

ASSIGNMENT : 1

Section 1: Multiple Choice

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

1. ALU
2. RAM
3. CU
4. 1 and 3 both

Answer: (2) RAM

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

Answer: Random Access Memory (RAM) is a type of computer memory that's essential for the efficient performance of your device. It's a temporary storage space where your computer keeps data that is actively being used or processed.

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

1. HDD
2. SSD
3. SD card
4. 1 and 2 both

Answer: none of the above (RAM)

4. What is the purpose of a GPU?

Answer: The graphics processing unit (GPU) in your device helps handle graphics-related work like graphics, effects, and video.

Section 2: True or False

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

Answer: 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.**

Answer: True

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

Answer: True

Section 3: Short Answer

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

Answer:

HDD (Hard Disk Drive)	SSD (Solid State Drive)
<ul style="list-style-type: none">➤ Uses spinning disks to read/write data, making it slower in data transfer.➤ Can produce noise from spinning disks and moving read/write heads.➤ Consumes more power due to mechanical movements.	<ul style="list-style-type: none">➤ Uses flash memory with no moving parts, providing much faster data access and boot times.➤ Silent operation since there are no moving parts.➤ More energy-efficient, which can help extend battery life in laptops.

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

Answer: BIOS (basic input/output system) is the program a computer's microprocessor uses to start the computer system after it is powered on. It also manages data flow between the computer's operating system (OS).

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

Answer: Keyboard: A primary device used for typing text, entering commands, and navigating through software.

Mouse: A pointing device that allows you to interact with graphical elements on the screen.

Joystick: Typically used for gaming, it provides directional input through a pivoting stick.

Section 4: Practical Application

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

Answer:

- **CPU:** The central processing unit (CPU), also called a processor, is located inside the computer case on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out commands.
- **RAM slots:** RAM is usually stored outside the CPU in separate chips. RAM memory modules are installed into slots on the computer motherboard.
- **SATA connectors:** A computer bus interface that connects host bus adapters to mass storage devices such as hard disk drives, optical drives, and solid-state drives.
A computer bus interface that connects host bus adapters to mass storage devices such as hard disk drives, optical drives, and solid-state drives.
- **PCI-E slot:** PCIe slots are located on the motherboard, typically in a row near the CPU socket. They are often color-coded or labelled according to their size (x1, x4, x8, x16).

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

Answer: **1. Turn off your computer** and unplug it from the power source. For additional safety, press the power button for a few seconds to discharge any residual electricity.

2. Open the computer case: Depending on your case, you might need to unscrew some screws or push a latch to access the interior. Refer to your computer's manual if you're unsure how to do this.

3. Locate the RAM slots: These are usually located near the CPU socket. They are long, slim slots with small clips on either end.

4. Prepare the RAM module: Hold the RAM by its edges, avoiding contact with the gold connectors to prevent damage from static electricity.

5.Align the RAM module: There's a small notch in the connector edge of the RAM module that aligns with the key in the RAM slot. Make sure they match.

6.Insert the RAM module: Gently push the RAM module into the slot. Apply firm and even pressure until the clips on either end snap into place, securing the RAM.

7.Close the computer case: Replace any screws or secure any latches you removed earlier.

8.Reconnect and test: Plug your computer back in, turn it on, and check if the system recognizes the new RAM. You can do this by entering the BIOS setup during the boot process or checking your system properties in the operating system.

Section 5: Essay

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

Answered:

Importance of Proper Cooling

- 1. Prevents Overheating:** High temperatures can cause components to overheat, leading to system instability, crashes, and potential hardware damage.
- 2. Maintains Performance:** Components like the CPU and GPU can throttle their performance to reduce heat, which can affect the overall system performance.
- 3. Extends Lifespan:** Consistently high temperatures can degrade hardware components over time, shortening their lifespan.
- 4. Improves Efficiency:** Efficient cooling can help maintain energy efficiency by reducing the need for components to work harder than necessary to stay cool.

Cooling Methods and Their Effectiveness

- 1. Air Cooling:**
 - **Effectiveness:** Good for general use and mild gaming or computing tasks.
 - **Components:** Utilizes fans and heatsinks to dissipate heat from components like the CPU and GPU.
 - **Pros:** Cost-effective, easy to install and maintain.
 - **Cons:** Less effective in extremely high-performance systems or overclocked components.
- 2. Liquid Cooling:**
 - **Effectiveness:** Excellent for high-performance systems and overclocking.

- **Components:** Uses a liquid coolant, radiator, pump, and water blocks to transfer and dissipate heat.
 - **Pros:** More efficient at transferring heat, quieter operation.
 - **Cons:** More expensive, complex installation, and potential for leaks.
- 3. Thermoelectric Cooling (Peltier Coolers):**
- **Effectiveness:** Very effective for cooling specific components like CPUs or GPUs.
 - **Components:** Uses thermoelectric modules to create a heat flux between the junction of two different types of materials.
 - **Pros:** Can achieve very low temperatures, good for overclocking.
 - **Cons:** High power consumption, requires additional cooling methods (like air or liquid) to dissipate the heat generated.
- 4. Phase Change Cooling:**
- **Effectiveness:** Extremely effective, often used in extreme overclocking scenarios.
 - **Components:** Similar to a refrigerator, uses a compressor to change the phase of a refrigerant to absorb and dissipate heat.
 - **Pros:** Can achieve sub-zero temperatures, optimal for extreme performance.
 - **Cons:** Very expensive, complex installation, and high power consumption.
- 5. Passive Cooling:**
- **Effectiveness:** Suitable for low-power devices and systems.
 - **Components:** Uses heatsinks and natural convection without any fans or liquid.
 - **Pros:** Silent operation, no moving parts, zero power consumption.
 - **Cons:** Limited cooling capacity, not suitable for high-performance systems.

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

Answer:

Key Points About Bus Width:

1. **Measured in Bits:** The bus width is typically measured in bits. Common bus widths are 8, 16, 32, and 64 bits.
2. **Data Transfer Rate:** A wider bus can carry more data at once, thus increasing the overall data transfer rate.
3. **Processor and Memory Matching:** The bus width often matches the processor's data width and memory width, enabling efficient data transfer between the CPU and memory.
4. **Performance Impact:** Larger bus widths allow for better performance as more data can be processed per clock cycle. This is crucial for tasks that require high-speed data processing.

Significance in Computer Architecture:

1. **Speed and Efficiency:** The bus width directly impacts the speed and efficiency of data transfer within the computer system.
2. **System Performance:** A wider bus can significantly enhance system performance, particularly in applications that involve large data sets or require rapid data processing.
3. **Scalability:** It allows for more scalable systems, as future upgrades can leverage wider buses to maintain or improve performance.