A+ - Troubleshooting And Helpdesk

Assignment module 2 : Installation and Maintenance of Hardware and Its Components

Section 1: Multiple Choice

1. Which of the following precautions should be taken before working on computer hardware?

a) Ensure the computer is plugged in to prevent electrostatic discharge.

b) Wear an anti-static wrist strap to prevent damage from electrostatic discharge.

c) Work on carpeted surfaces to prevent slipping.

d) Use magnetic tools to handle components more easily.

2. What is the purpose of thermal paste during CPU installation?

a) To insulate the CPU from heat

b) To provide mechanical support for the CPU.

c) To improve thermal conductivity between the CPU and the heat sink.

d) To prevent the CPU from overheating.

3. Which tool is used to measure the output voltage of a power supply unit (PSU)?

a) Multimeter

b) Screwdriver

c) Pliers

d) Hex key

4. Which component is responsible for storing BIOS settings, such as date and time, even when the computer is powered off?

a) CMOS battery

b) CPU

c) RAM

d) Hard drive

Section 2: True or False

5. True or False: When installing a new hard drive, it is essential to format it before use

True

6. True or False: A POST (Power-On Self-Test) error indicates a problem with the CPU.

False

7. True or False: It is safe to remove a USB flash drive from a computer without ejecting it first.

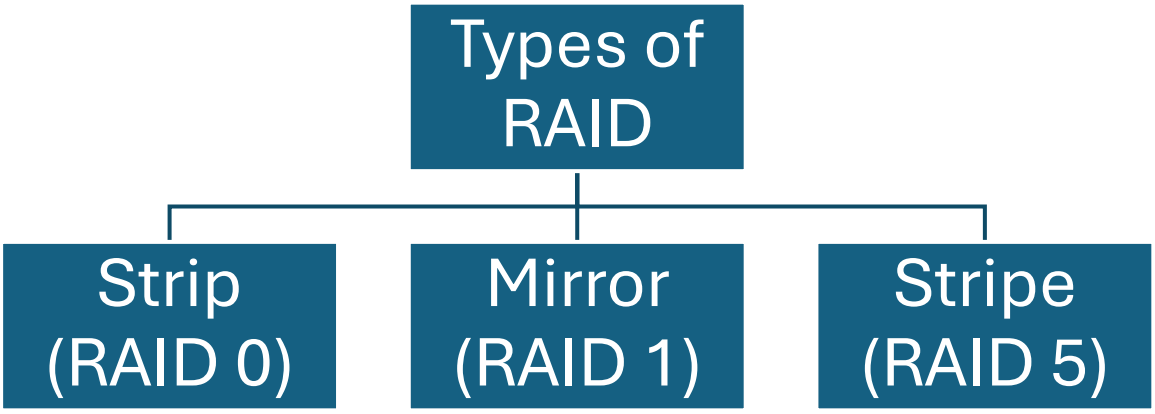
False

Section 3: Short Answer

8. Describe the steps involved in installing a new graphics card in a desktop computer.
9. What is RAID, and what are some common RAID configurations?

Answer:-

The full form of RAID is been mention below



Strip (RAID 0)

As in the RAID level 0 is the type of storage which is the subunit of the dynamic HDD as in this type of the storage both Storage unit can be used one after another as this is

- It had redundancy problem
- It had a fast performance
- As one failure can cost to the lost of entire data

Mirro (RAID 1)

As in the RAID level 0 is the type of storage which is the subunit of the dynamic HDD as in this type of from the 2 HHD's we can only use the one respective HDD as other is used as the backup of the respective data

- It had slower performance
- As it had more chances of failover

Stripe(RAID 5)

Purpose: Balance of performance + redundancy
Min. disks: 3
Redundancy: Parity-based
Pros:

- Can survive **one disk failure**
- More usable capacity than RAID 1

Cons:

- Slower write performance due to parity calculation
- If two disks fail → data loss

Section 4: Practical Application

10. Demonstrate how to replace a CPU fan in a desktop computer.

Replacing a CPU fan is an important hardware maintenance task that ensures proper cooling of the processor. The following steps demonstrate the complete procedure:

1. Power Off and Unplug the Computer:
Shut down the desktop computer and remove all power cables and peripherals. This ensures safety and prevents electrical damage.

2. Open the Computer Case:
Remove the screws on the side panel and slide the cover off. Place the computer on a clean table to work comfortably.

3. Locate the CPU Fan and Heatsink:
The CPU fan is mounted directly on top of the processor, attached to the heatsink. Identify the fan's power connector attached to the motherboard header labeled "CPU_FAN."

4. Disconnect the CPU Fan Cable:
Gently unplug the fan's 3-pin or 4-pin connector from the motherboard to avoid damaging the pins.

5. Remove the Old Fan and Heatsink Assembly:
Depending on the CPU socket type, unlock the mounting mechanism:

- Intel: rotate or pull the plastic push-pins.
- AMD: release the side-mounted retention clips.

Once unlocked, lift the heatsink and fan assembly carefully.

6. Clean Off Old Thermal Paste:
Use isopropyl alcohol and a lint-free cloth to remove old thermal paste from the CPU surface and the base of the heatsink. This ensures proper heat transfer for the new fan.

7. Apply New Thermal Paste:
Place a small pea-sized drop of thermal paste at the center of the CPU. This helps fill microscopic gaps and improves cooling.

8. Install the New CPU Fan:
Place the new heatsink and fan assembly on top of the CPU and secure it using the appropriate clips or push-pins. Ensure it is tightly fixed to maintain proper contact.

9. Reconnect the Fan Cable:
Plug the fan connector back into the CPU FAN header on the motherboard.

10. Close and Test the System:
Reattach the case panel, reconnect power cables, and turn on the computer. Enter the BIOS or use monitoring software to check that the CPU fan is working and temperatures are normal.

This complete procedure ensures proper CPU cooling and prevents overheating issues.

Section 5: Essay

11. Discuss the importance of regular maintenance for computer hardware and provide examples of maintenance tasks.

Regular maintenance of computer hardware is essential to ensure reliable performance, long lifespan, and efficient operation of the system. Without proper maintenance, computers may overheat, slow down, or fail unexpectedly. The importance and examples are discussed below:

1. Prevents Overheating:

Dust buildup inside fans, vents, and heatsinks reduces airflow and causes overheating. Regular cleaning helps maintain proper cooling and prevents hardware damage.

2. Increases Hardware Lifespan:

Components like the CPU, GPU, power supply, and hard drives last longer when they operate under optimal temperature and clean conditions.

3. Improves System Performance:

A well-maintained system runs faster and smoother. Clean fans, firm cable connections, and updated components ensure efficient operation.

4. Reduces System Failures:

Loose cables, failing fans, and old thermal paste can cause random shutdowns or hardware errors. Maintenance helps detect issues early and prevents sudden breakdowns.

5. Reduces Repair and Replacement Costs:

Regular checks help fix small problems before they turn into major faults, saving repair expenses.

Examples of Hardware Maintenance Tasks

1. Cleaning Components:

- Removing dust from fans, power supply, motherboard, and vents using compressed air.
- Cleaning the keyboard, mouse, and monitor.

2. Cooling System Maintenance:

- Replacing old thermal paste on the CPU/GPU.
- Ensuring all cooling fans are functional and replacing noisy or damaged ones.

3. Checking Connections and Components:

- Reseating RAM modules and expansion cards.
- Ensuring that cables are tightly connected.
- Inspecting hardware for damage or bulging capacitors.

4. Storage and Power Maintenance:

- Checking hard disk health using tools like SMART.
- Defragmenting HDDs to improve speed (not needed for SSDs).
- Ensuring the power supply is clean and well-ventilated.

5. External Maintenance:

- Cleaning ports like USB, HDMI, and Ethernet.
- Keeping peripherals dust-free.

Regular hardware maintenance improves reliability, prevents overheating, and ensures that the computer performs efficiently for a longer time.