

Assignment-1

Hardware And Components Basics 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: RAM is a high-speed, volatile memory that temporarily stores the data and programs currently being used so the CPU can access them quickly.

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

1. HDD

2. SSD

3. RAM

4. SD card

Ans: RAM

4. What is the purpose of a GPU?

Ans: The purpose of a GPU is to rapidly handle complex mathematical calculations in parallel to accelerate the rendering of images, videos, and animations.

Section 2: True or False

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

Section 3: Short Answer

8. Explain the difference between HDD and SSD.

Ans:

HDD	SSD
Uses spinning disks and mechanical parts.	Uses electronic components.
Uses spinning magnetic disks for storage.	Uses NAND flash memory with no moving parts.
Slower boot times and file access.	Much faster boot times and file access.
Produces noise due to spinning disks.	Operates silently.
Consumes more power.	Uses less power, improving battery life.
Has moving parts, making it prone to damage.	More durable and shock-resistant.
Performance can suffer from fragmentation.	No fragmentation, performance remains consistent.

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

Ans: BIOS (Basic Input/Output System) is a firmware stored in the computer's ROM.

Function of BIOS:

1. Booting the System – Performs POST to check hardware (RAM, Keyboard, storage, etc) before loading the OS.
2. Loads the Operating System – Finds and loads the OS from storage into RAM.
3. Hardware Communication – Provides a basic interface between the operating system and hardware components.
4. System Configuration – Allows users to configure hardware settings via BIOS setup utility.

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

Ans: Keyboard (typing), Mouse (pointing), and Scanner (digitizing) are common input devices used to provide data to the computer.

Three Common Input Devices:

1. Keyboard:

- Used to enter text, numbers, and commands into the computer.
- Works on the principle of keys mapped to specific characters/functions.

2. Mouse:

- A pointing device used to control the cursor on the screen.
- Supports operations like click, drag, drop, and scroll.

3. Scanner:

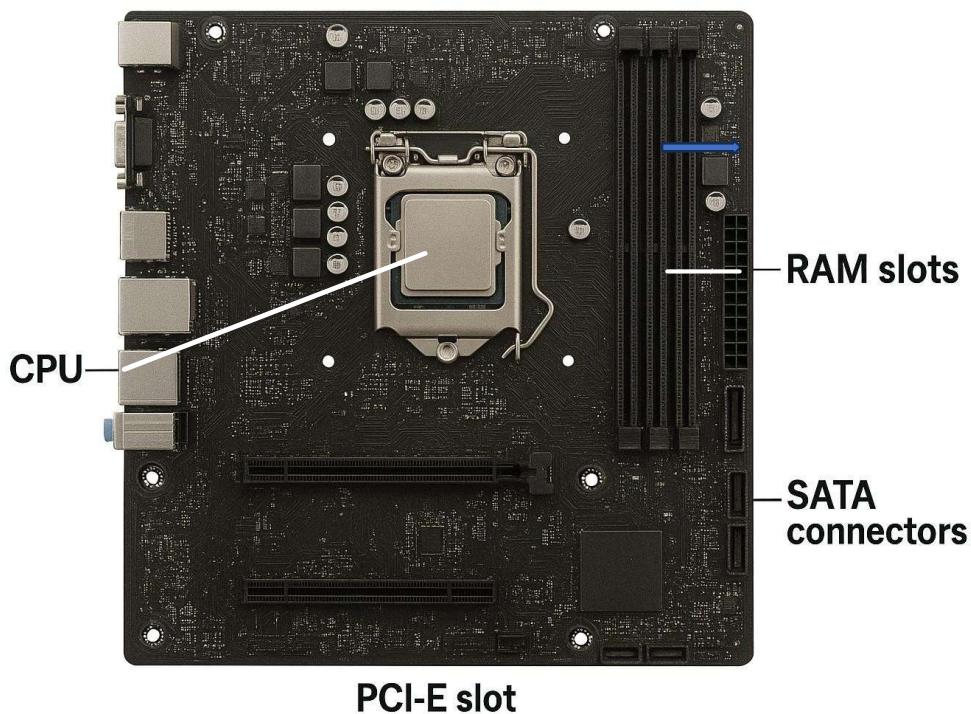
- Converts physical documents or images into digital form.
- Often used for digitizing photos, text or barcodes.

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:



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

Ans: Steps to install a RAM module are:-

1. Power Off and Unplug:-

- Shut down the computer completely.
- Disconnect the power cable and remove any connected devices for safety.

2. Open the computer case:-

- Use a screwdriver if required.
- Remove the side panel to access the motherboard.

3. Locate the RAM Slots:-

- Find the long, narrow slots near the CPU socket on the motherboard.
- They may be labelled DIMM1, DIMM2 etc.

4. Prepare the RAM Slot:-

- Push down the plastic clips at both ends of the RAM slot.
- This unlocks the slot and prepares it for the RAM stick.

5. Align the RAM module:-

- Hold the RAM module by the edges.
- Notice the notch in the connector- it must line up with the slot key.

6. Insert the RAM:-

- Place the RAM module into the slot.
- Apply firm, even pressure on both ends until you hear a click as the clips lock the RAM in place.

7. Close the Case:-

- Reattach the side panel of the case securely.

8. Reconnect and Power On:-

- Plug in the power cable.
- Start the computer to ensure the system detects the new RAM.

Section 5: Essay

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

Ans: Importance of proper cooling mechanisms in a computer system.

A Computer generates heat when its components (CPU, GPU, RAM, Power Supply, etc) operate. If this heat is not managed properly, it can cause overheating, which leads to:

- Reduced Performance
- System instability
- Reduced lifespan of components due to long-term heat damage.
- Complete hardware failure in extreme cases.

Therefore, proper cooling mechanisms are essential to maintain performance, stability and durability of the system.

Examples of Cooling Methods and Their Effectiveness:

1. Air Cooling:

- Method: Uses metal heat sinks attached to components with fans pushing air to dissipate heat.
- Effectiveness: Most common and cost-effective. Sufficient for normal usage and moderate gaming.
- Limitation: Less effective in high-performance systems; Performance depends on airflow inside the case.

2. Liquid Cooling:

- Method: Uses liquid coolant circulated through tubes and a radiator to absorb and release heat.
- Effectiveness: Provides superior cooling compared to air cooling, especially for overclocked CPUs.
- Limitation: More expensive and requires maintenance; risk of leaks.

3. Thermal Paste:

- Method: A conductive paste applied between the CPU/GPU and heat sink to eliminate air gaps.
- Effectiveness: Essential for efficient heat transfer; inexpensive but critical.

4. Case Ventilation:

- Method: Proper placement of intake and exhaust fans to ensure good airflow.
- Effectiveness: Prevents heat buildup inside the case, supports other cooling methods.

5. Advanced Cooling Methods:

- Phase-Change Cooling: Extremely effective, used in experimental/overclocking setups.
- Passive Cooling: Large heat sinks without fans, used in silent or low-power systems.

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

Ans: Concept of Bus Width and its Significance in Computer Architecture.

A bus in computer architecture is a communication system that transfers data between components of a computer, such as the CPU, memory, and input/output devices.

The bus width refers to the number of bits that can be transmitted simultaneously through the bus. It is usually expressed in bits, such as 8-bit, 16-bit, 32-bit, 64-bit.

Significance:

- Data Transfer Speed: Wider buses transfer more data at once, improving system performance.
- Memory Addressing: The width of the address bus decides how much memory can be accessed.
- System Architecture: Must match CPU design; modern systems use 64-bit buses for high performance.