

CTEVT, DIPLOMA, QUESTION & SOLUTION

Also Useful for Computer fundamentals

Computer Application

(For Diploma I Yrs. I Part & II Part)

First & Second Semester

(Engineering All)



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- 1) 2078 Magh Regular/Back
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- 5) Some additional Question Solution

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Computer Application__(Engg. All) 2nd Sem

(2078) Question Paper Solution.

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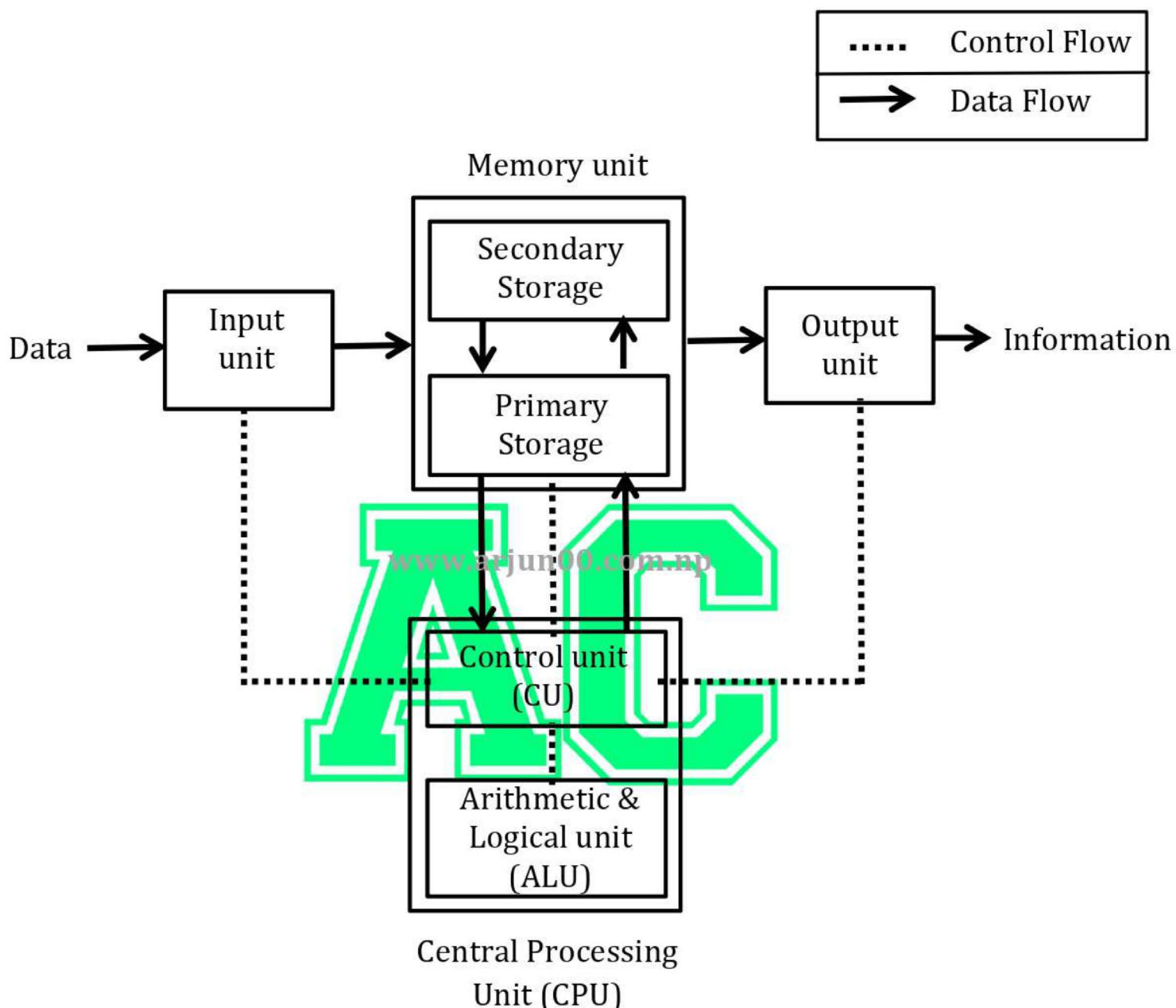
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1. a) Differentiate between computer Hardware and software.

Hardware	Software
Hardware is a physical part of the computer.	Software is the program which is executed by CPU.
It can be seen and touched.	It cannot be Seen and touched.
Hardware can perform any task without software.	Software cannot be executed without hardware.
Hardware is physical parts of the computer that causes processing of data.	Software is a set of instructions that tells a computer exactly what to do.
Hardware is repaired in case of problem.	Software is debugged in case of problem.
Computer viruses cannot affect hardware.	Computer viruses can affect software.
Examples :- RAM, ROM, Printer, Monitor, Mouse, Hard disk and more.	Examples :- Google Chrome, MySQL, MS Word, Excel, PowerPoint, Notepad, Photoshop and more.
<i>It has four main categories:</i> Input Devices , Output Devices ,Storage Devices & Internal Components.	<i>It is mainly divided into:</i> System software and Application software.

b) Draw a well labelled block diagram of digital computer.



→ **The Major Blocks of Digital Computer are :-**

- a) Input Unit
- b) Memory Unit
- c) Central Processing Unit (CPU)
- d) Output Unit

#Additional

a) Input Unit :

- ✓ The input unit is formed by the input devices attached to the computer.
- ✓ Input devices are used to interact with a computer system or used enter data and instructions to the computer.
- ✓ These devices convert input data and instructions into a suitable binary form such as ASCII, which can be acceptable by the computer.
- ✓ ***An input unit performs the following function:***
 - It accepts data and instruction from the outside worlds.
 - It converts these data and instruction into computer understandable from a binary form.
 - It supplied the converted data and instruction to the computer system for further processing.

- ✓ Some of the common examples of input devices are *keyboard, mouse, scanner, light pen, joystick, microphone, barcode reader* etc.

b) Memory Unit

- ✓ This unit is also called *storage unit*.
- ✓ The data and instructions, which are entered through an input unit must be stored on the computer before the actual processing starts.
- ✓ The result produces by the computer after processing is also kept somewhere before passed to the output units.
- ✓ If intermediate results are produced during processing, it should be stored in somewhere in memory.
- ✓ The storage unit of a computer performs all these needs.

✓ **The specific functions performed by the storage unit are as follow:**

- It stored data and instructions, which are entered through input devices.
- It stores an intermediate result of processing.
- It stores the final result of processing before these results are passed to an output device.

✓ **The storage unit of computers consists of two types of memory or storage:**

- **Primary Memory:** It is the main memory of the computer. It is used for storing data and instructions during processing. It is the only memory which is directly accessible to CPU. It is usually expensive, faster of read/write operation and used in small storage capacity. *Example: RAM, ROM, Cache Memory*

- **Secondary Memory:** It is the additional memory of the computer. It is used for storing large amount of data for longer period of time. It is also used for transferring data from one computer to another. It is usually cheaper, slower and used in larger storage capacity. It is not directly accessible to CPU. It requires primary memory for its operations.

Example: Hard disk, DVD, CD, Pen drive.

c) Central Processing Unit (CPU) :

- ✓ The CPU is like the brain of a computer.
- ✓ Its primary function is to organize and execute instructions.
- ✓ CPU performs operations on data from main memory and returns the results of processing to main memory.
- ✓ It is the logic machine. So, its main function is run the program by fetching instructions from the RAM, evaluating and executing them in sequence.

✓ **The functions of the CPU are:**

- Read instruction from memory
- Communicate with all peripherals using the system bus.
- It controls the sequence of instructions.
- It controls the flow of data from one component to another component.
- Performs the computing task specified in the program.

✓ **The different sub components of the CPU are:**

- i) **Arithmetic and Logical Unit (ALU):** The function of an ALU is to perform arithmetic and logical operations. Arithmetic operations include addition, subtraction, multiplication and division. Logical operations include AND, OR, NOT, ($=, >, <, >=, <=$) operations. Arithmetic operations are used for calculations whereas logical operations are used for making comparison and provide the capability of decision making.

The main functions of ALU are as follow:

- ✓ It accepts operands from registers.
- ✓ It performs arithmetic and logic operations.
- ✓ It returns a result to register or a memory.

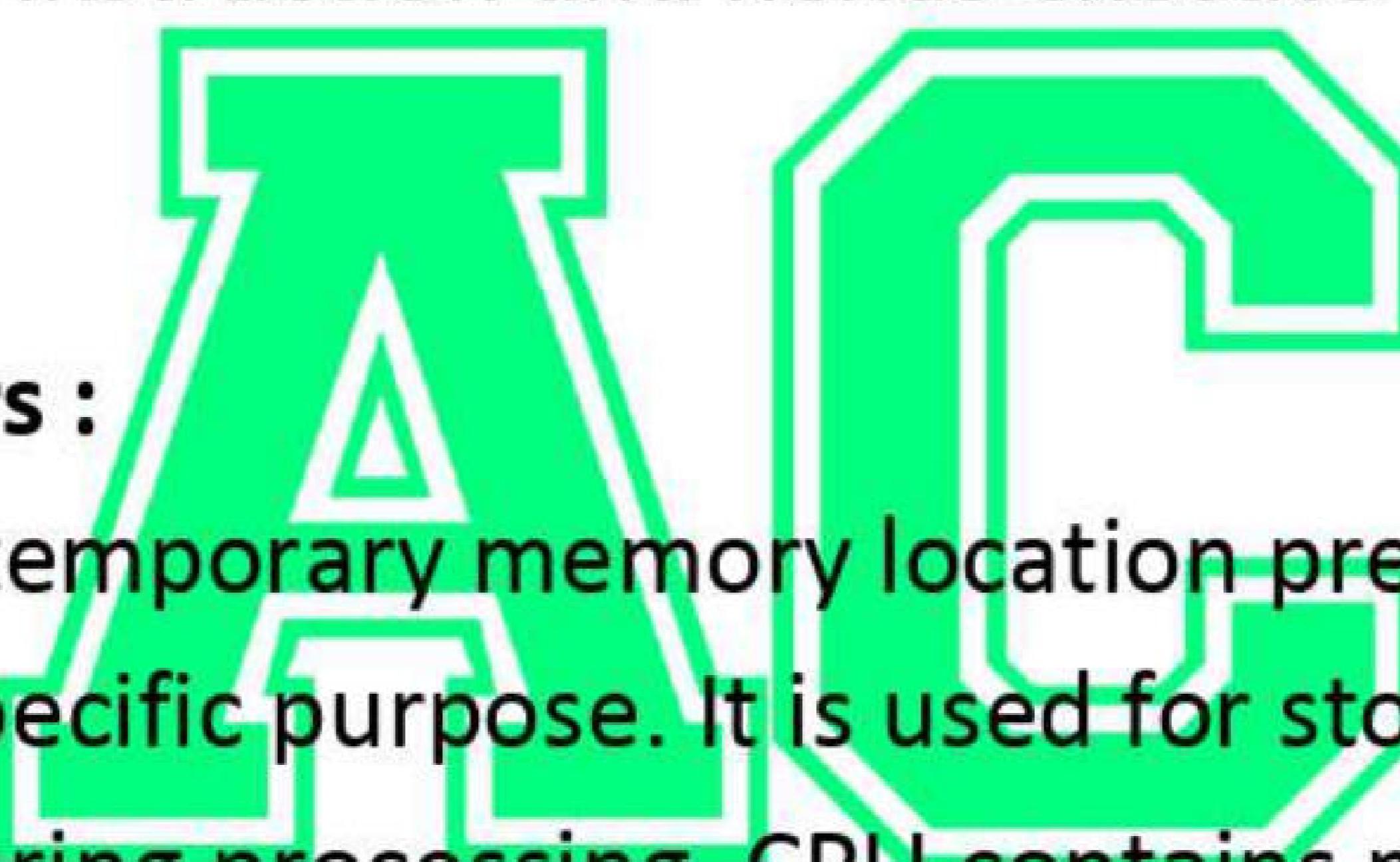
- ii) **Control Unit (CU) :** Control Unit responsible for controlling all the components of the computer. It uses control signal for controlling. It instructs the components of computer system how to carry out a program's instructions. It also directs the movement of electronic signals between different components of the computer.

The main functions of control units are given below:

- ✓ It performs the data processing operations with the aid of program prepared by the user and send control signals to various parts of the computer system.
- ✓ It gives commands to transfer data from the input devices to the memory to an arithmetic logic unit.
- ✓ It also transfers the results from ALU to the memory and then to the output devices.
- ✓ It stores a program in the memory.
- ✓ It fetches the required instruction from the main storage and decode each instruction and hence execute them in sequence.

iii) Set of Registers :

A register is a temporary memory location present inside CPU reserved for specific purpose. It is used for storing data and instructions during processing. CPU contains multiple registers, some of them are: Memory address register (MAR), Instruction register (IR), Accumulator register (AR).



d) Output Unit :

- ✓ Output Unit provides the result after processing to the user.
- ✓ It consists of devices that translate information processed by the computer into a form that humans can understand.
- ✓ *The outputs provided by the computer are of two types:*

- **Hardcopy output:** It refers to printed output, printed on the paper or some material that can be touched. It is permanent in nature and can be kept in paper files or can be used later even after the computer is turned OFF. It can be used only for the output of text and image. *For example: outputs produced on paper by printer.*
- **Softcopy output:** It refers to output that is shown on a display screen or sound produced by speaker. This kind of output is untouchable. It is temporary in nature. It remains with user only till the computer is in ON state. It can be used for the output of text, image, audio and video. *For example: Output displayed on the screen.*

✓ The main functions of the output unit are as follow:

- Accepts the result produced by the computer which is in electric binary signals.
- It then converts the result into human readable form.
- Finally, it supplied the converted results to the outside world.

2. a) What do you mean by an Operating System? What are its functions?

→ **Operating system (OS)** is system software that manages hardware and software resources of the computer and makes it ready to use. It is a collection of programs that controls overall operation of the computer. It acts as interface between user and hardware. Example: Windows, MS DOS, Linux, Android.

→ **The functions of the OS are:**

- **Process Management:** The process management includes handling the scheduling of processes, control access like file memory I/O and CPU, control execution of application, create, execute and delete system process, cancel or resume a process etc.
- **Memory management:** The activities of memory management handled by OS are: allocate memory, free memory re-allocate memory to a program when a used block is freed, keep track of memory usage etc.
- **File management:** The file management task includes creating and deleting of files and directories, provide access to files, allocate space for files, keep back-up of files and secure files.
- **Device management:** The device management task includes open, close and write device drivers and communicate, control and monitor the device drivers.
- **Protection and Security:** OS protects the resources of system. User authentication, file attributes like read and write, encryption and back up of data etc. are some protections provided by OS.
- **User interface:** Operating system provides an interface between the computer user and computer hardware.
- **Control over system performance:** It includes recording delays between request for a service and responding from system.
- **Error detecting:** It includes production of dumps, traces, error messages and other debugging and error detecting aids.
- **Coordination between other software and users:** It includes coordination and assignment of compilers, interpreters, assemblers and other software to the various users of computer system.

b) Differentiate between GUI and **(CLI or CUI)** with examples.

(Command Line Interface) CLI	(Graphical User Interface) GUI
<p>A CLI is an interface that allows the user to perform tasks by issuing commands in successive lines of text or command lines. <i>It also known as Character User Interface (CUI).</i></p>	<p>A GUI enables users to interact with the operating system or application.</p>
<p>It needs less memory than the GUI.</p>	<p>It needs more memory because it has various graphics components.</p>
<p>It is not easy to use.</p>	<p>It is easy to use.</p>
<p>It is faster than the GUI.</p>	<p>It is slower than the CLI.</p>
<p>It is less flexible than GUI.</p>	<p>It is more flexible than CLI.</p>
<p>It needs the only keyboard.</p>	<p>It needs both a keyboard and a mouse.</p>
<p>Its appearance may not be modified or changed.</p>	<p>Its appearance may be modified or changed.</p>
<p>Its precision is high as compared to GUI.</p>	<p>Its precision is low as compared to CLI.</p>
<p>No graphics are used in the CLI.</p>	<p>Graphics are used in the GUI.</p>
<p>It is usually 8 or 16 bit OS.</p>	<p>It is usually 32 or 64 bit OS.</p>
<p>Spelling mistakes and typing errors are not avoided.</p>	<p>Spelling mistakes and typing errors are avoided.</p>
<p>No menus are provided in the CLI.</p>	<p>Menus are provided in the GUI.</p>

The information can be viewed to the user in plain text and files in the CLI.	In a GUI, information can be viewed or presented to the user in several ways, including simple text, videos, graphics, etc.
Example :- MS DOS , UNIX , Linux.	Example :- (Windows 7,8,10) , Mac OS ,Android.

3. a) Differentiate between a word processing package and a spreadsheet package. Why do we use MS Powerpoint?

Word Processing Package	Spreadsheet Package
A word processing package is an application software used for creating, editing, formatting, and printing text-based documents.	Spreadsheet package is a software program used primarily for organizing and manipulating numerical data and performing calculations.
It's designed for tasks involving creating written content, such as letters, reports, essays, and other textual documents.	It presents data in a grid-like format, where rows are labeled with numbers and columns are labeled with letters.
It is limited to basic mathematical operations.	It supports complex calculations and formulas.
The file extension for Word Processing package is ".doc or .docx"	The extension for a Spreadsheet Package file is ".xls or .xlsx "
It allows insertion of images, tables, charts, and other media.	It has limited support for visual elements like charts.
Example : Microsoft Word, Google Doc, Lotus notes , Word star etc.	Example : Ms Excel , Google Sheets, LibreOffice Cal, Apple Numbers etc.

→ We use MS PowerPoint to create visual presentations with text, images, and multimedia elements to effectively communicate information to an audience.

b) Define Database. Explain DBMS.

→ A **database** is a structured collection of data that is stored electronically in a computer system. Databases can store any type of data, including numbers, words, images, videos, and files.

→ A **Database Management System (DBMS)** is a software that allows users to create, manage, and interact with databases. It acts as an interface between the database and the user, allowing users to access, organize, and manipulate data. DBMSs are used to store, retrieve, and organize large amounts of data quickly and efficiently.

Examples of DBMS :- MySQL, Oracle Database, Microsoft SQL Server, PostgreSQL, MongoDB, Cassandra, Redis, IBM Db2, and Apache Cassandra.

Advantages of DBMS	Disadvantages of DBMS
<ul style="list-style-type: none">• Redundancy can be reduced.• Inconsistency can be avoided.• Standards can be enforced.• Integrity can be maintained.• Data can be shared.• Provides security.• Providing user interface to access data.• Provides facility for backup and recovery.• Easier access to the data.	<ul style="list-style-type: none">• The initial investment for implementing DBMS is high.• Experienced database experts are required.• Improper design of database may result in loss of data.• Security is the major concern area in DBMS.• DBMS may fail to operate and the failure may result in loss for the organization.• The cost for maintenance, update, backup and recovery remains for ever.

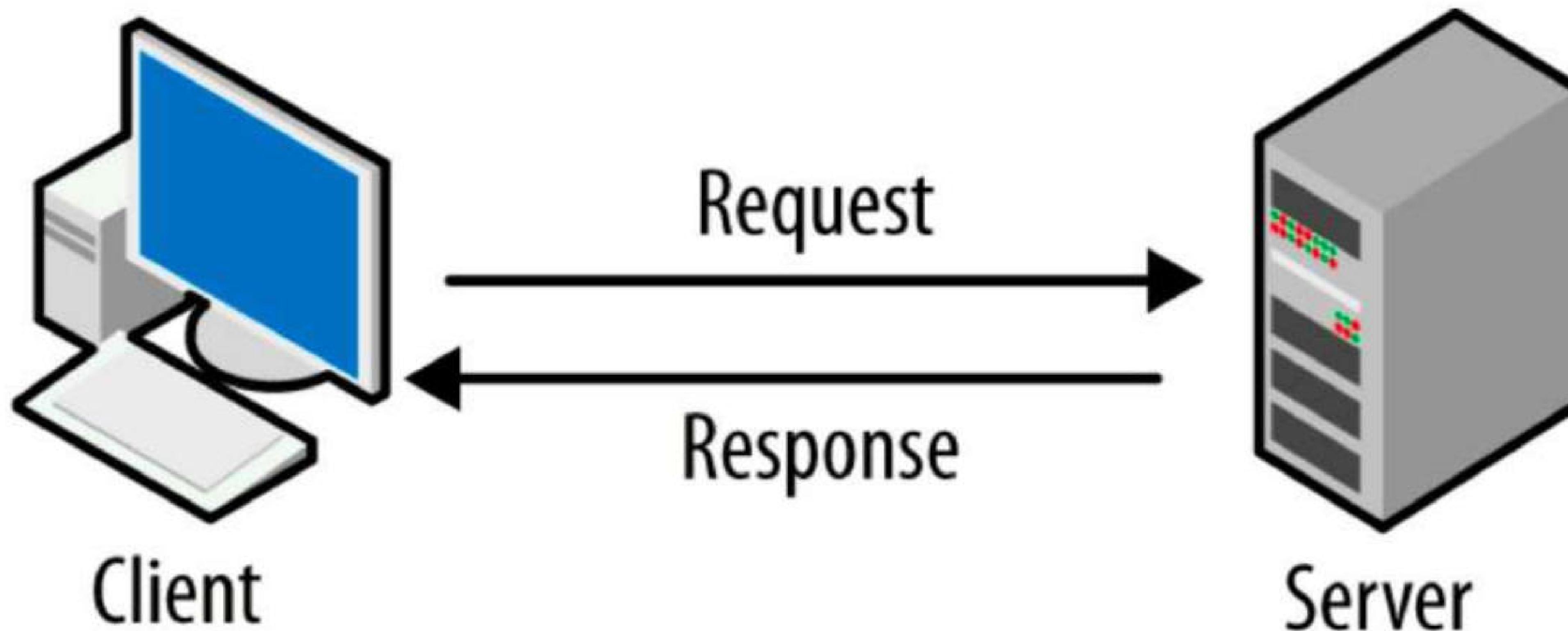
4. a) Define computer virus. List its removal techniques.

→ A **computer virus** is a type of malicious software that can damage a computer's data, files, and software. Viruses can disrupt systems, cause operational issues, and lead to data loss and leakage.

→ **Here are some steps you can take to remove a computer virus:**

- **Install antivirus software:** Download and install antivirus software to protect your computer from viruses, trojans, ransomware, and other threats.
- **Run a virus scan:** Run a virus scan to detect and remove malware from your device.
- **Disconnect from the internet:** Disconnecting from the internet prevents the virus from spreading and downloading more harmful payloads.
- **Reboot into safe mode:** Safe mode prevents most types of malware from running, allowing you to remove the malware without interference.
- **Delete temporary files:** Use your computer's disk cleanup to delete temporary files, as some viruses are found in them.
- **Delete or quarantine the virus:** Once the virus is detected, you can delete or quarantine it. Quarantining isolates the virus from the rest of your computer.
- **Reboot your computer:** After removing the virus, reboot your computer.
- **Change your passwords:** Change all your passwords to help protect your computer.
- **Uninstall suspicious apps:** Use a third-party uninstaller to check and uninstall any suspicious or unwanted programs.
- **Remove browser extensions:** Remove any unfamiliar or unnecessary browser extensions and plugins.

b) Explain the concept of client and server with a suitable figure.



→ The **client/server** model is a network architecture where a *client sends requests to a server*, and the *server responds to fulfill the request*. The client/server model is a distributed application structure that divides tasks between the client and the server.

- ***Client:***

- ***Client:***
- ✓ A client is a computer or software that requests a service or resource from a server.
- ✓ It interacts with the server through a network, typically the internet.
- ✓ Examples: Web browsers (like Chrome or Firefox), email clients (like Outlook), and apps that request data from a server.

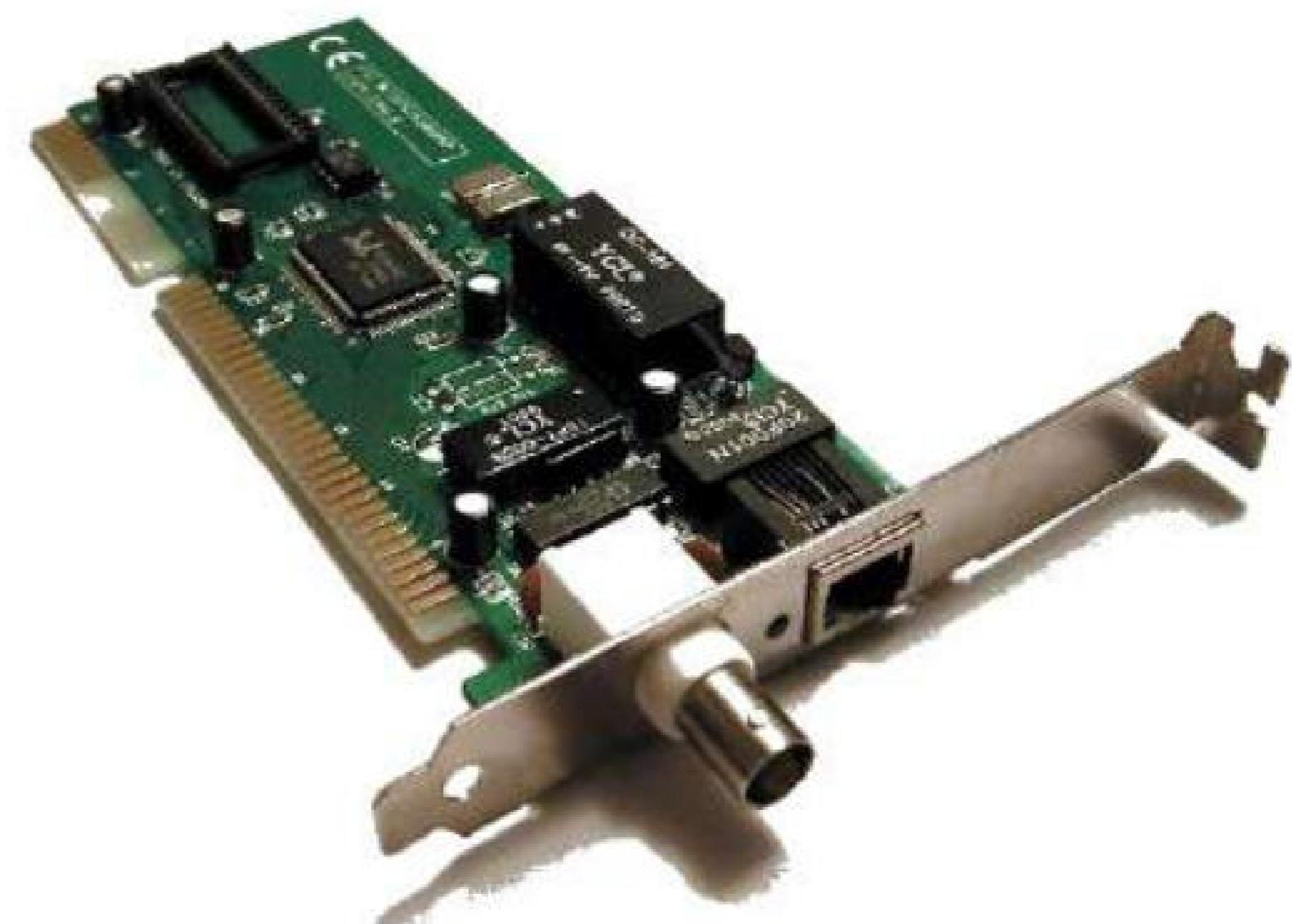
- ***Server:***

- ***Server:***
- ✓ A server is a powerful computer or software program that provides services, resources, or data to clients.
- ✓ It listens for requests from clients, processes them, and returns the appropriate response.
- ✓ Examples: Web servers (like Apache or Nginx), database servers (like MySQL), and email servers.

5. Write short notes on:

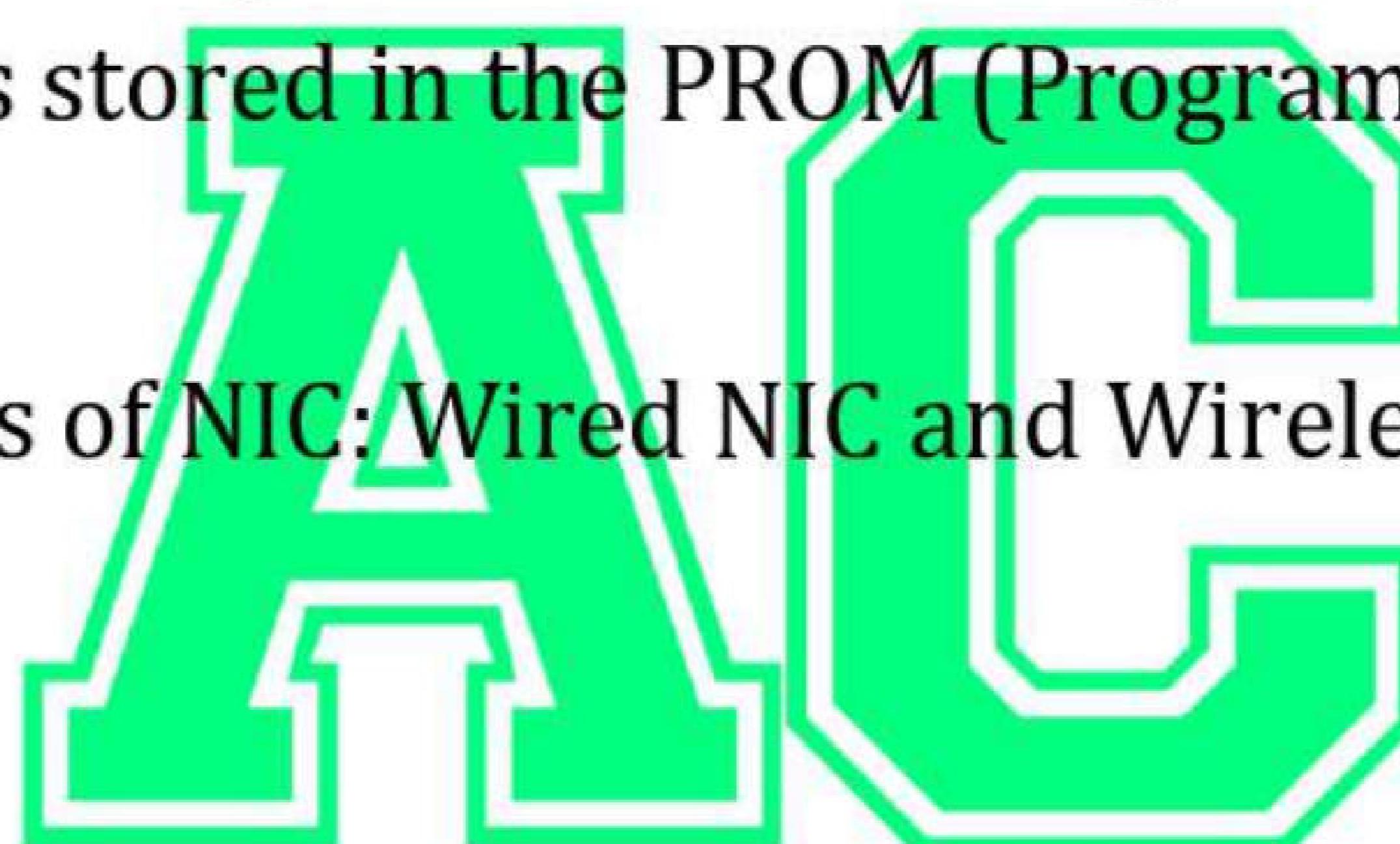
a) NIC

- NIC stands for ***network interface card***.
- NIC is a hardware component used to connect a computer with another computer onto a network.
- It can support a transfer rate of 10,100 to 1000 Mb/s.
- The MAC address or physical address is encoded on the network card chip which is assigned by the IEEE to identify a network card uniquely. The MAC address is stored in the PROM (Programmable read-only memory).
- There are two types of NIC: Wired NIC and Wireless NIC.



b) LAN

- ***Local Area Network*** is a group of computers connected to each other in a small area such as building, office.
- LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial cable, etc.
- It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.
- The data is transferred at an extremely faster rate in Local Area Network.
- Local Area Network provides higher security.



c) Disk Operating System

- A **disk operating system** (DOS) is a computer operating system that runs from a disk storage device, such as a hard disk drive, floppy disk, or optical disc. DOS is a 16-bit systems.
- DOS is often used as an acronym to refer to a family of operating systems, most commonly Microsoft DOS (MS-DOS).
- DOS is an early operating system that uses a command line to access, manage, and control a computer's hardware and hard drive.
- *Tim Paterson* developed the first disk operating system (DOS), originally called QDOS (Quick and Dirty Operating System), in 1980s.
- DOS is a single-tasking, ~~single-user~~ operating system that can only run one program at a time.



d) Web Browsers

- A web browser is a software application that allows a connected device communicate with ~~web servers on the world wide web~~. Browsers request files from web servers using HTTP. The server returns the information, which the browser then displays on your device.
- The first web browser World Wide Web was invented in the year of 1990 by Tim Berners-Lee. Later, it becomes Nexus.
- Google Chrome, Microsoft Edge, Mozilla Firefox, and Safari are examples of web browsers.

How does a Web Browser Work?

- A web browser helps us find information anywhere on the internet. It is installed on the client computer and requests information from the web server such a type of working model is called a client-server model.

- The browser receives information through HTTP protocol. In which transmission of data is defined. When the browser received data from the server, it is rendered in HTML to user-readable form and, information is displayed on the device screen.

e) Auxiliary Memory

- Auxiliary memory is the additional memory of the computer.
- It is also called as Secondary Memory or storage device of the computer.
- It is used for storing large amount of data for longer period of time.
- It's nonvolatile, meaning it doesn't lose stored data when the device is powered down.
- ***It has features like:***
 - ✓ It can be magnetic, optical or flash memory.
 - ✓ It is used for permanent storage.
 - ✓ It is also used for transferring data from one computer to another.
 - ✓ It is usually cheaper.
 - ✓ Slower for read/write operation.
 - ✓ It is used in larger storage capacity.
 - ✓ It is not directly accessible to CPU. It requires primary memory for its operations.
- Example: Hard disk, floppy disks, DVD, CD, Flash drive, memory chip etc.



f) Optical Storage

→ It is also called as *Optical Disk*.

Optical storage is a method of storing data using a laser to *read and write data* on an optical medium. The data is recorded on the medium as a pattern of tiny pits that are arranged in a spiral track on the disk's surface. A laser beam is then used to read the data by shining light on the medium and reflecting it back.



Examples of optical storage media include: Compact discs (CDs), Digital versatile discs (DVDs), Blu-ray discs, Write-once read-many (WORM) cartridges, and Erasable optical cartridges.

Advantages	Disadvantages
<ul style="list-style-type: none"> • Small and portable. • Cheap to produce. • Large market of music, movies and games. • Most desktop computers or laptops are equipped with CD/DVD/Blu-ray drive. 	<ul style="list-style-type: none"> • Fragile, easy to get scratched. • Slower data transferring rate. • Required specified drives to write data to the discs. • Limited number of writes.

The End

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Computer Application_(Engg. All) 1st Sem

(2079) Question Paper Solution.

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1. a) What is computer software? Describe the system software in brief.

→ **Computer software** is a set of instructions, data, or programs that run on a computer to perform specific tasks. Computer Software are two types :- System Software , Application Software.

→ **System software** is a type of computer program that runs a computer's hardware and application programs. It's the interface between the hardware and the user applications. System software is written in a low-level computer language so that it can communicate with hardware and software. System software runs in the background and manages all functioning of the computer itself.

Examples :- operating systems, language translators, Device driver, antivirus software, disk formatting software, etc.

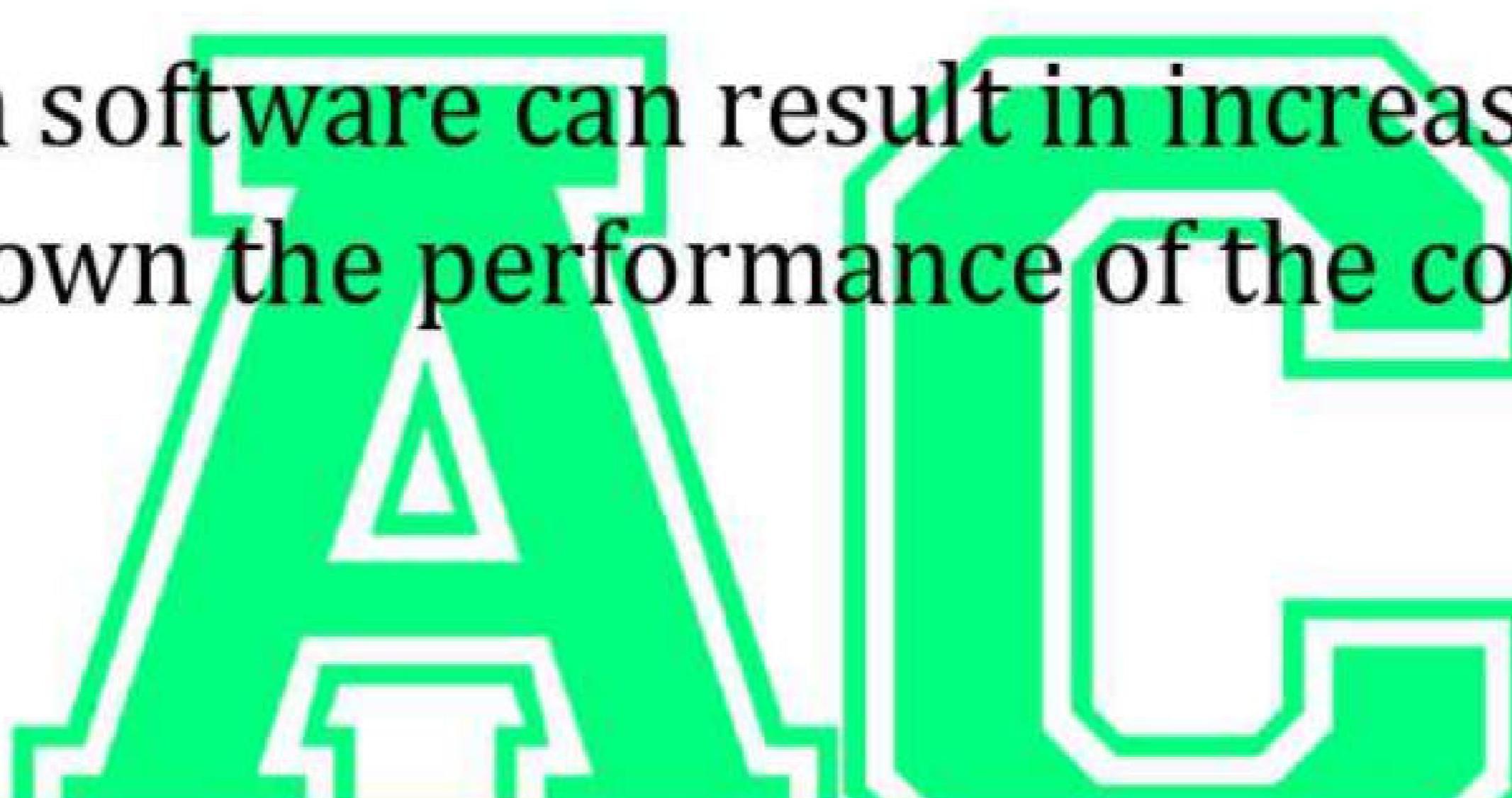
Features of System Software :

- ✓ It is very difficult to design system software.
- ✓ It is smaller in size.
- ✓ Difficulties in manipulation.
- ✓ System Software is difficult to understand.
- ✓ It is usually written in a low-level language.

- ✓ System software is responsible to directly connect the computer with hardware that enables the computer to run.
- ✓ It must be as efficient as possible for the smooth functioning of the computer system.

Disadvantages of System Software

- ✓ It can be complex and difficult to understand, especially for non-technical users.
- ✓ Some system software, such as operating systems and security software, can be expensive.
- ✓ Updating system software can take time and might cause compatibility problems.
- ✓ The use of system software can result in increased system overhead, which can slow down the performance of the computer and reduce its efficiency.



b) Differentiate between 3rd and 4th generation computer with examples.

3rd Generation Computer	4th Generation Computer
3 rd Generation computers were developed from 1964-1971 .	4 th Generation computers were developed from 1971-1980
3 rd Generation computers used Integrated Circuit (IC)	4 th Generation computers used microprocessors or VLSI/VVLSI.
They are slower than fourth-generation computers.	They are faster computers.
It is expensive.	It is cheaper.

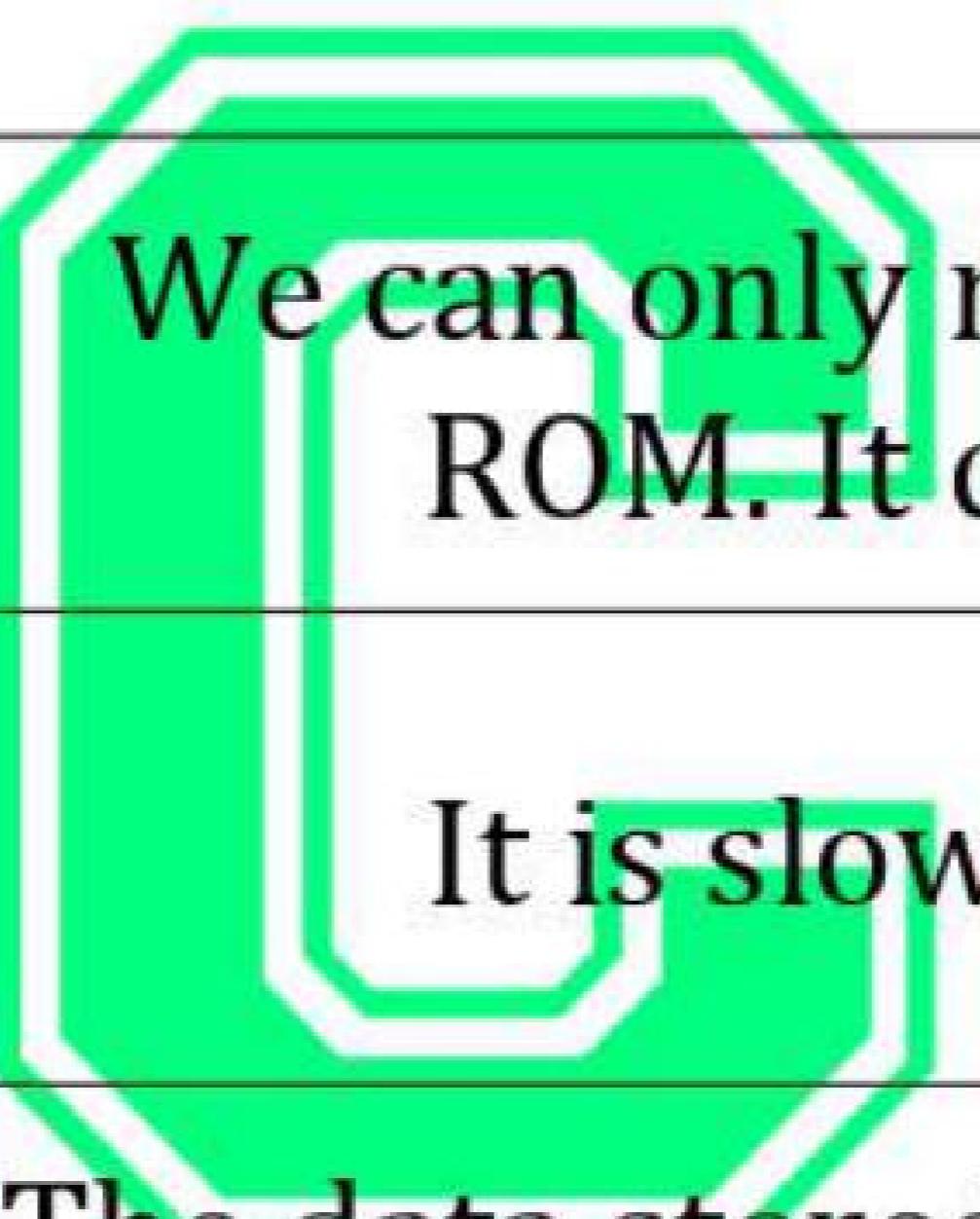
It consumed more electricity	It consumed less electricity.
The Speed of 3 rd Generation Computer was around 100 Nano Seconds .	The speed of the 4 th generation computer is measured in Picoseconds .
The 3 rd generation computers used Integrated Circuit [IC] and it was designed and developed by Jack Kilby.	In 1971, Intel released the 4004 microprocessor.
Less Portable	Highly Portable.
They are called “Mini Computers”.	They are called “Micro Computers”.
Main memory was increased in the form of PROM and DRAM.	Main memory was increased in the form of EPROM and SRAM.
Example :- IBM 360 series, ICL 1900 series , Honeywell 200 series.	Example :- IBM Desktop PC , Dell notebook , HP laptop, iPad.

2. a) Draw a neat block diagram of a digital computer and explain how data is processed in a computer.

→ Refer to the Solution 2078 of Q. No. 1(b) on page 4.

b) What is memory? Write the differences between RAM and ROM.

→ **Memory** is a hardware component that is capable of storing data, instruction, programs in the computer. It can store data temporarily during processing or permanently for future references. The main types of memories in a computer are: *primary memory & secondary memory*.

RAM	ROM
<p>RAM stands for <i>Random Access Memory.</i></p>	<p>ROM stands for <i>Read Only Memory.</i></p>
<p>It is a read & write memory. The data can be written and read.</p>	<p>It is a read only memory. The data can only be read.</p>
<p>It is a volatile memory as it temporarily stores the files as long as the computer is on and working.</p>	<p>It is a non-volatile memory as it permanently stores the files even when the power is turned off, such as game cartridge and BIOS program stored in the memory of a computer, etc.</p>
<p>The storage capacity ranges from 1 to 256 GB.</p>	<p>Its storage capacity ranges from 4 to 8 MB.</p>
<p>Data stored in RAM can be retrieved and altered.</p>	 <p>We can only read the data stored in ROM. It cannot be altered.</p>
<p>It is faster than ROM as it is a high-speed memory.</p>	 <p>It is slower than the RAM.</p>
<p>The data stored in RAM is used by the CPU in real-time to run the computer.</p>	<p>The data stored in ROM is used by CPU only when it is transferred to RAM.</p>
<p>RAM is more expensive than ROM.</p>	<p>ROM is generally cheaper than RAM.</p>
<p>It temporarily stores the files and data that the CPU needs to process the current instructions or work.</p>	<p>It stores the BIOS program on the motherboard of a computer, which is needed to bootstrap the computer.</p>
<p>Examples: It is used as CPU Cache, Primary Memory in a computer.</p>	<p>Examples: It is used as Firmware by micro-controllers.</p>
<p>The stored data is easy to access.</p>	<p>The stored data is not as easy to access as it is in ROM.</p>
<p>Types: DRAM , SRAM</p>	<p>Types: PROM ,EPROM ,EEPROM.</p>

3. a) Describe the functions of operating system.

→ Refer to the Solution 2078 of Q. No. 2(a) on page 9.

b) Write any four internal DOS commands and its function.

→ The Four internal DOS commands and their functions:

- ✓ **CD:** The *CD (Change Directory)* command is used to enter or exit from the any directory.

Syntax: C:\> CD <Director>

- ✓ **DEL:** The *DEL (Delete)* command is used to delete any file from the system.

Syntax: C:\> DEL <filename>



- ✓ **REN:** The *REN (Rename)* command is used to rename files or directories.

Syntax: C:\> REN <Oldfilename> <Newfilename>

- ✓ **CLS :** The *CLS (clear screen)* command is used to clear the screen.

Syntax: C:\>CLS

4. a) Differentiate between HUB and Switch.

Hub	Switch
It is a broadcast device.	It is a point-to-point device.
It operates at the physical layer.	It operates at the datalink layer.
It is not an intelligent device.	It is an intelligent device.

It simply broadcasts the incoming packet.	It uses a switching table to find the correct destination.
It cannot be used as a repeater.	It can be used as a repeater.
It's a basic device.	It's a more advanced device.
It is cheaper	It is Expensive
Hub has 4/12 ports.	Switch can have 24 to 48 ports.
Speed of original hub is 10Mbps; modern hubs are 100Mbps.	Maximum speed is 10Mbps to 100Mbps.
Example: TP-Link TL-SF1005D	Example: Cisco Catalyst 2960
It's harder to hack computers connected to a hub.	It's a bit easier to hack computers connected to a switch.

b) Discuss about various cables used in networking.

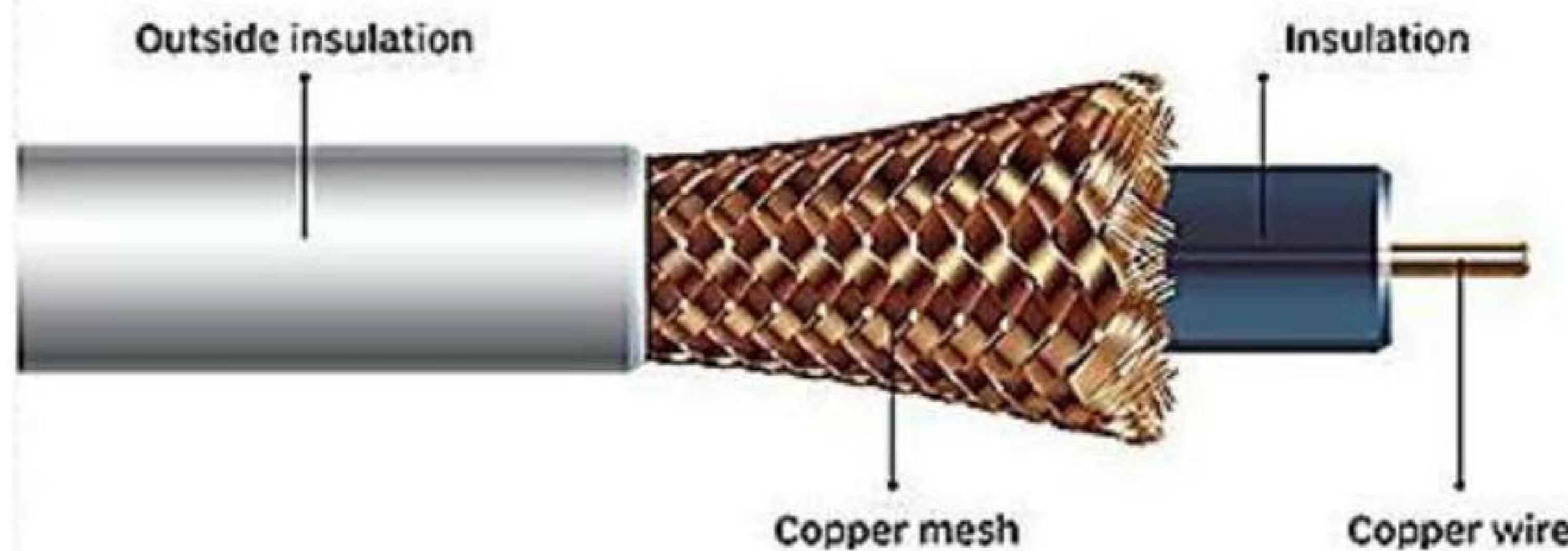
→ There are several types of cables used in networking are :

a) coaxial cable :

- ✓ Coaxial cable is very commonly used transmission media, for example, TV wire is usually a coaxial cable.
- ✓ The name of the cable is coaxial as it contains two conductors parallel to each other.
- ✓ It has a higher frequency as compared to Twisted pair cable.
- ✓ A coaxial cable is also known as **coax**.
- ✓ The inner conductor of the coaxial cable is made up of copper, and the outer conductor is made up of copper mesh. The middle core is made up of non-conductive cover that separates the inner conductor from the outer conductor.

- ✓ The middle core is responsible for the data transferring whereas the copper mesh prevents from the EMI(Electromagnetic interference).

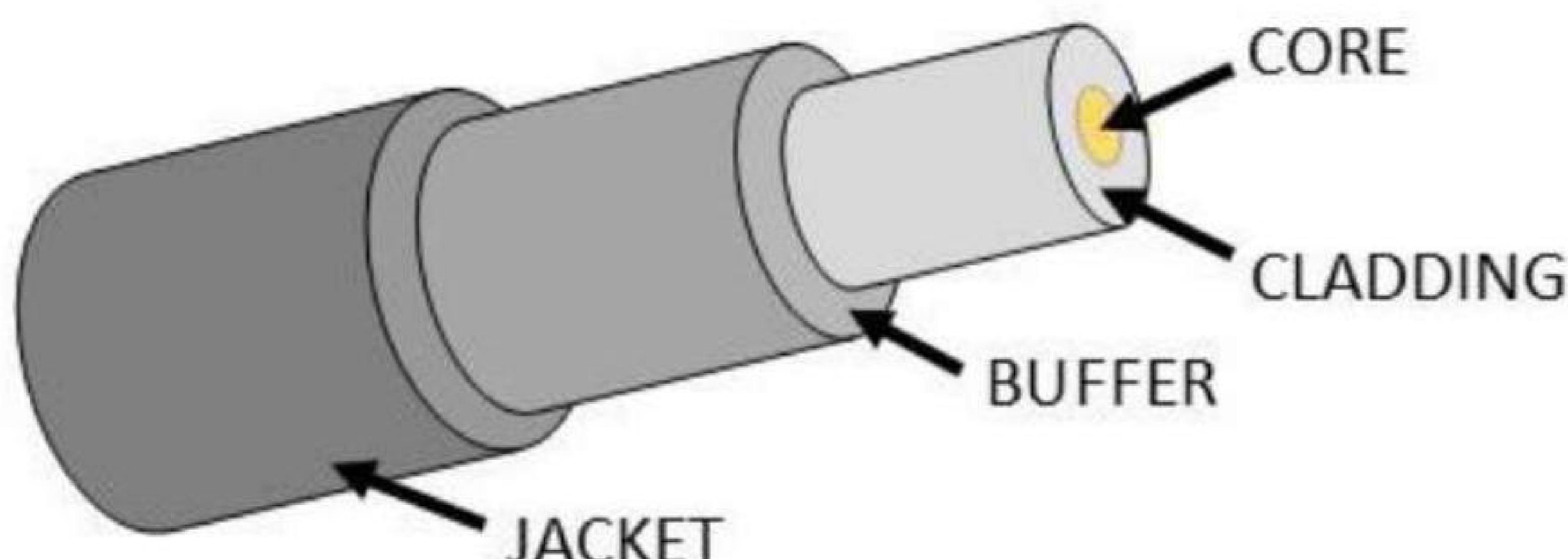
Coaxial cable



b) Fibre Optic :

- ✓ Fibre optic cable is a cable that uses electrical signals for communication.
- ✓ Fibre optic is a cable that holds the optical fibres coated in plastic that are used to send the data by pulses of light.
- ✓ The plastic coating protects the optical fibres from heat, cold, electromagnetic interference from other types of wiring.
- ✓ Fibre optics provide faster data transmission than copper wires.

FIBER CABLE CONSTRUCTION



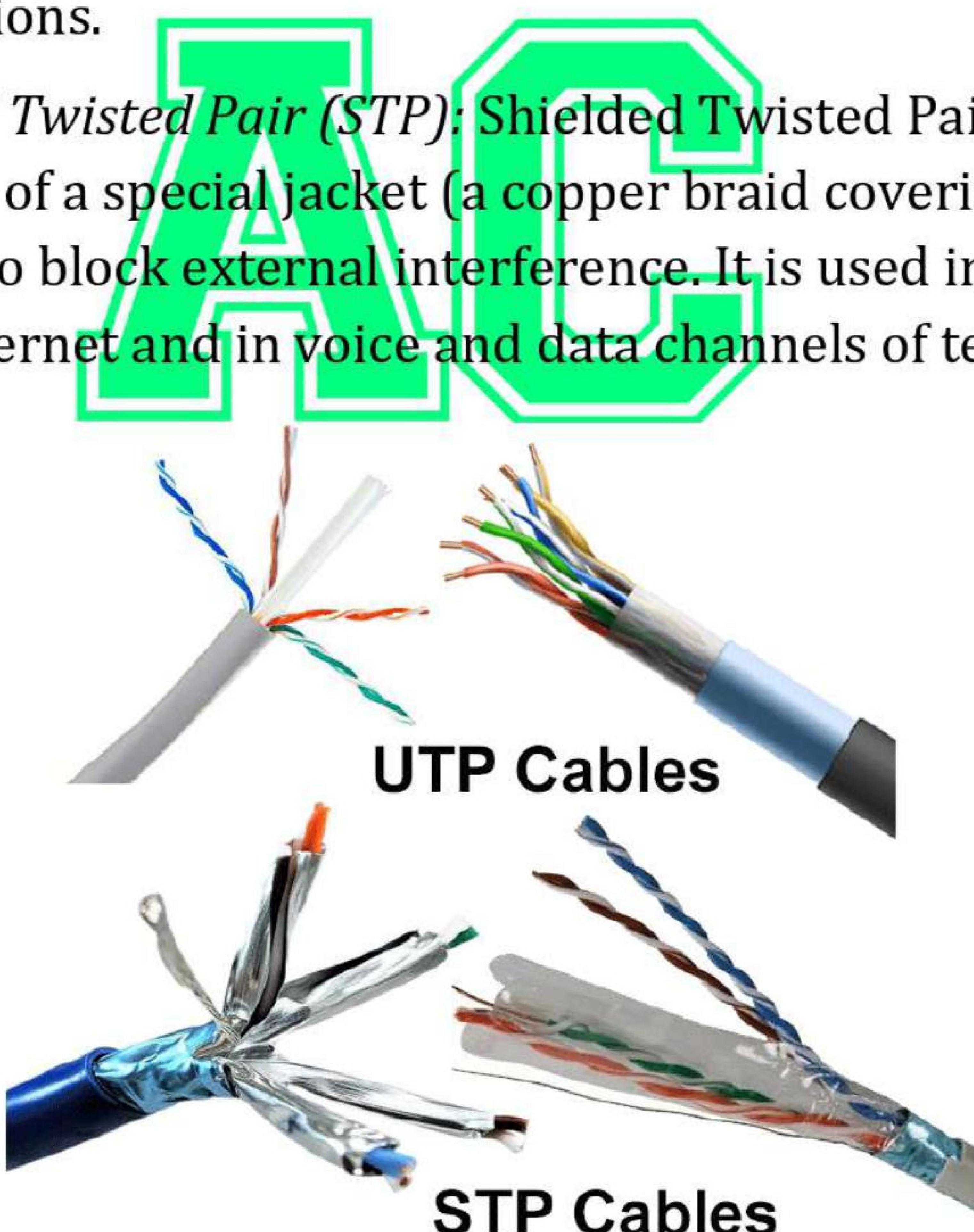
c) Twisted Pair Cable :

→ It consists of 2 separately insulated conductor wires wound about each other. Generally, several such pairs are bundled together in a protective sheath. They are the most widely used Transmission Media.

→ ***Twisted Pair is of two types:***

a) *Unshielded Twisted Pair (UTP):* UTP consists of two insulated copper wires twisted around one another. This type of cable has the ability to block interference and does not depend on a physical shield for this purpose. It is used for telephonic applications.

b) *Shielded Twisted Pair (STP):* Shielded Twisted Pair cable consists of a special jacket (a copper braid covering or a foil shield) to block external interference. It is used in fast-data-rate Ethernet and in voice and data channels of telephone lines.



5. a) Write the features of spreadsheet package.

→ ***The features of a Spreadsheet Package :-***

- ✓ It allows checking validation and data entry rules.
- ✓ It allows creating different kinds of charts according to the data given such as-pie chart, bar chart and line chart.
- ✓ It allows creating tables with different formats.
- ✓ It provides formulas for mathematical and logical operation.
- ✓ It allows sorting and filtering the data.
- ✓ It allows adding record, deleting records and modifying records.
- ✓ It has the features of word processing such as –bold, italics, font size, font name, font color etc.
- ✓ It provides the facility of merging the cells.
- ✓ It is used for labeling name and protecting cell documents.
- ✓ It allow to print the documents such as worksheets, graphs etc.

b) What is computer Viruses? Write the different technique to remove the computer viruses from the computer.

→ ***Refer to the Solution 2078 of Q. No. 4(a) on page 14.***

6. Write short notes on: (Any Two)

i) Web Browser:

→ ***Refer to the Solution 2078 of Q. No. 5(b) on page 17.***

ii) CRT

- ✓ CRT stands for ***Cathode Ray Tube.***
- ✓ It was introduced by Karl Ferdinand Braun in 1897.
- ✓ It utilizes more electricity.

- ✓ It has an electron gun that is located at the end of the system tube. The electron gun releases an electron beam at the phosphor dots on the system screen.
- ✓ It is less expensive than LCD.
- ✓ It has less image resolution but is better in grayscale.
- ✓ It comprises a phosphor screen, an electron gun, a vacuum glass tube, and a deflection plate.
- ✓ Image retention is not present in CRT.
- ✓ It is heavy, bulky, and big in size.
- ✓ It is faster than LCD.
- ✓ It is utilized the electron gun to create an image.
- ✓ It may be affected by an external magnetic field.
- ✓ It is mainly utilized in televisions and was previously utilized in computer monitors.



iii) Hard disk

→ A **hard disk** is a type of data storage device that uses magnetic media to store digital information and rotational platters to retrieve it. Hard disk are the primary storage component of a computer system. It is Non-volatile memory. So, the stored data will not be lost after the computer is turned off. Hard disk is cheaper per unit storage. Data Corruption rate is very low in hard disk. Hard disk rotates 3600-15000 rpm. So, it can carry faster for *Read/Write* operation.

They are frequently located in the drive bay and linked to the motherboard using cables in various formats, including Advanced Technology Attachment (ATA), Serial ATA, Parallel ATA, and Small Computer System Interface (SCSI).

iv) Topology

→ A **network topology** is the physical and logical arrangement of nodes and connections in a network. Nodes usually include devices such as switches, routers and software with switch and router features. Network topologies are often represented as a graph.

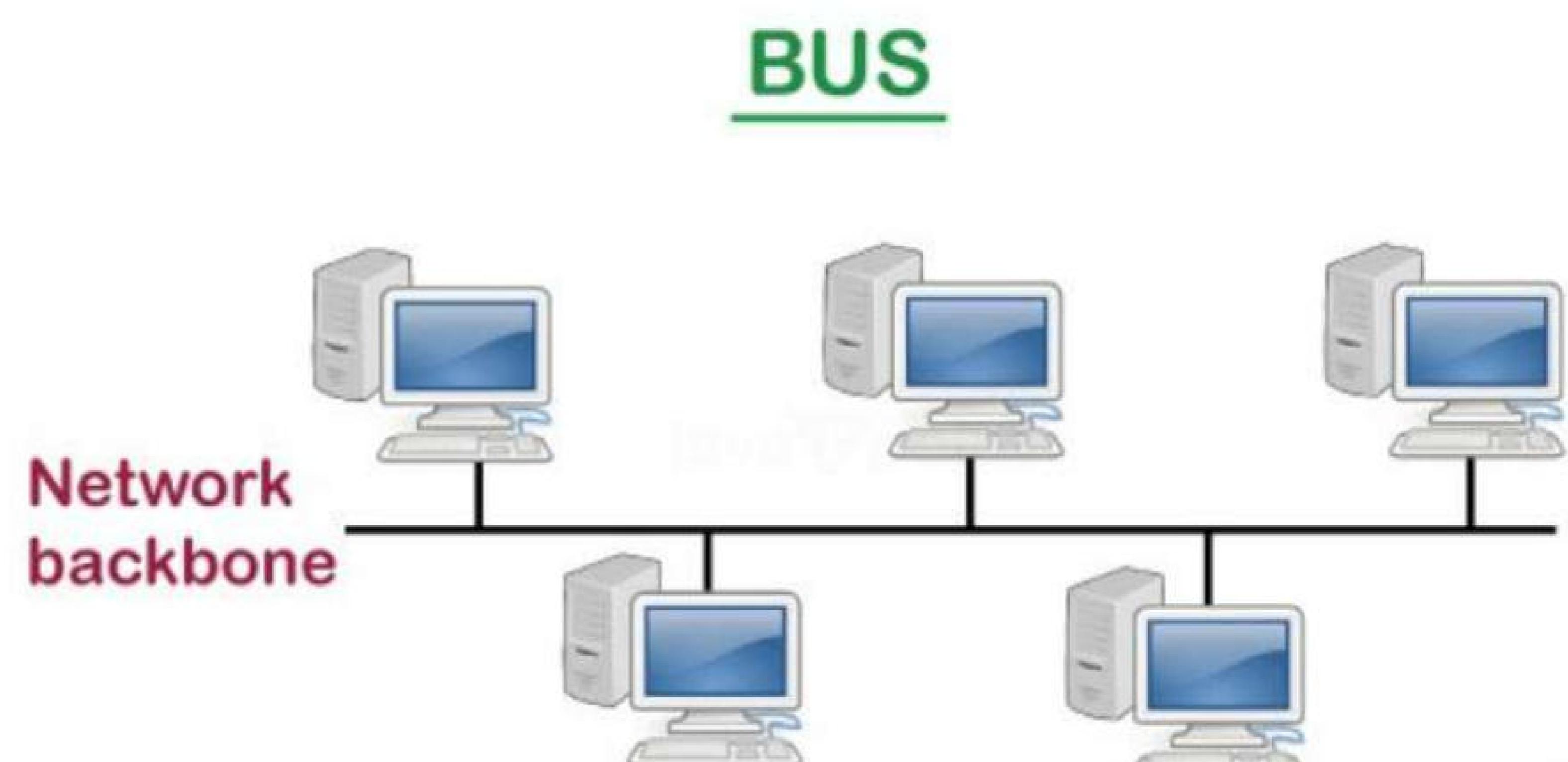
➤ There are six types of network topology which are :-

- Bus Topology
- Ring Topology
- Tree Topology
- Star Topology
- Mesh Topology
- Hybrid Topology

#Additional



1) Bus Topology



- The bus topology is designed in such a way that all the stations are connected through a single cable known as a backbone cable.

- Each node is either connected to the backbone cable by drop cable or directly connected to the backbone cable.
- When a node wants to send a message over the network, it puts a message over the network. All the stations available in the network will receive the message whether it has been addressed or not.
- The bus topology is mainly used in 802.3 (ethernet) and 802.4 standard networks.
- The configuration of a bus topology is quite simpler as compared to other topologies.
- The backbone cable is considered as a "single lane" through which the message is broadcast to all the stations.
- The most common access method of the bus topologies is CSMA (Carrier Sense Multiple Access).

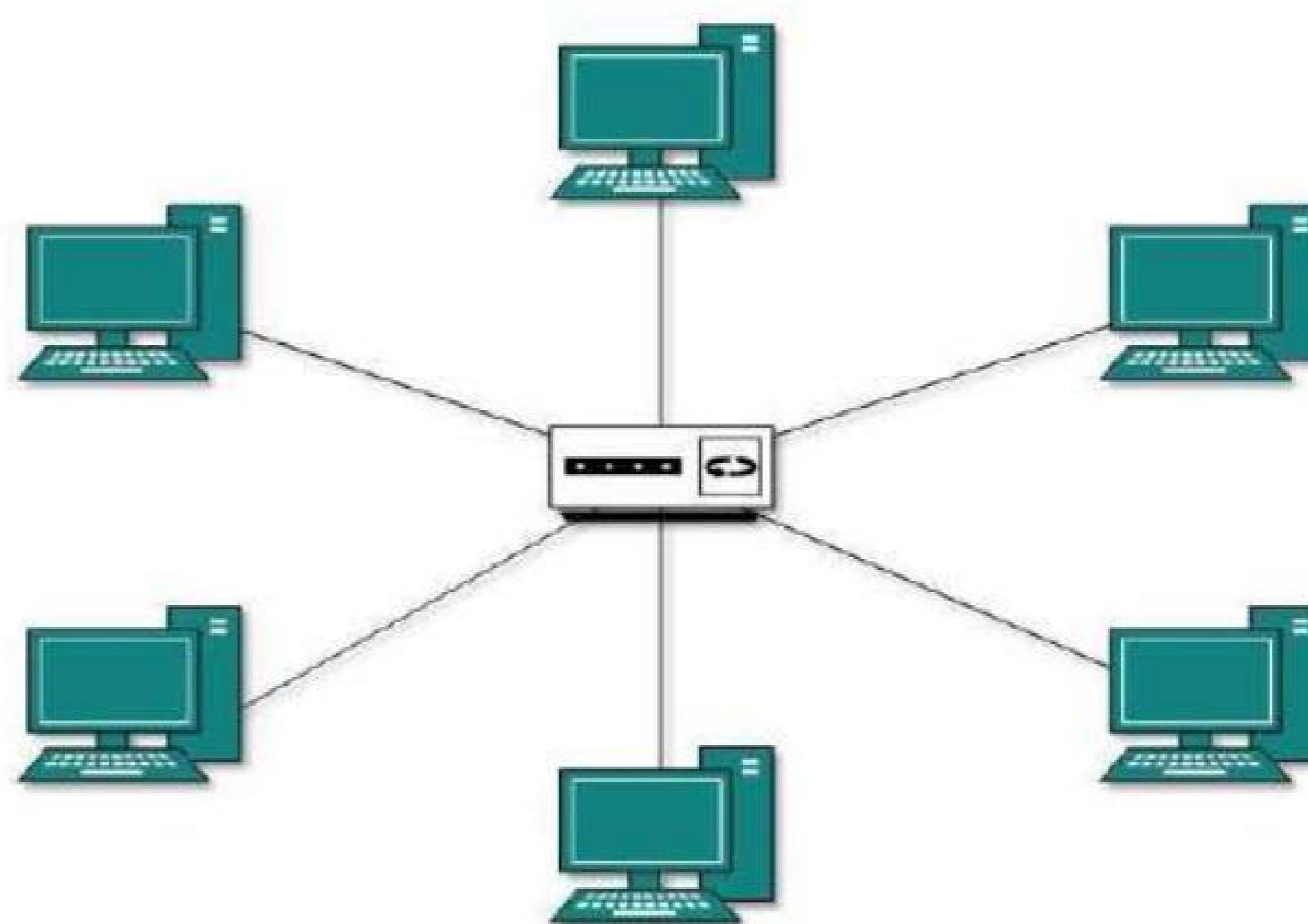
2) Ring Topology



- Ring topology is like a bus topology, but with connected ends.
- The node that receives the message from the previous node will retransmit to the next node.
- The data flows in one direction, i.e., it is unidirectional.
- The data flows in a single loop continuously known as an endless loop.
- It has no terminated ends, i.e., each node is connected to other nodes and having no termination point.
- The data in a ring topology flow in a clockwise direction.
- The most common access method of the ring topology is token passing.

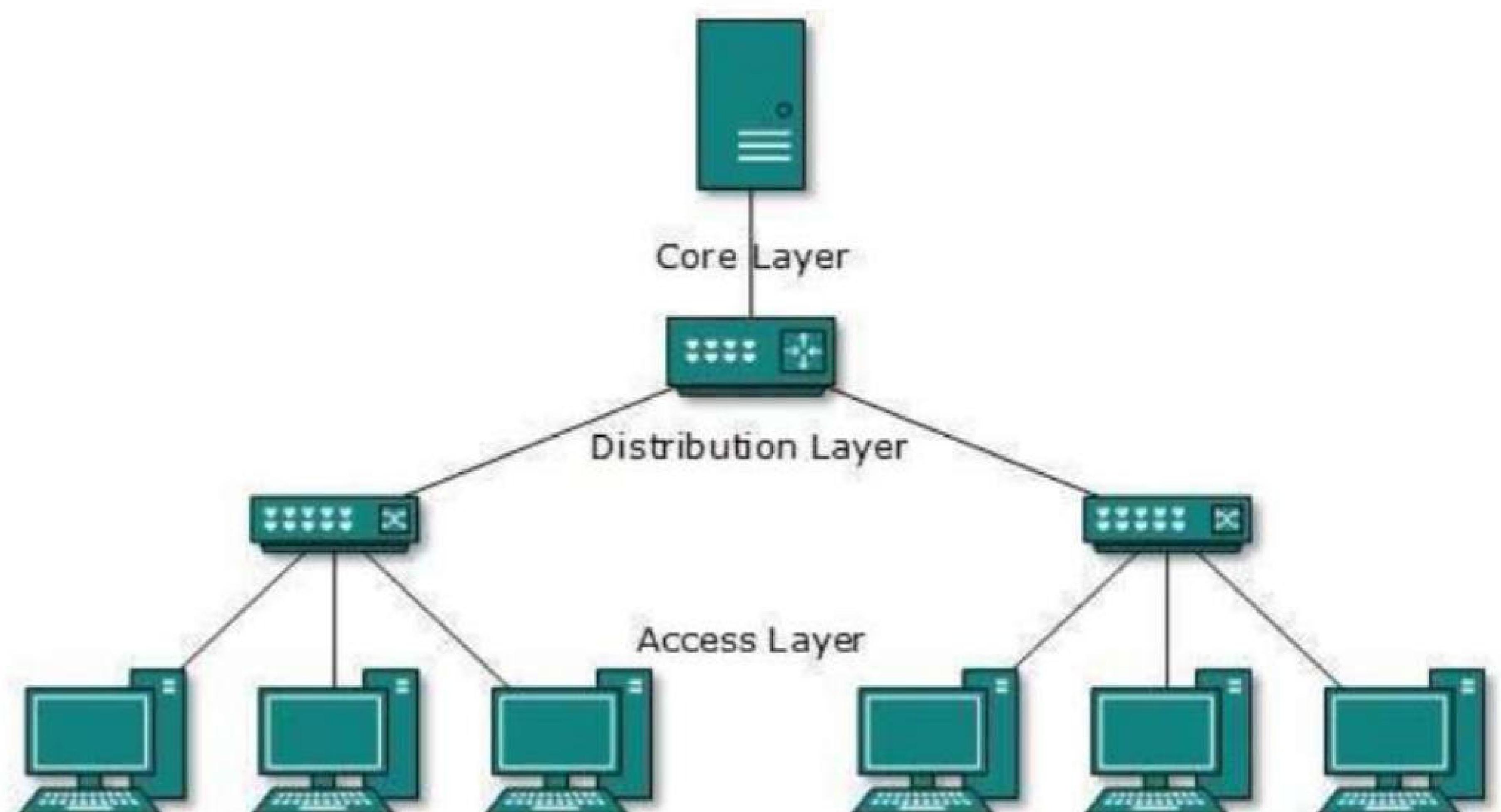
- *Token passing:* It is a network access method in which token is passed from one node to another node.
- *Token:* It is a frame that circulates around the network.

3) Star Topology



- *Star topology* is an arrangement of the network in which every node is connected to the central hub, switch or a central computer.
- The central computer is known as a **server**, and the peripheral devices attached to the server are known as **clients**.
- Coaxial cable or RJ-45 cables are used to connect the computers.
- Hubs or Switches are mainly used as connection devices in a physical star topology.
- Star topology is the most popular **topology** in network implementation.

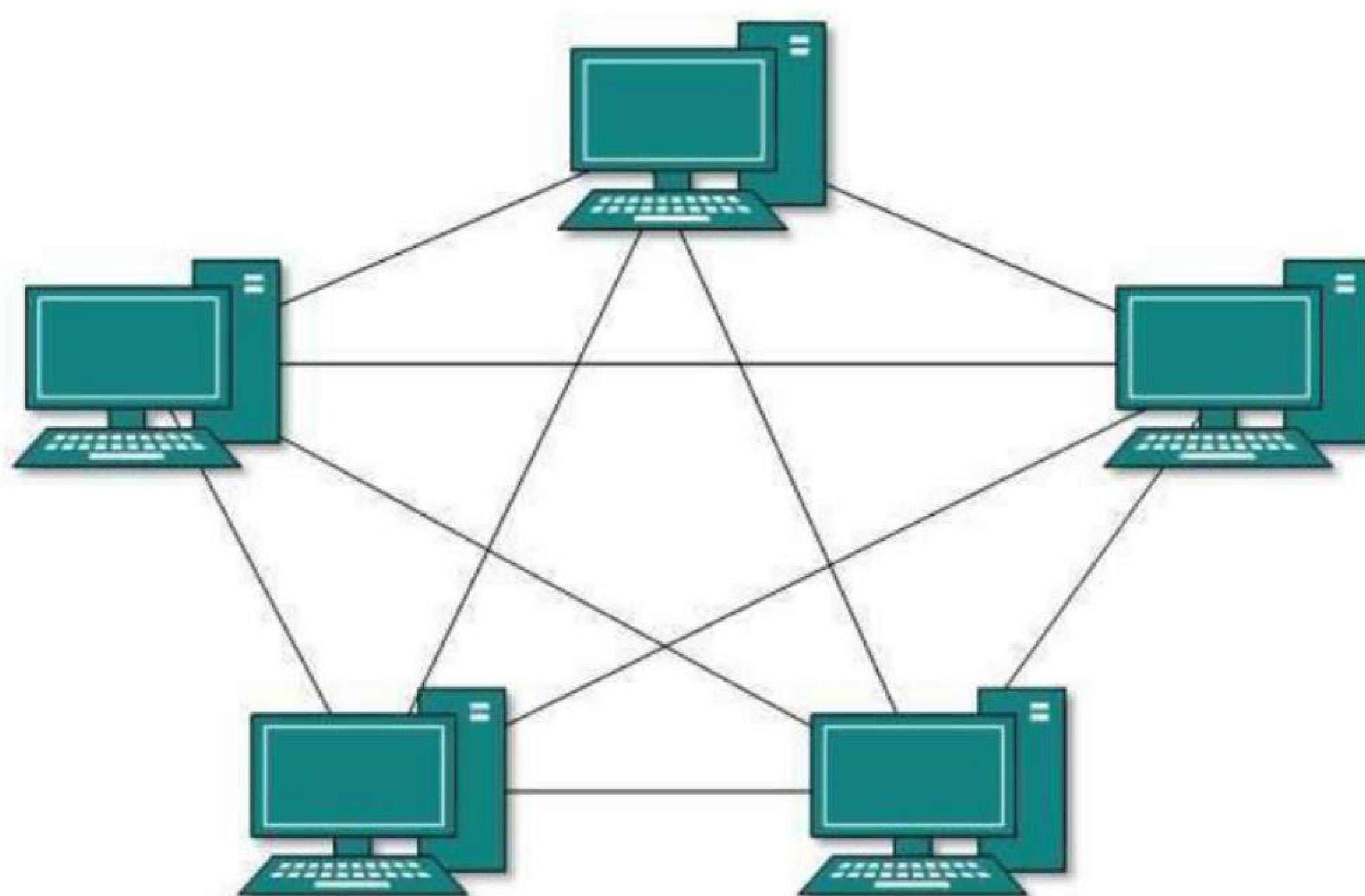
4) Tree topology



- *Tree topology* combines the characteristics of bus topology and star topology.
- A tree topology is a type of structure in which all the computers are connected with each other in hierarchical fashion.
- The top-most node in tree topology is known as a root node, and all other nodes are the descendants of the root node.
- There is only one path exists between two nodes for the data transmission. Thus, it forms a parent-child hierarchy.

5) Mesh topology

- Mesh technology is an arrangement of the network in which computers are interconnected with each other through various redundant connections.
- There are multiple paths from one computer to another computer.
- It does not contain the switch, hub or any central computer which acts as a central point of communication.

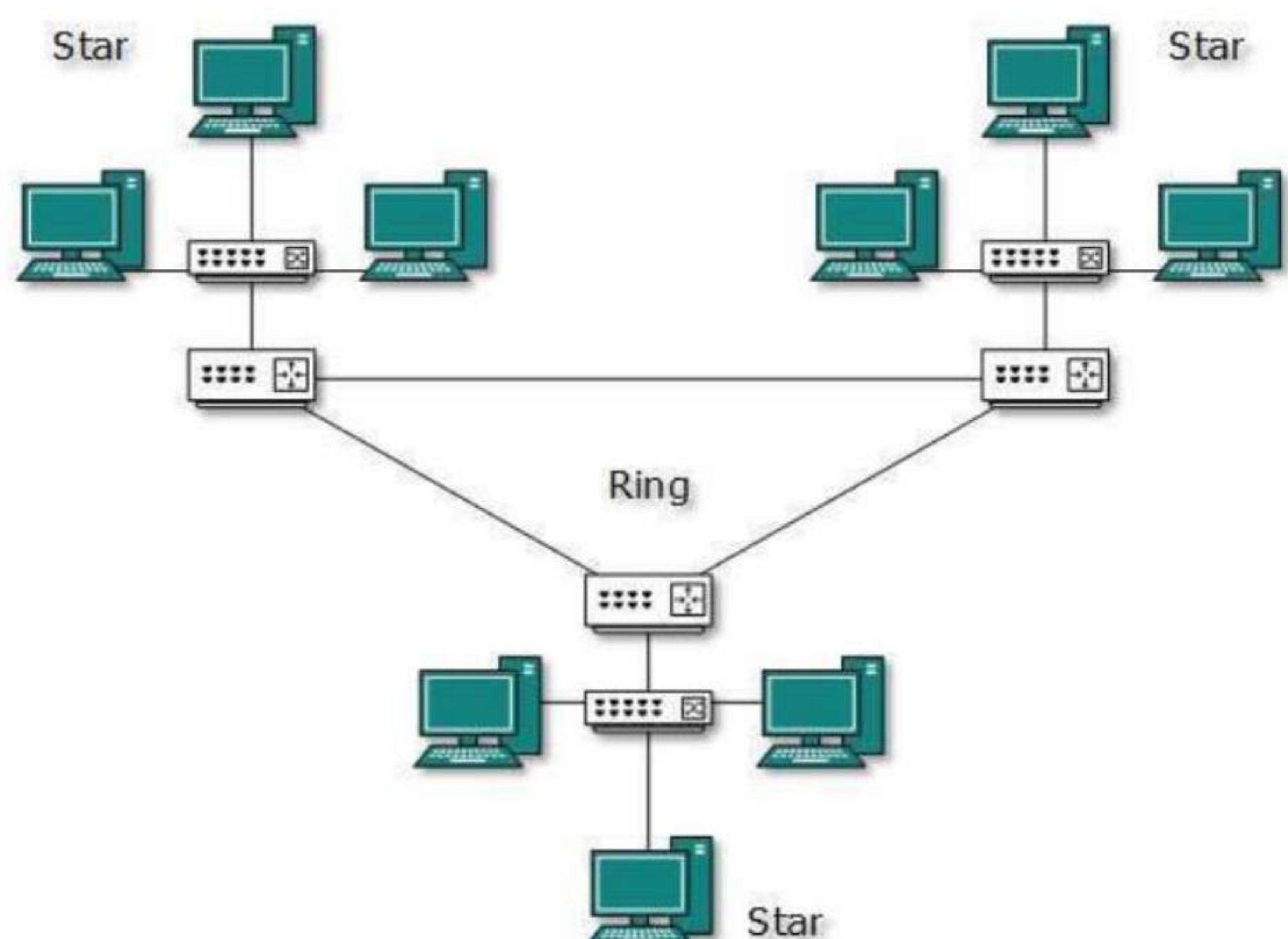


- The Internet is an example of the mesh topology.
- Mesh topology is mainly used for WAN implementations where communication failures are a critical concern.
- Mesh topology is mainly used for wireless networks.
- Mesh topology can be formed by using the formula:-
Number of cables = $(n \times (n - 1)) / 2$;

6) Hybrid Topology

- The combination of various different topologies is known as **Hybrid topology**.
- A Hybrid topology is a connection between different links and nodes to transfer the data.
- When two or more different topologies are combined together is termed as Hybrid topology and if similar topologies are connected with each other will not result in Hybrid topology.

For example, if there exist a ring topology in one branch of ICICI bank and bus topology in another branch of ICICI bank, connecting these two topologies will result in Hybrid topology.



The End

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Computer Application__(Engg. All) 1st Sem

(2080) Question Paper Solution.

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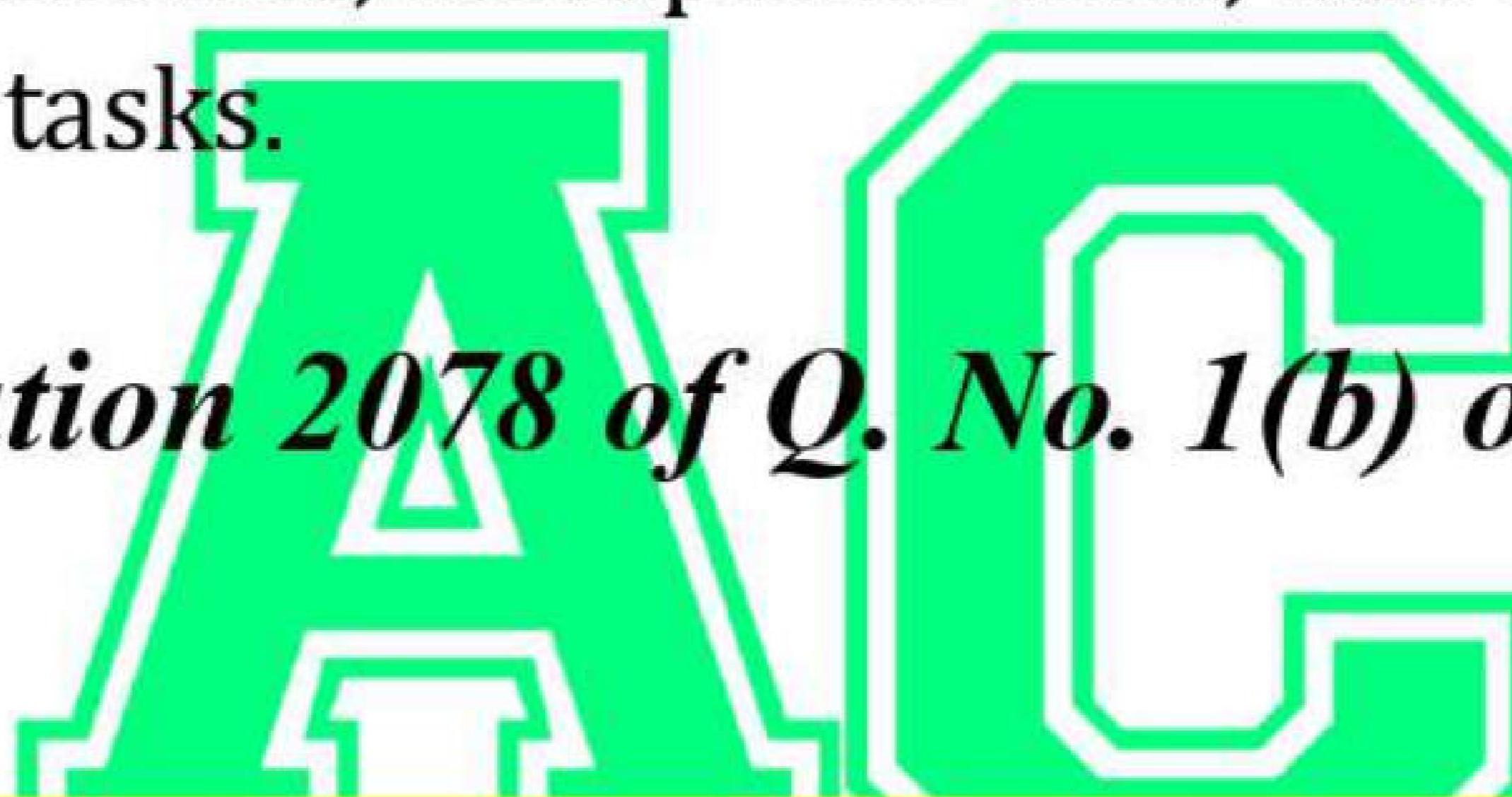
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1) What is computer? Draw the block diagram and explain about digital computer.

→ A *computer* is an electronic device that can process and store information. It can perform calculations, manipulate data, and execute instructions to accomplish specific tasks.

→ Refer to the Solution 2078 of Q. No. 1(b) on page 4.



2) i. What is primary memory? Explain about ROM and its types in brief.

→ **Primary Memory** is the main memory of the computer. It is used for storing data and instructions during processing. It is the only memory which is directly accessible to CPU. It is usually expensive, faster of read/write operation and used in small storage capacity. *Example: RAM, ROM, Cache Memory.*

→ ROM stands for "**Read Only Memory**". It is a read only memory. The data can only be read. It is a non-volatile memory as it permanently stores the files even when the power is turned off, such as game cartridge and BIOS program stored in the memory of a computer, etc.

Its storage capacity ranges from 4 to 8 MB. We can only read the data stored in ROM. It cannot be altered. It is slower than the RAM. The data stored in ROM is used by CPU only when it is transferred to RAM. ROM is generally cheaper than RAM. It stores the BIOS program on the motherboard of a computer, which is needed to bootstrap the computer. Examples: It is used as Firmware by micro-controllers. The stored data is not as easy to access as it is in ROM.

→ **Types of ROM:** PROM ,EPROM ,EEPROM.

→ **PROM** stands for "*Programmable Read-Only Memory*". It was invented in 1956 by **Wen Tsing Chow**. It is a one-time programmable only. PROM is a read-only type of memory storage system. Bipolar transistors are used in the PROM , which need much power but work very quickly. It is an older EPROM version. It is more cost-efficient than EPROM. It will become useless if there is a flaw, mistake, or calculation error while writing to PROM.

→ **EPROM** stands for "*Erasable Programmable Read-Only Memory*". It was developed by **Dov Frohman** at Intel in 1971. It is programmable. It may be both a read and write memory storage system. EPROM is an improved and newer version of PROM. MOS transistors are used in EPROM. It is less cost-effective compared to PROM. EPROM is re-writable and erasable, we can utilize it several times, even if we make a mistake when writing on it.

→ **EEPROM** stands for "*Electrically Erasable Programmable Read-Only Memory*". It was developed in 1978 at Intel by **George Perlegos**. It is utilized as a replacement for PROM and EPROM. It uses electricity to remove the content. It is a non-volatile ROM chip that is utilized in computer systems and other electronic devices to store a small quantity of data. It is completely encased in an opaque plastic case. A single data byte may be completely erased and reprogrammed using EEPROM, not just some parts of it.

ii) What is CPU? Explain with its internal diagram.

- The CPU is like the brain of a computer. Its primary function is to organize and execute instructions. CPU performs operations on data from main memory and returns the results of processing to main memory. It is the logic machine.
- Internal Diagram :

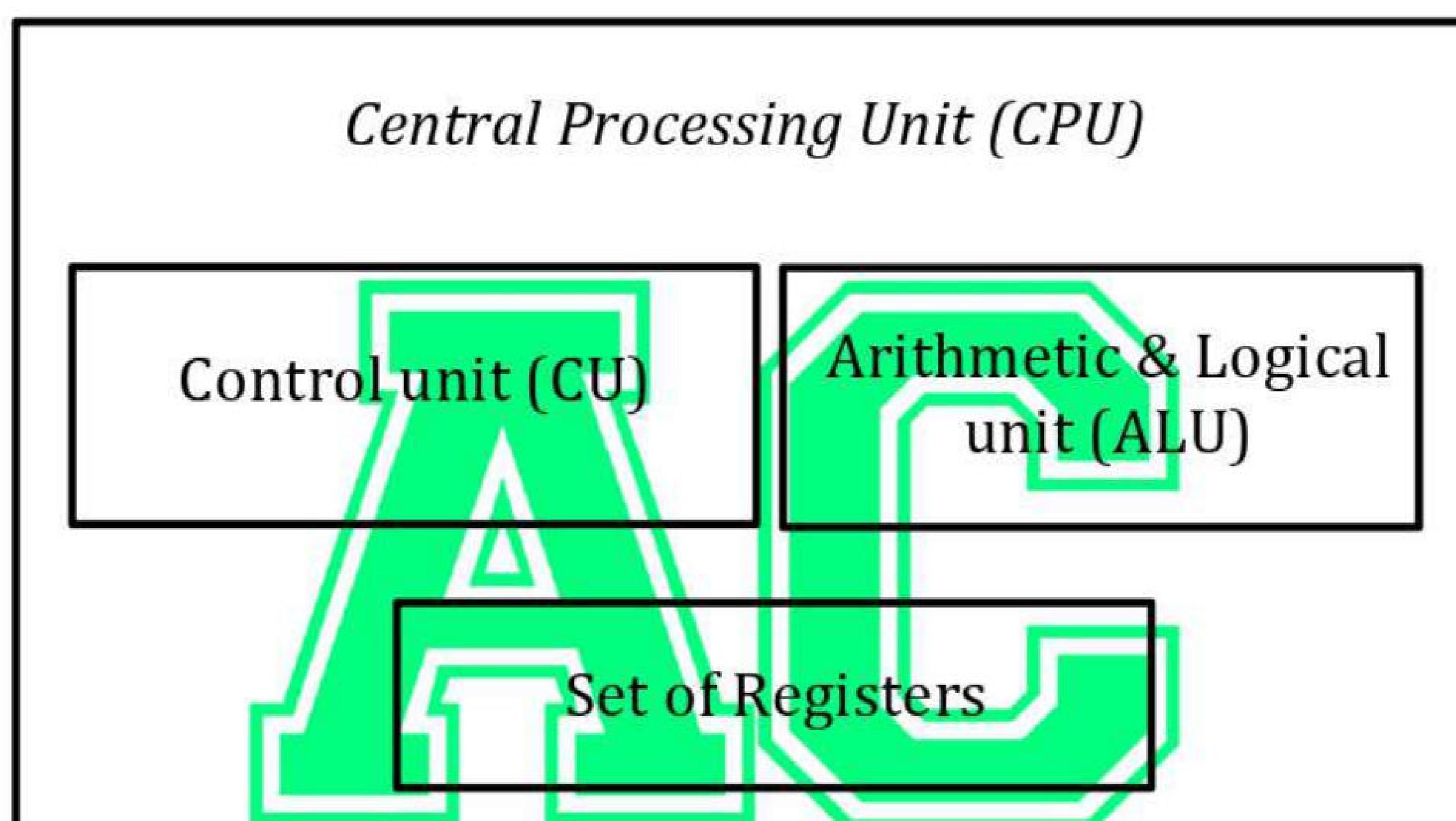


Figure : CPU

Reminding Part ,

- Refer to the Solution 2078 of Q. No. 1(b) on page 7

3) Explain the types of operating system. Describe the function of operating system.

- Types of Operating System are :-

- i) **Single user single Tasking OS:** An operating system that allows a single user to perform only one task at a time is called a Single-User Single-Tasking Operating System. Functions like printing a document, downloading images, etc., can be performed only one at a time. Examples include MS-DOS, Palm OS, etc.
- ii) **Single User Multi Tasking OS:** An operating system that allows a single user to operate multiple programs at the same time is called Single-User Multi-Tasking Operating System. This is the type of OS most people use on their desktop and laptop computers. Example:- Apple's Mac OS, Windows 95 and all later versions of windows.
- iii) **Multiuser OS:** Multi-user operating system allows multiple users to access a computer's resources at the same time. Multi-user OS must ensure that the requirements of various users are balanced and that each program has sufficient and separate resources. This is to prevent a problem with one user from affecting the entire community of users.
Examples : Linux, **UNIX**, VMS and mainframe operating system like MVS.
- iv) **Multiprocessing OS:** Multiprocessing operating system uses of two or more CPU within a single computer system. These multiple CPUs are in a close communication sharing the computer BUS memory and other peripheral devices. Examples : UNIX, LINUX, and Solaris etc.
- v) **Real Time OS:** Real Time operating system are designed to respond to an event within a predetermined time processing is done within a time constraint. They are used to respond the queries in the areas like medical imaging system, industrial control systems etc.
Example: Lynx OS

vi) **Embedded OS:** An embedded operating system is a device-specific, low-resource operating system that is embedded in the ROM of a device and is used in appliances like microwaves, washing machines, and traffic control systems etc.

→ Refer to the Solution 2078 of Q. No. 2(a) on page 9.

4) Define database management system. Point out the features of word processor.

→ A **Database Management System** (DBMS) is a software that allows users to create, manage, and interact with databases. It acts as an interface between the database and the user, allowing users to access, organize, and manipulate data. DBMSs are used to store, retrieve, and organize large amounts of data quickly and efficiently.

→ **Features of word processor :-**

- **Insert Text:** Used to insert text anywhere in the document.
- **Delete Text:** Used to erase characters, words, lines, or pages.
- **Cut and Paste:** Used to remove (cut) a section of text from one place in a document and insert (paste) it somewhere else.
- **Copy:** Used to duplicate a section of text.
- **Page Size and Margins:** Allows you to define various page sizes and margins, and the word processor will automatically readjust the text so that it fits.
- **Search and Replace:** Used to search for a particular word or phrase. The searched word or phrase can also be replaced with a new one if needed.
- **Word Wrap:** The word processor automatically moves to the next line when the first line is filled with text. It will readjust text if margins are changed.

- **Print:** Used to send a document to a printer to get a hard copy.
- **Font Specifications:** Change fonts within a document, such as specifying bold, italics, underline, font size, and typeface.
- **File Management:** Provides capabilities to create, delete, move, and search for files.
- **Windows:** Edit two or more documents at the same time, each in a separate window.
- **Spell Checking:** Identifies words that don't appear in a standard dictionary.
- **Grammar Checking:** Identifies sentences, paragraphs, and punctuation that don't meet commonly recognized rules of grammar.
- **Footnotes and Cross-References:** Automates the numbering and placement of footnotes and enables easy cross-referencing of other sections of the document.
- **Automated Lists:** Automatically creates bulleted or numbered lists, including multi-level outlines.
- **Graphics:** Allows embedding illustrations, graphs, and possibly even videos into a document.
- **Headers, Footers, and Page Numbering:** Specify customized headers and footers that the word processor places at the top and bottom of every page, with automatic page numbering.
- **Layout:** Specify different margins within a single document and various methods for indenting paragraphs.
- **Macros:** Define and run a character or word that represents a series of keystrokes to save time by replacing common combinations of keystrokes.
- **Merge:** Merge text from one file into another, useful for generating many files with the same format but different data, such as mailing labels.

5) How do we remove viruses from PC? What are the characteristics of computer virus? Calculate how many bytes are there in 128Gb of Solid State Drive (SSD).

→ **Refer to the Solution 2078 of Q. No. 4(a) on page 14.**

→ **The characteristics of computer virus :**

- ✓ It can multiply or replicate itself.
- ✓ It has a self-replicating code called a virus signature.
- ✓ It needs a host program to attack itself.
- ✓ It has a development period during which no damage is done. After the development period, it starts to reveal its behavior.
- ✓ It can infect other programs by modifying them.
- ✓ Viruses can harm computer resources, such as reducing disk space, slowing down the system, or causing data loss.
- ✓ Viruses can be hidden in programs or files, making them difficult to detect.

→ **Calculating Bytes in a Solid State Drive (SSD):**

To calculate the number of bytes in 128GB of SSD, we use the following conversions:

$$1 \text{ GB} = 1,073,741,824 \text{ bytes}$$

Now, substitute the values:

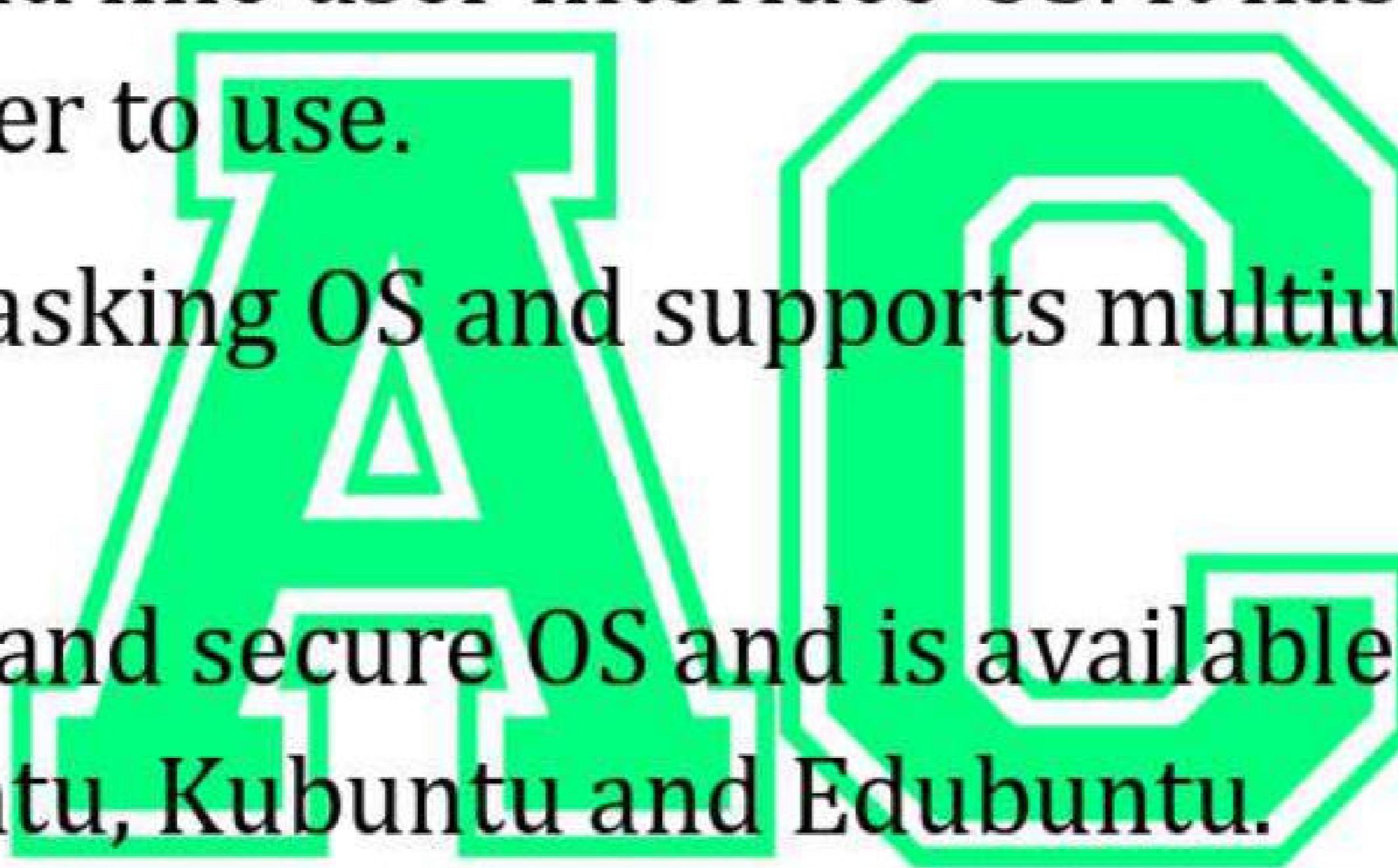
$$\begin{aligned}128 \text{ GB} &\times 1,073,741,824 \text{ bytes/GB} \\&= 137,438,953,472 \text{ bytes}\end{aligned}$$

Therefore, There are approximately 137,438,953,472 bytes in a 128GB Solid State Drive (SSD).

6. Write short notes on: (Any Two)

a) Linux:

- ✓ *Linux* is a *free and open-source operating system* (OS) that is used for computers, servers, mobile devices, and more.
- ✓ It is based on the Linux kernel, which was first released in *1991 by Linus Torvalds*. It is copyright under the GNU public license.
- ✓ Since Linux follows the open development model, it is constantly upgraded by programmers across the globe.
- ✓ Some organizations offer Linux with add on features and capabilities. Red Hat, Man drake, Debian and Novell are popular vendors of Linux OS.
- ✓ Linux is a command line user interface OS. It has GUI interfaces that is convenient for the user to use.
- ✓ It is 32-bit multi-tasking OS and supports multiuser and multi processors.
- ✓ Linux is a reliable and secure OS and is available almost for free. Some Linux OS are Ubuntu, Kubuntu and Edubuntu.
- ✓ Full form of Linux is ***Lovable Intellect Not Using XP***.



b) Flash Memory:

- ✓ *Flash memory* is a type of non-volatile memory that can store data even when a device is not powered on.
- ✓ It can be electrically erased and reprogrammed.
- ✓ It is small and light weight device making them easy to carry around in your pocket or on a keychain.
- ✓ Flash memory is primarily used for quick file transfer due to its fast read and write speeds.

- ✓ Flash memory is a type of *EEPROM memory* that is widely used for data storage and transfer in consumer devices like *smartphones, digital cameras, USB drives, and SD cards*.

c) Switch

- ✓ **Switch** is a point-to-point communication device that operates at the data link layer of the OSI model.
- ✓ It is an intelligent device.
- ✓ It uses a switching table to find the correct destination.
- ✓ It can be used as a repeater.
- ✓ It's a more advanced device.
- ✓ Switches are expensive, especially those that offer advanced features.
- ✓ It provides dedicated ~~bandwidth~~ to each port.
- ✓ If a switch fails, all connected devices can lose network access.
- ✓ Switch can have 24 to 48 ports.
- ✓ Maximum speed is 10Mbps to 100Mbps.
- ✓ Example: Cisco Catalyst 2960
- ✓ It's a bit easier to hack computers connected to a switch.

The End

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Computer Application__(Engg. All) 1st Sem

(2080/81) Question Paper Solution.

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1. a) What is computer generation? Write the features of fifth generation of computers.

→ A **computer generation** is a period of time when there is a change in the technology used in computers, including both hardware and software.

→ *The different types of computer generations are:*

- ✓ First Generation (1940-1956) Vacuum Tubes.
- ✓ Second Generation (1956-1963) Transistors.
- ✓ Third Generation (1964-1971) Integrated Circuits.
- ✓ Fourth Generation (1971-1990) Microprocessors.
- ✓ Fifth Generation (1990 to Present & beyond) Artificial Intelligence.

→ *The features of fifth generation of computers :*

- ✓ The ULSI (ultra large scale integration) technology is used in this generation of computers.
- ✓ Natural language processing is now in its fifth phase of development.
- ✓ In this generation's computers, artificial intelligence has progressed.
- ✓ Parallel processing has advanced on these computers.
- ✓ The fifth-generation computer includes more user-friendly interfaces and multimedia functions.
- ✓ These PCs can be purchased for a lower price.

- ✓ Computers that are more portable and powerful.
- ✓ Computers are dependable and less expensive.
- ✓ It's easier to manufacture in a commercial setting.
- ✓ Desktop computers are straightforward to operate.
- ✓ Mainframe computers are extremely efficient.

b) Differentiate SRAM and DRAM.

SRAM	DRAM
SRAM stands for <i>Static Random Access Memory.</i>	DRAM stands for <i>Dynamic Random Access Memory.</i>
In SRAM, data is lost only after the computer is turned OFF.	In DRAM, data is lost only after few milliseconds even if the computer is in ON state.
It is faster for read/write operation.	It is slower for read/write operation.
It stores data in the form of voltage.	It stores data in the form of charge.
It is expensive.	It is cheaper.
SRAM is used in high-speed cache memory	DRAM is used in lower-speed main memory
Refreshing circuit is not required.	Refreshing circuit is required to prevent data loss.
SRAM Consumes less power and generates less heat.	DRAM Uses more power and generates more heat.
It is rarely used at present.	It is commonly used at present.

2) What is digital computer? Draw the block diagram of computer and write the different types of computer according to function/processing. Describe any one of them.

→ **Digital computers** operate on discontinuous data like 0 and 1. It operates by counting and calculation. It is a general purpose computer. Its accuracy is high. It usually has high storage capacity. It can be reprogrammed. Example:- Desktop PC, Laptop.

→ **Refer to the Solution 2078 of Q. No. 1(b) on page 4.**

3. a) Write the differences between CUI and GUI.

→ **Refer to the Solution 2078 of Q. No. 2(b) on page 11.**

b) Explain MS-DOS system files.

→ A computer file created by an application running under the DOS operating system is called an *MS-DOS system file*.

MS-DOS use the following files:

✓ **IO. SYS:** A hidden executable binary file that processes instructions that tell the operating system how the computer is set up when it is booted or started. It contains the default MS-DOS device drivers (hardware interfacing routines) and the DOS initialization program.

✓ **MSDOS. SYS:** The MSDOS.SYS file is a hidden, system, read-only file created on the root of the boot drive. There are several configurations that can be changed using this file. Most values in the MSDOS.SYS are either 0 or 1, which is off or on.

✓ **COMMAND.COM:** COMMAND.COM is the default command-line interpreter for MS-DOS. It is the default user interface as well. COMMAND.COM is the command shell on MS-DOS and PC-DOS, as well as versions of Windows that depend on DOS. Gives users a command line interface to DOS as well as a way to run scripts called "batch files" with the .BAT file extension.

✓ **config.sys:** config.sys is a configuration file on DOS systems. It is a text file that contains the settings and commands to load drives in a DOS system the most commands in config.sys include:

- **BUFFERS** → This command is used to specify the buffer size.
- **FILES** → This command is used to determine the number of files that a user can open simultaneously.

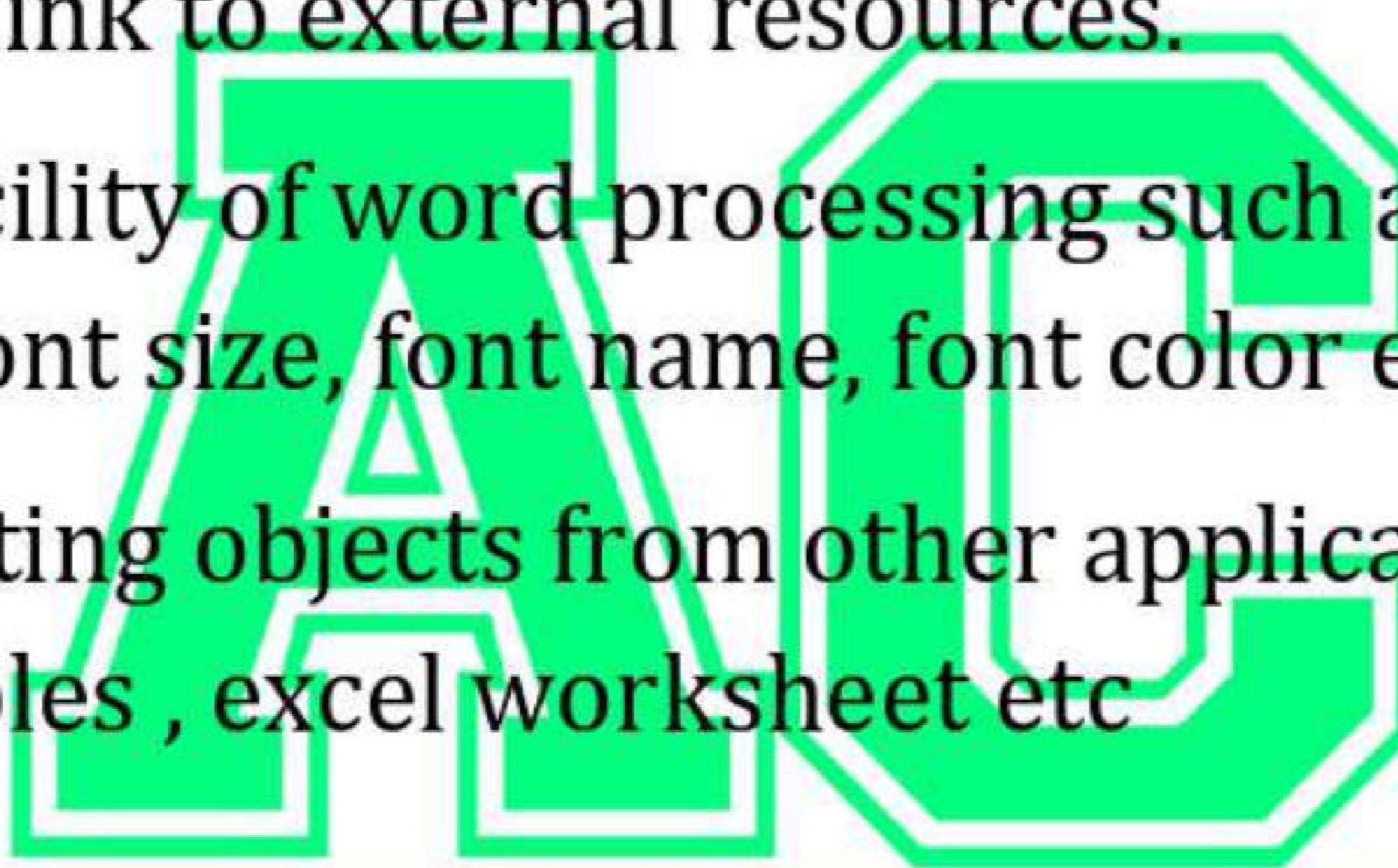
✓ **autoexec.bat:** autoexec.bat stands for "Automatic Execution Batch" file. It is a startup file used by MS-DOS that contains commands that are to be executed by the operating system when the computer first boots.

4) What is database management system? Discuss about the features of presentation package.

- ✓ A **Database Management System** (DBMS) is a software that allows users to create, manage, and interact with databases.
- ✓ It acts as an interface between the database and the user, allowing users to access, organize, and manipulate data.
- ✓ DBMSs are used to store, retrieve, and organize large amounts of data quickly and efficiently.
- ✓ **Examples of DBMS :-** MySQL, Oracle Database, Microsoft SQL Server, PostgreSQL, MongoDB, Cassandra, Redis, IBM Db2, and Apache Cassandra.

→ The features of Presentation package:

- ✓ It provides slide show for the document.
- ✓ It provides several types of transitions for the slide.
- ✓ It provides presentation of document in different formats.
- ✓ It provides built in wizards for designing of slides.
- ✓ It provides drawing tools such as arrows, boxes etc.
- ✓ It provides animation with sound.
- ✓ It provides automating the presentation such as self running presentation and product demonstrations.
- ✓ It provides hyperlink to external resources.
- ✓ It provides the facility of word processing such as –bold ,italic, bullets and numbering, font size, font name, font color etc.
- ✓ It provides importing objects from other applications such as –video clips, pictures, tables , excel worksheet etc



5 a) What is topology? Write the different types of topology.

Explain any two of them.

→ Refer to the Solution 2079 of Q. No. 6(iv) on page 30.

b) Define hub, switch, modern and router.

→ **Hub** is a broadcast device that operates at the *physical layer* of the OSI model.

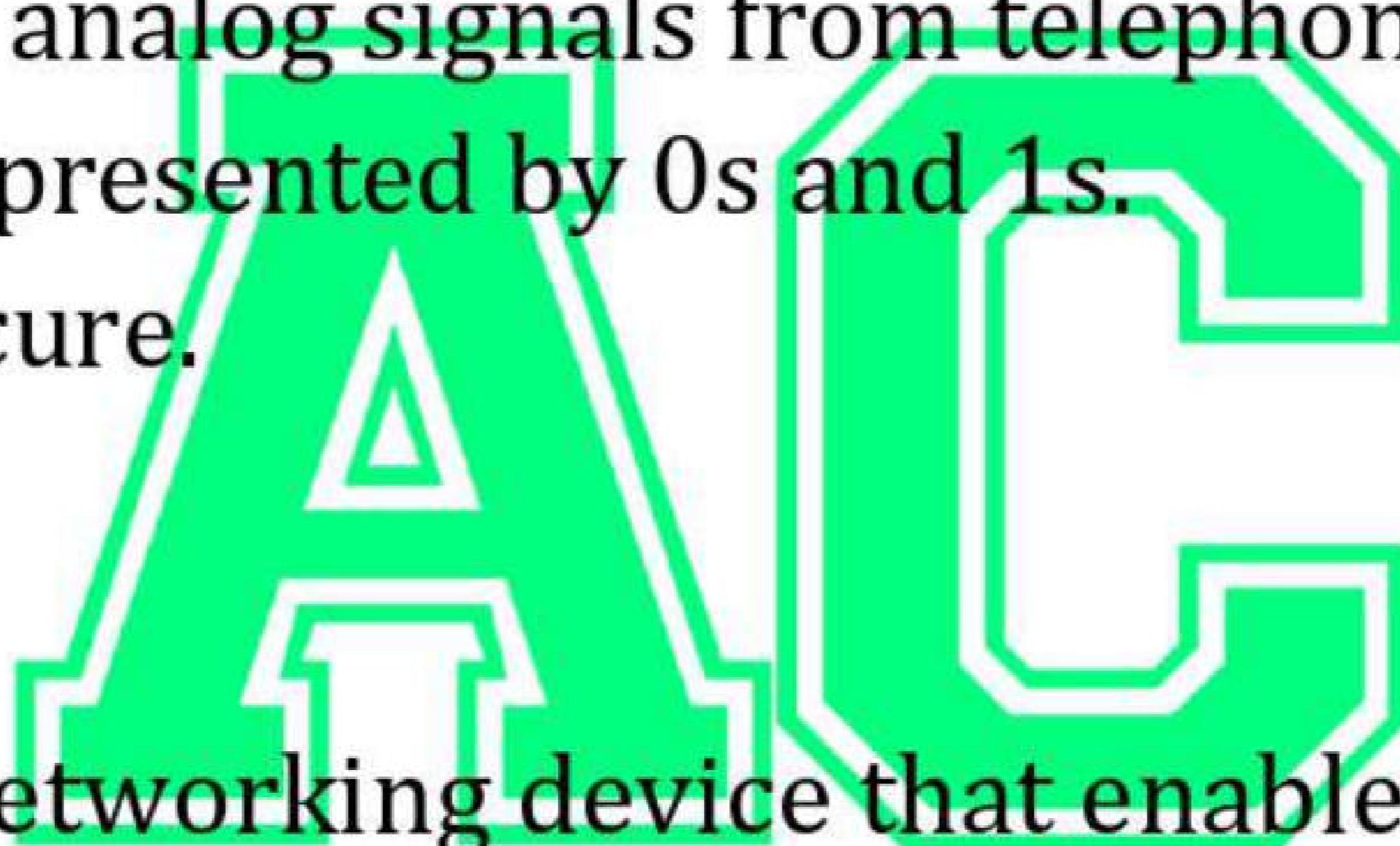
- ✓ It simply broadcasts the incoming packet. Hub has 4/12 ports.
- ✓ Hub is a simple, inexpensive, and less intelligent networking device that connects multiple devices in a network.

→ **Switch** is a point-to-point communication device that operates at the *data link layer* of the OSI model.

- ✓ It is an intelligent device.
- ✓ It uses a switching table to find the correct destination.
- ✓ It can be used as a repeater.

→ A **modem** is a device that modulates and demodulates the electrical signal and maintains a dedicated connection between the internet and home/office network.

- ✓ It works on the *data link layer* of the OSI model.
- ✓ Modem converts ~~analog signals from telephone wires into digital form, which is represented by 0s and 1s.~~
- ✓ Modem is not secure.



→ The **router** is a networking device that enables multiple devices to connect to wired or wireless networks.

- ✓ It works on the *physical, data-link, and network layers* of the OSI model.
- ✓ Router is highly secure. It is expensive.

6. Write short notes on: (any TWO)

a) Computer virus

→ Refer to the Solution 2078 of Q. No. 4(a) on page 14.

b) CRT monitor

→ Refer to the Solution 2079 of Q. No. 6(ii) on page 28.

c) Linux

→ Refer to the Solution 2080 of Q. No. 6(a) on page 43.

The End

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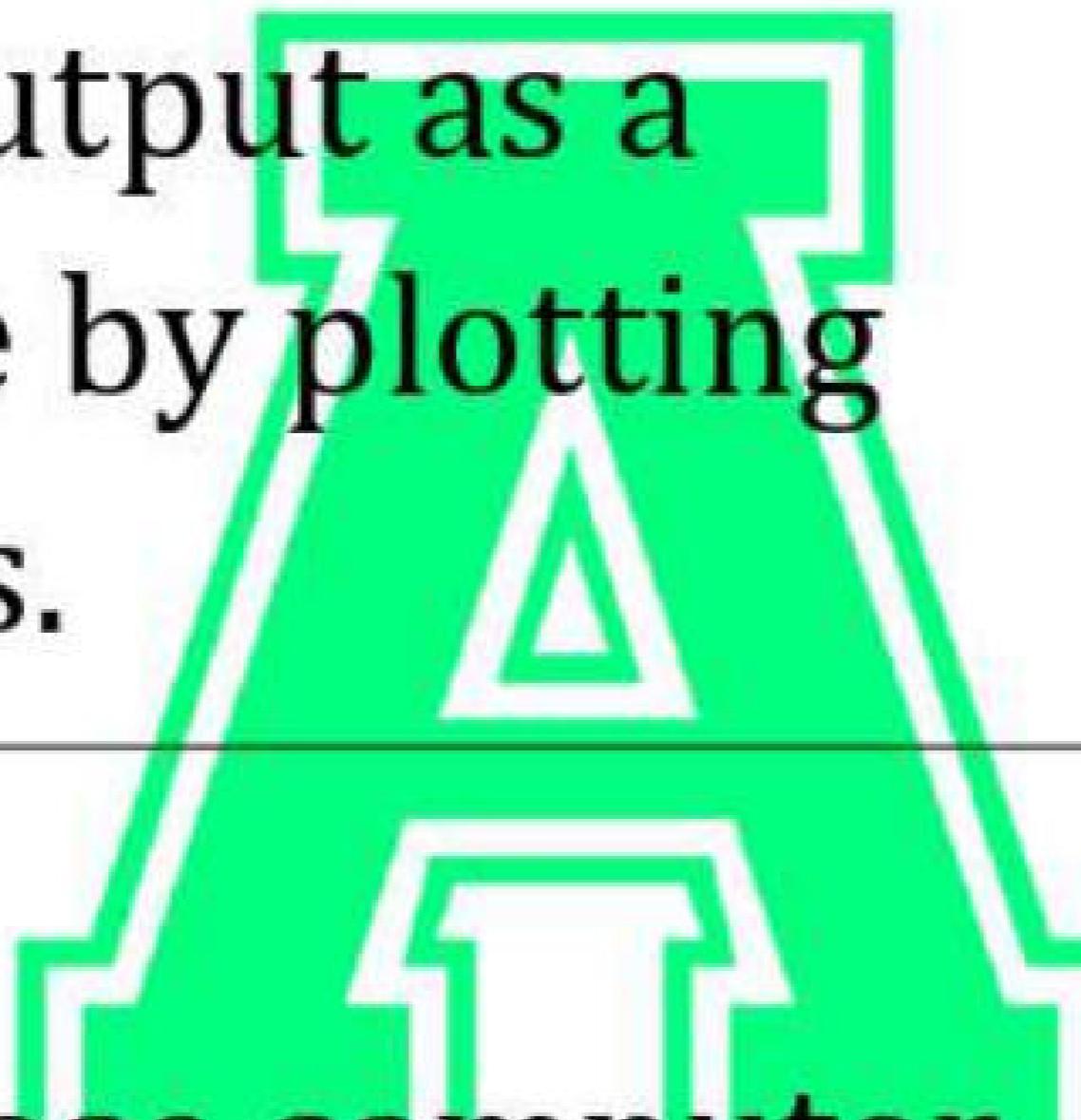
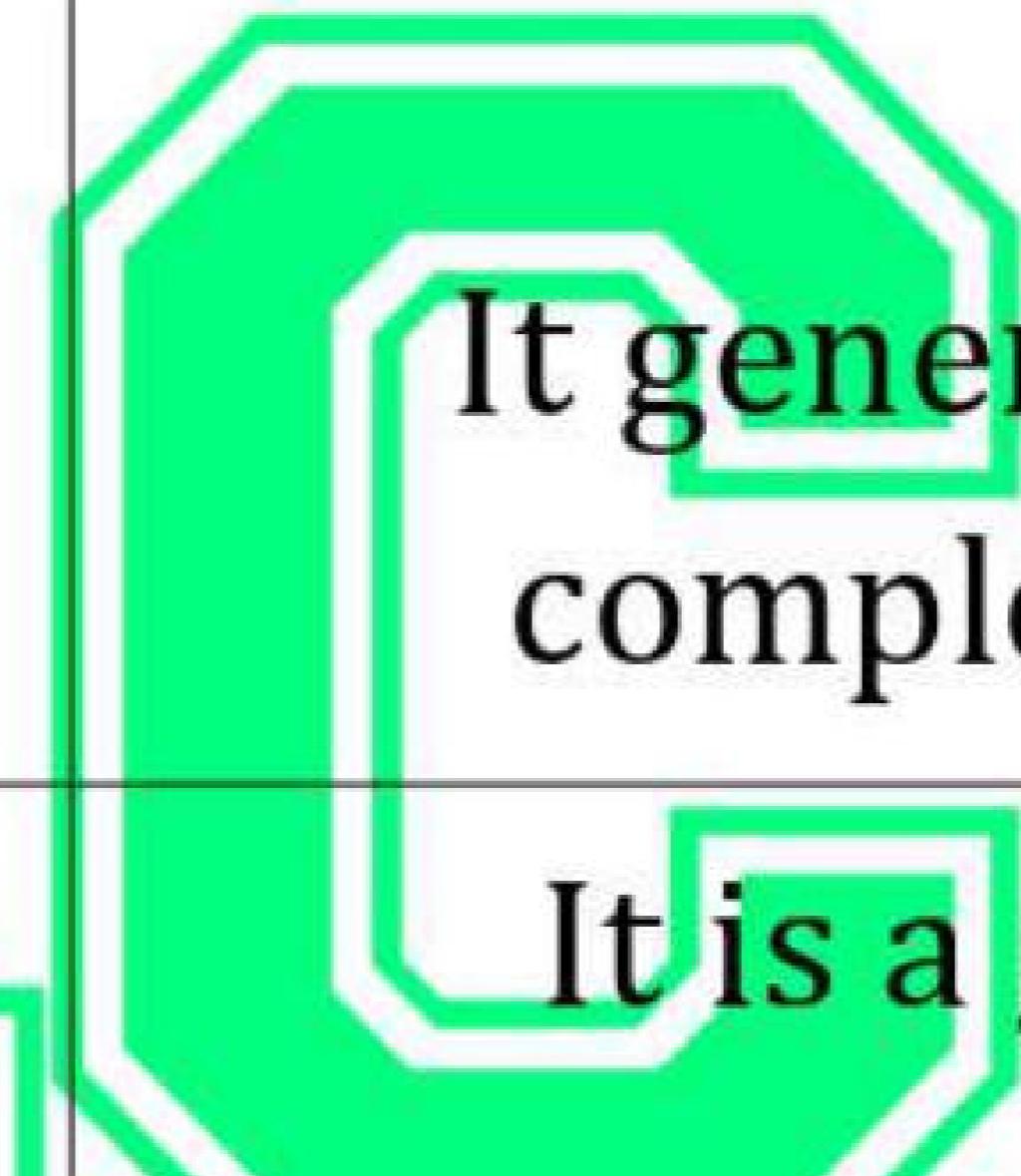
you can **donate** as you wish.



ARJUN CHAUDHARY
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Some Additional Question Solution

1) Differentiate between analog and digital computer.

ANALOG COMPUTER	DIGITAL COMPUTER
It operates on continuous data like temperature, speed, pressure.	It operates on discontinuous data like 0 and 1.
It operates by measuring and comparing.	It operates by counting and calculation.
It generates output as a continuous wave by plotting values.	 It generates output after complete computation.
It is a special purpose computer.	 It is a general purpose computer.
Its accuracy is low.	Its accuracy is high.
It has either very low or no any storage capacity.	It usually has high storage capacity.
It cannot be reprogrammed.	It can be reprogrammed.
It is more expensive.	It is Less expensive.
Example: Presley	Example: Desktop PC, Laptop.

2) Differentiate between CRT and LCD.

CRT	LCD
CRT stands for <i>Cathode Ray Tube</i> .	LCD stands for <i>Liquid Crystal Displays</i> .
It has an electron gun that is located at the end of the system tube. The electron gun releases an electron beam at the phosphor dots on the system screen.	It has a crystal-like liquid that guides light to the screen from the bottom of the display.
It was introduced by Karl Ferdinand Braun in 1897.	It was introduced by George H. Heilmeier in 1968.
It utilizes more electricity.	It utilizes less electricity.
It is less expensive than CRT.	It is more expensive than LCD. Its image resolution is higher than CRT because it has high-quality support.
It has less image resolution but is better in grayscale.	Its main components are internal light sources, nematic liquid crystals, and glass plates.
It comprises a phosphor screen, an electron gun, a vacuum glass tube, and a deflection plate.	
Image retention is not present in CRT.	Image retention is good in LCD.
It is heavy, bulky, and big in size.	It is small and thin in size.
It is faster than LCD.	It is slower than CRT.
It is utilized the electron gun to create an image.	It is utilized liquid crystal to create an image.
It may be affected by an external magnetic field.	It may be affected by extreme temperature levels (high and low).
It is mainly utilized in televisions and was previously utilized in computer monitors.	It is mainly utilized in flat screens.

3) Explain the types of Computer on the basis of working principle. Explain them with suitable example.

→ The types of Computers on the basis of working principles:-

- **Analog Computers**:- Analog computer operates on continuous data like temperature, speed, pressure. It operates by measuring and comparing. It is a special purpose computer. Its accuracy is low. It has either very low or no any storage capacity. Presley is an example of analog computer and analog devices are speedometer, thermometer, ammeter, voltmeter, etc. It cannot be reprogrammed.

Its wave form is represented as:

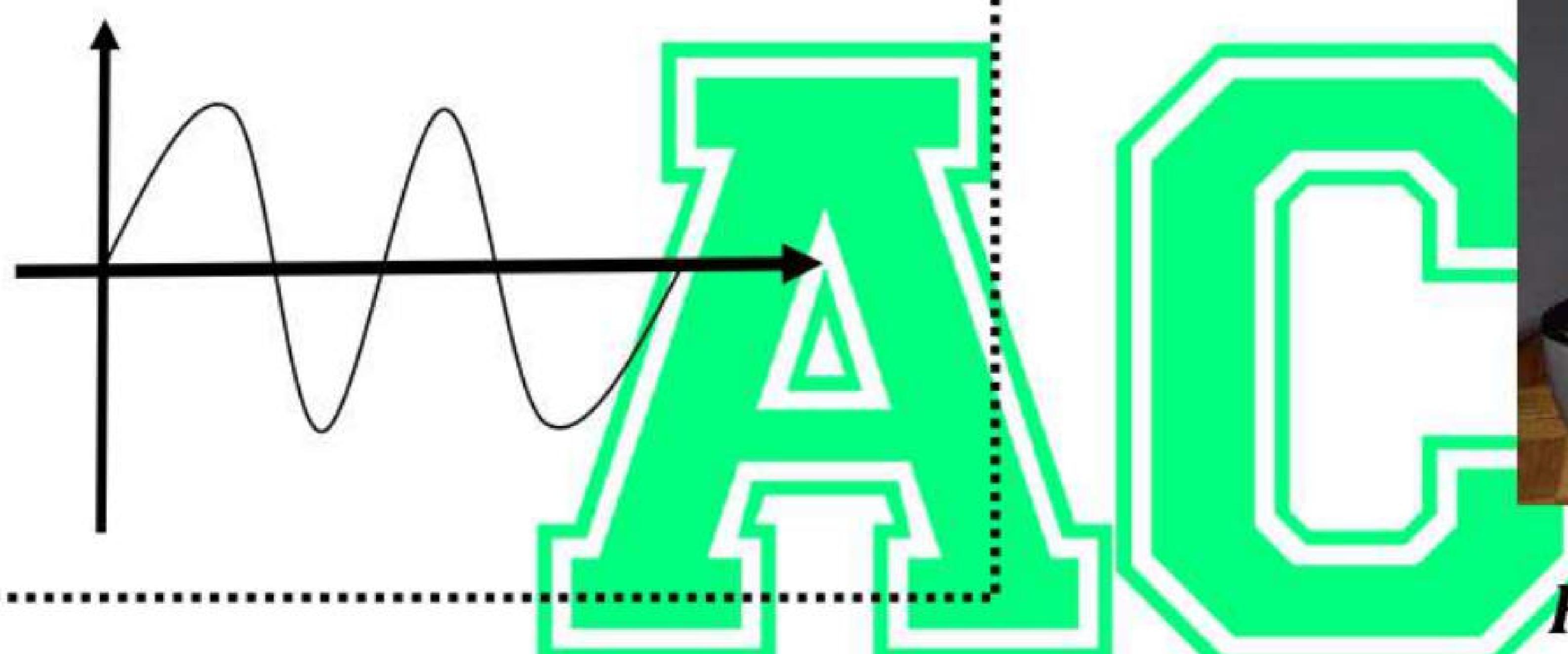


Fig:- Analog Computers

- **Digital Computers**:- Digital computers operate on discontinuous data like 0 and 1. It operates by counting and calculation. It is a general purpose computer. Its accuracy is high. It usually has high storage capacity. It can be reprogrammed. Example:- Desktop PC, Laptop.

Its wave form is represented as:

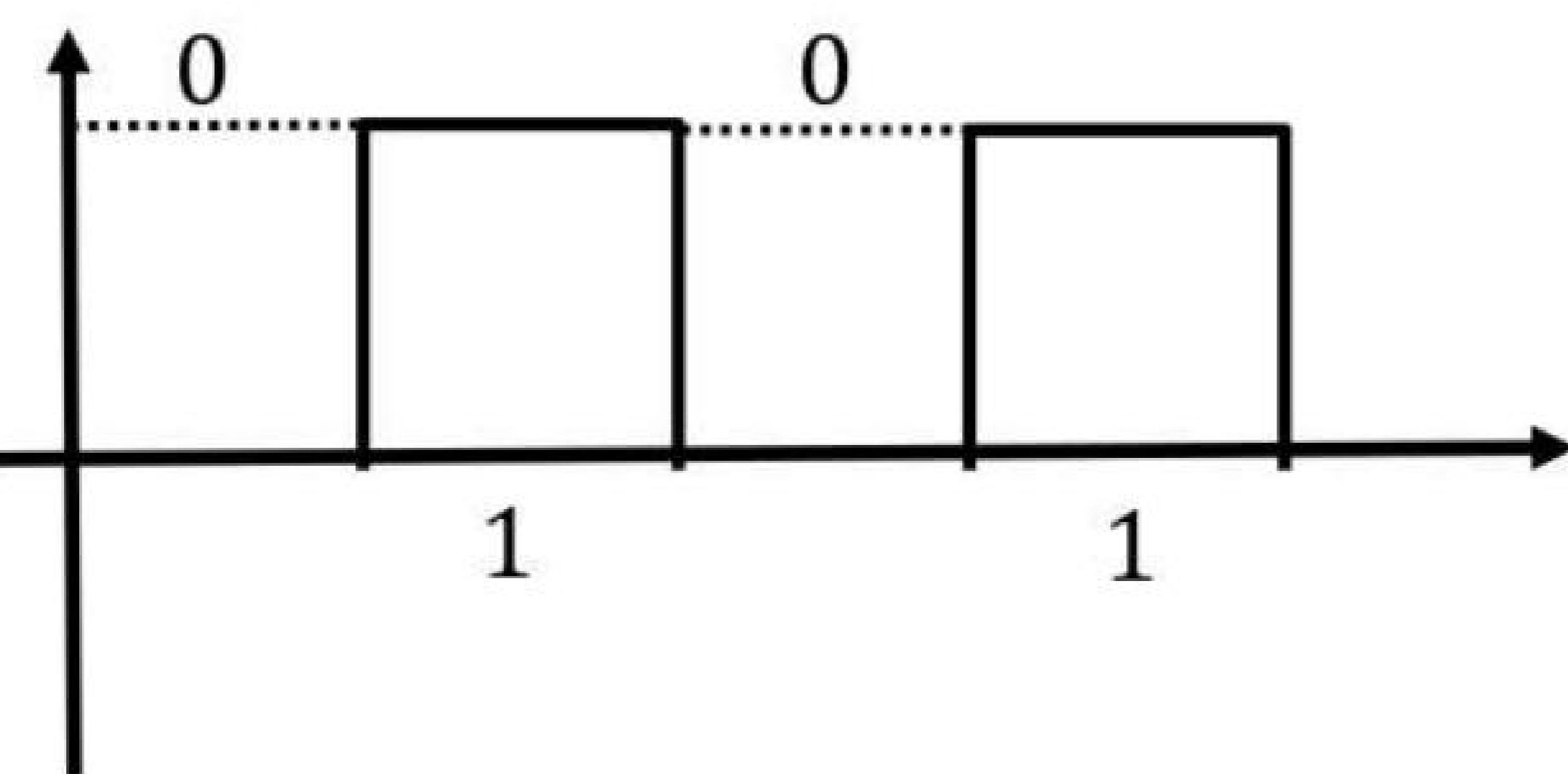


Fig:- Digital Computers

- **Hybrid Computers:** It has the combined features of both analog and digital computer. It can operate on both continuous and discontinuous data. It can convert analog data into digital and vice-versa. It is a special purpose computer. It is used in application areas like hospital, rocket launching, weather forecasting, industry, aviation.

Examples: Forensic, Defense, Ultrasound machine etc.

4) Differentiate between Primary memory and secondary memory.

Primary memory	Secondary memory.
It is the main memory or system memory of the computer.	It is the additional memory or the storage device of the computer.
It is a temporary memory except ROM.	It is a Permanent memory.
It is directly accessed by CPU.	It is not directly accessible via the CPU.
It is both volatile and non-volatile memory.	It is a non-volatile memory in nature.
It is a semi-conductor memory.	It can be magnetic, optical or flash memory.
It is used in smaller storage capacity.	It is used in large storage capacity.
The speed of accessing data is faster in primary memory	The speed of accessing data is slower in secondary memory.
It is more costly than secondary memory.	It is cheaper than primary memory.
Example: RAM, ROM, Cache Memory	Example: Hard disk, DVD, CD, Pen drive.

5) What is UPS? Differentiate between impact and non-impact Printer

- UPS stands for ***Uninterruptible Power Supply***.

An Uninterruptible Power Supply (UPS) is an electrical device used to provide emergency electrical power to different electrical loads in the case of a main power supply failure.



Impact Printer	Non Impact Printer
Printing is done by physically touching the printing material.	Printing is done by spraying liquid or powder ink without touching the printing material.
It uses mechanical method for printing. It use ink ribbon for printing.	It uses either electrostatic or electromagnetic mechanism for printing. It uses either liquid or powder ink for printing.
It is rarely used at present.	It is commonly used at present.
It is usually single colored.	It can be single or multiple colored.
It is cheaper.	It is expensive.
It can print multiple copies at a same time by using carbon paper.	It cannot print multiple copies at a same time.
It is <i>noisy, slow for printing, and has low printing quality.</i>	It produces <i>low noise, faster for printing, and has better printing quality.</i>
Example: Dot matrix printer, Daisy wheel printer, Line printer.	Example: Inkjet printer, Laser printer.

6) Differentiate between Hardcopy and Softcopy.

Hardcopy	Softcopy
Hard copy is in printed form.	Soft copy is in electronic form.
It can be touched or felt.	It cannot be touched or felt.
It is printed on papers.	It is stored on storage devices.
Its duplicate copies can be produced with cost.	Its duplicate copies can be produced without any cost.
It is difficult to modify.	It is easier to modify.
Hard copy does not require an electronic interface like computers or mobiles etc to read and display.	Soft copy requires an electronic interface like computers or mobiles etc to read and display.
It is a physical copy.	It is a virtual copy.
Hard copies can not be converted into soft copies.	Soft copies can be converted into hard copies.
These copies are mainly preferred in official works.	These copies are mainly preferred for private purposes.
Hard copies example includes books, official letters, notes, news papers, magazines etc.	Soft copies example includes ebooks, pdf files, word documents, presentation files, scanned copy etc.

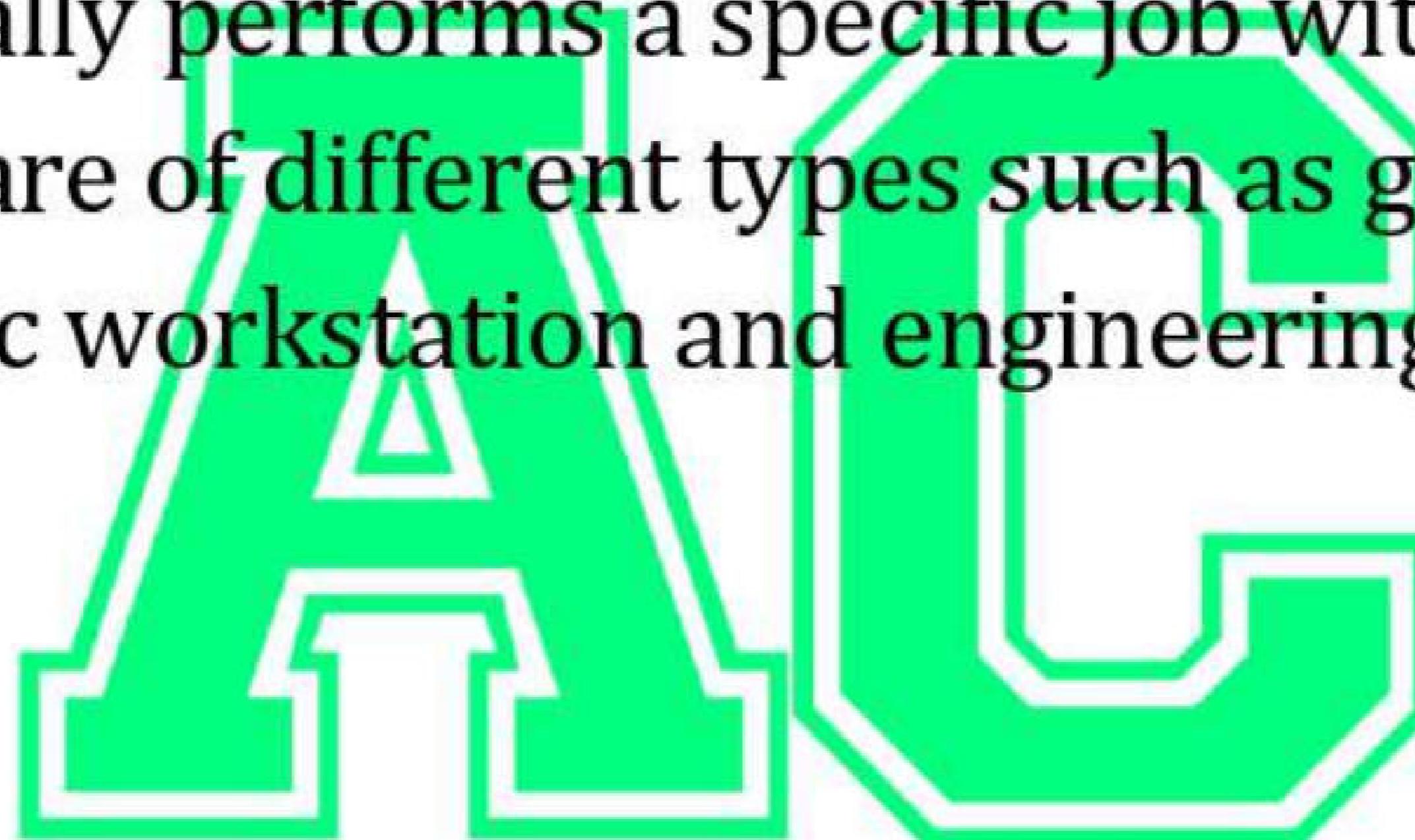
7) Explain the types of Computer on the basis of size.

→ The types of Computers on the basis of size:-

- ✓ ***Super Computer*** : Super Computer is the fastest in terms of processing speed. It is the most expensive among all types of computer, it cost around 15-20 million dollars. It is usually hybrid and special purpose computer. It requires high skilled experts to operate a super computer. Its application area includes: scientific research, controlling rockets and satellites, nuclear reactions, weather forecasting. *Example: CRAY, ANURAG, PARAM.*
- ✓ ***Mainframe Computer*** : Mainframe Computer is the largest computer on the basis of size. It occupies around 100 sq. ft area. It contains around 100 I/O terminals. It has large storage capacity. It is used for storing large amount of data, large volume processing and supporting large number of users at a same time. It is used by large bank, university, e-mail provider and website providers.
Example: CYBER 170, IBM 1401.
- ✓ ***Mini Computer*** : Mini Computer is smaller in size than mainframe. It occupies around 100 sq. ft. It contains around 50 I/O terminals. It is slower, cheaper and has lower storage capacity than mainframe. It supports less number of users and requests at a time as compared to mainframe. It is mainly used by medium sized organization with limited amount of data to be stored and less number of user to support such as medium sized bank, business organization, college, insurance company. *Example: MAGNUM, HCL Mini.*

✓ **Micro Computer** : Micro Computer is the smallest computer on the basis of size. It has single I/O terminal, so it is developed for a single user. It has least storage capacity, slowest processing speed and cheapest cost. It can be portable or non-portable. It is used for personal use such as creating documents, accessing Internet, small scale processing, entertainment, communication. *Example: Desktop PC, Laptop.*

✓ **Workstation** : Workstation is a single user computer that is designed for technical or scientific applications. It has a faster microprocessor, a large amount of RAM and high speed graphic adapters. It generally ~~performs~~ a specific job with great expertise; accordingly, they are of different types such as graphics workstation, music workstation and engineering design workstation.



8) Explain the different types of computer virus.

→ **The different types of computer virus :**

✓ **Trojan Horse** :- A Trojan horse is malware like a virus or a worm. However, it is technically one-of-a-kind from the virus. While worms are terrific from viruses in that they don't require a bunch of reports, they're, however, a form of malware. Worms self-replicate and spread throughout networks and gadgets, frequently exploiting vulnerabilities.

✓ **Computer Worm** :- A Computer worm is similar to a virus but is technically different from the virus. While worms are distinct from viruses in that they don't require a host file, they're still a form of malware. Worms self-replicate and spread across networks and devices, often exploiting vulnerabilities.

✓ **Boot sector virus**: Boot sector virus is the type of virus was more common when floppy disks were popular for booting a computer. While they are not common today, this type of virus still exists and causes problems. It runs its operation when we start it up. The program is tied to the boot menu.

✓ **File infector**: File infector viruses attach to the host files, so this means they usually stick to files that you use often. Anytime you open or run the file, the virus keeps running. It can take over the file completely.

✓ **Macro-virus**: Macro-virus is one of the type of file based virus. It attaches to files made from programs that support macros. Some examples are MS Excel and Word, which people unknowingly download them from email attachment.

✓ **Polymorphic virus**: Polymorphic viruses are harder to detect. This is because security programs scan coding to identify viruses, but these specific viruses both encrypt and change their coding. They change their operations over time continuously and also change their digital signature every time it replicates.

✓ **FAT Virus**: FAT viruses target your file allocation system, which is where information about files and where to find them exists. It even destroys files and entire directories.

✓ **Stealth virus**: A stealth virus is a file virus, that uses special techniques to hide the presence from users and virus scanners.

9. Write short notes on:

a) Search Engine

→ A **search engine** is Internet based software. It is used to access the required information or location of the information form the Internet. When an user request for search by providing keyword, it provides the list of websites and their links, from its database. Some of the popular search engines at present are google.com, bing.com, yahoosearch.com, webcrawler.com.

b) Internet and WWW

→ The **Internet** is an interconnection of thousands of networks and millions of computers linking businesses, education institutions, government agencies and individuals together. It is the world largest, computer network. It is used for exchange of information, communication, email, real time conversation, electronic commercial activities, online classes, online banking, social media etc. Internet has made the communication easier, faster and cheaper. It has made information searching and sharing easier. However, it has also increased computer crimes including the piracy, hacking, pornography etc.

→ **WWW** stands for **World Wide Web**. It is one of the service provided by the Internet. It is an information system where documents and other web resources are interlinked together and are accessible over the Internet using URL. It is a network of online content that is formatted in HTML and accessed via HTTP. It refers to all the interlinked HTML pages that can be accessed over the Internet.

c) Email

→ *Email* stands for *Electronic Mail*. It is a method to send messages from one computer to another computer through the Internet. It is mostly used in business, education, technical communication, and document interactions. It allows communicating with people all over the world without bothering them. It can be used for transmission of text, image, audio, video in electronic format. Present e-mail service is based on store and forward concept, ie. the e-mail sent by the sender is stored in e-mail server before forwarding it to the receiver. It doesn't require the sender and the receiver to be connected at the same time. It uses protocol like, SMTP, POP and IMAP.



d) Mouse

→ A **mouse** is an input device that is used with a computer. A mouse is a handheld hardware input device that controls a cursor in a GUI and can move and select text, icons, files, and folders.

A mouse usually has two or three buttons. These buttons are used to perform different tasks such as selecting an object or opening a program etc. It may also include a wheel that can be rolled with the finger to scroll the screen. Mouse typically connects to the computer through USB port or wireless connection.

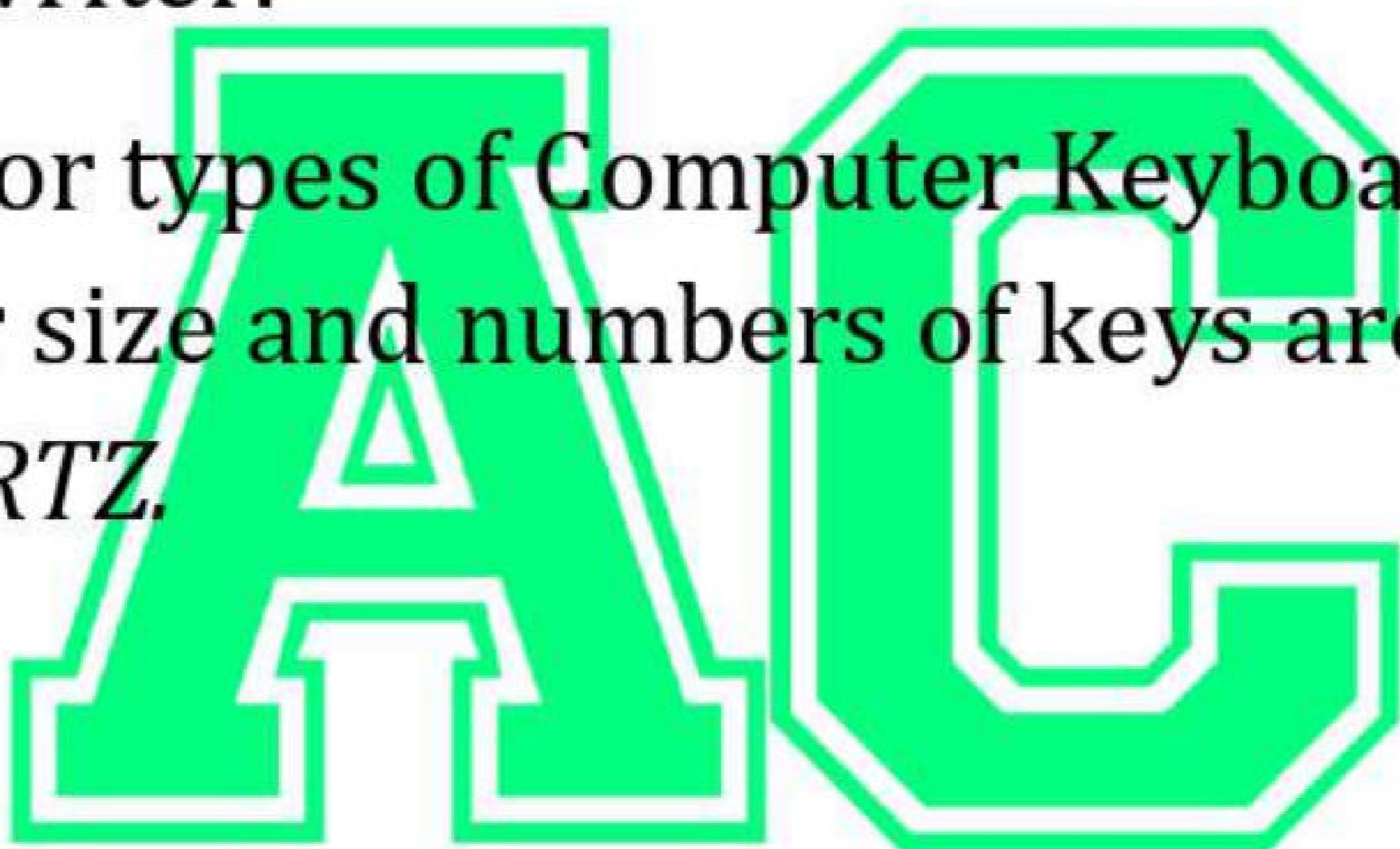
The first computer mouse was invented by *Douglas Engelbart* in **1963**.

e) Keyboard



→ **Keyboard** is an input device used to input data into the computer. Keyboard is the most common, familiar and most important input device. It looks like a typewriter. It has got various keys, which are used to feed data and commands to the computer. Commonly, we use a standard QWERTY keyboard with letters arranged in the same order as those on a typewriter.

There are four major types of Computer Keyboard used worldwide depending on their size and numbers of keys are *QWERTY, AZERTY, DVORAK and QWERTZ*.



f) Utility programs.

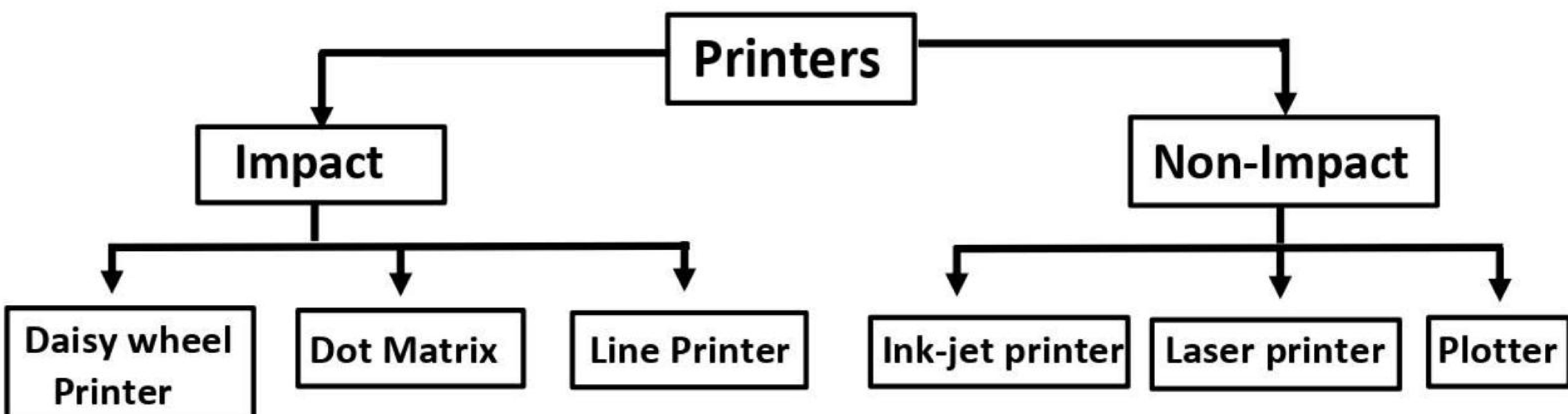
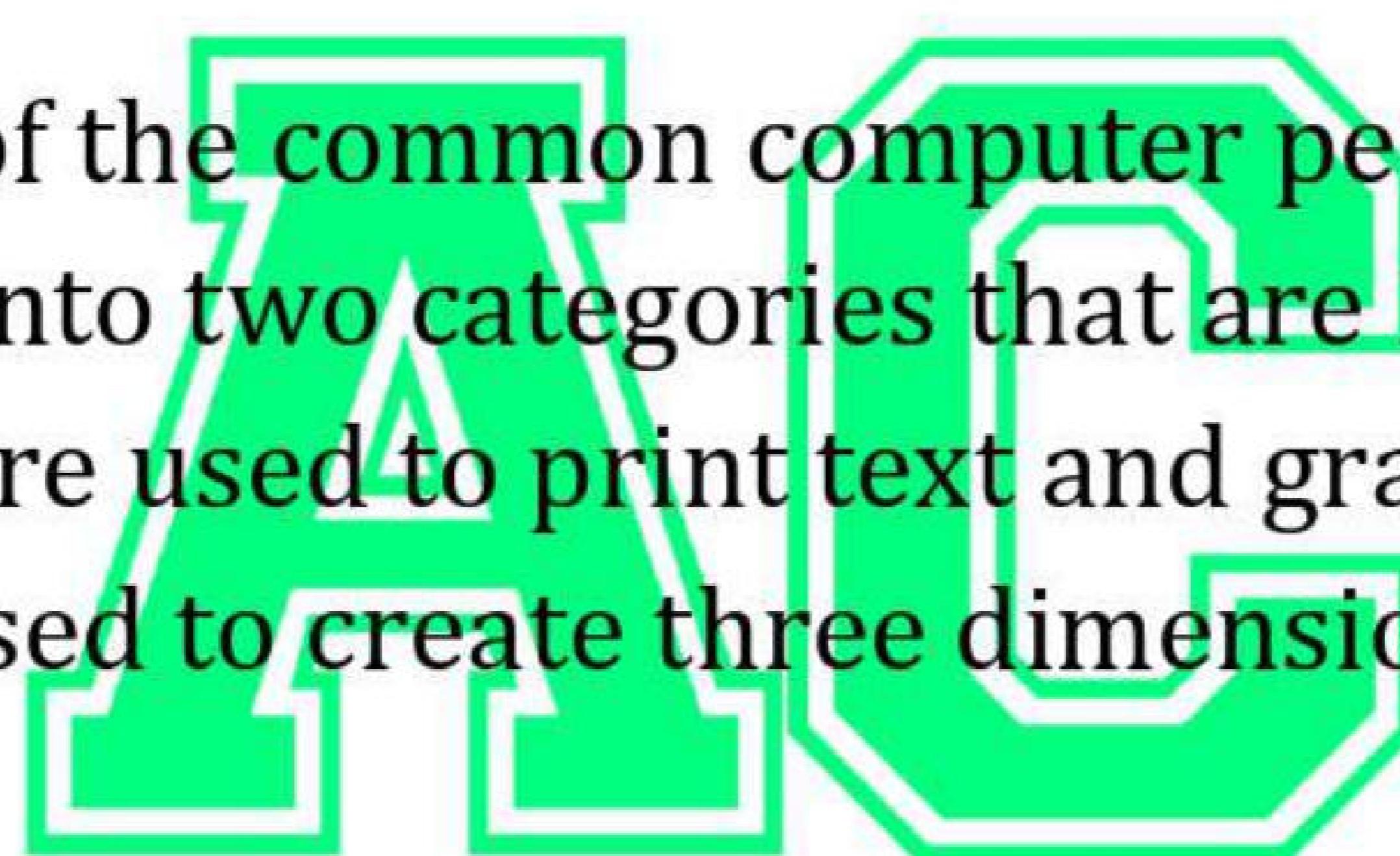
→ **Utility software** is system software designed to help, analyze, configure, optimize or maintain a computer. It is used to support the computer infrastructure in contrast to application software, which is aimed at directly performing tasks that benefit ordinary users. Although a basic set of utility programs is usually distributed with an operating system (OS), operating system, users often install replacements or facilities to carry out tasks which are beyond the capabilities of the operating system.

g) Printer

→ A printer is a hardware output device that is used to generate hard copy and print any document. A document can be of any type such as a text file, image, or the combination of both. It accepts input command by users on a computer or on other devices to print the documents. For example, if you have to submit a project report at your college, you need to create a soft copy of your report and print it with the help of the printer.



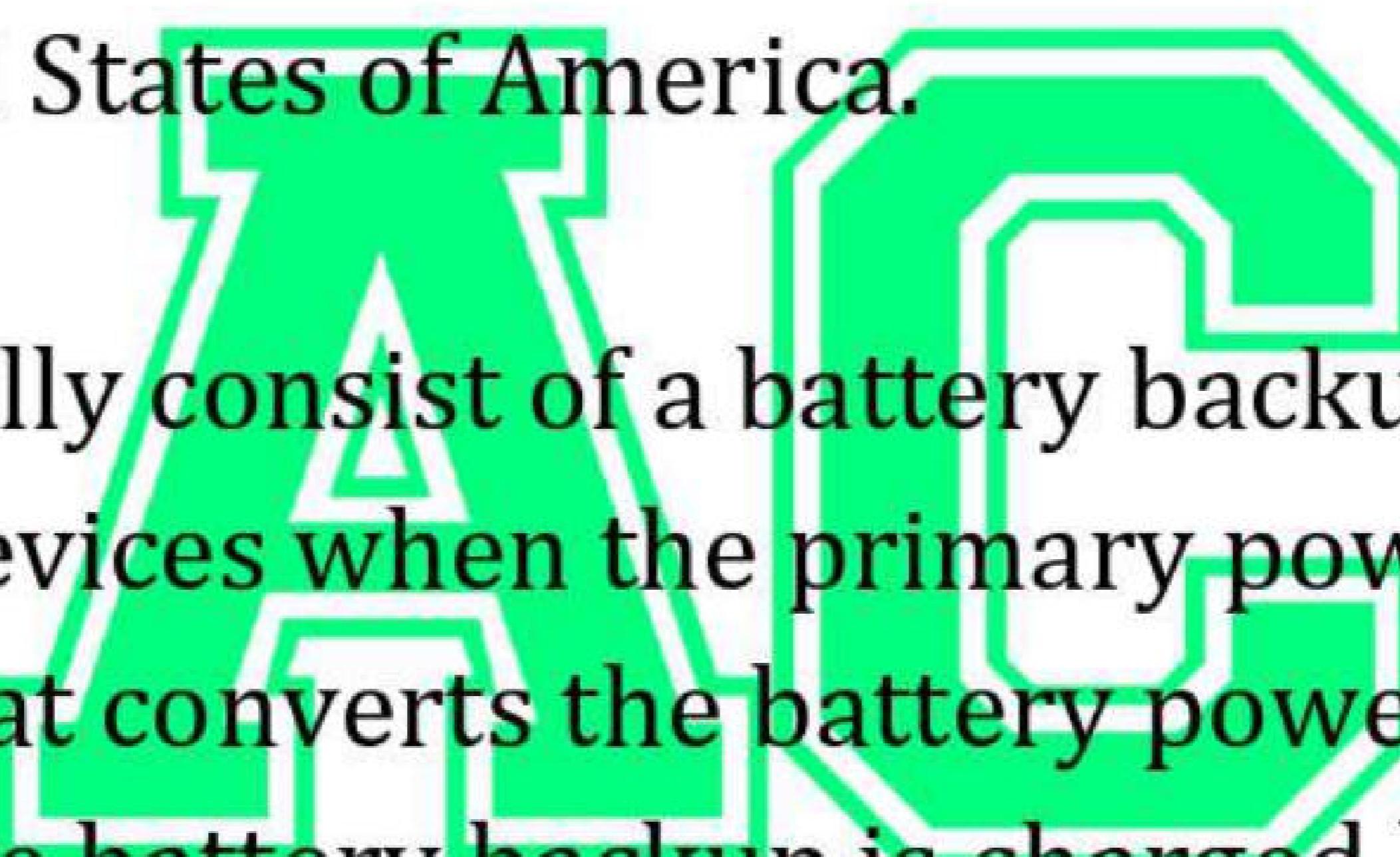
Printers are one of the common computer peripheral devices that can be classified into two categories that are 2D and 3D printers. The 2D printers are used to print text and graphics on a paper, and 3D printers are used to create three dimensional physical objects.



h) UPS

→ UPS stands for ***Uninterruptible Power Supply***. An Uninterruptible Power Supply (UPS) is an electrical device used to provide emergency electrical power to different electrical loads in the case of a main power supply failure. A UPS or uninterruptible power supply uses batteries and super capacitors to store electrical energy and delivers this stored electrical energy when the main input power supply fails. However, a typical UPS battery can supply electrical power for a short duration. Hence, UPSs are mostly used as short run time backup power sources for small loads.

UPS was ***invented by James E. Casey*** on 28th August 1907 in the Washington United States of America.



UPS systems typically consist of a battery backup that provides power to the connected devices when the primary power source fails, along with an inverter that converts the battery power to AC power that the devices can use. The battery backup is charged by the primary power source when it is available, and the UPS system monitors the incoming power to detect any fluctuations or interruptions that could damage the connected devices.

Types of UPS:

- Standby UPS
- Line Interactive UPS
- Online UPS

MAN (Metropolitan Area Network)

- A **metropolitan area network** is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network.
- Government agencies use MAN to connect to the citizens and private industries.
- In MAN, various LANs are connected to each other through a telephone exchange line.
- The most widely used protocols in MAN are RS-232, Frame Relay, ATM, ISDN, OC-3, ADSL, etc.
- It has a higher range than Local Area Network(LAN).

Uses Of Metropolitan Area Network:

- ✓ MAN is used in communication between the banks in a city.
- ✓ It can be used in an Airline Reservation.
- ✓ It can be used in a college within a city.
- ✓ It can also be used for communication in the military.

WAN (Wide Area Network)

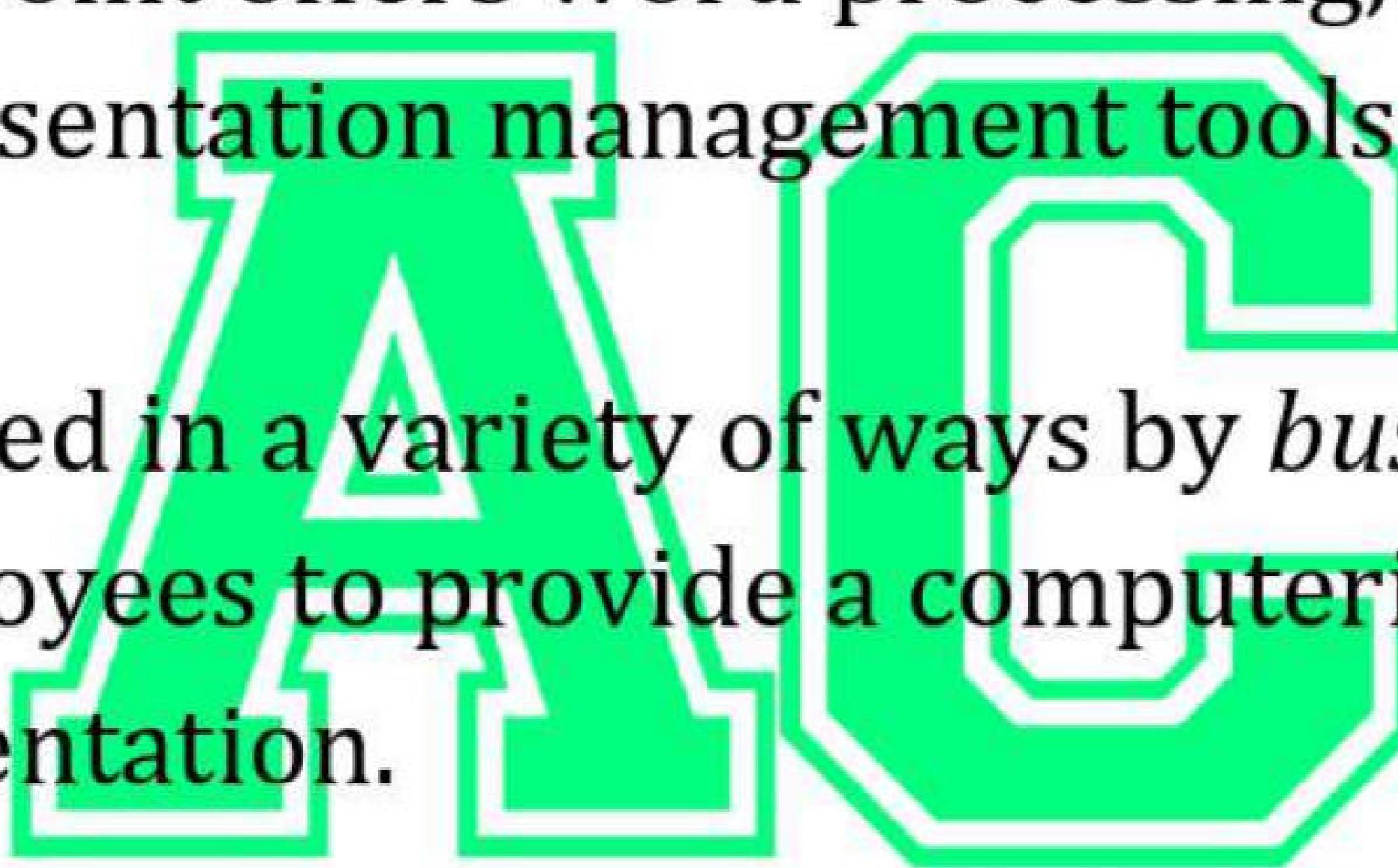
- A **Wide Area Network** is a network that extends over a large geographical area such as states or countries.
- A Wide Area Network is quite bigger network than the LAN.
- A Wide Area Network is not limited to a single location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.
- The internet is one of the biggest WAN in the world.
- A Wide Area Network is widely used in the field of Business, government, and education.

10) Compare analog, digital and hybrid computer.

Analog Computer	Digital Computer	Hybrid Computer
It operates on continuous data like temperature, speed, pressure.	It operates on discontinuous data like 0 and 1.	It has the combined features of both analog and digital computer.
It operates by measuring and comparing.	It operates by counting and calculation.	It can operate on both continuous and discontinuous data.
It generates output as a continuous wave by plotting values.	It generates output after complete computation.	It can convert analog data into digital and vice-versa.
It is a special purpose computer.	It is a general purpose computer.	It is a special purpose computer.
Its accuracy is low.	Its accuracy is high.	Its accuracy is high.
It is more expensive.	It is Less expensive.	It is more expensive.
It has either very low or no any storage capacity.	It usually has high storage capacity.	It usually has high storage capacity.
It cannot be reprogrammed.	It can be reprogrammed.	It can be reprogrammed.
Example: Presley	Example: Desktop PC, Laptop.	Example :- It Used in hospitals, rocket launching, weather forecasting, industry, aviation.

11) Explain the Microsoft PowerPoint presentation.

- **Microsoft PowerPoint** is a powerful *presentation software* developed by **Microsoft**.
- It is a standard component of the company's *Microsoft Office suite* software, and is bundled together with *Word, Excel* and other office productivity tools.
- The program uses slides to convey information rich in multimedia.
- Microsoft PowerPoint is a complete *presentation graphics package*.
- It gives you everything you need to produce a professional-looking presentation.
- Microsoft PowerPoint offers word processing, outlining, drawing, graphing, and presentation management tools all designed to be easy to use and learn.
- It is commonly used in a variety of ways by *business, education* and *government* employees to provide a computerized "slide- show for enhancing a presentation.



12) What is Multimedia ?

→ **Multimedia** is a form of communication that combines different content forms such as *text, audio, images, animations, or video* into a single interactive presentation, in contrast to traditional mass media which featured little to no interaction from users, such as printed material or audio recordings.

The term "Multimedia" was coined by singer and artist Nob Goldstein in 1966.

13) Explain antivirus.

- **Antivirus** is computer software that may prevent, detect, and remove malware in a single system or device.
- It protects the system from viruses and provides much more protection.
- It also protects the system against worms, Trojan horses, spyware, adware, and other harmful threats.
- The user may run the antivirus program in the background and continue with his daily tasks.
- It scans PCs, servers, and mobile devices and protects the system against harmful software.
- Most antivirus software offers real-time protection.
- These antivirus software packages operate continuously in the computer system, alerting the user when there is a threat and protecting the system from harm. As a result, it is a better technique for protecting systems, data, and resources.
- Antivirus software includes *Norton, AVG, Avast, Kaspersky, McAfee and Bitdefender*.

14) Define scanner. Explain types of scanner.

- A **scanner** is a device that converts physical documents into digital images that can be stored on a computer. It uses a scanning head with sensors to capture the image as light or electrical charges. Scanners can be used for many purposes, including backing up, archiving, and sharing documents.



Types of Scanner :-

- **Flatbed Scanner :-** It is the most commonly used type of optical scanner which is readily available in the market. The documents are placed on a flat surface by lifting the cover and then the lid is closed after placing the documents. It is easy to operate and user friendly. It can be used to scan a wide variety of documents such as books, magazines and images. Some flatbed scanners also come equipped with Bluetooth or wireless technologies as well as automatic feeders which makes the process easy and simple.
- **Sheetfed Scanner :-** The main characteristic of a sheetfed scanner is that they are specifically designed to handle loose sheets of paper. These scanners are great in scanning enormous amount of paper sheets. They are generally a little smaller than flatbed scanners and feature a lesser image resolution. They are mainly used by business and offices who have a limited amount of space. Sheetfed scanners are fast in terms of paperweight and size (pages per minute). They are equipped with a feeder tray which automatically feeds into the scanner.



- Drum Scanner :-** The drum scanner rotates scanned page around a drum for faster scanning. It scans with a photomultiplier tube rather than a charge-coupled device which is used in flatbed scanners. The drum scanners use photomultiplier tubes which are excessively sensitive to light. The image is mounted on the glass tube available in the scanner and when the scanning starts the light is moved on top of the image while the photomultiplier tubes (PMT) pick up its reflection and process it. Drum scanners are generally known for their high resolution.



15) Difference between LAN , MAN and WAN.

LAN	MAN	WAN
LAN is a group of computers connected to each other in a small area such as office, schools, universities, organizations, etc.	A MAN is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network.	A WAN is a network that extends over a large geographical area such as states or countries.
LAN stands for " <i>Local Area Network</i> ".	MAN stands for " <i>Metropolitan Area Network</i> ".	WAN stands for " <i>Wide Area Network</i> ".
LAN is a wired network, i.e., all the computers and printers are connected through wires.	The connections in MAN are connected through modem or cables/ wires.	The network of WAN is connected through broadband services, 3G or 4G internet services, etc.
The ownership of LAN is private.	The ownership of MAN might be public or private.	The ownership of WAN might be private or public.

The internet speed of LAN is very high, i.e., 1000 Mbps.	The speed of MAN is moderate, i.e., 44-155 Mbps.	The speed of WAN is relatively less than MAN and LAN, i.e., 150 Mbps.
The maintenance cost of LAN is easy.	The maintenance cost of MAN is difficult.	The maintenance cost of WAN is difficult.
The bandwidth of LAN is high.	The bandwidth of MAN is less.	The bandwidth of WAN is relatively low.
Example : College, School, University and Hospital.	Example : City and Building.	Example : Broadband & internet throughout the country or continent.

16) Difference between Compiler and Interpreter.

Feature/ Characteristic	Compiler	Interpreter
Translation Method	Translates complete program at once if the program is free from syntax error.	Translates one line statement at a time if the statement is free from syntax error.
Error Identification	Identifies error only after compiling the complete program.	Identifies error after interpreting each line.
Translation Speed	Extremely fast	Slow
Debugging	Difficult and time-consuming	Easier and faster
Program Size	Usually a larger program and requires larger memory space.	Smaller program and requires less memory space.

Object Code	Saves object code for future reference	Doesn't save object code for future reference.
Usage in New Programming Languages	Most new programming languages don't use a compiler.	Most new programming languages use an interpreter.
Examples of Programming Languages	C, C++, Java	BASIC, Visual Basic, C#

The End

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