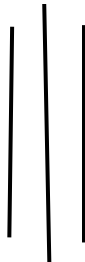


# CRIMSON COLLEGE OF TECHNOLOGY

( AFFILATED TO POKHARA UNIVERSITY )

Butwal – 13, Devinagar



## Lab Report on CPU

### **Submitted By:**

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## **Lab Report:** Introduction to Desktop / Workstation ( CPU ) and Disassembling / Assembling process.

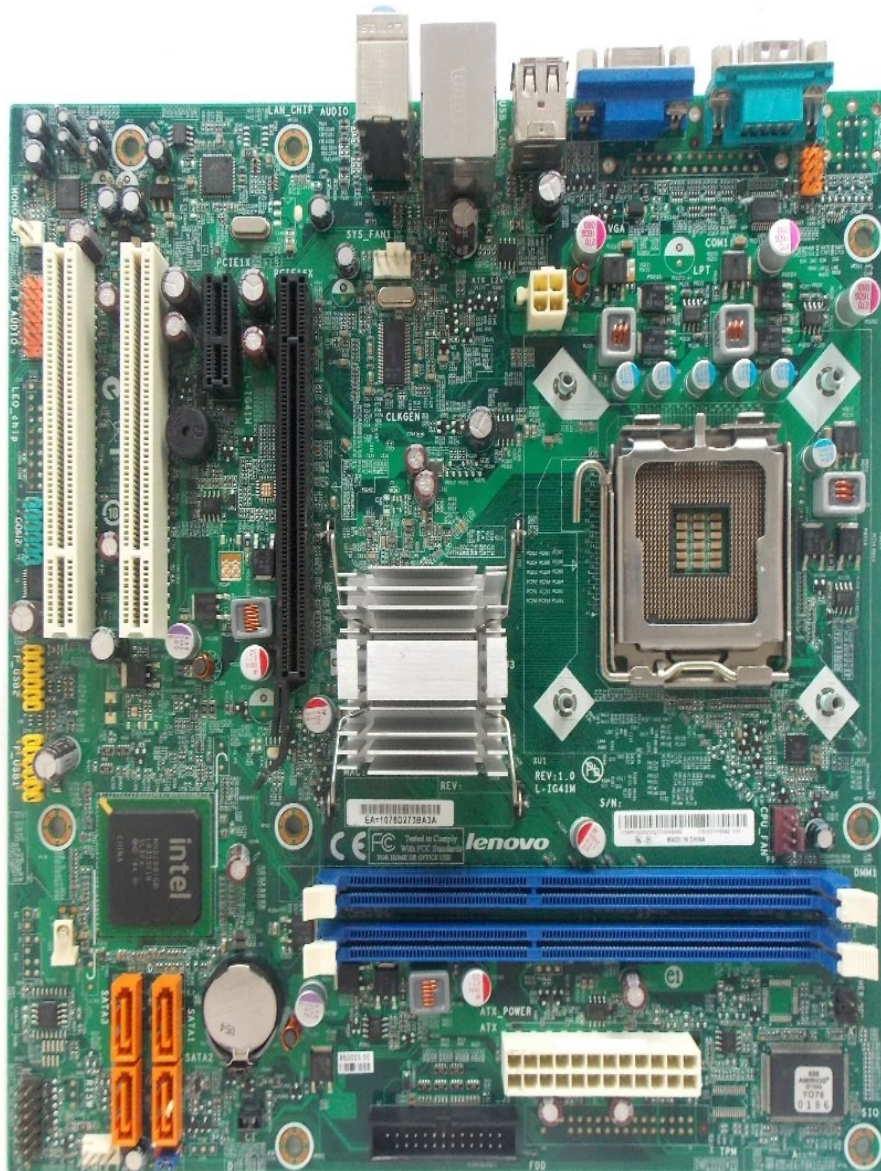
### **Introduction:**

This laboratory report is intended to give an overview of the major components of a desktop computer, focusing on the CPU. It also describes the step-by-step process of disassembling and assembling a desktop computer. Such knowledge is important for anyone interested in computer hardware, either out of curiosity, academically, or even for professional purposes. Practical experience with such processes will ensure that the individual can understand how computers work, be able to troubleshoot hardware problems, and upgrade or repair them with confidence.

### **Objectives:**

The main objectives of this lab report are to:

1. **Understand Desktop Components:** The different components of a desktop computer, such as CPU, motherboard, RAM, storage devices, power supply, and peripheral devices. This includes knowledge of the functioning and importance of each component concerning the overall working of the computer.
2. **To Learn the Disassembling Process:** Acquire the skills and knowledge required to safely and effectively disassemble a desktop computer, identify each component and remove it, understand the connections and interfaces, and follow proper safety protocols to prevent damage to the hardware.
3. **To Learn the Assembling Process:** The process of reassembling the desktop computer, installation and connection of all components, applying thermal paste on the CPU, securing the cooling system, connecting power and data cables, and seating and functioning of all components.



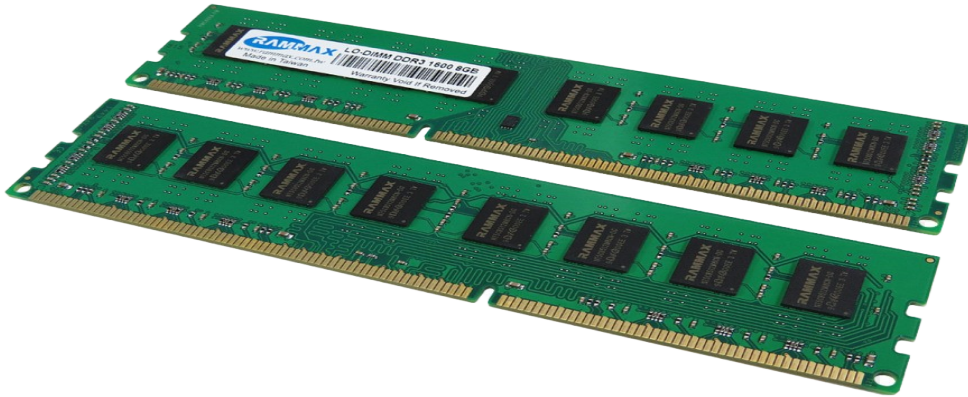
**Fig:- Motherboard**

# **Motherboard:-**

A motherboard generally is the largest printed circuit board inside the frame and working parts of a machine. It provides electricity and communicates to and between the central processing unit, random access memory, and every other component of the hardware of the computer. Motherboards are varied, with each designed to be compatible with only a certain model and size of the computer. Since various types of processors and memories are designed to function optimally with particular types of motherboards, it is pretty difficult to find a motherboard that will be compatible with all other types of CPUs and memory. Hard drives, on the other hand, tend to be universal to many different motherboards and can be used in most brands and types.

The point of connection for most of the elements and peripherals, could house the computer motherboard. When it comes to tower computers, one can seek a motherboard either on the right or the left side of the tower-the most sizeable circuit board. The first motherboards of personal computers included relatively fewer real components. The very first IBM PC motherboard had only a CPU and some card ports. Users inserted various components, including memory and controllers for floppy drives, into the slots provided. Compaq was the first company to use a motherboard not designed based on an IBM design. The new architecture was powered by a CPU provided by Intel. As soon as Compaq's sales took off, other businesses followed suit in rapid succession even though several companies within the industry thought it was a kind of gamble.

But by the 1990s, Intel had already dominated the market for personal computer motherboards. Asus, Gigabyte Technology, and Micro-Star International or MSI are the three most influential companies in the field of motherboard making. Intel is no longer one of the ten best motherboard manufacturers in the world, although Asus is now the largest motherboard maker on the planet.



**Fig:- RAM ( Random Access Memory )**



**Fig:- SATA Cable**

**SATA Cable:** SATA cable can mainly be used to connect an internal hard drive to the mother board of a computer, and connecting a hard drive to another. The ATA, ATAPI that are connected to the central computer motherboard are connected to an external computer.

The SATA interface provides very fast and high-performance connections from the hard drive to the motherboard. Through the SATA cable, version 1 transfers 1.5 GB data per second, version 2 transfers 3 GB data per second, while the third one can transfer 6 GB data per second.

### **Types of SATA Cable:**

1. **Micro SATA:** Combined micro SATA, Molex 5V power, and SATA data cable for internal drives and backplane applications.
2. **SATA Bracket:** Dual-port e-SATA expansion brackets to make your computer outputs compatible with e-SATA drives.
3. **SATA Bridge:** Seamlessly connects ATA devices to a SATA motherboard or PCI card.
4. **e-SATA:** External connections to your computer, cable lengths 0.5 to 2m long.

**RAM (Random Access Memory ):** RAM, or Random Access Memory, is the section of a computer's temporary storage that holds data while a computer is running. It's termed "random access" since any part of this memory is directly accessible and fast. The RAM somewhat resembles something 'memory' in the Human Brain. The memory of the human brain is one of the most important roles played by the brain. It is very helpful in remembering things; due to memory, a person remembers his past, and the same thing goes for computers; they also have memories.

### **Types of RAM:**

1. **Static RAM:** The SRAM stands for Static RAM. In this type of RAM, the data is represented by the state of a six transistor memory cell. Static RAM is primarily used as a cache memory for the processor or CPU.
2. **Dynamic RAM:** DRAM means Dynamic Random Access Memory. It's a type of RAM that stores each bit of data in an independent capacitor on a specific integrated circuit. The dynamic RAM has become the computer's standard memory over the years, used for the majority of today's modern desktop computers.



**Fig:- Hard-disk Drive**

# **Hard-disk Drive:-**

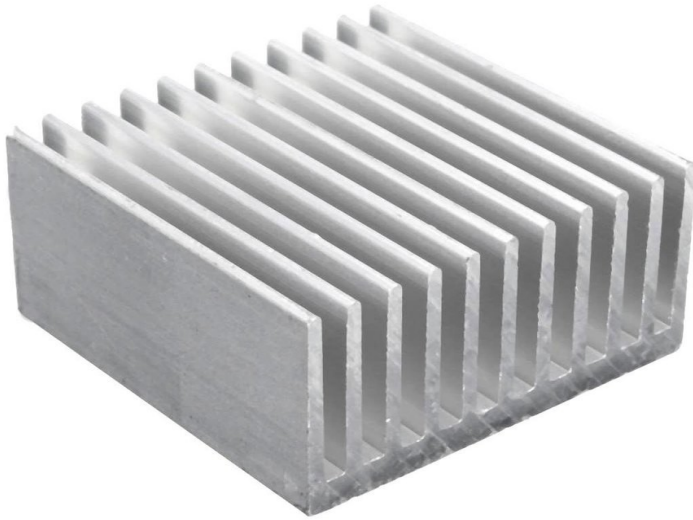
A hard disk drive of a computer is a non-volatile device for data storage. Non-volatile means retaining stored data on shutdown of the device. All computers require storage devices, and the hard disk drive is one device used for storing purposes.

Typically, HDDs are installed in desktop computers, mobile devices, consumer electronics, and enterprise storage arrays in data centers. They use magnetic disks for storing the operating system, software programs, and other types of files.

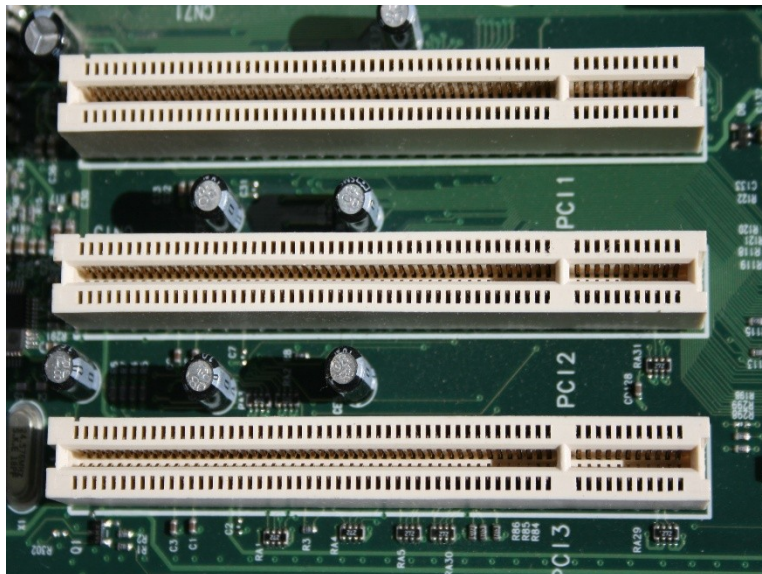
In particular, hard disk drives manage the reading and writing of a hard disk for data storage. Hard disk drives come into play in a computer as a primary or secondary storage device. They are located more often than not inside the drive bay. It also communicates with the motherboard using ATA, Serial ATA, parallel ATA, Small Computer System Interface or any similar formats. It also has an interface connected to the power supply unit; however, a hard disk drive is able to hold information stored for as long as it does not receive any power.

A hard disk drive-hard drive for short-and hard disk are not the same thing, but they come together in one package and either term can be used to refer to the whole thing.





**Fig:- Heat Sink**



**Fig:- PCI Slot**

**PCI Slot:-** Peripheral Component Interconnect or, in short PCI, is an old local computer bus. It is used to connect hardware devices internally within the computer. Besides, the PCI is a part of the standard of the PCI bus. Furthermore, detailed information about the PCI slot will be given in this article by MiniTool.

PCI bus supports the functions present on the processor bus with a standardized format different from any specific processor's native bus. The PCI slot refers to an embedded slot on a device, which lets you attach various hardware components such as network cards, sound cards, disk controllers, and other kinds of peripherals. These can be referred to as PCI devices.

The PCI slot usually is used as a component of conventional do-it-yourself desktop computer. Hence, PCI is also referred to as conventional PCI. With the occurrence of the successor PCI Express, PCI slot gradually get obsolete. Even so, it is still in use.

**Heat Sink:-** The heat sink is a device used in electronic equipment to prevent overheating. It is usually made from materials that are good conductors of heat, such as aluminum or copper. The heat sink always rests on top of parts, such as the CPU in a computer, and helps pull heat away from these components. It does this through a series of fins that allow the heat to escape.

Heat sinks usually are passive in nature, but in many cases, along with a blowing fan to take the hot air ahead or a liquid cooling mechanism wherein the heat would be transferred as it moves on through pipes to help increase effectiveness in cooling efficiency of the heatsink for electronic devices.

### **How Does a Heat Sink Work?**

Here's how this device keeps your system from overheating:

#### **1. Absorbing Heat**

See, heat sinks work like a giant metal sponge that absorbs heat. This means it is kept right on top of that portion of the computer where heating occurs, like the CPU part. Through this thermal paste, these two surfaces-the heat sink with a layer of thermal paste-will be able to suck as much heat as possible. This is paste which fills up all small dents and helps heat to move from CPU to heat sink to be dissipated more effectively.

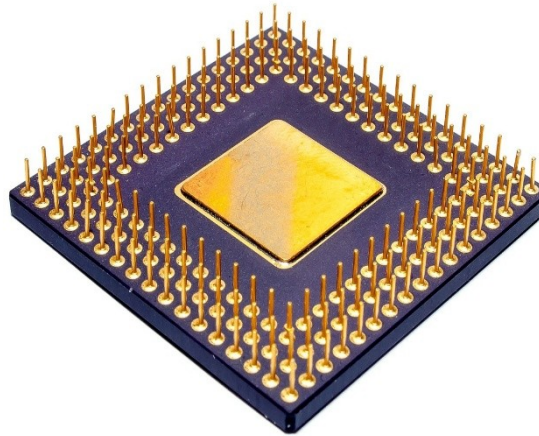


**Fig:- CPU Cooler**

**CPU Cooler:-** A CPU cooler is very important in your computer for sustaining performance and longevity. It serves to dissipate heat from the CPU, hence preventing overheating, which may lead to damage.

There are two major types of CPU coolers:

1. **Air Coolers:** These use a combination of a heatsink and a fan to draw heat away from the CPU. Generally, they are more affordable and easier to install.
2. **Liquid Coolers:** These would involve a liquid coolant to take away heat from the CPU. Much more effective at cooling, but they can also be more costly and complicated to set up.



**Fig:- CPU Chip**

**CPU Chip:-** The Central Processing Unit, or CPU chip, is the computer's brain. It performs all the calculations and work that take place to run programs and applications. It is the primary components responsible for executing instruction for a computer system.

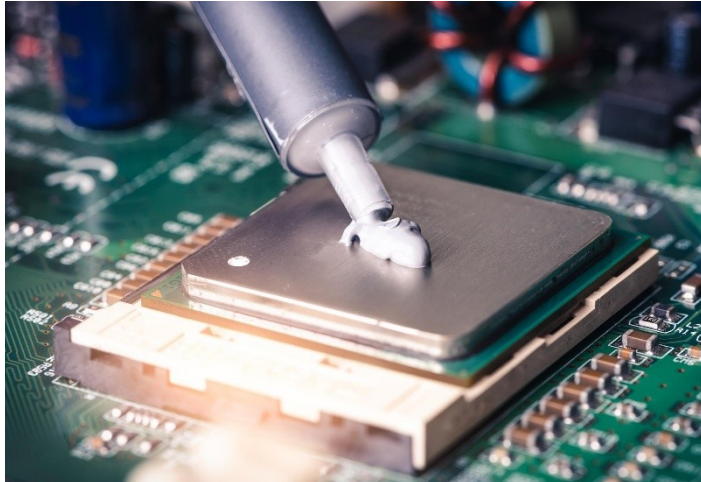
Following is a rundown of important considerations about the CPU chips:

**Core Count:** Modern CPUs are multicores, meaning they can run multiple tasks all at once. More cores generally mean better multitasking and performance.

**Clock Speed:** Measured in GHz, this indicates how fast the CPU can process instructions. Higher clock speeds usually mean better performance.

**Architecture:** This refers to the design and technology behind the CPU. Newer architectures often bring along improvements in both performance and energy efficiency.

**Cache:** This is a small amount of high-speed memory that is part of the CPU. It speeds up access to data and instructions that are used frequently.



**Fig:- Thermal Paste**

**Thermal Paste:-** Thermal paste (also called thermal grease or thermal compound) is a material which is used between the processor and the heat sink. You can buy small tubes of thermal paste from electronics stores, often with a small, shovel-like tool (an applicator).

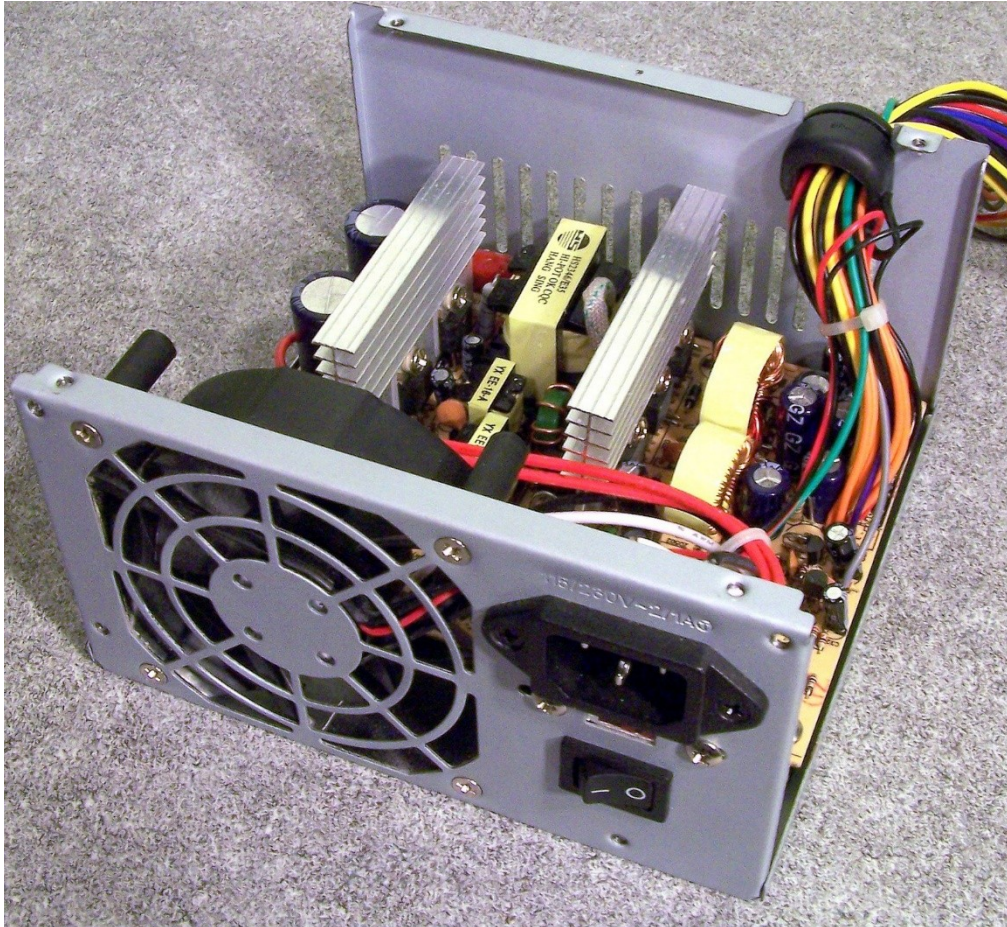
You'll want a tube of thermal paste when building a PC to keep your PC running smooth. Some CPU heat sinks have thermal paste applied to it already so that you can install it and go. Some hardware enthusiasts, however, will swear by and manually apply their favorite brand of thermal paste.

Thermal paste is responsible for providing an interface to transfer heat from the CPU to the heat sink, which discharges it away from the hardware. This will keep the CPU cool, especially when hard at work with the processing of tasks.

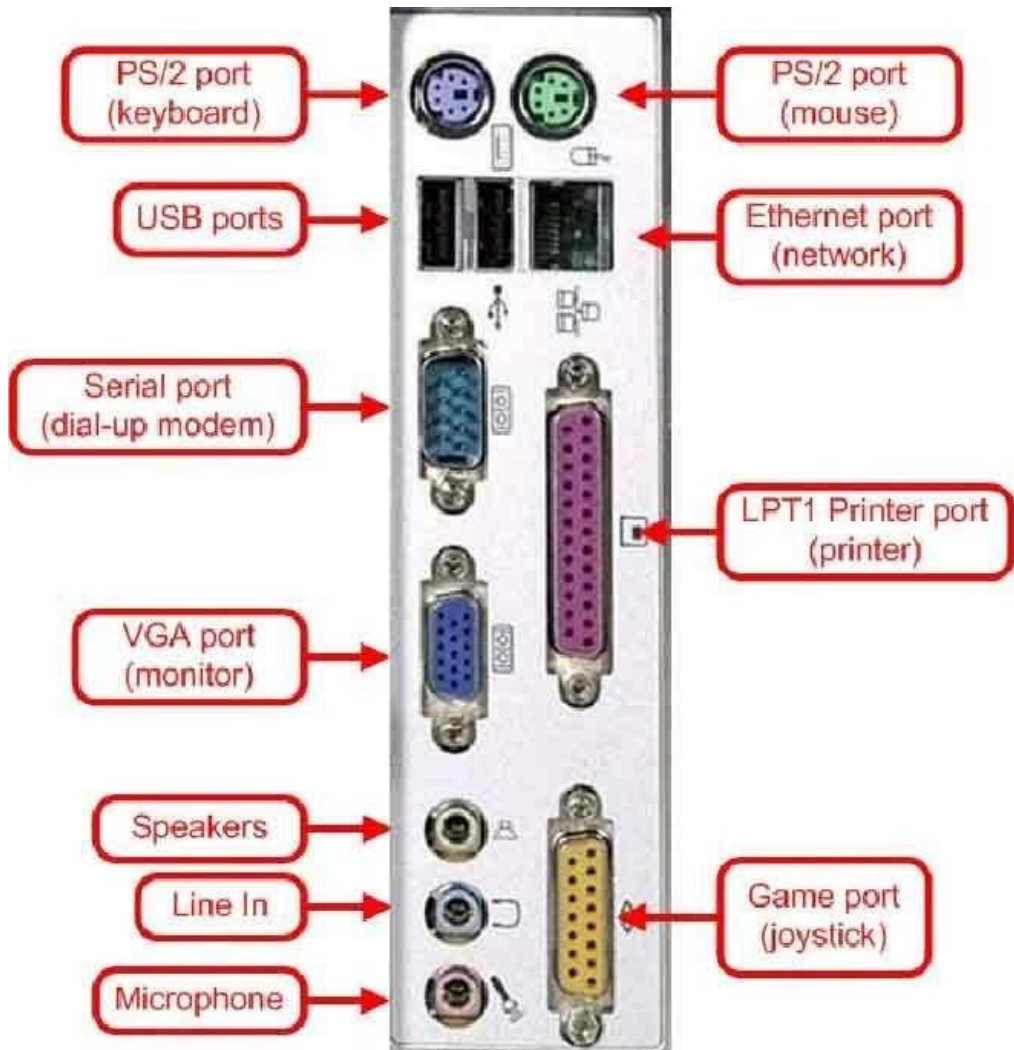
You may also find the term "stock thermal paste." This kind is thermal paste applied by the manufacturer, such as on a prebuilt machine. But the thing is, some manufacturers skimp out on the thermal paste and use some compound that is not very good at conducting heat.

As such, enthusiasts will often replace this stock thermal paste with their preferred brand of "aftermarket" paste---the stuff you buy off the shelves.





**Fig:- Power Supply**



**Fig:- Ports**

### **1) PS/2 port:**

The PS/2 port is a 6-pin mini-DIN connector, used for connecting keyboards and mouse. The keyboard port is typically purple, while the mouse port is green.

### **2) USB ports:**

USB (Universal Serial Bus) ports are widely used connectors that allow various peripherals & devices to be connected to computers & other electronic devices.

### **3) Ethernet port:**

An Ethernet port, also known as an RJ45 port, allows the computer to connect to a local network or the internet using an Ethernet cable.

### **4) Serial port:**

A serial port is a hardware interface used for serial communication between devices. Serial ports were commonly found on older computers and peripherals.

### **5) VGA port:**

A VGA (Video Graphics Array) port is a standard analog video interface used to connect displays, such as monitors or projectors, to computers and other devices.

### **6) LPT1 Printer port:**

LPT1, also known as the parallel port, is a legacy hardware interface used for connecting printers & other devices to computers.



## **Conclusion:-**

This lab provided participants with a comprehensive understanding of desktop/workstation components and hands-on experience in the disassembling and assembling processes. Acquiring these skills is invaluable for troubleshooting, upgrading and customizing computer systems, making it an essential practical exercise for individuals involved in the field of computer hardware.