COMPUTER BASICS

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What is a Computer?

An electronic device that stores, retrieves, and processes data, and can be programmed with instructions. A computer is composed of hardware and software, and can exist in a variety of sizes and configurations.

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Hardware & Software

The term hardware refers to the physical components of your computer such as the system unit, mouse, keyboard, monitor etc.

The software is the instructions that makes the computer work. Software is held either on your computers hard disk, CD-ROM, DVD or on a diskette (floppy disk) and is loaded (i.e. copied) from the disk into the computers RAM (Random Access Memory), as and when required.

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Types of Computers

Mini and Mainframe Computers

Very powerful, used by large organisations such an banks to control the entire business operation. Very expensive!

Personal Computers

Cheap and easy to use. Often used as stand-alone computers or in a network. May be connected to large mainframe computers within big companies.

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Hardware Components

Input Devices -- *"How to tell it what to do"*

- A keyboard and mouse are the standard way to interact with the computer. Other devices include joysticks and game pads used primarily for games.

Output Devices -- *"How it shows you what it is doing"*

- The monitor (the screen) is how the computer sends information back to you. A printer is also an output device.

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Hardware Components

INPUT DEVICES

- **The Mouse**
  - Used to ‘drive’ Microsoft Windows
- **The Keyboard**
  - The keyboard is still the commonest way of entering information into a computer

- **Tracker Balls**
  - an alternative to the traditional mouse and often used by graphic designers

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Hardware Components

INPUT DEVICES

- **Scanners**
  - A scanner allows you to scan printed material and convert it into a file format that may be used within the PC
- **Touch Pads**
  - A device that lays on the desktop and responds to pressure
- **Light Pens**
  - Used to allow users to point to areas on a screen
- **Joysticks**
  - Many games require a joystick for the proper playing of the game

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Hardware Components

OUTPUT DEVICES

- **VDU**
  - The computer screen is used for outputting information in an understandable format
- **Printers**
  - There are many different types of printers.
  - In large organizations laser printers are most commonly used due to the fact that they can print very fast and give a very high quality output.

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Hardware Components

OUTPUT DEVICES

- **Plotters**
  - A plotter is an output device similar to a printer, but normally allows you to print larger images.
- **Speakers**
  - Enhances the value of educational and presentation products.
- **Speech synthesisers**
  - Gives you the ability to not only to display text on a monitor but also to read the text to you

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Hardware Components

Storage Devices -- "How it saves data and programs"

- Hard disk drives are an internal, higher capacity drive which also stores the operating system which runs when you power on the computer.

- "Floppy" disk drives allow you to save work on small disks and take the data with you.

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Hardware Components

Hard Disks

- Speed:
  - Very fast!
  - The speed of a hard disk is often quoted as "average access time" speed, measured in milliseconds. The smaller this number the faster the disk.
- Capacity:
  - Enormous! Often 40/80 Gigabytes. A Gigabyte is equivalent to 1024 Megabytes.
- Cost:
  - Hard disks costs are falling rapidly and normally represent the cheapest way of storing data.

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Hardware Components

Diskettes (Floppy Disks)

- Speed:
  - Very slow!
- Capacity:
  - Normally 1.44 Mbytes.
- Cost:
  - Very cheap.

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Hardware Components

CD-ROM Disks

- Speed:
  - Much slower than hard disks. The original CD-ROM speciation is given a value of 1x speed, and later, faster CD-ROMs are quoted as a multiple of this value.
- Capacity:
  - Around 650 Mbytes and more

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Hardware Components

DVD Drives

- Speed:
  - Much faster than CD-ROM drives but not as fast as hard disks.
- Capacity:
  - Up to 17 Gbytes.
- Cost:
  - Slightly higher than CD-ROM drives.

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Main Parts of Computer

Memory -- *"How the processor stores and uses immediate data"*

- **RAM - Random Access Memory**
  - The main 'working' memory used by the computer.
  - When the operating system loads from disk when you first switch on the computer, it is copied into RAM.
  - As a rough rule, a Microsoft Windows based computer will operate faster if you install more RAM. Data and programs stored in RAM are volatile (i.e. the information is lost when you switch off the computer).

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Hardware Components

Memory

- **ROM – Read Only Memory**
  - Read Only Memory (ROM) as the name suggests is a special type of memory chip that holds software that can be read but not written to.
  - A good example is the ROM-BIOS chip, which contains read-only software.
  - Often network cards and video cards also contain ROM chips.

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Hardware Components

How Computer Memory Is Measured

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- **Bit**
  - All computers work on a binary numbering system, i.e. they process data in one's or zero's. This 1 or 0 level of storage is called a bit.
- **Byte**
  - A byte consists of eight bits.
- **Kilobyte**
  - A kilobyte (KB) consists of 1024 bytes.
- **Megabyte**
  - A megabyte (MB) consists of 1024 kilobytes.
- **Gigabyte**
  - A gigabyte (GB) consists of 1024 megabytes.

Hardware Components

Microprocessors -- *"The brain of the computer"*

- PCs primarily use microprocessors (sometimes called the chip). The older Intel versions include the 386, 486 and now the Pentium line.

The **CPU (Central Processing Unit)** is normally an Intel Pentium (or equivalent) and it is one of the most important components within your computer.

- It determines how fast your computer will run and is measured by its MHz speed.
- Thus a 600 MHz Pentium is much faster than say a 400 MHz Pentium CPU.
- It is the CPU that performs all the calculations within the computer.

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Hardware Components

Some of the Factors
That Impact on a Computer's Performance

- CPU speed
- RAM size
- Hard disk speed and capacity

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Software Component

Operating systems software

The operating system is a special type of program that loads automatically when you start your computer.

The operating system allows you to use the advanced features of a modern computer without having to learn all the details of how the hardware works

The link between the hardware and you, the user

Makes the computer easy to use without having to understand bits and bytes!

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Software Component

Applications software

An application program is the type of program that you use once the operating system has been loaded.

Examples include word-processing programs, spreadsheets and databases

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Software Component

Application Software

- **Word processing applications**
  - Microsoft Word
  - Lotus Word Pro
  - WordPerfect
- **Spreadsheets**
  - Microsoft Excel
  - Lotus 123
- **Database**
  - Microsoft Access
  - Lotus Approach

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Software Component

Application Software

- **Payroll**
  - Sage software
- **Presentation tools**
  - Microsoft PowerPoint
  - Lotus Freelance
- **Desktop publishing**
  - Abode Photoshop
- **Multimedia applications**
  - Microsoft's Encarta CD-ROM based encyclopaedias

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Information Network

- **LAN**
  - A LAN (Local Area Network) is a system whereby individual PCs are connected together within a company or organization
- **WAN**
  - A WAN (Wide Area Network) as the name implies allows you to connect to other computers over a wider area (i.e. the whole world).

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Information Network

Uses of Network

If ten people are working together within an office it makes sense for them all to be connected.

- In this way the office can have a single printer and all ten people can print to it.
- In a similar way other devices such as modems or scanners can be shared.
- Even more useful is the ability to share information when connected to a network.

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Computer Accessories

- **Modem**
  - Short for “MODulate/DEModulate”. The modem sends information from your computer across the telephone system.
  - The modem at the other end of the phone line, converts the signal back into a format that can be used by the receiving computer.

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Uses of Computer

PC at Home

Common uses for the computer within the home

- Computer games
- Working from Home
- Banking from Home
- Connecting to the Web

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Uses of Computer

Computers in Education

- CBT (Computer Based Training)
  - Computer Based Training (CBT) offers a low cost solution to training needs where you need to train a large amount of people on a single subject.
  - These programs are normally supplied on CD-ROM and combine text, graphics and sound.
  - Packages range from general encyclopaedias right through to learning a foreign language.

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Uses of Computer

Office Applications

- Automated Production Systems
  - Many car factories are almost completely automated and the cars are assembled by computer-controlled robots.
  - This automation is becoming increasingly common throughout industry.

- Design Systems
  - Many products are designed using CAD (Computer Aided Design) programs to produce exact specifications and detailed drawings on the computer before producing models of new products.

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Uses of Computer

Office Applications

- Stock Control
  - Stock control is ideal for automation and in many companies it is now completely computerized.
  - The stock control system keeps track of the number of items in stock and can automatically order replacement items when required.
- Accounts / Payroll
  - In most large organizations the accounts are maintained by a computerized system.
  - Due to the repetitive nature of accounts a computer system is ideally suited to this task and accuracy is guaranteed.

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Uses of Computer

Computers in Daily Life

- Accounts
- Games
- Educational
- On-line banking
- Smart ID cards
- Supermarkets
- Working from home (Tele-working)
- Internet

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Create a Good Working Environment

- **Frequent breaks away from the computer**
- **Appropriate positioning of screens, chairs and keyboards**
- **Provision of adequate lighting and ventilation.**

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Health & Safety Precautions

- Make sure that cables are safely secured
- Make sure that power points are not overloaded
- Also be aware of:
  - Repetitive Strain Injury (RSI)
  - Glare from screens
  - Bad posture

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Value of Backup

- The most important thing that you store on your computer is information.
- Often the contents of a hard disk can represent years of work.
- If the hard disk stops working one day you could lose all those years of work.
- For this reason it is VITAL that you take regular backups of the information that is stored on the computer.

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Value of Backup

- **Organize your computer for more efficient backups**
- **Complete vs. incremental backups**
- **Use 'off-site' storage**

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Value of Backup

- Use passwords
- Understand the Importance of shutting down your computer properly
- Use a UPS (Un-interruptible Power Supply)

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Likes & Dislikes of Computer

- **Things computer like**:
  - Good ventilation
  - Clean environment
  - Stable, vibration free surface
- **Things computer don't like**:
  - Dust
  - Drinking and eating over the keyboard
  - Heat, Cold or Moisture
  - Don't place objects on top of monitors.
  - Don't place floppy disks near monitors.

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Computer Virus

- **What are computer viruses?**
  - Viruses are small programs that hide themselves on your disks (both diskettes and your hard disk).
  - Unless you use virus detection software the first time that you know that you have a virus is when it activates.
  - Different viruses are activated in different ways.

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Computer Virus

- **How do viruses infect PCs?**
  - Viruses hide on a disk and when you access the disk (either a diskette or another hard disk over a network) the virus program will start and infect your computer.
  - The worst thing about a computer virus is that they can spread from one computer to another, either via use of infected floppy disk, or over a computer network, including the Internet.

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Computer Virus

- **How to prevent virus damage**
  - There are a number of third party anti-virus products available.
  - Most of these are better than the rather rudimentary products available within DOS and Windows, but of course you do have to pay for them!
  - The main thing about your virus checker is that it should be kept up to date.
  - Many companies supply updated disks on a regular basis or allow you to receive updates through an electronic, on-line bulletin board.

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Software Copyright

- Be aware on software copyright issues
- Freeware
- Shareware
- What about software that you find on the Internet?
- Software site licenses

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Software Copyright

- If your computer system holds information about individuals then you have a moral and legal duty to treat that information with respect.
- In a free society you have a right to ensure that information held about you is not abused.
- In many countries this right is enshrined under data protection laws

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Now Let us start our Computers

and get going

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Paper Code: BM1006.1 **Semester-I**

BASICS OF COMPUTER-I

Bachelor of Commerce (B.Com)
Three Year Programme

New Scheme of Examination

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B.Com-I (First Semester)
Basics of Computer-I
PAPER CODE: BM1006.1

Theory Paper Max Marks: 80
Time: 3 Hrs **Internal marks: 20**

Note: - The Examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory covering all the units and shall carry 8 small questions of 2 marks each. The rest of the eight questions will be set from all the four units. The examiner will set two questions from each unit out of which the candidate shall attempt four questions selecting one question from each unit. All the questions shall carry 16 marks each.

Unit-I

Fundamentals of Computers: Model of a digital computer, functioning of a digital computer, Historical evolution of computers, Classification of computers: According to Purpose, According to Technology, According to Size and Storage Capacity, Human being v/s Computer.

Unit-II

Input output devices Storage devices: Input Devices: Mouse, Keyboard, Light pen, Track Ball, Joystick, MICR, Optical Mark Reader and Optical Character Reader Scanners, Voice system, Web Camera. Output Devices: Hard Copy Output Devices; Line Printers, Character Printers, Chain Printers, Dot-matrix Printers, Daisy Wheel Printer, Laser Printers, Ink Jet Printers; Plotters, Soft Copy device – Monitor, Sound Cards and speakers.

Unit-III

Introduction to windows: Types of windows, Windows as an operating system, Windows explorer, using clipboard, using paint brush, control panel installing a printer.

Unit-IV

MS-WORD: Fundamentals of MS-WORD: Menus, Toolbars, Ruler Scroll bar, creating, Editing saving. Importing Exporting and insert fig files; Working with Frames, Columns, Pictures, Tables, Macros and Mail Merge.

Suggested Readings:

1. Introduction of Information System ALEXISLEON,
2. Computer Fundamentals-Nasib Singh Gill.

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CHAPTER-1

FUNDAMENTALS OF COMPUTERS

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the following about a computer system:

- Historical evolution of computers and computer generations
- Working model of a digital computer and functions of a digital computer
- Basic characteristics of digital computer
- Types of computers
- Classification of digital computers-
- Similarities between human beings and computer system

STRUCTURE OF THIS LESSON

1.1 Introduction

1.2 Historical Evolution of Computers

1.3 Computer Generations

1.3.1 First Generation (1946-1959)
1.3.2 Second Generation (1959-1965)
1.3.3 Third Generation (1965-1971)
1.3.4 Fourth Generation (1971-1985)
1.3.5 Fifth Generation (Beyond 1985 and Till-Date)

1.4 Model of a Digital Computer

1.5 Functioning of a Digital Computer

1.6 Characteristics of Digital Computer

1.7 Classification of Computers

1.7.1 Analog Computers
1.7.2 Digital Computers
1.7.3 Hybrid Computers
1.7.4 Difference between Analog and Digital Computers

1.8 Classification of Digital Computers

1.8.1 Supercomputer
1.8.2 Mainframe Computers
1.8.3 Minicomputers
1.8.4 Microcomputers and its Types

1.9 Human Beings Vs Computer Systems

Summary of the Lesson
Self Assessment Questions and Exercises

1.1 INTRODUCTION

Let us begin with the word 'compute', which means 'to calculate'. We all are familiar with calculations in our day to day life. We apply mathematical operations like addition, subtraction, multiplication, etc. and many other formulae for calculations. Simpler calculations take less time but complex calculations take much longer time. Another factor is accuracy in calculations. So man

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explored the idea to develop a machine which can perform this type of arithmetic calculation faster and with full accuracy. This gave birth to a device or machine called **'computer'**.

Definition of Computer

"A computer is an electronic machine that operates under the control of instructions, that accepts the input data, processes or manipulates the given data according to the predefined instructions and stores the result for future use".

Figure 1.1: Components of a Computer

It can also retrieve the stored results as and when required again. Now-a-days, data is processed with the help of computer. This modern technique to process data is known as Electronic Data Processing (EDP). Computer is also known as Electronic Data Processing machine.

The term data processing means:

- Arithmetic and logical operations on data to get required results.
- To send and receive information from one location to another.
- Arranging data into a specific order etc.

1.2 HISTORICAL EVOLUTION OF COMPUTERS

Man has developed from time to time various instruments to assist him in day-to-day calculation and for his data-processing needs. Depending upon the type of instruments used, the span of period has been split into following three ages:

- ***Dark Age (5000 B.C. - 1890 A.D.)***
- ***Middle Age (1890 - 1944)***
- ***Modern Age (Since 1944)***

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Dark Age (5000 B.C. - 1890 A.D.)

In this age all the computing devices were manual-mechanical in nature and all the earliest data processing equipment were all manual-mechanical devices. We refer to the era when these machines were used exclusively as the Dark Ages of data processing. This age introduced several devices such as Abacus, Napier's bones, Pascal's Calculator, etc.

Middle Age (1890-1944)

In the Middle Age, all computing devices were electro-mechanical in nature. In other words, these worked mechanically with the help of electricity. Examples include Hollerith's Tabulating Machine, Atanasoff Berry Computer (ABC), etc.

Modern Age (Since 1944)

Computers changed over time; they improved in speed, power and efficiency. Those changes are recognized as a progression of generations of discoveries, each characterized by specific developments.

Mark I (1944)

Howard H. Aiken of Harvard University in 1937 designed a machine that could automatically perform a sequence of arithmetic operations and it was completed in 1944. It was named Mark I. It was an electromechanical (relay) device, like the calculators which preceded it.

1.3 COMPUTER GENERATIONS

Each generation of computers is characterized by major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, and more powerful and more efficient and reliable devices. Read about each generation and the developments that led to the current devices that we use today.

The term generation indicates the type of technology used in the computer construction. As new technology was emerging, it was being used in the making of computer. The new technology improved the speed, accuracy and storage capacity of the computers. Different technologies have been used for computers in different times.

Therefore, computers can be divided into five generations depending upon the technologies used. **These are:**

1. First Generation (1946 – 1959)
2. Second Generation (1959 – 1965)
3. Third Generation (1965 – 1971)
4. Fourth Generation (1971- 1985)
5. Fifth Generation (1985 onwards)

1.3.1 First Generation (1946-1959)

All subsequent computers after Mark I were all electronic. The early first-generation computers were powered by thousands of vacuum tubes. The first computers used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms. A magnetic drum, also referred to as drum, is a metal cylinder coated with magnetic iron-oxide material on which data and programs can be stored. Magnetic drums were once use as a primary storage device but have since been implemented as auxiliary storage devices.

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Figure 1.2: Vacuum Tubes

Examples:

- Electronic Numerical Integrator and Calculator (ENIAC),
- Electronic Discrete Variable Automatic Computer (EDVAC)
- Electronic Delay Storage Automatic Computer (EDSAC)
- UNIVAC I

Characteristics of First Generation

- *Vacuum tubes*
- *Magnetic tape and magnetic drum for external storage*
- *Punched cards for input*
- *Punched cards and paper for output*
- *Machine and assembly languages*
- *Human operators to set switches*
- ***Examples :*** *UNIVAC I, UNIVAC II, Datamatic 100, EDSAC, Burrough 2202, etc.*

1.3.2 Second Generation (1959-1965)

Transistors replaced vacuum tubes and ushered in the second generation computer. Transistor is a device composed of semiconductor material that amplifies a signal or opens or closes a circuit. Invented in 1947 at Bell Labs, transistors have become the key ingredient of all digital circuits, including computers. Today's **latest microprocessor** contains tens of millions of microscopic transistors.

Figure 1.3: Transistor

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The first computers of this generation were developed for the atomic energy industry.

Characteristics of Second Generation

- *Transistors*
- *Magnetic-core storage*
- *Magnetic tape and magnetic disk for external storage*
- *Punched cards and magnetic tape for input*
- *Punched cards and paper for output*
- *High-level languages- FORTRAN, COBOL, PL/I, BASIC and others*
- *Human operators to handle cards*
- ***Examples :*** *Honeywell 200-, 400-, 800-series, IBM 7070/7080, CDC 1604, Burrough B5000 series, etc.*

1.3.3 Third Generation (1965-1971)

During this time integrated circuits with transistors, resistors, and capacitors were etched onto a piece of silicon. This reduced the price and size of computers, adding to a general trend in the computer industry of miniaturization. The development of the integrated circuit was the hallmark of the third generation of computers. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.

Figure 1.4: Integrated Circuits

Characteristics of Third Generation

- *Integrated circuits*
- *Improved disk storage*
- *Monitors and keyboards for input and output*
- *More high-level languages, including RPG and Pascal*
- *First complete operating system meant less involvement for human operators*
- *Family of computers introduced allowing compatibility*
- *Minicomputers used commercially*
- *Examples: IBM System/360, IBM System/370, Burrough 5700/6700, PDP-8 Series, PDP-11 Series, etc.*

1.3.4 Fourth Generation (1971-1985)

The microprocessor brought the fourth generation of computers, as thousands of integrated circuits we rebuilt onto a single silicon chip. A silicon chip contained a CPU. In the world of personal

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computers, the terms microprocessor and CPU are used interchangeably. At the heart of all personal computers and most workstations sits a microprocessor.

Figure 1.5: Microprocessor

Microprocessors also control the logic of almost all digital devices, from clock radios to fuel-injection systems for automobiles.

Three basic characteristics differentiate microprocessors:

- **Instruction Set:** The set of instructions that the microprocessor can execute.
- **Bandwidth:** The number of bits processed in a single instruction.
- **Clock Speed:** Given in megahertz (MHz), the clock speed determines how many instructions per second the processor can execute.

Characteristics of Fourth Generation

- *LSI and VLSI*
- *Magnetic disk most common external storage*
- *Introduction of microcomputers*
- *Fourth-generation languages (4GLs) emerged and application software for microcomputers became popular*
- *Microcomputers used - Compaq Deskpro 386*
- ***Typical examples** : Burroughs B7700 and HP 3000 minicomputers*

1.3.5 Fifth Generation (Beyond 1985 and till-date)

The changes that have occurred since 1985 are plentiful. Computers have got tinier, more reliable, and many times faster. Computers are mostly built using components from many different corporations.

Computers have become more and more online orientated in modern times, especially with the development of the World Wide Web. Popular companies like Google and Yahoo! were started because of the internet.

Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today. Artificial Intelligence is the branch of computer science concerned with making computers behave like humans. The term was coined in 1956 by John McCarthy at the Massachusetts Institute of Technology.

Characteristics of Fifth Generation

- *Development of true artificial intelligence*
- *Development of Natural Language Processing*

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- *Advancement in Parallel Processing*
- *Advancement in Superconductor Technology*

Fifth generation computers are supposed to be the ideal computers. The scientists are working to design such computers that will have the following features.

1. Having their own thinking power
2. Making decisions themselves
3. Having capabilities of learning
4. Having capabilities of reasoning
5. Having large capacity of internal storage
6. Having extra high processing speed
7. Having capabilities of parallel processing

1.4 MODEL OF A DIGITAL COMPUTER

Modern computer systems are available in numerous physical shapes and sizes, and truly speaking there is no end to it. In Computer System, different parts of a computer are organized in such a way that, it helps to perform various operations to complete the given specific task. A computer is a sort of electric brain, which capable to solve mathematical problems with in movements or produce desired information or a controlling order.

Figure 1.6: Basic Components of a Digital Computer

All modern digital computers consist of three main components. These are indicated in the block diagram ***(Fig. 1.7).***

Remarks

Fig. 1.7: Model of a Digital Computer

1.5 FUNCTIONING OF A DIGITAL COMPUTER

Let us now study the organisation and function of each unit in detail.

I. Input Unit

A unit provided to supply data to the computer is called ***Input Unit.*** This unit is also called Input Devices Unit and uses devices like mouse, lightpen, keyboard etc. to transfer data/information to the computer directly or may collect data on magnetic disks and tapes and later transfer it to the system.

Peripherals is the term applied to all devices that are connected to the CPU but are not part of the CPU. These include the Input/Output (I/O) and mass storage devices and other computer devices such as analog-to-digital converters. The collection of all peripheral equipments is called the computer configuration.

There are two types of peripherals given as under:

i) Off-line Peripheral and

ii) On-line Peripheral.

Auxiliary devices that are not directly connected to the CPU, such as keypunches, card sorters, and so on. These are called off-line devices. The term on-line devices refers to equipment that is connected to the CPU.

II. Central Processing Unit (CPU)

This unit is called the brain or heart and soul of the computer system. It comes in different shapes viz. Vertical CPU, Mid-Tower, Horizontal CPU, etc. Few popular CPU types are shown in ***Fig. 1.8.***

Remarks

(a) Mid Tower CPU *(b) Vertical CPU*

Fig. 1.8: Few Popular CPU Shapes

It has the following three sub-units:

i) Primary Storage Unit (or Memory Unit)

ii) Arithmetic & Logic Unit (ALU)

iii) Control Unit

a) Primary Storage Unit

We are already aware that the computer is capable of storing data/instruction/information into it. Where does the data get stored? The answer to this question is the memory unit. Memory is a part of the microcomputer that holds data for processing, instructions for processing the data and information i.e. processed data.

As we have different types of data to be stored, this memory unit has four major logical areas, which are not shown in the figure to avoid complexity.

i) Input Storage Area

The input data does not straight away go to the processor. It is first stored in this area till the processor asks for it.

ii) Working Storage Area

'Working storage area' is like a sheet of scratch paper. When the data is being processed, there are some intermediate results that are not required as output but are required to obtain the output. Such results are stored in ***working storage area***.

iii) Output Storage Area

The final output is not taken by the output devices immediately but is stored in memory till the output device is ready to receive it. Thus an ***'output storage area'*** holds the finished results of the processing operations until they are released on the output device.

iv) Program Storage Area

In addition to above, the primary storage also contains a ***'program storage area'***. The instructions for data manipulation are stored in this area.

b) Arithmetic & Logic Unit (ALU)

This unit is capable of performing arithmetic operations and logical operations on the data stored in storage area. The basic arithmetic and logical operations include addition, subtraction, multiplication,

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Remarks

division, ORing, ANDing, NOT (complementing), increment, decrement, shifting, clearing operations, etc. The data is transferred to ALU for processing and the intermediate results and final results are transferred to the storage area.

c) Control Unit

This unit controls the operation of each unit of computer system by issuing control signals on the basis of instructions provided to the computer as a program. So this unit can be called the central nervous system of the computer. This unit generates timing and control signals necessary for execution of instructions. It provides status, control and timing signals necessary for the operation of other parts of the CPU, memory, and I/O devices. It controls the entire operation of the computer. It is actually the control section of the CPU, which acts as the brain of a computer.

III. Output Unit

The result generated by CPU is either transferred directly or from the output area of the memory to the output devices like visual display units (VDU) or printers, etc.

Mass Storage Devices

The primary storage area of the computer is limited in size and is expensive. Only, the frequently required instructions are stored in it. To supplement this limited memory, we use auxiliary or secondary storage devices like magnetic tapes and disks. The data can be transferred to/from these devices by the processor at a very fast speed. But as compared to primary storage, secondary storage is slow. But the advantage of secondary storage devices is that apart from being cheap, they are transferable which primary storage is not. There is no limit to secondary storage memory. This can be compared to human beings who use a note-book or pocket-diary to store the notes to supplement the brain.

1.6 CHARACTERISTICS OF DIGITAL COMPUTER

Now-a-days computer is playing a main role in everyday life it has become the need of people just like television, telephone or other electronic devices at home. It solves the human problems very quickly as well as accurately. The important characteristics of a computer are described below:

1. ***Speed***
2. ***Arithmetical and Logical Operations***
3. ***Accuracy***
4. ***Reliability***
5. ***Storage***
6. ***Retrieving data and programs***
7. ***Automation***
8. ***Versatility***
9. ***Communications***
10. ***Diligence***
11. ***No Feelings***
12. ***Consistency***
13. ***Precision***

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1.7 CLASSIFICATION OF COMPUTERS

Though in general we use digital computers, however, present day computers may be classified into three categories:

- *Analog*
- *Digital*
- *Hybrid*

1.7.1 Analog Computers

Analog computers are computers which work on the basis of continuous measurement of physical quantities, e.g. pressure, voltage, current, temperature, current, length, etc. We can quote a number of instruments that work on the principles of analog computers.

Limitations of Analog Computers

- *These don't have logical facilities afforded by programming*
- *Don't have the ability to store data in large quantities*
- *Cost of implementation of computation is very high*

Examples **:** Thermometer, Speedometer, Wall-clock, Voltmeter, Ammeter, etc.

1.7.2 Digital Computers

Digital computers are computers which represent data in terms of discrete number and processes data using the standard arithmetic operations. These computers directly operate on numbers and produce precise results. These are used in a unlimited number of applications. The basic differences between analog and digital computers are listed in ***Table No. 1.1.***

We will be concerned with digital computers only because of the following reasons :

- *The tasks that can be done on analog computers can also be done on digital computers while the reverse is not true.*
- *To understand the calculations made by an analog computer, some mathematical background is necessary, whereas digital computer can be used and understood without much mathematical background.*
- *The digital computer is used extensively in many areas of application.*

1.7.3 Hybrid Computers

Design features of Analog and Digital computers can be combined to create a Hybrid Computer. Such computers are used for special applications only. Examples of such computers include:

- *Chemical Process Control*
- *Patient Monitoring System*
- *Electronic Calculating Scale*
- *Missile Guidance Computer*
- *Flight Simulators For Training Air-plane Pilots*
- *Petroleum Distillation Monitoring Systems*

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1.7.4 Difference between Analog and Digital Computers

Table 1.1 : Analog Vs. Digital Computer

S.No	*Analog Computers*	*Digital Computers*
1.	Represent continuous measurement of physical quantities e.g. rotation, voltage, temperature, etc.	Represent numbers by discrete coded patterns
2.	Accuracy is quite limited	Unlimited accuracy
3.	Represent physical or mathematical quantities	Represent numbers, letters and other symbols
4.	Data-storage scattered in various non-interchangeable devices	Data-storage concentrated in space, interchangeable and unlimited in duration
5.	Distinct elements used for each operation	Identical elements used in sequence
6.	Sets up analogy of problem	Breaks down problem into arithmetic operations
7.	Best-suited to represent measurable quantities and simulate response of physical systems by mathematical analogies	Best suited to handle discrete random processes, statistical data, and numerical problems of business and scientific nature
8.	Serves as model and mirrors relations of actual system	Digital computer compounds arithmetic data, unrelated to system it represents
9.	Operations usually carried out in real-time of physical system	Time of operations usually does not correspond to real-time.
10.	Relatively few devices used and easier programming	Many devices needed and difficult programming
11.	Basic operation performed by relatively few 'single-purpose' devices (integrators, multipliers, magnitude-comparators, etc.	Operation performed by relatively many interchangeable arithmetic devices such as adders, registers, accumulators, etc.

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1.8 CLASSIFICATION OF DIGITAL COMPUTERS

There is a wide variety of computers in the market today which differ in terms of physical size, price, capacity, and performance. The variety is so wide that it is sometimes difficult to see those elements that are shared by many computers and those elements that tend to differ among computers.

Depending upon their speed and memory size, computers are classified into following four main groups.

1. Supercomputer
2. Mainframe computer

Remarks

3. Mini computer
4. Microcomputer

This classification implies differences between classes between in one or more characteristics. In the 1960s, before the microcomputer, there was a clear-cut distinction between minicomputers and mainframes. The most important characteristics that could be used to differentiate the two types of computers were :

- *Speed*
- *Instruction sizes*
- *Number of CPU registers*
- *Word Length*
- *Main Memory Size*
- *Complexity of I/O modules*
- *Operating System Complexity*
- *Physical size*
- *Cost*
- *Virtual address space*
- *Secondary Memory Size*
- *Degree of Multiprogramming*

1.8.1 Supercomputer

Supercomputer is the most powerful and fastest, and also very expensive. It was developed in 1980s. It is used to process large amount of data and to solve the complicated scientific problems. It can perform more than one trillions calculations per second. It has large number of processors connected parallel. So parallel processing is done in this computer. In a single supercomputer thousands of users can be connected at the same time and the supercomputer handles the work of each user separately.

Supercomputers are mainly used for:

- Weather forecasting.
- Nuclear energy research.
- Aircraft design.
- Automotive design.
- To control industrial units.

A supercomputer is shown in ***Fig. 1.9.***

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Fig. 1.9: Super Computer

Examples :

- *CRAY X-MP/14, X-MP/24, X-MP/48*
- *CRAY Y-MP, Y-MPC*
- *CRAY 2*
- *CRAY 3*
- *ETA (EDC-ETA 10, ETA 20)*
- *C-DAC's PARAM*
- *NEC (NEC SX-3)*
- *IBM 3090 (with vector)*
- *Fujitsu (VP Series)*
- *Hitachi (HITAC S-300)*
- *PARAM,*

  etc.

1.8.2 Mainframe Computers

The mainframe remains a distinct class of computers and is very powerful large general purpose computers. Large organisations use mainframe computer. Some of the key differences between the high end of mainframe class and the high end of the minicomputer class are there. One of the most dramatic differences is the speed of the two classes.

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Fig. 1.10: Mainframe Computer

Examples :

- *DEC's VAX-8350, -8650*
- *HP 9000 Model 870S/400, Model 870S/300*
- *IBM 4300 Series (small to medium-size models)*
- *IBM 308X Series (large models)*
- *Latest model IBM 3090 Series (IBM 3090/600 installed in 1988)*
- *IBM Enterprise System/9000 Series*
- *ICL Series*
- *MEDHA Series*
- *Sperry Series; etc.*

1.8.3 Minicomputers

Minicomputers are faster and more powerful than microcomputers. The word-length of these computers is usually 32-bits or more. A minicomputer can support up to 64 or even 100 terminals. Minicomputers can support a greater variety of fast peripheral devices. Minicomputers are extensively used for multi-user and interactive applications in colleges, universities, research organisations, government organisations, industries and so on. These are also used for sophisticated real-time Industrial controls and interactive engineering design work.

Examples :

- *Wipro S-68030V and S-68033V built around Motorola 68030 CPU*

Remarks

- *HP 9000 series 800 (a Supermini) built around HP's VLSI RISC Processor*
- *HCL Magnum built around 68030 and 68040 CPUs*
- *IBM AS/400/B60 (installed in 1988)*
- *DEC's VAX 8842 (installed in 1988)*
- *Wipro LandMark 860 (a Supermini) built around Intel's 64-bit RISC processor i860 CPU, and so on.*

The capabilities of a minicomputer are between mainframe and personal computer. These computers are also known as midrange computers.

The minicomputers are used in business, education and many other government departments. Although some minicomputers are designed for a single user but most are designed to handle multiple terminals. Minicomputers are commonly used as servers in network environment and hundreds of personal computers can be connected to the network with a minicomputer acting as server like mainframes, minicomputers are used as web servers. Single user minicomputers are used for sophisticated design tasks.

The first minicomputer was introduced in the mid-1960s by Digital Equipment Corporation (DEC). After this IBM Corporation (AS/400 computers) Data General Corporation and Prime Computer also designed the mini computers.

1.8.4 Microcomputers and its Types

The microcomputers are also known as personal computers or simply PCs. Microprocessor is used in this type of computer. These are very small in size and cost. The IBM's first microcomputer was designed in 1981 and was named as IBM-PC. After this many computer hardware companies copied the design of IBM-PC. The term "PC-compatible" refers any personal computer based on the original IBM personal computer design.

On the basis of cost and performance, personal computers can be classified as :

- *Personal Computer (PC)*
- *Personal Computer with Extended Technology (PC/XT)*
- *Personal Computer with Advanced Technology (PC/AT)*
- *Super AT or Super Micro*

Personal Computer (PC)

PC is the simplest and cheapest type of personal computer. It uses Intel 8086/8088 as CPU, 640 KB RAM, 8KB ROM and normally two floppy disk drives. One of the drives is normally meant for holding bootable floppy diskette and the second one is used for holding the application package as well as for secondary storage. This type of computer does not contain any hard-disk. It is a single-user system. Its ROM can be extended from 8KB to 64 KB. It uses MS-DOS operation system. It may also employ 8087 math co-processor.

PC/XT

This type of computer contains hard-disk(s) as well as floppy disk drive i.e. 360 KB/1.2 MB. Its cost is obviously more than the PC due to additional components. It is also a single-user system. Its ROM

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can also be extended up to 64 KB. It also normally uses MS-DOS operation system. It may also employ 8087 math co-processor.

PC/AT

It contains 80286 as CPU, 640 KB RAM (can be expanded to 4 MB), 64 KB ROM (can be expanded to 128 KB), hard-disk drive and floppy-disk drive (360 KB/1.2 MB). Microprocessor 80286 is more powerful than the microprocessors of PC and PC/XTs. Up to 4 terminals can be connected to PC/AT to make it multi-user system by using XENIX as an operating system. Hard-disk capacity may lie in the range 20-80 MB. It uses 80287 math co-processor. Processing speed of PC, PC/XT and PC/AT lies in the range 1-5 MIPS.

Super AT (or Super micros)

These computers use a 32-bit CPU such as Intel 80386 or 80486. The processing speed of 80386 and 80496 may range from 3 to 5 MIPS and 12 MIPS at 25 MHz respectively. RAM size of these lie in the range 2-8 MB. In case of 80386 microprocessor, it can be extended up to 32 MB and in case of 80486 up to 64 MB. Hard-disk capacity of these lies in the range 200 MB-780 MB. Normally, UNIX is used as a multi-user operating system on these systems. 80386 CPU offers the connectivity up to 8-12 terminals whereas 80486 offers the connectivity up to 16-64 terminals.

Personal computers are available in two models. These are:

1. Desktop PCs
2. Tower PCs

A desktop personal computer is most popular model of personal computer. The system unit of the desktop personal computer can lie flat on the desk or table. In desktop personal computer, the monitor is usually placed on the system unit.

Another model of the personal computer is known as tower personal computer. The system unit of the tower PC is vertically placed on the desk of table. Usually the system unit of the tower model is placed on the floor to make desk space free and user can place other devices such as printer, scanner etc. on the desktop. Today computer tables are available which are specially designed for this purpose. The tower models are mostly used at homes and offices.

Microcomputers are further divided into following categories.

1. Laptop computer
2. Workstation
3. Network computer
4. Handheld computer

Laptop computer

Laptop computer is also known as notebook computer. It is small size (85-by-11 inch notebook computer and can fit inside a briefcase. The laptop computer is operated on a special battery and it does not have to be plugged in like desktop computer. The laptop computer is portable and fully functional microcomputer. It is mostly used during journey. It can be used on your lap in an airplane. It is because it is referred to as laptop computer.

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Workstations

Workstations are special single user computers having the same features as personal computer but have the processing speed equivalent to minicomputer or mainframe computer. A workstation computer can be fitted on a desktop. Scientists, engineers, architects and graphic designers mostly use these computers.

Workstations use sophisticated display screens featuring high-resolution color graphics and operating systems such as UNIX, Windows NT, 95, 98 those permitted multitasking. Workstations also use powerful networking links to other computers.

Most significant feature of workstations is the powerful processor which churns out results much faster than the PCs.

Examples : Sun-, Apollo-, Hewlett-Packard-, NeXT- and IBM-workstations.

Network Computers

Network computers are also version of personal computers having less processing power, memory and storage. These are specially designed as terminals for network environment. Some types of network computers have no storage. The network computers are designed for network, Internet or Intranet for data entry or to access data on the network. The network computers depend upon the network's server for data storage and to use software. These computers also use the network's server to perform some processing tasks.

Handheld Computer

In the mid 1990s, many new types of small personal computing devices have been introduced and these are referred to as handheld computers. These computers are also referred to as Palmtop Computers. The handheld computers sometimes called Mini-Notebook Computers. The type of computer is named as handheld computer because it can fit in one hand while you can operate it with the other hand. Because of its reduced size, the screen of handheld computer is quite small. Similarly it also has small keyboard. The handheld computers are preferred by business traveler. Some handheld computers have a specialized keyboard. These computers are used by mobile employees, such as meter readers and parcel delivery people, whose jobs require them to move from place to place.

The examples of handheld computers are:

1. Personal Digital Assistants
2. Cellular telephones
3. H/PC Pro devices

Personal Digital Assistants (PDAs)

The PDA is one of the more popular lightweight mobile devices in use today. A PDA provides special functions such as taking notes, organizing telephone numbers and addresses. Most PDAs also offer a variety of other application software such as word processing, spreadsheet and games etc. Some PDAs include electronic books that enable users to read a book on the PDA's screen.

Many PDAs are web-based and users can send/receive e-mails and access the Internet. Similarly, some PDAs also provide telephone capabilities.

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Cellular phones

A cellular phone is a web-based telephone having features of analog and digital devices. It is also referred to as Smart Phone. In addition to basic phone capabilities, a cellular phone also provides the functions to receive and send e-mails & faxes and to access the Internet.

H/PC Pro Devices

H/PC Pro dive is new development in handheld technology. These systems are larger than PDAs but they are not quite as large as typical notebook PCs. These devices have features between PDAs and notebook PCs. The H/PC Pro device includes a full-size keyboard but it does not include disk. These systems also have RAM with very low storage capacity and slow speed of processor.

1.9 HUMAN BEINGS VS COMPUTER SYSTEMS

We have already gone through the anatomy of a digital computer and functioning of a computer system using its various components. Besides, we are also well versed and aware with the functioning of human-beings using its various organs.

Processing of data by hand is satisfactory only when the amount of data to be processed is small and also the manual data processing is slow, monotonous and often subject to error. Human-beings utilises past experiences and intuitions for decision making whereas computer follows an algorithmic procedure. Human-beings as a decision maker utilises heuristic. Society will benefit most if complementary strengths of human beings and computers are utilised. Definitely, computers today have more intelligence than in the past and the strides are being made to increase machine capabilities.

The Newell-Simon model suggests that there are limitations on the ability of human as information processors :

* *One set of limits concerns the processing of data and is directly related to short-term memory*
* *Another set of limits is the ability of humans to detect differences*
* *Humans are also limited in their ability to generate, integrate, and interpret probabilistic data.*

Functional similarities of a computer system with human being is in the following ***Table 1.2.***

Table 1.2 :Computer Vs. Human-being (Similarities)

S.NO.	COMPUTER ELEMENT	PURPOSE	HUMAN-BEING
1.	Input	*Used to receive data and instructions in computer-compatible form*	*Input to the system is through ears, eyes, mouth or nose*
2.	Main Storage	*Used to hold input data and instructions temporarily before it is processed*	*Data and instructions are stored in brain and can be recalled whenever needed*
3.	Secondary Storage	*Used as an extension to main storage and the*	*Use pocket-diaries, notebooks, etc. to store*

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		contents stored in it are retained permanently	*contents for permanent use.*
4.	ALU	*Used to carry out arithmetic and logical computations desired in an instruction execution*	*Portion of our brain is used to carry out comparisons and calculations for helping out in logical judgements*
5.	Control Unit	*Used to receive stored instructions in serial fashion and one at a time.* *Interpret each instruction and prompt its execution by one of the units like input, output, storage or ALU.*	*Our brain controls our mental or body actions on the basis of calculations and comparisons.* *Before taking any action, the old results stored in brain are also referred to and thus brain acts as a CPU.*
6.	Output	*Used to give out results via a suitable device e.g. VDU, printer, plotter, etc.*	*Output is either in the form of a speech using mouth or some action e.g. writing, gesture, body language, etc.*

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SUMMARY OF THE LESSON

You learnt the following in this lesson:

- A computer is an electronic machine that operates under the control of instructions, that accepts the input data, processes or manipulates the given data according to the predefined instructions and stores the result for future use.
- In Dark Age (5000 B.C. - 1890 A.D.), all the computing devices were manual-mechanical in nature and all the earliest data processing equipment were all manual-mechanical devices.

  In Middle Age (1890-1944), all computing devices were electro-mechanical in nature
- In Modern Age (SINCE 1944), computers changed over time; they improved in speed, power and efficiency.
- The computers can be divided into five generations depending upon the technologies used. These generation are:
  - First Generation (1946 – 1959)
  - Second Generation (1959 – 1965)
  - Third Generation (1965 – 1971)
  - Fourth Generation (1971- 1985)
  - Fifth Generation (1985 onwards)

Remarks

- Modern computer systems are available in numerous physical shapes and sizes, and truly speaking there is no end to it.
- The important characteristics of a computer are *speed, arithmetical and logical operations, accuracy, reliability, storage, retrieving data and programs, automation, versatility, communications, diligence, no feelings, consistency and precision*
- Though in general we use digital computers, however, present day computers may be classified into three categories – *Analog, Digital and Hybrid.*
- Digital computers are computers which represent data in terms of discrete number and processes data using the standard arithmetic operations
- Design features of Analog and Digital computers can be combined to create a Hybrid Computer. Such computers are used for special applications only.
- Depending upon their speed and memory size, computers are classified into four main groups – Supercomputer, Mainframe computer, Mini computer and Microcomputer.
- The examples of handheld computers are Personal Digital Assistants and Cellular telephones.
- Processing of data by hand is satisfactory only when the amount of data to be processed is small and also the manual data processing is slow, monotonous and often subject to error.
- Human-beings utilises past experiences and intuitions for decision making whereas computer follows an algorithmic procedure. Human-beings as a decision maker utilises heuristic.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. What is a Computer? What capabilities does a computer possess?
2. How do analog computers differ digital computers?
3. State the criteria for classification of digital computers.
4. Is digital computer more accurate than analog computer? Justify your answer.
5. Discuss the important features of micro, mini, mainframes and super-computers.
6. What are the operations that a computer is able to perform?
7. How do you compare human beings and computers?
8. What are the fundamental components of a computer system? Which component of a computer system executes the program?
9. Why are microcomputers so popular in comparison to other computers?
10. What is a digital computer? Provide its anatomy and explain the functioning of such a computer through its block diagram

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CHAPTER - 2

INPUT/OUTPUT DEVICES AND OTHER HARDWARE

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the basic concepts of peripheral devices as well as important hardware components as under:

- Input/Output concepts
- Input devices
  - *Commonly used input devices such as Keyboards, Mouse, Joysticks, Trackballs, Touch Screens, Light Pens, Touch Pad, Digitizer, Voice Systems and Scanners*
- Output devices
  - *Commonly used output devices such as Monitors, Printers and Plotters*
- Other important hardware such as -
  - Motherboard, RAM, Video Card, Digital storage, Power Supply Unit, Expansion cards, Sound Card, Network card, etc.

STRUCTURE OF THIS LESSON

2.1 Introduction

2.2 Input Devices

- 2.2.1 Keyboards
- 2.2.2 Mouse
- 2.2.3 Joysticks
- 2.2.4 Trackballs
- 2.2.5 Touch Screens
- 2.2.6 Light Pens
- 2.2.7 Touch Pad
- 2.2.8 Digitizer
- 2.2.9 Voice Systems
- 2.2.10 Scanners

2.3. Output Concepts

2.4 Output Devices

- 2.4.1 Monitors
- 2.4.2 Printers
  - 2.4.2.1 Types OF Printers
  - 2.4.2.2 Character Printers

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2.4.2.3 Daisy-Wheel Printer
2.4.2.4 Dot-Matrix Printer
2.2.4.5 Line Printers
2.4.2.6 Page Printers
2.4.2.7 Laser Printer
2.4.2.8 Inkjet Printer
2.4.3 Plotter
2.4.3.1 Drum Plotter
2.4.3.2 Flatbed Plotter
2.4.3.3 The Inkjet Plotter
2.4.3.4 Led Plotter
2.4.4 Projector
2.5 Other Hardware

Summary of the Lesson
Self Assessment Questions and Exercises

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2.1 INTRODUCTION

A ***computer peripheral*** is any external device that provides input and output for the computer. For example, a keyboard and mouse are input peripherals, while a monitor and printer are output peripherals. Computer peripherals, or peripheral devices, are sometimes called "I/O devices" because they provide input and output for the computer. Some peripherals, such as external hard drives, provide both input and output for the computer.

2.2 INPUT DEVICES

An **input device** is any hardware device that sends data to the computer, without any input devices, a computer would only be a display device and not allow users to interact with it, much like a TV. Following continuing research in the field of computer hardware, we have a large number of input devices. Recall that before data can be processed by the computer, they must be translated into machine-readable form and entered into the computer by an input device.

Here, we list a variety of input devices:

- **Punched Cards and Card Readers**
- **Keyboards**
- **Joysticks**
- **Trackballs**
- **Mouse**
- **Touch Screens**
- **Light Pens**

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- **Touch Pad**
- **Digitizer**
- **Voice Systems**
- **Key to Magnetic Media**
- **Financial Transaction Terminals**
- **Machine Vision Systems**
- **Source Data Input**
- **Magnetic-ink Character Recognition (MICR)**
- **Magnetic Strips**
- **Optical Recognition**
- **Point-of-Sale Terminals**
- **Barcode reader**
- **Digital camera**
- **Microphone**
- **MIDI keyboard**
- **Mouse (pointing device)**
- **Remote**
- **Scanner**
- ***Webcam***

Few popular and commonly used input devices are briefly described below.

2.2.1 Keyboards

A keyboard is one of the today's most common and familiar input device. A keyboard's primary function is to act as an **input device.** The computer **keyboard** is used to enter text information into the computer, as when you type the contents of a report.

Figure 2.1: Keyboards

2.2.2 Mouse

Mouse is a pointing device and it has been around us for more than 20 years. The mouse usually contains one to three buttons; as the user rolls it on a flat surface, the mouse controls cursor movement on the screen. When the user presses one of the buttons, the mouse either marks a place on the screen or makes selections from data on the screen.

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Different types of mouse are shown in ***Fig. 2.2.***

(a) Simple Mouse ***(b) Cordless Mouse*** ***(c) Ball-point Mouse***

Fig. 2.2: Different Types of Mouse

Advantages

- *It is simple device and very easy to use.*
- *It is not that very expensive.*
- *It moves the cursor faster than the arrow keys of keyboard do.*

Disadvantages

- *The movement of the cursor is not very sensitive to movement of mouse.*
- *If the contact between wheels and mouse pad is lost, the cursor does not move.*

2.2.3 Joysticks

A joystick is also a pointing device. It is used to move the cursor position on a CRT screen. Its function is similar to a mouse, except that with a mouse the cursor stops moving as soon as you stop moving the mouse. A joystick is a stick which has spherical ball at its lower end as well as at its upper end. A joystick uses a lever to control the position of the cursor. It internally translates the lever position and speed with which the joystick is moved into digital signals that are sent to the computer to control the cursor movement. Most joysticks include two buttons called triggers.

Fig. 2.3: Joystick

Joysticks are used for Computer games but they are also used occasionally for CAD/CAM systems and other applications.

2.2.4 Trackballs

Trackball is another pointing device. A trackball is a mouse lying on its back. A trackball uses a hard sphere to control cursor movement. The ball can be rotated by hand in any direction. The associated electronic circuitry detects the direction and speed of spin. The trackball translates the sphere's

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direction and speed of rotation into digital signal used to control the cursor. The information is sent to the CPU for initiating further necessary action.

Different types of Trackball are shown in ***Fig. 2.4.***

(a) ***(b)***

(c)

Fig. 2.4: Various Types of Trackballs

2.2.5 Touch Screens

A touch screen is basically a display screen which can identify the occurrence and position of a touch inside the display region. The word normally refers to a touch or tap to the display of the gadget by a finger or hand. Touch screens can also identify added inactive objects, such as a stylus. However, if the object identified is active, as with a light pen, the phrase touch screen is normally irrelevant. The facility to interact directly with a display normally specifies the existence of a touch screen.

Figure 2.5: Touch Screen Monitor

Such touch screen displays can be connected to computers, laptops, PDAs, cell phones etc. They also project an important function in the blueprint of digital.

2.2.6 Light Pens

A light pen is similar to a mouse, except that with a light pen we can move the pointer and select objects on the display screen by directly pointing to the object with the pen. It is a pen like device which is connected to the machine by a cable.

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Light pens are shown in ***Fig. 2.6.***

Fig. 2.6: Light Pens

2.2.7 Touch Pad

A small, touch-sensitive pad is used as a pointing device on some portable computers. By moving a finger or other object along the pad, we can move the pointer on the display screen. The touch pad is related to the touch screen, but activated by different means. The touch pad uses pressure-sensitive materials to record data at the point where the pad is touched. Many appliances around the home, such as microwave ovens, use touch pads for programming time or temperature.

Fig. 2.7: Touch Pad Using a Point-device

2.2.8 Digitizer

A digitizer, or graphics tablet, is similar to a light pen; however, instead of drawing on the screen, a separate tablet is used on which a special stylus is moved. Input tablets or digitizer tablets or graphical tablets are typically found in CAD terminals or engineering workstations, etc.

Digitizers are also called Digitizing Tablets, Graphics Tablets, Touch Tablets, or simply Tablets. Top-view of digitizer along with tablet is shown in ***Fig. 2.8.***

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Fig. 2.8: Digitizer With Tablet

2.2.9 Voice Systems

Audio input provides direct and "user friendly" means of inputting data and instructions to the computer. Recently, a number of Voice Data Entry (VDE) systems have been developed. Voice recognition is one of the newest, most complex input techniques used to interact with the computer. The user inputs data by speaking into a microphone.

2.2.10 Scanners

Scanner is a kind of input device that can read text or printed paper and translates the information in a convenient form to be understood by the computer. All kinds of scanned documents using an optical scanner gets converted in the form of bit-map and thus it does not distinguish between text or graphics. In order to edit text read by an optical scanner, we need an OCR system to translate the image into ASCII format. Almost all optical scanners sold today come along with OCR packages.

There are six distinct types of scanners:

- handheld
- flatbed
- sheetfed
- photo drum, and
- slide.

Each of these styles has its own practical applications and limitations. Theoretically, you could also include digital cameras as a type of scanner.

Flatbed (or simple) and Hand-held scanners are the most popular scanners in maximum use. These are shown in ***Fig. 2.9 (a)*** and ***(b)*** respectively.

(a)

(b)

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(c) **(d)**

(a) to (c) Flatbed Scanners (d) Hand-held Scanner

Fig. 2.9: Types of Scanners

2.3. OUTPUT CONCEPTS

The output devices receive results and other information from the computer and provide it to the users. Output is the process of translating data in machine-readable form into a form understandable to humans or readable by other machines.

In today's information society, people require clear, legible and output. Output that can be understood by humans can be categorized as:

- ***Hard copy***
- ***Soft copy***

Hard copy is the output, such as paper, that can be read immediately or stored and read later. It is relatively stable and permanent form of output. ***Soft copy*** is usually a screen-displayed output. It is transient form of output and is lost when the computer is turned off. But if the data needed to create the soft copy have been saved on disk or tapes, the soft copy can be reproduced on the screen anytime.

2.4 OUTPUT DEVICES

Any peripheral that receives or displays output from a computer. An inkjet printer is a good example of an **output device** that can make a hard copy of anything on a computer. Below is a listing of all the different computer output devices found on a computer:

- Flat panel
- Monitor
- Printer
- Projector
- Sound card
- Speakers
- Video card

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An **output device** is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) to the outside world.

Examples of output devices:

- Monitors
- Printers
- Plotters
- Speakers
- Headphones
- Voice Response Systems

Most of the computer output devices are common to home as well as office environments. At the same time, there are some devices, which are not as commonly available. Having said that, let's take a look at computer output devices list.

2.4.1 Monitors

A computer display is also called a display screen or video display terminal (VDT). A monitor is a screen used to display the output. Images are represented on monitors by individual dots called pixels. A pixel is the smallest unit on the screen that can be turned on and off or made different shades. The density of the dots determines the clarity of the images, the resolution.

Types of Computer Monitors

The computer **monitor** (also known as a **VDU** or **V**isual **D**isplay **U**nit) is the most common computer output device. For desktop computers, cathode ray monitors (**CRT**) are gradually being replaced by flat-screen monitors such as the Liquid Crystal Displays (**LCD**) and Thin Film Transistor (**TFT**) displays used with laptop computers because they use less power and take up less space.

2.4.2 Printers

A **printer** is a peripheral which produces a text and/or graphics of documents stored in electronic form, usually on physical print media such as paper or transparencies. Many printers are primarily used as local peripherals, and are attached by a printer cable or, in most new printers, a USB cable to a computer which serves as a document source. Some printers, commonly known as **network printers**, have built-in network interfaces, typically wireless and/or Ethernet based, and can serve as a hard copy device for any user on the network. Individual printers are often designed to support both local and network connected users at the same time. There are several printer technologies, the most common of which are:

- the daisy wheel printer
- the dot-matrix printer (also called *impact matrix printer*)
- the inkjet printer and the bubble jet printer
- the laser printer

Today, daisy wheel printers and matrix printers are hardly ever used.

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2.4.2.1 Types of Printers

A printer is an output device that produces a *hard copy* of data. The resolution of printer output is expressed as DPI. Printers can be classified into different types in several ways.

First, the printers can be divided into three categories by the way they print.

- **Serial Printers:** Also called a character printer. Print a single character at a time. They are usually inexpensive and slow.
- **Line Printers:** Print a line at a time. They are expensive and very fast. Line printers use a band, a chain, etc.
- **Page Printers:** Also called a laser printer. Print a page at a time. They usually use a laser to produce page images. Quality is best. This is a little bit expensive, but the price of the personal laser printer is decreasing. The price range of the personal laser printer is around $400, today.

Second, printers can be classified into two forms according to the use of a hammer.

- **Impact Printers:** Hammer hits ribbons, papers or print head. Dot-matrix and daisy-wheel printers are the example. Noisy.
- **Nonimpact Printers:** They do not have the hammer and do not hit. An example is an ink-jet and laser printer.

So, let's take a closer look at the various types of printers.

2.4.2.2 Character Printers

They are used to print only one character at a time. A typewriter is an example of a character printer. Some of character printers are described below.

2.4.2.3 Daisy-Wheel Printer

Daisy-Wheel Printer prints typewriter-like very high quality characters. However, they are slower and less reliable than dot-matrix printers. Microcomputer users seldom use this printer, because the better dot-matrix printers and inexpensive laser printers are available today. The speeds of daisy-wheel printers range from 30 to 60 characters per second (cps).

Figure 2.14: A daisy-wheel print wheel

2.4.2.4 Dot-Matrix Printer

The **dot-matrix printer** allows you to print documents on paper thanks to the "back and forth" motion of a carriage housing a print head.

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Dot-matrix printers are printers that write characters and form graphic images using one or two columns of tiny dots on a print head. The dot hammer moving serially across the paper strikes an inked-ribbon and creates images on paper.

- The print head travels from side to side across the paper and is made up of numerous pins which are pushed out to form the shape of each character.
- The pins hit an ink ribbon against the paper so the characters are printed out.
- The paper is usually continuous with holes down each side and perforations so the pages can be easily separated by tearing.

Because the pins make an impact against the paper the characters can be printed through several layers of self-carbonating paper to produce duplicate copies.

Figure 2.15: Dot Matrix Pins

An animation showing how head of a 21 pin dot-matrix printer moves across the paper, firing the pins that strike the ink against the paper.

Character Matrix Printer

Character matrix printers are a category of computer printers (typically impact printers) that place characters from a fixed character set anywhere onto a fixed grid of possible locations on the page. Examples of these are daisy wheel printers, golf ball printers, chain printers, and band printers. A character printer prints one character at a time.

2.2.4.5 Line Printers

Line printers, as the name implies, print an entire line of text at a time. The **line printer** is a form of high speed impact printer in which one line of type is printed at a time. They are mostly associated with the early days of computing, but the technology is still in use. Print speeds of 600 to 1200 lines-per-minute (approximately 10 to 20 pages per minute) were common.

Figure 2.16: IBM 1403 line printer

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Designs

Four principal designs existed:

- Drum printers
- Chain (train) printers
- Band Printers

2.4.2.6 Page Printers

These are the very high speed non impact printers. They can produce documents at speeds of over 20,000 lines per minute. Electronics, xerography, lasers, and other technologies have made these high-volume systems possible. These techniques called electro-photographic techniques have developed from the paper copier technology. Page printers can produce pages of output at a rate equal to a photo copier.

2.4.2.7 Laser Printer

Laser printers are page printers that print one page at a time. It is a non-impact printer. A *laser printer* is a printer that uses the electro-photographic method used in a copy machine. A **laser printer** is a common type of computer printer that rapidly produces high quality text and graphics on plain paper.

Figure 2.17: The basic components of a laser printer

The **laser printer**s produce quality print-outs inexpensively at a high print speed. However, these printers are mostly used in professional and semi-professional settings because of their high cost.

2.4.2.8 Inkjet Printer

Ink-jet is a printer mechanism that sprays one or more color of ink at high speed onto the paper and produces high-quality printing. This printer also produces color printing as well as high-quality image. That is, ink-jet printers can be used for variety of color printing at a relatively low cost. Ink-jet printing has two methods: Continuous stream method and drop-on- demand method.

Inkjet printing, like laser printing, is a non-impact method.

Figure 2.18: Ink Jet Printer

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2.4.3 Plotter

Plotters were the first type of printer that could print with color and render graphics and full-size engineering drawings. As a rule, plotters are much more expensive than printers. They are most frequently used for CAE (computer-aided engineering) applications, such as CAD (computer-aided design) and CAM (computer-aided manufacturing). Hewlett-Packard is the leading vendor of plotters worldwide.

Plotters are divided into four types:

1. Drum plotters
2. Flatbed plotters
3. Inkjet plotters
4. LED plotters

2.4.3.1 Drum Plotter

A drum plotter is pen plotter that wraps the paper around a drum with a pin feed attachment. The drum then rotates the paper as pens move across it and draw the image. It was the first output device used to print graphics and large engineering drawings.

Figure 2.19: A drum plotter

2.4.3.2 Flatbed Plotter

A flat-bed plotter is a mechanical drafting device used with many CAD programs for designers. The paper remains stationary on a flat surface while a pen moves across it horizontally and vertically. A flatbed plotter is also known as Table Plotter.

Figure 2.20: Flatbed Plotter

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2.4.3.3 The Inkjet Plotter

This is the third kind of Plotter which is called as the Inkjet plotter. The inkjet plotter creates an image by spraying small droplets of ink onto a piece of paper. A popular choice for advertising agencies and graphic designers, inkjet plotters are used generally for large outputs, such as banners and billboards and large signs often seen on roadsides.

Figure 2.21: Inkjet plotter

In Today's world, virtually all inkjets create color. Low-end inkjets make the most of the three ink colors (cyan, magenta and yellow), but finally create a complex black that is often mud-spattered. Four-color inkjets make use of the black ink created for pure black printing alone.

2.4.3.4 Led Plotter

LED plotters are also called as Electrostatic plotters. It works similar to Laser Printers except that it uses LED as the heat source instead of Laser.

Figure 2.22: LED plotter

2.4.4 Projector

Projectors are display devices that project a computer created image. The computer sends the image data to the video card which then sends the video image to the projector. They are typically used for presentations or for viewing videos.

An output device that can take the display of a computer screen and project a large version of it onto a flat surface. **Projectors** are often used in meetings and presentations so that everyone in the room can view the presentation. In the picture to the right, are a ViewSonic projector and an example of what a

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projector may look like. Projectors used with computers are small devices that are rarely much larger than a toaster and typically weigh a few pounds.

Figure 2.23: Projector

2.5 OTHER HARDWARE

Computer hardware is the collection of physical parts of a computer system. Apart from computer case, monitor, keyboard, mouse, printers, plotters, etc., it also includes all the parts inside the computer case, such as the hard disk drive, motherboard, video card, and many others. Computer hardware is what you can physically touch. Few such computer hardware devices and components are discussed as under.

Motherboard

The **motherboard** is the main circuit board of a computer. It contains the central processing unit (CPU), the Basic Input/Output System (BIOS), memory, mass storage interfaces, serial and parallel ports, expansion slots, and all the controllers for standard peripheral devices like the keyboard, disk drive and display screen.

Figure 2.24: Motherboard

The **chipset** and other motherboard circuitry are the "smarts" of the motherboard. Their job is to direct traffic and control the flow of information inside the computer.

The **chipset** is a critical part of any computer, because it plays a big role in determining what sorts of features the computer can support.

CPU

The central processing unit (CPU), also called a **processor**, is located inside the **computer case** on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out

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commands. Whenever you press a key, click the mouse, or start an application, you're sending instructions to the CPU.

Fig. 2.25: Processor

The CPU is generally a **two-inch ceramic square** with a **silicon chip** located inside. The chip is usually about the size of a thumbnail. The CPU fits into the motherboard's **CPU socket**, which is covered by the **heat sink**, an object that absorbs heat from the CPU.

A processor's **speed** is measured in **megahertz (MHz)**, or millions of instructions per second; and **gigahertz (GHz)**, or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components—not just the processor. There are 2 main chip manufacturers, **Intel and AMD**.

RAM

Random Access Memory (RAM) is a critical performance component for computers. When a computer boots up, opens a program, and then opens a file, it loads these elements into RAM to do the work.

Figure 2.26: RAM

In general, you want to have as much RAM in your computer as you can afford. If you are running a 32 bit operating system, then each program can make use 2GB to 3 GB of RAM. If you have a 64bit OS, then each program can use as much RAM as you have available.

Video Card

A video card or Graphics Processing Unit (GPU) is the part of the computer that connects to the monitor. The GPU takes the video image and puts it in a form that can be displayed on the monitor. In most laptops, this is built into the system and cannot be replaced. In most desktop computers, the GPU fits into a slot on the motherboard, and can often be upgraded.

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Digital storage

Every computer needs a storage device to store the operating system, programs and files. In the vast majority of cases, this is provided by one or more hard drives. Most computers have at least one internal hard drive, and they have the capability to connect to external drives.

Figure 2.27: Hard Disk

Most computers also have the ability to read and write optical disc like CD, DVD or Blu-ray. These are used for loading data and programs on and off the computer.

Digital storage is a critical part of any computer system, and using storage properly can be the difference between keeping your photos and losing them. For more information, take the course on digital storage and backups.

Power Supply Unit

The power supply unit in a computer **converts the power** from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components.

Figure 2.28: Power Supply Unit

Expansion cards

Most computers have **expansion slots** on the motherboard that allow you to add various types of **expansion cards**. These are sometimes called **PCI (peripheral component interconnect) cards**. You may never have to add any PCI cards because most motherboards have built-in video, sound, network, and other capabilities. However, if you want to boost the performance of your computer or update the capabilities of an older computer, you can always add one or more cards. Below are some of the most common types of expansion cards.

Sound Card

The **sound card**, also called an audio card, is responsible for **what you hear** in the speakers or headphones. Most motherboards have integrated sound, but you can upgrade to a dedicated sound card for higher-quality sound.

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Network card

The **network card** allows your computer to communicate over a network and access the Internet. It can either connect with an **Ethernet** cable or through a **wireless** connection (often called **Wi-Fi**). Many motherboards have built-in network connections, and a network card can also be added to an expansion slot.

Bluetooth card

Bluetooth is a technology for wireless communication over short distances. It's often used in computers to communicate with wireless **keyboards**, **mice**, and **printers**. It's often built into the motherboard or included in a **wireless network card**. For computers that don't have Bluetooth, a USB adapter, called a **dongle**, can be purchased.

Figure 2.29: Dongle

SUMMARY OF THE LESSON

You learnt the following in this lesson:

- An **input device** is any hardware device that sends data to the computer, without any input devices, a computer would only be a display device and not allow users to interact with it, much like a TV.
- A keyboard is one of the today's most common and familiar input devices. A keyboard's primary function is to act as an **input device.**
- Mouse is a pointing device and it has been around us for more than 20 years
- A joystick is also a pointing device. It is used to move the cursor position on a CRT screen. Its function is similar to a mouse, except that with a mouse the cursor stops moving as soon as you stop moving the mouse.
- A touch screen is basically a display screen which can identify the occurrence and position of a touch inside the display region.
- Scanner is a kind of input device that can read text or printed paper and translates the information in a convenient form to be understood by the computer.
- ***Hard copy*** is the output, such as paper, that can be read immediately or stored and read later. It is relatively stable and permanent form of output. ***Soft copy*** is usually a screen-displayed output.
- Any peripheral that receives or displays output from a computer. An inkjet printer is a good example of an **output device** that can make a hard copy of anything on a computer.

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- The computer **monitor** (also know as a **VDU** or **V**isual **D**isplay **U**nit) is the most common computer output device.
- A **printer** is a peripheral which produces a text and/or graphics of documents stored in electronic form, usually on physical print media such as paper or transparencies.
- A printer is an output device that produces a *hard copy* of data. The resolution of printer output is expressed as DPI. Printers can be classified into different types in several ways.
- Plotters were the first type of printer that could print with color and render graphics and full-size engineering drawings.
- Computer hardware is the collection of physical parts of a computer system. Apart from computer case, monitor, keyboard, mouse, printers, plotters, etc., it also includes all the parts inside the computer case, such as the hard disk drive, motherboard, video card, and many others.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. What are input devices?
2. What do you mean by keyboard?
3. Explain the concept of mouse?
4. Explain the speech recognition system in detail?
5. What do you mean by digital camera?
6. Explain the working of scanners?
7. What do you mean by output devices?
8. What are printers? Explain the various types of printers in detail?
9. Explain the various types of plotters?
10. What do you mean by monitor?
11. Explain the various types of monitors?
12. What do you mean by projector?
13. State the necessities of Input and Output devices.
14. What are the reasons for the visual display unit to be more popular than punched card reader?
15. What is a Keyboard? How does a simple keyboard differ from an ergonomically designed keyboard?

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CHAPTER - 3

WINDOWS OPERATING SYSTEM

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the basic concepts of windows. Readers will be able to understand the following:

- Windows operating system, its common features, Windows Explorer.
- Control Panel, Print Manager and other elements of Windows GUI

STRUCTURE OF THIS LESSON

3.1 Windows Operating System

3.1.1 Common Features of Windows GUI

3.1.2 Windows Explorer

3.1.3 Print Manager and Installing Printers

3.1.4 Control Panel

3.1.5 Using Paint Brush

3.1.6 Using Clipboard in Windows

3.1.7 My Computer

Summary of the Lesson

Self Assessment Questions and Exercises

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3.1 WINDOWS OPERATING SYSTEM

Microsoft Windows (or simply **Windows**) is a meta family of graphical operating systems developed, marketed, and sold by Microsoft. It consists of several families of operating systems, each of which cater to a certain sector of the computing industry.

The Windows operating system is developed and maintained by Microsoft, the company founded by Bill Gates. The first version was released in 1985. Since then, it has grown significantly, and it now dominates the market. Windows uses a graphical user interface to make it easier for people to use their computers. The primary ways that people navigate are through icons on the desktop and the Start menu.

As of April 2014, the most recent versions of Windows for personal computers, smartphones, server computers and embedded devices are respectively Windows 8.1, Windows Phone 8.1, Windows Server 2012 R2 and Windows Embedded 8. A specialized version of Windows runs on the Xbox One game console.

Remarks

The next version of Windows is Windows 10 and is currently available as a technical preview; it is set for release for phones, tablets, laptops, and PCs in late 2015.

However, versions of Windows operating system with its date of release are provided in **Table 3.1.**

Table 3.1: Windows Operating System Versions

Date	Version
1981 Sept.	Interface Manager
1983	Windows was announced
1985 Nov.	Windows 1.0 for 8088 CPUs released
1987 Dec.	Windows 2.0 for 386 CPUs, up to 16 mbyte RAM addressable
1988/89	Windows 2.1 for 286/386
1990	Windows 3.0
1992 April	3.1 (janus) includes MS-DOS 5.0
1993 Nov.	Windows for Workgroups 3.11 (snowball) rudimentarily networkable
1995 Aug.	Windows 95 4.0 Codename "Chicago" was released
1996 Feb.	Windows 95 Version A (OSR1)
1996 Aug.	Windows 95 (detroit) Version B (OSR2) first time with FAT-32 support
1997 April	Windows 95 Version B (OSR2.1)
1997 Nov.	Windows 95 Version C (OSR2.5)
1998 June	Windows 98 (memphis) about 5,000 bugs fixed
1999 May	Windows 98 SE (Second Edition)
2000 Sept.	Windows Me (Millenium)
1980 Aug.	XENIX OS cooperation with SCO
1982 Feb.	XENIX 2.3 cooperation with SCO
1983 April	XENIX 3.0 cooperation with SCO
1987	MS OS/2 1.0 cooperation with IBM
1988	OS/2 1.1 cooperation with IBM
1991	OS/2 1.3 cooperation with IBM
1992	OS/2 2.0 cooperation with IBM
1993 July	Windows NT 3.1 & Advanced Server; 3.1 million lines of source code, supports HPFS
1994 Sept.	Windows NT 3.5 (daytona), Workstation and Server, with opengl and Netware client; 9 million lines of source code
1995 May	Windows NT 3.51, updae, transparent compression with NTFS file system, PCMCIA support, for Power-PCs available too
1996 Aug.	Windows NT 4.0 (cairo) 16 million lines of source code, no support for HPFS anymore
1996	Windows NT Terminal Server Edition (hydra)
1997	Windows NT Server 4.0 Enterprise Edition
1998	Windows NT Server 4.0 Terminal Server Edition
2000 Feb.	Windows 2000, Windows version 5.0; 30 million lines of source code, about 10,000 bugs fixed

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2000 Sept.	2000 Datacenter Server
2001 Oct.	Windows XP (whistler), Windows version 5.1
2002	Windows XP Media Center Edition, Windows XP Tablet PC Edition
2003 April	Windows Server 2003 version 5.2 (whistler server)
2006	Windows Vista, Windows version 6.0, Codename Longhorn (Client)
2006 June	Windows Compute Cluster Server 2003 (Windows CCS 2003)
2008 Feb.	Windows Server 2008 (Codename Longhorn)
2007 July	Windows Home Server 1.0
2009 Oct.	Windows 7 (Codename Vienna)
2012 Oct. 26	Windows 8
2013 Oct. 18	Windows 8.1 (Codename Blue)

3.1.1 Common Features of Windows GUI

Desktop view of GUI of Windows 7 Home Premium is shown in **Fig. 3.1.**

Fig. 3.1: Desktop View of Windows 7 Home Premium

A present day GUI has the following common features:

a) ***Pointing device(s)***: These allow users to point at different parts of the screen as well as can be used to initiate a command. Besides, these can also be used to manipulate objects on the screen by:

- *selecting objects on the screen*
- *moving objects around the screen, or*
- *merging several objects into another object*

Examples: Mouse, light pen, joystick, touch sensitive screen, touch pad and so on.

b) ***Windows :*** It graphically display the progress of the action initiated. When a screen is divided into several independent regions, each one of these is called a window. Each window can highlight results related to the action fired in the respective window.

c) ***Switching capability :*** Windows system offers the switching capability from one application to another or for sharing of data among various applications.

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d) ***Resizing and Movement :*** Windows system also support resizing as well as moving around feature of windows.

e) ***Graphical Bit-mapped Displays :*** Bit-mapped display are made up of small pixels and offer a very high resolution. Bit-mapped displays have almost replaced character-based displays. Bit-mapped displays wonderful support graphic manipulation. This feature of these displays is also called WYSIWYG i.e. What You See Is What You Get.

f) Functionality to support graphics along with height-parameters, color attributes, video-attributes, etc.

g) ***Icon :*** Icons provide a symbolic representation of any system-entity or user-defined object, etc. such as file, folder, address, table, book, applications and so on. A folder icon consists a group of files or other folder icons. Double clicking on the folder icon causes a window to be opened displaying a list of icons and folder icons representing the folder's contents.

h) ***Dialog box :*** Dialog box is used to capture user information or to present information to the user. Normally, a dialog box is displayed to get additional information. Dialog boxes are also used to indicate error messages in the form of alert boxes. Dialog boxes also use a wide range of screen control elements to communicate with the user.

i) ***Check box :*** Such a box is used to capture the information intending confirmation pertaining to any kind of actions desired by the end-user.

j) ***Sliders :*** These are used to show the relative position of the contents or to move to a different position.

k) ***Desktop Metaphors :*** In desktop graphical metaphor, users are not aware of applications and they deal with files, folder, drawers, clipboard and an out-box. For example, merely clicking the mouse on an icon representing the Report cause word processor to get started and to load the report file automatically.

l) ***Menus :*** The functionality on a GUI system must be arranged in the form of structured menus such as horizontal menus, pull-down menus, etc. From the menu, the end-user can select any operation of his choice such as File, Edit, Search, Tool and so on. Rather than remembering commands at each stage, a menu can be used to provide a list of items. Each menu element can be either a word or an icon representing a command or a function. Menu item can be invoked by moving the cursor on the menu item and selecting the item by clicking the mouse.

3.1.2 Windows Explorer

Windows Explorer displays the hierarchical structure of files, folders, and drives on your computer. It also shows any network drives that have been mapped to drive letters on your computer.

Windows Explorer is automatically launched any time you open a folder in **Windows** XP.

Using Windows Explorer, you can copy, move, rename, and search for files and folders. For example, you can open a folder that contains a file you want to copy or move, and then drag the file to another folder or drive.

There are other places in Windows where you can view and work with files and folders. My Documents is a convenient place to store documents, graphics, or other files you want to access quickly.

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You can also view My Network Places, which lists other computers that are connected to your local area network (LAN). When you delete files or folders from your hard disk, Windows places them in the Recycle Bin, where you can retrieve them, until you empty the Recycle Bin. Files or folders deleted from a floppy disk or a network drive are permanently deleted and are not sent to the Recycle Bin.

To open Windows Explorer, click **Start**, point to **All Programs**, point to **Accessories**, and then click **Windows Explorer**.

3.1.3 Print Manager and Installing Printers

Both in Windows 7 and Windows 8, the *Print Management* console is part of *Administrative Tools*. However, it is not available in all editions of Windows. Only users of Windows 7 Professional, Ultimate and Enterprise will be able to use it. In Windows 8 it is available in Windows 8 Pro and Enterprise.

While a search for the term *Print Management* in Windows 7's *Start Menu* will return the appropriate result, doing the same in Windows 8's *Start* screen will not. That's why, to make sure you find it, it is best to open the *Control Panel* and go to *System and Security -> Administrative Tools*.

Fig. 3.2: Administrative Tools Menu

This will work both in Windows 7 and Windows 8.

When you first launch *Print Management*, its window will look similar to the screenshot below.

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Remarks

Fig. 3.3: Print Management Menu

Installing Printer in Windows 7 - Step by Step Guide

- Click on **Start** and then click on "**Device & Printers**" – Then you get the Printers page.
- Then go top and find "**add a printer**" menu, Click on "**add a printer**".
- Now you got a **printer setup wizard** front of you and asking to "how do you want to install your printer" with **USB cable** (Local printer) or **Wireless** / Network.
- Under Local printer you can Install printer with **LPT** port and with the **USB** cable.
- Select the USB port and select "**USB001 (Virtual port for USB printer)**" and then click on **next.**
- Now in the next windows pick your appropriate **drivers** for this particular printer.
- After that you get your printer driver successfully installed

3.1.4 Control Panel

The Control Panel is a part of the Microsoft Windows graphical user interface which allows users to view and manipulate basic system **settings** and controls via applets, such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options.

To open the Control Panel, click the Start button on the taskbar and then click Control Panel on the Start menu. Windows 7 gives you three different views for looking at your computer's Control Panel: To switch views, click the View By drop-down button (labelled Category by default) in the upper-right corner of the Control Panel and then choose one of the views from the button's drop-down menu.

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Fig. 3.4: Control Panel Menu

By default, the Control Panel is displayed in Category view, which is separated into eight categories, ranging from System and Security to Ease of Access. To open a window with the Control Panel options for any one of these categories, simply click the category's hyperlink.

Fig. 3.5: Control Panel Menu

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Remarks

3.1.5 Using Paint Brush

Paint formerly known as Paintbrush for Windows is a simple graphics painting program that has been included with almost all versions of Microsoft Windows since its first release. It is often referred to as MS Paint or Microsoft Paint.

The program opens and saves files as Windows bitmap (24-bit, 256 color, 16 color, and monochrome, all with the .bmp extension), JPEG, GIF, PNG, and TIFF. The program can be in color mode or two-color black-and-white, but there is no gray scale mode. For its simplicity, it rapidly became one of the most used applications in the early versions of Windows—introducing many to painting on a computer for the first time—and still has strong associations with the immediate usability of the old Windows workspace.

Steps to Start the Paint Brush

1).Click on the Start Button.

2).Click Programs.

3).Click Accessories.

4).Click on Paint.

Then you will screen as shown below:

Fig. 3.6: Paint Screen

Menus

Four of the Paint menus—File, Edit, View and Help—are common to almost all Windows programs. Menus that are special to Windows Paint are Image and Colors. The menu of greatest interest is the Image Menu.

File Edit View Image Colors Help

Fig. 3.7: Paint Menu

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Toolbox

All the little grey boxes down the left are called the tools and together they make the toolbox. The individual tools will each be explained separately further down. Under the toolbox is a small area where you see different options according to which tool you're using.

Fig. 3.8: Paint Toolbox

Paste Options

In this picture, with the selection tool active, you have a choice between paste opaque and paste transparent (selected, as you can tell by the dark background).

Fig. 3.9: Paint Paste Options

The Colour Palette

Under the main window is the colour palette. The two squares set apart from the rest at the left end of the palette show the active colours; the colours presently in use. When you click on a colour in the palette with the left mouse button, that colour will be the primary or foreground colour, here shown as pink. The colour you click on with the right mouse button will be the secondary or background colour, here shown as white.

3.1.6 Using Clipboard in Windows

In Windows and other operating systems, the *Clipboard* is a short-term storage area for all kinds of information that you have copied from one place and you plan to use in another place. You can copy just about anything to the *Clipboard*: strings of text, images, video, files, folders, shortcuts, etc.

When you copy (or cut) something, it is stored in the *Clipboard*. When you copy (or cut) something else that piece of information overwrites the previous contents. This is because Windows provides support for a single clipboard transaction.

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When you paste the contents of the *Clipboard*, the contents remains available for further pasting operations. It is overwritten only when you copy or cut something else.

What Can You Copy to the Clipboard?

Just about anything that can be selected in Windows: text of all kinds, graphics, files (including shortcuts) or folders.

What Can You Paste from the Clipboard?

Pasting the contents of the *Clipboard* depends on where you want to perform the paste. For example, if you are working with text, you can paste text only in apps and programs that work with text. Following the same rule, you can paste graphics only in apps and programs that work with graphics, and so on.

If the contents of the *Clipboard* cannot be pasted where you want to, it will not be pasted there but the contents of the *Clipboard* will remain intact.

How to Manage the Clipboard in Windows?

Windows XP had a *Clipboard Viewer* that allowed users to view the contents of the local clipboard, clear the clipboard or save copied and cut items.

Unfortunately, this program was removed from Windows Vista and subsequent versions of Windows, including Windows 8.1.

Therefore, if you want to view the contents of the clipboard and manage it, you must use third-party programs developed by companies other than Microsoft.

Windows XP had **clipbrd.exe,** referred to as the **Clipboard Viewer** or the **ClipBook Viewer**, which could be used to see what was saved on your clipboard. If you try to search for this exe file in Windows Vista, Windows 7 or Windows 8, you will be unable to find clipbrd.exe.

Clipboard in Windows 7 / 8

In Windows XP this file was situated in ***C:\Windows\System32\clipbrd.exe***. It is now missing as a part of the Windows 7 | 8 installation. You can try to copy it from a Windows XP installation, if you have access to it, and paste it in your System32 folder. In most cases this is known to work.

Clipboard Viewer

If you wish, you can download Windows Clipboard Viewer but if it does not work or if you are confronted with a message of sorts: *Entry Point Not Found*, then you may try to run it in Windows XP/SP2 compatibility mode and see if it works.

The Windows Clipboard is very basic in nature and does not offer many features. As a result, many free Clipboard alternatives like ArchiveClipboard, Enhanced Clipboard Manager, CopyCat, Clipboardic, Orange Note, Ditto, Clipboard Magic, etc, are available on the Internet.

3.1.7 My Computer

The ‘My Computer’ icon gives us easy access to our hard drives, removable flash drives and other network-related locations. But if you’re one who enjoys a **clutter-free desktop**, then maybe you can use this tweak to remove the many program and folder shortcuts on your desktop.

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Fig. 3.10: My Computer

Here's a way to get more usefulness out of "My Computer" by adding the shortcuts that you need to it. This also gives you **quick access** to the program or folder and works very well with Windows Explorer tabs tweak like Clover.

SUMMARY OF THE LESSON

You learnt the following in this lesson:

- Operating System (OS) is a collection of software written to provide the fundamental instructions that a computer needs to manage resources, such as memory, the file system, and processes.
- Windows Explorer displays the hierarchical structure of files, folders, and drives on your computer. It also shows any network drives that have been mapped to drive letters on your computer.
- Both in Windows 7 and Windows 8, the *Print Management* console is part of *Administrative Tools*.
- The Control Panel is a part of the Microsoft Windows graphical user interface which allows users to view and manipulate basic system **settings** and controls via applets, such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options.
- Paint formerly known as Paintbrush for Windows is a simple graphics painting program that has been included with almost all versions of Microsoft Windows since its first release. It is often referred to as MS Paint or Microsoft Paint.

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Remarks

- In Windows and other operating systems, the *Clipboard* is a short-term storage area for all kinds of information that you have copied from one place and you plan to use in another place.
- The 'My Computer' icon gives us easy access to our hard drives, removable flash drives and other network-related locations.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. What is an operating system?
2. Discuss the important functions of an operating system.
3. What is a File Manager? Outline its responsibilities.
4. Chart the family of operating system.
5. What is Windows operating system? List its important versions.
6. What is the purpose of a clipboard?
7. What is Print Manager?
8. What is 'My Computer'?
9. What is Paint program/Paint Brush?
10. What are main features of Windows operating system?
11. What is Control Panel? How is it useful?

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CHAPTER – 4

INTRODUCTION TO MICROSOFT WORD

OBJECTIVES OF THIS LESSON

This lesson is aimed to make you understand the concepts of word processing and MS-Word. Readers will be able to understand the following:

- Concept and features of word processing
- Basic concepts of MS-Word
- Different components of Word document window
- Different types of Menu and their various options
- Various types of Toolbars with their different options
- Use of Ruler to set the margins of document
- Scrolling of document with the help of Scroll bar
- To check the spelling and grammar mistakes of text of document
- Creating, editing and saving of document by various ways.

STRUCTURE OF THIS LESSON

4.1 Introduction
4.2 Word Processor
4.3 Ms-Word
4.4 Features of Ms-Word
4.5 Components of Word Document Window
4.6 Menu Bar
4.6.1 File Menu
4.6.2 Edit Menu
4.6.3 View Menu
4.6.4 Insert Menu
4.6.5 Format Menu
4.6.6 Tools Menu
4.6.7 Table Menu
4.6.8 Window Menu
4.6.9 Help Menu
4.7 Toolbars
4.7.1 Standard Toolbar
4.7.2 Format Toolbar
4.7.3 Drawing Toolbar

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4.8 Scroll Bar
4.9 Ruler
4.10 Creating a Document
4.10.1 Creating a New Document
4.10.2 Opening a Saved Document
4.10.3 Closing a Document
4.11 Editing and Formatting A Document
4.11.1 Editing Text
4.11.2 Undo and Redo
4.11.3 Cut, Copy and Paste
4.11.4 Clear Formatting
4.11.5 Find and Replace
4.11.6 Go To
4.11.7 Character Formatting
4.11.8 Bullets or numbering
4.11.9 Other Formatting Features
4.11.10 Paragraph Alignment
4.11.11 Spelling Check
4.12 Saving a Document
Summary of the Lesson
Self Assessment Questions and Exercises

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4.1 INTRODUCTION

There are many ways of conveying information. Writing is one of them. Earlier we were using manual typewriters to prepare documents, then electronic typewriters and now we are using computers to prepare any type of document. Many applications programs have been developed that helps us to quickly create documents with a professional look. One such most popular program is word processor. A word processor provides general tools for creating, editing, saving, formatting and printing the documents. We can create all types of documents that are used in our daily lives with the help of word processor. In fact word processor provides a great role in every field for creating different types of documents. Therefore, it is suggested generally that every person must be aware of word processing and its features.

4.2 WORD PROCESSOR

Word processor is software that enables us to create, edit, save and print the documents. With the help of this, users can make their document more effectively by combining text, graphics and images. There are number of word processors such as MS-Word, Word Star, Write, Word Perfect, Chi Writer etc. The most popular and commonly used word processor is MS-Word.

4.3 MICROSOFT WORD (MS-WORD)

Microsoft word is the most popular and commonly used word processor. It is used to create different types of documents such as letter, reports, memos, invoices, proposals etc. MS-Word is used to save, edit and print the document. With the help of different toolbars, we can make the document attractive

Remarks

and error free. In MS-Word, mail merge is used to quickly create letters, mailing labels, envelops and catalogues by merging the information from two different files. MS-Word also provides the facility of creating table and formatting of data in the table. There are many versions of MS-Word. This lesion discusses the features of MS-Word 2003.

Steps to open MS-Word

Click on start button, go to all programs options, choose the MS-Office from the given options and then choose the MS-Word.

4.4 FEATURES OF MS-WORD

MS-Word provides many features some of them are given as:

- To create professional looking documents
- To edit text or to make changes in existing document
- To define different page layout for a document
- To format text in a document and enhance its appearance and readability
- To display documents
- To save, retrieve and delete documents
- To print documents
- To import text, graphics and images
- To search and replace text strings
- To check spelling and grammatical mistakes
- To correct use of improper writing styles in a document
- To use online-templates
- To mail merge
- To use word styles and word special features

4.5 COMPONENTS OF WORD DOCUMENT WINDOW

The word document window as shown below has the following basic components

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(a) Title Bar

Title bar displays the document name followed by program name. It also display minimize, maximize and close buttons.

(b) Menu Bar

The menu bar is placed just below the title bar. This is the traditional windows style drop-down menu. When you point to any menu title and click once with the mouse, the menu will open, displaying all the commands available under this menu. Clicking on the desired command would tell word to execute that command.

(c) Toolbars

The Toolbar is placed just below the Menu bar. It contains buttons, drop-down menus and other controls that help you to quickly create the document, alter the appearance and arrangement of documents by executing a variety of word commands.

(d) Formatting Toolbar

Formatting Toolbar contains shortcut buttons for the most popular commands. For example, icons for changing fonts, style, font size, text alignment etc

(e) Ruler

Ruler is used to set margins, indents, tabs and helps you to create document as per dimensions required.

(f) Scroll Bar

Scroll bar is used to view parts of the document. You can go anywhere, up and down, right and left in your document by using horizontal and vertical scroll bars.

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(g) Status Bar

This is normally the last line of your screen. Status bar displays position of the insertion point and working mode buttons. It displays the information about current page, section number, current/total pages in the document, current cursor position, current line number, current column number etc.

(h) View Buttons

View button changes the layout view of the document to Normal View, Web Layout View, Reading Layout View, Print Layout View, or Outline View.

(i) Task Pane

Task pane provides easy access to commonly used menus, buttons and tools.

4.6 MENU BAR

The Menu Bar is placed just below the Title Bar. It displays the headings of different menu items as shown below:

Menu bar contains various types of menus like file menu, edit menu, view menu, insert menu, format menu, tools menu, table menu, window menu and help menu. Commands are grouped under each of these menu headings according to function. When you point to any menu title and click once with the mouse, the menu will open, displaying all the commands available under this menu. Clicking on the desired command would tell word to execute that command. Some commands have ellipses (…) in front of them. These commands have further sub commands. Commands appearing in dim mode cannot be executed unless the prerequisite functions required by that command have not been performed. Various types of menus are explained in details in the following topics.

4.6.1 File Menu

The File menu contains a number of options, which are following:-

- NEW- This creates a new document. It can be from scratch or from a template.

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- OPEN- Already prepared document is opened through this command.
- CLOSE- currently working document is closed.
- SAVE- It saves document either on H:/ drive or on C:/ drive or on disc or on CD ROM.
- SAVE AS- This command allows to save the current document again with different location and/or under a different name.
- SAVE AS WEB PAGE- Saves the document as a web page and can be linked to web.
- SEARCH – The Word files containing the key words type in the box will be searched by this command.
- VERSION – used to save different version of document, by date.
- WEB PAGE PREVIEW – to preview how document would look like as a web page.
- PAGE SET UP- to set the margins selects page orientation, selects paper source and size, add line numbers and borders and view the page in preview mode.
- PRINT PREVIEW- This view shows how a document will appear on paper without actually printing it.
- PRINT- Print all pages in the active document or the currently selected page or a range of pages.
- SEND TO – used to send document to a variety of places.
- PROPERTIES - to show the details of current document.
- EXIT- used to exit from both the document and M.S. Word.

4.6.2 Edit Menu

This menu involves a number of editing options, which are following:-

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- UNDO & REPEAT – This command undo or repeat the actions that have performed.
- CUT- It takes out the highlighted text.
- COPY- used to copy the highlighted text.
- OFFICE CLIPBOARD – used to collect text and graphics from different documents or other program and then paste them into any office document.
- PASTE – used to paste copied text or graphics.
- PASTE SPECIAL – used to paste text in HTML or unformatted text.
- PASTE AS HYPERLINK – used to paste material as hyperlink into document.
- CLEAR- it is the other way of delete as it clears all formats or contents.
- SELECT ALL- It selects the whole text for formatting or deleting.
- FIND- It looks for a word or phrase within document.
- REPLACE- It replaces a word or phrase in document with any other word or phrase.
- GO TO- This command will take the user to the place in document where it finds the text type in the box.
- LINKS – used to display or change information for each link in current file. (It is unavailable if no links are present in document)
- OBJECTS – used to edit the objects placed in document.

4.6.3 View Menu

The view Menu involves a number of viewing options, which are following:-

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- NORMAL: This view lets the user to see the document using the whole screen including any formatting.
- WEB LAYOUT- Through this view, user can see the document as it would appear on a webpage.
- PRINT LAYOUT-Through this view, user can see ruler and can adjust margins or tabs. It also allows seeing the edge of document as it would appear when it is printed.
- OUTLINE- User can see the document as in Normal view but without any formatting.
- TASK PANE – used to show the options like templates for new documents from other documents, the clipboard, ClipArt & Styles and Formatting.
- TOOLBARS- You can see all the different toolbar options and to invoke and customize them.
- RULER- For adjusting margins, this command activates the ruler in PRINT LAYOUT view.
- DOCUMENT MAP – used to see different styles that have been applied to document.
- HEADER and FOOTER- It allow creating Header and Footer for document. In this we can add time, date, page number etc.
- FOOTNOTES- This command allows to go to the footnotes, which already prepared in document.
- MARKUP – used to display or hide comments or track changes such as insertion, deletions and formatting changes.
- FULL SCREEN – it allows using the entire screen to view the document without any Menu or Toolbar.
- ZOOM- used to zoom in or out of document.

4.6.4 Insert Menu

Insert menu has many commands which are very useful for inserting different things into document. These are following:

BREAK - used to insert Page break, Column break or text Wrapping Break into document.

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- PAGE NUMBERS- used to insert page numbers into document.
- DATE AND TIME- used to insert date and time into document.
- AUTO TEXT – used to insert automatic text into document selected from a list of options.
- FIELD – used to set a field within document such as user name, address block etc.
- SYMBOL – used to insert a symbol into document either picture or alphabetical symbol.
- COMMENT – used to insert a comment into document.
- REFERENCE – used to insert a caption, footnote, cross-reference or an index and table into documents.
- WEB COMPONENT – used to insert web pages components as link bars for navigation.
- PICTURE- allows inserting picture from Clipart or from file.
- DIAGRAM – used to insert an organizational chart from different choices.
- TEXT BOX – used to insert text anywhere within the document and move the whole box around.
- FILE – used to insert another file directly into document.
- OBJECT – used to insert an object into document such as Adobe Photoshop Image, Acrobat file or Bitmap image.
- BOOKMARK – used to identify a location or text selection that user name and identify for future reference.
- HYPERLINK- adds a hyperlink when the address of a webpage is typed.

4.6.5 Format Menu

The Format Menu involves a number of options, which are following:-

- FONT- It changes the style of font, size, color and formatting applied to fonts.

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- PARAGRAPH- used to change alignment, indentation and spacing.
- BULLET AND NUMBERING – used to change bullets, their indentation and the indentation of bulleted text.
- BORDER AND SHADING – used to apply border to document, to apply shading to paragraph(s) or document.
- COLUMNS – used to insert and edit columns into document.
- TABS- It sets the tabs for document.
- DROP CAP – allows taking first letter of word and capitalizing it and pulling it away from text.
- TEXT DIRECTION – used to rotate selected text in table cells that the user can read it from top to bottom or from bottom to top.
- CHANGE CASE – used to change words to upper case, lower case, toggle case, title case or sentence case.
- BACKGROUND – used to change the color of document, add pictures, watermarks, pattern etc.
- THEME – used to apply formatting theme (heading, fonts, background colors and bullet point) to document
- FRAMES – used to make information easier to access or to display the content of web sites that has multiple pages.
- AUTOFORMAT – allows to choose settings that will automatically apply those changes to every document written by user.
- STYLE AND FORMATTING – used to apply heading styles and formatting to text.
- REVEAL FORMATTING – shows all different formatting options have been applied to document.
- OBJECT – used to edit object inserted from INSERT Menu.

4.6.6 TOOLS MENU

The Tool menu involves a number of options, which are following:-

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- SPELLING AND GRAMMER- This command checks the spelling and grammar in the document.
- LANGUAGE – used to set the language and look words up in thesaurus.
- WORD COUNT- It allows you to count how many words you have in your document like paragraph, pages and lines.
- AUTOSUMMARIZE – used to create summary as main points and then allows to place that in different parts of document.
- TRACK CHANGES – it allows to specify changes in current document and keeps track of changes by reviewer's name.
- MERGE DOCUMENTS – used to merge the document and to display the merge result in current document, target document or in a new document.
- ONLINE COLLABORATION- used to schedule meeting and web discussion related to document.
- LETTERS AND MAILING – This option consist Mail merge, envelopes and letters, and letter wizard etc. it is used to create an address for printing on envelope, create letter from template or merge address created into a label format that is ready for printing.
- MACRO- used to automate the task, if a task performed repeatedly. Basically, a macro is a series of word commands and instructions that can be group together as a single command.
- TEMPLATE AND ADD-INS – used to attach a different template to active document, modify document styles or to load add-in programs
- AUTOCORRECT – used to correct common mistakes that the user make personally and want to correct them.
- OPTIONS – used to set the parameters for printing, saving, editing, spelling and grammar etc.

4.6.7 Table Menu

This menu allows inserting and then modifying the table within document. It consists of following options:

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- DRAW TABLE – used to draw a table into document.
- INSERT – used to insert a table into document.
- DELETE – used to delete the table, cells, columns and/or rows.
- SELECT – table, cells, columns and/or rows can be selected by using this.
- MERGE CELLS – used to merge two or more cells into one.
- SPLIT CELLS – used to split one cell into two or more cells.
- SPLIT TABLE – this is used to split the table.
- TABLE AUTOFORMAT – used to apply a specific format to table.
- AUTOFIT – used to automatically set the area where the text will fit and rows and columns are also evenly distributed.
- HEADING AND ROWS REPEAT – it allows the user to keep the heading and row in place at the top of each page as table spans in many pages.
- CONVERT – used to change the text to a table, and a table to text format.
- SORT – used to sort the text alphabetically forwards or backwards.
- FORMULA – used to input formula.
- HIDE GRIDLINES – used to hides the table's gridlines.
- TABLE PROPERTIES – used to edit the properties of table such as: alignment of table and text wrapping, row, column and cell alignment.

4.6.8 Window Menu

The Window menu provides different options to move between documents, and these are following:

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- NEW WINDOW – used to open new window with same content as the active document consists. So different parts of document can be viewed at the same time.
- ARRANGE ALL – used to show all open files in separate windows on the screen that makes easy dragging between files.
- SPLIT – used to define a split into two panes or removes the split
- DOCUMENT 1 – it shows all currently open active documents.

4.6.9 Help Menu

The Help menu gives the idea to do something in Word or how something works. This menu has following options:

- MICROSOFT WORD HELP –used to provide the possible topics related to answer of query typed in subject of question.
- SHOW OFFICE ASSISTANT – it shows an animated paperclip that gives suggestions about what the computer thinks related to the work performed by user on document.
- WHAT'S THIS – used to reveal the formatting where cursor clicked.
- OFFICE ON THE WEB – used to take the user to website with tips on MS Office software.
- WORDPERFECT HELP – used to provide a help menu related to WordPerfect document if user is working on that.
- DETECT AND REPAIR – used to find and fix errors in all Office files.
- ABOUT MICROSOFT WORD – it specifies information about Word i.e license information etc.

4.7 TOOLBARS

The toolbar is placed just below the menu bar. It has made every application easier to use. When you move your mouse pointer to any of the icon in the toolbar, it displays a tool tip which show the function performed by them. Toolbar contains various types of tools like standard toolbar, formatting toolbar, drawing toolbar, header and footer toolbar, picture toolbar, mail merge toolbar etc. Some of the most commonly used toolbars are explained in details in the following topics.

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4.7.1 Standard Toolbar

It displays a collection of icons or pictures that enable to perform common word processing functions easily and quickly. This tool bar has following options:

- **New blank document** – used to creates a new blank document based on the Normal.dot template.
- **Open** – used to Display the file to be opened.
- **Save** – used to Saves the active document. Displays the (File > Save As) dialog box the first time a document is saved.
- **E-mail** – used to Emails the active workbook or active worksheet.
- **Search** – this option is used to Find files, Web pages, and Outlook items based on the search criteria entered by user.
- **Print** – used to Prints the active document.
- **Print Preview** – it is used to see the preview of page.
- **Spelling and Grammar** – used to check spelling and grammar.
- **Cut** – used to Cut the current selection of text.
- **Copy** – used to make Copy of the selected text.
- **Paste** - Pastes the text that has currently cut or copy by the user.
- **Format Painter** - Copies the text format (not the line spacing) allowing it be pasted elsewhere.
- **Undo** - Undoes the last action performed.
- **Redo** – used to redo the task.
- **Insert Hyperlink** – used to insert hyperlink. Hyperlink is used to connect two files.
- **Tables and Borders** - used to draw of the Table and Borders.
- **Insert Table** - Inserts a table in the document with the number of columns and rows specify.
- **Insert Excel Worksheet** - Inserts a new Microsoft Excel worksheet at the insertion point. Drag to select the number of rows and columns.
- **Columns** – used to divide the text in columns or Changes the number of columns in a document or a section of a document.
- **Drawing** - Toggles the display of the Drawing toolbar.
- **Document Map** - Displays the document map for the active document.
- **Paragraph Formatting** - Toggles the display of all the non printing characters.
- **Zoom** - Adjusts the size that the document appears on the screen.
- **Microsoft Word Help** – used to get help.

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Remarks

- **Read** – used to Display the Reading Layout view.

4.7.2 Formatting Toolbar

Formatting toolbar displayed directly below the standard toolbar. It displays a collection of icons that are used to change the appearance of document. This tool bar has following options:

- **Style-**Select the style to apply to paragraphs.
- **Font-** Changes the font of the selected text.
- **Font size** – used to increase or decrease the size of font of selected text.
- **Bold-**Makes selected text and numbers bold.
- **Italic-** Makes selected text and numbers italic.
- **Underline-** Underlines selected text and numbers.
- **Align left-** Aligns to the left with a ragged right margin.
- **Align right-**Aligns to the right with a ragged left margin.
- **Center-** Centers the selected text.
- **Justify** – used to justify the selected text
- **Numbering** – used for numbering the selected text.
- **Bullets** – used to apply bullets to text selected by user.
- **Decrease indent** – used to decrease the indent by one character.
- **Increase indent** – used to increase the indent by one character.
- **Outside Border-** Adds or removes a border around selected text or objects.
- **Highlight text** – used to highlight the text with selected color.
- **Font color** – used to apply selected color to selected text.

4.7.3 Drawing Toolbar

This toolbar displays the collection of icons for drawing purpose. Following are the options of drawing tool bar:

- **Drawing-** used to Access a submenu to manipulate shapes and text boxes.
- **Select object-** used to Select any object or placeholder.
- **Insert auto shape-** used to Access a submenu of readymade shapes.
- **Draw line-** It is used to draw a single straight line.
- **Draw arrow-** used to Draw an arrow which can be modified using the FORMATTING button.

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Remarks

- **Draw rectangle-** used to Draw boxes or rectangles.
- **Draw oval-** used to Draw ovals and circles.
- **Insert textbox-** used to Enter text in a text box.
- **Insert word art-** used to Insert pre-formatted, stylized text.
- **Insert diagram-** used to Insert a diagram or organization chart.
- **Insert clipart-** used to insert clipart. It Opens *Insert ClipArt* task pane to select *Clip Art.*
- **Insert picture-** used to Insert an image stored on a disk.
- **Fill color-**Apply color from edge to edge of a selected shape.
- **Line color-**Apply color to a selected line or border.
- **Font color-**Apply color to selected text.
- **Line style-**Choose a style (thickness) for a selected line or border.
- **Dash style-**Choose a dash style for a selected line or border.
- **Arrow style-**Modify the style (arrow head, direction) of a selected arrow.
- **Shadow-**Choose a shadow style for selected text, shape, or object.
- **3-D effect-**Choose a 3-D effect for a selected shape.

4.8 SCROLL BAR

It is used to scroll the window horizontally or vertically. Scroll Bar is a long thin strip with arrows and a sliding section at the edge of the window. There are two types of scroll Bars.

Horizontal Scroll bar – It is used for shifting the MS word Screen display left or right.

Vertical scroll bar – It is used for shifting the MS word Screen display up or down.

The space between horizontal and vertical scroll bar is known as scroll box. Scroll box represents the length of document graphically as well as indicates which part of the document currently on screen.

4.9 RULER

It displayed directly above the document text area or it is generally found below the main toolbars. It is a measuring tool. It measures the horizontal distance from the left margin of the page. The ruler is used to change the format of document quickly. To display the ruler:

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Remarks

1. Click View on the Menu bar.
2. The option Ruler should have a check mark next to it. If it has a check mark next to it, press Esc to close the menu. If it does *not* have a check mark next to it, continue to the next step.

Click Ruler. The ruler now appears below the toolbars.

4.10 CREATING A DOCUMENT

To keep data within a new file in word, you have to create a new document. A new document can be created by using the menu option or the toolbar option. The menu option gives more options for choosing new document. However, the toolbar is the faster and easier way of getting a blank document on screen.

4.10.1 Creating a New Document

Document can be created from scratch or it can be based on a template or using a wizard.

The steps to create a new document are:

1. From the File menu, select ***New.*** The New Document task pane appears. From the new section, click **BLANK DOCUMENT.** A new document appears.

   Or

2. Click on new document icon on tool bar.

Shortcut: To open a new dialog box, you can press ctrl + N.

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Remarks

To open the document on a specific template or to use a wizard, type or select the name of the template or wizard in the template box. It no template is selected, MS-Word uses the Normal Template. MS-Word gives a temporary name to new document that will visible in the title bar, until you save it with a unique name of your choice.

Entering Text

When you create the new document, the blinking insertion point inside the document window shows your current position. The text you type will be appeared at current position.

4.10.2 Opening a Saved Document

The steps to open a saved document are:

1. Go to file menu. A dialog box will appear.
2. Click on open option and choose the desired document you want to open. From the open dialog box, open document by double clicking on it or **type file name** and click **open** button.

Shortcut: To open the open dialog box, press Ctrl + O

4.10.3 Closing a Document

The steps to close a document are:

1. Go to file menu and press close.
2. In case, you forgot to save your file, before closing, a message box will appear.
3. Click **Yes** button, if you wish to save the changes or click **No** button, if you do not wish to save the changes.

Or

To close a document in MS-Word, click on the **close button** on the top right corner of the Menu Bar. If the document has not been saved, a **prompt box** appears. Click on the Yes button to save the changes or No button, if you do not wish to save the changes.

Shortcut: for closing a current file is Ctrl + W.

4.11 EDITING AND FORMATTING A DOCUMENT

After creating and saving a document, you may need modifications in the document. For instance, you may like to add text at a particular location or you may like to move a paragraph from one page to another or delete a portion of the text. Making modification in a document is called editing. Editing is the process of changing the appearance of the text, deleting a portion of the text or moving a part of the text. It is necessary to select the text before move, format, delete or changing text. Text can be selected with the help of mouse or keyboard. It is very easy to select the text with the help of mouse as compared to keyboard. The mouse methods for selecting the text are following:

1. **Select a word-** To select a word, double click the word.

2. Select the line- To select a line you can select with the help of mouse or by placing a cursor on the left side and then press shift + end for selecting the whole line at once.

3. Select the sentence – Sentence can be selected by hold down **ctrl** key and click anywhere in sentences.

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Remarks

4. Selection of paragraph – The paragraph can be selected by clicking three times anywhere within the paragraph. That can also be done by double clicking in left margin beside the paragraph.

5. Selection of all the text – Press ctrl + A to select all text in the current document.

4.11.1 Editing Text

- **Inserting text:** After writing entire text, sometimes it is needed to add a word or a sentence or may be a paragraph. It can be done by just point the cursor where the user wants to insert and type the text. After that, rest of the text gets adjusted automatically.
- **Deleting text:** Text can be deleted by following way:

- Select the text to be erased or deleted.
- Press the **delete or backspace key**.

- **Replacing text :** To replace an existing word or text in document with a new word or text, following steps are used:

  -Select the word or text to be replaced.

  -Type the new word or text.

4.11.2 Undo and Redo

Word remembers the last 100 things done by user. If the user regrets some editing, that can always undo it easily, or even then again redo it again. On the toolbar user find the button: (shortcut key Ctrl + z) and pushing this will remove the last action. When regretting this the redo function can be used, push the "redo" button on the toolbar or use the shortcut key Ctrl + y.

For Undo:

1. go to edit → select undo

For Redo:

2. go to edit → select redo

4.11.3 Cut, Copy and Paste

Often in word processing, you will need to transfer information within the same document or from one document to another. Instead of having to re-type or replace this information, Word allows you to move a block of text (a word, sentence, paragraph, page, document, or graphic). Cut, Copy and Paste are extremely time-saving features. The Cut, Copy and Paste buttons are located on the Standard toolbar as well as in edit menu.

Cut, Copy, and Paste
on the Standard Toolbar

(a) Cut and Paste

- The Cut feature allows you to remove selected text from the document and temporarily place it on the Office Clipboard.

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Remarks

- The Clipboard is a temporary storage file in your computer's memory. Items placed on the Clipboard will remain there until you exit Word.
- The Paste feature allows you to get text from the Clipboard and place it in the same or even another document.

There are three methods for cut and paste:

(i) Using Cut and Paste

-Select text

-Click **Cut** button in standard toolbar or select **cut** option from **edit** menu or press **ctrl+x.**

-Move the cursor where text is to be placed

-Click the **paste** button or press **ctrl + v.**

(ii) Using Mouse

-Select the text.

-Move the cursor anywhere in highlighted area.

-Press the left mouse button and hold it, while the mouse pointer is still in highlighted area.

-Without releasing the mouse button, drag the mouse pointer where text is to be displayed.

-Release the mouse button, as the dotted line is positioned at the right spot. Text is appeared at the new location.

(iii) Using right button of the mouse

-Select text and press right button of the mouse. A submenu appears as shown in figure:

-Click **cut** option.

-Move the cursor at the position where text is to be placed.

-Press right button and select **paste** option.

(b) Copy and Paste

- The Copy feature allows you to copy selected text from the document and temporarily place it on the Clipboard.
- The Paste feature allows you to get text from the Clipboard and place it in the same or even another document.
- You can Copy information from many different sources including Websites, Emails, and other Office applications like Excel and PowerPoint.

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Remarks

(i) Using Copy and Paste

-Select text

-Click **Copy** button in standard toolbar or select **copy** option from **edit** menu or press **ctrl + c.**

-Move the cursor where text is to be copied.

-Click the **paste** button or press **ctrl + v.**

(ii) Using Mouse

-Select the text.

-Move the cursor anywhere in highlighted area.

-Press and hold the **ctrl key**, while the mouse pointer is still in highlighted area. Without releasing the **ctrl key** press and hold left mouse button

-Without releasing the ctrl or mouse button, drag the mouse pointer where text is to be copied.

-Release the mouse button, as the dotted line is positioned at the right spot. Text is appeared at the new location.

(iii) Using Right Button of the Mouse

-Select text and press right button of the mouse. A submenu appears

-Click **copy** option.

-Move the cursor at the position where text is to be placed.

-Press right button and select **paste** option.

(c) Paste Special

This command is used for special or advanced pasting whereas the inserted contents will have a special formatting that the user select.

(d) Paste as Hyperlink

A common editing task is copying information from one document and pasting it in another. By using a minor variation on pasting, information can be pasted to appear as a hyperlink in a document. To paste information in this manner, follow these steps:

1. Select the information to be copied and press **Ctrl + C**. This copies the information to the Clipboard.
2. Position the insertion pointer where you want the link to appear.
3. Choose Paste As Hyperlink from the Edit menu.

4.11.4 Clear Formatting

This is used to clear the formatting of the selected text. To do this

Edit menu →clear→ clear formats.

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Remarks

4.11.5 Find and Replace

(a) Find

The **Find** feature quickly searches the document for a specific word, phrase or data in

document. This is particularly useful when searching for data that appears more than once.

Steps for finding the data

1. Choose **Edit** from the Menu bar.
2. Choose **Find…**
3. Click **More** to expand the Dialog Box.
4. Enter your data in the Find What.
5. Click **Find Next**
6. When you are finished searching your document, click **Close**

(b) Replace

The **Replace** feature actually works in conjunction with the Find feature by first

searching for specific text or formatting and then replacing it with new text or formatting.

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Remarks

Steps for replacing the data

1. Choose **Edit** from the Menu bar.
2. Click **More** to expand the Dialog Box
3. Enter the data in the Find What
4. Enter the data in the Replace With
5. Set the options.
6. Click **Replace** or **Replace All**
7. When you are finished searching your document, click **Close**

4.11.6 Go To

The **Go To** feature quickly moves the cursor to a desired location. It is needed to know the page or section number.

- Choose **Edit** from the Menu bar
- Choose **Go To…**
- **Enter** a page number
- Click **Go To**

4.11.7 Character Formatting

For formatting of the character to a single word, select the word. To several words or to few characters within a word, select the text to be changed.

For formatting: click on FORMAT menu, Click FONT.

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Remarks

Font of text-

- Select the text you want to change
- Click a font name in the Font box on the Formatting toolbar.

Size of text -

- Select the text you want to change.
- Click a point size in the Font Size box on the Formatting toolbar.

Bold text-

- Select the text you want to change.
- Click Bold on the formatting toolbar.

Italic text-

- Select the text you want to change.
- Click Italic on the formatting toolbar.

Underline text-

- Select the text you want to change.
- Click underline on Formatting toolbar.

4.11.8 Bullets or Numbering

Word lets you make two types of lists: bulleted and numbered. Bulleted and numbered lists help to simplify steps or items to the reader. A bullet is usually a black circle but it can be any other symbol used to highlight items in a list. Numbers (or letters) are used when information has to be in a certain order. You can use the default Bullets and Numbering settings by clicking on the appropriate button on the Formatting toolbar.

Steps for adding bullets or numbering:

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Remarks

- Select the items you want to apply bullets or numbering to
- To add bullets, click Bullets on Formatting toolbar.
- To add numbering, click Numbering on Formatting toolbar

4.11.9 Other Formatting Features

Change the color of text

- Select the text you want to change the color.
- Click the Font Color on the Formatting toolbar.
- For applying different color, click the arrow next to the Font Color button

Add or change the background color or texture

- Select BACKGROUND from FORMAT menu, and then click color (required for background) or click MORE COLORS to see additional color choices. Click on FILL EFFECTS for special effects, such as texture.
- Select the option according to choice.

Remove background

- Select BACKGROUND from FORMAT menu.
- Click on No Fill.

Changing Case of text

Sometimes, it is required to change the case of text. The case could be upper case, lower case or title case.

-To change case choose format menu, then click change case.

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Remarks

A dialog box will appear with following options:

-Upper case

-Lower case

-Title case

-Sentence case

-Toggle case

Using Tabs

Tabs are used to create parallel columns. Tab stops are set by default at half – inch across the page. Tabs are used to indent the first line of the paragraph. There are five tab stops available:

- Left
- Centre
- Right
- Decimal
- Bar

There are two options of setting tab:

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Remarks

-Firstly enable ruler from View menu → Ruler. Click on ruler.

-We can also select the tabs from Format menu.

Drop Cap

Sometimes, the document contains articles like in newspaper or magazine. In Microsoft word, there is a feature of drop cap. This feature provides with the text effects.

-To use this feature, click on Format menu → choose drop cap option.

-A dialog box will appear.

-Choose position of dropped word and then set options available.

4.11.10 Paragraph Alignment

A Paragraph has its own formatting characteristics, such as alignment, spacing and styles

(i) Horizontal Alignment of Text

- **Align text with the left margin**

  -Select the text you want to align left.

  -Click Align Left (Ctrl+L) on the formatting toolbar.

- **Align text with right margin**

  -Select the text you want to align right.

  -Click Align right (Ctrl+R) on the formatting toolbar.

- **Center text**

  -Select the text you want to center

  -Click Center (Ctrl+E) on the Formatting toolbar.

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Remarks

- **Justify text**

  -Select the text you want to justify.

  -Click justify (Ctrl+J) on the Formatting toolbar.

(ii) Controlling Line Spacing

Paragraph can easily specify as single or double spaced. Line spacing can be used for the entire document or for individual paragraphs. Line spacing can be changed by following steps:

-Select the paragraph(s) for spacing change. **To select the entire document** Press the Ctrl + A.

To select a specific paragraph place the cursor in the paragraph to be spaced.

-Select Paragraph from FORMAT menu.

-Select different spacing option from LINE SPACING box.

-Click on OK.

These steps update the document with the specified changes.

4.11.11 Spelling Check

Spelling is one of the best features of Word since it frees you from bothering about the spelling of your text.

- Select Spelling from the Tools menu.
- A spell check dialog box appears. The spell check program starts picking up each word in your document and searching that word in its dictionary. If the word is found in the dictionary, the program moves on to the new word. All words that appear red color are spelling mistakes.

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Remarks

4.12 SAVING A DOCUMENT

Always save your documents frequently to avoid any loss of data. When you first save a document, you will have to specify the name and location of the file.

(i) Save

To save a file following steps are used

1. Click on file menu and select save option
2. The save as dialog box appear
3. Type the name of the file in the file name text box
4. Click save button in save as dialog box

Shortcut: To save a file, press ctrl + S

(ii) Save As

From this option existing file is saved with a different name at some specific location with a special file format. Steps for save As are:-

1. Click on 'save As' in file menu.
2. Specify a new name to file in file name box.
3. Click on 'save' to save changes.

To make the copy of file, use 'save in' option from drop down menu. To save the file, a new folder can also be defined. To save file in new folder, select a option " create new folder" or use shortcut key Ctrl + F12.

(iii) Save file in another formats

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Remarks

A file can be saved in another format too. For this, follow these steps:-

1. Click on 'save as' in file menu.
2. A box will open in file menu for new file name.
3. Now click on 'save as type' in drop down list and choose the format in which you want to save your file.
4. Click on save button.

(iv) Save as Web Page

By using this option you can save file in HTML format, where it can be seen by using web browser. To do this, follow these steps:-

1. Using 'file name' sub option, we can give any name to the file.
2. By using 'Save in' option, you can choose that place or drive where you want to save the file.

Importing Exporting and Inserting Graphics

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SUMMARY OF THE LESSON

You learnt the following in this lesson:

- Word processor is a computer program that is used to create, edit, view, format, store, retrieve and print documents.
- MS-Word is one of the popular word processing software that consists of various tools and functions to format the document.
- MS-Word also consists of different menu options used to give direction to software.
- To start MS Word, Start > Programs > Microsoft Office > Microsoft Word
- To open a new document, select File > New
- To save a document, select File > Save
- To exit MS Word, Select File > Exit
- Undo command reserves the last action performed.
- Redo command repeats the last action.
- To copy test, select Edit > Copy
- To paste text, select Edit > Paste
- Formatting toolbar consists of buttons, that help to format the document like Font, Font Size, Bold, Italic, Underline etc.

Remarks

- Numbered list and Bulleted list add importance to a list of points in a document.
- Find is used to find text, select Edit > Find.
- Replace is used to replace a text, select Edit > Replace.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. What do you mean by Word Processor? How it is useful?
2. Discuss the components of Word Document Window.
3. What is the use of title bar?
4. What is the purpose of standard toolbar?
5. What is the purpose of formatting toolbar?
6. Write down the steps to create a document.
7. Discuss various ways and steps to save a document.
8. Discuss the steps to close document.
9. What is editing? Explain various commands used for editing.
10. Write the steps to find and replace text from the document
11. What is the purpose of undo and redo?
12. State the steps to cut and copy the text.
13. How can you find out the text available in document?
14. Explain various option of help menu.
15. State the steps to align text.
16. Explain the steps to change the font and font size by giving example.
17. What will you do to save a document
18. How will you start the MS Word to create your document?
19. What are the shortcut keys for cut, copy and paste?
20. What do you understand by text wrapping

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Remarks

CHAPTER - 5

ADVANCED FEATURES OF MICROSOFT WORD

OBJECTIVES OF THIS LESSON

In addition to the basic features described in the previous chapter, MS-Word also provides very useful additional features such as Import, Export, Frame, Table, Mail-merge, Macros etc. These advanced features are discussed in this chapter. Readers will be able to understand and used the following advanced features of MS-Word:

- Import and Export
- Working with Frames
- Multi column specification of a document
- Various ways to insert the pictures in Word document
- Creating and formatting of table
- Macro and its uses
- Mail Merge

STRUCTURE OF THIS LESSON

5.1 Introduction
5.2 Importing, Exporting and Inserting Pictures
5.2.1 Importing Clip Art Images
5.2.2 Importing Graphics from Other Files
5.2.3 Export Data from Ms Word
5.3 Working with Frames
5.4 Columns
5.4.1 Creating Multi-Column Documents
5.5 Picture
5.5.1 Inserting a Picture Using Clip-Art
5.5.2 Inserting a Picture From File
5.5.3 Inserting a Picture from Scanner or Camera
5.5.4 Drawing Objects in a Document
5.5.5 Inserting Autoshapes
5.5.6 Inserting a Picture Using Word Art
5.5.7 Inserting a Chart
5.6 Create a Table
5.6.1 Inserting Row and Column in Existing Table
5.6.2 Delete a Table
5.6.3 Delete Row or Column
5.6.4 Change the Column Width in a Table
5.6.5 Change the Row Height in a Table
5.6.6 Autofit
5.6.7 Sorting Text in Table

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Remarks

5.6.8 Formatting Text in Table
5.6.9 Formatting of Table
5.7 Macros
5.7.1 Recording a Macro
5.7.2 Running a Macro
5.8 Mail Merge
5.9 Shortcut Keys
Summary of the Lesson
Self Assessment Questions and Exercises

5.1 INTRODUCTION

MS-Word is a powerful word-processing tool. Apart from common features, MS-Word also provides very useful advanced features such as Import, Export, Frame, Table, Mail-Merge, Macros etc. These advanced features are quite helpful and are discussed in this chapter.

5.2 IMPORTING, EXPORTING AND INSERTING PICTURES

MS-Word can directly import graphics file created in most of the common graphics file formats. For example if you create a drawing in Paint, AutoCAD or CorelDraw and want to show it in your word document, you can insert it very easily. Some of the common graphics file formats that MS-Word can use are given as:

1. Windows Metafile (.WMF)
2. Enhance Metafile (.EMF)
3. JPEG File Interchange Format (.JPG)
4. Kodak Photo CD (.PCD)
5. PC Paintbrush (.PCX)
6. Windows Bitmap (.BMP) etc.

Graphics can be imported either from other applications by using picture objects command from insert menu or copy a graphics from other file and paste in document.

5.2.1 Importing Clip Art Images

Word includes a number of Clip Art images that you can include in your document. For instance, it has Clip Art files for an anchor, dinner, animals, office equipment etc. To insert any graphics file in your document, use the insert, picture command

To insert the clip art at any desired position of the text follow the following steps:

1. Position the insertion point where you want to insert the graphics
2. From insert menu choose picture and then choose clip art
3. A dialog box will appear on your screen from which you can select image.
4. Select the image that you want to import in your document.

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Remarks

5. Click at OK button.

5.2.2 Importing Graphics from other files

If you import an image or graphics into a MS-Word document, MS-Word inserts or embedded, the image in MS-Word document and the image becomes a part of the document. To import a graphics object or any part of the graphics object or a saved file containing graphics matter, copy the graphics to the clipboard using copy from the edit menu and then paste into the current document or following steps are used:

1. In your MS-Word document, on the Insert Menu, click Picture > From File

2. Browse to the location of the image file you want to insert in your MS-Word source document, and then select the image file.

3. Click the insert button. MS-Word inserts the image in your document and displays the image.

5.2.3 Export Data from MS Word

Exporting Data from MS Word document can provide data for other applications, such as Microsoft Excel, to analyze. To share this data with another application you can export it in a format the other application recognizes. You also need to organize the data in a consistent pattern the receiving application expects. The most basic format that other applications accept is plain text; word can save any document in this format. Organizing the data in a pattern requires checking that the file contains consistent markers to indicate where data records and their fields start and end.

Steps to export data from MS Word

1. Open your MS-Word application and the word document that contains the data you want to export.

2. Check the data for proper organization. Each data record must start on a new line and contains separators. Such as comma, space or tab between each field of information.

3. Click the file tab and select the Save As command.

4. Choose the format from “save as type” drop down menu in Save As dialog box.

5. Enter a name for your data export file.

6. Click the save button to export the data.

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Remarks

5.3 WORKING WITH FRAMES

A frame is created with the help of text tool or with picture frame button. Frames are used for text or provide a specified area for a particular thing. We can edit text by placing a cursor in the frame and for editing text we can highlight the text.

Steps for placing a frame in document:

- Firstly select text area option and drop down with the help of cursor.
  Select Format → frame menu.
- In frames, two options are present first is, 'table of content in frame' and 'new frame page. Select 'new frame page' as shown.

In the Table of Content in Frame option, the user can add new frame at different places such as left side of frame, right side of frame, below the frame and above the frame.

5.4 COLUMNS

Displaying information in columns gives the writer more options for displaying different types of information on a page while remaining easy for the viewer to read. Certain kinds of information are best displayed using columns. Newspaper, newsletters, reports, announcements, school projects, or other types of publications, often use Word's column feature.

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Remarks

5.4.1 Creating Multi-Column Documents

In MS-Word, multi-column documents can be created by two ways:

- By using column option under format menu.
- By using word's table function.

Creating Columns using column option

To make columns in a document, click on format menu → columns. From the dialog box select the number of columns their width, spacing etc.

Creating Columns using Table Function

A table is made up of rows and columns. The intersection of rows and column is called a cell. Cell is used to enter text. A table is generally used to organize data and information in a better way. For making multi column document, we can make table and nested tables.

5.5 Picture

In MS-Word, mainly two types of graphics are used. These are drawing objects and pictures. Drawing objects include Autoshapes, curves, lines, and WordArt etc. Pictures are graphics that are created from another file. Pictures include bitmaps, photographs, scanned pictures and clip art etc.

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5.5.1 Inserting a Picture Using Clip-Art

MS -Word provides many options to insert a picture and for this we can use clip art, we can insert a picture from file, scanner or camera, in our document. The picture option shows drawing option and word art option. The new picture could be in the form of charts. We can also use clip art in ms-excel and power point also.

Steps to insert clip art:-

1. Click on insert menu → picture→ clip art.
2. Select an image from clip art.
3. A dialog box will appear on screen from which image can be searched.
4. Select the image that you want to insert in your document.

5.5.2 Inserting a Picture from File

Steps to insert a picture from file:

Click on Insert menu→ picture →From File.

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-A dialog box will appear that will ask for name and location for picture to be inserted.

-Give picture name and location to insert the picture.

5.5.3 Inserting a Picture from Scanner or Camera

- On the Insert menu in Microsoft word, click on picture, and then click on From Scanner or Camera.

-If camera is selected, a picture needs to be clicked first, then it will be inserted.

-If scanner is chosen, firstly we have to set image settings. Then image will be displayed on screen.

5.5.4 Drawing Objects in a Document

For drawing graphics objects in a word document, we can use drawing toolbar. While clicking on Insert menu, then picture, then new drawing, A drawing canvas will appear on word document. By using drawing toolbar, we can draw any kind of picture.

5.5.5 Inserting Autoshapes

We can insert pre-defined shapes in our word document.

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Remarks

- Click on insert menu→ picture→ autoshapes.
- A AutoShapes toolbar will appear.
- Choose the desired shape from that and draw it.

5.5.6 Inserting a Picture Using Word Art

- Click on insert menu→ picture→ word art.
- A dialog box will appear.

- Choose a word art style, press ok.
- Type the text in next dialog box and press ok.

- For editing the word art object, either double click on object or choose word art toolbar from view menu→toolbars→WordArt.

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5.5.7 Inserting a Chart

It is a feature in MS Word which enables the user to see chart in document.

In main menu we can select insert →picture →chart to see any chart in a document.

Chart is used in different word documents mainly in business documents which has numerical values.

Chart enables the correct and better view of numerical values.

As we choose chart option, a chart is appeared with datasheet in document. Modify the data sheet as per requirements and click outside the chart and datasheet. The chart will appear in document.

		A	B	C	D	E
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	
1	East	20.4	27.4	90	20.4	
2	West	30.6	38.6	34.6	31.6	
3	North	45.9	46.9	45	43.9	

5.6 CREATE A TABLE

Creating table in MS Word is a very powerful and flexible facility. Table help you to emphasize and organize information in a document. A table consists of rows and columns of boxes called cell, that you can fill with text or graphics. Steps for creating a table

- Click on the Table menu.
- A drop down menu appears.
- The Insert Table window appears after clicking Insert Table.
- Enter the Number of Rows and Number of columns.
- Click OK.

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5.6.1 Inserting Row and Column in Existing Table

To insert rows and column in existing table, steps are following:

- Place the cursor in table, where row is to be inserted.
- Click on **table** menu option.
- Click on **insert.** A submenu will appear.
- Click on **Rows above** or **Rows below** depending on choice.

In the same way, column can be inserted also.

5.6.2 Delete a Table

- Click the table.
- Pointing to Delete on the Table menu, click Table.

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5.6.3 Delete Row or Column

0. Take the mouse pointer in the row or column that you want to delete.
1. Click the Table menu option.
2. A submenu will appear as soon as, you click on Delete.
3. Click on the option Rows or Column, depending on your requirement.

5.6.4 Change the Column Width in a Table

- Place the pointer on the column boundary you want to do wide until it becomes and then drag the boundary until your column gets the desired width.
- If you want to change the column width to a specific measurement, click a cell in the column, on the Table menu, click Table Properties and then click the Column tab.
- Select the options you want.

Remarks

5.6.5 Change the Row Height in a Table

- Place the pointer on the row boundary you want to move until it becomes and then drag the boundary.
- If you want to change a row height to a specific measurement, click a cell in the row, on the Table menu, click Table Properties, and then click the Row tab.
- Select the options you want.

5.6.6 Autofit

Auto fit is a great feature in word. This feature automatically tries to adjust text in cells so as to keep consistent look of the data in table. For using autofit, perform following steps:

- Click on Table menu.
- Select Auto fit. A submenu will appear.

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- Select one of the following:-
    1. Auto fit to contents: Automatically adjust the width of columns in the table.
    2. Auto fit to Window: Automatically resizes the table to make it fit into window.
    3. Fixed column width: This option will make width of all columns same as current column width.
    4. Distribute rows evenly: This will make all rows of same height.
    5. Distribute columns evenly: This will make all columns of same height.

5.6.7 Sorting Text in Table

Microsoft word allows us to sort data in a table. For sorting ascending and descending are the two options. It is also possible to sort data from two or more columns. To perform sorting, steps are:

- Select column which we want to sort.
- Click on table menu→select sort option.
- A dialog box will appear.

Remarks

- Specify column name, its type and sort order. Press ok.

5.6.8 Formatting Text in Table

Once a table is created, we can easily enter text in the table. The table data could require formatting. The formatting can be done on individual cells of the table or whole table data can be formatted in one time.

- Click on cell or select table to format.
- Apply formatting as normal text using formatting toolbar.

5.6.9 Formatting of Table

Like table text, the whole table can be formatted also. We can add and remove borders; change the border type, border colors, and cell fill color. The text of table can be formatted like normal text. We can also change the direction of text in table cells.

There are two ways to format a table:

- Click on table menu→ choose Table AutoFormat.
- A dialog box will appear. Choose required formatting.

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5.7 MACROS

As a document is created in MS- Word, it is find that we must complete many small tasks over & over. If a task is performed repeatedly in Microsoft Word, then the task can be automated by using a macro. Basically, a macro is a series of word commands and instructions that is used as group together as a single command. Word macros can help save time by automating repetitive tasks such as:

•Inserting frequently-used phrases

•Formatting headers and footers

•Inserting page and column breaks

After recording a macro containing all of the steps that make up a task, we can direct Word to automatically perform this task at any time by running that macro,

5.7.1 Recording a Macro

- Open the document.
- From the Tools menu, select the Macro submenu. Click on Record New Macro

A dialog box will appear.

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Provide required information. Press ok. We can assign a keyboard shortcut to macro. Recording will get started. The Stop Recording toolbar will appear in the upper left of Word window.

Perform the tasks to be repeated. And stop recording.

5.7.2 Running a Macro

- Press the keystroke combination that you assigned when recorded the macro,
- From the Tools menu, select the Macro submenu. Click on Macros.
- Choose macro name to run.

5.8 MAIL MERGE

Mail Merge is generally used when a user wants to send the same letter or document to different persons with different addresses. It basically helps us to merge the address data base with a form of letter to create individual letters. Thus it saves times when you want to send the same letter to large number of people. Steps in mail merge:

- Select **Tools** on the main menu.
- Select **Letters and Mailings → Mail Merge**.

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Remarks

STEP 1: Selecting the document type

Letters: allows to tailor one letter to many individuals.

E-mail messages: allows to personalize a message as you would form letters and send them via email.

Envelopes: allows to print envelopes with different addresses.

Labels: allows to print labels with different addresses.

Directory: allows to gather varied but related information into a list.

STEP 2: Establishing the Main Document

Use the current document: uses the document currently open.

Start from a template: uses a preset Word template. Once we make this selection, the *Select template* link appears. Clicking it takes to the *Select Template* dialog box, where you can choose the template you want to use.

Start from existing document: uses a previously saved document. Once we make this selection, we can choose from a list of recently used files or select another of your files.

STEP 3: Selecting the recipients

Use an existing list: uses a previously saved list.

Select from Outlook contacts: uses your Outlook contacts as recipients.

Type a new list: allows to create your own list by typing each recipient.

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STEP 4: Writing your document

Address block: allows to specify the format of recipient names, whether to insert the company name and postal address, and the format of the postal address.

Greeting Line: allows to format how the greeting line will appear (e.g., *Dear Mr. Randall,*) and choose which format to use for invalid names (e.g., *Dear Sir or Madam,*).

More items: allows to insert additional database fields.

STEP 5: Previewing your documents

At this point, we are almost ready to merge. It is a good idea to preview documents. We can browse through the documents by clicking the PREVIOUS or NEXT button. We can also locate specific recipients.

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STEP 6: Completing the merge

Once the merge is complete, we can print the merged documents or, prior to printing, we can edit individual documents.

5.9 Shortcut Keys

Shortcut	Function
Ctrl+A	Select all text in a document
Ctrl+Shift+A	Format selected text as all caps
Ctrl+B	Bold the selected text
Ctrl+C	Copy the selected text or object
Ctrl+Shift+C	Copy the format of the selected text
Ctrl+D	Display the Format | Font dialog box
Ctrl+E	Center the selected paragraph
Ctrl+Shift+H	Apply hidden text formatting to the selected text
Ctrl+I	Italicize the selected text

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Ctrl+J	Justify the selected paragraph
Ctrl+K	Insert a hyperlink within the selected text
Ctrl+Shift+K	Format select text as small caps
Ctrl+L	Left align the selected paragraph
Ctrl+M	Indent the selected paragraph from the left
Ctrl+Q	Remove paragraph formatting from selected paragraph
Ctrl+R	Right align the selected paragraph
Ctrl+T	Apply a hanging indent to the selected paragraph
Ctrl+U	Underline the selected text
Ctrl+Shift+D	Double-underline the selected text
Ctrl+Shift+W	Underline the selected words but not spaces
Ctrl+V	Paste cut/copied text or object
Ctrl+Shift+V	Paste copied format
Ctrl+0	Add/Remove one line space before the selected paragraph
Ctrl+1	Apply single-space lines to the selected text
Ctrl+2	Apply double-space lines to the selected text
Ctrl+5	Apply 1.5-space lines to the selected text
Ctrl+Spacebar	Remove selected text's manual character formatting

Shortcut	**Function**
Ctrl+Equal Sign	Subscript the selected text
Ctrl+Shift+Plus Sign	Superscript the selected text
Ctrl+Shift+Q	Apply Symbol font to the selected text
Ctrl+Shift+F	Change the selected text's font
Ctrl+Shift+P	Change the selected text's font size
Ctrl+Shift+>	Increase the selected text's font size by one point
Ctrl+Shift+<	Decrease the selected text's font size by one point
Ctrl+]	Increase the selected text's font size by one point
Ctrl+[	Decrease the selected text's font size by one point
Shift+Enter	Insert a line break
Ctrl+Enter	Insert a page break

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Ctrl+Shift+Enter	Insert a section break
Alt+Ctrl+Minus Sign	Insert an em dash
Ctrl+Minus Sign	Insert an en dash
Ctrl+Hyphen	Insert an optional hyphen
Ctrl+Shift+Hyphen	Insert a nonbreaking hyphen
Ctrl+Shift+spacebar	Insert a nonbreaking space
Alt+Ctrl+C	Insert the copyright symbol
Alt+Ctrl+R	Insert the registered trademark symbol
Alt+Ctrl+Period	Insert and ellipsis

Shortcut	**Function**
Alt+Ctrl+K	Enable AutoFormat
Ctrl+Shift+L	Apply the List style to the selected text
Ctrl+Shift+N	Apply the Normal style to the selected text
Ctrl+Shift+S	Apply a style to the selected text
Alt+Ctrl+1	Apply the Heading 1 style to the selected text
Alt+Ctrl+2	Apply the Heading 2 style to the selected text
Alt+Ctrl+3	Apply the Heading 3 style to the selected text
Tab	Move to next cell in a row; Start a new row if pressed within a row's last cell
Shift+Tab	Move to previous cell in a row
Alt+Home	Move to the first cell in a row
Alt+End	Move to the last cell in a row
Alt+Page Up	Move to the first cell in a column
Alt+Page Down	Move to the last cell in a column
Up Arrow	Move to the previous row
Down Arrow	Move to the next row
Enter	Start a new paragraph within a cell
Ctrl+Tab	Insert a tab within a cell
Ctrl+N	Open a new document that is the same type as the current or most recently opened document
Ctrl+O	Display the File | Open dialog box

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Ctrl+W	Close the current document
Ctrl+S	Save the current document
Alt+Ctrl+S	Split the document window
Alt+Shift+C	Remove the document window split
F1	Display Word Help dialog box
Shift+F1	Open Reveal formatting dialog box or open context-sensitive Word Help
F2	Move selected text of object
Shift+F2	Copy the selected text
F3	Insert AutoText
Shift+F3	Change the case of the selected text
F4	Repeat last action
Shift+F4	Repeat Find or Go To
F5	Display the Edit | Go To dialog box
Shift+F5	Move to the last change
F6	Move to the next pane or frame
Shift+F6	Move to the previous pane or frame
F7	Display Tools | Spelling and Grammar dialog box
Shift+F7	Display the Tools | Language | Thesaurus dialog box
F8	Extend the selection
Shift+F8	Shrink the selection
F9	Update the selected fields
Shift+F9	Switch between a field code and its product
F10	Activate the Word menu bar
Shift+F10	Display the shortcut menu
F11	Move to the next field
Shift+F11	Move to the previous field
F12	Display the File | Save As dialog box
Shift+F12	Save the current document

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SUMMARY OF THE LESSON

You learnt the following in this lesson:

- Data can be exported/ imported in MS-Word.
- In MS-Word, pictures can be inserted by various ways such as using AutoShapes, ClipArt, From Files, from scanner and Camera etc.
- Multi-Column facility makes more than one column in single document.
- With the help of spell check option, we can make error free document.
- To create a table, select Table > Insert > Table
- You can enter data in a cell of a table by clicking in it.
- To insert rows / columns select, Table > Insert
- To merge cells, select Table > Merge Cells
- A macro is a series of word commands and instructions that is used as group together as a single command. Word macros can help save time by automating repetitive tasks. Macro is used to edit and format the document.
- Mail merge is used to send same letter to different recipients.

SELF ASSESSMENT QUESTIONS AND EXERCISES

1. Discuss the steps of import and export in MS Word.
2. What is the use of Frame? How a frame can be created?
3. Discuss Table- handling in MS-Word.
4. How multi-column document can be created?
5. What are the steps for recording and running of a macro?
6. Discuss various ways to insert picture in a document.
7. How a table can be created?
8. What are the steps to insert row and column in a table?
9. How can you format text in a table?
10. How will you insert an Autoshape in your document? Explain.
11. What is Clip Art gallery?
12. Inserting a table in your document saves a lots of time, how? Explain.
13. What is the difference between clip art and word art?
14. What do you mean by macro?
15. What is the purpose of Mail merge?
16. How can you create and use a macro?
17. Describe the concept of Mail merge by giving suitable example.

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