UNIT:- 1

Basics Of Computer

Topic Covered :-

- **Introduction: Block diagram of a computer, characteristics of Computer.**
- **Generation of computer: First, Second, Third, Fourth and Fifth.**
- **Classification of Computer system: Mini Computers, Micro Computers, Mainframe computer, super computer.**
- **Uses and Application of Computer.**
- **Basics of Windows: Desk top, file, folder, icon, Windows explorer, and Control panel, Recycle bin, etc.**

What is computer?

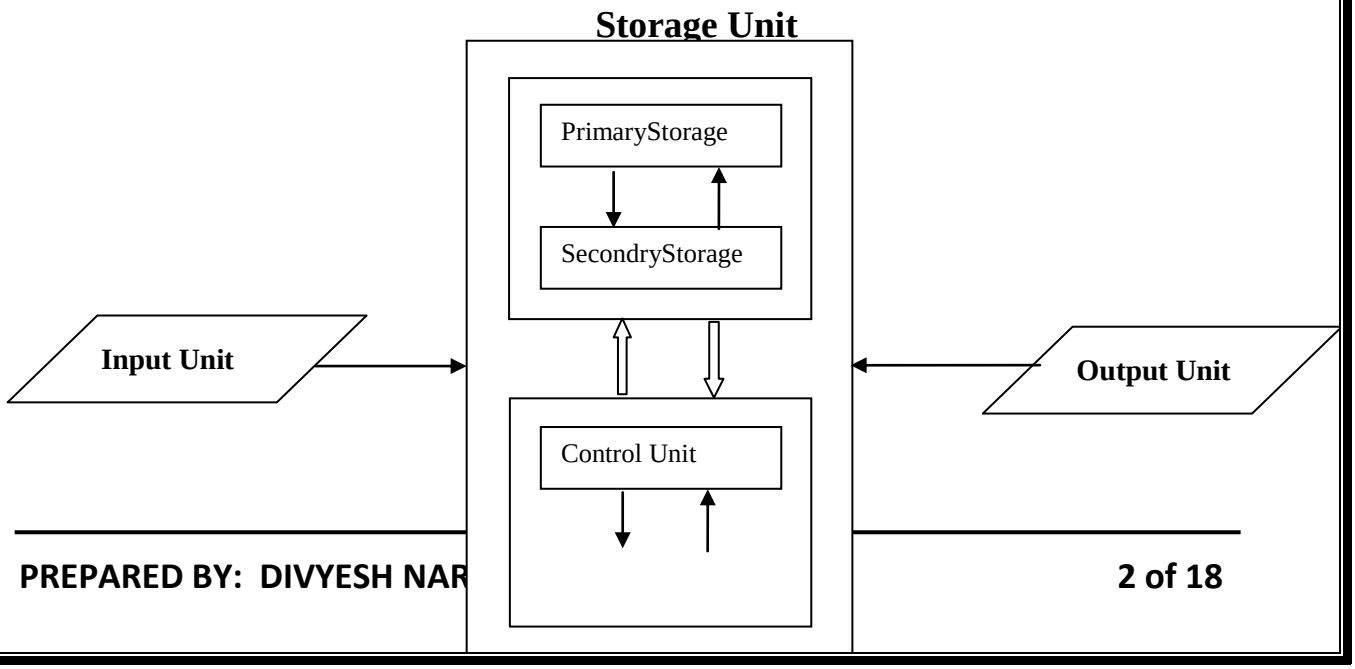
- Computer is an electronic machine through which mathematical and logical calculation can be performed at high speed with accuracy.

- A Computer is a device that accepts information (in the form of digitalized data) and manipulates it for some result based on a program or sequence of instructions on how the data is to be processed. Complex computers also include the means for storing data

- **Five Basic Operation Done By Computer System.**

1) **Inputting :-** The process of entering data into the computer system.
2) **Storing :-** It is used to store data to make them readily available for initial or additional processing.
3) **Processing :-** Performing arithmetic or logical operations on data, to convertThem into useful information.
4) **Outputting :-** The process of producing useful information or results for the usersuch as printed report.
5) **Controlling :-** Directing the manner & sequence in which all of the above operationAre performed.

Que :1) Draw Block Diagram Of Basic Organization Of Computer System.



ALU

CPU-(Central Processing Unit)

- It display five major blocks of digital computer system.
- These five units are corresponds to five basic operations-like Inputting, Outputting, Storing, Controlling, Outputting.
- The function of each of these units are describe below.
-

1) Input Unit

- ✓ It accepts or read the instructions & data from the outside world.
- ✓ It converts these data in computer acceptable form.
- ✓ It supplies the converted data to the computer system for further processing.

2) Output Unit

- ✓ It accepts the result produced by computer, which are in coded form & hence cannot
  Be easily understood by us.
- ✓ It converts these coded results to human acceptable form.
- ✓ It supplies the converted results to outside world.

3) Storage Unit

- ✓ The data & Instructions required for processing are received from I/P devices.
- ✓ It is stored intermediate result of processing.
- ✓ It is stored final result of processing , before these results are released to an O/P devices.
- ✓ Mainly two types of storage Devices :

1. Primary Storage

- ✓ It is also known as Main Memory.
- ✓ It is used to hold piece of program instruction & data, Intermediate result

of processing on which computer system is currently working on. Ex. RAM,ROM,PROM etc.

- ✓ It can hold information only while the computer system on when computer System is switched off or reset, the Information held in primary storage are disappeared.
- ✓ It has limited storage capacity because it is very expensive.

2. Secondary Storage

- ✓ It is used to store data & information of those jobs, on which computer system
  Is not working on currently, but needs to hold them for processing later.
  Ex. Magnetic tape ,Optical disk, Floppy Disk.
- ✓ It is also known as Auxiliary storage.
- ✓ It is solved the problem of primary storage.
- ✓ Secondary storage is much cheaper than primary storage & it can retain Information Even when computer system is switched off or reset.

4) Arithmetic logical Unit (ALU) :

- ✓ ALU is a place in computer system, where actual execution of the operation are Done.
- ✓ Calculation & Different kinds of decision are made in ALU.
- ✓ At the time of processing, data are transferred from primary storage to ALU & after Processing on data, information & results are transferred from ALU to primary Storage.
- ✓ Any arithmetic & logic operations are determine by the ALU.

5) Control Unit :

✓ It acts as a central nervous system for other components of computer system.

✓ It manages & coordinates the entire computer system.

✓ It obtains instruction from programmed stored in main memory, interprets the instruction & issues signals to particular unit of system to execute them.

✓ Control unit & arithmetic logic unit are jointly known as CPU.

- ✓ CPU is brain of computer system.
- ✓ In computer system, all major calculations & comparisons are made inside CPU By ALU.
- ✓ CPU is responsible for activating & controlling the operations of other units of Computer system by control unit.

Que :2) Characteristic Of Computer System.

Introduction:-

- ➢ A computer is, at its most basic, a machine which can take instruction, and perform computations based on those instructions. Computer is used to perform arithmetic calculations at fast speed, now they are used in nearly every field. You can use computer for banking application ,Word processing, desktop publishing , weather forecasting ,railway ticket reservations, control of machines, scientific research etc. For instance, when you go to a railway reservations counter, the operator feeds your request for a ticket reservation into the computer. The computer then analyses the data fed by the operator and makes a reservation. Then it prints a ticket for you. The ticket is the output generated by the computer based on the reservation request (input) entered by the operator.

- **Characteristic of a 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:**
   Computer operate at very high speed. A computer can perform several millions instructions(calculation) per second. For Ex: It can add or multiply 20,00,000 numbers in a second.Generallyspedd of computer is specified in MIPS(million instruction per second)

2. **Accuracy:**

Computer performs with a very high degree of consistent accuracy. Most of the times computer make mistakes if they are not programmed correctly. That is if the programmer written the program to do some calculation did not consider all aspect of data, it can give incorrect result.

3. **Diligence:**
Whenhuman being is required to work continuously for few hours, they become tired and start losing concentration. A computer can continue to work for hours(or even days) at same speed and accuracy.

4. **Versatility:**
Computer are versatile, the same computer can be used for various application. For example, you can use a PC to prepare document, spread sheet, presentation or to play game, music and video etc.

5. **HugeStorage Capacity:**
A computer can store huge amount of data in its memory. You can store almost any type of data such as letter, picture, sound etc. You can also recall stored data from the computer whenever you need. The information can be stored for several years with accuracy

6. **Dumb machine**
A computer is dumb machine. It has no intelligence of its own. It can not think or apply its judgment. It gets its power from the program that its run. It will do only what it ask to do and in what sequence.

7. **No emotion:**
Computers are not living beings. So they do not have any emotion.

Que :3) Explain Generation Of Computer System.

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 generation depending upon the technology used. These are :

1) First Generation (1942 – 1955)

2) Second Generation (1955 – 1964)
3) Third Generation (1964 – 1975)
4) Fourth Generation (Since 1975)
5) Fifth Generation (Since 1980)

1) First Generation Computers (1942 – 1955)

- ✓ The vacuum tube technology was used in first- generation computers. Mark 1m, ENIAC, EDSAC, EDVAC, UNIVAC-1 etc.
- ✓ Machines belong to the first generation of computers. The machine language only was used in first- generation computers.

- **Advantage** :
  - ✓ These computers were the fastest of their time.
  - ✓ They were programmed using machine language.
  - ✓ The electronic digital computers were introduced due to the vaccum tube technology.

- **Disadvantage**
  - ✓ Very big in size.
  - ✓ Not reliable.
  - ✓ Consumed large amount of energy.
  - ✓ Constant maintenance required.
  - ✓ More heat generated and air-conditioning was required.
  - ✓ More costly.
  - ✓ Very slow in speed.
  - ✓ Non-portable.
  - ✓ They used only machine language.

2) Second Generation Computers (1942 – 1955)

- ✓ The transistor technology was used in second-generation computers. The electronic component transistor was invented in 1948 at bell laboratories.
- ✓ The transistor is smaller in size and more reliable than vaccum tube. Therefore, the transistor technology was used in computer in place of vaccum tube technology.
- ✓ The programming assembly language was also introduced in second-generation computers.

- **Advantage** :
  - ✓ Low in Cost
  - ✓ Smaller in Size.
  - ✓ Fast in speed.
  - ✓ Less heat generated more reliable and accurate in calculations.
  - ✓ Consumed low power etc.
  - ✓ Used for commercial purpose.
  - ✓ Portable

✓ **Disadvantages**

- ✓ Cooling system was required.
- ✓ Constant maintenance was require.
- ✓ Commercial production was difficult.
- ✓ Only used for specific purposes.
- ✓ Costly and not versatile.
- ✓ Punch cards were used for input.

3) Third Generation Computers (1964-1971)

- ✓ 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.
- ✓ Instead of punched cards and printouts, users interacted with third generation computers.
- ✓ keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory.

✓ **Advantages**

- ✓ Smaller in size as compared to previous generations.
- ✓ More reliable.
- ✓ Used less energy.
- ✓ Produced less heat as compared to the previous two generations of computers.
- ✓ Better speed and could calculate data in nanoseconds.

- ✓ Used fan for head discharge to prevent damage.
- ✓ Maintenance cost was low because hardware failure is rare.
- ✓ Totally general purpose.
- ✓ Could be used for high level language.
- ✓ High storage capacity than previous generation's computer.

- **Disadvantages**

- ✓ Air conditioning was required.
- ✓ Highly sophisticated technology required for the manufacturing of IC chips.

4) Fourth Generation Computers ((1971-Present**)**

- ✓ The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip.
- ✓ What in the first generation filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer—from the central processing unitand memory to input/output controls—on a single chip.
- ✓ As these small computers became more powerful, they could be linked together to form networks, which eventually led to the development of the Internet. Fourth generation computers also saw the development of GUIs, the mouseand handheld devices.

- ✓ **Advantages:**
- ✓ Air conditioning is not required in most cases.
- ✓ Faster in computation than the last generations
- ✓ Totally general purpose.
- ✓ Heat generated is negligible
- ✓ Smallest in size it's because of the high component density.

- ✓ **Disadvantages:**
- ✓ Highly sophisticated technology required for the manufacture of LSI chips.

5) Fifth GenerationComputers (Present)

- ✓ 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.
- ✓ The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

- ✓ **Advantages:**
- ✓ This type of computer is versatile device by which we can perform various types of programme.
- ✓ Low cost than first, second and third generation Computer.
- ✓ High speed than first, second and third generation Computer.
- ✓ This computer have artificial intelligence.

- **disadvantages**
- ✓ fifth generation computers have yet to be agreed upon, but many feel that they are two of its advantages: AI and the overall advanced technology. The addition of AI worries many due to the computers possibly becoming smart enough to replace humans altogether, and many people are becoming reliant on the advanced technology for tasks that they can do without computers.

Que :4) Explain Classification Of Computer System.

- ➢ Computer is classified according to their data processing speed, amount of data they can hold and price. Generally, a computer with high processing speed and large internal storage is called a big computer.
- ➢ Due to rapidly improving technology, we are always confused among the categories of computers.
- ➢ Depending upon their speed and memory size, computer is classified into following main groups:
    1) Analog
    2) Digital

a) Super computer
b) Mainframe computer

c) Minicomputer
d) Micro computer

3)Hybrid

Analog:

- An analog computer is one which can perform multiple calculations at once and can work with infinite fraction of numbers. The term analog does not relate to how the computer is powered and it is possible to have electronic analog computer at particular tasks.

Digital:

Super computer:

- Super computer 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 calculation per seconds. It has large number of processors connected parallel. So parallel processing is done in this computer. In a single super computer thousands of users can be connected at the same time and the supercomputer handle the work of each user separately. Super computer are mainly used for:

✓ Weather forecasting.
✓ Nuclear energy research.
✓ Aircraft design.
✓ Automotive design.
✓ Online banking.
✓ To control industrial units.

Mainframe Computer:

- Mainframe computers are also large-scale computers but supercomputers are larger than mainframe. These are also very expensive. The mainframe computer specially requires a very large clean room with air-Conditioner. This makes it very expensive to buy and operate. It can support a large number of various equipments.

- It also has multiple processors. Large mainframe system can handle the input and output requirements of several thousands of users.
- For example, IBM, S/390 mainframe with terminals or PCs.

Mini Computer:

- These are smaller in size, have lower processing speed and also have lower cost than mainframe.
- These computers are known as minicomputers because of their small size as compared to other computers at that time. 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.

Micro computer:

- 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 names of IBM-PC. The term "PC-compatible" refers any personal computer based on the origin IBM personal computer design. The most popular types of personal computers are the PC and the APPLE.
  - **Hybrid**
    - Hybrid computer is a digital computer that accepts analog signals, converts them to digital and processes them in digital form. This integration is obtained by digital to analog and analog to digital data converter. A hybrid computer may use or produce analog data or digital data.
    - It accepts a continuously varying input, which is then converted into a set of discrete values for digital processing. A hybrid computer system setup offers a cost-effective method of performing complex simulation. A hybrid computer capable of real-time solution has been less expensive than any equivalent digital computer. Hybrid computers have been necessary for success system development. An example of hybrid computer is the computer used in hospitals to measure the heartbeat of the patient.

Que :5) Define Term :

1) **Desk Top :-**

2) **File :-**
   - ✓ A File is collection of text or data stored on a storage device, such as a Floppy disk or hard disk.
   - ✓ A computer file is not much different from a conventional pear file that you must have used. Just as you store different types of documents (Invoices, letters, reminders, memos, etc) in conventional files, computer files too store information.

3) **Folder :-**
   - ✓ A folder is also known as directory and used to store files, sub-directories to manage the different data files separate from each other.

4) **Icon :-**
   - ✓ Icon is small graphical element used to represent File, Folder or Application program. Icon can be of 2 types :(1) **System** Icon (2) **Short-cut** icon.
   - ✓

5) **Windows Explorer :-**

   - ✓ Windows Explorer is a file manager appication. Windows Explorer presents a browsing mode where each folder would open new window showing its contents, in a spatial file manager fashion.
   - ✓ Folder Sizes and views are automatically set according to the contents of the newly opened folder. Windows Explorer can also create new folder or delete exiting folder or files. Windows Explorer can also be used to format a floppy or hard disk.
   - ✓ Let us open Window Explorer.

- Click the start button on the taskbar to open the start menu.
- Choose programs from the start menu and then click window explorer.

✓ The window Explorer window contains two panes. The **left** pane of the window displays all drives and folders in our system. The **right** pane displays the contents of the selected drive of folder.

✓ Accordingly, the right pane is displaying all folders and files at the root level of drive c: If you want to see the contents of any drive or folder displayed in the left pane, click the desired drive/folder or use up/down arrow keys to highlight the desired drive/Folder.

✓ Notice that as you click on highlight any folder, windows displays the contents of that folder and changes the icon from closed folder to open folder.

The information displayed in the right pane can be viewed in four different view modes-Large icons, small icons, Detail icons; list.You can choose the desired view by using the view button in the buttons toolbar.

6) Control Panel :-

✓ control panel contains utilities for customizing windows interface. A user can Add/Remove program, change color scheme, Fonts, Sound, Date & Time, Keyboard, Mouse, Modem, Printer etc.

7) Recycle Bin :-

✓ The Recycle Bin keeps files that have been deleted, whether accidentally or intentionally so any File that is deleted from hard disk drive of the computer is moved to place called "Recycle Bin".

✓ The File stored in the Recycle bin can be restored to their original location using "RESTORE" option.

✓ By selecting "Empty Recycle Bin" the remaining file is to be permanently deleted from the computer. Any Files that are deleted from Floppy, Flash Memory or any other drive are not moved to "Recycle Bin"

Que : 6) Uses and Application of computer

- **Education :**

Getting the right kind of information is a major challenge as is getting information to make sense. College students spend an average of 5-6 hours a week on the internet. that computers can significantly enhance performance in learning. Students exposed to the internet say they think the web has helped them improve the quality of their academic research and of their written work. One revolution in education is the advent of distance learning. This offers a variety of internet and video-based online courses.

- **Health and Medicine :**

Computer technology is radically changing the tools of medicine. All medical information can now be digitized. Software is now able to Mental health researchers are using computers to screen troubled teenagers in need of psychotherapy. A patient paralyzed by a stroke has received an implant that allows communication between his brain and a computer.

- **Science :**

Scientists have long been users of it. A new adventure among scientists is the idea of a "collaboratory", an internet based collaborative laboratory, in which researchers all over the world can work easily together even at a distance.

- **Business :**

Business clearly see the interest as a way to enhance productivity and competitiveness. Some areas of business that are undergoing rapid changes are sales and marketing, retailing, banking, stock trading, etc.

- **Recreation and Entertainment:**

Our entertainment and pleasure-time have also been affected by computerization. For example:

i) In movies, computer generated graphics give freedom to designers so that special effects and even imaginary characters can play a part in making movies, videos, and commercials.

ii) In sports, computers compile statistics, sell tickets, create training programs and diets for athletes, and suggest game plan strategies based on the competitor's past performance.

iii) In restaurants, almost every one has eaten food where the clerk enters an order by indicating choices on a rather unusual looking cash register; the device

directly enters the actual data into a computer, and calculates the cost and then prints a receipt.

- **Government:**

Various departments of the Government use computer for their planning, control and law enforcement activities. To name a few – Traffic, Tourism, Information & Broadcasting, Education, Aviation and many others.

- **Defence:**

There are many uses computers in Defence such as:

1) Controlling UAV or unmanned air-crafts an example is Predator. If you have cable I would recommend watching the shows “Future Weapons" and “Modern Marvels". The show future weapon gives an entire hour to the predator.

2) They are also used on Intercontinental Ballistic Missiles (ICBMs) that uses GPS and Computers to help the missile get to the target.

3) Computers are used to track incoming missiles and help slew weapons systems onto the incoming target to destroy them.

4) Computers are used in helping the military find out where all their assets are (Situational Awareness) and in Communications/Battle Management Systems.

5) Computers are used in the logistic and ordering functions of getting equipments to and around the battlefield.

6) Computers are used in tanks and planes and ships to target enemy forces, help run the platform and more recently to help diagnose any problems with the platforms.

7) Computers help design and test new systems.

- **Sports:**

In today's technologically growing society, computers are being used in nearly every activity.

- **Recording Information**

Official statistics keepers and some scouts use computers to record statistics, take notes and chat online while attending and working at a sports event.

- **Analyzing Movements**

The best athletes pay close attention to detail. Computers can slow recorded video and allow people to study their specific movements to try to improve their tendencies and repair poor habits.

- **Writers**

Many sportswriters attend several sporting events a week, and they take their computers with them to write during the game or shortly after while their thoughts are fresh in their mind.

- **Scoreboard**

While some scoreboards are manually updated, most professional sports venues have very modern scoreboards that are programmed to update statistics and information immediately after the information is entered into the computer.

- **Safety**

Computers have aided in the design of safety equipment in sports such as football helmets to shoes to mouth guards

➢ Explain Uses and Application Of Computer System.

The use of computers is increasing at such a rate that there is hardly any field where computers are not used. The following list describes some of the applications of computers:

- ✓ In offices and homes for preparing documents and to perform other data processing jobs.
- ✓ To prepare salary slips and salary cheques in offices and factories.
- ✓ To maintain accounts and transfer funds in banks.
- ✓ To store and retrieve large amount of information in offices.
- ✓ To send and receive electronic mail/fax.
- ✓ To search and retrieve information from other computers.
- ✓ To reserve tickets in the transportation sector, e.g. railway, airlines, etc.
- ✓ To regulate traffic lights on roads and to control machines and robots in factories.
- ✓ To design automobiles, buildings and dams and to forecast weather.
- ✓ To create animation/ cartoon movies and compose music.
- ✓ To control modern automobiles, trains, airplanes, etc.

- ✓ To control electronic appliances such as air-conditions, TVs , VCRs, vacuum cleaners, etc.
- ✓ To do on-line banking, buy and sell merchandise, shares, bounds, etc.
- ✓ To control and simulate defense equipment.
- ✓ For scientific and industrial research.