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.

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

Ans: Stores data it needs to retrieve quickly.

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

Ans: Random Access Memory (RAM).

1. What is the purpose of a GPU?

Ans: Helps handle graphics – related work like graphics effects, and videos.

Section 2: True or False

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

Ans: True

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

Ans: True

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

Ans: True

Section 3: Short Answer

1. Explain the difference between HDD and SSD.

Ans: HDD:

* Uses physical disks (platters) and mechanical heads to read/write data
* Data is stored on a magnetic coating on the disks
* Slower access times (average 5-10 MS)
* Higher capacity options available (up to 16TB)
* Generally, less expensive per GB
* More prone to mechanical failure and physical damage.

SSD:

* Uses interconnected flash memory chips to store data
* No moving parts, making it faster and more durable
* Faster access times (average 0.1 – 0.2 MS)
* Lower capacity options available (up to 8TB)
* Generally, more expensive per GB
* Less prone to physical damage and mechanical failure.

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

Ans: BIOS (Basic input / output system)

1. Hardware Detection: BIOS detects and initializes hardware components like CPU, RAM, KEYBORD, MOUSE, and STORAGE devices.
2. Boot Process: BIOS searches for a bootable device (like a hard drive or SSD), loads the operating system, and passes control to it.
3. Configuration: BIOS provides a setup utility (accessible during boot) to configure settings like.

* Boot order
* Time and date
* Security settings (passwords, secure boot)
* Hardware settings (fan control, USB ports)

1. Low-Level Input / Output Operations: BIOS provides a set of routines for basic input/output operations, such as:

* Keyboard and mouse input
* Display output (text and graphics)
* Disk I/O operations

1. Self-Test: BIOS performs a power-on Self-Test (POST) to verify hardware functionality during boot.
2. Interface: BIOS acts as an interface between the operating system and hardware components, allowing the OS to interact with hardware without needing to know the hardware details
3. List and briefly explain three input devices commonly used with computers.

Ands:

1. Keyboard: A keyboard is an input device that allows users to type text, numbers, and commands into a computer. Contains keys for letters, numbers, symbols, and special functions.
2. Mouse: A mouse is an input device that allows users to interact with graphical elements on the screen, such as icons, menus, and buttons. It is used to select, drag, and click item.
3. Touchscreen or graphics tablet: A touchscreen or graphics tablet is an input device that allows users to interact with the computer by touching the screen or using a stylus. It is used for drawing, handwriting, and navigating the graphical interface.

Section 4: Practical Application

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

Ans.

1. CPU: The central processing unit, usually located in a socket in the center of the motherboard.
2. RAM Slots: The memory slots where you insert the RAM modules (DIMM or DDR).
3. SATA Connectors: The connectors for attaching storage devices like hard drivers or solid-state drives.
4. PCI-E Slot: The expansion slot for adding hardware components like graphics cards, sound card, or network cards.
5. Demonstrate how to install a RAM module into a computer.

Ans:

Step 1: Prepare the Computer.

Shut down the computer and unplug the power cord.

Step 2: Open the Computer Case.

Remove screws or clips to access the interior.

Step 3: Locate the RAM Slote.

Find the RAM slots on the motherboard, usually

near the CPU.

Step 4: Align the RAM Module.

Match the notches on the RAM module with the tabs

On the RAM slot.

Step 5: Insert the RAM Module.

Push the RAM module into the slot at a 45-degree

angle.

Step 6: Secure the RAM Module.

Apply even pressure to both ends until it clicks into

Place.

Step 7: Verify Installation.

Double-check the modules is firmly seated and

Recognized by the system in the BIOS.

Section 5: Essav

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

Ans:

1. Reduced performance
2. System crashes
3. Hardware damage
4. Shortened lifespan

Effective cooling methods include:

1. Air Cooling: Uses fans to circulate air through the system, dissipating heat from components.

* Effectiveness: 6/10 (limited by airflow and dust buildup)

1. Liquid Cooling: Uses a liquid coolant to absorb heat, transferring it to a radiator for dissipation.

* Effectiveness: 8/10 (more efficient than air cooling, but requires maintenance)

1. Heat Slink: Metal blocks with fins, attached to components to dissipate heat.

* Effectiveness: 7/10 (dependent on design and airflow)

1. Case Fans: Fans installed in the case to improve airflow and exhaust hot air.

* Effectiveness: 5/10 (depended on case design and fan placement.)

1. Thermal Paste: Applied to CPU/GPU dies to improve heat transfer to heat sinks.

* Effectiveness: 9/10 (crucial for efficient heat transfer)

1. Rediators: Uses in liquid cooling systems to dissipate heat from the coolant.

* Effectiveness: 8/10 (dependent on design, size, and airflow)

1. All-in-One (AIO) Liquid Coolers: Pre-assembled liquid cooling system for CPUs/GPUs.

* Effectiveness: 8.5/10 (convenient, but may have limited upgradeability)

Proper cooling mechanisms ensure:

* Optimal performance
* Extended hardware lifespan
* Reduced noise levels
* Increased system reliability

When choosing a cooling method, consider factors like:

* System configuration
* Component specifications
* Case design
* Noise tolerance
* Budget

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

Ans: Significance of bus width:

1. Data transfer rate: A wider bus allows for more data to be transferred at once, increasing the overall data transfer rate.
2. Performance: A wider bus can improve system performance by reducing the time it takes to transfer data between components.
3. Memory access: A wider bus can provide faster memory access times, as more data can be transferred between the CPU and memory.
4. Scalability: A wider bus can support more devices and components, making it easier to add new features and functionality to the system.

Common bus width:

* 8-bit (older systems)
* 16-bit (older systems)
* 32-bit (common in older systems and some embedded systems)
* 64-bit (common in modern systems, including desktops, laptops, and servers)
* 128-bit (used in some specialized systems, like graphics processing units).