**Name: Kishan Barvaliya**

**Batch: Hardware (Abdul Hamid Sir) 9:30am to 10:30am**

**Assignment**

**Module -1: Understanding of Hardware and Its Components**

**Section 1: Multiple Choice**

1.Which of the following is NOT a component of the CPU?

**Ans: RAM**

2. What is the function of RAM in a computer?



**Ans:**



* **Temporary Data Storage - RAM stores data and programs that are currently in use, allowing the CPU to access them quickly.**



* **Speeding Up Performance – Since RAM is much faster than a hard drive or SSD, it helps improve the speed of operations by reducing the need to access slower storage devices.**
* **Multitasking Support – More RAM allows the system to run multiple applications smoothly without slowing down.**
* **Volatile Memory – RAM loses all stored data when the computer is turned off, unlike a hard drive or SSD, which retains data permanently.**

3. Which of the following is a primary storage device?

**Ans:** . **1.HDD 2. SSD**

4. What is the purpose of a GPU?

**Ans: A Graphics Processing Unit (GPU) is a specialized processor optimized for graphics rendering and parallel processing tasks. Optimizes visual performance for gaming, video editing, and 3D rendering by efficiently processing images and animations. Outside of graphics, GPU designs offer high-speed parallel processing, making them suitable for use in AI, deep learning, and scientific computing applications. Support for multiple displays and an increase in overall system performance in graphics-intensive applications**

**Section 2: True or False**

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

**Ans: True**



6. True or False: A UPS (Uninterruptible Power Supply) is a hardware

device that provides emergency power to a load when the input power

source fails.

**Ans: True**

7.True or False: An expansion card is a circuit board that enhances the

functionality of a component.

**Ans: True**

**Section 3: Short Answer**

8.Explain the difference between HDD and SSD.

**Ans:**

| **Feature** | **HDD (Hard Disk Drive)** | **SSD (Solid State Drive)** |
| --- | --- | --- |
| Technology | **Uses magnetic disks and moving parts** | **Uses flash memory (NAND-based), no moving parts** |
| Speed | **Slower due to mechanical movement** | **Faster with instant data access** |
| Durability | **Prone to damage from physical shock** | **More durable, resistant to drops and vibrations** |
| Lifespan | **Longer lifespan in terms of write cycles** | **Limited write/erase cycles but sufficient for most users** |
| Noise | **Produces noise due to moving parts** | **Silent operation without moving parts** |
| Cost | **More affordable, cheaper per GB** | **More expensive per GB, but offers better performance** |
| Size | **Bulky and heavier due to mechanical components** | **Smaller, lighter, and more compact** |

9.Describe the function of BIOS in a computer system

**Ans: Key Functions of BIOS:**

**1.Power-On Self Test (POST):**

**When you power on your computer, the BIOS runs POST to check the hardware components (RAM, keyboard, disk drives) to make sure th-at everything is functional.**

**2.Bootloader Execution:**

**After POST BIOS finds the bootable device (hard drive/SSD), loads the bootloader, and starts the OS.**

**3.Hardware Initialization:**

**BIOS sets up critical hardware elements like CPU (Processor), Memory (RAM), I/O devices (keyboard, display, etc.).**

**4.System Configuration:**

**Data at the BIOS level manages configuration settings like the system time, boot order, and hardware. These are stored on a small memory chip located on the motherboard called CMOS.**

**5.BIOS Setup Utility:**

**It exposes a user interface (via keys such as F2, DEL or ESC at boot) to change**

**6.Low-Level I/O Control:**

**BIOS provides low-level drivers to control basic peripherals before the operating system takes over.**

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

**Ans: 1.Keyboard**

**It is a device that we use to enter text, numbers, commands, etc., into the computer. These include letters, numbers, function keys, and special characters.**

**2.Mouse**

**A mouse is a pointing device that enables users to interact with the computer’s graphical user interface (GUI). Its called is used to move the cursor, select items, and execute commands by clicking.**

**3.Scanner**

**Scan: A device that creates a copy of a physical document or image in digital format. It takes physical words, or images, scans them, and transmits them to the computer for future purposes, storage and/or editing.**

**Section 4: Practical Application**

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

● CPU

● RAM slots

● SATA connectors● PCI-E slot

**Ans: DONE**

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

**Ans: DONE**

**Section 5: Essay**

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

**Ans:**

**In modern computing, performance and reliability heavily rely upon effective cooling systems. When computer parts such as the CPU, GPU, and power supply work, they produce heat. Without managing this heat, system instability, decline in performance, and in some cases irreversible hardware damage may occur. That is why you have to make sure that you have proper cooling mechanisms in place in your computer system so you don mhe to think about it and enjoy your overall high and efficient performance of your computer system,Avoid Over Heating The essential purpose of a good cooling is to avoid overheating. When parts start to get too warm, they will throttle their speeds in order to lower their temperature, and in turn slow down the whole machine. In more extreme scenarios, the system can simply crash, or it may become irreparably damaged, particularly in sensitive components (e.g. some CPUs),Cooling in computing can be of many kinds, each with its pros and cons. The most prevalent form of cooling is air cooling, which employs fans and heat sinks. Fans blow cooler air across the system, and heat sinks — usually metal — soak up and distribute heat from components. For general use such as web browsing, office productivity, and media playback, air cooling can be inexpensive and demonstrably effective,For more demanding systems, such as gaming PCs or workstations used for video editing or 3D rendering, liquid cooling is a more efficient option. Its liquid coolant flows through tubes and radiators to absorb heat and keep components operating at lower temperatures under high load. Liquid cooling is typically quieter than multiple high-speed fans, too. More expensive but thermally superior, recommended for high-performance applications.**

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

**Ans:**

**In computer architecture, bus width can also refer to the number n of bits that can be moved at once on a computer bus. It is a communication system that carries data between the CPU, memory, and input/output devices. Bus width The data bus width determines how much data can be kopied at once, and influences overall system performance,In general, the bus width is given in bits. For example, the buses can be often measured in 8, 16, 32 bit and 64-bit. As an example, if a bus can transfer 32 bits of data in a single cycle, when the bus is expanded to a 64-bit bus, double the amount can be transferred. This has direct implications on the speed at which data can move through the system, affecting everything from application speeds to system responsiveness,** **In a computer system, there are three types of buses—the data bus, address bus, and control bus. The width of the data bus is where the data count is transferred and the width of address bus is determine the address count to the memory. The larger the width of the address bus, the more addressable memory can be accessed. For example a 32 bit address bus can access 4GB of memory, while a 64 bit address bus can access much more — theoretically up to 18.4 million TB.**

**The importance of bus width becomes very apparent with tasks that deal with large amounts of data, in other words gaming, video editing, or scientific computing. Wider Bus: The wider the bus, the more the data goes faster.**