu
7	106		Sunil
8	107		Sapna
9	108		Murti
10	109		Prakash
11	110		Rishav

Fig. 2.23(A)

Fig. 2.24 show the selection of cell :

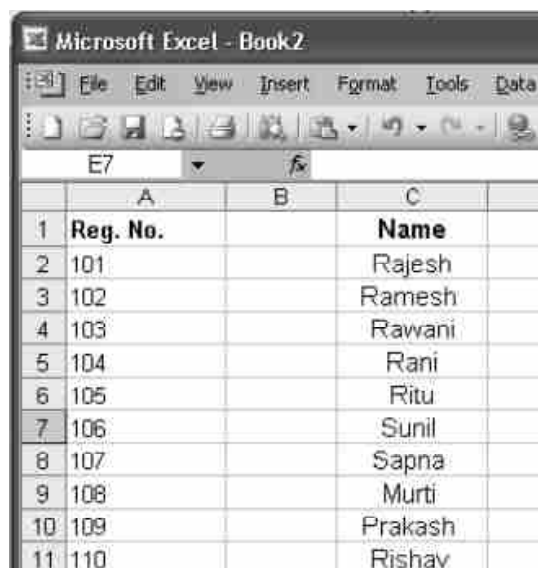


The screenshot shows the same Microsoft Excel window. The active cell is C1, and the name bar shows 'Name'. The 'Name' column (C1 to C11) is selected, indicated by a grey background.

	A	B	C	D
1	<b>Reg. No.</b>		<b>Name</b>	
2	101		Rajesh	
3	102		Ramesh	
4	103		Rawani	
5	104		Rani	
6	105		Ritu	
7	106		Sunil	
8	107		Sapna	
9	108		Murti	
10	109		Prakash	
11	110		Rishav	

Fig. 2.24

Figure shows in cell C1 to C11 the contents are aligned to Center.



The screenshot shows the same Microsoft Excel window. The active cell is E7. The 'Name' column (C1 to C11) now has centered text.

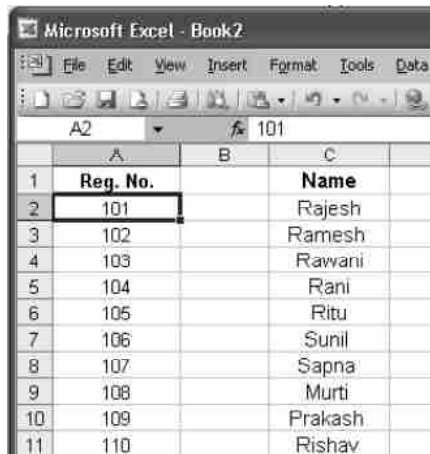
	A	B	C
1	<b>Reg. No.</b>		<b>Name</b>
2	101		Rajesh
3	102		Ramesh
4	103		Rawani
5	104		Rani
6	105		Ritu
7	106		Sunil
8	107		Sapna
9	108		Murti
10	109		Prakash
11	110		Rishav

Fig. 2.25



Changing the alignment in a cell or group of cells by an angle, can be achieved by following the steps given below :

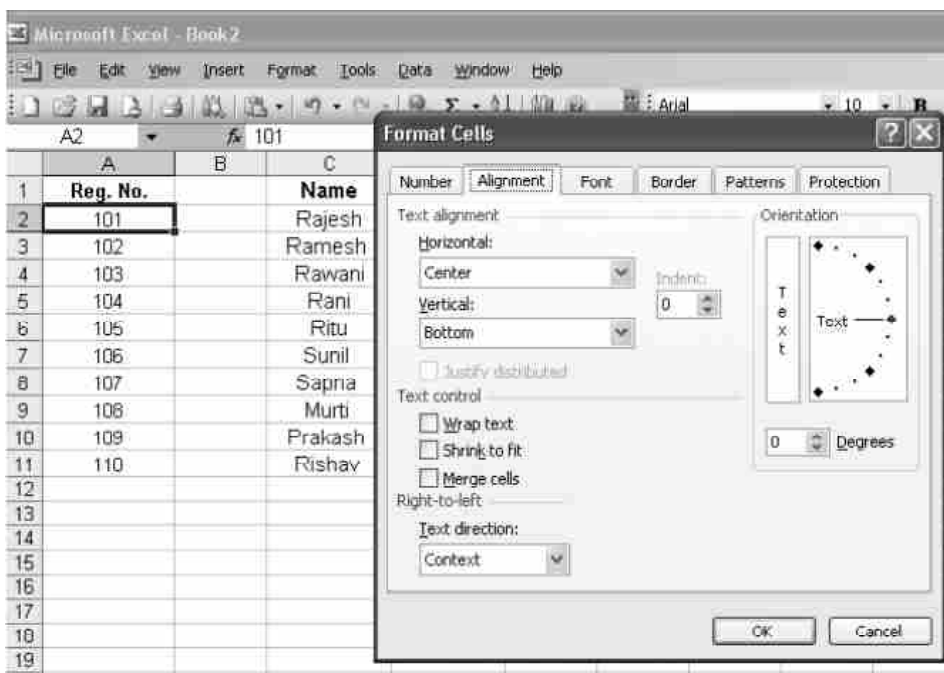
- (1) Select the group of cells as shown in **Fig. 2.26**.



	A	B	C
1	<b>Reg. No.</b>		<b>Name</b>
2	101		Rajesh
3	102		Ramesh
4	103		Rawani
5	104		Rani
6	105		Ritu
7	106		Sunil
8	107		Sapna
9	108		Murti
10	109		Prakash
11	110		Rishav

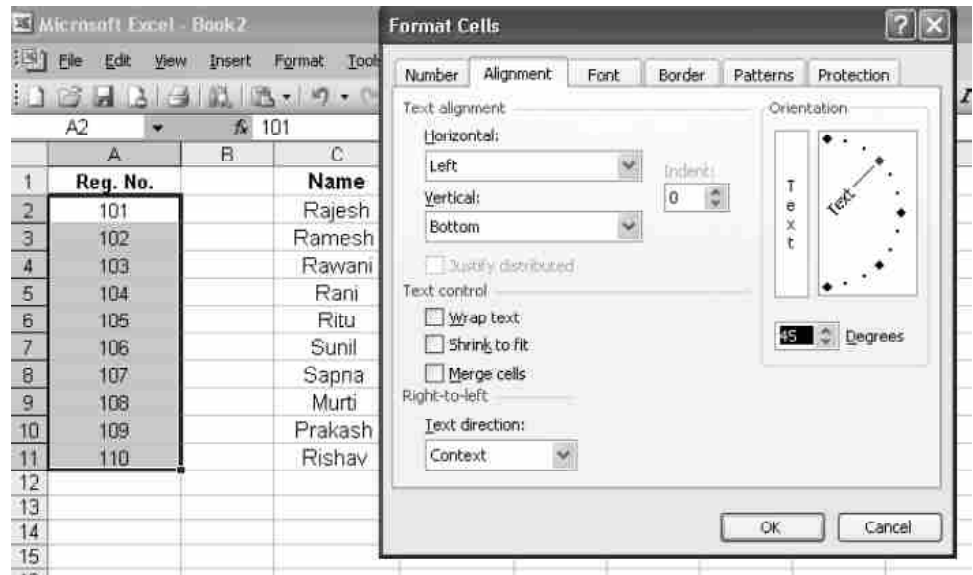
**Fig. 2.26**

- (2) Click on the format option of the Menu Bar. Select cells option from the drop down menu. We will get another menu titled format cells.
- (3) Select Alignment button from the format cells menu we will get the screen as shown in **Fig. 2.27**.



**Fig. 2.27**

- (4) Now select the degrees by which we want to align the text as shown in the following **Fig. 2.28**.



**Fig. 2.28**

(5) Press OK. We will get the screen as shown in **Fig. 2.29**.



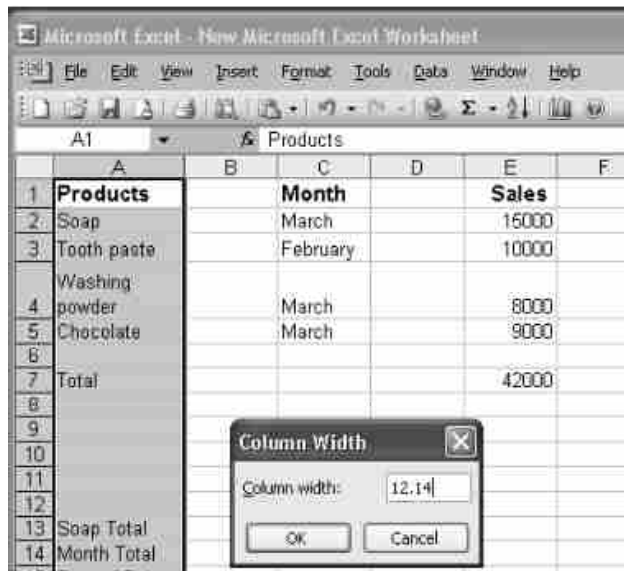
**Fig. 2.29**

**Changing the column width :** By default each cell can have 1 characters. However the width of each column can be changed and different columns in a sheet can have different width.

To change the column width follows the steps given below :

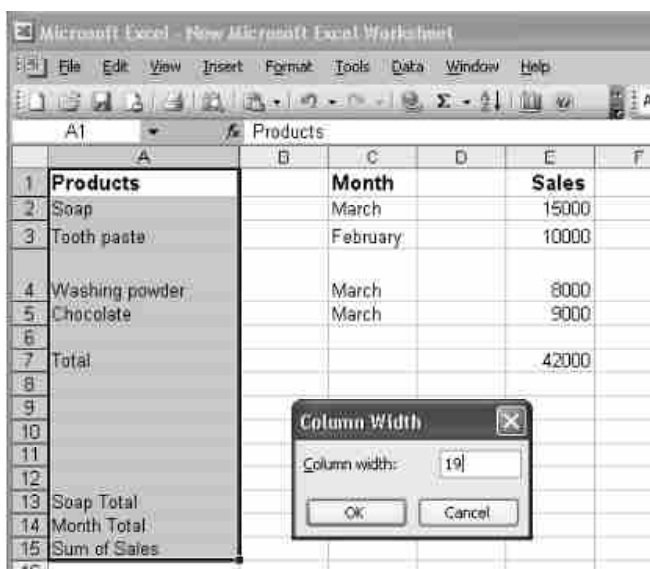
- (1) Select the column of which we want to change the width by placing the mouse pointer on the respective column.
- (2) Click on the format button which is on the Menu bar.

- (3) In the drop down menu move the mouse pointer over the column option. We will get a sequence, now select width option in that and we will get the screen as shown in **Fig. 2.30**.



**Fig. 2.30**

- (4) Take the mouse pointer to the box next to column width which is presently showing 12.14 and click. Now enter a number which will represent the width of the column. For example 19 is typed and will get the display as shown in **Fig. 2.31**.

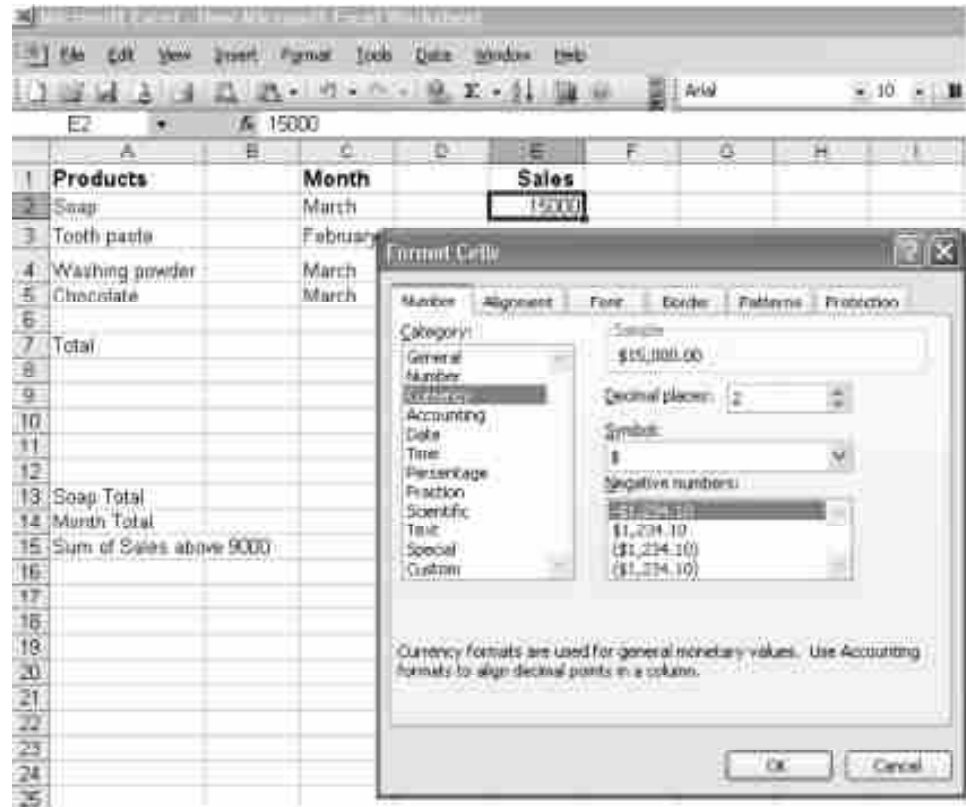


**Fig. 2.31**

**Note :** If we want to decrease the width of the column we can type a number which is less than 12.14

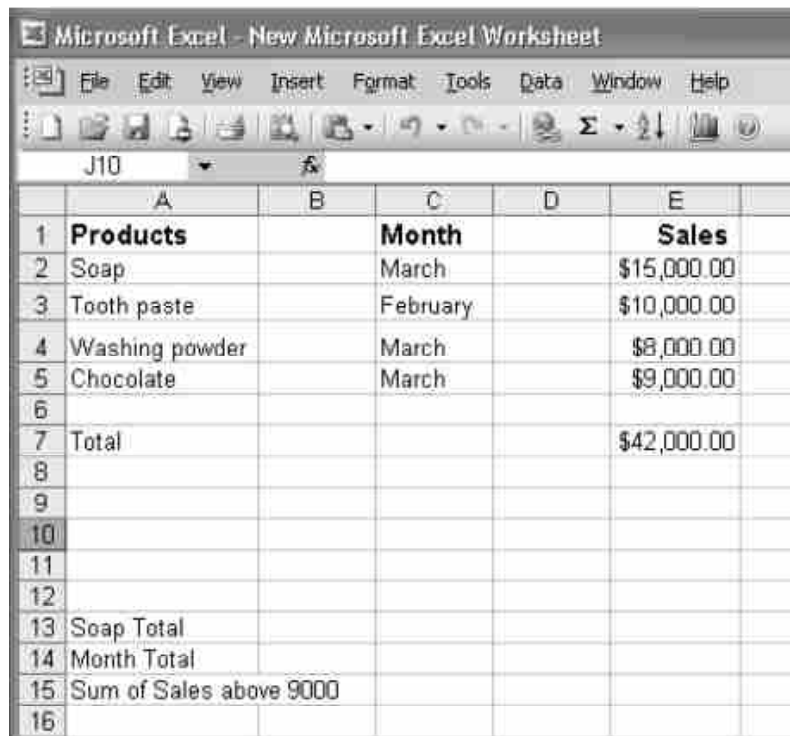
**Formatting :** Formatting is how information appears in cells; it does not alter the data in any way. To format a cell, we select it, and then apply the formatting we want. We can also format a range of cells. Cells and ranges can be formatted before or after data is entered.

Now select the required format say for example currency we will get the screen as shown in **Fig. 2.32**, here we can again select the required pattern of currency.



**Fig. 2.32**

Click on OK we will get the required format it also shown in **Fig. 2.33**



**Fig. 2.33**

**Bold, Italic and Underline** : Appearance like Bold, Italic and Underline can be given to the contents of a cell. Follow the steps given below :

- (1) Select the cell/cells of which we want to change the appearance.
- (2) Click on Bold, Italic and Underlined from the formatting bar depending **Fig. 2.34**

	A	B	C	D	E
1	<b><i>Products</i></b>		<b><i>Month</i></b>		<b><i>Sales</i></b>
2	Soap		March		15,000.00
3	Tooth paste		February		10,000.00
4	Washing powder		March		8,000.00
5	Chocolate		March		9,000.00
6					
7	<b>Total</b>				42,000.00
8					

**Fig. 2.34**

**Note** : We can apply more than one format to the contents of a given cell/cells as shown in **Fig. 2.34**.

## 2.5 Database :

An organized collection of data arranged in rows and columns is a database. It is also called an excel list. The columns are called fields, the column labels or headings are field names. Each row in the list below the field name is a record.

### **Auto Filter : Data > Filter > Auto Filter**

Auto filter helps us to display the records, which meet a particular condition. When this option is selected, drop down controls are placed next to each field name. On clicking on this drop down control, the contents of the field without repetition are displayed.

**Data Sort** : Sorting is arranging the records in a database, based on one or more fields (Columns). Data Sort brings the related records together, so that the records in the database are easily accessible. Records can be arranged in ascending or descending order.

The command is DATA > SORT.

**Advanced Filter** : Advanced Filter criteria can include multiple conditions applied in a single column, multiple criteria applied to multiple columns, and conditions created as the result of a formula. Consider the example shown in **Fig. 2.35**.

	A	B	C	D	E	F
1						
2						
3						
4	<b>Serial No.</b>		<b>Name</b>		<b>City</b>	<b>Phone No.</b>
5	1		Rajesh		Guwahati	2301461
6	2		Ramen		Guwahati	2311361
7	3		Gokul		Guwahati	2311456
8	4		Suvami		Guwahati	2301206
9	5		Ananth		Delhi	211119
10	6		Kalpna		Ranchi	311119
11	7		Muruli		Guwahati	2311467
12	8		Mukhuta		Bangalore	266675

Fig. 2.35

**Example of Advanced Filter Criteria :** Advanced filter criteria can include multiple conditions applied in a single column, multiple criteria applied to multiple columns, and conditions created as the result of a formula.

**Multiple Conditions in a Single Column :** If we have two or more conditions for a single column, type the criteria directly below each other in separate rows. For example the following criteria range displays the rows that contain "Raiesh", "Suvami" or "Ramen" in the Name column.

Serial No.	Name	City	Phone No.
1	Rajesh	Guwahati	2301461
2	Suvami	Guwahati	2311361
3	Ramen	Guwahati	2311456

**One Condition in Two or More Column :** To find data that meets one condition in two or more columns, enter all the criteria in the source row of the criteria range. For example, the following criteria range displays all rows that contain "Ananth" in the name column, "Delhi" in the city column and 211119 in the phone column.

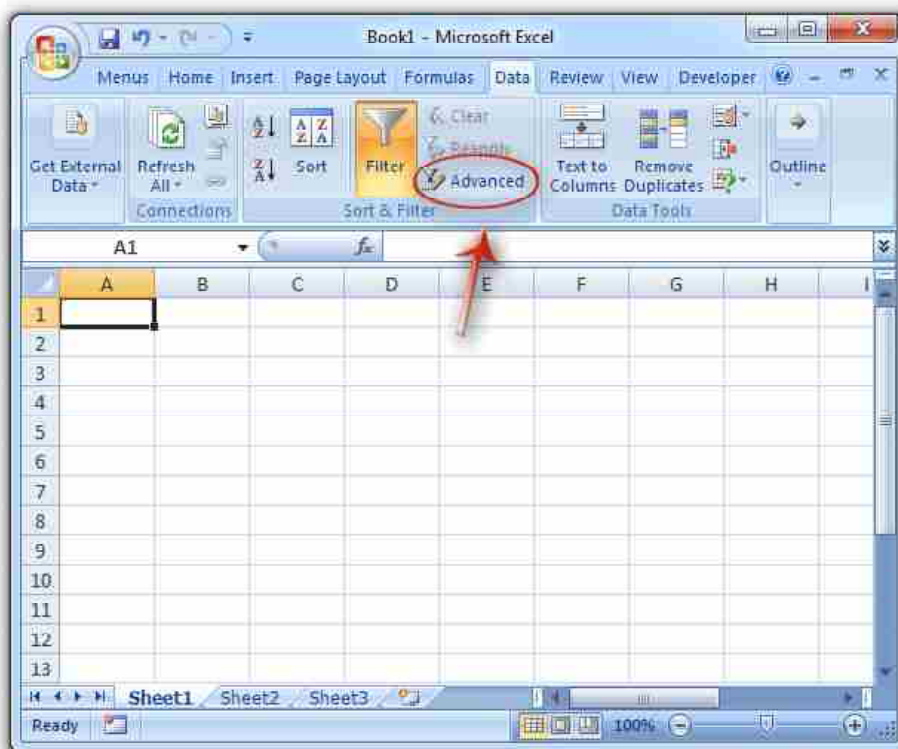
--	--	--	--

**One Condition in One Column or Another :** To find data that meets either a condition in one column or a condition in another column, enter the criteria in different rows of the criteria range. For example, the following criteria range displays all rows that contain either "Ananth" in the Name Column, "Delhi" in the city column, or Phone numbers equal to 211119.



Now let us consider the criteria of one condition in one column or another and work on the example database given in **Fig. 2.36**. Follow the steps given below :

- (1) Type the criteria label, in the rows below the criteria labels, type the criteria we want to match.
- (2) On the Data menu, point to filter and then click Advanced Filter.
- (3) We will get Advanced Filter menu. How we have got the following options and select required ones appropriately.



**Fig. 2.36**

- (a) To filter the list by hiding rows that doesn't match our criteria. Click Filter the list, in-place.
- (b) To filter the list by copying rows that match our criteria to another area of the worksheet, click copy to another location, click in the Copy to box, and then click the upper left corner of the area where we want to paste the rows.
- (c) In the criteria range box, enter the reference for the criteria range, including the criteria labels. To move the Advanced Filter dialog box out of the way temporarily while we select the criteria range, click collapse Dialog.

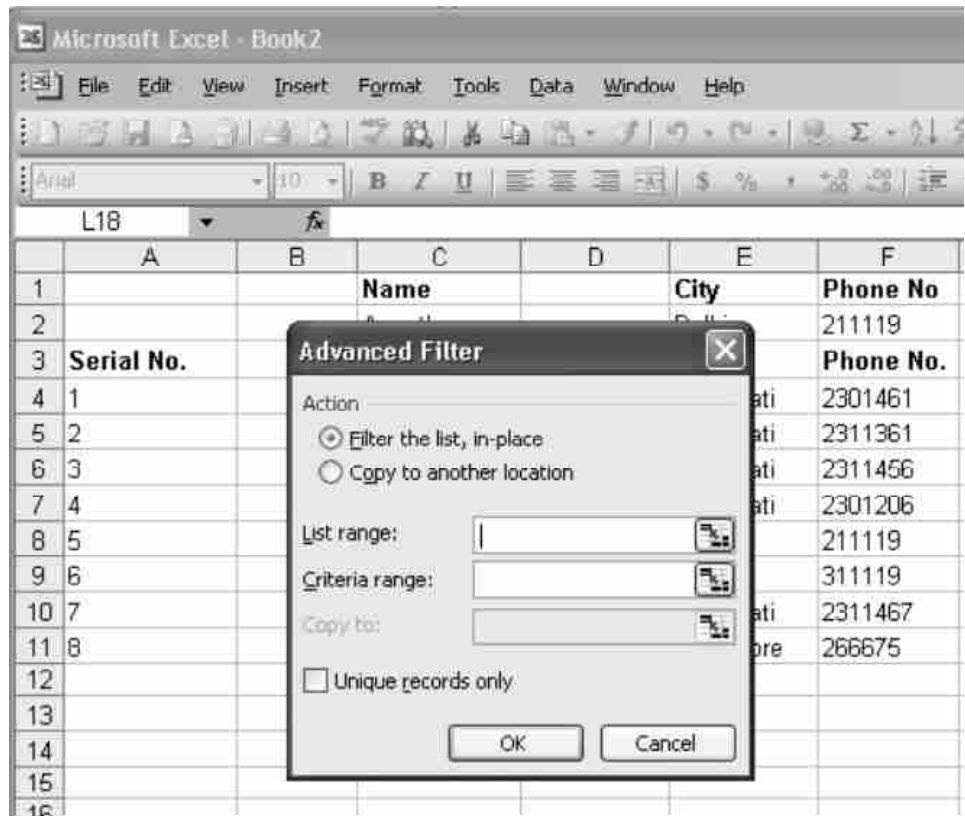


Fig. 2.37

- (4) Click on to OK we will get the filtered table which is shown in Fig. 2.38.

Serial No.	Name	City	Phone No.
1	Rajesh	Guwahati	2301461
2	Ramen	Guwahati	2311361
3	Gokul	Guwahati	2311456
4	Suvami	Guwahati	2301206
5	Ananth	Delhi	2311119
6	Kalpana	Ranchi	3311119
7	Muruli	Guwahati	2311467
8	Mukhtha	Bangalore	266675

Fig. 2.38

## 2.6 Charts :

Charts are graphical representation of information. Excel has tools to draw different types of charts: they are Bar Charts, Area Charts, Pie Charts, Line Charts, and Radar Charts etc.



To create charts consider the following example as shown figure below :

	A	B	C	D	E	F
1	<b>Sales Counter of ABC Retail</b>					
2						
3	<b>Product</b>	<b>April</b>	<b>May</b>	<b>June</b>		
4	Soap	3000	3700	3300		
5	Paste	3500	3300	3900		
6	Stationary	2000	1900	2300		
7	Pen	700	780	900		
8						

**Fig. 2.39**

Follow the steps given below to create a chart.

- (1) Select the data range of which we want to create the chart as shown in **Fig. 2.40**.

	A	B	C	D	E
1	<b>Sales Counter of ABC Retail</b>				
2					
3	<b>Product</b>	<b>April</b>	<b>May</b>	<b>June</b>	
4	Soap	3000	3700	3300	
5	Paste	3500	3300	3900	
6	Stationary	2000	1900	2300	
7	Pen	700	780	900	
8					
9					
10					

**Fig. 2.40**

- (2) Click on the Chart wizard available on the Standard tool bar we will get the screen as shown in the **Fig. 2.41**.

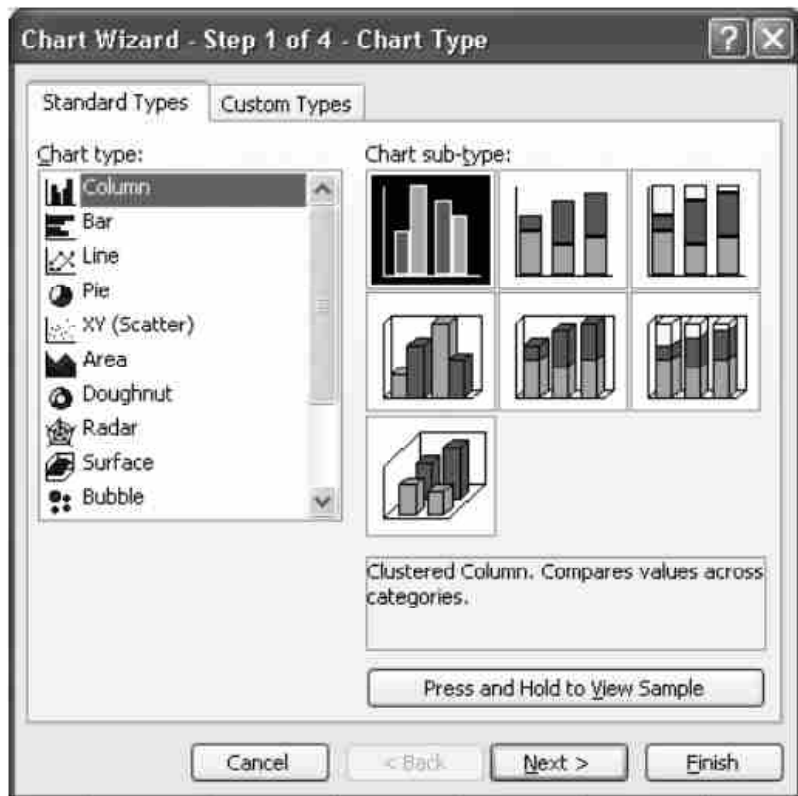


Fig. 2.41

- (3) Here we can select the kind of chart we want to create. For example as shown Bubble stock, XY etc. In the specific chart we can select Chart sub-type also. We can also see the view of the sample chart by pressing the left mouse button and holding it down. (Let us consider the chart selected above in figure and discuss.)
- (4) Click on to Next we will get the screen as shown in Fig. 2.42 Chart Wizard.

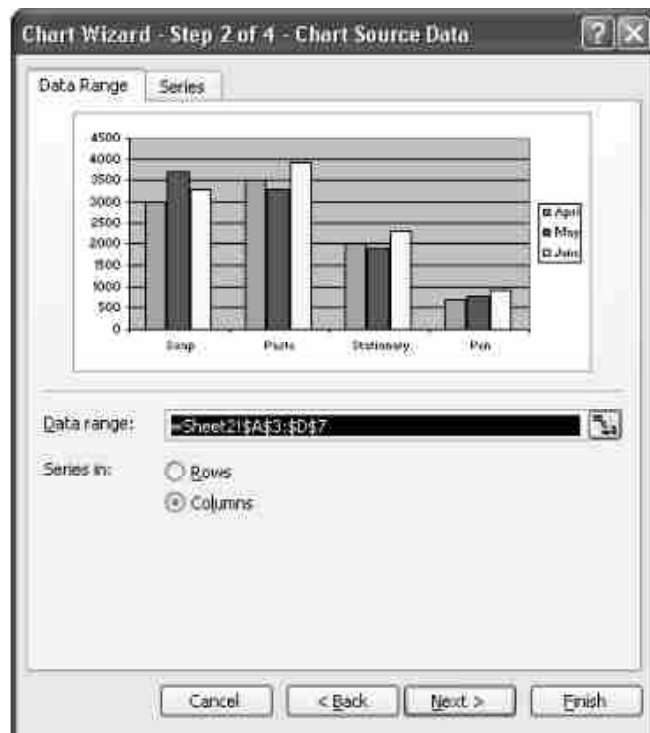


Fig. 2.42

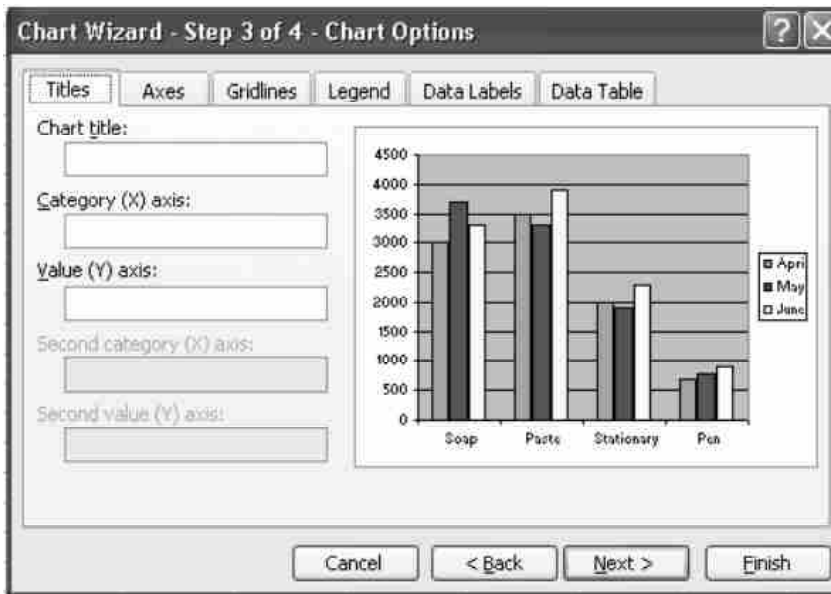
(5) Here we can change the data range if we want. (The cell range selected in the first step can be altered). Here we can go to the previous step and can make any allocations in the previous step. Here now we can select Series in as :

(a) Columns

(b) Rows Columns :

(A) Columns :

(6) Click on the Next we will get the screen as shown in **Fig. 2.43**.



**Fig. 2.43**

(7) We can give the title to the chart in Chart title box. For example, "Sales Report of ABC Retail". Then we can give the name to represent x-axis for example products and we can give a name to represent y-axis for example Rupees.

Chart title is the title to the chart.



**Fig. 2.44**

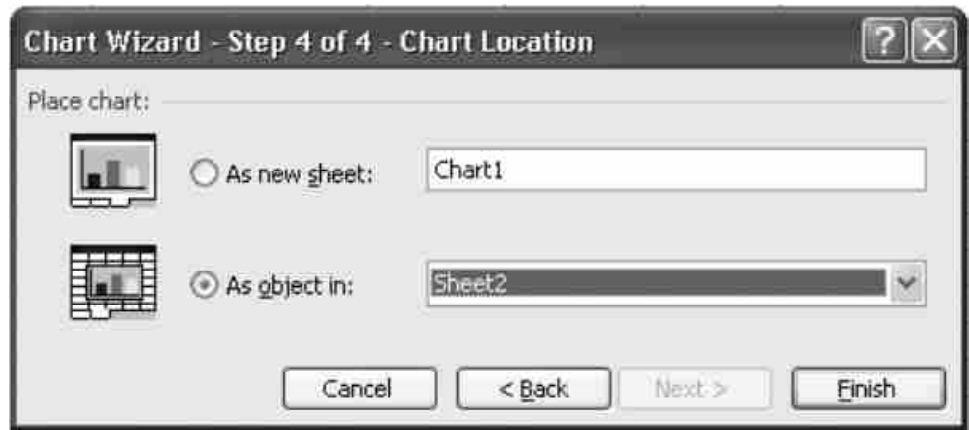


Fig. 2.45

- (9) Now we can select the chart to be displayed in a new sheet or as an object in any of the sheets of the work book.
- (a) **As object in sheet :** We can select it to be the object in sheet 1 or sheet 2 or sheet 3 etc. Then click on to Finish. We will get the screen as shown below :

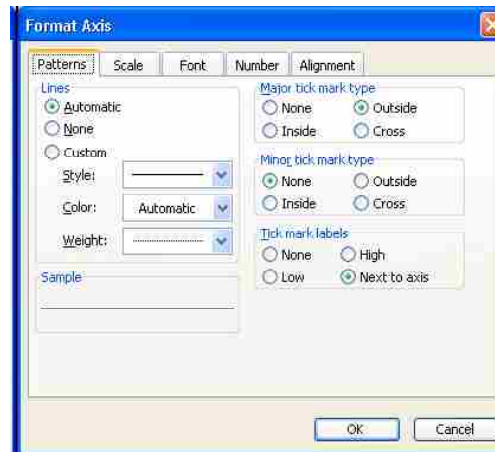


Fig. 2.46

- (b) **As a new sheet :** We can place the chart in a new sheet by clicking on to the radio button adjacent to As new sheet. We will get the figure as shown below :

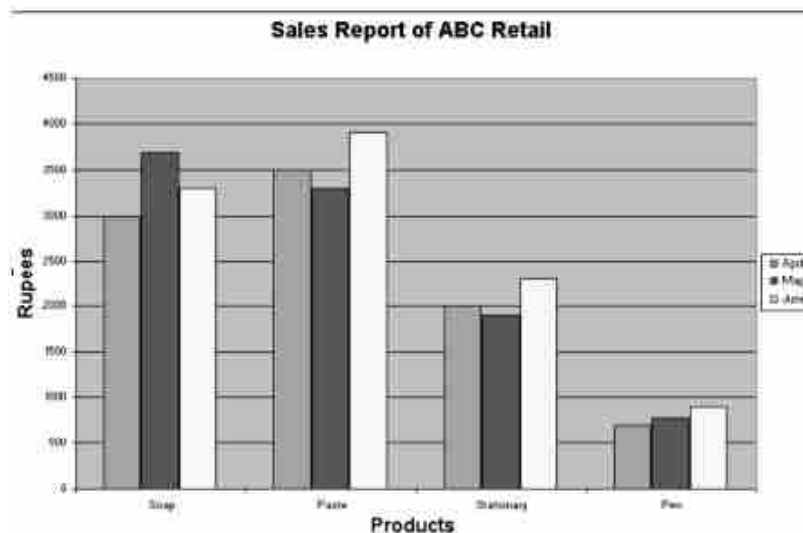
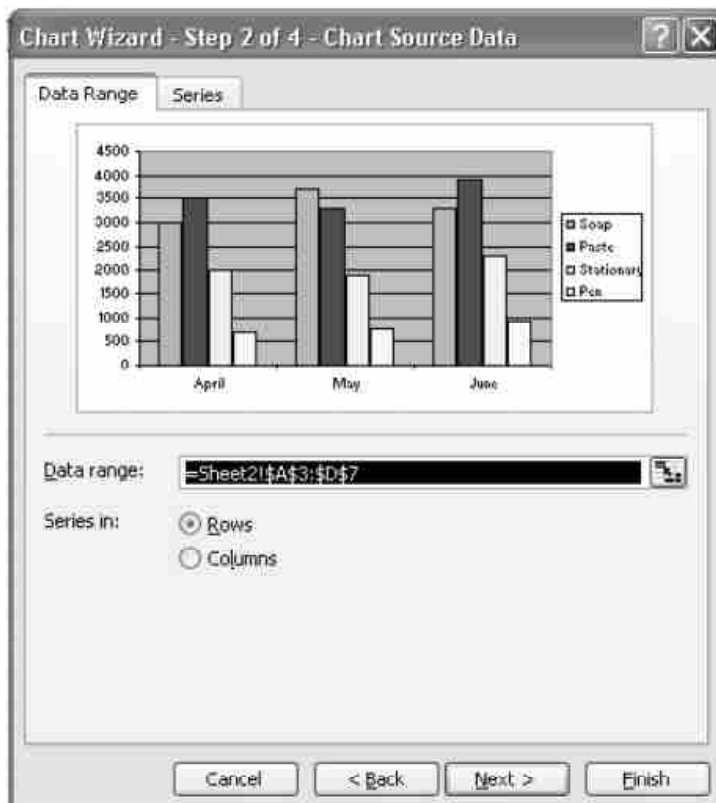


Fig. 2.47

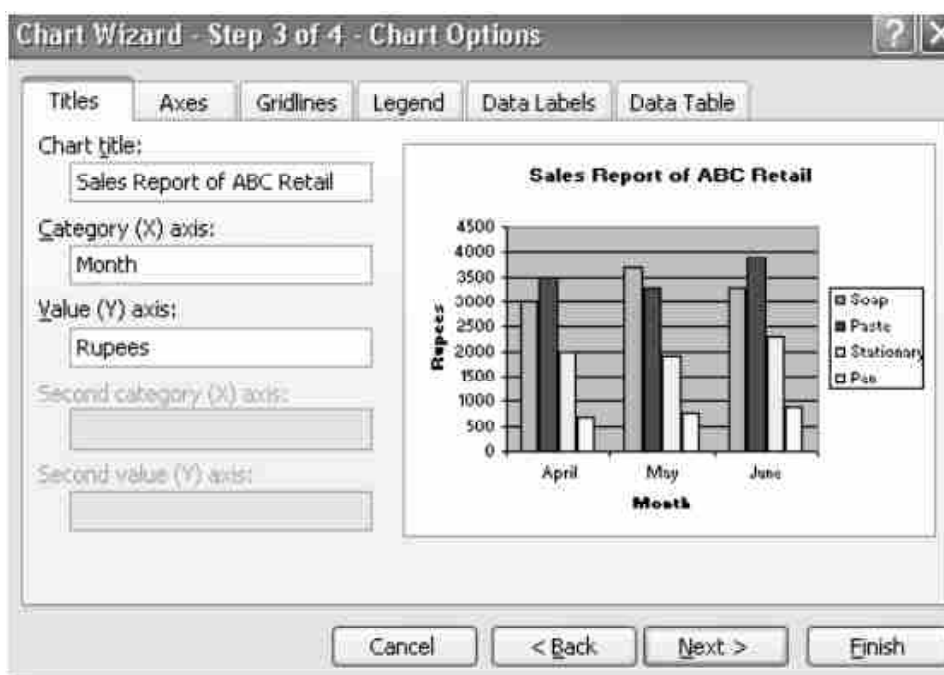
**Note :** We can observe a box containing the meaning of each colour in the chart.

**(B) Rows :**

- (10) Click on to Next. On the screen we got, we can give the title to the chart in chart title box. For example "Sales Report of ABC Retail". Then we can give the name to represent X axis for example "Month" in the category (X) axis box and we can give a name to represent Y axis for example "Rupees" in value (Y) axis box.



**Fig. 2.48**



**Fig. 2.49**

(11) Click on to Next we will get as shown in Fig. 2.50.

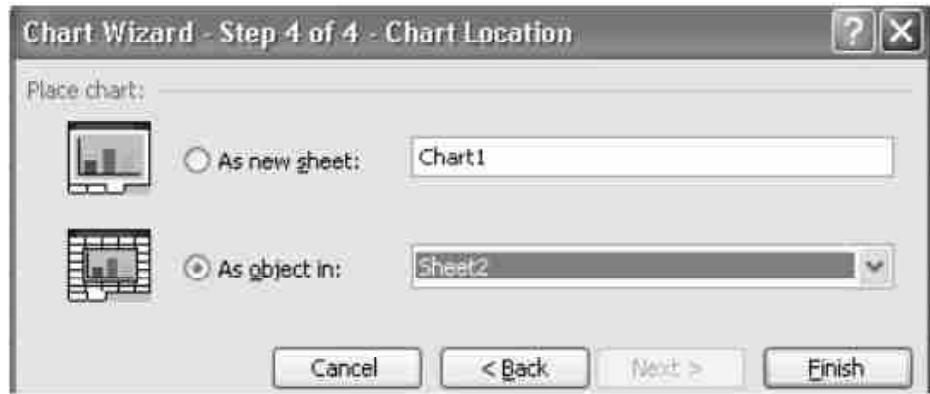


Fig. 2.50

(12) Now we can select the chart to be displayed in a new sheet or as an object in any of the sheets of the work book.

(a) **As object in sheet :** We can select it to be the object in sheet 1 or sheet 2 or sheet 3 etc. Then click on to Finish. We will get the screen as shown below.

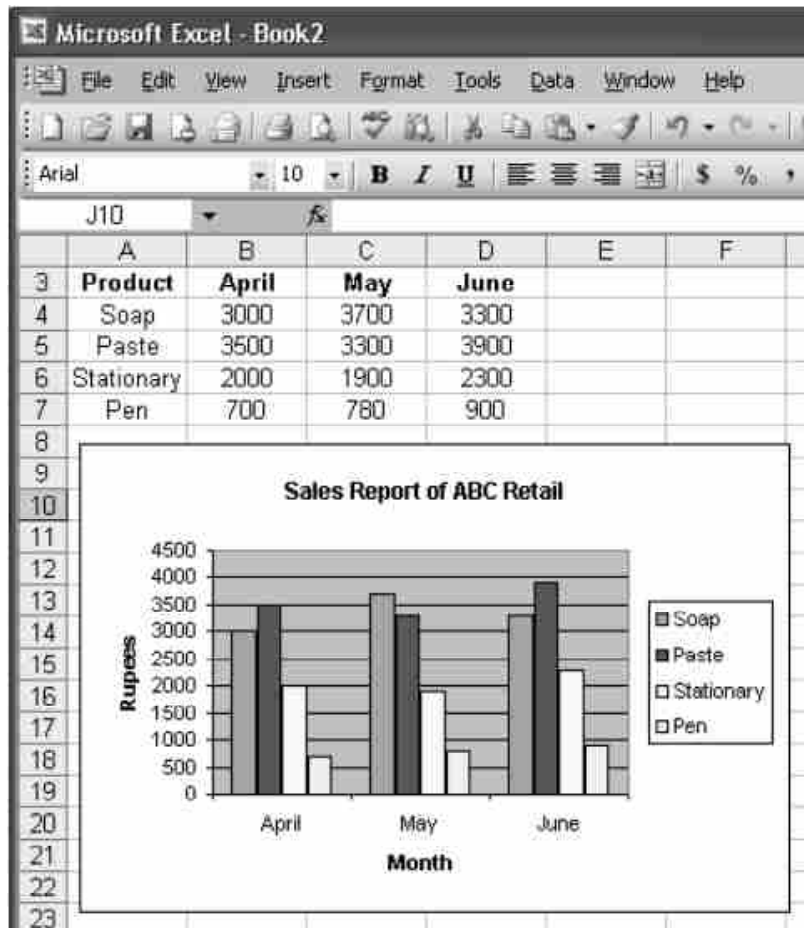
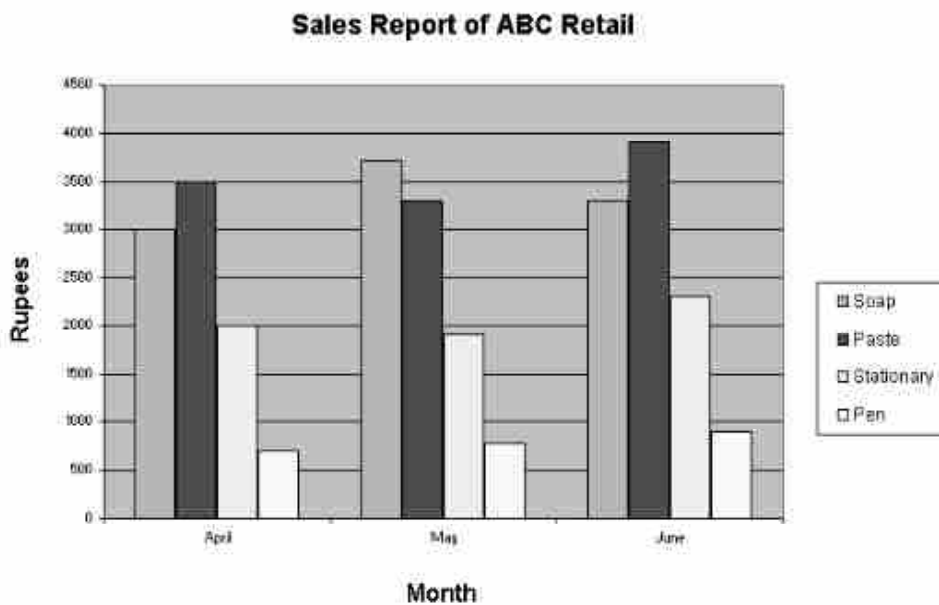


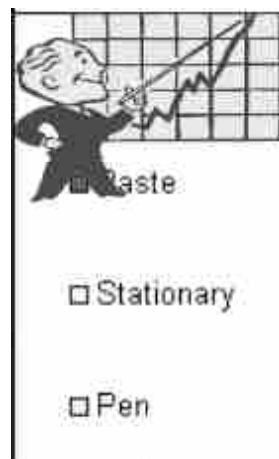
Fig. 2.51

(b) **As a new sheet :** We can place the chart in a new sheet also (explained).



**Fig. 2.52**

**Note :** We can observe a box containing the meaning of each color as shown in **Fig. 2.53** in the chart drawn.



**Fig. 2.53**

### Check Your Progress :

1. Fill in the blanks with appropriate words.
  - (i) We have to make use of ranges for carrying ..... at through function.
  - (ii) A ..... is a collection of some commonly used words, which can be reproduced by dragging fill handle.
  - (iii) Excel has ..... to draw different types of charts.
  - (iv) Charts are graphical representation of .....

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### 2.7 Let Us Sum Up :

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**In this unit we have discussed the following concepts :**

- Instead of using the formulas to do certain calculations functions are provided in Excel. Entering the formulas when many cells involved is difficult so functions are used.

- Common functions like average ( ), max ( ), min ( ) are used to find average of numeric values among the range of cells, to find the largest value in the given range of cells, to find the lowest value in the given range respectively.
- Logical functions like if ( ) is also used to check certain conditions and to take a decision.
- We can also prepare a list of commonly used words which can be used of text or numbers in a cell can be changed as per the requirements.
- Column width and row height can also be changed. The appearance of the value in a cell can also be changed according to the requirement. An Excel list or Database can be created.
- Auto filter feature of Excel helps to display the records, which meet certain conditions.

---

### **2.8 Answers for Check Your Progress :**

---

1. (i) calculations, (ii) custom list, (iii) tools, (iv) information
- 

### **2.9 Glossary :**

---

1. **Range :** A range is a sequence of cell addresses.
  2. **Formatting :** Formatting is how information appears in cells.
  3. **Database :** An organized collection of data arranged in rows and columns is a database.
  4. **Charts :** Charts are graphical representation of information.
- 

### **2.10 Assignment :**

---

1. Discuss any four functions.
  2. Give the syntax of if ( ), sum if ( ), count if ( ).
  3. What are criteria in filtering ?
  4. What are Charts and how do we use it ?
- 

### **2.11 Activities :**

---

1. Create a worksheet with the following details :  
Student Roll number, Student name, Student class, Student marks in four different subjects.  
(a) Calculate the total marks obtained by each student.  
(b) Decide the result as follows :

Total Marks	Result
>350	Distinction
>=200	Pass
<200	Fail



---

**2.12 Case Study :**

---

1. Explain following command with its use, syntax and example.
  - a. Sum ( )
  - b. Average ( )
  - c. Max ( )
  - d. Min ( )
  - e. Count ( )
  - f. Upper ( )
  - g. Lower ( )
2. What is If and Sum\_If? Differentiate it.
3. Create a worksheet with the following details Student Roll number, Student name, Student class, Student marks in 4 different subjects. Now calculate the total marks obtained by each student.

---

**2.13 Further Readings :**

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1. Parameswaram, R.(2010), 'Computer Applications in Business', S Chand & Company, India
2. Rajaraman, V.(2013), 'Fundamentals of Computer', Prentice Hall India Learning Private Ltd.
3. Saxena, Sanjay & Chopra, P.(2006), 'Computer Application in Management', Vikas Publication House Pvt Ltd.



**-----  
: UNIT STRUCTURE :  
-----**

- 3.0 Learning Objectives**
- 3.1 Introduction**
- 3.2 Starting of Microsoft PowerPoint**
  - 3.2.1 Parts of PowerPoint Window**
- 3.3 Creation of PowerPoint Presentation**
- 3.4 To Include a Chart in the Slide**
- 3.5 To Impart a Data Sheet**
- 3.6 Formatting Options**
- 3.7 Slide Transaction**
- 3.8 Different Views of the Presentation**
- 3.9 Let Us Sum Up**
- 3.10 Answers for Check Your Progress**
- 3.11 Glossary**
- 3.12 Assignment**
- 3.13 Activities**
- 3.14 Case Study**
- 3.15 Further Readings**

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**3.0 Learning Objectives :**

**After going through this unit you will be able to :**

- define how to start MS PowerPoint
- explain Parts of PowerPoint Window
- define Creation of PowerPoint presentation
- explain Saving the PowerPoint presentation
- Outline Chart in a slide
- explain Imparting Data sheet from a file
- Outline Formatting the slides
- define Slide transactions
- explain Different views of the presentation.

---

**3.1 Introduction :**

Microsoft PowerPoint is a most widely used utility to create presentation relating to products, organisation, research papers etc. This presentation can be created at ease and with immense speed. This is

effective software which provides techniques for designing the dynamic presentations. Using this software a slide can be designed, text can be inserted, graphics can be inserted and animation can be given to the slides and the objects within the slide.

### 3.2 Starting of Microsoft PowerPoint :

Following steps are undertaken to start Microsoft PowerPoint.

- (1) Move the mouse pointer over the start button present on the extreme left of the task bar and then click the left mouse button. A push up menu appears.
- (2) Place the mouse pointer over the program option inside the push up menu. A second menu gets displayed immediately.
- (3) Move the mouse pointer over Microsoft PowerPoint option and click the left mouse button. You will get the screen as shown below

**Fig. 3.1**



**Fig. 3.1**

- (4) You can create a new presentation by one of the methods given below :
  - (a) Auto Content Wizard
  - (b) Design Template
  - (c) Blank presentation

Each of this presentation method can be selected using the radio button adjacent to each of them or You can open an existing presentation.

**Let us Consider Blank Presentation :** You can create a blank presentation by clicking an OK of the below shown menu as already, radio button next to Blank presentation is selected.

After following the above mentioned steps you will get a screen as shown below **Fig. 3.2**. Different parts of the following figure is given below :



Fig. 3.2

### 3.3.1 Parts of PowerPoint Window :

- (1) **Title Bar** : Display the application name, file name and various window controlled like minimize button, maximise button and close button.
- (2) **Menu Bar** : Different options for selection.
- (3) **Standard Tool Bar** : Displayed by default, allows to give common commands like saving the file, opening a file, printing etc.
- (4) **Formatting Tool Bar** : allows the user to give commands related to formatting cells and cell contents like Bold, Underline, Font Style, Font Size, color etc.
- (5) **The Drawing Palette** : This is used to draw different shapes.
- (6) **View Bar** : This is used to change the view of the screen.

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### 3.3 Creation of PowerPoint Presentation :

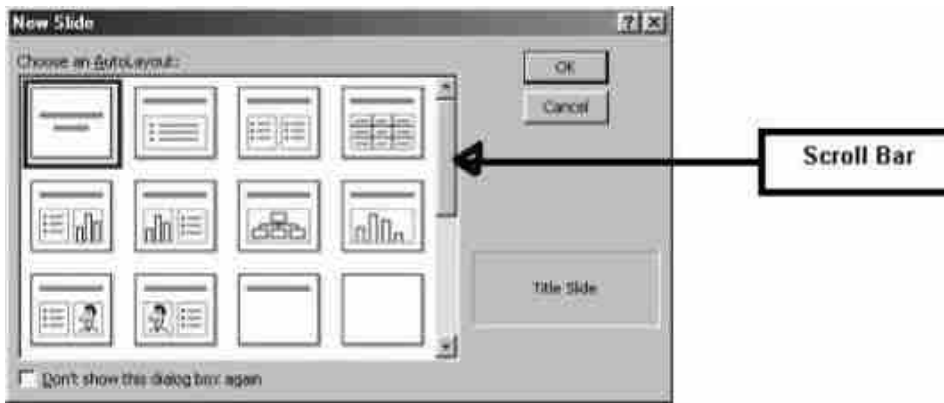
---

**Slide Layouts** : Each PowerPoint presentation can have only one slide or it can have more than one slide. Each of these slides can have its own page layout associated with it in the presentation. The page layout decides the position of the various objects like text, picture etc. in the slide. Page layout also specifies the appearance of the text like its style, color, size etc.

PowerPoint provides 24 different types of page layouts along with a blank page.

**Steps to create PowerPoint presentation follow the given steps to create the PowerPoint presentation :**

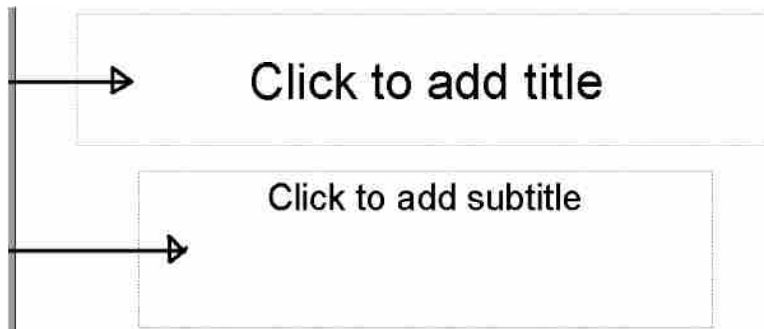
- (1) Select the slide layout by moving the mouse pointer over the required layout and click the left mouse button, then click on OK or you can cancel the selection by clicking on the Cancel.



**Fig. 3.3**

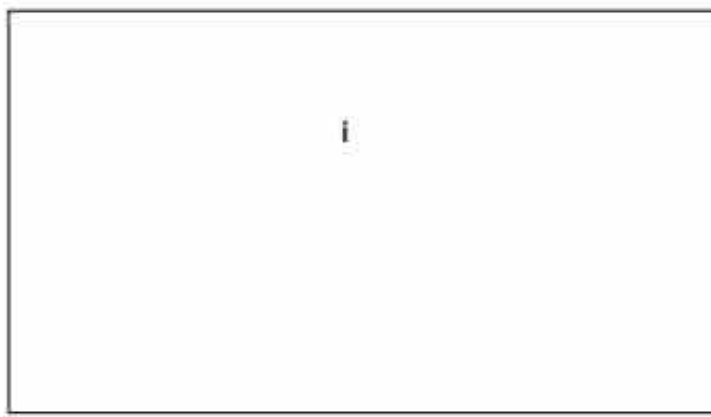
Each of these layouts has different names like Title slide, Bulleted List, Table, Organization, Charts etc. as discussed earlier. 24 different layouts are available. On the screen 12 layouts are visible; use the scroll bar to see the other layouts.

The above selected layout has the name Bulleted list. On clicking OK, you will get the screen as shown below :



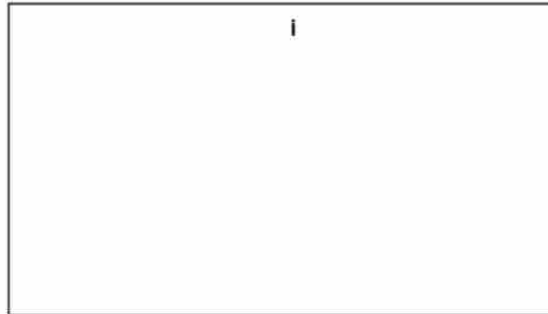
**Fig. 3.4**

- (2) To add text to the upper box as given in the box, click the mouse pointer inside the box. Now you can type any text you want. Say for example K. K. Handiqui State Open University.
- (3) Now to add text to the lower box, click inside that box and start typing the text you want to add. You will get the screen as shown in **Fig. 3.5**.



**Fig. 3.5**

- (4) Save this presentation. Use save icon of Standard tool bar or file option of Menu bar. While saving give the name for the presentation.
- (5) To view the slide show Click on to Slide show option which is on the Menu bar. You will get a drop down menu. Click on to view show you will get the slide show presented on the screen **Fig. 3.6.**

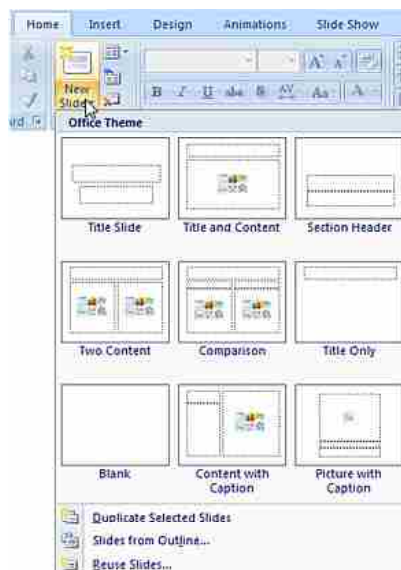


**Fig. 3.6**

**Note :** Press function key F5 to see the slide show instead of step 5. To come back from the slide show to the PowerPoint menu press Esc Key.

**Adding more Slide to an existing presentation :** Consider the presentation already created above and follow the steps given below to add more slides to an existing presentation.

- (1) Be in the above created presentation (**Fig. 3.5**) Click on to insert option on the menu bar. From the drop down menu click on to New Slide option. or Press Ctrl and M simultaneously being in the above– created presentation (**Fig. 3.5**) or Click on to New Slide icon which is on the Standard tool Bar being in the above created presentation (**Fig. 3.5**)
- (2) You will get the slide layout menu and now you can select a required layout for the slide and enter the text in the slide. Let us assume that we have selected table layouts. It is shown in **Fig. 3.7.**



**Fig. 3.7**

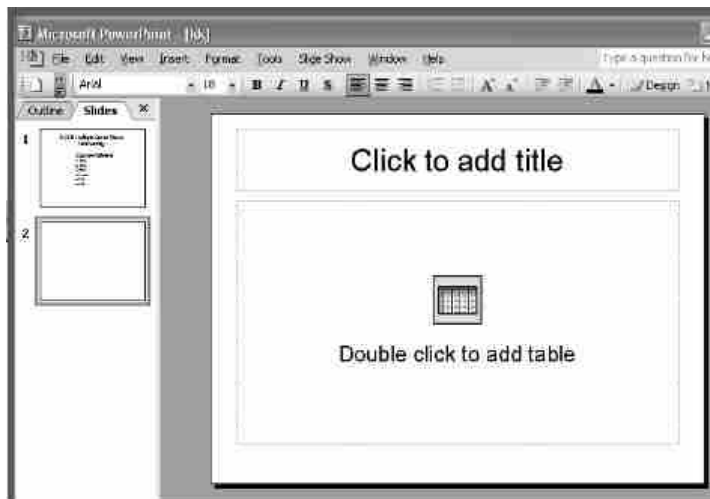


Fig. 3.8

- (4) Now you can add title in the upper box.
- (5) Now double click on to the lower box. You will get a menu as shown in Fig. 3.9.

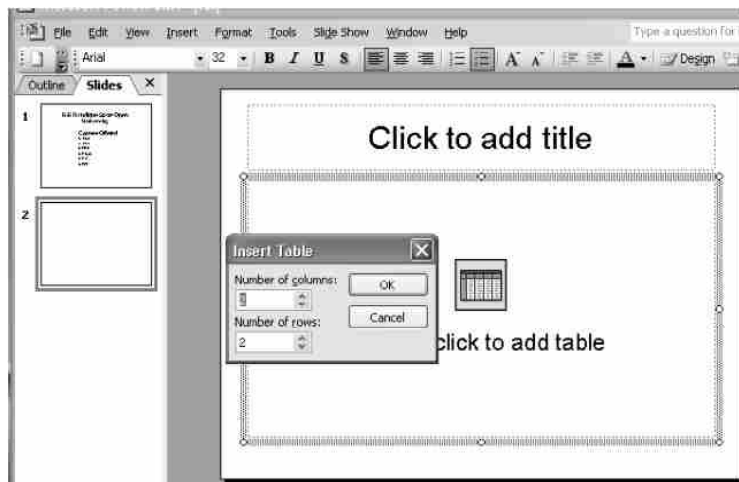


Fig. 3.9

- (6) Here you select the number of rows and columns you want in the table by using small arrows present adjacent to Number of Columns and number of rows box. Then click which is present in the insert table menu. You will get the screen as shown in Fig. 3.10.

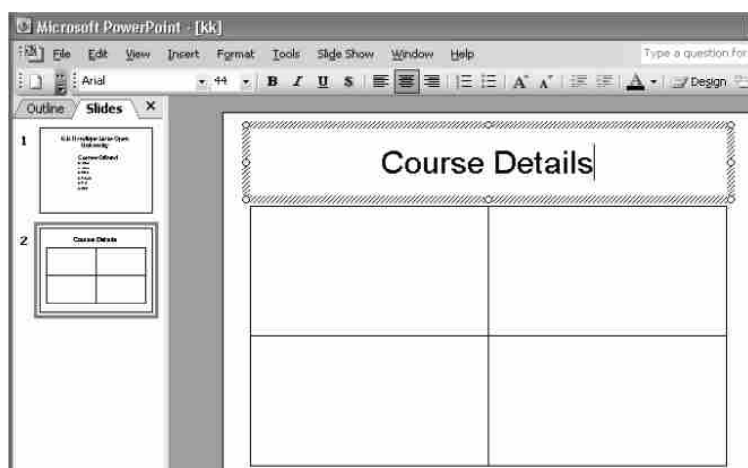
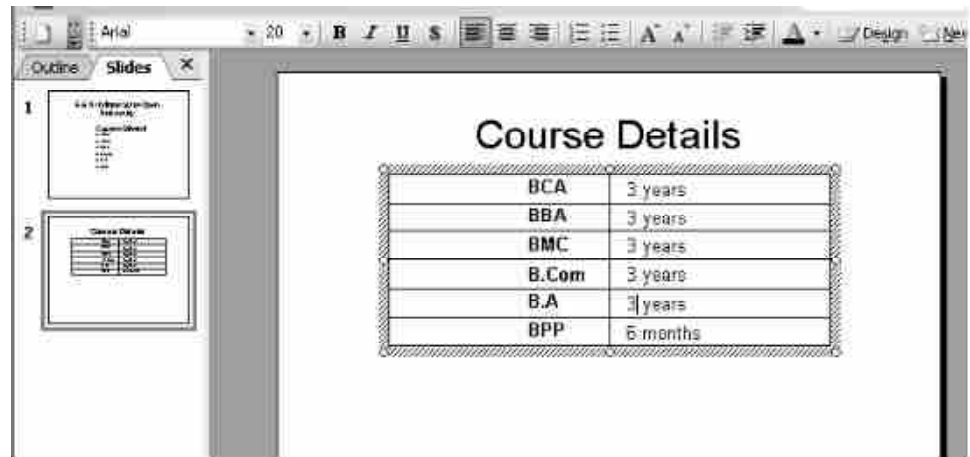


Fig. 3.10

- (7) How you can enter the contents in this table shown in **Fig. 3.11** Microsoft Powerpoint (Presentation)



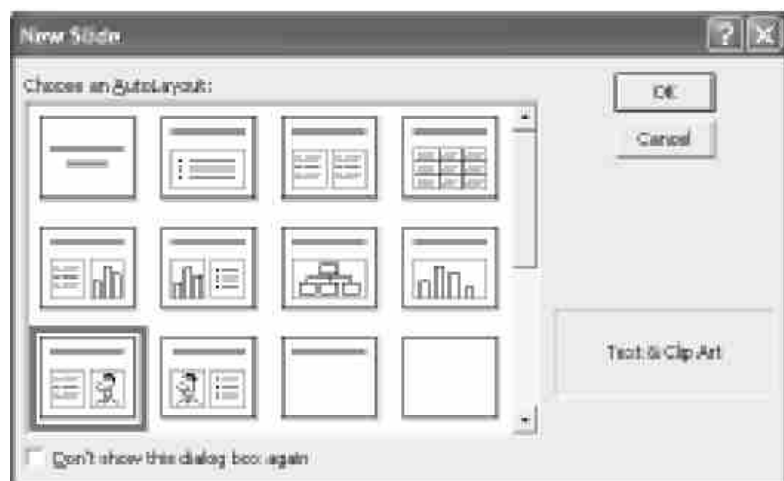
**Fig. 3.11**

- (8) Save the presentation.  
 (9) Run the slide show by pressing F5.

**Note :** When you press F5 it will show the first slide not to go to the second slide press space bar key of the key board.

**To add a slide with picture for the existing presentation :** Consider the presentation already created above and follow the steps given below to add more slides to an existing presentation.

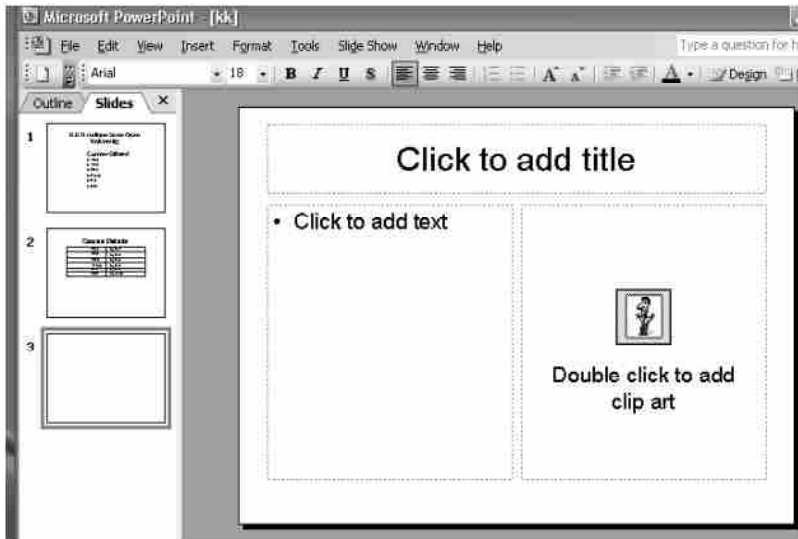
- (1) Be in the above-created presentation (**Fig. 3.11**). Click on to Insert option on the Menu Bar. From the drop down menu click on to New Slide option or Press Ctrl and M simultaneously being in the above- created presentation (**Fig. 3.11**). or Click on to New slide icon which is on the Standard tool bar being in the above created presentation (**Fig. 3.11**)
- (2) You will get the slide layout menu and now you can select a required layout for the slide and enter the text and picture in the slide. Let us assume that we have selected layout as shown in **Fig. 3.12**.



**Fig. 3.12**



(3) Now click on OK you will get the screen as shown in **Fig. 3.13**.



**Fig. 3.13**

- (4) Add Title to the slide and add text at the left hand box shown.
- (5) To add the picture at the right box follow the steps given below,
  - (a) Double click as instructed in the box you will get a menu as shown in **Fig. 3.14**.



**Fig. 3.14**

- (b) Now you can select any of the titles among the available ones as shown in **Fig. 3.14**. For example we have selected "Academic". Again you will get a menu, **Fig. 3.15** which contains different pictures. Now click on the picture you want to insert and Click on to OK on that menu you will get the slide as shown in **Fig. 3.16**.



Fig. 3.15

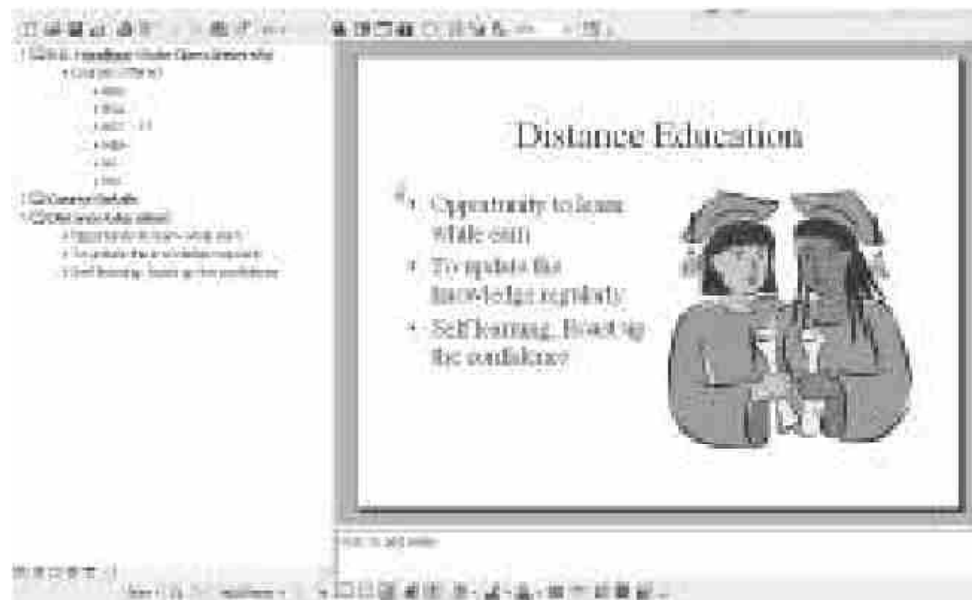


Fig. 3.16

(c) Save the presentation as discussed earlier.

**Note :** To insert the pictures from the file.... 1) Execute the step (a) of the above steps,

(6) Click on to the import clips item you will get **Fig. 3.17**.

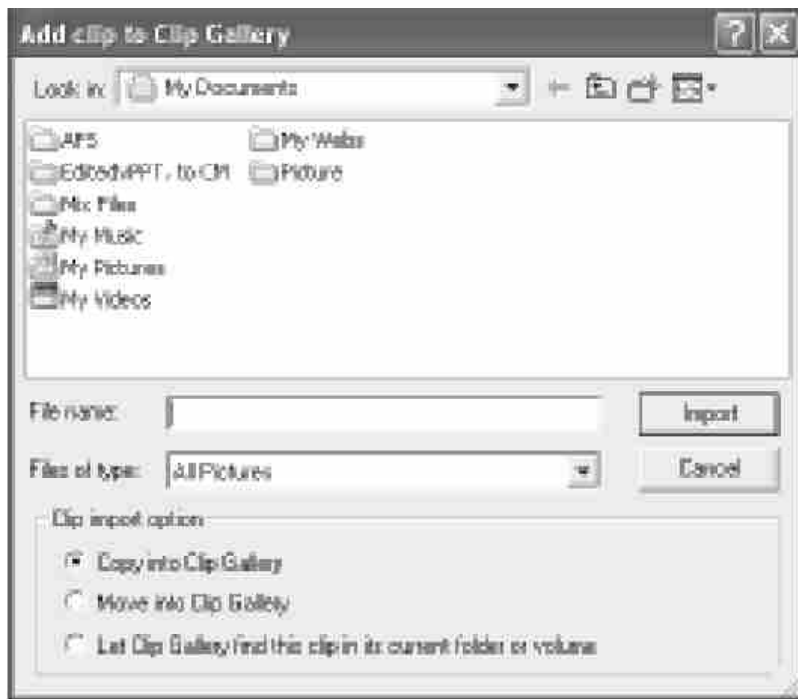


Fig. 3.17

- (7) Select the file from where you want to insert the file. You can select required drive and required folder.
- (8) Click on to Import item. You will get a menu as shown in Fig. 3.18.

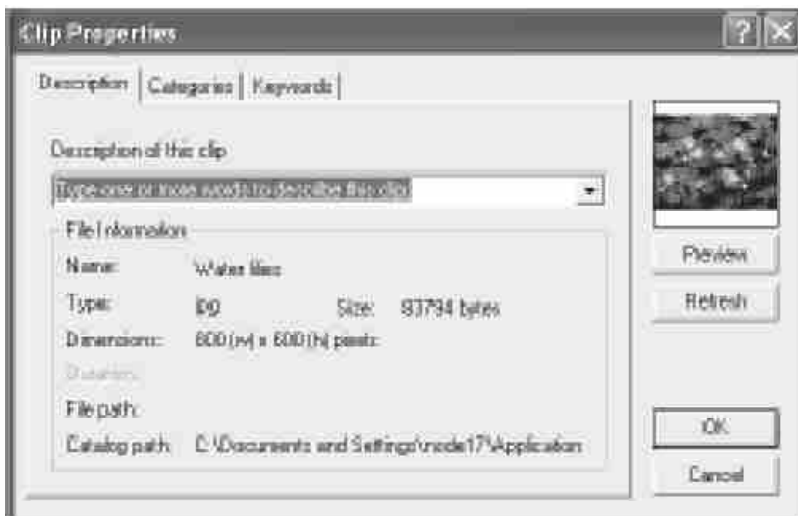
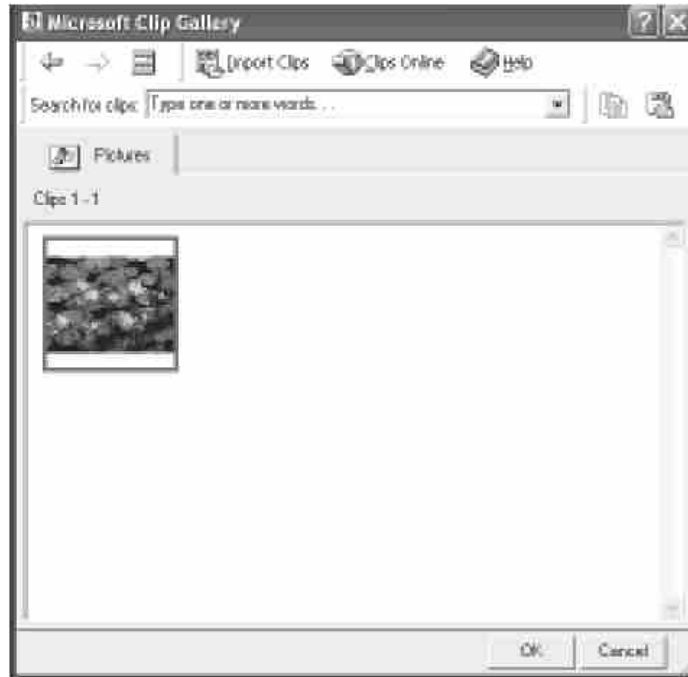


Fig. 3.18

- (9) Click on to OK you will get the menu as shown :



**Fig. 3.19**

- (10) Click on OK you will get the picture inserted in the box of the slide.

**Save the PowerPoint presentation :** We can save the files in different ways which are discussed in other applications like MS Word, MS Excel etc. The procedure is same. Even performing the tasks live opening of an existing presentation, or closing a presentation without saving it, is also similar to the process carried out in other applications, So, you can follow the same procedure:

**Note :** The default extension used for the PowerPoint presentation file is ppt.

---

### **3.4 To Include a Chart in the Slide :**

---

To include a chart in the slide follow the steps given below :

- (1) Follow the steps to insert a new slide as explained earlier and select the chart layout as shown in **Fig. 3.20** and click OK.



**Fig. 3.20**

- (2) Add title to the slide. For example Admission chart.
- (3) Double click at the chart area, you will get default chart. To have your data you can edit the data sheet according to your needs.
- (4) You can change the type of the plot, style etc. Right click on to the chart area and edit it.



Fig. 3.21

### 3.5 To Impart a Data Sheet :

You can import a data sheet from a file for example from Excel. To do so follow the steps given below :

- (1) Double click at the chart area. You will get default chart. Click on to the Import file icon present on the standard tool bar and select the data sheetm which you want to import, according to which you want to draw the chart.
- (2) You can change the type of the plot, style etc. To do som right click on to the chart area and edit it.

Microsoft PowerPoint



Fig. 3.22

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### 3.6 Formatting Options :

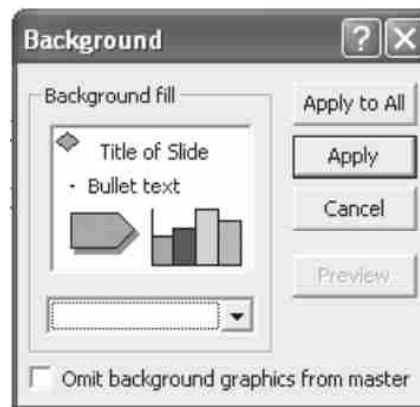
---

**Font Style :** Font style of the text can be changed by selecting the text of which you want to change the font style and clicking on to the required font style icon available on the formatting tool bar. Similarly Font and their size can be changed. Select the text and use the required icons respectively.

**Aligning Text :** After selecting the text, use required icons depending on whether you want to Align the text Left, Centre or Right respectively. To have Numbers or Bullets use the following icons respectively.

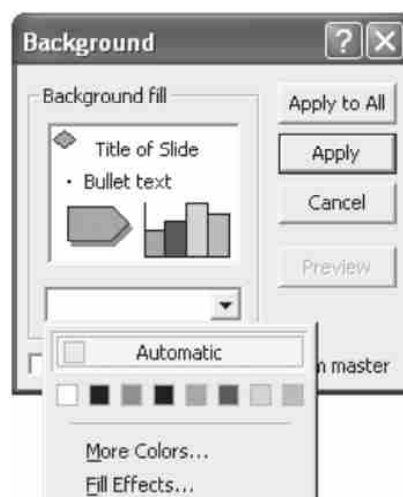
**Background of the Slides :** The background of the slide can be changed according to our needs to give an attractive look to the slide. Follow the steps given below to change the Background of the slide.

- (1) Click on to Format option on the menu Bar. From the drop down menu click on the Background option. You will get a menu shown in **Fig. 3.23**.

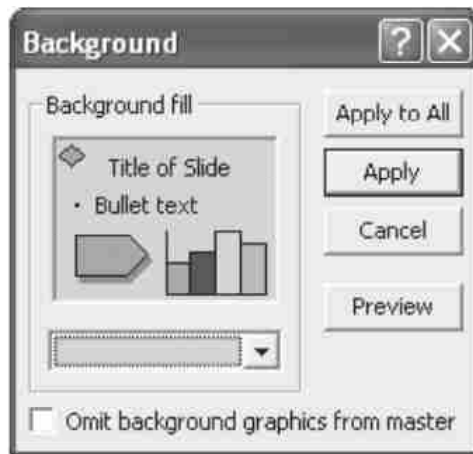


**Fig. 3.23**

- (2) To select the required Background click on the arrow mark as shown above. You will get different colour on the resulting menu as shown in **Fig. 3.24**, select the required color for the Background. For example assume that you have selected grey colors as Background color then you will get the color applied to the sample slide in the menu as shown in **Fig. 3.25**.



**Fig. 3.24**

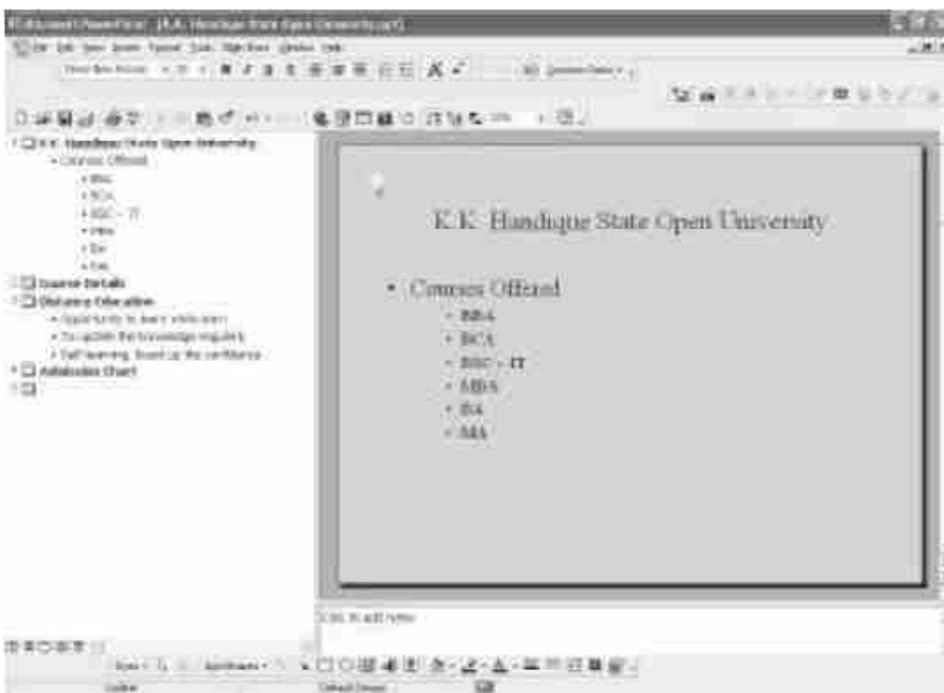


**Fig. 3.25**

- (3) You can apply this Background color to all the slides in the presentation by selecting. Apply to All option or you can select Apply option to apply the Background color only to the current slide in the presentation. Or you can cancel this menu by clicking on the Cancel option. You can click on to Preview option to see the new background color on the slide without actually applying it to the slide and if you did not like it you can select a different Background color.

**Note :** All options discussed above are available in Menu shown in Fig. 3.23.

Fig. 3.26 shows the application of the Background color to one slide.



**Fig. 3.26**

**More Color :** If you are not satisfied with the available colors, then you can click on to More colors option. This option is available in menu shown in Fig. 3.24. You will get a menu as shown in Fig. 3.27.

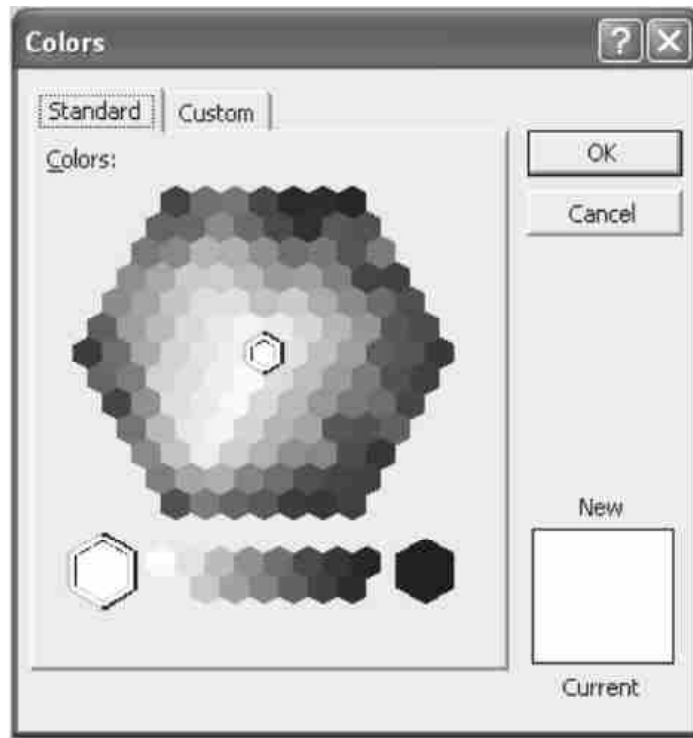


Fig. 3.27

Now select the required color by clicking on your required color, you will get the display of your selected color in the box titled "New" at the right bottom corner of the menu as shown in Fig. 3.29. Now click OK. You will get the color applied on sample slide as shown in Fig. 3.30 and now you can apply this color to all the slides or current slide.

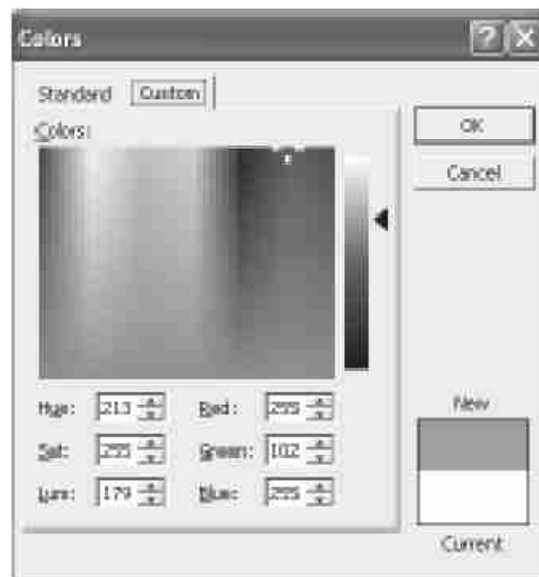


Fig. 3.28

**Fill Effects** : You have different kinds of Background color fill effects. Follow the steps given below.

- (1) After selecting the required colors click on the arrow as shown in Fig. 3.29. In the resulting menu select Fill Effects as shown in Fig. 3.30. You will get a menu as shown in Fig. 3.30.



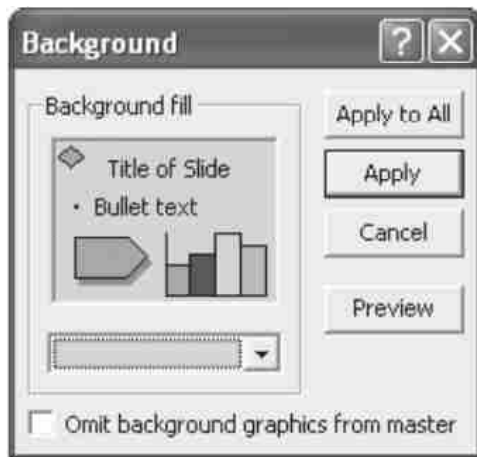


Fig. 3.29

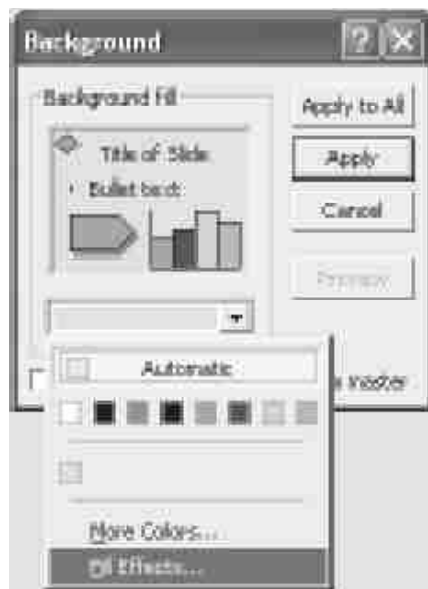


Fig. 3.30

(2) You can use Gradient according to your Fig. 3.31.



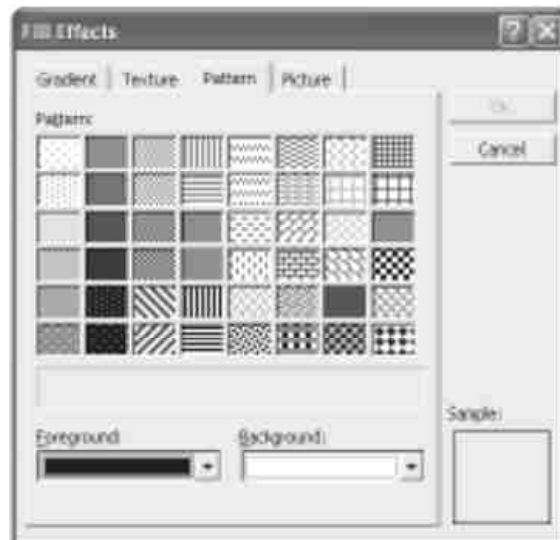
Fig. 3.31

(3) You can select the texture **Fig. 3.32**.



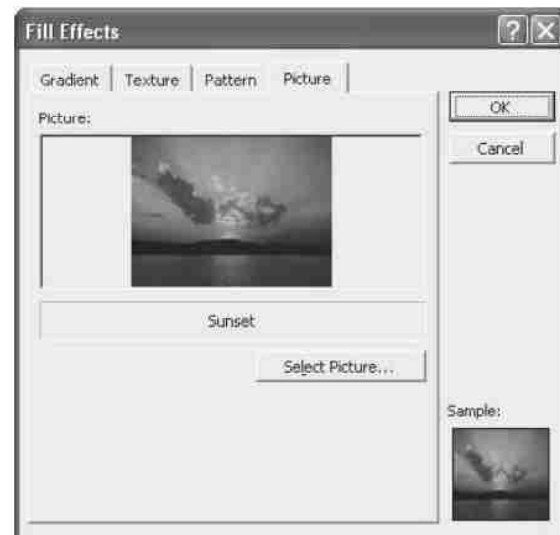
**Fig. 3.32**

(4) You can select Pattern **Fig. 3.33**.



**Fig. 3.33**

(5) You select pictures **Fig. 3.34**.



**Fig. 3.34**

**Note :** Try all the options.

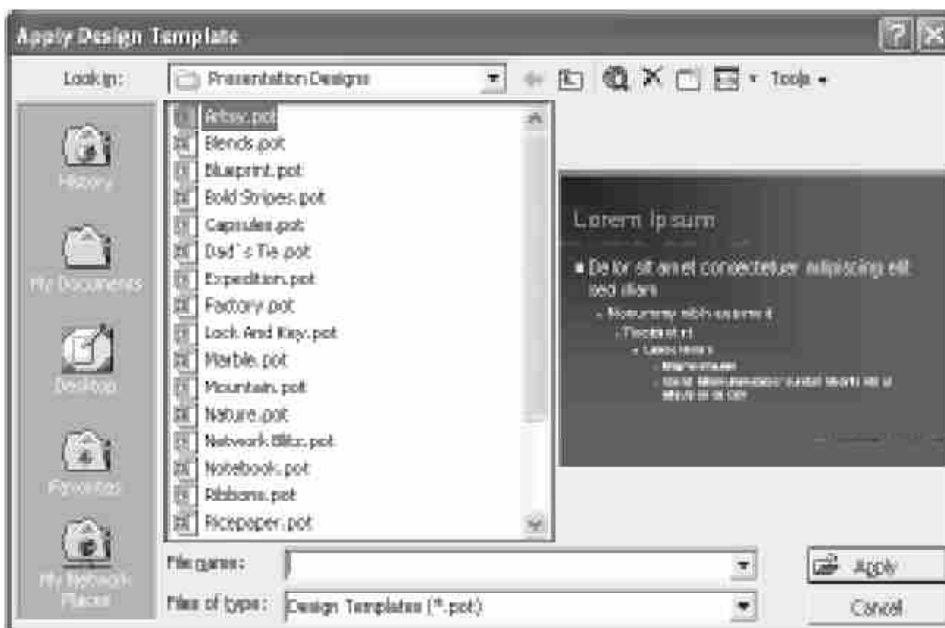
**Applying Design Templates :** You can apply different design templates to the slides to improve the appearance of the slides. To do so, follow the steps given below.

- (1) Click on to Format option present in the menu Bar you will get the screen as shown in **Fig. 3.35**.



**Fig. 3.35**

- (2) Click on Apply Design Template option of the drop down menu. You will get another menu as shown in **Fig. 3.36**.

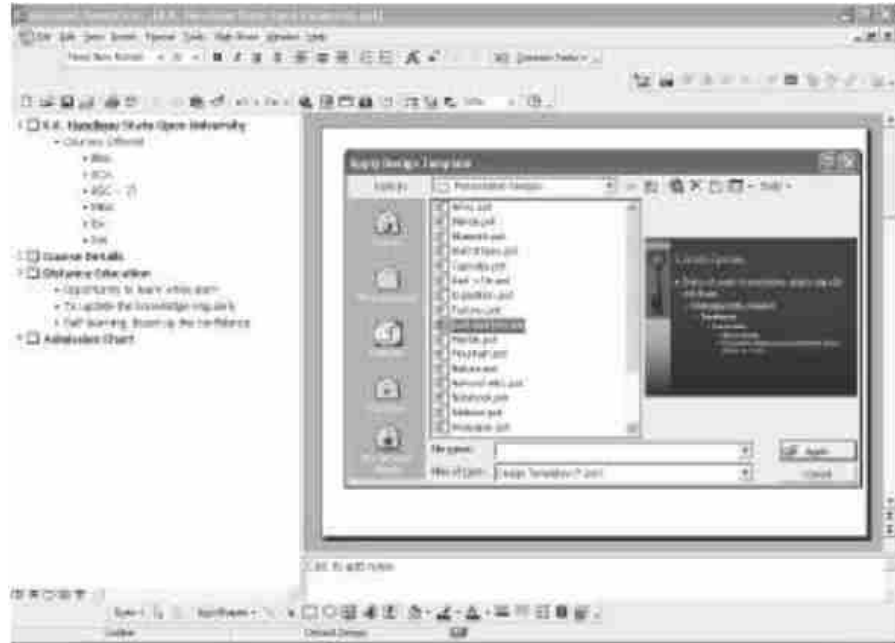


**Fig. 3.36**

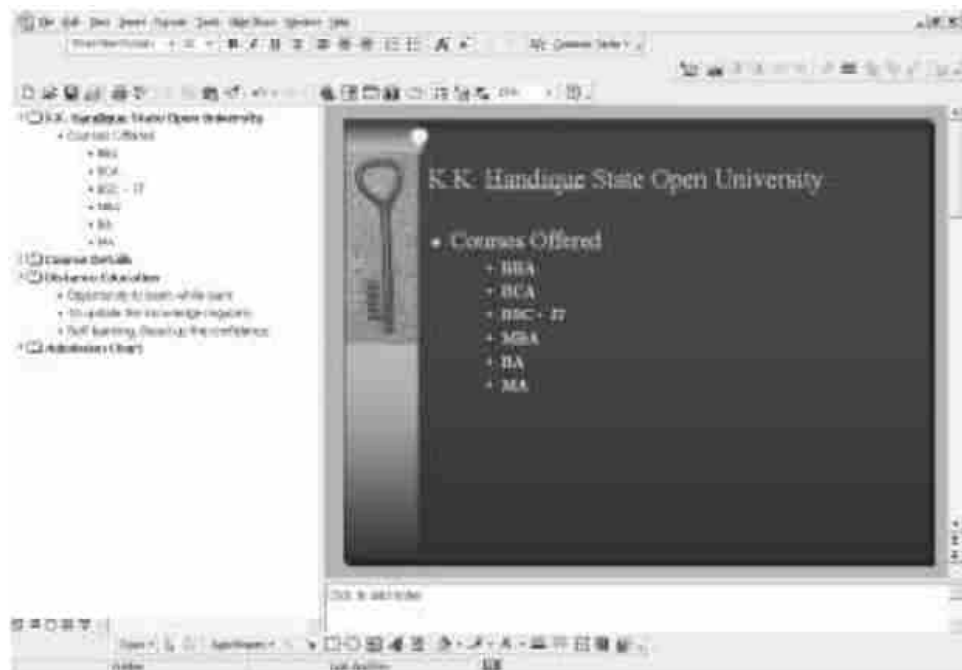
- (3) You can select any of the templates available in the list by clicking on it and clicking on the Apply Option in that menu. The template will be applied on the slides of the presentation. You can also cannot this menu by clicking Cancel option present.

**Note :** Right side box present in the Apply Design Template menu [Fig. 3.36] will display the application of the selected design Template on the sample side; so by looking at that you can choose the correct template.

**Example :** Let us select Fill Bar design Template Fig. 3.37 and apply it to the slides Fig. 3.38.



**Fig. 3.37**



**Fig. 3.38**

---

### **3.7 Slide Transaction :**

---

During the slide show if you want to give different kinds of transition to the slides follow the steps given below.

- (1) Click on to Slide show option present on the Menu Bar you will get a drop down menu as shown in Fig. 3.39.

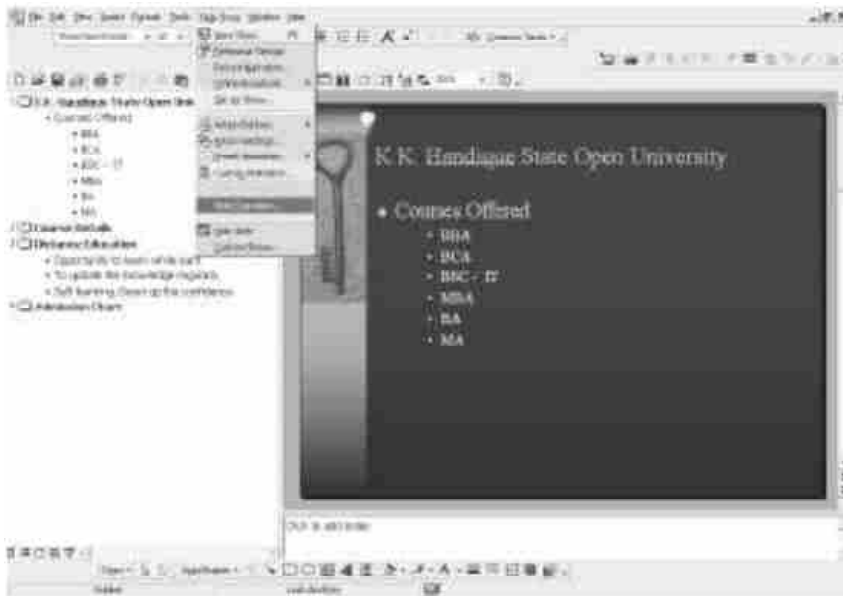


Fig. 3.39

- (2) Click on to Slide Transition option you will get a menu as shown in Fig. 3.40. This menu has different options let us see each of these options.
- (a) **Effect :** By default it is No Transition. You can select different kinds of effects for transition by clicking on the arrow as shown in Fig.9.40and clicking on the required effect. The effect of your selection is shown in the box of the menu immediately (Fig. 3.40). The effect can be made slow, Medium or Fast.
  - (b) **Advances :** This is used to move from one slide to another slide in a presentation during slide show. You can select the option on mouse click or Automatically after. You can select both the options also (Fig. 3.40).

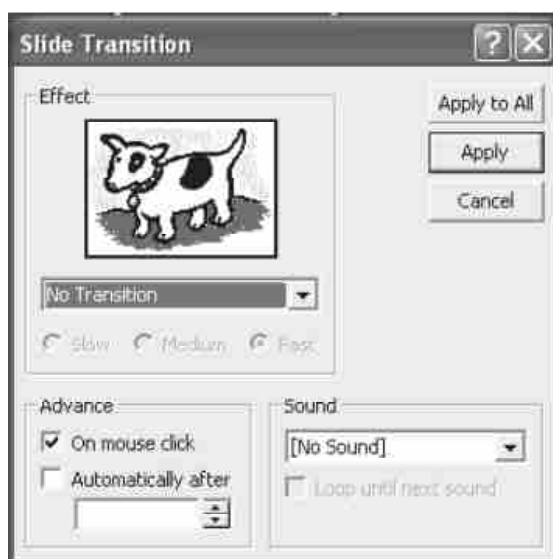


Fig. 3.40

**On Mouse Click :** When you select this option you are required click the mouse button to advance to the next slide.

**Automatically after** : When you select this option after certain amount of time as you have selected, the next slide will be displayed on the screen.

When you select both the options, the slide will be advanced either by mouse click or automatically whichever is first.

- (c) **Sound** : You can select different kinds of sounds during the appearance of the slide to do so click at the sound option of Slide T ransition menu and select the required type of sound (**Fig. 3.40**).

**Note** : Now you can apply this Slide Transition feature to all the slides (Apply to All) of the presentation or the current slide (Apply). You can also Cancel the menu (Cancel) **Fig. 3.40**.

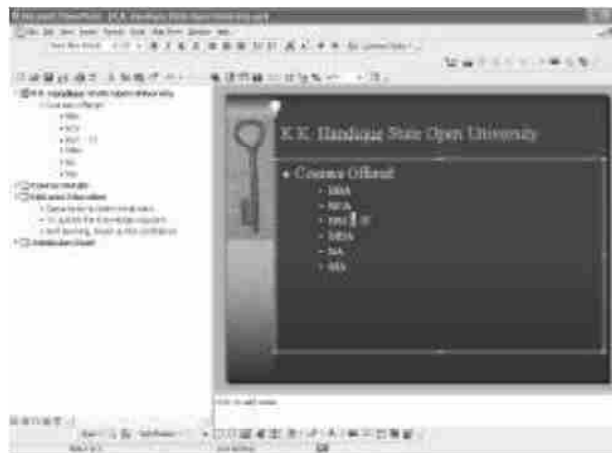
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### **3.8 Different Views of the Presentation :**

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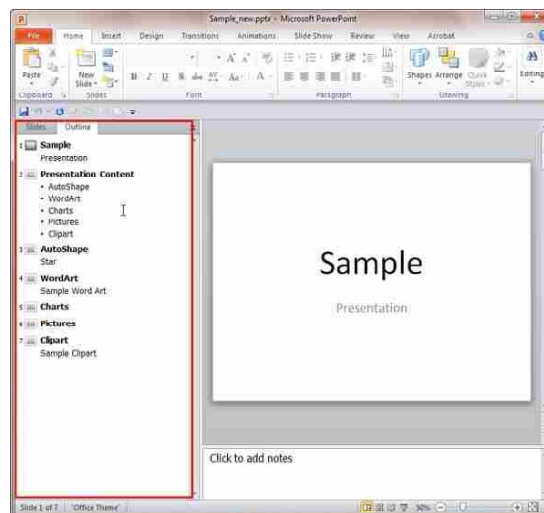
You can have the different views of your presentation.

- (1) **Normal View** : Click on this you will get normal view.



**Fig. 3.41**

- (2) **Outline View** : Click on this to get an outline view as shown in **Fig. 3.42**



**Fig. 3.42**

(3) **Slide View** : Click on this to get a view as shown in **Fig. 3.43**.



**Fig. 3.43**

(4) **Slide Sorter View** : Click on this to get the view as shown in **Fig. 3.44**.



**Fig. 3.44**

(5) **Slide show** : This takes you to slide show.

**Check Your Progress :**

1. Write true or false for the following statements :
  - (i) You can create a new presentation by Autocontent Wizard.
  - (ii) You can apply sound affect while presenting the slides.
  - (iii) We cannot insert graphics in Microsoft PowerPoint.
2. Define Microsoft PowerPoint.

---

**3.9 Let Us Sum Up :**

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PowerPoint provides 24 different types of page layouts along with a blank page. A PowerPoint presentation can include one or more slides. You can even add more slides to the existing presentation. The default extension used for the PowerPoint presentation file is ppt. A chart can be included in a slide. A Data Sheet can also be imported from a file say from Excel. The appearance of the text in the slides can be changed to suit the requirement. Attractive books can be given to slides by

changing the Background. You can also have the required kind of transitions for the slides in the PowerPoint presentations.

---

**3.10 Answers for Check Your Progress :**

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1. (i) true, (ii) true, (iii) false
2. Microsoft PowerPoint is a most widely used utility to create presentation relating to products, organisation, research papers etc. Using this software a slide can be designed, text can be inserted, graphics can be inserted and animation can be given to the slides and the objects within the slide.

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**3.11 Glossary :**

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1. **PowerPoint :** PowerPoint is Presentation Software that can help to quickly create effective "Slide based" presentations.

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**3.12 Assignment :**

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1. Explain different basic parts of PowerPoint Window.
2. What are PowerPoint presentation ? Why they are used ?
3. What are the different views of presentation ?

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**3.13 Activities :**

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1. How do you import a Data Sheet from Excel ?

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**3.14 Case Study :**

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1. Explain slide transition.

---

**3.15 Further Readings :**

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1. Jain, V.; MS Excel 2002–Training Guide, BPB Publication, New Delhi.
2. Lotia, M.; World2000–An Introduction, BPB Publication, New Delhi.
3. Rajaraman, V. (2004); Fundamentals of Computers, 4th Edition, Pentice–Hall of India, New Delhi.
4. Syganski; Introduction to Information Technology, Pearson Education, Delhi–110092.
5. Witherspoon; PowerPoint 2000 Fast & Easy, BPB Publication, New Delhi.



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## **BLOCK SUMMARY**

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The block has given details of the MS-Excel and MS-PowerPoint. In which user learnt about how to create excel sheet and how to you use functions of the MS-Excel. Furthermore, user learnt about creation of the PowerPoint presentation, adding animation and slide transitions.

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## **BLOCK ASSIGNMENT**

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### **Short Answer Questions :**

1. What is a Database
2. Explain the steps in creating a PowerPoint presentation

### **Long Question :**

1. Explain the different parts of MS Excel Window

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❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	1	2	3
No. of Hrs.			

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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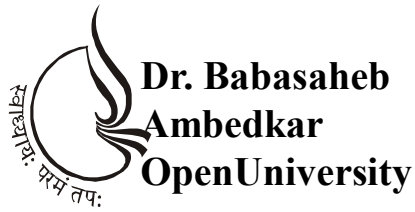
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**BBAR-303**

# **Management & Information System**

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## **BLOCK-4 APPLICATIONS OF INFORMATION SYSTEM**

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### **UNIT 1**

INFORMATION TECHNOLOGY

### **UNIT 2**

INTERNET TOOLS

### **UNIT 3**

WORKING WITH INTERNET

### **UNIT 4**

MANAGEMENT ISSUES IN MIS

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## **BLOCK 4 : APPLICATIONS OF INFORMATION SYSTEM**

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### **Block Introduction**

In this block you will learn about information technology as today there is technological era is there and we are surrounded by the technology. You will learn about the different area where now a days technology is going to use like Hardware Engineering, Networking, Management Information System, Internet and Software and So on. User will learn about the advantages and disadvantages of information technology as well as applications of information technology.

You will come to know about the Internet, Evolution of Internet, Internet terminologies, connection of internet and applications of internet. You will learn about the Internet tools like Web Browser, Web Server, E-Mail, Search Engines, World Wide Web and Internet Security.

In this block user will have detail about the Management Information System, Information Security and Control, Quality Assurance, Ethical and Social Dimensions.

## **Block Objectives**

**After learning this block, you will be able to :**

- About Information Technology
- Area and Applications of Information Technology
- Detail about Internet and Evolution of Internet
- Connection to Internet and Applications of Internet
- Detail about Internet tools
- Idea about Internet Security
- Concept of MIS
- Information Security and Quality Assurance
- Idea about Managing Global information system

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**Block Structure**

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Unit 1 : Information Technology

Unit 2 : Internet Tools

Unit 3 : Working with Internet

Unit 4 : Management Issues in MIS



**: UNIT STRUCTURE :**

- 1.0 Learning Objectives**
- 1.1 Introduction**
- 1.2 Areas of Information Technology**
- 1.3 Advantages and Disadvantages of Information Technology**
- 1.4 Application of Information Technology**
- 1.5 Let Us Sum Up**
- 1.6 Answers for Check Your Progress**
- 1.7 Glossary**
- 1.8 Assignment**
- 1.9 Activities**
- 1.10 Case Study**
- 1.11 Further Readings**

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**1.0 Learning Objectives :**

**After going through this unit, you will be able to :**

- define Areas of Information Technology
- explain Applications of Information Technology
- explain Advantages and disadvantages of Information Technology.

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**1.1 Introduction :**

Information Technology (IT) may be defined as the technology which is used to acquire, store, organize and process data to a form which can be used in specified applications, and disseminate the processed data. Information is processed data or processing of data, based on which decisions can be taken and appropriate actions initiated.

Information is also processed data which improved our knowledge, enabling us to do our work better. As an example of how organizing data enhances our understanding, let us consider marks obtained by students in an examination. The marks by themselves do not give any immediate idea about the performance of the class. By processing this data, a bar chart may be obtained, which gives the number of students with marks between 100 and 90, 90 and 80, 80 and 70, and so on. This Chart (**Fig. 1.1**) gives the teacher of the class information on the performance of the class, which would enable him or her to initiate appropriate action.

Bar chart giving performance of students in class

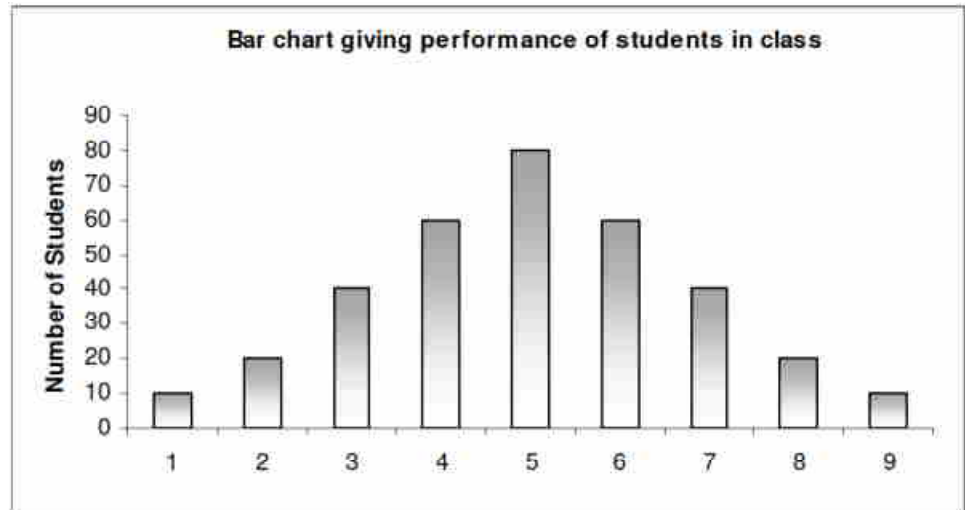


Fig. 1.1

This is a simple example to have a basic idea and concept of information technology. Actually data is processed through computer based systems for various applications.

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## 1.2 Areas of Information Technology :

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There are various areas of information technology. These areas could be broadly classified as :

- (1) **Hardware Engineering** : It is a science related to electronic circuits and components. The hardware of the computer consists of different types of units such as memory devices, CPU, input and output devices. Memory devices are the devices based on electronic circuits and components to store the instructions and data required for operation.

Memory is needed for the following purposes :

- (i) To store the program and data during execution.
- (ii) To store the program for repetitive use.
- (iii) To store the data for the future.
- (iv) To store the result of execution.

Semi-conductor memory and magnetic disk memory are two-types of memory we use.

- **CPU (Central Processing Unit)** : The Control Unit, Arithmetic Logic Unit and Memory Unit together form the Central Processing Unit (CPU) of the computer.
- **Input Devices** : These devices allow supply of data to the computers. The data can be fed in the form text or graphics. Keyboard, light pen and mouse are the examples of input devices. The input devices help us to communicate with the electronic computer by converting the human understandable signals and numbers into appropriate electric signals.



- **Output Devices :** These devices provide output result which are processed by the user. Visual Display Unit (VDU), Printer and Plotter are the examples of output devices.

The output devices help the computer to communicate with us by converting the electric signals to human understandable signals.

- (2) **Networking :** It is a science related to Internet and interconnected network of computers. A network is a communication system that enables computer users to share computer equipment, application software, data voice and video transmissions. Networks can link users who are across the room or across the world. Network information is transmitted by wire or through radio waves, such as microwaves. There are two primary reasons for having a network.

**First :** By sharing software and equipment, network owners are able to save expenses on resources. One printer can be used for an entire office, saving the cost of attaching a printer to each computer.

**Second :** Networks make people more productive. People are able to share information without leaving their offices or homes.

- **Networking Elements :** Today's networks have several common elements:
  - (i) **Nodes :** Any device or entity or computer connected to a network is a node.
  - (ii) **Cabling :** The communication wire used to connect equipment in a network is called a cable. The cable provides a medium for the electrical signal that carries information from one networked computer to another. The signal contains data that are used by workstations, hosts and printers. Most nodes (or computers) have a network interface card (NIC) that can capture the signal and translates it for use by the node.
  - (iii) **Topology :** All networks have a physical layout that determines how the data signal goes from one node to the next. The physical layout is the topology of the network. The topology is most easily represented by drawing the connections between network nodes. Nodes connected in star patterns are known as the Star Topology, in circles known as the Ring Topology, and in a straight line pattern is known as the Bus Topology.

- (3) **MIS (Management Information System) :** It is a tool used by management for improving the productivities. A system is a set of processes interacting with each other in response to inputs to produce outputs. A process is a set of operations carried on inputs with the system. Management Information System (MIS) is an

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application of management of the information of a system. The processing of data is carried out by various persons trained in the organization. The processing of data is performed by using computer which utilizes hardware and software components. The principle of management is utilized for operation on a data system. This may involve :

- (i) Planning of data processing.
- (ii) Planning of software and hardware.
- (iii) Planning for new software.
- (iv) Planning for advanced hardware.
- (v) Coordinating the personnel.
- (vi) Organizing and arranging day-to-day operation.
- (vii) Communicating with programmers and data entry operators.
- (viii) Motivating the personnel for better accuracy and efficiency.
- (ix) Initiating the personnel for learning new system and crating there interest.
- (x) Establishing the control over the complete system to avoid unnecessary expenditure, work, waste of time etc.

The MIS cell performs some of the major functions :

- (i) Monitoring of useful information.
- (ii) Designing of better procedure.
- (iii) To assist in decision making.
- (iv) To form an interface between different systems.

**(4) Internet and Software :** It is the area in which the sharing of resources and communication can be performed. We consider three types of network:

- (i) Local Area Network (LAN) :** A series of interconnected computers, printers and other computer equipments that share hardware and software resources. The service area is usually limited to a given floor, office area, or building.
- (ii) Metropolitan Area Network (MAN) :** A network that reaches throughout a large area such as a city or a large university campus.
- (iii) Wide Area Network (WAN) :** A far reaching system of networks. WANs can across state lines and across continents. They make it possible for thousands of users to send data to one another.

We may define Internet as a worldwide Computer networks whose constituents are computer networks such as LAN, MAN and WAN located in organizations. All these individual networks are interconnected using routers and publish switched telephone networks.

All computers connected to the Internet communicate with one another using a common set of rules. The common set of rules is called a protocol. TCP/IP (Transmission Control Protocol/ Internet Protocol) is the protocol used by the Internet.

An important point to note use any technology such as Ethernet, token ring or any type of connection such as ring, bus, star etc. provided the rules of communications among computers is standardized as TCP/IP.

The Network Interface Unit (NIU) of every computer/device which wants to send or receive messages must have an address. Such an address is called an IP address. It should be noted that routers which interconnect local networks are special purpose computers and will require IP addresses. The IP address is 4 bytes long. It is difficult for people to remember a string of 32 bits. Thus IP address is expressed in the so called dotted decimal format.

For example, an IP address is : 144.16.79.48

Where each number is the decimal equivalent of a byte (Remember that with 8 bits we can represent 0 to 255). Fortunately, in day-to-day use, it is not necessary to remember the IP address of your machine in numerical form. A character string which is easy to remember is usually assigned as your address. The actual assignment of IP addresses follows a systematic process to make it easy to route messages between networks. Each Internet Service Provider (ISP) who manages a group of users is assigned a set of IP addresses by an international agency. The ISP in-turns assigns a subset of addresses to each organization from this set.

The heart of any network is the communication software used to guide data along their way. All networks use or more software protocols that enable data packaging and transmission. Protocols define the rules for handling and interpreting transmitted data. Each data packet is constructed according to the rules of the network protocol. For example, many college campuses use the Transmission Control Protocol/Internet Protocol (TCP/IP) to transmit data. Novell Netware networks use the Internet Packet Exchange (IPX) and the Sequence Packet Exchange (SPX) protocols. These protocols can be transmitted on a single network as long as workstations can recognize the protocols.

The speed at which data are transported on a network is called Data transmission on a network is called Data transmission rate. On some networks the speed may be as low as one megabits per second (Mbps), and others it may be over 100 Mbps.

- (5) **Enterprise Resource Planning (ERP)** : It is the area in which the planning of available resources and forecast the demand of the customer is performed by use of computer system. ERP is also known as Enterprise Systems which appear to be dream come true.

These commercial software packages promise the seamless integration of all the information flowing through a company, financial and accounting information, supply chain information, customer information.

An enterprise system enable a company to integrate the data used throughout its entire organization. This list shows some of the many functions supported by SPA' R/3 package. Germany's SAP is the fastest software company in the world.

At the heart of an enterprise system is a central database that draws data from and feeds data into a series of applications supporting diverse company functions.

- (6) **GUI Applications :** There are front end tools used for customization of software. Graphical User Interfaces or GUIs are found on most of today's microcomputers. GUIs are based on the philosophy that people can use computers intuitively – that is with minimal training – if they can manipulate on screen objects that represents tasks or commands.

GUI is a work environment, ranks etc., provided by software like windows, Presenting picture and graphics to operate various commands.

Graphical objects are the key elements of GUIs. A graphical object is a small picture on the screen that you can manipulate using a mouse or other input device. Each graphical object represents a computer task, command or a rat world object. You show the computer what you want it to do by manipulating an object instead of entering commands or selecting menu options.

Most graphical user interface are based on a metaphor in which computer components are represented by real–world objects. For example, a user interface using a desktop metaphor might represent documents as file folders and storage as a filing cabinet.

The greatest advance is provision of very good graphical user interface, which makes it easy for any one to use the system for information.

- (7) **Database Application :** There are the database related applications software.

**Data :** Data is defined as facts related to people, places, events or things, which can be represented using number and letter.

**Example :** Name, address, age or facts related to people. These facts are represented using alphabets, numbers or a mix of both.

**Database :** A collection of interrelated data stoned together with controlled redundancy to serve one or more applications, so that the data stored are independent of the programs that use them and so that a common, controlled approach can be used for adding, modifying and retrieving data.

It is a form of data construction created to store the data in a suitable format. The database provides an information about the type of application or the case for which the data is stored.

**Example : Address File**

Name	Age	Address	Occupation

**Database System :** A database system is an integrated collection of related files along with details of the interpretation of the data contained therein.

**Database Management System (DBMS)** is a software or a software system – a collection of software required for using a database.

**Example :** MS–ACCESS, FOXPRO, ORACLE etc. Two main types of facilities are supported by the DBMS :

- (i) **The Data Definition Facility or Data Definition Language (DDL) :** DDL can be used to define the conceptual scheme and also give some details about how to implement this scheme in the physical devices used to store the data.
- (ii) **The Data Manipulation Facility or Data Manipulation Language (DML) :** DML is a language used to manipulate data in the database. Data manipulation involves retrieval of data from the database, insertion of new data into the database and deletion or modification of existing data.

**(8) Operating Systems :** This is a science of study of operational system of computer.

A Operating System is the software that controls the computer's use of its hardware resources such as memory and disk storage space. An operating system works like an air traffic controller to coordinate the activities within the computer. Just as an airport cannot function without air traffic controllers, a computer cannot function with an operating system.

The operating system also works as a liaison between the computer hardware and application software. An operating system helps you start an application, then it works "behind the scenes" while an application software is running to perform tasks essential to the efficient functioning of the computer system.

The names of the most popular microcomputer operating systems are FOS (Disk Operating System), Microsoft Windows, OS/2 and Mac OS, UNIX, VMS and MVS, LINUX are the familiar names of the operating systems used in mini or mainframe computers. Operating systems for micro, mini and mainframe computers perform many similar tasks.

- (9) **Computer Aided Design** : It is the design of the product by use of the computer software. There are several readymade tools available in computer systems to generate pictures. We will classify the pictures as geometrical objects which can be drawn using line segments, circles, curves, edipses, triangles etc. and as natural objects such as an elephant, and human face. Geometrical objects are easy to generate using the primitive operations available on a PC. Generating figures using line segments, circles etc. is known as vector graphics, vector graphics programs are used extensively to create engineering design drawings, generally called Computer Aided Design (CAD) tools. One of the most popular CAD tools is called AUTOCAD which allows viewing different aspects of an object such as top view, side view, frontal view, and a 3D perspective. The major advantages of tools such as AUTOCAD are :
- (i) Precise drawings to scale and control of colour.
  - (ii) Blending colous and shading
  - (iii) Ability to slowly rotate a 3D object view on the screen and make alterations as needed.

- (10) **E-Commerce** : It is the commercial activity performed by use of electronic media. The virtual world of business is E-Commerce. The Internet has inter-connected number of users creating a new world markets and new business opportunities.

E-Commerce is a commercial activity by using electronic media by executing business transaction such as contract ordering, invoicing payment on interactive electronic media. This refers to all types of transactions relating to commercial activities based on processing and transmission of digitized data, text, sound and images.

It is defined as any transfer involving some exchange of value over an Internet. The E-Commerce involves a user with a computer linked to the Internet which employs an Internet browser to contact web sites in order to exchange the value for goods or services or transfer of funds between accounts. The goods exchanged may be electronic documents, images and sound files. The electronic services may include ATM, Financial Planning, Online Games etc. The E-Commerce is used in number of fields such as –

- (i) Sharing of information
- (ii) Document exchange
- (iii) Messages dispatch
- (iv) Market and advertising
- (v) Payment transaction

It is used in wide areas of business and commercial applications. Some of the applications are :

- (a) **Web Site Development** : The website can be created for any business organization which contains the information of the organization, the products manufactured and the location, capacity etc. of the company. The website contains number of files having photograph and picture of the company products. It also provides information about the communications to be done with different departments.
- (b) **Online Training** : It is possible to provide training to the students by using the Internet and video conferencing system. The training can be given in various areas of engineering, science, medical etc.
- (c) **Shopping** : It is used for purpose of shopping where the products could be displayed and the information regarding the product can be provided. The orders could be accepted.
- (d) **Real Estate** : The e-commerce for real estate business is for display and choice of various properties and their locations.
- (e) **Customer Services** : It can be used for providing various services to the customers like the information about trains, buses, hotels etc. The e-mail service can also be provided.
- (f) **Medical Consultations** : It can be used for consultation of the expert doctor regarding the diagnosis.
- (g) **Online Library** : It can be used for the library in which online books could be provided and e-books could be obtained on the Internet.
- (h) **Online Banking** : It can be used for online banking services where the transactions of payment could be made on the Internet through the credit cards system.

The E-Commerce applications are :

- (1) **Business to business E-Commerce** : The Intranet can connect all businesses to one another regardless of their locations or positions the supply chain of Internet connections.
  - (2) **Business to consumer E-Commerce** : The connection of business houses or companies to consumer for display of their advertisement and marketing of their products.
  - (3) **Intra Company E-Commerce** : The new tools of E-Commerce such as TCP/IP connectivity and WEB browser have finally enable the building and sharing of information within the company. The intra company applications of WEB based technology are called intranets
- (11) **Webpage Development** : This is a development of customize marketing documents placed on the Internet site for the view of the customers. The World Wide Web (WWW, W3 or the Web for Short) is the most visual part of the Internet. It is also the fastest

growing part of the Internet which may be because it is so easy to access and explore. It is based on the display of Web pages, which are computer documents that can present text, graphics and sounds.

A Web page represents a single location on the Web. A Web site is made up of two or more interconnected Web pages presented as a unified place on the Web. A common term used on the Web is home page. This is the intended central or starting place on a Web site.

In 1989 Tim Banners Lee and his team in the European Laboratory for Particle Physics designed the present form of the documentation language and called it Hypertext Markup Language (HTML for short) which is a basic tool for designing Web page. It is a documentation language to mark the headings, title, table and forms.

The Web is visual, allowing you to see more than just text on your computer screen. For example, with the Web you can preview a piece of art and then download it, copying it to your computer.

You can still view written information as well, but text can be formatted in different ways to fit the overall presentation of the Web page.

The Web is an ideal medium for the transmission of multi-media information. With the click of a button you can download clip from your favorite movie or hear a snippet (to remove by cutting off) of audio from a famous radio address.

The Web's highly graphical nature makes it ideal for presenting artwork and photographic images. Pictures of family, friends and especially pets have become increasingly popular among Web creators.

Web pages also serve as an ideal medium for transferring computer software. Many corporate Web sites, for example, allow users to download free demonstration programs, add-on pieces, or upgrades to existing computer applications.

HTML and hyperlinks are the basis of web's versatility. Links on a web page can take the viewer to another place on the same web page or to different web page altogether. They can be links to images, or they can activate the transfer of digitized information such as video or audio clips. (Web links are also commonly known as hyperlinked) Hyperlinks can call up windows for sending e-mail, or even take the views to locations on the internet outside the web.

Hyperlinks are the easiest way to access information on the Internet. Hyperlinks are based on the principles of hypertext, which is a method of publishing that relies on interactive participation.



When a web page is developed the following are to be planned :

- (i) Content of the Page
- (ii) Appearance of the Page

The appearance of the web page is coded in HTML language using HTML tags.

- (12) Application Developers :** This is an area of software development of the commercial applications, business and engineering application. This is an area of application software. Application software helps you accomplish a specific task using the computer. It helps you produce documents, perform calculation, manage financial resources, create graphics, compose music, play games, maintain files of information, and so on.

Because there is such a vast amount of application software developed so far, it is helpful to classify it. One way to classify application software is to use these categories : Productivity, business, education, reference and entertainment.

Productivity software can be classified as follows :

- (a) **Electronic Mail Software :** provides you with a computerized mail box that collect documents or "mail" you receive electronically from other computer users. You can send electronic mail messages, you can read your electronic mail on your computer screen, you can save or throw away your electronic mail after you read it, and you can compose electronic replies to the mail you receive.
- (b) **Graphical Software** helps you draw pictures, 3-D images, and animations
- (c) **Desktop Publishing Software** provides you with computerized tools for page layout and design that combine text and graphics.
- (d) **Scheduling Software** helps you keep tracks of appointment, due date, and special dates such as birthdays and holidays.
- (e) **Word Processing Software** helps you produce documents such as reports, letters, papers, and manuscripts.
- (f) **Spreadsheet Software** is frequently used by financial analysis to examine investment opportunities, by managers to create budgets, by entrepreneurs to create business plans, and even by educators to keep track of student grades. It helps you work with numbers.
- (g) **Database Management Software** helps you work with facts and figures, particularly stored in database.
- (h) **Business Software** helps business and organizations efficiently accomplish routine tasks.
- (i) **Entertainment Software** transforms your computer from productivity and business to fun and games.

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- (j) **Education Software** is designed to help you learn more about a particular topic.
  - (k) **Reference Software**, such as an electronic encyclopedia, helps you look up facts on any topic.
  - (l) **Educational Simulations** let you work with a computerized model of something in the real world, manipulate it, and see what happens.
- (13) **Multimedia System** : These are the recreational systems used for entertainment, games, fun etc. Multimedia system is defined as an integrated collection of computer-based text, graphics, sound, animation, photo images, and video. It also refers to the integrated use of multiple media, such as slides, video tapes, audio tapes, records, CD-ROMs and Photos.

Computer technology is replacing or controlling many of the technologies and media that were previously used for multimedia presentations. Advances in computer technology have made it possible to combine text, photo images, speech, music animated sequences, and video into a single interactive computer presentation. To display realistic graphic and video, your computer system must have a high-resolution monitor and a CD-ROM drive.

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### 1.3 Advantages and Disadvantages of Information Technology :

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The information technology is the technology used for processing of information on the computer system. The use of computer system provides a large number of advantages for processing information.

#### **Advantages :**

- (a) The data can be stored permanently
- (b) Large number of calculation can be performed at very fast processing speed.
- (c) The degree of accuracy is very high
- (d) The operations like deletion of data, modification of data can be done very easily.
- (e) The operations of retrieval of data can be performed and the data can be searched immediately from the stored data.
- (f) The operations such as indexing or arranging the data is possible
- (g) The variety of functions can be utilized in the operations.
- (h) It allows for the decisions and logical comparisons.
- (i) It allows for creation of standard libraries.
- (j) It is possible to obtain the results in the formatted form.
- (k) It allows for production of graphics and aesthetics (the study of the nature of beauty).

The information technology revolution has occurred because of the above advances which are obtained in processing of data.

**Disadvantages :** The following are the important disadvantages:

**(1) Cost of Software/Hardware and Migration :** A significant disadvantage of information technology/system is cost. In addition to the cost of purchasing and/or developing the software, the hardware has to be upgraded to allow for the extensive programs and the workspaces required for their execution and storage.

An additional cost is that of migration from a traditionally separate application environment to an integrated one.

**(2) Problems Associated with Centralization :** Centralization also means that the data is accessible from a single source, namely the database. This increases the potential severity of security breaches and disruption of operation of the organization because of downtimes and failure. The replacement of monolithic centralized database by a federation of independent and cooperating distributed database resolves some of the problems resulting from failures and downtimes.

**(3) Complexity of Backup and Recovery :** While centralization reduces duplication, the lack of duplication requires that the database be adequately backup so that in the case of failure the data can be recovered. Backup and recovery operations are fairly complex in the information system management.

#### **1.4 Application of Information Technology :**

The Information Technology can be utilized in a large number of fields such as :

**(1) Railway Reservation System :** In this system the reservation records of the passengers are maintained for different trains and classes. The reservation system maintains the records of passenger name, age, destination etc. in database files.

**(2) Industries and Commerce :** The profitability being the prime motto, industries and commercial houses have exploited the use of computers to a large extent to achieve the aim. The versatility of the computers to handle a wide variety of situations, calculations and decision making capacity has been proved as a boon to the commercial world. The tremendous speed and accuracy which could be depended upon have been put to use effectively. The voluminous, tedious and repetitive arithmetic figures and operations involved in the commercial transactions were invariably source of monotony and fatigue for man.

The errors were common, therefore rechecking meant more time and effort and loss of profit. Since the computers have been loaded with these responsibilities the efficiency has increased beyond imagination.

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- (3) **Banks** : The Information Technology is used in the bank for maintaining the accounts of the saving and current accounts. These records are maintained in the files and the calculations of transactions can be done very easily. These are used for clearing of cheques and even counting of cash.
- (4) **Inventory Control** : Inventory Control is control of store records. The aim being to avoid the dead inventory, it would be highly desirable to have an all-time up-to-date information about the position of the stock of raw materials, finished, goods and semi-finished goods. The daily receipt of stocks have to be added to the books. The issue of raw materials for processing deducted from the stock and the stock at the end of the day is known to plan the future procurement. This involves tedious calculations and repetitive operation leading to monotony or errors. The use of computers for this purpose has been highly accepted by industries in general. The inventory costs have in fact been reduced considerably. By an up-to-date maintenance of inventory and purchases the industrial operations are stream lined for the higher efficiency.
- (5) **Production Planning and Control** : The computers have been the best aids to planning the production schedules. The client wise demand of the goods, production wise manufacturing requirements, item wise actual production, capacity wise manufacturing planning, various such combinations for planning the production control of and industry can be possible only if the computers come to rescue.
- (6) **Costing and Budgetary Control** : To achieve the goal of profit making in an industry, the control over manufacturing cost becomes an effective remedy. The industries having a series of manufacturing process, the product costing world involves a number of calculations and a range of decision makings. The computers can take up this job and provide the necessary costing figures to control the manufacturing costs. The budget of an industry world involve a number of factors like market behaviour, product demands, financial resources, man power costing and the management policies. The computers can provide useful database for an efficient budgetary control.
- (7) **Sales Analysis and Market Research** : The efficient marketing management of an industry can be supported by the information available by the computer in a variety of classification and combinations like data wise, item wise, party wise, product wise, territory wise and salesman wise sale figures. The computer can also prepare product invoices if required. This type of analysis can certainly become a strong base for marketing managers.
- (8) **Financial Accounting and Pay Roll** : The computers have become the most efficient tool in financial accounting and auditing. The entire book keeping is made through the computers. The preparation

of tax balances, profits and loss statements, financial balance sheet which used to take months for the account department, involving number of commerce figures and the scope for many other supporting information.

- (9) **Social and Educational Fields :** Along with the sale of computer in industries, it has entered the social and educational field of the society. The right from learning a simple programming language upto performing the most complicated calculations of space technology, the computers have become almost indispensable. The government organizations, educational institutes and research institutes have accepted computer for all their needs of data storage, processing and report retrievals. It is used for online training.
- (10) **Space Technology :** The assembling of space shuttles followed by an adequate quality control and testing is normally performed with the help of large computers in the space technology. Even the path control of space shuttles is done entirely through computer. Apart from this, number of information regarding atmospheric pressure, temperatures, movements of planet and all relevant information are stored in computer which helps in making the space program a success.
- (11) **Weather Forecasting :** The computers have extended their use in giving the exact weather forecasting for entire country. The computer stores all the data required about the pressure in air, temperature, hot currents etc. in its memory and supplies the daily forecast after proper calculations and certain logical decisions. The forecast can be possibility of rains, the temperature in different parts of country and trend of sea water regarding tide and ebb. The rain prediction helps the formers for better crops, saves fisherman from tide and temperature information is for the benefit of public in general.
- (12) **Manufacturing System :** It is used in operation of manufacturing systems. The computer can provide instructions to the manufacturing machine which performs the machining system operations according to the type of drawing supplied. The use of computer system allows animations, and alternate design being evolved.
- (13) **Crime Detection :** The computer has been proved as an effective tool in keeping track of perfect information regarding crime. The finger prints, the crime pattern, sequences of crime and the personal records of all professional criminals are stored in the computer storage when and incident of a fresh crime comes to the notice of authorities, the execution of crime is compared with that of the computer records. This helps in the detection of criminal, checking the past record of criminal and for preventive measures to control the crime level in a particular area. The Police Deptt., Central Bureau of Investigations, the Regional Forensic Laboratory are required with full fledged computer systems.

- (14) **Research** : It is used in scientific research to find new technologies, to obtain assessment of the experimental results. The number of scientific institutions are using large level mini computers for their scientific computations. Because of their basic characteristics of high speed in calculations and wide storage, computers can play a vital role for such institutions, in arriving at a required result.
- (15) **Government Organizations** : As the union and state government have a large setup of functions, computers can do a lot of them. Management Information System (MIS), for government is fully computerized, which provides upto date data for quick and correct decisions for police. The distribution system of sales supplies, financial control and budgetary systems are based upon the information provided by the mainframe computer systems installed at government offices.
- (16) **Recreation** : The computers have a variety of software for games and recreations. The games have been designed for all the level of people. This fact has made computer the most popular amongst all the age groups of people.

**Check Your Progress :**

1. Fill in the blanks with appropriate words:
  - (i) Management Information System is a tool used by ..... for improving the productivities.
  - (ii) E-Commerce is the ..... activity performed by use of electronic media.
  - (iii) The Control Unit, Arithmetic Logic Unit and ..... together form the Central Processing Unit (CPU) of the computer.
  - (iv) Database Management Software helps to work with facts and figures, particularly stored in .....
  - (v) Entertainment software transforms your computer from productivity and business to .....
2. Define Web page.

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**1.5 Let Us Sum Up :**

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- Information Technology is primarily concerned with acquisition, storage, processing and organization of data. It is also concerned with widely disseminating organized and processed data for use by people and organizations. In early days of IT, data mainly meant numbers and text. This has changed now. Now data in all forms numbers, text, graphics, audio and video are processed by computers toolstools.
- The hardware of the computer consists of different types of units such as memory devices, CPU, input and output devices. Networking of computers increases the utility of each computer as it can obtain

services of other computers and expensive peripherals attached to the network. Internet is a world wide network whose constituents are millions of smaller networks. In other words it is a network of networks. Operating system is an organized collection of programs that acts as an interface between machine hardware and the user providing the user with a set of facilities and maintenance of the program. Application software are developed for the specific area of application.

- The sharing of business information, maintaining business relationships and conducting business transactions using telecommunication networks is usually defined as E (Electronic)–Commerce.
- Multimedia refers to the integrated use of multiple media, such as slides, video tapes, audio tapes, records, CD–ROMs, and photos.
- Information Technology (IT) is profoundly affecting our day–to–day living. Computers are everywhere: in government offices, courts, businesses, public utilities, banks, homes etc. It is essential to be conversant with their applications and know how to use them to live in today's world.

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### 1.6 Answers for Check Your Progress :

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1. (i) Management, (ii) commercial, (iii) Memory Unit, (iv) database, (v) fun and games.
2. A Web page represents a single location on the Web. A Web site is made up of two or more interconnected Web pages presented as a unified place on the Web. A common term used on the Web is home page. This is the intended central or starting place on a Web site.

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### 1.7 Glossary :

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1. **Information Technology** : Information Technology may be defined as the technology which is used to acquire, store, organize and process data to a form which can be used in specified applications, and disseminate the processed data.
2. **Network** : A network is a communication system that enables computer users to share computer equipment, application software, data voice and video transmissions.
3. **Node** : Any device or entity or computer connected to a network is a node.
4. **Topology** : All networks have a physical layout that determines how the data signal goes from one node to the next. The physical layout is the topology of the network.
5. **Database System** : A database system is an integrated collection of related files along with details of the interpretation of the data contained therein.

- 6. Operating System :** A Operating System is the software that controls the computer's use of its hardware resources such as memory and disk storage space. The operating system also works as a liaison between the computer hardware and application software.
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**1.8 Assignment :**

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1. Define Information Technology : What is the difference between data and information ? Give an example of organizing data which allows human decision making.
  2. Discuss the different areas of Information Technology.
- 

**1.9 Activities :**

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1. What are the ways IT is affecting our day-to-day life ?
- 

**1.10 Case Study :**

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1. Explain applications of Information Technology.
- 

**1.11 Further Readings :**

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1. Jain, V.; MS Excel 2002–Training Guide, BPB Publication, New Delhi.
2. Lotia, M.; World2000–An Introduction, BPB Publication, New Delhi.
3. Rajaraman, V. (2004); Fundamentals of Computers, 4th Edition, Pentice–Hall of India, New Delhi.
4. Syganski; Introduction to Information Technology, Pearson Education, Delhi–110092.
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## INTERNET TOOLS

### **: UNIT STRUCTURE :**

#### **2.0 Learning Objectives**

#### **2.1 Introduction**

#### **2.2 Web Browsers**

#### **2.3 Web Server**

#### **2.4 Electronic Mail**

#### **2.5 Search Engines**

#### **2.6 World Wide Web**

##### **2.6.1 Web Pages**

#### **2.7 Internet Security**

##### **2.7.1 Types of Attack**

##### **2.7.2 Malicious Software**

#### **2.8 Let Us Sum Up**

#### **2.9 Answers for Check Your Progress**

#### **2.10 Glossary**

#### **2.11 Assignment**

#### **2.12 Activities**

#### **2.13 Case Study**

#### **2.14 Further Readings**

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#### **2.0 Learning Objectives :**

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**After going through this unit, you will be able to :**

- discuss about web-browsers and web servers
- learn to use e-mail
- define search engine
- learn the basics of the World Wide Web
- describe different issues of internet security

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#### **2.1 Introduction :**

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Internet is a kind of network that is built using wires or other wireless medium. It is not limited to a few places but is a network that is used worldwide, and hence can be called an international network or network of networks.

We browse through the Internet using a Web browser which is an application software used on the computer which we use to access the Internet.

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## 2.2 Web Browsers :

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A web browser (commonly referred to as a browser) is a software application for presenting and retrieving the information resources and traversing through the resources on the World Wide Web. The common web browsers are *Google Chrome*, *Firefox*, *Internet Explorer*, *Opera*, and *Safari*.

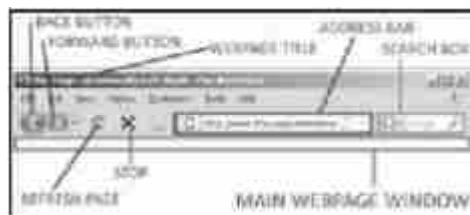
The first web browser was invented in 1990 by Sir Tim Berners-Lee. It was called World Wide Web and was later renamed Nexus.

**Homepage** is the webpage that your browser uses when it starts the webpage that appears every time you open your browser.



**Fig 2.1 Web Browsers**

The different parts of a Mozilla Firefox browser window are shown below :

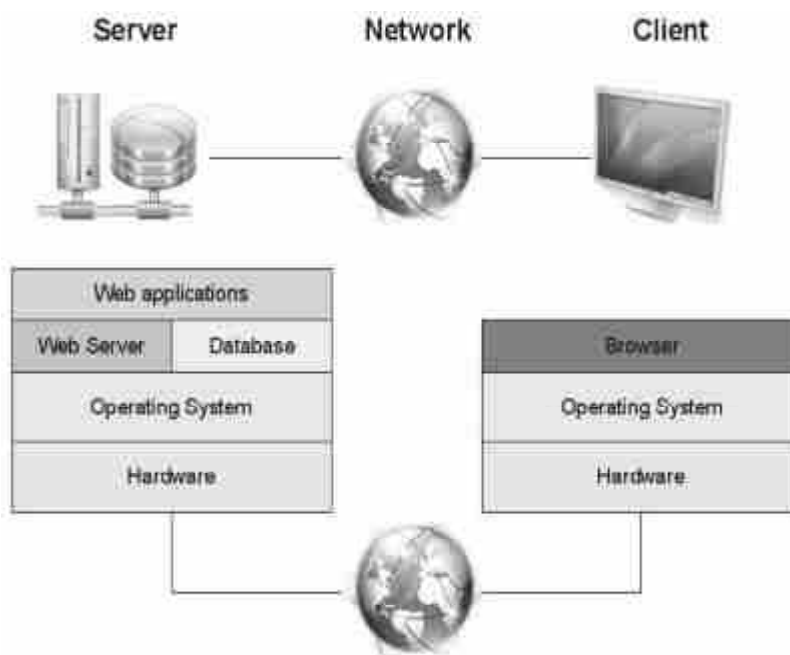


**Fig. 2.2 Browser Window**

- Each webpage has an address or URL. This is indicated in the *Address Bar*. If you want to open a webpage then you have to type its address on the Address Bar.
- Most web pages will have titles. You can check the title of the page by looking at the *webpage title*, it is also called title bar.
- The actual webpage itself is displayed in the Main Webpage Window. It is cut off in the picture above, but would normally fill most of the screen.
- You can reload a page by hitting the "Refresh" button. This will update it to the latest version of the page.

- If a webpage takes a long time to load you can stop loading it by hitting the "Stop" button.
- Through the "Search Box" you can search any term on the Internet.

In a network such as the World Wide Web, all the computers are divided into two categories: client and server. These web browsers are used while communicating with the web server in a network such as World Wide Web. A web client is software that accesses a web server by sending requests and processing the resulting response. The Fig. 2.3 shows how a web server and a web client is connected to a network and what components are actually held by them for communicating each other.



**Fig. 2.3 : A Web Server and a Client**

The web server is the computer on the Internet that stores the web pages, images and other web resources. When we click a hyperlink or type a URL into the web browser, a request for the web page is made by the web client to the web server. The server then receives the request and responds by sending the HTML page to the browser. The browser then interprets and displays the page.

The client-side processing is carried out by the **Web browser**. The browser consists of an interface and processing software. **Web browsers** are programs running on the client. They are called browsers because they allow the users to browse the resources available on the servers. We can search for and view different kinds of information on the Web with browsers. The main purpose of a web browser is to make the information resources in the Web available to the users. A browser allows you to view the documents written in HTML (Hyper Text Markup Language). These documents are called *web pages*.

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### **2.3 Web Server :**

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Server software runs exclusively on server machines, handling the storage and transmission of documents. In contrast, client software such as Netscape, Internet Explorer, etc. runs on client computer that access, translates and displays documents.

A web server is a software package that processes HTML documents for viewing by Web browsers that runs on client computers. Web servers can be run from any hardware platform. There are servers that are specifically designed for Macintosh computers, PCs, Silicon Graphics, and various other platforms, including the Amiga. It can also run under several operating systems, including MS Windows, Windows NT, Unix, Linux etc.

The web server is responsible for document storage and retrieval. It sends the document requested (or an error message) back to the requesting client. The client interprets and presents the document. The client is responsible for document presentation. The language that web clients and servers use to communicate with each other is called the Hypertext Transfer Protocol (HTTP). All web clients and servers must be able to speak HTTP in order to send and receive hypermedia documents. For this reason, web servers are often called HTTP servers, or HTTP Daemons (HTTPD).

#### **Check Your Progress – 1 :**

1. Distinguish between web server and web browser.
2. Explain the contents of web browser window.

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### **2.4 Electronic Mail :**

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Electronic mail, most commonly referred to as *email* or *e-mail* is a method of exchanging digital messages from a sender to one or more recipients. Modern email operates across the Internet or other computer networks.

Internet email messages consist of two major sections :

1. **Header :** Structured into fields such as From, To, CC, Subject, Date, and other information about the email.
2. **Body :** The basic content, as unstructured text; sometimes contains a signature block at the end. This is exactly the same as the body of a regular letter.

Common header fields for email include :

- **To :** This contains the email address or addresses and optionally names of the message's recipients.
- **Subject :** This contains a brief summary of the topic of the message.
- **Bcc (Blind Carbon Copy) :** This contains the addresses added to the delivery list but not (usually) listed in the message data, remaining invisible to other recipients.
- **Cc (Carbon Copy) :** This contains the addresses added to the delivery list listed in the message data.

**Message body –**

Most modern graphic email clients allow the use of either plain text or HTML for the message body at the option of the user. HTML email messages often include an automatically generated plain text copy as well, for compatibility reasons.

A typical e-mail window is shown below :



**Fig. 2.4 Email Window**

The text written in the message body part can be formatted; it means you can change the font size (text size), font type, make change the alignment of the text, can be converted to bold text or italic text etc. You can also attach another document along with the email written by you by clicking the button "*Add Attachment*". After composing the email click on the "**Send**" button to finally send it to destination and within a second it will be delivered to the recipient's mailbox.

Some examples of Email services are Gmail, Yahoo Mail, Rediff Mail, Hotmail etc among many others.

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## **2.5 Search Engines :**

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The Web is quickly becoming a vast information space that needs search tools to find information efficiently. The search engines can be defined as the tool created for finding, classifying and storing information about various Websites on the Internet. These can help in locating information of relevance on a particular subject by using various search methods.

A search engine is a service that indexes, organizes, and often rates and reviews Web sites. Search engines are online utilities that quickly search thousands of Web documents for an entered word or phrase. Search engines are usually accessed through Web browser software. Each search engine provides different searching options and has its own look.

A web search engine can also be defined as a software system that is designed to search for information on the World Wide Web. The search

results are generally presented in a line of results often referred to as search engine results pages (SERPs). The most commonly used search engines are shown below :



**Fig. 2.5 Examples of Search Engines**

You may wonder as to how the search engines find the answers to a query so quickly. Actually it is a four-step process and the steps are:

- **Crawling** : the Web, following links to find pages.
- **Indexing** : the pages to create an index from every word to every place it occurs.
- **Ranking** : the pages so that the best ones show up first.
- **Displaying** : the results in a way that is easy for the user to understand.

Given below is a list of important search engines which you can use for searching the web.

<b>Name</b>	<b>URL</b>
Google	<a href="http://www.google.com">http://www.google.com</a>
Yahoo	<a href="http://www.yahoo.com">http://www.yahoo.com</a>
Altavista	<a href="http://www.altavista.com">http://www.altavista.com</a>
Excite	<a href="http://www.excite.com">http://www.excite.com</a>
Hotbot	<a href="http://www.hotbot.com">http://www.hotbot.com</a>
Infoseek	<a href="http://www.infoseek.com">http://www.infoseek.com</a>
Lycos	<a href="http://www.lycos.com">http://www.lycos.com</a>
Northern Light	<a href="http://www.northernlight.com">http://www.northernlight.com</a>
Webcrawler	<a href="http://www.webcrawler.com">http://www.webcrawler.com</a>

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## **2.6 World Wide Web :**

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The **World Wide Web**– known as **WWW** or **W3** or simply, the Web – is one of several Internet resource discovery tools developed to help people publish, organize and provide access to information on the

Internet. The Web was first developed by Berners Lec in 1989 while working at CERN, European Particle Physics Laboratory in Switzerland, and has now become the most powerful, and popular, resource discovery tool on the Internet. The WWW can be defined as a hypertext, multimedia, distributed information system that provides links to hypertext documents, as well as to many other Internet tools and databases.

The most important things required to understand the underlying mechanism of the Web are the client–server architecture, the Hypertext Transfer protocol (HTTP), Universal Resource Locators (URLs) which we have already seen very briefly and the another important resource is Hypertext Markup Language (HTML). The most common method of creating a web document is through the use of Markup Languages. Most of these are created by adding a set of formatting code to ASCII text to show fonts, justifications, links, etc. on the web. A Markup language is a language that uses tags to indicate a change in presentation style or a change in content type.

By now, you can imagine that the web *documents* are referring to each other by *links*. This simple view is known as the *hypertext* paradigm. The reader sees on the screen a document with sensitive parts of text representing the links. A link is followed by mere pointing and clicking.

### 2.7.1 Web Pages :

A web page is nothing but a hypertext document which is suitable for the World Wide Web and can be accessed through a web browser and displayed on a monitor or mobile device. Web pages are usually written in HTML or XHTML and may contain static contents or dynamic contents. Web pages provide navigation to other web pages via *hypertext links*. Hypertext is a system of organizing, navigating, distributing and publishing information electronically. A web page of the website of Krishna Kanta Handiqui State Open University is shown below:



Fig. 2.6 Webpage of KKHSOU

### **Contents of a Web Page :**

A web page may contain various types of information, which can be divided into two main groups – perceived information (visible to the website visitor) and hidden information (hidden from the visitor's eye).

Depending on the purpose and target audience of a website, its perceived information could be textual, non-textual and interactive.

The non-textual information includes static images (e.g. GIF, JPEG, PNG or TIFF), animated images (e.g. animated GIF, Flash, Shockwave, Java Applet), vector formats (e.g. Flash, SVG), audio file formats (MIDI, WAV, MP3, Java Applets), video files (WMV, RM, FLV, MPG, MOV) etc. Interactive content on web pages could be displayed via DHTML, interactive illustrations, DHTML based buttons. *Hyperlink* or *link* is a navigational element in a web page through which navigation between the content on separate pages is possible.

The hidden information on web pages includes comments, metadata, charset details, CSS visual specifications, scripts (e.g. the interactivity focused JavaScript) etc.

Depending on the type of information contained in a web page, web pages can be divided into three categories:

- **dynamic web page**
- **static web page**
- **active web page**

A *dynamic web page* is a kind of web page that has been prepared with fresh information (content and/or layout), for each individual viewing. It is not static because it changes with the time (ex. a news content), the user (ex. preferences in a login session), the user interaction (ex. web page game), the context (parametric customization), or any combination of the foregoing.

A web page is **static**, if it does not change its behaviour in response to external actions. A static web page remains the same, i.e. static, for all its life, unless and until someone manually changes its contents. Examples of some static web pages are some home pages, page specifying the contact details, etc., which do not change that often.

An **active web page** is a web page that executes a program on the client machine, i.e. web browser. It means the web page shown by a web browser is the program currently executed by the client and hence that page is called an active web page.

### **Creating a Web Page :**

A web page can be created in many different ways. There are a lot of web pages created by simply using HTML code which are simple and not very interactive. Advanced web pages can be created by using a programming language which is also known as scripting languages, such as **JSP, PHP, Python or Perl**.



## How do web pages work ?

The information on a web page is displayed online with the help of a web browser, which connects with the server where the website's contents are hosted through the Hypertext Transfer Protocol (HTTP). For instance, if you look at the URL of the web page you are on at the moment, you could notice the prefix 'http://', which tells the browser what protocol to use to execute the particular URL request.

Each web page's contents are usually presented in HTML or XHTML format, which allows for the information to be easily structured and then quickly read by the client's web browser. With the help of CSS (Cascading Style Sheets), designers can precisely control the web page's look and feel as far as the layout typographic elements, colour scheme and navigation are concerned. CSS instructions can be either embedded within the HTML web page (valid for that particular page) or can be included in a separate external file (valid for the whole site).

### Check Your Progress – 2 :

1. Give the common header fields for email.
2. Explain in brief the working of a search engine. Also give an example.

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## 2.7 Internet Security :

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Internet security concerns with security to individual or computer from attacks related to the internet. Internet security is one of the biggest concerns of today's internet world. Internet allows us to exchange information through unsecure channels and this may cause attacks like identity theft, data theft among many other attacks. These attacks are present even though different data protection methods are being used like data encryption, digital signatures.

### 2.7.1 Types of Attack :

There are many different types of attacks. Let us look at the most common groups of attacks like passive attacks, active attacks, distributed attacks, close-in attacks and exploitation attacks by insiders.

**Passive Attack :** A passive attack includes monitoring traffic in the computer system to get important data or personal information like passwords. Passive attack results in disclosure of information to the attacker without the consent of the user.

**Active Attack :** In an active attack, the attacker tries to break into the defences of the computer systems. This type of attack can be implemented by using viruses, worms or Trojan horse and result in modification of data or denial-of-service attacks.

**Distributed Attack :** In this type of attack the attacker uses software like Trojan horse to get inside the computer and then this software is later distributed to other computer systems.

**Close-in Attack :** In close-in attack someone attempts to get physically close to network components, data, and systems in order to learn more about a network.

**Insider Attack :** In insider attacks someone from the inside intentionally steal or manipulate information, pass sensitive information to outsiders and deny access to authorised users.

### **2.7.2 Malicious Software :**

Some of the malicious software used in performing some of the above attacks to the computer system is listed below:

**Malware :** Malware is short for malicious software and are designed to damage a system. Examples are viruses and Trojan horses.

**Viruses :** One of the most well known Internet security problem, viruses is software program written to disrupt computer systems and steal or disrupt data.

**Worms :** Worms are more dangerous than viruses as they cannot be detected by anti-virus software. Worms replicate themselves and can spread themselves through the network to perform malicious tasks.

**Spyware :** Spyware refers to software that collects information about the user of a computer by monitoring its activities and sending the information to others without the users consent.

**Trojan Horse :** Trojan horse is a kind of software that pretends as harmless software but in reality steals data and damages the computer system.

### **Anti-virus Software :**

Viruses are the most common way to harm a computers security. Anti-virus software is a type of software that is used to protect the computer systems from any computer virus attacks from the internet world. Some of the most well-known anti-viruse software are:

- Norton Anti-virus
- Avast Anti-virus

### **Check Your Progress – 3 :**

1. What are the different type of internet attacks ?
2. Give two example of anti-virus software.

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## **2.8 Let Us Sum Up :**

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- A **web browser** is a software application for presenting and retrieving the information resources and traversing through the resources on the World Wide Web.
- **Homepage** is the webpage that your browser uses when it starts the webpage that appears every time you open your browser.

- A **web server** is a software package that processes HTML documents for viewing by Web browsers that runs on client computers. Web servers can be run from any hardware platform.
- **Electronic mail**, most commonly referred to as email or e-mail is a method of exchanging digital messages from a sender to one or more recipients.
- A web search **engine** can also be defined as a software system that is designed to search for information on the World Wide Web.
- The **World Wide Web**– known as **WWW or W3** or simply, the Web – is one of several Internet resource discovery tools developed to help people publish, organize and provide access to information on the Internet.
- In a network such as the **World Wide Web**, all the computers are divided into two categories: client and server. The client-side processing is carried out by the Web browser.
- A **web page** is nothing but a hypertext document which is suitable for the World Wide Web and can be accessed through a web browser and displayed on a monitor or mobile device. **Web pages** can be divided into three categories: dynamic web page, static web page, and active web page.
- Internet security concerns with security to individual or computer from attacks related to the internet. There are many different types of attacks like passive attacks, active attacks, distributed attacks, close-in attacks and exploitation attacks by insiders.

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## 2.9 Answers for Check Your Progress :

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### Check Your Progress – 1 :

1. A Web server is a computer that delivers (serves up) Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the <http://www.pcwebopedia.com/index.html> in your browser, this sends a request to the server whose domain name is pcwebopedia.com. The server then fetches the page named index.html and sends it to your browser. Web browser, a software application used to locate and display Web pages which is found on a client computer. The main function of the Web browser is to make the information resource available to the users. The two most popular browsers are Netscape Navigator and Microsoft Internet Explorer. Both of these are graphical browsers, which mean that they can display graphics as well as text.
2. The different parts of a Mozilla Firefox browser window are: Each webpage as an address or URL. This is indicated in the Address Bar. If you want to open a webpage then you have to type its address on the Address Bar. Most web pages will have titles. You can check the title of the page by looking at the webpage title, it is also called

title bar. The actual webpage itself is displayed in the Main Webpage Window. It is cut off in the picture above, but would normally fill most of the screen. You can reload a page by hitting the "Refresh" button. This will update it to the latest version. If a webpage takes a long time to load, you can stop loading it by hitting the "Stop" button. Through the "Search Box" you can search any term on the Internet.

**Check Your Progress – 2 :**

1. The common header fields for email include :  
**To** : This contains the email address or addresses and optionally names of the message's recipients. **Subject** : This contains a brief summary of the topic of the message. **Bcc (Blind Carbon Copy)** : This contains the addresses added to the delivery list but not (usually) listed in the message data, remaining invisible to other recipients. **CC (Carbon Copy)** : This contains the addresses added to the delivery list listed in the message data.
2. The working of a search engine is a four–step process and the steps are as follows : **Crawling** : the Web, following links to find pages; **Indexing** : the pages to create an index from every word every place it occurs; **Ranking** : the pages so that the best ones show up first; **Displaying** : the results in a way that is easy for the user to understand.

**Check Your Progress – 3 :**

1. The different types of attacks are : **Passive Attack** : A passive attack includes monitoring traffic in the computer system to get important data or personal information like passwords. **Active Attack** : In an active attack, the attacker tries to break into the defences of the computer systems. **Distributed Attack** : In this type of attack the attacker uses software like Trojan horse to get inside the computer and then this software is later distributed to other computer systems. **Close–in Attack** : In close–in attack someone attempts to get physically close to network components, data, and systems in order to learn more about a network. **Insider Attack** : In insider attacks someone from the inside intentionally steals or manipulates information, pass sensitive information to outsiders and deny access to authorised users.
2. Two example of anti–virus software are: Avast Antivirus and Norton Antivirus.

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**2.10 Glossary :**

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1. **Internet** : Network of Networks is called an Internet. The Internet can be defined as a network of globally connected computers.
2. **Web Browser** : A Web Browser is free client software that helps us to view web pages, graphics, and most online content.

3. **Home Page** : This is the default setting, or the page that opens up when we start the browser.
4. **Links** : This is the hypertext which, when clicked, connects us to another site or another page within the same site.
5. **Web Page** : This is the context that is on our screen at any given time. The information on the page can be viewed by scrolling up and down.
6. **Search Engines** : It is a type of software that helps us to search the Web by typing the topic name, which we are interested in.

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### 2.11 Assignment :

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1. What is a Search Engine and how does it work ?
2. What is an Electronic mail ? Describe the common header fields associated with an email.
3. What is Web server application ? How is it different from a Web browser ?
4. Explain internet security in brief.
5. Write short notes on the following :
  - (a) World Wide Web
  - (b) Email
  - (c) Search Engines
  - (d) Malicious Software

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### 2.12 Activities :

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1. Describe how the Web browser communicates with the web server.

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### 2.13 Case Study :

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1. Explain different available connection for the Internet.

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### 2.14 Further Readings :

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1. Jain, V.; MS Excel 2002–Training Guide, BPB Publication, New Delhi.
2. Lotia, M.; World2000–An Introduction, BPB Publication, New Delhi.
3. Rajaraman, V. (2004); Fundamentals of Computers, 4th Edition, Pentice–Hall of India, New Delhi.
4. Syganski; Introduction to Information Technology, Pearson Education, Delhi–110092.
5. Witherspoon; PowerPoint 2000 Fast & Easy, BPB Publication, New Delhi.



**: UNIT STRUCTURE :**

- 3.0 Learning Objectives**
- 3.1 Introduction**
- 3.2 Internet**
  - 3.2.1 Internet Architecture**
- 3.3 Evolution of Internet**
- 3.4 Basic Internet Terminologies**
- 3.5 Getting connected to Internet**
  - 3.5.1 Dial-Up Connections**
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- 3.11 Activities**
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**3.0 Learning Objectives :**

**After going through this unit, you will be able to :**

- define Internet
- describe the evolution of Internet
- illustrate the steps to getting connected to Internet
- describe the application of Internet

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**3.1 Introduction :**

Ever since the advent of computers, researchers have indulged in a continuous quest to bring the world closer through computers. This effort gave rise to the Internet. It is through the Internet that today millions of people communicate and share information, regardless of their location. This unit will focus on the basics of the Internet and also shed light upon how the Internet works along with its applications.

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### 3.2 Internet :

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The Internet can be defined as a **network of globally connected computers** that is **decentralized by design**. This definition can be broken down into three parts. Let's understand each part of the definition in isolation.

**It is a network :** A network is a collection of computers. The Internet can also be referred to as a network because it is a collection of millions of computers.

**Globally connected computers :** This means that you can be connected to the Internet, regardless of your location. The Internet has brought people in the world closer by connecting computers located in the remotest of locations.

**Decentralized design :** The Internet has a decentralized design. That is, there is no centralized body that controls the way in which the Internet functions. The Internet does provide online services that are centrally administered, but as a whole, it would not be incorrect to say that the Internet has a decentralized design. Each computer connected to the Internet is called a host. The operator user of a particular host can choose from the millions of available Internet services and can also make services available through the Internet.

You can consider Internet to have the following characteristics :

- A complex network – with simplified definition as a 'network of network'
- Disorganized – Internet can be cumbersome and confusing, even for experienced users
- A decentralized system – millions of individual networks and over 200 million individual computers connected through the world
- Composed of many billions of files (web pages).
- Dynamic – changing every minute of every day. On an average, a new network is connected to the Internet every 30 minutes.
- Expanding exponentially – the Internet is growing at the rate not less than 15% per month.

In order to access the Internet, one requires the following:

- A client computer with necessary hardware and client software
- Connectivity through Internet Service Provider (ISP) for flow of data
- Host computer(s) which is also called Web server hosting the desired
- Processor of Pentium (Intel based) or AMD or Macintosh
- Network Interface Card (NIC)

- Modem, it can be an external or internal (fitted inside the computer)  
The necessary software that must be found on the client computer is :
- Operating system like Windows, UNIX, LINUX or OS/2 etc.
- Web browser like Netscape, Internet explorer, Firefox etc. (it must be compatible with the operating system).

**Common methods of Internet access in homes include** dial-up, landline, broadband (ADSL) (**over coaxial cable, fiber optic or copper wires**), Wi-Fi, satellite and 3G technology cell phones etc. Let us now look at the architecture of the internet.

### **3.3.1 Internet Architecture :**

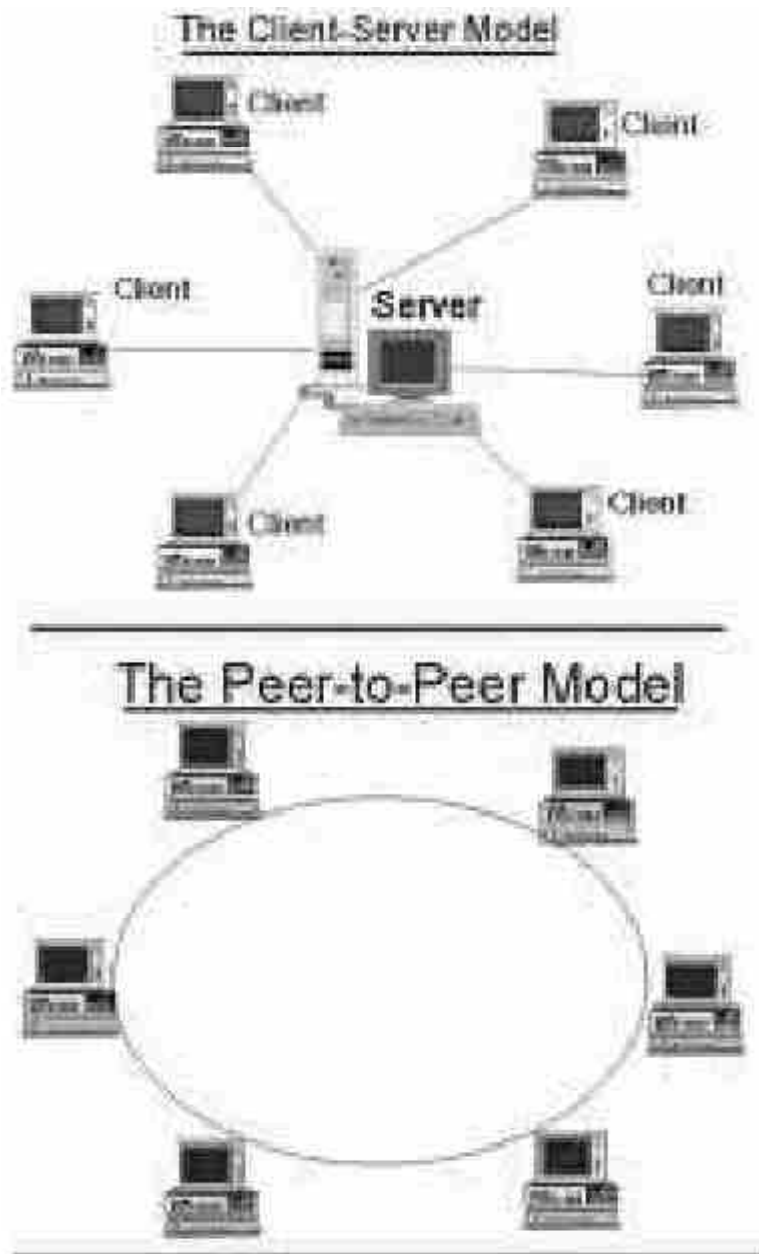
It is important to understand what the term "architecture" means. The notion of network architecture was introduced during the Internet research phase by the research community that had developed the Arpanet protocols. Network architecture is a set of high-level design principles that guides the technical design of the network, especially the engineering of its protocols and algorithms. There are two commonly used architectures in Internet technology and they are: peer-to-peer and client server architecture.

**Peer-to-peer :** Peer-to-peer is a communication model in which each and every node is capable of sharing information and can initiate a communication session. On the Internet, peer-to-peer (referred to as P2P) is a type of transient Internet network that allows a group of computer users with the same networking program to connect with each other and directly access files from one another's hard drives. **Napster** and **Gnutella** are examples of this kind of peer-to-peer software.

**Client Server :** The Client-Server Architecture is based on the principle where the client computer requests for some data and the data are sent by the server computer through the network. The concept of client/server computing has particular importance on the Internet because most of the programmes are built using this design. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources, such as files, devices, and even processing power.



The following figure shows the two architectures :



**Fig. 3.1 : Client Server and Peer-to-Peer Architecture**

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### 3.3 Evolution of Internet :

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The Internet was born in the 1970s in a small government project of the United States of America called the APRANET. The APRANET had many computers connected to each other through modems or leased lines and was aimed for exchange of data between computers using the technique of packet switching. In the 1980s a new concept was introduced where a worldwide network of interconnected TCP/IP networks existed simultaneously called the Internet Protocol Suite (TCP/IP). Later the TCP/IP network was allowed access to supercomputers for research purposes.

In the 1990s the APRANET was decommissioned and the Internet was fully commercialized, which led to the rapid growth of Internet in not only America, but also in other continents like Europe and Australia. At the same time, the Internet also spread through to Asia.

Another major for the growth of Internet came when the HTML, i.e. Hyper Text Markup Language and web browsers were developed. Together the HTML and browsers, software that helped people view web pages, graphics, and most online content, easily transformed the Internet.

Since the mid-90s many new Internet technologies were launched and well accepted which made the Internet even more popular. Some of these technologies are Email, VoIP, two-way interactive video calls, and the World Wide Web or Web in short. The Web with its collection of shopping sites, online databases, gaming websites, music and video sites, blogs, and discussion forums on any topic, instantly became popular and helped rose the Internet even more and to its present form.

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### **3.4 Basic Internet Terminologies :**

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Some basic internet terms and terminologies that are used more often than the others while using internet are:

**URL or Uniform Resource Locator** – Every website has a specific location or address.

**Web Browser** – We need web browsers to use the internet. A Web Browser is free client software that helps us to view web pages, graphics, and most online content.

**WWW, World Wide Web or Web** – World Wide Web as the name suggests is the interactive collection of hypertext pages linked to one another. They may include text, graphics and/or links to other spots in the Web.

**Homepage** – This is the default setting, or the page that opens up when we start the browser.

**Links** – This is the hypertext which, when clicked, connects us to another site or another page within the same site. In most cases, for better visibility the links are highlighted in blue or underlined.

**Web page** – This is the context that is on our screen at any given time. The information on the page can be viewed by scrolling up and down.

**Search Engines** – One of the most common uses of internet is to find information. This is done by using search engines. It is a type of software that helps us to search the Web by typing the topic name, which we are interested in. One of the most common examples of search engines is Google.

#### **Check Your Progress – 1 :**

1. Choose the correct answer
  - (a) In a peer-to-peer communication model a group of computers use
    - (i) Different network program
    - (ii) Same network program
    - (iii) None of the above

- (b) Internet is
- (i) Complex system           (ii) Decentralized system
  - (iii) Dynamic system       (iv) All of the above
- (c) Which is not an example of search engine?
- (i) Google                       (ii) KKHSOU website
  - (iii) Bing                       (iv) Yahoo
- (d) Give examples of two web browsers.
2. What do you understand by client–server architecture ?

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### 3.5 Getting connected to Internet :

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In order to connect to the Internet, one requires the following:

- A client computer with necessary hardware and client software
- The connectivity through Internet Service Provider (ISP) for flow of data
- Host computer(s) which is also called Web server hosting the desired data.

The necessary hardware devices that must be had on the client computer are :

- Processor of Pentium (Intel based) or AMD or Macintosh
- Network Interface Card (NIC)
- Modem, it can be an external or internal (fitted inside the computer)

The necessary software's that must be found on the client computer are :

- Operating system like Windows, UNIX, LINUX or OS/2 etc.
- Web browser like Netscape, Internet explorer, Firefox etc. (it must be compatible with the operating system)
- Common methods of Internet access in homes include **dial-up, landline broadband (ADSL)** (over coaxial cable, fibre optic or copper wires), **Wi-Fi, satellite and 3G technology cell phones.**

We will concentrate basically on the following methods

- dial-up connections
- ADSL connections and
- Cable Connections

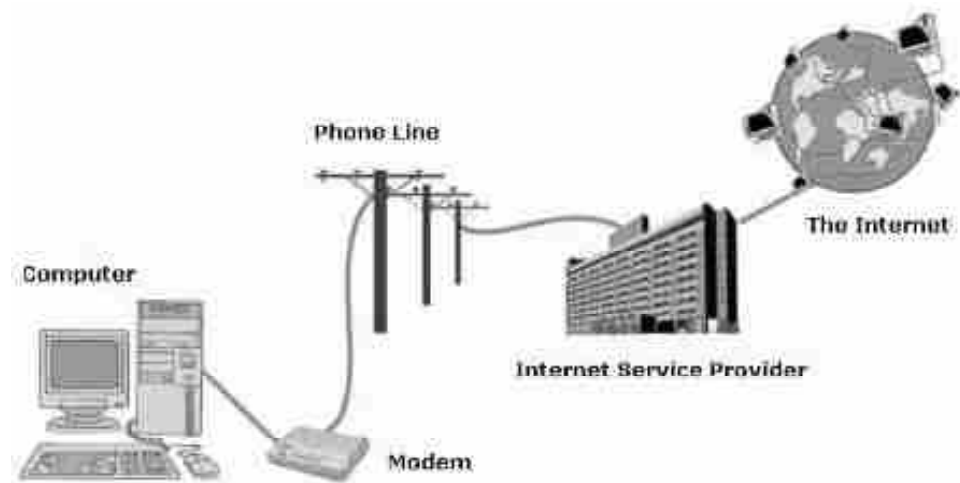
#### 3.6.1 Dial-Up Connections :

Dial-up connections is a type of Internet connectivity that operates through a standard telephone line. Before a person can subscribe to a dial-up service, he or she must have a computer and dial-up modem. A telephone line feeds into the modem. The modem is controlled by software in the computer; for example, the Network Connections utility that comes with Microsoft Windows operating systems. Here you can

setup a profile for the ISP (Internet Service Provider, like BSNL), which will tell the modem what phone number to call and how to communicate with the dial-up service. The ISP itself provides this information.

Upon joining a dial-up service, the subscriber chooses a username and password. Once the modem calls the phone number and makes a connection, a "handshake" takes place in which upon joining a dial-up service, the subscriber chooses a username and password. Once the modem calls the phone number and makes a connection, a "handshake" takes place in which information is exchanged between the computer modem and the remote server. The username and password are supplied by the modem. This grants the user an access through the dial-up gateway to the Internet. Dial-up connections can be very economic and are widely available; the cost per minute is comparable to that of a local phone call, or priced as a monthly plan which will include a certain amount of time. As these connections use a standard modem the hardware costs are minimal. Dial-up connections are very slow compared to other connection types. When connected to the internet the same phone line cannot be used for phone calls, so if anyone calls you when you are connected, they will get the busy signal.

Dial-up connections transfer data over an analogue line, so before the data is sent it has to be converted from digital to analogue, Likewise, when data is received it has to be converted from analogue to digital (this is what the modem does), This adds a performance overhead which affects the speed of the connection.



**Fig. 3.2 : Dial-up Connection**

### **3.6.2 ADSL Connections :**

ADSL (Asymmetric Digital Subscribers Line) connections are becoming more and more widely available and can provide an excellent Internet connection. The connections work by splitting your phone line into two separate channels, one for data (Internet) and other voice (phone calls), which means you can talk on the phone and be connected to the Internet at the same time.

You will often see ADSL connection services advertised as having different speed specifications. Given below are some common configurations:

256Kbps/128Kbps      or      512Kbps/128Kbps  
 1Mbps/256Kbps      or      2Mbps/512Kbps  
 8Mbps/1024Kbps

Notice that there are two values to each configuration. The first figure states the download speed and the second figure is the maximum upload speed. As an example let us take the second configuration 512Kbps/128Kbps. This means that you can potentially download data at a speed of 512Kbps and upload data at 128Kbps.

**Advantage of ADSL connections :** ADSL technology eliminates the need for a second phone line by allowing voice and data transfer at the same time (you can use the phone as normal while connected to the Internet). Because ADSL transfers data digitally, it eliminates the usual performance overhead associated with standard dial-up connections. In other words, ADSL doesn't need to convert the data from digital to analogue and back again.

**Disadvantage of ADSL connections :** ADSL connections are not available to everyone. You should always ensure that you have ADSL coverage in your area. The hardware costs can be quite significant as you will need a special ADSL modem and ADSL filters to use the service. Most ISPs allow you to hire these items which can reduce the initial cost. Because ADSL connections are always on you will need a firewall to protect your PC.

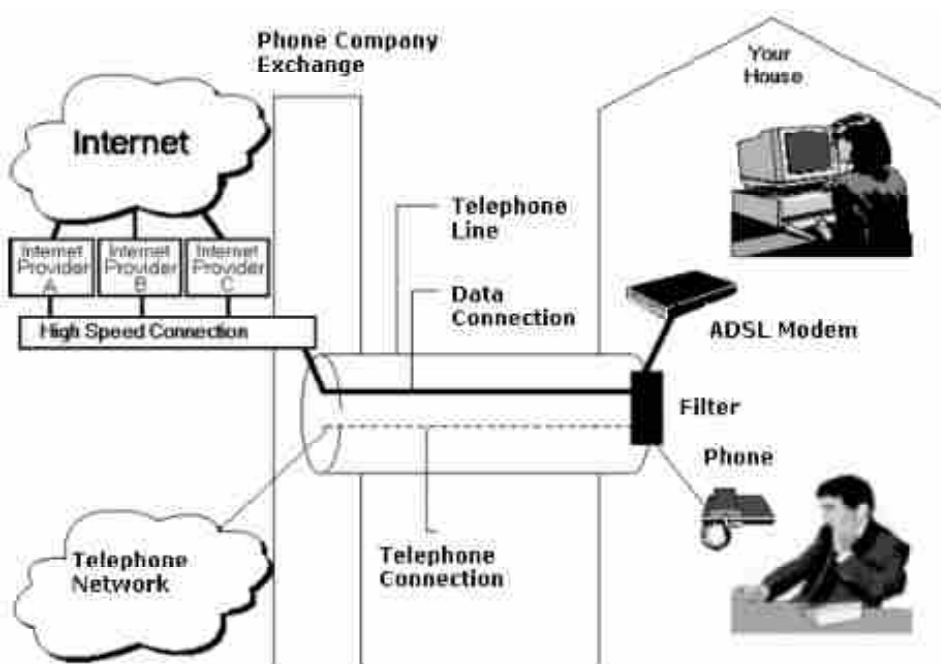


Fig. 3.3 : ADSL Connection

### **3.6.3 Cable Connections :**

Cable connections are considered one of the best types of Internet connection available to the home user because they offer very fast and reliable connections with a fixed monthly fee. Cable companies usually offer different packages to suit different Internet subscribers.

The different packages will offer different speed specifications and bandwidth limits. Because a cable connection uses a totally separate medium to transfer data it doesn't affect your ability to make/ receive phone calls.

**Advantage of Cable connection :** Speed is a major reason for having a cable connection. Like ADSL connections, cable connections transfer data digitally, eliminating any digital/analogue conversion overhead. Cable connections are always on, eliminating long waits to make a connection.

**Disadvantage of Cable connection :** Cable connections are not available in every area. You will need to contact the cable company of your choice to ensure that you have coverage.

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## **3.6 Application of Internet :**

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Internet is an interconnection of large number of heterogeneous computer networks all over the world that can share information back and forth. These interconnected network exchange information by using same standards and protocols. Now-a-days the application of Internet touches the every field of modern society. Let us briefly focus some of them.

**Email :** Email is now an essential communication tool in business. It is also excellent for keeping in touch with family and friends. The advantages to email is that it is free (no charge per use) when compared to telephone, fax and postal services.

**Information :** There is a huge amount of information available on the Internet for just about every subject known to man, ranging from government law and services, trade fairs and conferences, market information, new ideas and technical support.

**Services :** Many services are now provided on the Internet such as online banking, job seeking and applications, and hotel reservations. Often these services are not available off-line or cost more.

**E-Commerce :** The Internet is a very effective way to buy and sell products all over the world. Business houses use the Internet to provide product information, online support service, etc. Companies carry out online trading including advertising, selling, buying, distributing products, and providing after-sales services through the Internet.

**Communities :** Communities of all types have sprung up on the Internet. Institutions use the Internet for voice and video conferencing and other forms of communication that allow people to telecommute, or

work from a distance. It is a great way to meet up with people of similar interest and discuss common issues. Scientists and scholars use the Internet to communicate with colleagues, to perform research, to distribute lecture notes and course materials to students, and to publish papers and articles.

**Entertainment :** Entertainment is another popular reason why many people prefer to surf the Internet. In fact, media of Internet has become quite successful in trapping multifaceted entertainment factor. Downloading games, visiting chat rooms, online gaming or just surfing the Web are some of the uses people have discovered. There are numerous games that may be downloaded from the Internet for free.

**Check Your Progress – 2 :**

1. Choose the correct answer
  - (a) Dial-up connections are
    - (i) Very fast
    - (ii) Fast
    - (iii) Very slow
    - (iv) None of the above
  - (b) Dial-up connections transfer data over
    - (i) Analog line
    - (ii) Digital line
    - (iii) Both analog and digital
    - (iv) None of the above
  - (c) In ADSL connection data and voice
    - (i) Can be sent at the same time
    - (ii) Can send one at a time
    - (iii) Cannot be sent
    - (iv) All of the above
  - (d) Give examples of two web browsers.
2. Give an example of an application of internet.

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**3.7 Let Us Sum Up :**

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- The Internet can be defined as a network of globally connected computers that is decentralized by design.
- There are two commonly used architectures in Internet technology and they are : peer-to-peer and client server architecture.
- The APRANET had many computers connected to each other through modems or leased lines and was aimed for exchange of data between computers using the technique of packet switching.
- Dial-up connections is a type of Internet connectivity that operates through a standard telephone line.
- ADSL (Asymmetric Digital Subscribers Line) connections work by splitting your phone line into two separate channels, one for data (Internet) and other voice (phone calls), which means you can talk on the phone and be connected to the Internet at the same time.
- Cable companies usually offer different packages to suit different Internet subscribers.

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### 3.8 Answers for Check Your Progress :

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#### Check Your Progress – 1 :

1. (a) (ii) same network program,  
(b) (ii) decentralized system,  
(c) (ii) KKHSOU website,  
(d) Firefox and Internet Explorer
2. The Client–Server Architecture is based on the principle where the client computer requests for some data and the data are sent by the server computer through the network. The concept of *client/server* computing has particular importance on the Internet because most of the programmes are built using this design. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources, such as files, devices, and even processing power.

#### Check Your Progress – 2 :

1. (a) (iii) very slow,  
(b) (i) analogue line,  
(c) (i) can be sent at the same time,  
(d) Gmail from Google and Yahoo Mail from Yahoo Answer to
2. An important application of internet is **Email** : It is an essential communication tool in business. The advantages of email are that it is free when compared to telephone, fax and postal services.

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### 3.9 Glossary :

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1. **Web Client** : A web client is software that accesses a web server by sending requests and processing the resulting response.
2. **Web Server** : A web server and a web client is connected to a network and what components are actually held by them for communicating each other.
3. **E-Mail** : E-mail is a method of exchanging digital messages from a sender to one or more recipients.
4. **Malware** : Malware is short for malicious software and are designed to damage a system.
5. **Viruses** : One of the most well-known Internet security problem, viruses are software program written to disrupt computer systems and steal or disrupt data.
6. **Worms** : Worms are more dangerous than viruses as they cannot be detected by anti-virus software. Worms replicate themselves and can spread themselves through the network to perform malicious tasks.



7. **Spyware** : Spyware refers to software that collects information about the user of a computer by monitoring its activities and sending the information to others without the user's consent.

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**3.10 Assignment :**

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1. What is Internet ? Explain why Internet has a decentralized design ?
2. Define the terms Web page, Web browser, URL and Home page.
3. Differentiate between the dial-up and ADSL Internet connection.
4. Differentiate between the ADSL Internet connection and cable Internet connection.
5. What is an Electronic mail ? Describe the common header fields associated with an email.
6. Write short notes on the following :
  - (a) Dial-up connections                      (b) ADSL connections
  - (c) Uniform resource locator            (d) WWW
  - (e) Web browsers

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**3.11 Activities :**

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1. There are many application areas of Internet. Identify four of them and describe two of them.

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**3.12 Case Study :**

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1. Discuss about e-mail with its all components.

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**3.13 Further Readings :**

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1. Jain, V.; MS Excel 2002–Training Guide, BPB Publication, New Delhi.
2. Lotia, M.; World2000–An Introduction, BPB Publication, New Delhi.
3. Rajaraman, V. (2004); Fundamentals of Computers, 4th Edition, Pentice–Hall of India, New Delhi.
4. Syganski; Introduction to Information Technology, Pearson Education, Delhi–110092.
5. Witherspoon; PowerPoint 2000 Fast & Easy, BPB Publication, New Delhi. :



**: UNIT STRUCTURE :**

- 4.0 Learning Objectives**
- 4.1 Introduction**
- 4.2 Concept of MIS**
- 4.3 Information Security and Control**
- 4.4 Quality Assurance**
- 4.5 Ethical and Social Dimensions**
- 4.6 Intellectual Property Rights as Related to IT Services/IT Products**
- 4.7 Managing Global Information Systems**
- 4.8 Let Us Sum Up**
- 4.9 Answers for Check Your Progress**
- 4.10 Glossary**
- 4.11 Assignment**
- 4.12 Activities**
- 4.13 Case Study**
- 4.14 Further Readings**

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**4.0 Learning Objectives :**

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**After going through this unit you will be able to :**

- discuss information security and control
- learn quality assurance
- describe ethical and social dimensions
- discuss Intellectual property rights as related to IT services/IT products
- discuss managing global information systems

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**4.1 Introduction :**

In the previous unit we have learnt about managing IT functions in an organization. In this unit, we will learn about how information security and control is important in an organization, the meaning quality assurance, social and ethical dimensions needs to be considered in an organization, discuss the intellectual property rights as related to IT products and how does it help the organizations, the different challenges that businesses have to face while managing global information system.

Information Technology and computers have changed business processes and the way businesses operate. Thus in this Information Age,

"Information" has emerged as one of the most valuable and sought after resource conferring competitive advantage on the organizations using it. Information systems has helped the organizations to have a competitive edge over their competitors in terms of cost savings, increased productivity and revenue gains. This has raised certain issues in the areas of security, privacy, confidentiality, destruction and theft of information and information systems. These security threats can be from both internal and external sources. Thus industries need to keep their information secure. It is interesting to know that according to various studies as much as 80–95% of the security threats come from internal networks. Thus, in other words in today's business information security and control is very important.

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#### **4.2 Concept of MIS :**

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Management Information Systems (MIS) is the study of people, technology, organizations, and the relationships among them. MIS is a people-oriented field with an emphasis on service through technology.

Let us discuss MIS in the following ways :

To the managers, MIS is an implementation of the organizational systems and procedures.

To a programmer it is the dealing with file structures and file processing.

As MIS stands for Management Information System , we discuss the three terms in this way that **System** suggests integration and holistic view, **Information** stands for processed data, and **Management** is the ultimate user, the decision makers.

Management information system can thus be analyzed as follows :

- Management covers the planning, control, and administration of the operations of a concern. The top management handles planning; the middle management concentrates on controlling; and the lower management is concerned with actual administration.

#### **Information :**

- Information, in MIS, means the processed data that helps the management in planning, controlling and operations. Data means all the facts arising out of the operations of the concern. Data is processed i. e. recorded, summarized, compared and finally presented to the management in the form of MIS report.

#### **System :**

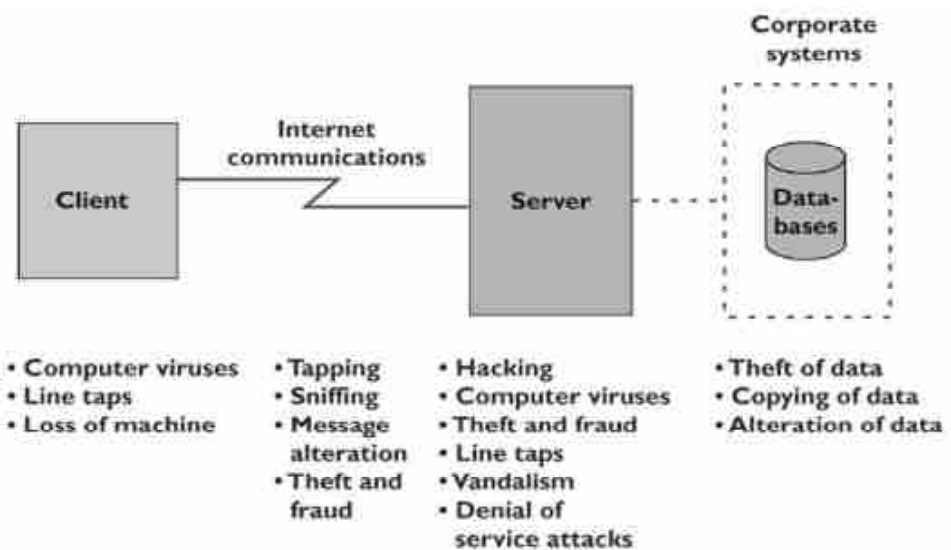
- A system is made up of inputs, processing, output and feedback or control.

Thus MIS means a system for processing data in order to give proper information to the management for performing its functions.

**4.3 Information Security and Control :**

The term Information Security refers to the policies and procedures that are used to protect the data and information systems from unauthorized access, use, disclosure, modification and destruction of data. Control refers to the methods and procedures that are used to ensure the safety of the organization's assets, the accuracy and reliability of the data and operational adherence to the organizational standards.

Businesses deal with large amounts of data and when such data and information are stored in electronic form and are accessible over networks they become vulnerable to different kinds of threats. The figure below shows some of the most common threats to information systems.



**Fig. 4.1**

In a client-server environment, as illustrated in the above figure, security challenges and vulnerabilities can occur at each of the client, server and the corporate database access points and also in the communication between these layers. On the client side the system may be used without authorization, or the user may introduce some errors. The system may be hacked and vital information may be stolen or altered. Some crackers also attack the systems of the organizations to bring them down and make them ineffective. Both hacker and a cracker intends to gain unauthorized access to the computer systems but a cracker is a hacker with a criminal intent. Cyber vandalism is also another threat to the organizations. It is a type of malicious behavior that causes damage to data and computers and potentially disrupt the services of the organizations.

Even during transmission of data over the networks the data may be destroyed or altered. As the systems nowadays are highly networked, they are constantly at a threat from malicious softwares. These malwares poses a variety of threats such as virus, worms and Trojan horses. Viruses and worms may infect data and programs in the computers and cause heavy damage to organizations. They may enter the system from the downloaded files from Internet, from emails or instant messaging or from

infected machines. Spywares and Keyloggers are also posing threats to the organizations. Power failures and natural disasters like flood, fire or others may also disrupt the normal functioning of a computer system. The growing use of smart phones by corporate executives is adding to the problem of information security as these networks are more vulnerable. There is a greater risk of information security if the organization network is a part of the Internet.

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#### **4.4 Quality Assurance :**

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Information is an organizational resource. Quality of information in an organization is very important for the proper functioning of the organization. The increased information requirement day by day has also increased the responsibilities of the quality assurance departments. Low quality information will adversely affect the performance of the organization as it directly affects the decision making. Therefore the quality assurance of information products is critical. Quality refers to offering the information service in a way that meets the organizational needs.

Quality assurance generally means any systematic process of checking whether the product or service that is developed is meeting the specified requirements or not. There are management as well as users duties to quality control and assurance.

The management information system control and quality assurance duties includes the approval of the information system plan and budget, major software and hardware systems approval and the information systems procedures for quality assurance and control.

Quality assurance duties of the users are as participants in application and database development and maintenance. This requires knowledge of the context data. That is the users should be able to identify the invalid data.

In the present competitive world, customers are the kings and every organization is striving to give better quality products and services to attract the customers. A quality product means that product is better than the other similar products in the market. Companies with better quality products can gain a competitive edge over other companies in the market. However from information point of view quality means focusing on the production and delivery of timely, accurate and reliable information. Japanese companies have emphasized product/service quality in their organizational processes through total quality management (TQM). According to Edward Deming, who coined this term, it is just not a technique of quality control but a philosophy of quality management where every organizational member is involved.

The basic beliefs that provides the foundation of TQM are

- i. Quality is defined by customers
- ii. It is achieved by the management
- iii. It's the whole organization's responsibility.

Quality assurance is a significant issue and there are many conditions for quality control: organizational commitment to quality, processing the information according to operations of the organization and quality of the applications that are used in the organizations should be maintained

**Check Your Progress – 1 :**

• **Fill in the blanks :**

1. A ..... is a hacker with a criminal intent.
2. Policies and procedures that are used to protect the data and information systems from unauthorized access, use, disclosure, modification and destruction of data is .....
3. During transmission of data over the networks the ..... may be destroyed.
4. Viruses and ..... may infect data and programs in the computers and cause heavy damage to organizations.
5. .... generally means any systematic process of checking whether the product or service that is developed is meeting the specified requirements or not.
6. .... is a philosophy of quality management where every organizational member is involved.

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**4.5 Ethical and Social Dimensions :**

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With the changes in the field of Information Technology and greater use of computers in the organizations, there has been a significant change in the nature of the work which has given rise to social and ethical issues. Today's managers are concerned much about the social and ethical dimensions as they emerge from the societal context. Information system is a part of the societal system. Both these dimensions are interrelated. Let's discuss each separately.

1. **Ethical Dimension :** Ethics are the principles that govern the behavior of a person or an organization for conducting any activity. It is thus concerned with what is right or wrong in the behavior. Ethics in Management Information Systems seeks to safeguard individuals and society by proper use of technology. Ethical dimension is important to consider for the managers to take any decisions because many things are related to use of information systems in organizations. Ethical dimensions include obligations to management, society, and employer and also the country. New ethical questions are being raised by use of information systems as they have created various opportunities. Improvement in technology has helped the society to progress but at the same time the number of crimes has also increased which in turn has threatened the cherished social values.

Advancement in networking and information technology has given rise to two types of ethical issues which pose challenges to those who are concerned with information systems.

- Privacy rights
- Intellectual property rights

Information technology allows the information to be gathered, stored, combined and shared on a scale never seen before. It has changed the dynamics of organizations.

Mason foresaw two threats to privacy: growth of Information technology and increased value of information in decision making. Privacy rights in case of organizations are concerned with the employees, customers, suppliers, financiers and share holders. It means their privacy should be free from interference and surveillance from other individuals or organizations. Internet cookies monitor the actions of the users in the Internet, and there is the Customer Relationship Management software that allows the companies to keep a track of the detailed behavior of the users. There is a saying the Information is Power. According to Simon, increase in information reduces uncertainty. Thus increase in global competitiveness among the companies has made the value of information increasing day by day. Thus, the information technology has threatened the privacy rights by making the invasions cheap, effective and profitable.

Intellectual property is the creations of human minds or organizations. Such properties are in the form of patents, copyrights and trade secrets. As per the Intellectual property rights, the creator of the intellectual property has the sole right to use that property.

**2. Social Dimension :** Social dimensions involve all those areas which affects the society as a whole. There is tremendous growth in business and the companies such as Facebook, Google and others would not have existed without information technology. Basically there are three social issues that are of concern.

- Employment challenges
- Quality of the work life
- Health issues

Information technology is both a boon and a bane to the society. Society has much progress in different fields due to the introduction of information technology but at the same time it has also created unemployment problems. Computers have replaced man in jobs.

Quality in work life has also been affected. Social isolation and self estrangement has emerged from Information technology. The social bonding between people has loosened and gadgets has found a prime place in family leisure times. Virtual office concepts has created lack of belongingness among the employees. There has also developed a psychological fear amongst the employees of losing their jobs.

Extensive use of computers in work place has caused many health related problems like stress, eyes strain, radiation exposure, blood pressure, blood sugar related problems and others.

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#### **4.6 Intellectual Property Rights as Related to IT Services/IT Products :**

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Intellectual property are created using the knowledge gained by people in their areas and Intellectual property rights means those individuals who have created such property has the sole right to use them. Thus, property that is the result of thought, namely intellectual activity, is called Intellectual property. It stimulates and promotes future creativity. Intellectual property law also attempts to checks that the owner's right to reap the rewards of their efforts are balanced against the public need for a competitive market.

There is no doubt that the extensive use of information technology in the companies and institutions has led to increased competition in the global market which in turn has led to availability of better quality products and services in the market. However, this also has led to invasion of the intellectual property rights. The contemporary software poses severe challenges to such rights and has created social and ethical issues. With digitalization, it has become much easier for things to be altered, replicated and transmitted over the digital mediums. Piracy has become common today because of the ease of doing things with Internet.

Certain rights are granted by Intellectual property rights. For example, authors can prevent others from copying their books, and the owner of a patented invention can prevent others from making, using or selling the product.

After a period of time, these exclusive rights may be lost or taken from the owner and given to the public. Globalization, digital data and Internet have all contributed to a greater need. However, the intellectual property rights do not prevent anyone from stepping on the owners' rights but does give the owner the right to take the trespasser to the court. The owner acquires exclusive rights and can file a lawsuit to stop others who use the property without authorization.

There are different areas of intellectual property protection.

- Copyrights
- Patents
- Trade marks

**1. Copyrights :** Copyright is a statutory grant that protects the expression of literary or artistic works. It is granted to the authors of original work including literary, dramatic, musical, artistic and other works. So books, songs, jewelry, play, movies, sculptors, paintings, choreographic works and even computer software can be protected by copyright. Copyright protection is also available for marketing materials, advertising copy and cartoons. Nevertheless some works



like titles, names, short phrases, ingredients list are not protected by copyright. Also copyrights do not protect ideas or facts; it protects only the unique way in which the ideas or facts are expressed. For example, copyright may protect an author's science fiction novel about the conversation between a human and a space alien but the author cannot stop others from using the underlying idea of such intergalactic conversations.

In case of individuals it protects their works from copying by others for whatsoever reason during their lifetime and also an additional 70 years after their death. For corporate owned works the copyright is for 95 years. The Copyright Act, 1957 which been amended by Copyright Amendment Act, 2012 governs the copyright law in India. The Copyright laws have been made so as to encourage creativity and authorship by ensuring that such creative minds receive the financial benefits from their works. In 1980, the Computer Software Copyright Act was passed. This act provides for protection of the software codes and for copies of the original sold in the market. This act is covered under the Copyright Act 1957.

- 2. Patents :** Patents are exclusive rights granted for inventions for a minimum period of 20 years from the date of filing the patent. It gives right to the patent holder to prevent others from selling and making the patented invention for such period. The main intention behind patent provisions is to ensure that the inventors get the full benefit, both financial and others, and also to make use of their inventions by providing details to those who wanted to use their inventions by getting a license from the patent's owner.

Generally, patents are of three types: utility, design and plant patents. Referring to patent commonly refers to the Utility patent, which allows the creator of an invention to stop others from making, using or selling that invention for the patented time.

Design patents include the patents for new and original designs that ornament a manufactured article. For example, new shape of a car or flashlight would qualify for design patents. Plant patents are the least frequently used type of patent – granted for any new asexually reproducible plants (such as flowers or plants reproducible by grafting or cloning).

- 3. Trademark :** A trademark is any distinctive sign that is used to differentiate the goods and services of one company from others. It may be a word, phrase, logo, graphic symbol or any other sign that identifies a business goods and services from the others. An important goal of trademark is to prevent the customers from being confused in the marketplace. Another goal of trademark law is to prevent a business from trading off another business's goodwill. A trademark is used for the marketing of a product.

Trademarks provide guarantee of quality and consistency of the product and service that they identify. A great amount of time, effort and money is spent by the companies in gaining the confidence of the consumers on their marks.

In addition to words, trademarks can also consists of slogans, as shown in the example below for McDonald's.



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#### **4.7 Managing Global Information Systems :**

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Information technology is playing an important and increasingly significant role in the world wide marketplace. Radical changes have occurred in the organizations due to new technologies. Majority of the world's large organizations are now engaged in international business activities and are earning great profits out of it.

A global information system refers to an information system which collects data, processes, stores and distributes data in a global context. Multinational organization uses global information systems to manage the information requirement of its international businesses. The needs of business survival and the urge to expand to new markets are some of the reasons that the organizations are becoming global. Today the international businesses have adopted the concept of "Think Globally, Act Locally". The strategic planning of such organizations should be global followed by a local flavor. By branching out to doing business in many countries, the businesses can continue growing and at the same time reduce the risks that it might face, even if conditions in one country change drastically.

When implementing information systems globally, the organizations have many objectives and face challenges in doing so. There are many challenges in political, geographical, economic and cultural dimensions that the businesses have to face to grow and sustain in the global marketplace.

Some of the challenges of the global information systems may be indicated as given below :

- Technological barriers
- Regulations and Tariffs
- Electronic payment mechanisms

- Different measurement standards
- Culture and language
- Time and distance
- Currency and legal barriers

Different business strategies are adopted by the organizations to operate global business. Such strategies are basically related to the control and decision-making. Proper strategy is important for a company to function effectively in different countries and thus strategies needs to be developed effectively to manage them effectively.

Although many different strategies can be followed when involving in international businesses, three most important are global strategy, multinational strategy and international strategy.

The multinational strategy is used when the company is involved in a number of markets beyond its home country. For each country the strategy should be different because of the difference in the demands of the customer needs and the competition in that market. In multinational strategy, the company believes in centralized financial powers but decentralization of production, marketing, sales etc. the companies in such strategy take the advantage of the resource availability and the market potential. Examples of companies using such strategy are Hewlett-Packard, Intel, General Motors etc.

The International strategy has been designed for the home market but it is also considered suitable for the international markets. International food companies such as McDonald's, Kentucky Fried Chicken (KFC) and Coca-Cola fits into this type. Such companies develop their products in the mother country and then market, and even produce the goods globally through franchisees or their own production units.

In the global strategy, the companies treat the world as one market and one source of supply with a little variation. These are transnational in approach.

**Check Your Progress – 2 :**

- **Fill up the blanks :**
  - a. Principles that govern the behavior of a person or an organization for conducting any activity are .....
  - b. Ethical dimensions include ..... to management, society, and employer and also the country.
  - c. Two types of ethical issues are and .....
  - d. Two threats to privacy according to Mason are ..... and ..... in decision making.
  - e. Increase in information for decision making reduces .....
  - f. .... is the creations of human minds or organizations.

- g. .... is granted to the authors of original work including literary, dramatic, musical, artistic and other works.
- h. Computer Software Copyright Act was passed in .....
- i. Three types of patents are ....., ..... and .....
- j. A ..... is any distinctive sign that is used to differentiate the goods and services of one company from others.

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**4.8 Let Us Sum Up :**

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In this unit we have learned the following :

1. Information Security refers to the policies and procedures that are used to protect the data and information systems from unauthorized access, use, disclosure, modification and destruction of data.
2. Control refers to the methods and procedures that are used to ensure the safety of the organization's assets, the accuracy and reliability of the data and operational adherence to the organizational standards.
3. Hacker and a cracker intend to gain unauthorized access to the computer systems but a cracker is a hacker with a criminal intent.
4. Viruses and worms may infect data and programs in the computers and cause heavy damage to organizations.
5. Quality of information in an organization is very important for the proper functioning of the organization
6. Quality assurance generally means any systematic process of checking whether the product or service that is developed is meeting the specified requirements or not.
7. Japanese companies have emphasized product/service quality in their organizational processes through total quality management (TQM).
8. Edward Deming had coined the term total quality management
9. Ethics are the principles that govern the behavior of a person or an organization for conducting any activity
10. Ethical dimensions include obligations to management, society, and employer and also the country.
11. Two types of ethical issues which pose challenges to those who are concerned with information systems are Privacy rights and Intellectual property rights
12. Mason foresaw two threats to privacy: growth of Information technology and increased value of information in decision making.
13. Intellectual property is the creations of human minds or organizations. Such properties are in the form of patents, copyrights and trade secrets.
14. Intellectual property rights mean those individuals who have created such property has the sole right to use them.

15. Intellectual property law also attempts to checks that the owner's right to reap the rewards of their efforts are balanced against the public need for a competitive market.
16. Copyright is a statutory grant that protects the expression of literary or artistic works. It is granted to the authors of original work including literary, dramatic, musical, artistic and other works.
17. The Copyright Act, 1957 which been amended by Copyright Amendment Act, 2012 governs the copyright law in India.
18. Patents are exclusive rights granted for inventions
19. Patents are of three types: utility, design and plant patents
20. A trademark is any distinctive sign that is used to differentiate the goods and services of one company from others. It may be a word, phrase, logo, graphic symbol or any other sign that identifies a business goods and services from the others.
21. Multinational organization uses global information systems to manage the information requirement of its international businesses
22. There are many challenges in political, geographical, economic and cultural dimensions that the businesses have to face to grow and sustain in the global marketplace.
23. Three most important different strategies when involving in international businesses, are global strategy, multinational strategy and international strategy.

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#### **4.9 Answers for Check Your Progress :**

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##### **Check Your Progress – 1 :**

1. cracker
2. Information Security
3. data
4. worms
5. Quality assurance
6. Total Quality Management

##### **Check Your Progress – 2 :**

- a. Ethics
- b. obligations
- c. Privacy rights, Intellectual property rights.
- d. growth of Information technology, increased value of information
- e. uncertainty
- f. Intellectual property.
- g. Copyright
- h. 1980
- i. utility patent, design patent and plant patent
- j. trademark

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#### **4.10 Glossary :**

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1. **Information Security :** Information Security refers to the policies and procedures that are used to protect the data and information systems from unauthorized access, use, disclosure, modification and destruction of data.

2. **Control** : Control refers to the methods and procedures that are used to ensure the safety of the organization's assets, the accuracy and reliability of the data and operational adherence to the organizational standards.
3. **Quality Assurance** : Quality assurance generally means any systematic process of checking whether the product or service that is developed is meeting the specified requirements or not.
4. **Copyrights** : Copyright is a statutory grant that protects the expression of literary or artistic works.
5. **Patents** : Patents are exclusive rights granted for inventions for a minimum period of 20 years from the date of filing the patent.
6. **Trademarks** : A trademark is any distinctive sign that is used to differentiate the goods and services of one company from others.

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**4.11 Assignment :**

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1. Why information security and control is important in an organization ?
2. What do you mean by the quality of information ? How can quality assurance help organizations in having a competitive edge over other companies ?
3. Explain why companies expand beyond a country's border.

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**4.12 Activities :**

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1. 'Globalization has posed new opportunities as well as challenges.' Explain this statement.

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**4.13 Case Study :**

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1. Discuss and differentiate Intellectual Property Protection and also give appropriate example.

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**4.14 Further Readings :**

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2. 'Management Information system', McGraw Hill, James O'Brien, George M Marakas, ramesh Behl
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5. Parameswaram, R., Computer Applications in Business.
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**BLOCK SUMMARY**

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The block has given details of information technology, detail of the area where the information technology is going to be used. You have learnt about the Internet as it is network of several networks. Various Internet tools are available like Web Browser, Web Server, E-Mail, Search Engines, World Wide Web and Internet Security so using which we learnt how actually all task is carry on.

The block has given idea about Management Information System as well how and when all information is processing, what security measure should be considered and what quality should be provided because quality assurance is area in which it is going to check that system is as per requirement or not.



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## **BLOCK ASSIGNMENT**

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### **Short Answer Questions :**

1. What do you mean by the Internet architecture? Describe the most commonly used Internet architecture.
2. Describe in brief the evolution of internet.
3. Describe World Wide Web and its functions.
4. Describe Web browser along with their features.

### **Long Question :**

1. Explain the Intellectual property rights

**Management & Information System**

❖ **Enrolment No. :**

1. How many hours did you need for studying the units ?

Unit No.	1	2	3	4
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Language and Style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Illustration used (Diagram, tables etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Conceptual Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Check your progress Quest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Feed back to CYP Question	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

3. Any other Comments

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