

**NETWORKING & SYSTEM ADMINISTRATION LA B****Experiment No.: 1****Aim:**

Identify the major components of a computer such as Motherboard, RAM modules, Daughter guards, Bus slots, SMPS, internal storage device and interfacing ports.

**Motherboard**

A motherboard is the main printed circuit board in general-purpose computers and other expandable systems. It holds and allows communication between many of the crucial electronic components of a system, such as the central processing unit and memory, and provides connectors for other peripherals. The motherboard serves as a single platform to connect all of the parts of a computer together. It connects the CPU, memory device, optical device, video device, sound card, and other ports and expansion cards directly or via cables.

Computer motherboard components and the functions are,

- 1) USB
- 2) Parallel port
- 3) CPU chip
- 4) RAM slots
- 5) Floppy controller
- 6) IDE controller
- 7) PCI slot
- 8) Mouse and keyboard.

A motherboard also known as the “main board” is the central circuit hub that allows connection between all components and peripherals attached to the computer. It also allows all the components such as CPU, graphics card, hard drive and the memory to receive power from the attached power supply.

**RAM Modules**

RAM stands for random access memory. It is also called RAM chip. It is often used as a general term used to describe SIMM, DIMM, and SO-DIMM memory.

RAM (Random Access Memory) is the hardware in a computing device where the operating system (OS), application programs and data in current use are kept so they can be quickly reached by the

**Name: Aswathi P****Roll No:38****Batch:S2 MCA****Date:19-03-2022**

device's processor. RAM is the main memory in a computer. It is much faster to read from and write to than other kinds of storage, such as a hard disk drive (HDD), solid- state drive (SSD) or optical drive.

Random Access Memory is volatile. That means data is retained in RAM as long as the computer is on, but it is lost when the computer is turned off. When the computer is rebooted, the OS and other files are reloaded into RAM, usually from an HDD or SSD.

## Function of RAM

Because of its volatility, RAM can't store permanent data. RAM can be compared to a person's short-term memory, and a hard disk drive to a person's long-term memory. Short-term memory is focused on immediate work, but it can only keep a limited number of facts in view at any one time. When a person's short-term memory fills up, it can be refreshed with facts stored in the brain's long-term memory.

A computer also works this way. If RAM fills up, the computer's processor must repeatedly go to the hard disk to overlay the old data in RAM with new data. This process slows the computer's operation.

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RAM modules

A computer's hard disk can become completely full of data and unable to take any more, but RAM won't run out of memory. However, the combination of RAM and storage memory can be completely used up

## **Daughter guards**

A daughter guards is connected directly in motherboard. Alternatively known as a bus slot or expansion port, an expansion slot is a connection or port inside a computer on the motherboard or riser card. it provide an installation point for a hardware expansion card to be connected.

daughter guards are usullay directly embedded through soldering like a motherboard, a daughter guards has sockets, pins, plugs and connectors to be a attached to other boards. typically, daughter guards are released as a post-launch update to a motherboard or expansion card. for example, a MIDI daughter guards is used to add on the functionally of the sound card.



## **SMPS**

A switched-mode power supply is an electronic power supply that incorporates a switching regulator to convert electrical power efficiently. Like other power supplies, an SMPS transfers power from a DC or AC source to DC loads, such as a personal computer, while converting voltage and current characteristics.

Like other power supplies, an SMPS transfers power from a DC or AC source (often mains power, see AC adapter) to DC loads, such as a personal computer, while converting voltage and current characteristics. Unlike a linear power supply the pass transistor of a switching-mode supply continually switches between low-dissipation, full-on and full-off states, and spends very little time in the high dissipation transitions, which minimizes wasted energy. A hypothetical ideal switched-mode power supply dissipates no power. Voltage regulation is achieved by varying the ratio of on-to-off time (also known as *duty cycles*). In contrast, a linear power supply regulates the output voltage by continually dissipating power in the pass transistor. This higher power conversion efficiency is an important advantage of a switched-mode power supply.

Switched-mode power supplies can also be substantially smaller and lighter than a linear supply because the transformer can be much smaller. This is because it operates on the switching frequency which ranges from several hundred kHz to several MHz in contrast to the 50-60Hz which is typical for the mains AC frequency. Despite the reduction in size, the power

supply topology itself and the requirement for electromagnetic interference (EMI) suppression in commercial designs result in a usually much greater component count and corresponding circuit complexity.

Switching regulators are used as replacements for linear regulators when higher efficiency, smaller size or lighter weight are required. They are, however, more complicated; switching currents can cause electrical noise problems if not carefully suppressed, and simple designs may have a poor power factor.

### **Benefits of SMPS**

- I. The switch mode power source is small in scale.
- II. The SMPS is very lightweight.
- III. The SMPS production range is large.

### **Limitations of SMPS**

- I. The complexity of SMPS is very large.
- II. Use of SMPS can only be a step down regular.
- III. In SMPS, the voltage output is just one.

### **Internal Storage Devices**

Most computers have some form of internal storage. The most common type of internal storage is the **hard disk**. At the most basic level, internal storage is needed to hold the operating system so that the computer is able to access the input and output devices.

Internal storage is the storage of the private data on the device memory. By default these files are private and are accessed by only your application and get deleted, when user delete your application.



There are three main categories of storage devices: **optical, magnetic and semiconductor**.

There are basically two kinds of internal memory: **ROM and RAM**. ROM stands for read-only memory. It is non-volatile, which means it can retain data even without power.

### What are the 5 types of storage?



### What are examples of internal storage devices?

- Hard Disk Drives. A hard disk drive (also known as a hard drive, HD, or HDD) can be found installed in almost every desktop and laptop computer. ...
- Floppy Disks. ...
- Tapes. ...
- Compact Discs (CDs) ...
- 10 Parts of a Motherboard and Their Function.
- 4 Examples of Different Computer Types.
- DVD and Blu-ray Discs. ...
- USB Flash Drives.

### External storage devices

- External HDDs and SSDs. ...
- Flash memory devices. ...
- Optical Storage Devices. ...
- Floppy Disks. ...
- Primary Storage: Random Access Memory (RAM) ...

- Secondary Storage: Hard Disk Drives (HDD) & Solid-State Drives (SSD) ...
- Hard Disk Drives (HDD) ...
- Solid-State Drives (SSD)

## **Interfacing port**

A port is a hardware interface that connects devices together. The port transfers electrical signals between the device and the computer. For example, an electrical wired plug.

### **What are the types of ports?**

**There are different types of ports available:**

- Serial port.
- Parallel port.
- USB port.
- PS/2 port.
- VGA port.
- Modem port.
- FireWire Port.
- Sockets.

### **Characteristics of Ports**

- External devices are connected to a computer using cables and ports.
- Ports are slots on the motherboard into which a cable of external device is plugged in.
- Examples of external devices attached via ports are the mouse, keyboard, monitor, microphone, speakers, etc.

#### What are characteristic Serial Ports?

A serial port carries out a serial communication interface and can transfer only one bit at a time. Moreover, it generally denotes RA-232 or other related standards like RS-422, RS-485, etc. Besides, these ports are usually present on the back of the computer and are part of the motherboard.

The ports are the physical docking points present in the computer through which the external devices are connected using cables. Or in other words, a port is an interface between the motherboard and an external device of the computer.

There are different types of ports available: Serial port. Parallel port.

Ports are slots on the motherboard into which a cable of external device is plugged in.

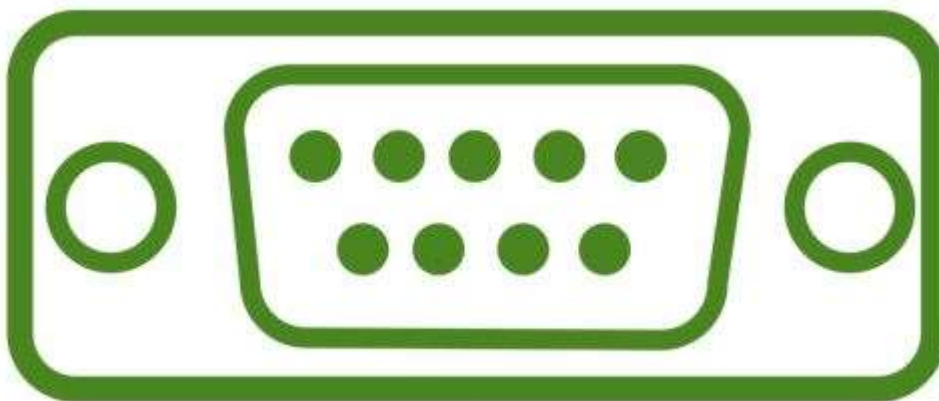
Examples of external devices attached via ports are the mouse, keyboard, monitor,

microphone, speakers, etc.

### 1. Serial port (COM Port):

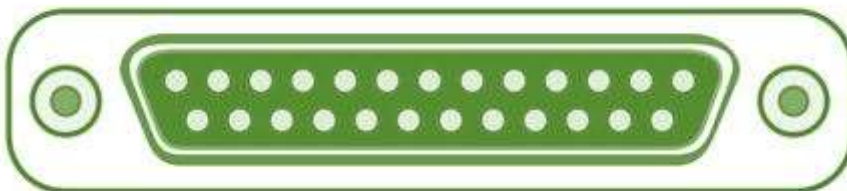
A serial port is also called a communication port and they are used for connection of external devices like a modem, mouse, or keyboard (basically in older PCs). Serial cables are cheaper to make in comparison to parallel cables and they are easier to shield from

interference. There are two versions of it, which are 9 pin model and 25 pin model. It transmits data at 115 KB/sec.



### 2. Parallel Port (LPT ports)

Parallel ports are generally used for connecting scanners and printers. It can send several bits at the same time as it uses parallel communication. Its data transfer speed is much higher in comparison with the serial port. It is a 25 pin model. It is also known as Printer Port or Line Printer Port.

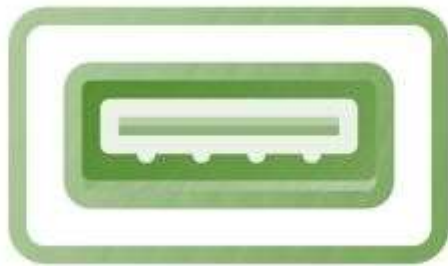


### 3. USB (Universal Serial Bus):

In 1997 USB was first introduced. This can connect all kinds of external USB devices, like external hard disk, printer, scanner, mouse, keyboard, etc. There are minimum of two USB Ports provided in most of the computer systems. It is a kind of new type serial connection



Port that is much faster than the old serial Ports and These USB Ports are much smarter and more versatile, as it allows the “daisy chaining” of up to 127 USB peripherals connected to one port. The data transfer rate in this is Data12 megabits per second. It also provides plug & plays communication.



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#### 4. PS/2 Port:

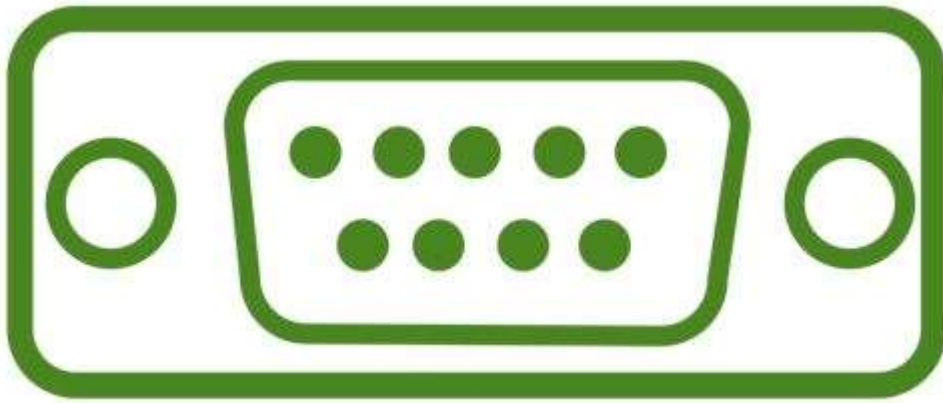
PS/2 ports are special ports used for connecting old computer keyboard and mouse. It was invented by IBM. In old computers, there are minimum of two PS/2 Ports, each for the keyboard and the mouse. It is a 6 pin mini Din connector.



#### 5. VGA Port:

VGA ports also known as Video Graphic Array connector are those which connect the monitor to a computer's video card. VGA port has 15 holes and it is similar to the serial port connector. But VGA Ports have holes in it and the serial port connector has pins in it.





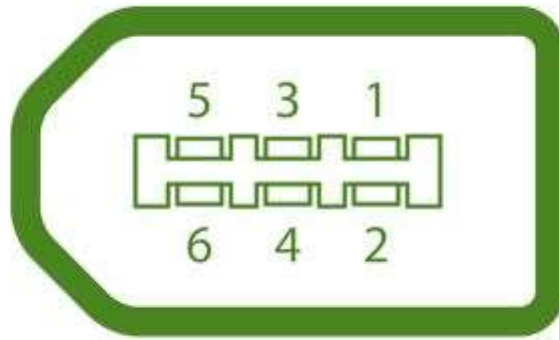
## 6. Sockets:

Microphones and speakers are connected with the help of Sockets to the sound card of the computer.



## 7. FireWire Port:

The IEEE 1394 interface, which is developed in the late 1980s and early 1990s by Apple as FireWire. It can transfer large amount of data at very high speed. It is used to connect camcorders and video equipment to the computer. It comes up with three variants which are 4-Pin FireWire 400 connector, 6-Pin FireWire 400 connector, and 9-Pin FireWire 800 connector.



### 8. Infrared Port:

An Infrared(IR) port is used to send and receive infrared signals from other devices. It is a kind of wireless type port with a limited range of 5-10ft.



### 9. Game Port:

These ports are used previously to connect a joystick to a PC. But nowadays it is replaced by USB ports.

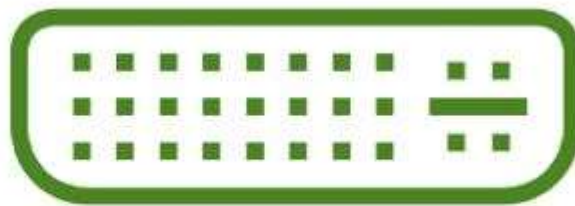
### 10. Modem Port:

As the name suggests, a Modem port is used to connect a PC's modem to the telephone network.



### 11. Digital Video Interface(DVI) Port:

DVI Port is used to connect LCD(flat panel) monitor to the computer's high-end video graphic cards and it is very popular among video card manufacturers.



### 12. Ethernet Port:

Ethernet Port helps to connect to a network and high-speed Internet(provided by LAN or other sources). It connects the network cable to a computer and resides in a Ethernet card. It provides a data travel speed of 10 Mb to 1000 Mb(megabits) per second.

