

Assignment

Module 1: understanding of hardware and its components

Section1: multiple choice

1. Which of the following is not a component of the CPU?
 - A) ALM
 - b) RAM**
 - C) CU
 - D) 1 and 3 both

2. What is the function of RAM in a computer?
 - The full form of RAM is random access memory. It is the temporary memory of a computer which stores data in it, RAM is volatile which mean when you switch of the computer all the data will lost
 - The function of RAM is:
 - 1- Writing and reading data in RAM is much faster as compared to hard driver or SSD.
 - 2- RAM stores data and instruction only when the computer is on.
 - 3- RAM enables multiple application to run at same time without slowing down the system.
 - 4- RAM acts as buffer between the slower permanent storage and the fast processor.
 - 5- When program or file is opened it is transferred from the hard drive into RAM.

3. Which of the following is a primary storage device?
 - A) HDD
 - B) SSD
 - C) SD CARD
 - D) 1 & 2 BOTH**

4. What is the purpose of a GPU?

The Graphics Processing unit is a special electronic chip in a computer which designed to create and display images, video and animation on the screen. It's kind of the artist of the computer which responsible for drawing everything which we see. It also coverts data into pictures, videos.

Section 2: True or False

5. The motherboard is the main circuit board of a computer where other components are attached.

TRUE

6. A UPS (Uninterruptible Power Supply) is a hardware device that provides emergency power to a load when the input power source fails.

TRUE

7. An expansion card is a circuit board that enhances the functionality of a component.

TRUE

Section 3: Short Answer

- 8 Explain the difference between HDD and SSD.

HDD-

- A data storage device used as secondary storage in computer.
- Stores data in binary form.
- Operating system, software and files are stored here.
- It's having components like DISK PLATTER, STEPPER, SPINDER MOTOR AND READ/WRITE HEAD which are used to stored and retrieve data.

SSD-

- A Storage device that uses non-volatiles flash memory
- Retains data when power is off.
- It performs in high speed and time then HDD and there no mechanical failure.
- The components used in SSD are NAND FLASH MEMORY, CONTROLLER, CONNECTOR, AND FIRMWARE.
- HDD= PLATTER, MOTOR, READ/WRITE HEAD

- SSD= NAND FLASH, CONTROLLER, CASH/INTERFACE

9. Describe the function of BIOS in a computer system.

- The BIOS is stored in non-volatile EEPROM on the motherboard and contains startup instruction.
- When the power switch is turned on the hardware boot sequence begins.
- The chipset generates a reset signal to the CPU until power is stable.
- THE CPU reads the address in ROM which jumps to the start of the BIOS instruction.
- Other devices like disk drives, optional drives, sound card, NIC, and USB are activated.
- The post provides power to the motherboard speaker to broadcast speaker to broadcast error codes and checks if CPU, RAM, and circuits are functional.
- Searches for the operating system boot device.

10. List and briefly explain three input devices commonly used with computers.

11.KEYBOARD-

- the most common input devices, used to type letters, numbers, and commands into a computer.
- Consists of keys for letters, numbers, symbols, and function keys.
- Used to type data, instruction, and commands into the computer.
- Special keys like Enter, shift, ctrl, Alt, and Esc give extra functions.

12.MOUSE-

- A pointing device that detects two-dimensional motion on a surface.
- Controls the movement of the cursor on the screen.
- Supports function like click, double -click drag-and-drop, and scrolling.
- Optical and laser mice are common today.

13.TRACKBALL-

- Similar to a mouse but designed as an upside-down mouse with a rotating ball.
- The ball is rotating with figures to move the cursor.

- Requires less space compared to the traditional mouse.
- Often used in laptop, CAD (computer-Aided design), and the graphic application.

14.MICROPHONE-

- Used to input sound into computer.
- Converts sound waves into digital signals.
- Commonly used for voice recording, video conferencing, and voice commands.

Section 4: Practical Application

11.Identify and label the following components on a diagram of a motherboard

- **CPU-** On the motherboard, the CPU fits into a CPU Socket, which is usually a large square socket located near the centre or top of the board. Usually near the top with a big cooling fan.
- **RAM-** Long, thin slots usually 2-4 located near the CPU sockets, where RAM modules are inserted. RAM is temporary memory used by the computer to store active data and programs while the system is running on the motherboard, RAM is installed in long, thin slots called DDIM Slots, placed close to the CPU socket for faster communication.
- **SATA CONNECTORS-** small, L-shaped ports (often 4-6) located on the side of the mother broad, used to connects storage devices like hard drives and SSDs. Small connectors at the edge.
- **PCI-E SLOTS-** Long slots used for Graphics cards and other add-on cards, and sound cards. The main PCI-E x16 slots graphics is usually the largest. The most common used a PCI-E slot is to install a GRAPHICS CARD, which provides better display and gaming performance.

12. Demonstrate how to install a RAM module into a computer.

- 1. POWER OFF AND PREPARE-** Shut down the computer, unplug the power cable, and ground yourself to avoid static electricity.
- 2. Open the case-** Place the computer on a flat surface. Remove the side panel of the CPU cabinet to access the motherboard. Once open, you will see the motherboard with the components.
- 3. Locate the RAM slots-** Find the RAM SLOTS on the motherboard. These are long, thin slots located close to the CPU socket. Most motherboards have 2-4 slots, often color-coded to support dual-channel memory.
- 4. Prepare the RAM module-** hold the RAM module carefully by the edges. Notice the small notch on the bottom edge of the RAM. This notch ensures that the RAM can only fit one way into the slot.
- 5. Insert the RAM-** Open the small plastic clip at both ends of the slot by gently pushing them outward. Align the RAM module's notch with the slot ridge. Press the RAM firmly into the slots using even pressure on both ends until you hear a click sound and the clips snap back into place, locking the RAM securely.
- 6. Close the Case and Reconnects-** Once the RAM is installed, close the side panel of the CPU cabinet. Tighten the screws or lock the latch. Reconnect the power cable and other devices.
- 7. Verify Installation-** Turn on the computer. Enter the BIOS setup. Check the system information to see if the new RAM is detected. Alternatively, in Windows, you can check installed memory by right-clicking This Computer and then Properties.

Section 5: Essay

- 13. Discuss the importance of proper cooling mechanisms in a computer system. Include examples of cooling methods and their effectiveness.**

When a computer is running, it is doing so many tasks at the same time. The CPU, RAM, power supply and even hard disk all are working together. While doing this work, they produce a lot of heat. If this heat is not removed properly, if this heat is not removed properly, then the temperature inside the computer will become high. This high heat is very dangerous for computer parts. It can make the system slow, it can restart suddenly, or in worse case it can

damage hardware permanently. So cooling system is very importance for smooth working of computer.

There are many types of cooling methods used in computers.

- **Air cooling (Fan and Heat sink):**

This is most common and cheap method. A metal part called heat sink is attached on CPU or GPU. Heat sink take heat from the chip. Then fan blows air to move this heat outside of computer case. Almost every normal computer and laptops use this method. It is simple and effective for daily use.

- **Liquid cooling:**

In this method, liquid or water with coolant is used. It goes through small pipes and carries the heat away from CPU and GPU. liquid cooling is more powerful than air cooling. It keeps temperature low even when computer is doing heavy tasks like gaming 3D rendering, or serve work. But it is costlier and needs more care.

- **Thermal paste:**

Between CPU/GPU and heat sink there are very small gaps of air. Air is bad conductor of heat. Thermal paste is applied of fill those gaps. This paste allows heat to move faster from CPU to heat sink. Without thermal paste, cooling is not effective. It is small but very important parts.

- **Passive cooling:**

This method does not use fan. It only used large heat sinks and natural air flow. It is silents but not very powerful. It is used in small devices like Wi-Fi route, tablets, and some mobile devices where heat production is low.

- **Advanced cooling:**

Some special system used very advanced cooling like liquid nitrogen or phase-change cooling. These can reduce temperature to very low level. This is not for normal users, it is used for experiments or in overclocking competition where people push CPU to maximum speed.

From all this we can cooling system is very important. It makes sure computer run safely, at full speed, and last for many years.

14. **Explain the concept of bus width and its significance in computer architecture.**

Inside computer there are many components like CPU, RAM, hard disk, input devices and output devices. All these components need to talk with each other and share data. For this, computer uses something called bus. A bus is like a road or pathway which connect all main parts transfer data, address and control signals.

BUS WIDTH means how many bits can travel together on that road in one clock Cycle. For example, if the bus width is 32- bit, then 32 bits can move at one time. If the bus width is 64-bit, then 64 bits can move at once.

Importance of bus width:

- **Faster Data Transfer:**

If bus width is more, then more data can travel at the same time. So, the computer can send and receive information quickly. For example, 64- bit bus can transfer double data compared to 32-bit bus.

- **Better performance:**

Wider bus helps CPU to handle more data at one time. This reduces waiting time and increases speed of processing. Programs will run more smoothly when bus width is more.

- **Memory supports:**

Bus width also controls how much memory can be used. A 32-bit system can use around **4 GB RAM only**. But a 64-bit system can use very big memory, even in terabytes. This is reason why modern computers and laptops are 64-bit, because today software and games need more RAM.

- **Compatibility:**

Software and hardware must match with bus width. A 32- bit operating system cannot use full power of a 64- bit CPU. That is why both must be compatible to get best performance.

So, bus width is very importance for **speed, memory capacity, and efficiency** of a computer system.

