**Assignment**

**module 2 : Installation and Maintenance of Hardware and Its**

**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.

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

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.

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

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

**Ans**: a) Multimeter

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

**Ans**: a) CMOS battery

**Section 2: True or False**

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

**Ans**: True

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

**Ans**: False

A **POST (Power-On Self-Test) error** can indicate issues with various hardware components, including RAM, GPU, motherboard, or storage devices. While a CPU issue **can** cause POST failure, not all POST errors are directly related to the CPU.

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

**Ans**: False

If you remove a USB flash drive without ejecting it, the computer might still be using it to read or write data. This can **corrupt files** or **damage the USB drive**. Ejecting it first makes sure everything is saved and safe to remove.

**Section 3: Short Answer**

8. Describe the steps involved in installing a new graphics card in a desktop computer.

**Ans:**

**1. Turn Off and Unplug the Computer**

* Shut down the computer and unplug it from the power source to avoid electrical damage.

**2. Open the Case**

* Remove the side panel of the case using a screwdriver (if needed).

**3. Locate the PCIe Slot**

* Find the PCIe x16 slot on the motherboard (usually the longest slot).

**4. Remove the Old Graphics Card (If Any)**

* Unscrew and gently remove the old graphics card.
* Unplug any power cables connected to it.

**5. Insert the New Graphics Card**

* Align the new graphics card with the PCIe slot and push it in firmly until it clicks.

**6. Secure the Card**

* Use screws to secure the card to the case to keep it stable.

**7. Connect Power Cables**

* If the card requires extra power, connect the PCIe power cables from the PSU.

**8. Close the Case and Reconnect Everything**

* Put the side panel back on and reconnect the power cables, monitor, and peripherals.

**9. Turn On the Computer and Install Drivers**

* Boot up the PC and install the latest graphics drivers from the manufacturer’s website (NVIDIA or AMD).

9. What is RAID, and what are some common RAID configurations?

**Ans:**

RAID (**Redundant Array of Independent/Inexpensive Disks**) is a technology that combines multiple hard drives or SSDs to improve **performance**, **data redundancy**, or both. It is commonly used in servers and high-performance computers.

**Common RAID Configurations:**

1. **RAID 0 (Striping)** – Splits data across multiple drives for **speed**, but **no redundancy** (if one drive fails, all data is lost).
2. **RAID 1 (Mirroring)** – Copies data to two drives for **data protection** (if one fails, the other still has all the data).
3. **RAID 5 (Striping with Parity)** – Uses at least 3 drives, balancing **speed** and **fault tolerance** by storing parity data (can recover from one drive failure).
4. **RAID 10 (RAID 1+0, Mirrored Stripes)** – Combines RAID 1 and RAID 0 for **both speed and redundancy** (requires at least 4 drives).

**Section 4: Practical Application**

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

**Ans:**

Steps to Replace a CPU Fan in a Desktop Computer:

**1. Turn Off and Unplug the Computer**

* Shut down the PC and unplug all cables to avoid electrical damage.

**2. Open the Case**

* Remove the side panel to access the motherboard.

**3. Disconnect the Old CPU Fan**

* Unplug the fan’s power cable from the **CPU\_FAN** header on the motherboard.

**4. Remove the Old Fan (or Heatsink and Fan Combo)**

* If the fan is attached to a heatsink, unscrew or unclip it carefully.
* If replacing both the fan and heatsink, unlock the heatsink screws/clips and remove it.

**5. Clean the CPU Surface (If Needed)**

* If replacing the heatsink too, clean the old thermal paste using **isopropyl alcohol** and a microfiber cloth.

**6. Install the New CPU Fan**

* If it’s a fan-only replacement, attach it to the heatsink using screws or clips.
* If installing a new heatsink, apply a small **pea-sized drop of thermal paste** on the CPU before mounting it.
* Secure the heatsink onto the motherboard if replaced.

**7. Reconnect the Fan Cable**

* Plug the new fan’s cable into the **CPU\_FAN** header on the motherboard.

**8. Close the Case and Test**

* Reattach the side panel, reconnect power, and turn on the PC to check if the fan is working properly.

**Section 5: Essay**

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

**Ans:**

Importance of Regular Maintenance for Computer Hardware

Regular maintenance is essential to ensure a computer runs efficiently, lasts longer, and prevents hardware failures. Neglecting maintenance can lead to overheating**,** slowperformance**,** or even hardware damage over time.

**Examples of Maintenance Tasks:**

1. **Cleaning Dust and Debris**
   * Dust buildup can block airflow, causing overheating.
   * Use compressed air to clean fans, vents, and heatsinks.
2. **Checking and Replacing Thermal Paste**
   * Over time, thermal paste dries out, reducing heat transfer.
   * Reapplying it keeps the CPU and GPU cool.
3. **Updating Drivers and Firmware**
   * Outdated drivers can cause compatibility issues or poor performance.
   * Regular updates ensure better stability and security.
4. **Checking for Loose Connections**
   * Ensure all power and data cables are securely connected.
   * Prevents random shutdowns or hardware failures.
5. **Monitoring Hard Drive Health**
   * Use tools like **CrystalDiskInfo** to check for bad sectors or signs of failure.
   * Regular backups prevent data loss.
6. **Cleaning the Keyboard and Mouse**
   * Dirt and debris can affect key presses and mouse movement.
   * Use isopropyl alcohol and cotton swabs to clean them.
7. **Power Supply and Surge Protection**
   * Use a **UPS (Uninterruptible Power Supply)** or surge protector to prevent power damage.