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Assignments :-

Module – 1 : Understanding of Hardware and its Components

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

Ans. RAM

Note :- Because the RAM is a temporary storage device it is not a CPU component.

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

Ans.

- RAM stands for Random Access Memory.

- **Temporary Storage** :- RAM provides temporary storage for data and application while the computer runs.
- **Fast Access** :- RAM enables fast access to data allowing the processor to perform tasks efficiently.
- **Multitasking** :- RAM perform to multiple applications to run simultaneously and improving productivity.
- **Improving Performance** :- RAM improves overall computer performance, reducing lag and increasing responsiveness.

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

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

Ans. None of These (Answer not Available)

Note :- Because HDD, SSD, SD Card is a Secondary Storage device. It is not Primary Storage device.

4. What is the purpose of a GPU?

Ans. The purpose of a GPU (Graphics Processing Unit) is to render images, animations, gaming, and video for the computer display like 2D and 3D graphics. It designed to perform rapid mathematical calculations and also used for

compute tasks, such as scientific simulations, data analysis, and machine learning.

Section 2 : True or False

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

Ans. True

Note :- The motherboard is indeed the main circuit board of a the computer, connecting and supporting various hardware components, such as : CPU, RAM, Storage Devices, GPU, Peripheral Devices like a USB, audio, Ethernet, etc.

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.

Ans. True

Note :- A UPS is a device that provides a backup power source to a system or load when the primary power source fails or drops below a certain threshold.

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

Ans. True

Note :- An expansion card is a circuit board that can be installed in a computer to enhance or add functionality to a specific component or system for example :- Graphics Cards, Sound Cards, Network Cards, Storage Controllers.

Section 3 : Short Answer

8. Explain the difference between HDD and SSD.

Ans.

Feature	HDD(Hard Disk Drive)	SSD(Solid State Drive)
Technology	Uses magnetic spinning disks and a mechanical arm to read/write data.	Uses flash memory (no moving parts) to store data.
Speed	Slower read/write speeds due to mechanical movement.	Much faster read/write speeds.
Durability	More prone to damage from drops or shocks (because of moving parts).	More durable shockresistant since it has no moving parts.
Noise	Produces noise due to spinning disks and moving heads.	Completely silent.

Power Consumption	Uses more power (mechanical operation).	Uses less power (energy-efficient).
Cost	Cheaper per GB.	More expensive per GB.
Storage Capacity	Available in larger capacities (up to several TBs at low cost).	Typically smaller capacities at the same price point.

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

Ans. The BIOS (Basic Input/Output System) is a critical component of a computer system that performs several foundational functions.

- **Power-On Self-Test (POST) :-** When the computer is powered on, the BIOS runs a POST to check the hardware components (like RAM, keyboard, and disk drives) to ensure they are functioning properly.
- **Boots Process :-** BIOS locates and loads the operating system from a storage device (like a hard drive or SSD) into the computer's memory (RAM). This process is called boot process.
- **Hardware Initialization :-** It initializes system hardware such as the CPU, memory, and peripheral devices, preparing them for operation.
- **BIOS Setup Utility :-** BIOS provides a configuration interface (usually accessible by pressing a key like Del, F2, or Esc during startup) where users can change

system settings such as boot order, clock settings, and hardware configurations.

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

Ans. There are three input devices commonly used are :-

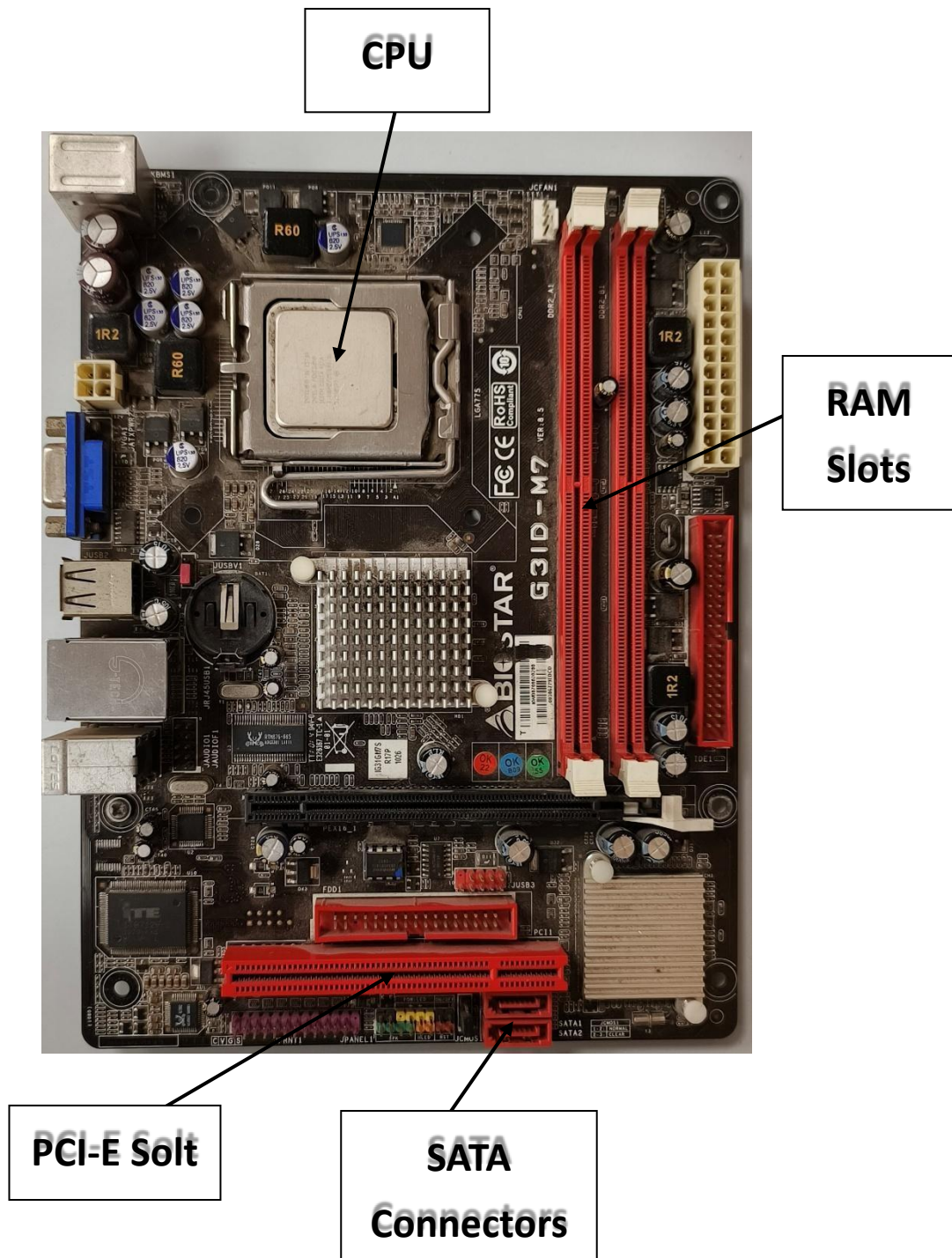
- **Keyboard** :- A keyboard is an input device that users to type text, commands, and other input into a computer. Keyboards typically have a QWERTY layout and include various keys for letters, numbers, and functions.
- **Mouse** :- A mouse is a pointing device that users to interact with graphical user interfaces (GUI). It typically has buttons for clicking and scrolling, and can be used to navigate, select, and manipulate object on the screen.
- **Touchscreen** :- A touchscreen is a display screen that responds to touch inputs, users to interact with a computer by tapping, swiping, or pinching their fingers on the screen. Touchscreens are commonly used in mobile devices, tablets, and some laptops.

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. Step-by-Step install a RAM :-

1. Power Down and Unplug the Computer

- Shut down your PC.
- Turn off the PSU switch (if applicable) and unplug the power cord.
- Press the power button once to discharge residual electricity.

2. Open the Computer Case

- Remove the side panel using a screwdriver if needed.
- Refer to your case's manual if unsure.

3. Ground Yourself

- Touch a metal part of the case or wear an antistatic wrist strap.
- This prevents damaging components with static electricity.

4. Locate the RAM Slots on the Motherboard

- Look for long slots near the CPU socket.
- These are usually labelled DIMM 1, DIMM 2, etc.

5. Prepare the RAM Slot

- Push the clips on each end of the slot outward to open them.

6. Align the RAM Module

- Match the notch on the RAM stick with the ridge in the RAM slot.
- The RAM can only fit one way due to this offset notch.

7. Insert the RAM

- Line up the RAM and press down firmly on both ends until the clips click into place.
- You may need a bit of pressure – don't be afraid, but don't force it sideways.

8. Verify Installation

- Ensure both clips are locked in.
- The RAM should sit level in the slot.

9. Reassemble and Boot

- Put the side panel back on.
- Plug the power back in and boot your PC.

10. Check System Recognizes RAM

- On Windows: Right-click This PC > Properties
Look at the Installed RAM section.
- Or enter BIOS/UEFI to confirm.

Section 5: Essay

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

Ans. Proper cooling mechanisms are essential in a computer system to ensure optimal performance, maintain hardware longevity, and prevent system failures. As components such as the CPU (Central Processing Unit), GPU (Graphical Processing Unit), power supply, and RAM.

- **Importance of Proper Cooling Mechanisms :-**

1. **Prevent Overheating :-** Excessive heat can damage components, reduce performance, and cause system crashes.
2. **Ensure Reliability :-** Cooling helps maintain component longevity and reliability.
3. **Optimize Performance :-** Cooling enables components to operate at optimal temperatures, ensuring peak performance.

- **Examples of Cooling Methods :-**

1. **Air Cooling :-** Uses fans to circulate air and dissipate heat.
2. **Liquid Cooling :-** Uses a liquid coolant to absorb heat and transfer it to a radiator.
3. **Heat Sinks :-** Metal blocks that absorb heat from components and dissipate it.

4. Heat Pipes :- Tubes filled with a liquid that vaporizes at high temperatures, carrying heat away.

• **Effectiveness of Cooling Methods :-**

1. Air Cooling :- Effective for most systems, but may not be sufficient for high-performance system.

2. Liquid Cooling :- Highly effective for high-performance system, offering better heat dissipation.

3. Heat Sinks :- Effective for specific components, such as CPUs and GPUs.

4. Heat Pipes :- Effective in high-performance systems, especially in laptops and compact devices.

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

Ans. Bus width refers to the number of bits (binary digits) that can be transmitted simultaneously over a bus, which is a communication pathway between components in a computer system.

• **Significance :-**

1. Data Transfer Rate :- A wider bus allows more data to be transferred in parallel, increasing the data transfer rate.

2. System Performance :- Bus width affects system performance, as it determines how much data can be processed and transferred between components.

3. Bandwidth :- Bus width contributes to the overall bandwidth of the system, influencing the amount of data that can be transmitted.

4. Memory Addressing Capacity :- The width of the address bus determines how much memory can be addressed.