Experiment: 1 **Date:6/02/24**

AIM:

To identify the major components of a computer system such as motherboard, ram modules, daughter cards, SMPS, bus loads, internal storage devices and interfacing ports. Specification of desktop and server class computers. Installation of common operating system for desktop and server use.

COMPUTER HARDWARE

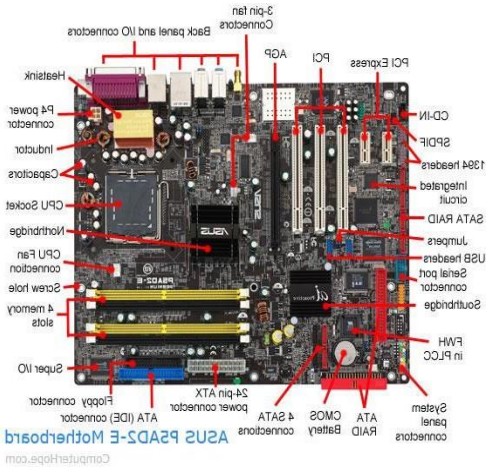
Computer hardware includes the physical parts of a computer, such as the case, central processing unit (CPU), monitor, mouse, keyboard, computer data storage, graphic cards, sound card, speakers and motherboard.

By contrast, software is the set of instructions that can be stored and run by hardware. Hardware is so-termed because it is "hard" or rigid with respect to changes, whereas software is "soft" because it is easy to change.

Hardware is typically directed by the software to execute any command or instruction. A combination of hardware and software forms a usable computing system, although other systems exist with only hardware.

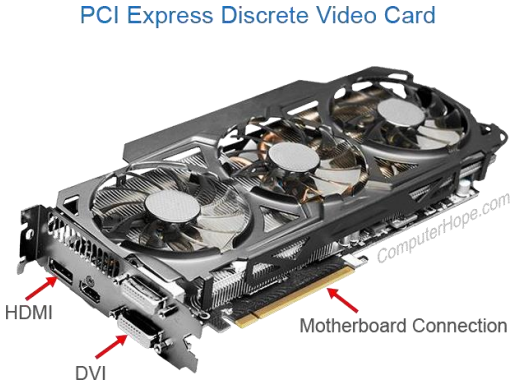
MOTHERBOARD

The motherboard serves as a single platform to connect all of the parts of a computer together. It connects the CPU, memory, hard drives, optical disk, video card, sound card, and other ports and expansion cards directly or via cables. It can be considered as the backbone of a computer. Motherboard contains ports to connect all of the internal components. It holds together many of the crucial components of a computer, including central processing unit, memory and connectors for input and output devices.



GPU(GRAPHIC PROCESSING UNITS)

GPUs also known as graphic cardsor video cards or graphics cards. In order to display pictures, videos, audios, and 2D or 3D animations, each device uses a GPU. A GPU performs fast calculations of arithmetic and frees up the CPU to do different things.



CMOS (COMPLEMENTARY METAL OXIDE SEMICONDUCTOR):

CMOS is a combination of NMOS and PMOS transistors that operates under the applied electrical field. The structure of CMOS was initially developed for high density and low power logic gates.

HDMI (HIGH DEFINITION MULTIMEDIA INTERFACE):

It is an all digital audio-video interface which transmits signals in uncompressed format,

Eg: uncompressed video data and compressed or uncompressed digital data from a HDMI-compliant source device to a computer monitor, video projector, digital television…etc.

SMPS

SMPS is an electronic power supply system that makes use of switching regulator to transfer electrical computer power effectively.

It is a PSU

(POWER SUPPLY UNIT) and is usually used in computers to change the voltage to the appropriate range for the

DGA (DOMAIN GENERATION ALGORITHM)

It is a techniqueused by cyber attackers to generate new domain names and IP addresses for malware's command and control servers.

COOLING FAN

A computer is any fan inside, or attached to, a computer case used for active cooling. Fans are used to draw cooler air into the case from the outside. Expel warm air from inside and move air across a heat sink to cool a particular component.

RAM MODULES

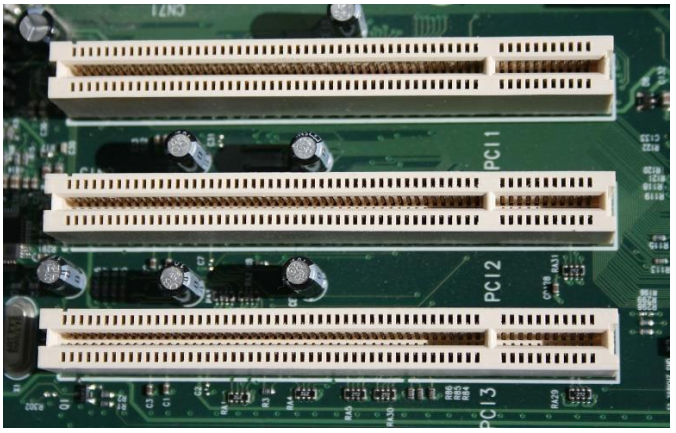
In computing, a memory module or RAM (random access memory) stick is a printed circuit board on which memory integrated circuit are mounted. Memory modules permit easy installation and replacement in electronic systems, especially computers such as personal computers, word stations, and servers. The first memory modules were proprietary designs that were specific to a model of computer from a specific manufacturer

DAUGHTER CARDS

A daughterboard (or daughter board , daughter card or daughtercard) is a circuit board that plugs into and extends the circuitry of another circuit board. The other circuit board may be the computer's main board (its motherboard) or it may be another board or card that is already in the computer, often a sound card. The term is commonly used by manufacturers of wavetable daughterboards that attach to existing sound cards.

BUS SLOT

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 provides an installation point for a hardware expansion card to be connected. For example, if you wanted to install a new video card in the computer, you'd purchase a video expansion card and install that card into the compatible expansion slot.



STORAGE DEVICES

A storage device is a kind of hardware, which is also known as storage, storage medium, digital storage, or storage media that has the ability to store information either temporarily or permanently. It is used to hold, port, and extract data files.

1) SSD (SOLID STATE DRIVE)

S SD is non-volatile storage device, it stores the data on flash memory chips and maintains the data in a permanent state, even when the power is off. As compared to electromechanical drives, SSDs have lower latency and access quickly. These storage devices store the data in the semiconductor cells.

Following are several types of SSDs:

SATA SSD: SATA is the acronym for 'serial advanced technology attachment'. Speaking of SSD type SSD is the most popular today.

M.2 SATA SSD: Its newer. and its format is lighter and smaller than the SATA SSD.

mSATA SSD: Its mini version of SATA. It has a smaller form factor mainly used in ultra-compact computers, laptops, mobile devices with an mSATA slot, in which the installation of an extended size SATA SSD is impossible.

2) HDD (HARD DISK DRIVE)

HDD is an electro mechanical storage device, which is an abbreviation of hard disk drive. It uses magnetic storage for storing and retrieving the digital data. It is a non-volatile storage device. Hard disk is installed internally in our computer systems, which is connecter directly to the disk controllers of the motherboard.HDD means data is retained when our computer system is shut down.

INPUT DEVICES/UNITS

An input device is essentially a piece of instrument or hardware that allows users to provide data, information, or control instructions to a computer used for interaction and control. Data is entered into a computer in a raw format, which is converted into computer understandable language by input devices and processed by a central processing unit (CPU) to produce output. Some common types of input devices are:

1) **KEYBAROD:** The keyboard is one of the primary input devices, which helps in entering data and commands in a computer. A normal keyboard is usually has a variety of keys, such as alphabetic character keys, function keys, number keys, arrow keys, and control keys. The keyboard can be connected to a computer using USB or BLUETOOTH.

2) **MOUSE:** Mouse is the most common and very popular pointing device that helps interact with a common through a process called 'point and click'. This is mainly used to move a cursor on the computer's screen and click on the corresponding object using buttons (usually left, right, and middle key roller buttons).

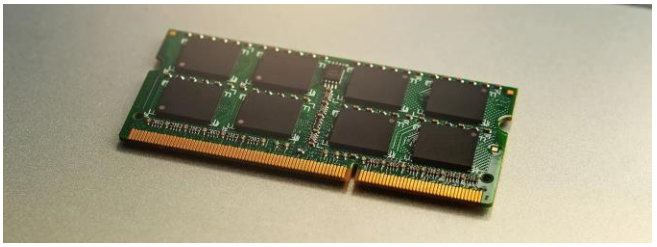
3) **SCANNER:** Scanner is an input device, which works more like a photocopy machine. It used when some information is available on paper and it is to be transferred to the hard disk of the computer for further manipulation.

PROCESSING UNIT

The part of a computer that performs logical and arithmetical operation on the data as specified in the instructions.

1) **CPU (CENTRAL PROCESSING UNIT)** A central processing unit is also called a processor, central processor, or microprocessor. It carries out all the important functions of a computer. It stores all important programs like operating systems and application software. It is often referred to as the brain of the computer.

2) **RAM (RANDOM ACCESS MEMORY):** Is a hardware device generally located on the motherboard of a computer of the CPU. It allows CPU store data, program, and program result when you switch on the computer.it is the read and write memory of a computer, which means the information can be written to it as well as read from it.



OUTPUT DEVICES/UNITS

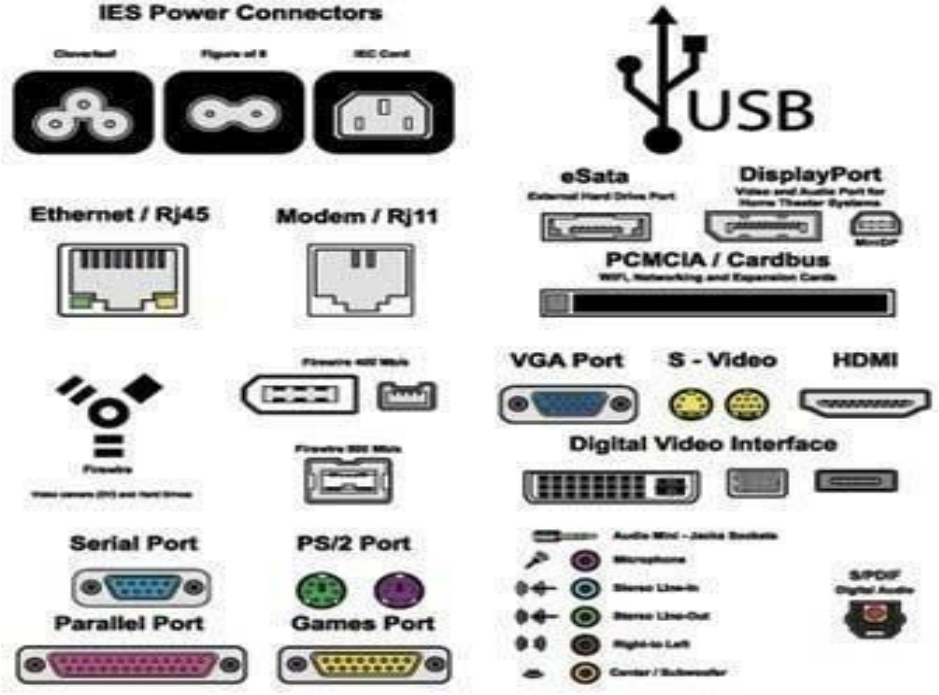
The output device displays the result of the processing of raw data that is entered in the computer through an input device. There are a number of output devices that displays output in different ways such as text, images, hard copies, and audio or video. Some popular output devices are

1) **MONITOR:** A monitor is a piece of computer hardware that accepts data from a computer and displays it on the system screen through the computers video card. Monitors have the ability to display information at much higher resolution. Additionally, these are much like televisions and also known as video screen, display, video display terminal, or video display unit.

2) **SPEAKERS:** The most common output devices, speakers accept sound data from a computer and play the sounds for users to hear.

3) **PROJECTOR:** Projector is an output device that accepts data from a computer and projects that data or information as a picture onto a wall or screen or any large surface.

INTERFACING PORTS: A port is a physical docking point using which an external device can be connected to the computer. It can also be programmatic docking point through which information flows from a program to the computer or over the Internet.



DESKTOP: A desktop computer is a personal computer designed for regular use at a single location on or near a desk due to its size and power requirements. The most common configuration has a case that houses the power supply, motherboard (a printed circuit board with a microprocessor as the central processing unit, memory, bus, certain peripherals and other electronic components), disk storage (usually one or more hard disk drives, solid state drives, optical disc drives, and in early models a floppy disk drive); a keyboard and mouse for input; and a computer monitor, speakers, and, often, a printer for output. The case may be oriented horizontally or vertically and placed either underneath, beside, or on top of a desk.