

Assignment module 1 :understanding hardware and its components

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Section 1: Multiple Choice

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

Answer: 2) RAM

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

Answer:

RAM (Random Access Memory) temporarily stores data and instructions that are currently being used by the CPU. It helps the computer work faster.

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

Answer: 4) 1 and 2 both (HDD and SSD)

4. What is the purpose of a GPU?

Answer:

A GPU (Graphics Processing Unit) is used to process and render graphics, images, and videos and helps in smooth visual display.

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Section 2: True or False

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

Answer: True

- 6. A UPS (Uninterruptible Power Supply) provides emergency power when input power fails.**

Answer: True

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

Answer: True

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Section 3: Short Answer

8. Explain the difference between HDD and SSD.

Answer:

HDD

Uses magnetic
disks

Slower
speed

More noise

Cheaper

SSD

Uses flash
memory

Faster
speed

Silent

More
expensive

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

Answer:

BIOS (Basic Input/Output System) is a firmware that starts the computer when it is powered on. It checks and initializes hardware components like the CPU, RAM, and storage devices, and then loads the operating system into memory so the computer can run.

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

Answer:

- 1.Keyboard: Used to enter text and commands.**
- 2.Mouse: Used to point, click, and select items.**
- 3.Scanner: Used to convert paper documents into digital format.**

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Section 4: Practical Application

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

Answer:

- CPU: Executes instructions and processes data.
- RAM Slots: Hold RAM modules.
- SATA Connectors: Connect storage devices like HDD and SSD.
- PCI-E Slot: Used to install expansion cards like graphics cards.

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

Answer (Steps):

1. Turn off the computer and unplug it.
2. Open the computer cabinet.
3. Locate the RAM slots on the motherboard.

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4.Open the slot clips.

5.Align the RAM properly and press gently until it clicks.

6.Close the cabinet and power on the system.

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Section 5: Essay

13. Importance of proper cooling mechanisms in a computer system

Answer:

Proper cooling mechanisms are essential for the smooth, safe, and efficient functioning of a computer system. During operation, components such as the CPU, GPU, power supply, and motherboard generate a significant amount of heat. If this heat is not properly controlled, it can damage hardware and reduce system performance.

Why Cooling Is Important

1.Prevents Overheating

Cooling systems remove excess heat from internal components. Overheating can cause system crashes, automatic shutdowns, or permanent hardware damage.

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2.Improves Performance

When components overheat, the system may reduce speed (thermal throttling) to protect itself. Proper cooling allows the CPU and GPU to run at optimal speeds without performance loss.

3.Increases Hardware Lifespan

Continuous exposure to high temperatures reduces the life of electronic components. Effective cooling helps maintain safe temperatures and extends hardware durability.

4.Ensures System Stability

Proper cooling prevents unexpected freezes, errors, and reboots, ensuring reliable and stable system operation.

5.Supports High-End Applications

Gaming, video editing, 3D rendering, and data processing require powerful hardware that

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generates more heat. Efficient cooling is necessary to handle such workloads smoothly.

Common Cooling Mechanisms

1.Air Cooling

Uses fans and heat sinks to circulate air and dissipate heat. It is cost-effective and commonly used in most computers.

2.Liquid Cooling

Uses liquid coolant to absorb and transfer heat away from components. It is more efficient than air cooling and used in high-performance systems.

3.Heat Sinks

Metal components attached to processors that absorb heat and help in its dissipation.

4.Thermal Paste

Applied between the processor and heat sink to improve heat transfer efficiency.

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5.Ventilation and Airflow

Proper cabinet design and airflow ensure hot air is expelled and cool air is drawn in.

Conclusion

Proper cooling mechanisms are vital for protecting computer hardware, maintaining performance, and ensuring system reliability. A well-cooled computer operates efficiently, lasts longer, and delivers consistent performance even under heavy workloads.

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

Answer:

Bus width refers to the number of bits of data that a computer bus can transfer at one time between different components of a computer system, such as the CPU, memory, and input/output devices. It is usually measured in bits, for example 8-bit, 16-bit, 32-bit, or 64-bit.

Concept of Bus Width

A computer bus acts like a data highway. Bus width determines how wide this highway is:

- A narrow bus can carry less data at a time.
- A wider bus can carry more data in a single transfer.

For example, a 32-bit bus can transfer 32 bits of data at once, while a 64-bit bus can transfer 64 bits

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of data at the same time, making data transfer faster.

Types of Buses Related to Bus Width

- 1.Data Bus: Carries actual data between CPU, memory, and devices.**
- 2.Address Bus: Carries memory addresses to locate data in memory.**
- 3.Control Bus: Carries control signals like read, write, and interrupt signals.**

Significance of Bus Width in Computer Architecture

- 1.Higher Data Transfer Speed: Wider bus width allows more data to be transferred simultaneously, increasing system speed.**
- 2.Better CPU Performance: The CPU can access more data per cycle, improving processing efficiency.**

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3.Improved Memory Access: Wider address bus allows access to larger memory capacity.

4.Enhanced System Performance: Overall performance of the computer improves due to faster communication between components.

5.Support for Modern Applications: Applications like gaming, graphics, and data processing require wider bus widths for smooth operation.

Conclusion

Bus width plays a crucial role in computer architecture by determining how much data can be transferred at a time. A wider bus width results in faster data transfer, better performance, and efficient system operation.