**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. **Shut Down and Unplug**  
   Power off your PC and disconnect it from the electrical outlet to avoid any risk of electric shock.
2. **Remove the Side Panel**  
   Open the computer case by taking off the side panel. This may require a screwdriver, depending on your case.
3. **Find the PCIe Slot**  
   Locate the PCI Express x16 slot on your motherboard — this is where your graphics card will go. It’s typically the largest slot.
4. **Take Out the Old GPU (if there is one)**  
   If there's an existing graphics card installed, disconnect any attached power cables, unscrew it from the case, and carefully pull it out of the slot.
5. **Install the New GPU**  
   Align the new graphics card with the PCIe slot and press it down firmly until it’s fully seated.
6. **Secure the Card**  
   Use screws to fasten the card to the case so it doesn’t move around.
7. **Plug in Power Cables (if needed)**  
   If your new GPU needs extra power, connect the necessary PCIe cables from your power supply unit (PSU).
8. **Close Up the Case and Reconnect Devices**  
   Reattach the side panel and plug your peripherals and power cable back into the PC.
9. **Boot Up and Install Drivers**  
   Turn the computer on. Once it starts, download and install the latest drivers for your new graphics card from the official NVIDIA or AMD website.

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

**Ans:**

**RAID (Redundant Array of Independent or Inexpensive Disks)** is a storage solution that links multiple hard drives or SSDs to either boost performance, provide data protection, or both. It’s often used in servers and high-performance systems to ensure speed and reliability.

**Popular RAID Types:**

1. **RAID 0 (Data Striping)** – Spreads data evenly across two or more drives to increase speed. However, it doesn’t offer any backup — if one drive fails, all data is lost.
2. **RAID 1 (Data Mirroring)** – Duplicates the same data onto two drives. If one fails, the other still holds all the information, offering solid data protection.
3. **RAID 5 (Striping with Parity)** – Requires at least three drives and provides a good balance of performance and fault tolerance. It stripes data while also storing parity info, allowing recovery if one drive goes down.
4. **RAID 10 (Mirror + Stripe / RAID 1+0)** – Combines the benefits of RAID 0 and RAID 1 by mirroring data and striping it for performance and redundancy. Needs a minimum of four drives.

**Section 4: Practical Application**

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

**Ans:**

1. **Shut Down and Unplug the PC**  
   Power off your computer completely and disconnect all cables to prevent any electrical issues while working inside.
2. **Open the Computer Case**  
   Remove the side panel to get access to the motherboard and CPU area.
3. **Unplug the Old Fan**  
   Locate the fan’s power connector on the motherboard (usually labelled CPU\_FAN) and gently unplug it.
4. **Take Out the Old Fan or Heatsink Assembly**  
   If it’s just the fan mounted on a heatsink, unscrew or unclip it.  
   If you're replacing the whole heatsink and fan unit, release any screws or locking clips holding it in place and remove it carefully.
5. **Clean the CPU (if needed)**  
   If you’re installing a new heatsink, clean off the old thermal paste from the top of the CPU using a microfiber cloth and isopropyl alcohol.
6. **Install the New Fan or Heatsink + Fan**
   * If you’re only changing the fan, secure it to the heatsink using the provided screws or clips.
   * If you’re installing a new heatsink, apply a small drop (about the size of a pea) of thermal paste onto the CPU, then place the new heatsink on top and fasten it properly.
7. **Reconnect the Fan Cable**  
   Plug the new fan’s cable into the CPU\_FAN header on the motherboard.
8. **Reassemble and Power On**  
   Close the case, reconnect all cables, and power on the computer to make sure the new fan is spinning and functioning properly.

**Section 5: Essay**

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

**Ans:**

**Why Regular Computer Hardware Maintenance Matters**

Taking care of your computer hardware regularly is crucial to keeping it running smoothly, extending its lifespan, and avoiding unexpected breakdowns. Skipping maintenance can lead to issues like overheating, sluggish performance, or even permanent damage to components over time.

**Common Maintenance Tasks to Keep Your PC in Top Shape:**

1. **Remove Dust and Debris**
   * Dust can block airflow and trap heat, causing parts to overheat.
   * Use compressed air to clean out fans, vents, and heatsinks.
2. **Inspect and Replace Thermal Paste**
   * Thermal paste can dry up over time, making heat transfer less effective.
   * Reapplying it on the CPU or GPU helps maintain proper cooling.
3. **Keep Drivers and Firmware Updated**
   * Outdated software can lead to bugs, crashes, or poor hardware performance.
   * Regular updates improve compatibility, stability, and security.
4. **Check Cable Connections**
   * Loose cables can cause random shutdowns or prevent hardware from working.
   * Make sure power and data connections are secure inside the case.
5. **Monitor Your Hard Drive’s Health**
   * Tools like Crystal Disk Info can warn you of failing drives.
   * Backing up your data regularly ensures you won’t lose anything important.
6. **Clean Your Keyboard and Mouse**
   * Crumbs, dust, and grime can affect how well your input devices work.
   * Use alcohol wipes or cotton swabs to gently clean around keys and buttons.
7. **Protect Against Power Surges**
   * Use a surge protector or a UPS to shield your computer from voltage spikes and power outages.
   * This helps prevent damage to your power supply and other components.