Assignment

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

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

1. ALU

2. RAM

3. CU

4. 1 and 3 both

*Ans: 2) RAM*

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

RAM is like a computer's short-term memory that helps it work faster by storing data and programs you're currently using. More RAM means better performance and the ability to run more applications at once.

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

1. HDD

2. SSD

3. SD card

4. 1 and 2 both

*Ans: 4)* *1 and 2 both (HDD &SSD)*

**4. What is the purpose of a GPU?**

*The purpose of a GPU (Graphics Processing Unit) is to quickly process and render graphics, such as images, videos, and animation. Allowing CPU to focus on other operations this makes tasks like gaming, video editing and 3D rendering faster and smoother.*

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

*ANS: TRUE*

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

*ANS: TRUE*

**8. Explain the difference between HDD and SSD.**

** HDD (Hard Disk Drive):**

* Technology: Uses spinning magnetic disks (platters) and read/write heads to access data.
* Speed: Slower read/write speeds because the mechanical parts need time to move.
* Durability: More prone to physical damage due to moving parts.
* Capacity: Generally offers larger storage capacities at a lower cost.
* Noise: Can be noisy because of the spinning disks and moving heads.

** SSD (Solid State Drive):**

* Technology: Uses flash memory (like in USB drives) with no moving parts.
* Speed: Much faster read/write speeds because data can be accessed almost instantly.
* Durability: More durable and resistant to physical shock since there are no moving parts.
* Capacity: Usually more expensive per gigabyte compared to HDDs, though prices are decreasing.
* Noise: Silent operation since there are no moving parts.

***SSD***

SSD stands for Solid State Drive.

*Instant access High reading and writing speed.*

*SSD is Expensive.*

*SSD is available in compact size and is relatively fast.*

***HDD***

*HDD stands for HARD DISK Drive.*

*Low speed, cannot performs multiple tasks smoothly.*

*HDD is cheap.*

*HDD is comparatively larger and slower then SSD.*

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

*BIOS (Basic Input/Output System) is firmware that initializes and tests hardware during startup, manages the boot process, and provides a basic interface between the operating system and the computer’s hardware.*

*The BIOS is firmware that plays a critical role in a computer's boot process and hardware management. Here are its key functions:*

1. ***Power-On Self Test (POST):*** *When the computer is powered on, the BIOS performs a series of diagnostic tests to ensure that the hardware components, such as memory, CPU, and storage devices, are functioning correctly.*
2. ***Boot Loader:*** *The BIOS locates and loads the operating system from the storage device (e.g., hard drive, SSD) into the computer's memory, initiating the boot process.*
3. **Hardware Initialization:** BIOS initializes and configures hardware components, including the CPU, memory, and peripherals, ensuring they are ready for use by the operating system.
4. ***BIOS Settings Configuration:*** The BIOS provides an interface (BIOS Setup Utility) where users can configure hardware settings, such as system clock, boot order, and device settings.

**5. *Handling and I/O Management:*** BIOS manages communication between the operating system and hardware by handling interrupts and managing input/output operations, particularly during the early stages of system boot.

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

**1) Keyboard**

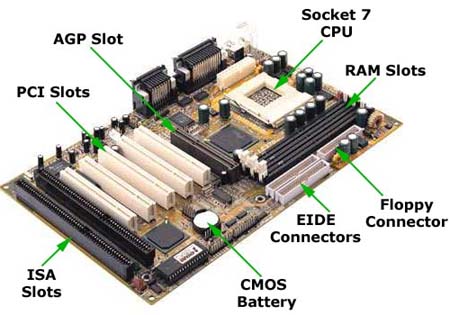
* **Description: A device with a set of keys or buttons that includes letters, numbers, and special functions.**
* **Function: Used for typing text, entering commands, and executing shortcuts. Essential for data entry and text manipulation.**

**2) Mouse**

* **Description: A pointing device with buttons and a scroll wheel.**
* **Function: Used to navigate the graphical user interface, select and manipulate objects on the screen, and execute commands through clicks and scrolling.**

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

**● CPU ● RAM slots ● SATA connectors ● PCI-E slot**

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

*1) Turn off and unplug the computer.*

*2) Open the case (remove side panel for desktops or a cover for laptops).*

*3) Locate the RAM slots.*

*4) Insert the RAM module (align notches and press down until it clicks).*

*5) Replace the case panel.*

*6) Reconnect and power on the computer.*

7*) Check system properties to confirm the RAM is recognized.*

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

*Proper cooling mechanisms are essential in a computer system to prevent overheating, which can lead to hardware damage, reduced performance, and system instability. Effective cooling ensures that components like the CPU, GPU, and power supply operate within safe temperature ranges, thereby extending their lifespan.*

***Examples of cooling methods:***

1. ***Air Cooling:*** *Utilizes fans and heat sinks to dissipate heat. It's cost-effective and sufficient for most consumer systems but may struggle with high-performance setups.*
2. ***Liquid Cooling:*** *Uses liquid to transfer heat away from components, offering better cooling efficiency and quieter operation than air cooling. It's ideal for high-performance or overclocked systems but is more expensive and complex to install.*

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

*The concept of bus width in computer architecture refers to the amount of data that can be transmitted simultaneously over a computer's bus.*

*A bus in computer architecture is a communication system that transfers data between different components, such as the CPU, memory. It consists of a set of parallel wires or traces that carry data, addresses, and control signals, enabling these components to communicate and work together efficiently.*

***Significance in Computer Architecture:***

* ***Efficiency:*** *A wider bus allows for more efficient data transfer and better performance, especially in systems with high data throughput requirements, such as gaming PCs, servers, and high-performance computing systems.*
* ***Scalability:*** *As applications and operating systems become more demanding, a wider bus helps ensure that the system can handle increased data loads without becoming a bottleneck.*
* ***Compatibility:*** *System designs often need to balance bus width with compatibility considerations, ensuring that components and peripherals can communicate effectively.*