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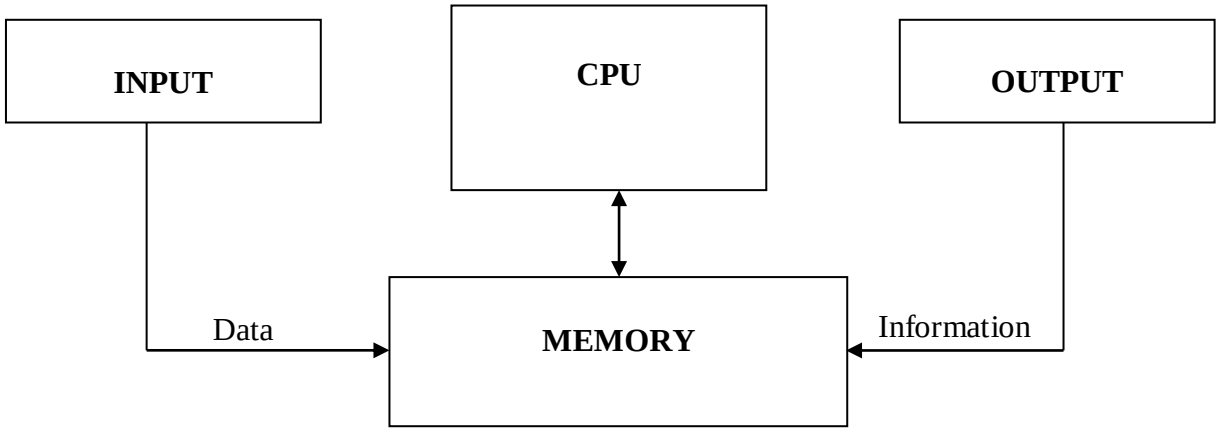
BCOM SEM – 1 COMPUTER APPLICATION IN BUSINESS

Sr. No.	Unit Name
1	Computer Basics
2	Input & Output Devices
3	Number Systems and Codes
4	Internet Basics

UNIT-1 : COMPUTER INTRODUCTION & CONCEPT

- **Introduction of computer**

Topic:- Definition of Computer



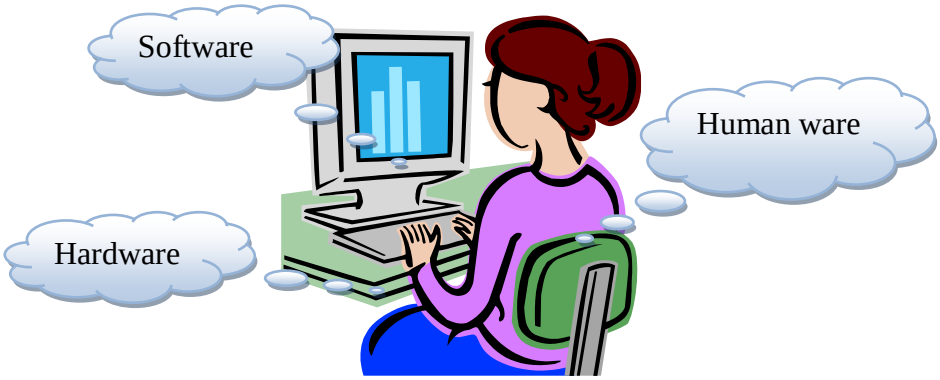
DEFINITION:-

A computer **accepts data from an input device** and **processes it** into useful information which it **displays on its output device**. A computer is a machine that **manipulates data according to a set of instructions**. It **performs high-speed mathematical calculations and logical operations**. **It can process, store and retrieve data.**

1 word Question Answer

Sr. no.	Question	Answer
1	Computer accepts data from which device?	Input device
2	Useful information display on which device?	Output device
3	Computer can Process, store and _____	Retrieve data
4	Computer perform High speed mathematical calculations and _____	Logical operations.

TOPIC: - COMPUTER SYSTEM:



- Hardware
  - I/O Devices
  - CPU
  - External Memory
- Software
  - Application Software
  - System Software
- Human ware
  - Programmer
  - Operator

1 word Question Answer

Sr. no.	***Question***	***Answer***
1	CPU is in Which type?	Hardware
2	Is I/O device is hardware?	Yes
3	Human ware has 2 type… 1st is Operator and 2nd is____	Programmer
4	Software has 2 type…. 1st is Application Software And 2nd is _____	System Software

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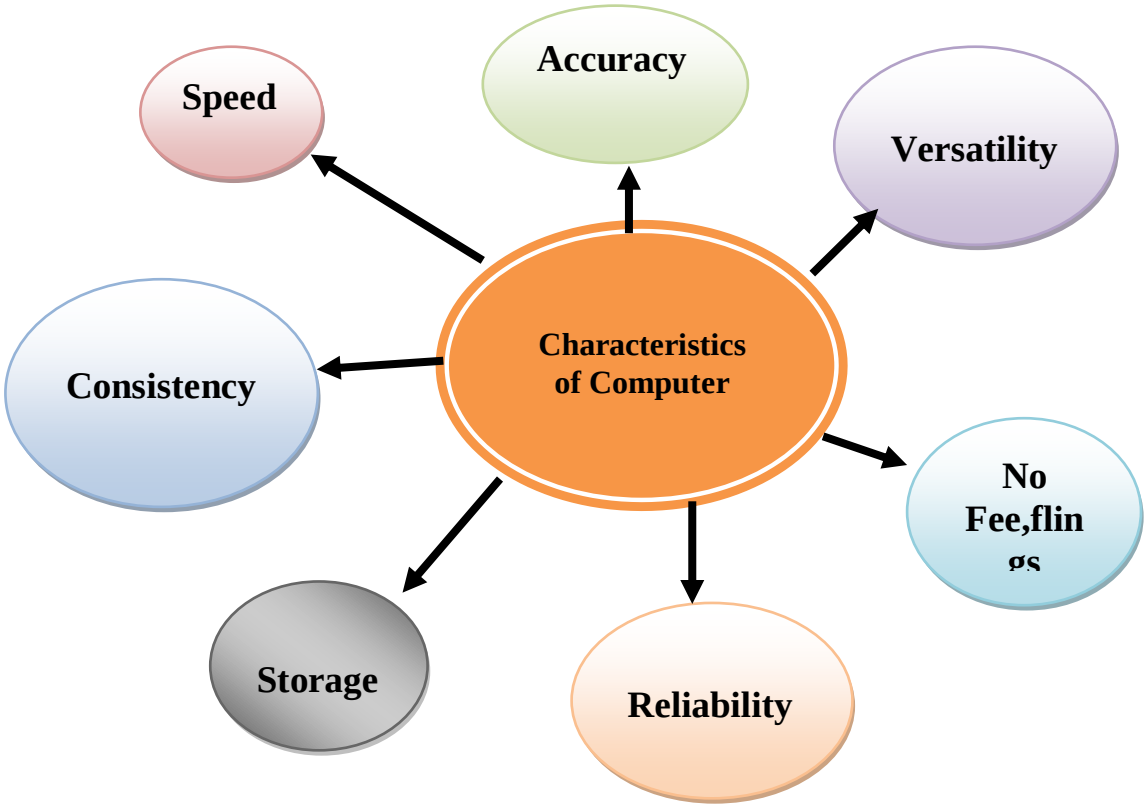
Topic:- Characteristics of computer



DETAILS:

The important characteristics of a computer are described below:

1. **Speed**

The computer is a **very high speed electronic device.** It is much faster than humans. Computer **can perform billions of calculations & operation on the data in a second**. The **time used by a computer to perform an operation is called the processing speed**. Computer speed is **measured in Mega Hertz (MHz) or Giga Hertz (GHz).**

2. **Accuracy**

Accuracy **means to provide results without any error**. Computer is an accurate device. It **can process large amount of data and give accurate, error-free output results** if we provide the **correct input data and set of instructions**. It can do **millions of operations in a second without any error**.

3. **Versatility**

Computer can perform **various types of tasks at a time without any single error**. It is the **most important feature of computer**. For example, at one moment you are editing text on computer, the next moment you are composing and sending emails etc.

4. **No Feelings**

Computer is an electronic device. It **has no feelings**. It identifies objects on the basis of instructions given to it. Computer **cannot make decision their self**. It`s **judgments are totally depends on instructions given to it.**

5. **Reliability**

The computer can **perform very complicated calculations without creating any problem and producing reliable results**. In general, computers are very reliable. Many **personal computers have never needed a service call**.

6. **Storage**

Computer **can store data permanently**. User can retrieve required data at any time. A computer **has internal as well as external or secondary storage**. In secondary storage, **a large amount of data and instructions can be stored for future use**. Text, graphic, pictures, audio and video files can be stored easily. The **storage capacity of the computer is increasing rapidly now days.**

7. **Consistency**

Computer can **repeat actions consistently (again and again) without losing its concentrations**. A computer will **carry out the activity with the same way every time**.

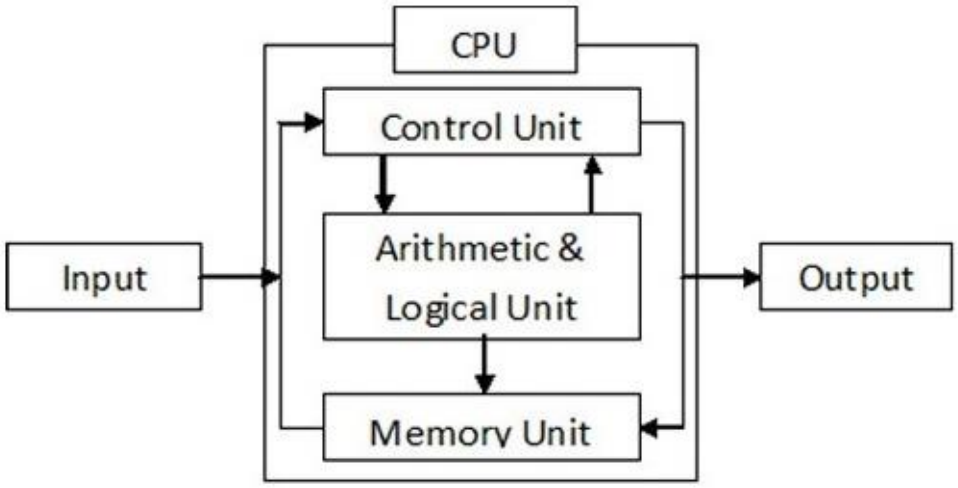
1 word Question Answer

Sr. no.	*Question*	*Answer*
1	The computer perform complicated calculations without any error is called	Reliability
2	Computer can store data permanently or Temporary?	Permanently
3	Computer can repeat actions consistently without losing its	Yes

	concentrations. Is this True?	
4	Computer provide results without any error. Is called?	Accuracy
5	Computer speed is measured in **???**	Mega Hertz (MHz) or Giga Hertz (GHz)
6	The time used by a computer to perform an operation is called _____	Processing speed
7	Computers all judgments are totally depends on_____	Instructions

TOPIC:- Block Diagram of Computer

A complete computer hardware system made up of central processing unit, input and output devices and storage devices. All the **units of computer system interact with each other via CPU**. The diagram shown below is the basic block diagram of computer system.



Detail:
Block Diagram of Computer

- **CPU: Central Processing Unit**

It is **a processor made up of the Control unit and ALU**. It is a heart of the computer, which **contains the necessary circuit to interpret and execute program instructions**. It

performs **all calculations and takes all decisions**. It **controls all units of the computer**. Today, the CPUs of almost all computers are **contained on a single chip**. Intel, Celeron, Pentium, Dual Core, and AMD etc all are different types of CPU.

- **ALU: Arithmetic Logic Unit**

ALU is the component of the CPU that performs **all arithmetic computation, such as addition and multiplication, and all comparison operations**. The **ALU is a combinational logic device which deals with basic logic operations.**

Whenever **calculations are required**, the **control unit transfers the data from storage unit to ALU** once the computations are done, the **results are transferred to the storage unit** by the control unit and then it is send to the output unit for displaying results.

- **Control Unit:**

It **controls all other units in the computer**. The control unit instructs the input unit, **where to store the data after receiving it from the user**. It controls the **flow of data and instructions from the storage unit to ALU**. It also controls the **flow of results from the ALU to the storage unit.** The control unit synchronizes its working.

- **Input Unit:**

Computers need **to receive data and instruction to solve any problem**. The input unit consists of **one or more input devices which are hardware devices that provide information and control signals to the computer**. It allows users **to interact with the CPU**. Commonly used input devices are Digital camera, Joystick, Keyboard, Microphone, Mouse, Scanner, Web Cam etc.

- **Storage Unit:**

The **storage unit of the computer holds data and instructions that are entered through the input unit**. It **preserves the intermediate and final results before these are sent to the output devices**. It also saves the data for the later use.

The various storage devices of a computer system are divided mainly into two categories.

- **Primary Storage/ Main Memory:**

It **stores and provides data very fast**. The primary memory is temporary in nature. The **data is lost, when the computer is switched off**. It is directly accessible to the CPU.

  - **RAM (Random Access Memory)**
  - **ROM (Read-only Memory)**

- **Secondary Memory/Auxiliary Memory**

It is **used to store the data permanently**. It is **much cheaper than the main storage**. It stores several programs, documents, data bases etc. The secondary memory is **slower than primary memory.**

- **Output Unit:**

Outputs are the **signals, data or information sent by the system to the outside**. The output unit of a computer **provides these results of a computation processed by CPU** to outside world. Output unit consist of many output devices like Printers, monitor, Visual Display Unit (VDU), speaker, projector, floppy disk, CD/DVD are the commonly used output devices.

1 word Question Answer

Sr. no.	*Question*	*Answer*
1	Full from of CPU.	Central Processing Unit
2	Full form of ALU	Arithmetic Logic Unit
3	RAM and ROM is	Primary Storage or Main Memory
4	Which unit is controls all other units in the computer?	Control unit
5	Which unit provides information and control signals to the computer? And allows users to interact with the CPU?	Input unit
6	Which Unit of the computer holds data and instructions entered through the input unit?	Storage unit
7	Which memory is used to store the data permanently?	Secondary memory
8	Secondary memory is also known as_____	Auxiliary Memory
9	Which unit provides these results of a computation processed by CPU to outside world	output unit
10	Printer, monitor and VDU are the example of output unit.VDU Stands for….	Visual Display Unit

TOPIC:- GENERATION OF COMPUTER

Generation of computer is characterized **by improvement in the computer**. The development that change the way computers **operate, resulting in increasingly smaller, cheaper, more powerful and more efficient and reliable devices**. With each new generation, it **becomes more advanced than the previous generation** before it.

In Computer language, **"Generation" is a set of Technology**. It provides **a framework for the growth of the computer technology**. There are totally Five Computer Generations till today. Discussed as following

First Generation

Period: 1945 To 1955
Technology: Vacuum Tubes which was a frail glass device that could control and amplify electronic signals

Advantages: Vacuum Tube technology made possible the advent of electronic digital computers.

Disadvantages:
1. Can perform calculations in milliseconds. But too bulky in size
2. It was unreliable
3. Generating too much heat
4. Prone to frequent hardware failures.
5. It also required a constant maintenance.
6. Non portable.
7. Commercial production was difficult and costly.
8. Limited commercial use**.**

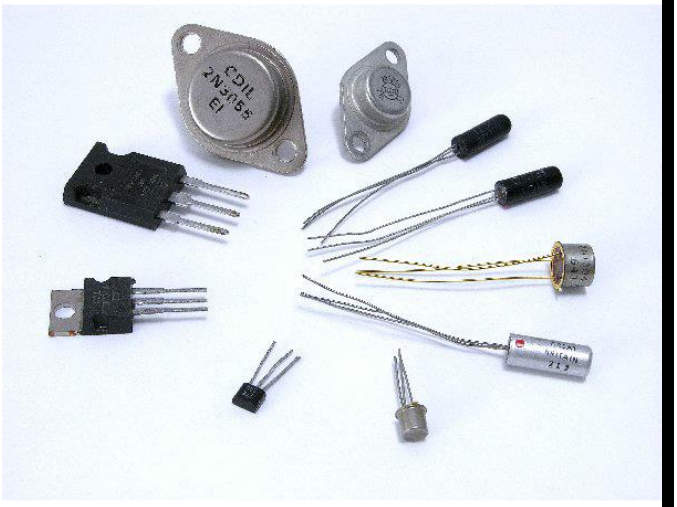
Second Generation

Period: 1955 To 1965

Technology: Transistor was a smaller and more reliable successor to the vacuum tubes.

Advantages:

1. As compared to first generation computers, it was smaller in size.
2. More reliable in information.
3. Less heat than Vacuum Tubes.
4. Under this generation computations were done in microseconds.
5. Better portability
6. Wider commercial use.



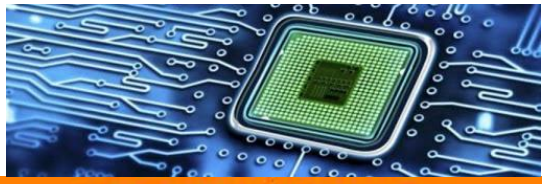
Disadvantages:

1. Protection from heat required.
2. Frequent maintenance was required.
3. Commercial production was difficult and costly.

Third Generation

Period: 1965 To 1980

Technology: Electronic technology continued and introduction of Silicon Chips. The computer Was designed with the help of Integrated Circuit



Advantages:

1. As Compared with previous generations, these Computers were smaller in size.
2. More reliable than second generation computers.
3. Generated less heat.
4. These computers were able to reduced computational time from microseconds to nanoseconds.
5. Maintenance cost is low because of hardware failure as not frequent.
6. Portable.
7. Widely use for commercial applications and was easier and cheaper.

Disadvantages:

1. Air conditioning required in many cases.
2. Highly sophisticated technology required for the manufacture of IC.

Fourth Generation

Period: 1980 To 1989

Technology: Small Scale Integration (SSI) Medium Scale Integration (MSI) Large Scale Integration (LSI) was introduced step by step. IC contained only about ten to twenty components in SSI, letter it possible to integrate to 100 components on a single chips in MSI and LSI it was possible integrate over 300 components onto a single chip.

Advantages:

1. Smallest in size due to high component density.
2. Very reliable as compare to any previous generations.
3. Heat generation is negligible.
4. Much faster in calculation than previous generations.
5. Hardware failure is negligible and hence minimum maintenance is required.
6. Easily portable.
7. Totally used for general purpose.
8. Cheapest among all generations.

Disadvantages:

1. Highly sophisticated technology required for the manufacture of LSI.

Forth generation computer are using sophisticated operating systems and programming languages like c, java which are very easy to understand by programmer.

Fifth Generation (Present and Beyond)

Period: Now

Technology: The main **aim is to bring machines with real knowledge of the world**, with genuine I.Q. and the **ability to reason logically**. In structure it will able to do multiple tasks simultaneously. In function it will not be algorithmic. In architecture, it will have **KIPS (Knowledge Information Processing System)**. This is called as Artificial Intelligence in computers.

Fifth generations computing devices are **only in the minds of advance research scientists.** They are under development and being tested in the laboratories. It is **based on nanotechnology and microelectronic technologies with high computing speeds and**

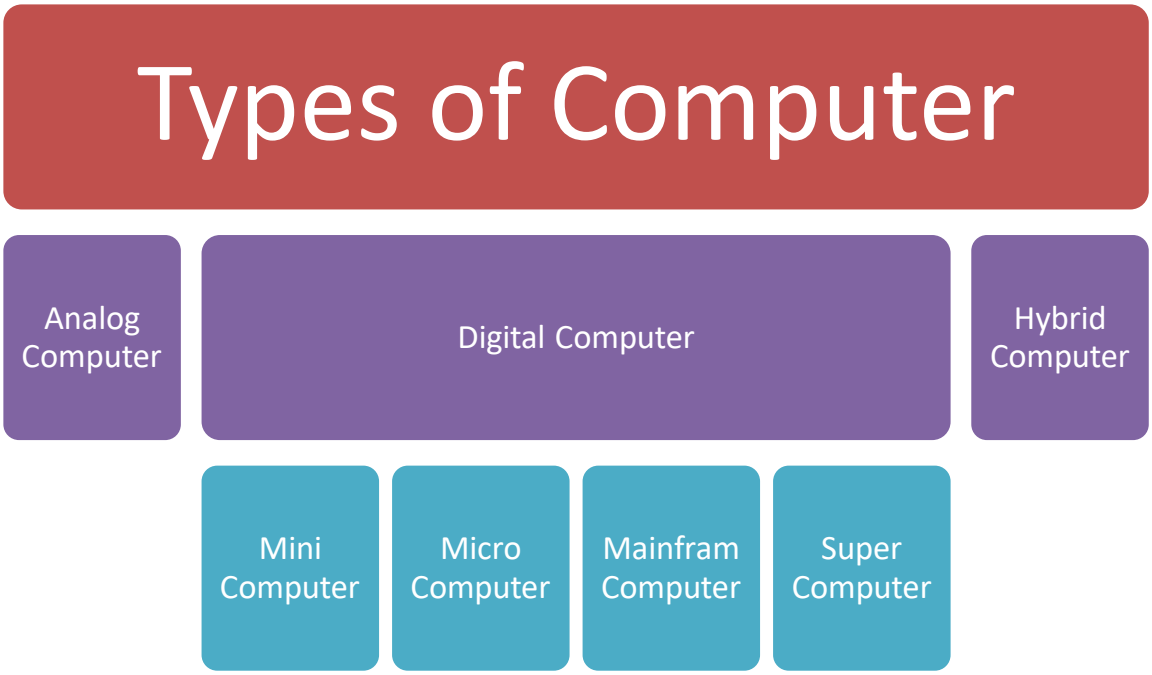
parallel processing. It will drastically change the computers in years to come. These computers will work based **on Artificial Intelligence (AI).**

1 word Question Answer

Sr. no.	*Question*	*Answer*
1	In Computer language, "Generation" Means_____	A set of Technology
2	First Generation technology	Vacuum Tubes
3	Transistor is used in which Generation?	Second generation
4	Time period of third generation	1965 To 1980
5	What is the full form of IC?	Integrated circuits
6	____ is the bulky, slow and suffered with heat and maintenance problem?	Vacuum Tubes
7	Third generation computer used which technology?	Integrated Circuit
8	What is the full form of SSI?	Small Scale Integration
9	What is the full form of MSI?	Medium Scale Integration
10	Small Scale Integration (SSI) Medium Scale Integration (MSI) Large Scale Integration (LSI) was introducing in which generation?	Fourth Generation
11	How many components onto a LSI single chip?	300
12	What is the full form of KIPS	Knowledge Information Processing System
13	In which generation computer will work based on Artificial Intelligence.	Fifth Generation
14	Which technology structure will able to do multiple tasks simultaneously?	Fifth Generation
15	Is third Generation computer is portable?	Yes

TOPIC:- CLASSIFICATION OF COMPUTERS

Computers can be **classified many different ways -- by size, by function, and/or by processing capacity**. The size of a computer often **determines its function and processing capacity**. The classification of computer, are as under:



1. Analog Computer

An analog computer is a device that **performs computations such as addition, multiplication, integration, and other operations using continuously-changeable physical quantities, such as electrical signals, sound wave, pressure** etc. They are **used to represent the quantities in the problem** to be solved.

Analog computers are **especially suited for the solution of complex non-linear equations** and for the simulating the **operation of aircraft, nuclear power plants, and industrial chemical processes.**

An analog computer is one which can **perform multiple calculations at once and can manage with infinite fractions of numbers**. Analog computers have some **problems and limitations such as the noise of its signals, temperature issues and non-linearity** etc.

2. **Digital Computer**

A digital computer is **an electronic computing machine and a programmable device** that processes information by the digital technology. The **digits, (binary bits) 0 and 1 are used to represent all information internally** in digital computer.

A digital computer is **designed to process data in numerical form**. Its **circuits perform directly the mathematical operations of addition, subtraction, multiplication, and division**.

- **Minicomputer**

A minicomputer was a **computer of a size intermediate between the largest mainframe computers and the smallest single-user systems** (microcomputers or personal computers). The minicomputer was **launched in 1959**.

A minicomputer was a **multiprocessing system capable of supporting from 4 to about 200 users simultaneously.** It had **reduced memory and slower processing speeds then mainframe**. The **speed was around the one millions per second**. Digital Equipment Corporation was the largest manufacturer of minicomputer..

They had relatively **high processing power and capacity** that mostly fit the needs of mid range organizations. It was **use for small and mid-size businesses for general business applications and for large organizations for department-level operations**.

- **Microcomputer**

It is a **small digital computer with a single microprocessor chip as its CPU**. It was **first introduced in the late 1970s** currently still in use. It has RAM for processing data and ROM for data storage. It has **limited input and output capabilities and less software and storage capacity as compared to other types**.

They are **physically small compared to mainframe and minicomputers**. It is **less powerful than larger computers**, but they are now as powerful as the minicomputers.

The **personal computer and the laptop are the most common example of a microcomputer**. They are used for many applications and that's why they are called general purpose computers. Many programming languages like **FORTRAN, PASKAL, and BASIC were used for various purposes by microcomputers.** Nowadays most of the high level languages are used on the microcomputers for programming. They use special purpose software packages like MS-Office, Photoshop, Page maker and many more. **High-performance microcomputer systems are widely used in business**, in engineering, in manufacturing and even at home.

- **Mainframe Computer**

Mainframe computers are computers used primarily by large organizations for critical applications, bulk data processing such as census, industry and consumer statistics, enterprise resource planning and transaction processing.

The term originally referred to the large cabinets called "main frames" that housed the central processing unit and main memory of early computers. Later, the term was used to distinguish high-end commercial machines from less powerful units. Most large-scale computer system architectures were established in the 1960s, but continue to evolve.

Modern mainframes can run multiple different instances of operating systems at the same time. This technique of virtual machines allows applications to run as if they were on physically distinct computers. In this role, a single mainframe can replace higher-functioning hardware services available to conventional servers. While mainframes pioneered this capability, virtualization is now available on most families of computer systems, though not always to the same degree or level of sophistication.

- **Super Computer**

A **supercomputer** is a computer with a very high-level computational capacity. Performance of a supercomputer is measured in floating point operations per second (FLOPS). As of 2015, there are supercomputers which could perform up-to quadrillions of FLOPS

Supercomputers were introduced in the 1960s, made initially, and for decades primarily, by Seymour Cray at Control Data Corporation (CDC), Cray Research and subsequent companies bearing his name or monogram. While the supercomputers of the 1970s used only a few processors, in the 1990s machines with thousands of processors began to appear and, by the end of the 20th century, massively parallel supercomputers with tens of thousands of "off-the-shelf" processors were the norm. China's Tianhe-2 supercomputer is currently the fastest in the world at 33.86 peta FLOPS (PFLOPS), or 33.86 quadrillion floating point operations per second

Supercomputers play an important role in the field of computational science, and are used for a wide range of computationally intensive tasks in various fields, including quantum mechanics, weather forecasting, climate research, oil and gas exploration, molecular modeling (computing the structures and properties of chemical compounds, biological macromolecules, polymers, and crystals), and physical simulations (such as simulations of the early moments of the universe, airplane and spacecraft aerodynamics, the detonation of nuclear weapons, and nuclear fusion).

3. HYBRID COMPUTER

Hybrid computers are computers that exhibit features of analog computers and digital computers. The digital component normally serves as the controller and provides logical and numerical operations, while the analog component often serves as a solver of differential equations and other mathematically complex equations. The first desktop hybrid computing system was the Hycomp 250, released by Packard Bell in 1961. Another early example was the HYDAC 2400, an integrated hybrid computer released by EAI in 1963. Late in the 20th century, hybrids dwindled with the increasing capabilities of digital computers including digital signal processors.

Hybrid computers can be used to obtain a very good but relatively imprecise 'seed' value, using an analog computer front-end, which is then fed into a digital computer iterative process to achieve the final desired degree of precision. With a three or four digit, highly accurate numerical seed, the total digital computation time to reach the desired precision is

dramatically reduced, since many fewer iterations are required. One of the main technical problems to be overcome in hybrid computers is minimizing digital-computer noise in analog computing elements and grounding systems.

Hybrid computers should be distinguished from hybrid systems. The latter may be no more than a digital computer equipped with an analog-to-digital converter at the input and/or a digital-to-analog converter at the output, to convert analog signals for ordinary digital signal processing, *and conversely*, e.g., for driving physical control systems, such as servomechanisms.

1 word Question Answer

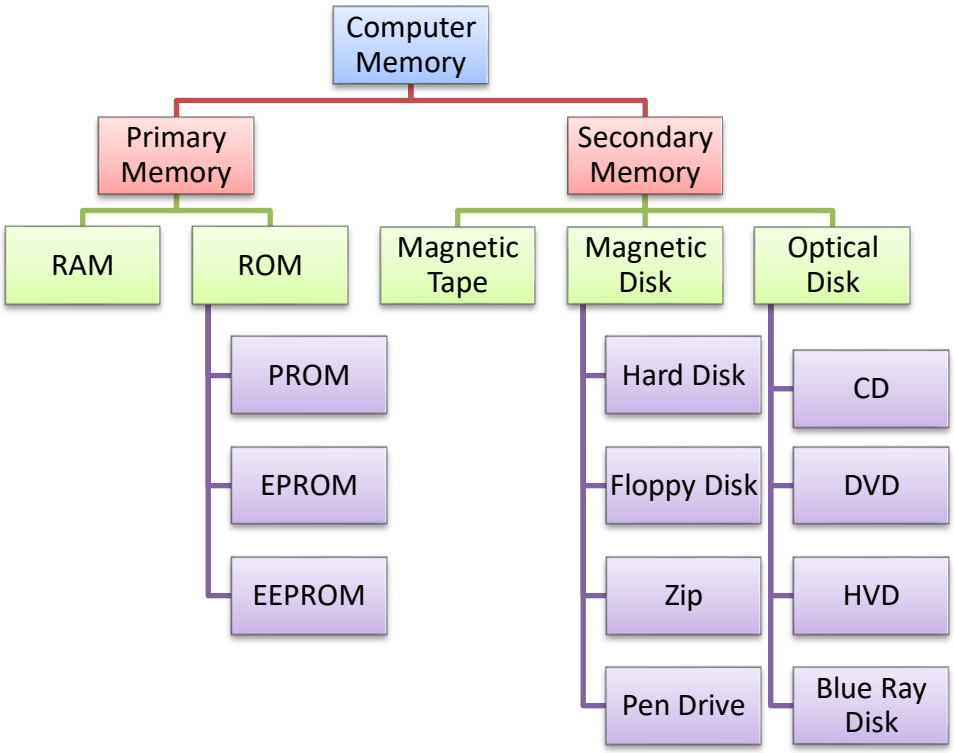
Sr. No.	*Question*	*Answer*
1	How many classification type of computer?	3
2	Digital Computer have 4 type.. 1) Micro computer 2) Mini computer 3)_____ 4) Super computer	Mainframe Computer
3	Which computers are especially suited for the solution of complex non-linear equations?	Analog Computer
4	Which computer used in operation of aircraft, nuclear power plants, and industrial chemical processes?	Analog Computer
5	Analog computers have some problems and limitations such as _____	The Noise of its signals
6	When Minicomputer was lunched?	1959
7	Which digits are used to represent all information internally in digital computer?	0 and 1 (binary bits)
8	A digital computer is designed to process data in_____	Numerical form
9	A minicomputer was a multiprocessing system capable of supporting from_____	4 to about 200 users simultaneously
10	Mini Computer was use for which type of businesses.	Small and mid-size

11	Micro Computer First Time Introduce in_____	1970
12	Personal Computer (PC) and Laptop are example of_____ computer.	Micro
13	Which Computer is reduced memory and slower processing speeds then mainframe?	Mini Computer
14	Micro Computer is also Called as_____	General purpose computers
15	Main Frame computer most large-scale computer system architectures were established in the_____	1960
16	FLOPS means_____	floating point operations per second
17	Supercomputers were introduced in the ____ made initially.	1960s
18	Supercomputers play an important role in the field of _____	computational science
19	Which computers are computers that exhibit features of analog computers and digital computers?	Hybrid computers
20	The first desktop hybrid computing system was the Hycomp 250, released by_____	Packard Bell in 1961

TOPIC:- STORAGE DEVICES

Computer has devices that **can store data or programs (instructions) on a temporary or permanent basic.** These storage devices are also **known as computer memory**. There are **two types of data storage device**; one is the **primary storage device or primary memory** and the other one is the **secondary storage device or secondary memory**.

Primary memory is a **volatile memory. It is used for execution of program**. Secondary memory is a **non volatile memory and is used to store data permanently.** The **volatile memory requires constant power supply** to execute programs. It is the kind of the **memory that is erased, if power supply cut**. The non volatile memory does not require constant power supply and data cannot be erased, if power supply cut. The classification of memory is as under:



1. Primary Memory

Primary memory is also **known as main memory or internal memory**, often referred as memory. This is the memory, **which is directly connected to the CPU**. The CPU can directly access this memory. The CPU **reads instructions stored in it and executes them whenever required**. It **comes in the form of integrated circuit (IC)**. It is a built-in memory and data can be retrieved very quickly.

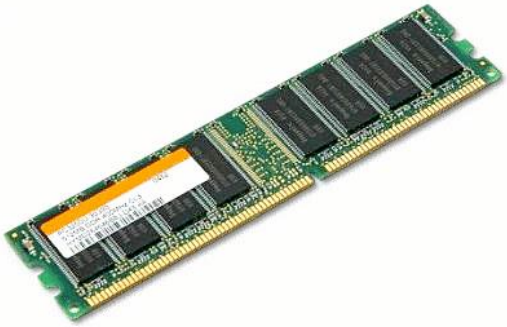
It **stores and provides data very fast which is required for programs running in CPU**. The primary memory is temporary (volatile) memory. The **data is lost, when the computer is switched off**. Every computer comes with a certain amount of main memory. RAM and ROM are the types of primary memory.

- **RAM**

The **RAM stands for "Random Access Memory".** The term "memory" is widely used to refer to RAM by computer people. RAM is **extremely important and considered as a main memory** since **files and programs are loaded into memory first from hard disk or any**

other secondary storage device and then execute. Consequently, RAM is used millions of times every second.

A computer uses RAM to hold temporary instructions and data needed to process them. This means that, **RAM gives our computer a temporary place to process data**. This enables the computer's CPU, to access instructions and data stored in memory very quickly.



RAM is **in the form of integrated chip (IC) same as microprocessor**. It is **made up of millions of transistors and capacitors mounted on semiconductor chip**. The **slots are available on computer's mother board to insert the RAM chip**. Every computer comes with a certain amount of RAM. We can expand the RAM memory to increase the speed of CPU.
There are two types of RAM. DRAM and SDRAM

❖ **DRAM (Dynamic Random Access Memory)**

It is the **most common types of computer memory (RAM)**. It can only **hold data for a very short period of time**. It **must be refreshed thousands of times per second to preserve the stored data**. DRAMs are **measured by storage capability and access time**. DRAM supports **access times of about 60 nanoseconds**. Access time represents the amount of time to save or return information. **The lower the nano speed, the faster the memory operates**. It can only execute either read or write operation at a time.

❖ **SRAM (Static Random Access Memory)**

It is introduced in late 1996. It retains memory and does not need to be refreshed. SRAM is faster than DRAM. SRAM supports **access times of about 10 nanoseconds**. It is also volatile memory. It is more complicated and take more space for a given storage capacity than dynamic RAM. It is **used for specialized application**.

- **ROM**

The ROM **stands for Read Only Memory**. It is also known as firmware. It is **an integrated circuit (IC) programmed for special data**. It is non volatile memory. It is **cheaper and reliable than RAM.**

Information is burnt into ROM chip at manufacturing time so it **cannot be altered or changed** by programmer and can only be read. The fresh information cannot be written in ROM. ROM is used to store the programs permanently. This chip is **not only used in computer,but is used in most other electronic devices**. It **preserves its content even when the computer is switched off**. ROM stores critical programs such as the programs that are required to start computer i.e. operating system.

❖ **PROM**

The full form of **PROM is programmable read-only memory**. They are **manufactured as blank chips on which data can be written with a special device**. This **device is called PROM programmer or PROM burner**. It can be programmed once only to record the information. Once it is programmed, **information written on it cannot be altered**. PROM is non volatile storage.

❖ **EPROM**

The **EPROM stands for Erasable programmable read only memory**. The information in **this memory can be erased only once and chip can be programmed again to store new information with PROM programmer**. The contents stored in EPROM can be cleared by exposing it for some time to ultra violet light. Information stored in chip **can only be read and it remains intact on the chip until it is erased**.

❖ **EEPROM**

It is an Acronym for **electrically erasable programmable read-only memory**. It is a **special type of PROM that can be erased by exposing it to an electrical charge**. Like other types of ROM, EEPROM retains its contents even when the power is turned off.

1 word Question Answer

Sr. No.	*Question*	*Answer*

1	Storage Device has mainly 2 types. 1 Primary Memory And 2._____	Secondary memory
2	The primary memory is _____memory	Temporary (volatile)
3	Primary memory data is lost, when the computer is_____.	Switched off.
4	In primary memory example.	RAM AND ROM
5	The RAM stands for _____.	Random access memory
6	RAM is extremely important and considered as a_____	Main memory
7	____ gives our computer a temporary place to process data.	RAM
8	____ is made up of millions of transistors and capacitors mounted on semiconductor chip.	RAM
9	_____ and _____are two types of RAM.	DRAM and SDRAM
10	What is the full form of DRAM?	Dynamic random access memory
11	DRAM supports access times of about _____ nanoseconds.	60
12	What is the Full form of SRAM?	Static random access memory
13	SRAM is introduced in____	1996
14	SRAM supports access times of about ____nanoseconds	10
15	What is the Full form of ROM.	Read only memory
16	ROM is also Known as_____	Firmware
17	Information is burnt into ROM chip at _____ time so it cannot be altered or changed by programmer and can only be read	Manufacturing time
18	ROM has 3 type. 1 PROM 2. EPROM AND 3. is_____	EEPROM

19	The EPROM stands for _____.	Erasable programmable read only memory
20	Which type of Rom is erased by exposing an electrical charge?	EEPROM

2. Secondary Memory/Storage:

Secondary storage is also termed as **auxiliary storage or backup storage**. The data can be stored in secondary storage for future use. Secondary storage media extends the storage capabilities of the computer system.

- **Hard Disk:**

It is also **known as magnetic disk**. It is **most famous storage device for PCs** because they are **convenient and cost-efficient**. The data stored on a disk remains for ever until they are **erased and reused at a future time**. We can access data stored on disk **sequentially as well as dynamically**. Most **PCs now come with hard disks, capacity of at least 80 GB and more**. The storage capacity of hard disks for personal computer ranges from 10 GB to 360 GB. It depends upon the recording surfaces used inside disk pack.

A hard disk **consists of one or more thin, circular, hard metal plates.** These **plates are packed in a single case**. The plates are **coated with a magnetic (metal oxide) material** that allows data to be **magnetically recorded on the surface of the plates**. The hard disk **platters spin at 5400 to 7200 revolution per minute (RPM).**

Advantages

- Dynamic access is possible.
- Single input information can be used simultaneously to update several related files.
- Storage reliability is high
- Storage capacity is high

Disadvantages

- Possibility of electromechanical failure
- More costly than optical disk

- **Floppy Disk**

It was the most popular secondary storage device **used to transfer data from one PC to another PC**. It **was introducing by IBM in 1972 and is also known as diskette**. Data can be directly access from floppy disk. Floppy disk is **made of round, flexible, plastic material**. It is coated with magnetic material. This disk is **covered with a plastic or cardboard sleeve for protection**. **One hole at the centre is provided for mounting disk into Floppy Disk Drive (FDD)**. Each disk is divided in concentric circles, known as tracks. The data is stored along with these tracks.

	Capacity	Size
1	360 KB	5 ¼”
2	720 KB	3 ½”
3	1.2 MB	5 ¼”
4	1.44 MB	3 ½”

Advantages

- Rewritable media and can be reused a number of times.
- Portable storage device
- Dynamically accessible
- Low cost storage device

Disadvantages

- A careful handling is required
- Damaged easily, not very reliable
- Heat, dust and humidity may damage it
- Electromagnetic field (speaker or mobile phone) may damage the disk

---

Optical Disks

Optical disk **uses light as a media to represent binary data**. In another words, **it store bit values as variations in light reflection**. Their storage **capacity is higher than magnetic storage and data life is also longer than magnetic storage**. They are inexpensive.

Different types of optical disks are available in market today. Some of them are as follows:

1. CD (Compact Disk)
2. DVD (Digital Versatile Disk)

3. Blue-Ray Disk

- **CD (Compact Disk)**

It is the advanced technology **used for storage of the information**. It is found in almost every computer. It is a portable disk. Its data **storage capacity is up to 650 MB**, usually hold 74 minutes of data. It can store **large amount of information such as music, videos, and text files, graphical file etc.** There are two types of CDs, one is CD-ROM and another is CD-RW.

CD-ROM is Read Only Memory. It **contains digital data that can be read many times, but cannot be rewritten**. **CD-RW is a type of Re-Writable CD, on which we can write information multiple times on the same disk surface.**

Advantages

- Very reliable storage media
- Not affected by magnetic field
- Randomly accessible
- Low cost
- Do not have read/write heads
- Compact size, light weight

Disadvantages

- Data access speed is slower than magnetic disks
- Require complicated mechanism compare to magnetic disk

- **DVD (Digital Versatile Disk)**

It is also termed as **Digital Video Disk**. It **looks like CD** but it **has larger storage capacity and clear than CD**. It can also **store video, audio, text files or any other computer file with high video and sound quality.** There are two types of DVDs. First one is single-layer; **single-sided DVD has a capacity of 4.7 GB** about seven times than the storage capacity of CD. Another one is double-layer; **double-sided DVD has a capacity about 17 GB**. The **DVD supports access rates of 600KBps (Kilo Byte per Second) to 10MBPS (Mega Byte per Second).**

Advantages

- Randomly accessible
- No wear and tear even if we keep replaying same thing
- No special treatment needed

- Better sound quality
- Long life
- Compact size and large storage capacity

Disadvantages

- It can be damaged if not handle properly
- Slower than magnetic disk

3. USB Drive/ PEN Drive

Sometimes we need to transfer some data between machines. The USB drive is a very handy tool for transferring data. USB is an abbreviation of Universal Serial Bus. It is also known as Pen drive. Because it looks like a pen and very easy to carry in our pocket, that`s why is known as pen drive. Pen drives are very compact in size as compared to CDs and DVDs. We can plug this device in USB port of computer system and the system automatically detects the new device. All the operating system like Windows ME/2000/XP, Mac OS (ver. 8.6 or above) and Linux kernel (version 2.4.0 or above) supports without drivers and Windows 98/Windows 95 supports with supplied USB Driver. Nowadays, USB 2.0 port is available with every desktop computer as well as laptop computers.

Pen drives are used to store data. They are removable and rewritable. The storage capacity of pen drive is available in range of 32 MB to 128 GB, which is larger than CDs and DVDs. Pen drive is a good supplement of floppy disks and zip disk. iPods and MP3 players are the most popular form of pen drives these days. The USB Pen Drive is shock-proof, dust-proof and its weight is very less. It does not need batteries to operate and has no moving parts.

Advantages

- Small size with high storage capacity
- Randomly accessible
- Not affected by dust, moisture, fungus
- The power consumption is very less
- Almost all operating system support
- Affordable price

Disadvantages

- Data transfer serially, so data transfer rate is less

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1 word Question Answer

Sr. No.	*Question*	*Answer*
1	Secondary storage is also termed as _____.	Auxiliary storage or backup storage.
2	_____ is also known as magnetic disk	Hard Disk
3	RPM means_____	Revolution Per Minute
4	The hard disk platters spin at _____revolution per minute (RPM).	5400 to 7200
5	Floppy disk was introducing by IBM in _____.	1972
6	The Maximum Capacity of Floppy Disk is_____and size is _____.	1.44 MB, 3 ½”
7	CD and DVD are example of_____.	Optical Disks
8	CD maximum data storage capacity is _____.	650 MB
9	CD-ROM is _____type of memory.	Read Only
10	_____is a type of Re-Writable CD, on which we can write information multiple times on the same disk surface.	CD-RW
11	_____is also termed as Digital Video Disk	DVD
12	Single-sided DVD has a capacity is_____.	4.7 GB
13	The DVD supports access rates of _____ to _____.	600KBps (Kilo Byte per Second) to 10MBPS (Mega Byte per Second).
14	What is the Full form of USB?	Universal Serial Bus
15	USB is also known as _____	Pen drive
16	_____ drive is removable and rewritable	Pen Drive
17	The storage capacity of pen drive is available in range _____.	32 MB to 128 GB

18	The _____is shock-proof, dust-proof and its weight is very less.	USB Pen Drive

CHAPTER – 2 : INPUT OUTPUT DEVICES

Input device

Any machine that **feeds data into a computer is known as input device**. It is a hardware device that sends digital information to the computer.

Without any input devices a computer would be a simple display device. It does not allow users to interact with computer, same like a TV. Below is a list of **different types of computer input devices**.

- Keyboard
- Scanner
- Light pen
- Mouse
- Joystick
- Touch Screen

1. Keyboard

Keyboard is a primary input device of computer. We can **enter data and give instructions through the keyboard.** There are so many types of input devices are in market today but not a single one comes in compare with keyboard. Computer keyboards are as same as typewriter keyboards but it has some extra keys.

- **Alphanumeric keys**
- **Arrow keys**
- **Command key**
- **Delete**
- **Enter Key**
- **Function Keys (F1 to F12)**
- **Numeric keypad**
- **Space Bar**
- **Caps Lock**

2. Mouse

The mouse is **a pointing device which controls the cursor movement on a display screen**. It allows the user **to move the pointer with his hand**. We can move the mouse on hard, smooth surface to trace the exact position. The screen pointer moves in the same direction in which the mouse moves by user. There are two or three buttons available on it. Each does different functions. It depends on the running program. Some mouse contains scroll wheel on it, to scroll the current screen in up or in down direction. It`s shape is as like as a real mouse and that's why its name is derived from natural mouse.

- **Mouse Pointer** is used to point or instruct to the computer
- **Mouse Pad** is a surface on which user can move the mouse.
- **Mouse Click** is used to instruct or select anything on computer.
- **Double Click** is used to open anything on computer.
- **Click and Drag** is used to move any file or content to new location.
- **Right Click** is used to open popup menu of selected content.

3. Light Pen:

It is a **hand-held, electronic device connected through wire to the computer**. **This pointing device can input data directly through the screen**. **Its shape is like pen hence its name derived.**

Light-sensitive detector is mounted on the tip of the light pen to select an object on a display screen. This detector is made up of photo cell. This cell is able to sense light and convert it into electric signals through circuitry. This photo cell **detector detects and record the changes**

occur in brightness of the screen at particular X,Y position of the video signal. These signals are sent to the computers. The computer

captures that point and display on the screen. It **can`t work with LCD but it can work with any CRT display.**

It is used for graphics and CAD. This pen is very **useful for an engineer, architect or a fashion designer**. They can use this pen to draw directly on the screen. Light-pen **can select an option by pointing directly for menu-based applications**. There is **no need to use mouse or the keyboard to select an option.**

---

4. Scanner:

A scanner is a device that can **read text, captures images from photographs, documents, magazine pages, and same type of sources for computer editing and display**. It **converts the hard copy into soft copy** by saving it into a computer.

OCR Scanner

OCR is **an abbreviation of Optical Character Recognition**. It translates **hand written text, type written text, printed text or images into electronic form.**

OCR scanners facilitate us to scan the information from **any documents and convert it into electronic signal and place into our computer system** automatically. We have to **just place our documents inside the scanner & the data is captured and interpreted** by scanner. Further processing is done by OCR scanners software.

OCR uses **matrix matching method to recognize the character**. Then compare this character with a library of character. If any match found, then pass the equal ASCII character signal to the computer.

It can easily and quickly read printed text and convert into electronic data. It can save our time and money. Due to it, we can avoid human errors and increase data quality. Data Entry is more efficient, accurate and faster than keyboard entry through OCR scanner.

OMR

Optical Mark Reader is abbreviated as an OMR. This is widely **used to evaluate the multiple choice questions in education examination, recruitment process, consumer or product surveys, assessments, or in voting system.**

It **reads the pre-printed forms, which is filled with color mark for evaluation**. The OMR scanner

detects the absence or presence of dark spot in an evaluation sheet. The recognization of color is done by reflection of light technology used in scanner. **The light is thrown on sheet to detect the dark spot** by scanner.

Source of light (LED) is placed on very specific place to sens e marks in certain columns. This needs very high accuracy in the designing and printing of answer sheets. If the **dark mark on the sheet are not in the exact position, where the light thrown, scanner cannot detect them**.

MICR

MICR is an abbreviation of Magnetic Ink Character Recognition. It is a character recognition technology. Basically it is **used by the banks to provide facility in the processing of cheque**. **Special magnetic ink,** which is sensitive to magnetic fields, is **used in the printing of certain characters on the cheque**. The **bottom line (cheque number, sort number, and account number) of all cheques printed with this ink**. **To print this magnetic ink** line, we **need a laser printer which accepts MICR toner (magnetic ink).**

Cheque passes through a machine when it needs to be read, **it magnetizes the ink and then automatically detect and translates the magnetic information**. Convert that character into digital signals and send to the computer.

The **use of MICR can reduce crime and the forgery of document**. For example, **if photocopy of cheque is produce and scanned through a machine**, MICR will **either not responds or it generates incorrect code.** In this way, lots of cheques can be processed daily and it saves the time. The **use of MICR can increase security**.

The **disadvantage of MICR scanner is that, it cannot process damaged cheque or document.**

OBR

This is an **abbreviation of Optical Barcode Reader**. It is also known as an **Optical Barcode Scanner**. This is an input device. It **helps to read the bar code**.

Barcode **uses a number of lines of different thickness and spacing between all that lines**. It indicates the desired data on certain products. Different bar and

space patterns are used to represent different characters. Set of these patterns are grouped together to form a code. It is **affixed to retail store items, books, identification cards, and postal mail to identify a particular product number, person, or location**.

The **reader uses a laser beam**. This **beam is sensitive to the reflections from the line and space thickness and variation**. The **reflected light is translated into digital data**. This is transferred to a computer for processing action or storage. **Bar codes and readers are most often seen in supermarkets and retail stores.**

Bar codes are mostly used on grocery items. **Common used bar code is a universal product code**. The bars are detected as ten digits. Among which **first five identify the supplier or manufacturer of the item and last five identify individual product**. The check digits are also there to ensure that the information read is correct or not.

---

5. Touch Screen

A touch screen is an electronic visual display unit. It allows the user to physically interact with the computer or other electronic device by touching the screen. The principle of touch screen is that, screen is sensitive to pressure. When we touch the screen, pressure developed. The screen can identify the position of the point of touch. ATM and touch screen cell phone are the best example of this technology. It is a best option to input simple data to the computer for processing.

- **Resistive**
- **Surface wave**
- **Capacitive**

---

6. Joy stick

A **joystick is a cursor control device**. It is similar to a mouse, **except that the cursor stops moving as soon as we stop moving the mouse.**

With a joystick, the **pointer continues moving in the direction the joystick is pointing**. We must return the joystick to its upright position, to stop the pointer. It has **a hand-held lever that pivots on one end and transmits its X-Y coordinates to a computer**. It has **one or more push-**

buttons. It is called switches, whose position can also be read by the computer.

Joysticks are especially **used when playing computer games, but they are also used occasionally for CAD/CAM systems and other applications.**

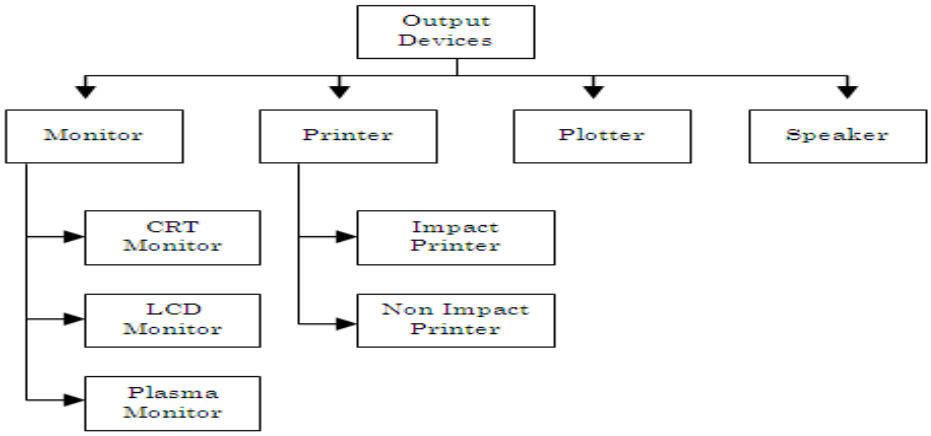
1 word Question Answer

Sr. No.	*Question*	*Answer*
1	Any machine that feeds data into a computer is known as	**Input Device**
2	_____Is a primary input device of computer	**Keyboard**
3	Computer keyboards are as same as _____but it has some extra keys.	**typewriter keyboards**
4	How many function keys ?	**F1 to F12**
5	_____ Is also known as pointing device.	**Mouse**
6	Which shape is like pen in input device	**Light pen**
7	Scanner has how many type?	**4**
8	Ocr is an abbreviation of _____	**Optical Character Recognition**
9	Which scanner is used matrix matching method to recognize the character.	**OCR**
8	Omr is an abbreviation of _____	**Optical Mark Reader**
9	Micr is an abbreviation of _____.	**Magnetic Ink Character Recognition**
10	Which scanner is provide facility in the processing of cheque.	**MICR**
11	The use of micr can reduce crime and the _____	**forgery of document**
12	Full form of obr is?	**Optical Barcode Reader**

13	_____ is a cursor control device.	**A joystick**

OUTPUT DEVICES

Output devices are **the peripheral devices that receive and display output from computer**. They are capable for representing information **in the form of screen information (visual), hard copy, or it may be in the form of audio**. Many types of output devices are available today; some of them are as under:



1. Monitor

Monitor is a most essential output device. It is also known **as display screen, video display terminal (VDT) or visual display unit (VDU)**. It **displays the video and graphics information** generated by the computer **through the video card**. The video card, inside the CPU, is responsible for **passing information processed by the CPU to monitor**. Monitor is connected via cable to the video card. Most monitors range in size from 15" to 21" or more.

- ❑ CRT
- ❑ LCD
- ❑ LED
- ❑ PLASMA

- **CRT Monitor**

CRT monitor is responsible **to display images and text data processed by CPU**. CRT is an **abbreviation for Cathode Ray Tube (picture tube).** It is a main component for CRT monitors. This is the oldest technology used for computer monitors and regular TV sets. The screen size of CRT monitors, vary between 15 to 21 inches. It is measured diagonally from one corner of the screen to the other. It **looks shorter than original**

size. The reason is that, **when measuring the size, the side of the picture tube is also included**.

Aside from cost, the **greatest advantage of CRT over other technologies is that the color display is consistent from any angle**. It creates a picture out of many lines of small colored dots. **The color** we see on the screen is **produced by combination of red, blue, and green, often referred to as RGB**. Let we understand how CRT monitor works.

Today, the monitors are **able to adjust the electron beam** such that they are **capable of setting multiple resolutions**. These monitors are **referred as multi sync monitors**. The monitor uses a wide variety of resolutions. The standard resolutions commonly used by the monitor are:

CGA (Color Graphics Adapter) – 320 x 200
EGA (Extended Graphics Adapter) – 640 x 350
VGA (Video Graphics Adapter) – 640x 480
SVGA (Super Video Graphics Adapter) - 800 x 600
XGA = 1024x768
SXGA = 1280x1024
UXGA = 1600x1200

Advantages:

- Multi sync (Resolution adjustment)
- Refresh Rates are high
- Color Clarity and Depth is good

Disadvantages:

- Very heavy and large
- Consume more amounts of Energy
- Generate excess heat

- **LCD**

It **stands for Liquid Crystal Display**. This technology is widely **used for flat panel monitors**. An LCD monitor is commonly 1 - 3 inches (2.5 - 7.5 cm) thick and weight less than 3 kilograms. It occupies less desk space. It consumes one-third electricity of CRT monitors. It emits less low-frequency radiation than CRTs. That's why it is a best choice for that people who work all day in front of the screen.

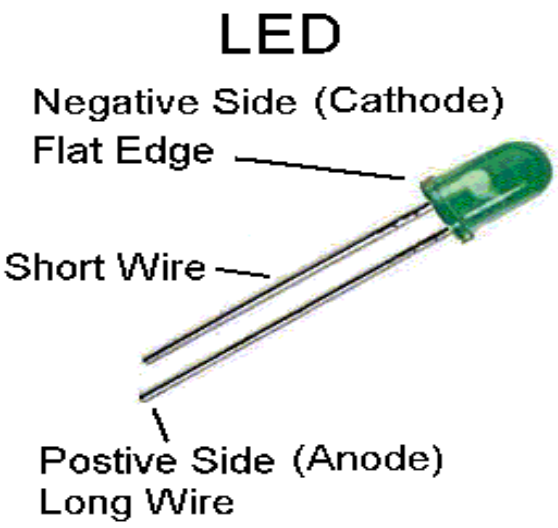
Monochrome (Black and White) LCD images look blue or dark gray on a grayish-white background. Color LCD displays use **two techniques for producing color: Passive matrix and thin film transistor (TFT). Passive matrix is less expensive than TFT but the sharpness of colored picture is not too good**. The other technology, **TFT produces color picture that are as sharp as CRT displays, but the technology is more expensive**. Important specifications of LCD monitor, **includes contrast ratio, brightness, viewing angle, and response time**.

Advantages:
- Portable and light
- Consume less electricity

Disadvantages:
- More expensive than CRT
- Sharpness of picture is less compare to CRT

LED TV

LED TV is a type of LCD television that uses light-emitting diodes (LEDs) to backlight the display instead of the cold cathode fluorescent lights (CCFLs) used in standard LCD televisions. LED TVs are more formally known as LED-backlight LCD television.



A flat panel LCD TV set that uses LEDs (light emitting diodes) for its backlight source rather than the traditional cold cathode fluorescent lamps (see CCFL). Smaller, more power efficient and having a greater optical range than the fluorescents, LEDs produce deeper blacks and more saturated color. Sony was the first to sell an LED TV in 2005.

An LED is a semiconductor device that emits visible light when an electric current passes through it. The light is not particularly bright, but in most LEDs it is monochromatic, occurring at a single wavelength.

Benefits of LEDs, includes:
- Low power requirement: Most types can be operated with battery power supplies.

- High efficiency: Most of the power supplied to an LED or IRED is converted into radiation in the desired form, with minimal heat production.
- Long life: When properly installed, an LED or IRED can function for decades.
- Indicator lights: These can be two-state (i.e., on/off), bar-graph, or alphabetic-numeric readouts.
- LCD panel backlighting: Specialized white LEDs are used in flat-panel computer displays.
- Fiber optic data transmission: Ease of modulation allows wide communications bandwidth with minimal noise, resulting in high speed and accuracy.
- Remote control: Most home-entertainment "remotes" use IREDs to transmit data to the main unit.
- Optoisolator: Stages in an electronic system can be connected together without unwanted interaction.

- **Plasma**

Plasma display is **a flat panel technology used for computer monitor and TV sets**. It is **a high-quality, large-format video systems**. They are good for viewing DVDs because of their big size screen and video performance.

Plasma display has many advantages over LCDs and CRTs. These have wide screens, compare to the CRT, but they have only about 6 inches (15 cm) thick. The viewing **angles are very wide, compared to LCD displays.** The contrast is equivalent to the CRTs. Plasma displays also have better brightness performance than CRT monitors. The **value of brightness, vary from 900 to 1000 units**. They are available in many sizes from 32 to 50 inches. The size is measured diagonally.

Limitations:

The use of **plasma display is limited to the domestic area yet**. It is **used where a very large image is wanted and without viewing from a near distance**. The necessary viewing distance greatly limits its use. The flickering problem also arises in plasma panels. This drawback also limits the use of this technology for computer use. High cost, phosphor aging and high power consumption, also the main drawback of Plasma display.

---

2. Printer

A printer is **an output device that prints characters, symbols, and graphics on paper**. The printed **output is known as hardcopy**. A printer is a peripheral device to produce permanent written material or graphics on paper or any other print material. It **accepts text and graphic in digital form** from a computer then **transfers these information to paper**,

usually standard size sheets of paper. Today a printer is a basic requirement for any business and home user.

Printers are normally compared based on the following attribute:

1. **Color**
2. **Resolution**
3. **Speed**
4. **Memory**

- **Impact printer**

Impact printers **worked something like a typewriter**. Impact printer **produces text and images when tiny wire pins on print head strike the ink ribbon by physically contacting the paper**. This is the oldest printing technology still it is used in production of printers.

Impact Printers **use a print head**. It contains **a number of metal pins**. Normally **page travels through the printer. Pin strike with an inked ribbon placed between the print head and the paper**. And the required output is printed on the paper.

- **Dot-matrix Printer**

Dot-matrix printer **consists of movable print head with pins and ribbon**. These printers impact the page to print a character, like a typewriter. The **print head moves forward and backward across the paper**. It produces text and graphics when pins on the print head strike the ink ribbon. The ink ribbon presses on the paper through head movement, and place a dot on paper. The **combination of these tiny dots, create text and images**. The printer **prints more dots per character, if the number of pins, are more**. This results in better quality.

The quality of dot-matrix printers are depends on speed and the number of pins they have. The **speed is between 50 and 500 CPS (Characters Per Second).** The number of **pins can be 9, 18 or 24.**

Advantages of dot-matrix printer:

1) Can print carbon copies
2) Cheaper than other printers
3) Low printing cost per page
4) Can be used on continuous form paper
5) Reliable, durable

Disadvantages of dot-matrix printer:

1) Noisy
2) Print quality is poor
3) Printing speed is low
4) Limited color printing

- **Daisywheel**

It is also **known as character printer**. As the name suggest, it **can print only characters not the graphics**. A daisy-wheel printer is similar to a ball-head typewriter. This type of **printer has a disk (wheel) made of plastic or metal on which the shape of each character stands out in relief along the outer edge**. To print a character, the motor inside the printer, **rotates the wheel until the required character is facing the paper**. A hammer strikes the wheel. The petal of wheel hit an ink ribbon, leaving the shape of the character on the paper. Daisywheel printers **can print 10 to 80 cps.**

Advantages of daisywheel printer:

1) Cheaper than other printers
2) Low printing cost per page

Disadvantages of daisywheel printer:

1) Due to moving parts, it is very noisy
2) Print quality is poor
3) Printing speed is very slow
4) Limited color printing
5) As the characters on the wheel are fixed, the size and font can only be changed by using a different wheel.

- **Line Printer**

This is the **fastest printer used for obtaining bulk output**. This is normally **used with mini or mainframe computer**. The complete line is printed in one print cycle. Line printer is classified further into two types i.e. chain printer and drum printer.

It **contains a chain of characters or pins that print an entire line at one time**. It is somewhat similar to the daisywheel. Instead of a disk, line printers have **a large spinning print drum or a looped print chain**. The drum or chain rotates over the paper's surface. At that time, **electromechanical hammers located behind the**

paper push the paper and ribbon onto the surface of the drum or chain. It leaves the shape of the character on the paper. This **mechanism allows multiple characters to be print simultaneously on the same line**.

Line printers **can print up to 3,000 lines per minute**. It uses **special mechanism for feeding paper**. This is **called tractor feeding**. The paper used for line printer is pre-punched holes along each side. This arrangement makes possible high-speed paper feeding.

Advantages of line printer:

1) Much faster than dot-matrix or daisy-wheel printers
2) Can be used on continuous form paper
3) Reliable, durable

Disadvantages of line printer:

1) Very noisy
2) Print quality is poor
3) Limited multi-font capability
4) Limited color printing

- **NON IMPACT PRINTERS**

Nonimpact printers **do not make contact with paper to produces text and graphics on paper**. Or we can say that nonimpact printers form characters and images without actually striking the paper. The output is printed on paper by **using special ink**. The **paper is fed to the prin**ter using the **printer mechanism and a head sprays the ink on it**.

Nonimpact printers are faster than impact printers. The **speed is usually 20,000 lines per minute**. They are also much quieter than impact printers because they have fewer moving parts. The **disadvantages of nonimpact printers are that they produce one copy at a time**, sometimes require specially treated paper stock, and the printed output may blur sometimes.

- **Inkjet printer**

Inkjet printers are non-impact printers which **print text and images by spraying ink from an ink cartridge to the paper** as it passes by. The ink cartridge contains print head. The print head of **inkjet printer contains up to 64 tiny nozzles**.

Advantages of inkjet printers:

1) Low cost
2) Good quality of output
3) Can print color text or image
4) Easy to use
5) Reasonably fast
6) Quieter than dot matrix printer

Disadvantages of inkjet printers:

1) Print head is less durable
2) Ink cartridges are expensive
3) Not good for high volume printing
4) Printing speed is less then laser printers
5) Chance of blurred effects on some papers
6) Highlighter marker cannot be used on inkjet printouts

- **Laser Printer**

Like a dot-matrix printer, a laser printer **creates images with dots using laser technology**. This printer **gives high speed and high quality output**. Laser printers are so popular because it can produce clear and sharp images of both text and graphics. It **provides resolutions from 300 DPI up to 1200 DPI.** (Dots per Inch)

They can print 4-32 text-only pages per minute for individual microcomputers, and more than 120 pages per minute for mainframes. The more expensive models can print in different colors. Unlike inkjet printers, laser printer use toner (black or colored dry powder ink) instead of liquid inks.

Advantages of laser printers:

1) High resolution, Best quality
2) High print speed
3) Low cost per page (compared to inkjet printers)
4) Printout is not sensitive to water
5) Good for high volume printing
6) Quite

Disadvantages of laser printers:

1) More expensive than inkjet printers
2) Less capable of printing high quality images such as photos.
3) The cost of toner replacement and drum replacement is high

4) Bulkier than inkjet printers
5) Warm up time needed

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3. Speaker: A speaker **gives us sound output from our computer**. It is an output device that **takes the electronic audio signal stored on memory like hard disk, CDs, tapes and DVDs and converts it into sound that we can hear**. The computer speakers are **attached with sound card in computer with the help of 3.5mm stereo jack plug**. The color of jack is generally green which help us in identifying the audio jack very easily. Nowadays USB speakers are also available in the market.

Computer speakers are **available in wide range according to quality and price**. To improve the sound quality, some of better computer speakers come with equalization features such as bass and treble controls.

1 word Question Answer

Sr. no.	Question	Answer
1	**CRT monitor abbreviation**	**Cathode Ray Tube.**
2	**LCD Monitor Full Form?**	**Liquid Crystal Display**
3	**Which Monitor is consumes less electricity? CRT or LCD**	**LCD(one-third of CRT display)**
4	**LCD monitors thickness & weight?**	**1-3 inches(2.5-7.5 cm) thickness Weight less than 3 Kg.**
5	**How many types of printer?**	**Main 2 Types. 1 impact printer 2 non Impact printer**
6	**Printer normally compares on color, _____, speed, memory attributes.**	**Resolution**
7	**CPS Means?**	**Character Per Second**
8	**Dot matrix printer speed**	**50 to 500 CPS**
9	**How many pin available on Dot matrix Printer?**	**9,18 or 24 Pins**

10	**Which printer is Known as Character Printer?**	**Daisywheel**
11	**Which type of printer has a disk made of plastic or metal**	**Daisywheel**
12	**Daisywheel printer Speed?**	**10 to 80 CPS**
13	**Which printer prints 3,000 lines per minute?**	**Line Printer**
14	**In Line Printer have Special Mechanism for feeding paper is called?**	**Tractor Feeding**
15	**In which printer Pre-punched Paper is used?**	**Line Printer**
16	**Non Impact Printer speed?**	**20,000 lines Per Minute**
17	**How many tiny nozzles used in Inject printer head?**	**64 tiny nozzles**
18	**Inject printer print text and images by spraying_____.**	**Ink from an ink cartridge.**
19	**Which printer is used normally in school, college ,home etc…?**	**Laser printer**
20	**Laser printer Print Resolution is up to?**	**3000 DPI to 1200 DPI**
21	**Laser printer Print _____ text only page per minutes with Micro Computer.**	**4-32 page**
22	**Laser printer Print _____ text only page per minutes with Mainframe Computer.**	**More than 120 pages**
23	**In which Printer powder ink is used?**	**Laser Printer**
24	**Which output Device gives us Sound Output?**	**Speaker**
25	**In Computer Audio jack size is_____ and generally _____ Color is used for identified.**	**3.5 mm, Green**

UNIT – 3 NUMBER SYSTEM & CODES

Number System

A number system is the set of symbols. It is a set of characters and mathematical rules. Each character of number represents the value according to its position. We can perform arithmetic operation with this type of number system. It is a way of counting things and quantity, performing calculations, comparing amounts. There are four types of positional number system, One of them is decimal number system which is widely use by us in normal life. All are described as follows:

Decimal Number System

The Decimal Number System uses base 10. There are ten digits from 0 through 9. This number system is very common and we use it in our daily life to calculate the things.

Binary Number System

The binary number uses base 2. This system uses two digits 0 and 1. Most of the modern computer systems operate using binary logic. All the information stored in computers is in binary form.

The binary number system works as same as the decimal number system. The basic difference between the Binary Number System and decimal number system is that the binary number system uses the base 2 and includes only the digits 0 and 1 and decimal number uses the base 10 and digits 0 through 9.

Octal Number System

The octal Number System uses base 8. It includes the digits 0 through 7. Any other digit makes the number an invalid octal number.

Hexadecimal Number System

The Hexadecimal Number System uses base 16. It involves the digits 0 through 9 and the letters A, B, C, D, E, and F. First ten values are denoted with digits 0 to 9 and rest of six i.e. 10, 11, 12, 13, 14, 15 are represented by A, B, C, D, E and F respectively.

Computer code

ASCII code

The computer can use only 0s and 1s for internal processing. Any numeric value is represented and processed internally by its binary translation. Now the question is, how to represent letters and all other non numeric characters with the help of 0s and 1s? The solution is ASCII code. Computers use ASCII code for representing the alphabet and other special characters.

ASCII is an abbreviation of the American Standard Code for Information Interchange. ASCII was developed by the American National Standards Institute (ANSI). In an ASCII code, all alphabets, number or any special character are represented with 7 bit binary number (combination of seven 0's or 1's). We can define 128 possible characters with 7 bit.

ASCII codes are used by computers to represent text. Due to this, it is possible to transfer data from one computer to another.

Sometimes text files stored in ASCII format are known as ASCII files. Text editors and word processors can store data generally in ASCII format. The data files, particularly which contain numeric data, are not stored in ASCII format. Executable programs are never stored in ASCII format.

There is several larger character sets are also available, that use 8 bits, which gives them 128 extra characters. The additional characters are used to represent non-alphabet characters, graphics symbols, and some mathematical symbols.

Unix and DOS-based operating systems use ASCII for text files. Windows NT and 2000 uses a newer code, Unicode. IBM's S/390 systems use a 8-bit code called EBCDIC. Some operating system uses a superset of ASCII called extended ASCII or high ASCII.

The following table contains list of ASCII code for all the letters and some special characters. For example, the ASCII code for the uppercase letter "A" is represented by the code 65. Now 65, is easily represented by 0s and 1s in binary.

BCD definition

BCD stands for Binary Coded Decimal. The BCD code converts each decimal digit in binary form and then stores each in its own byte. For example, a 4 digit number would take 4 bytes. BCD is one of primary ways numbers are stored in the computer.

These special binary codes are designed to represent decimal numbers. In BCD code, each decimal digits (0-9) is represented by its equivalent four-bit binary number.

The Decimal number 261 is stored as 00000010 00000110 00000001 in BCD form. Since computer storage requires the minimum of 1 byte, we can see that the upper four bits of each BCD number is wasted storage. Packed BCD is the best solution for this problem. This type of coding system stores the two digits in a single byte. Now the number is stored in Packed BCD scheme as 00000010 01100001.

These are widely used in digital logic applications like arithmetic circuits, encoders, decoders, code converters etc. It is also used in computer communication applications to provide error detection and error correction. The BCD code is used in BIOS. In many personal computers, the date and time stored in BIOS is in BCD form. The Atari 8-bit computers used BCD to implement floating-point algorithms. BCD is one of four primary ways numbers are stored in the computer.

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EBCDIC

EBCDIC is an abbreviation of Extended Binary Coded Decimal Information Code. It is an eight-bit code character set. It can represent 28 = 256 different characters. It can store one alphanumeric character or two decimal digits in a single byte.

EBCDIC was developed by International Business Machines (IBM). It was first used on the IBM 360 computer. This machine was presented to the market in 1964. Before 1981 most computers manufactured by IBM used this character set.

EBCDIC is now an obsolete coding system. It is still used in IBM mainframes and most IBM midrange computers. It is also used in some equipment, mainly in continued use of software written many years ago that need an EBCDIC communication environment.

There are four main parts of the EBCDIC code: 00000000 to 0011 1111 is used for control characters; 0100 0000 to 0111 1111 are used for punctuation; 1000 0000 to 1011 1111 for lowercase characters and 1100 0000 to 11111111 for uppercase characters and numbers.

EBCDIC uses all the 8 bits available to it, so parity checking cannot be used on an 8 bit system. EBCDIC has a wider range of control characters than ASCII.

Memory Measurement Units

We know units like kilogram, meter, liter etc. They are used to measure weight, length and capacity. Similarly, to measure the capacity of computer's memory, storage devices and length of programs, we can use the units like bit, nibble, byte, word etc.

BIT

BIT is an abbreviation of the binary digit.

It is the smallest units of data.

A single bit represent a single value, it is either '0' or '1'. The data given to the computer are converted into BITs, because the computer cannot understand the numbers (0-9), alphabets (a-z or A-Z) and special characters.

BYTE

One BYTE is a group of eight bits. It is an unit of memory measurement. Memory is measured in byte, kilobyte, megabyte, gigabyte, terabyte etc. Byte may represent any single character.

8 bits = 1 byte
1024 bytes = 1 kilobyte (KB)
1024 kilo bytes = 1 Mega byte (MB)
1024 mega bytes = 1 Giga byte (GB)
1024 giga bytes = 1 Tera byte (TB)

The computer uses Binary system so 210 is equals to 1024 bytes. Hence, 'Kilo' means 1024 in measuring units of computer.

NIBBLE

A NIBBLE is a combination of four BITs. It is used to represent the earlier BCD(Binary Decimal Code) or hexadecimal digit. Nibble can represent 16 different values.

For example:

Character 3 A is represented in nibble as 0011 1010.

WORD

A word is a collection of 16 bits. A word may be formed by combining two or more bytes.The word will be numbered from bit zero (b0) through fifteen (b15). Where bit 0 is the LSB (Least Significant Bit) and bit 15 is the MSB (Most Significant Bit). Bit b0 to Bit b7 is first byte and bit b8 through bit b15 form the another byte. We can represent 216 (65536) different values with a word of 16-bits.

DOUBLE WORD

Double Word is Two Words. It is a group of 32 bits. The double word can also be divided into four bytes, or eight nibbles. It can represent any data that requires 32 bits or less.

QUAD WORD

Quad Word is Four Words. It is a group of 64 bits.

Binary Number Formats

The format of all measuring unit is represented in the following table:

Name	Size in bits	Example
Bit	1 bit	1
Nibble	4 bits	0101
Byte	8 bits	0000 0101
Word	16 bits	0000 0000 0000 0101
Double Word	32 bits	0000 0000 0000 0000 0000 0000 0000 0101
Quad Word	64 bits	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0101

Parity Bit

One additional binary digit is added to a group of bits for error detection which is known as parity bit.

Parity is a technique of checking whether data is lost or not, when it is shifted from one place in storage to another or when transferred between computers. This bit is used for the purpose of identifying whether the bits being moved is arrived successfully or not.
Before the bits are transferred, they are counted. The parity bit is set to one, If the total number of data bits is even (parity bit is not included), so that the total number of bits sent will form an odd number.

The parity bit remains 0, if the total number of data bits is an odd number. At the receiving side, each incoming bits group is checked to detect if the group totals to an odd number. If the total is even, a transmission error has occurred. We can decide that the received data is corrupt and an error message is sent to the user.
Parity bit checking is used sometimes for transmitting ASCII characters, which have 7 bits, leaving the 8th bit as a parity bit.

Sign Bit

The sign bit is a bit, that indicate the sign of a number in a computer numbering format. Generally the most significant bit is used as a sign bit. If the sign bit is set to 1, the given number is negative and if bit is 0, it indicates a positive number.

Carry Bit

When two binary numbers are added and if the sum of the left most column produces a carry, then special bit, called carry bit is set to 1. Carry bit remains 0, if two binary numbers are added but no carry generated.

UNIT – 4 INTERNET BASICS

Internet Concept

By the turn of the century, information, including access to the Internet, will be the basis for personal, economic, and political advancement. The popular name for the Internet is the information superhighway.

Whether you want to find the latest financial news, browse through library catalogs, exchange information with colleagues, or join in a lively political debate, the Internet is the tool that will take you beyond telephones, faxes, and isolated computers to a burgeoning networked information frontier. The Internet supplements the traditional tools you use to gather information, Data Graphics, News and correspond with other people. Used skillfully, the Internet shrinks the world and brings information, expertise, and knowledge on nearly every subject imaginable straight to your computer.

The Internet links are computer networks all over the world so that users can share resources and communicate with each other. Some computers have direct access to all the facilities on the Internet such as the universities. And other computers, eg Privately-owned ones have indirect links through a commercial service provider, who offers some or all of the Internet facilities.

In order to be connected to Internet, you must go through service suppliers. Many options are offered with monthly rates. Depending on the option chosen, access time may vary.

The Internet is what we call a Meta network, that is, a network of networks that spans the globe. It's impossible to give an exact count of the number of networks or users that comprise the Internet, but it is easily in the thousands and millions respectively. The Internet employs a set of standardized protocols which allow for the sharing of resources among different kinds of computers that communicate with each other on the network.

These standards, sometimes referred to as the Internet Protocol Suite, are the rules that developers adhere to when creating new functions for the Internet.
The Internet is also what we call a distributed system; there is no central archives. Technically, no one runs the Internet. Rather, the Internet is made up of thousands of smaller networks. The Internet thrives and develops as its many users find new ways to create, display and retrieve the information that constitutes the Internet.

INTERNET SERVICES

1. Email concept:

- E-mail means Electronic Mail.
- Using e-mail, a user can send text, picture, sounds, programs or even movies to any other person on the Internet anywhere in the world.

Email Address:

- An address that use in E-mail services is known as e-mail address.
- This address helps us in identifying a user to whom we want to send e-mail.
- An e-mail address is always unique.
- The e-mail address has 2 main parts, joined by @(the at sign).
- First part is user name:-- User name is the name of the user that contains alphabets, numbers, underscore and some special characters but they can't contain comma, space & parenthesis.
- Second part is Domain name:-- The domain name is the name of computer owned by a company or Internet service. The host name provides the location of mailbox.

How to receive incoming Mail?

- Mail server receives and stores e-mail messages in mailboxes by using protocol called Post Office Protocol (POP) or POP3, mail servers are sometimes also called pop servers.
- To read the received mail, a person needs an e-mail application such an Outlook or Eudora.

How to send Mail?

- We write messages on our computer by using our application.
- Then we transfer the messages to an SMPT server. It is a mail server that accepts outgoing messages.
- We have to write the receiver's email address to send mail.
- There is one more field called Subject, which holds the subject of the message.

2. CHATTING

Online chat may refer to any kind of communication over the Internet that offers an instantaneous transmission of text-based messages from sender to receiver; hence the delay for visual access to the sent message shall not hamper the flow of communications in any of the directions. Online chat may address as well point-to-point communications as

well as multicast communications from one sender to many receivers.

Online chat in a lesser stringent definition may be primarily any direct text-based one-on-one chat or one-to-many group chat (formally also known as synchronous conferencing), using tools such as instant messengers, Internet Relay Chat, talkers and possibly MUDs. The expression online chat comes from the word chat which means "informal conversation".

3. CONFERENCING

A videoconference (also known as a *video teleconference*) is a set of interactive telecommunication technologies which allow two or more locations to interact via two-way video and audio transmissions simultaneously.

It has also been called visual collaboration and is a type of groupware. It differs from videophone in that it is designed to serve a conference rather than individuals.

Videoconferencing differs from videophone calls in that it's designed to serve a conference or multiple locations rather than individuals. It is an intermediate form of video telephony, first deployed commercially in the United States by AT&T Corporation during the early 1970s as part of their development of Picture phone technology.

With the introduction of relatively low cost, high capacity broadband telecommunication services in the late 1990s, coupled with powerful computing processors and video compression techniques, videoconferencing has made significant inroads in business, education, medicine and media. Like all long distance communications technologies (such as phone and Internet), by reducing the need to travel to bring people together the technology also contributes to reductions in carbon emissions, thereby helping to reduce global warming.

4. Internet Telephony

Internet telephony refers to communications services—Voice, fax, SMS, and/or voice-messaging applications—that are transported via the Internet, rather than the public switched telephone network (PSTN).

The steps involved in originating a VoIP telephone call are signaling and media channel setup, digitization of the analog voice signal, encoding, packetization, and transmission as Internet Protocol (IP) packets over a packet-switched network.

On the receiving side, similar steps (usually in the reverse order) such as reception of the IP packets, decoding of the packets and digital-to-analog conversion reproduce the original voice stream.

Even though IP Telephony and VoIP are terms that are used interchangeably, they are

actually different; IP telephony has to do with digital telephony systems that use IP protocols for voice communication while VoIP is actually a subset of IP Telephony. VoIP is a technology used by IP telephony as a means of transporting phone calls.

INTERNET CONNECTION METHODS

1. Dial Up Connection

Dial-up Internet access is a form of Internet access that uses the facilities of the public switched telephone network (PSTN) to establish a dialled connection to an Internet service provider (ISP) via telephone lines. The user's computer or router uses an attached modem to encode and decode Internet Protocol packets and control information into and from analogue audio frequency signals, respectively.

The term was coined during the early days of computer telecommunications when modems were needed to connect terminals or computers running terminal emulator software to mainframes, minicomputers, online services and bulletin board systems via a telephone line.

Dial-up connections to the Internet require no infrastructure other than the telephone network. Where telephone access is widely available, dial-up remains useful to travelers. Dial-up is often the only choice available for rural or remote areas, where broadband installations are not prevalent due to low population density, and high infrastructure cost. Dial-up access may also be an alternative for users on limited budgets, as it is offered free by some ISPs, though broadband is increasingly available at lower prices in many countries due to market competition.

Dial-up requires time to establish a telephone connection (up to several seconds, depending on the location) and perform handshaking for protocol synchronization before data transfers can take place. In locales with telephone connection charges, each connection incurs an incremental cost. If calls are time-metered, the duration of the connection incurs costs. Dial-up access is a transient connection, because either the user, ISP or phone company terminates the connection. Internet service providers will often set a limit on connection durations to allow sharing of resources, and will disconnect the user—requiring reconnection and the costs and delays associated with it. Technically-inclined users often find a way to disable the auto-disconnect program such that they can remain connected for days.

A 2008 Pew Internet and American Life Project study states that only 10 percent of US adults still used dial-up Internet access. Reasons for retaining dial-up access include lack of infrastructure and high broadband prices. This has allowed Dial-up providers such as

NetZero to continue spending marketing dollars to obtain customers and commit to having U.S. based customer support.

2. Leased Line

A leased line is a service contract between a provider and a customer, whereby the provider agrees to deliver a symmetric telecommunications line connecting two or more locations in exchange for a monthly rent (hence the term lease). It is sometimes known as a 'Private Circuit' or 'Data Line' in the UK or as CDN (Circuit Direct Number) in Italy. Unlike traditional PSTN lines it does not have a telephone number, each side of the line being permanently connected to the other. Leased lines can be used for telephone, data or Internet services. Some are ring down services, and some connect two PBXes.

Typically, leased lines are used by businesses to connect geographically distant offices. Unlike dial-up connections, a leased line is always active. The fee for the connection is a fixed monthly rate. The primary factors affecting the monthly fee are distance between end points and the speed of the circuit. Because the connection doesn't carry anybody else's communications, the carrier can assure a given level of quality.

An internet leased line is a premium internet connectivity product, delivered over fiber normally, which is dedicated and provides uncondensed, symmetrical speeds, Full Duplex. It is also known as an Ethernet leased line, DIA line, data circuit or private circuit.

For example, a T-1 channel can be leased, and provides a maximum transmission speed of 1.544 Mbit/s. The user can divide the connection into different lines for multiplexing data and voice communication, or use the channel for one high speed data circuit. Increasingly, leased lines are being used by companies, and even individuals, for Internet access because they afford faster data transfer rates and are cost-effective for heavy users of the Internet.

IP address

An Internet Protocol (IP) address is a numerical identification and logical address that is assigned to devices participating in a computer network utilizing the Internet Protocol for communication between its nodes.

Although IP addresses are stored as binary numbers, they are usually displayed in human-readable notations, such as 208.77.188.166 (for IPv4), and 2001:db8:0:1234:0:567:1:1 (for IPv6). The role of the IP address has been characterized as follows: "A name indicates what we seek. An address indicates where it is. A route indicates how to get there."

The original designers of TCP/IP defined an IP address as a 32-bit number and this system, now named Internet Protocol Version 4 (IPv4), is still in use today. However, due to

the enormous growth of the Internet and the resulting depletion of the address space, a new addressing system (IPv6), using 128 bits for the address, was developed in 1995 and last standardized by RFC 2460 in 1998.

The Internet Protocol also has the task of routing data packets between networks, and IP addresses specify the locations of the source and destination nodes in the topology of the routing system. For this purpose, some of the bits in an IP address are used to designate a sub network. The number of these bits is indicated in CIDR notation, appended to the IP address, e.g., *208.77.188.166/24*.

With the development of private networks and the threat of IPv4 address exhaustion, a group of private address spaces was set aside by RFC 1918. These *private addresses* may be used by anyone on private networks. They are often used with network address translators to connect to the global *public* Internet.

The Internet Assigned Numbers Authority (IANA) manages the IP address space allocations globally. IANA works in cooperation with five Regional Internet Registries (RIRs) to allocate IP address blocks to Local Internet Registries (Internet service providers) and other entities.

Domain Name System

A domain name is an identification label to define realms of administrative autonomy, authority, or control in the Internet, based on the Domain Name System (DNS).

Domain names are used in various networking contexts and application-specific naming and addressing purposes. A prominent example is the top-level Internet domains com, net and org.

Below these top-level domains in the DNS hierarchy are the second-level and third-level domain names that are open for reservation and registration by end-users that wish to connect local area networks to the Internet, run web sites, or create other publicly accessible Internet resources. The registration of these domain names is usually administered by domain name registrars who sell their services to the public.

Individual Internet host computers use domain names as host identifiers, or *hostnames*. Hostnames are the leaf labels in the domain name system usually without further subordinate domain name space. Hostnames appear as a component in Uniform Resource Locators (URLs) for Internet resources such as web sites (e.g., en.wikipedia.org).

Domain names are also used as simple identification labels to indicate ownership or control of a resource. Such examples are the realm identifiers used in the Session Initiation Protocol (SIP), the Domain Keys used to verify DNS domains in e-mail systems, and in many other Uniform Resource Identifiers (URIs).

An important purpose of domain names is to provide recognizable names to numerically addressed Internet resources. This abstraction allows any resource (e.g., website) to be moved to a different physical location in the address topology of the network, globally or locally in an intranet. Such a move usually requires changing the IP address of a resource and the corresponding translation of this IP address to and from its domain name.

FTP

File Transfer Protocol (FTP) is a network protocol used to exchange and manipulate files over a TCP computer network, such as the Internet. An FTP client may connect to an FTP server to manipulate files on that server.

- **Purpose**

  The objectives of FTP, as outlined by its RFC, are:

  1. To promote sharing of files (computer programs and/or data).
  2. To encourage indirect or implicit use of remote computers.
  3. To shield a user from variations in file storage systems among different hosts.
  4. To transfer data reliably, and efficiently.

- **Connection Methods**

FTP runs over TCP. It defaults to listen on port 21 for incoming connections from FTP clients. A connection to this port from the FTP Client forms the control stream on which commands are passed from the FTP client to the FTP server and on occasion from the FTP server to the FTP client.

FTP uses out-of-band control, which means it uses a separate connection for control and data. Thus, for the actual file transfer to take place, a different connection is required which is called the data stream. Depending on the transfer mode, the process of setting up the data stream is different. Port 21 for control (or program), port 20 for data.

In active mode, the FTP client opens a dynamic port, sends the FTP server the dynamic port number on which it is listening over the control stream and waits for a connection from the FTP server. When the FTP server initiates the data connection to the FTP client it binds the source port to port 20 on the FTP server.

In passive mode, the FTP server opens a dynamic port, sends the FTP client the server's IP address to connect to and the port on which it is listening (a 16-bit value broken into a high and low byte, as explained above) over the control stream and waits for a connection from the FTP client. In this case, the FTP client binds the source port of the connection to a dynamic port.

WWW

The World Wide Web (abbreviated as WWW or W3 and commonly known as the Web), is a system of interlinked hypertext documents accessed via the Internet. With a web browser, one can view web pages that may contain text, images, videos, and other multimedia and navigate between them via hyperlinks.

Using concepts from earlier hypertext systems, British engineer and computer scientist Sir Tim Berners-Lee, now living in Lexington, MA as the Director of the World Wide Web Consortium, wrote a proposal in March 1989 for what would eventually become the World Wide Web.

At CERN in Geneva, Switzerland, Berners-Lee and Belgian computer scientist Robert Cailliau proposed in 1990 to use "Hypertext ... to link and access information of various kinds as a web of nodes in which the user can browse at will", and publicly introduced the project in December.

"The World-Wide Web was developed to be a pool of human knowledge, and human culture, which would allow collaborators in remote sites to share their ideas and all aspects of a common project."

Web Browser

A web browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web. An information resource is identified by a Uniform Resource Identifier (URI) and may be a web page, image, video, or other piece of content.

Hyperlinks present in resources enable users easily to navigate their browsers to related resources. A web browser can also be defined as an application software or program designed to enable users to access, retrieve and view documents and other resources on the Internet.

Although browsers are primarily intended to access the World Wide Web, they can also be used to access information provided by web servers in private networks or files in file systems.

The major web browsers are Internet Explorer, Firefox, Google Chrome, Safari, and Opera.

The history of the web browser dates back to the late 1980s, when a variety of technologies laid the foundation for the first web browser, World Wide Web, by Tim Berners-Lee in 1991. That browser brought together a variety of existing and new software and hardware technologies.
