**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.

***Answer: 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.

***Answer: 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

***Answer: 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 Section

***Answer: 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.

 **Answer: True**  
(A new hard drive needs to be formatted to set up a file system before data can be stored.)

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

**Answer: False**  
(A POST error could indicate issues with various components like memory, motherboard, or graphics card, not just the CPU.)

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

**Answer: False**  
(Removing a USB flash drive without ejecting it can lead to data corruption or loss, as the system might still be writing to it.)

**Section 3: Short Answer**

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

ANSWER: Here are the general steps involved in installing a new graphics card in a desktop computer:

1. **Turn off and unplug the computer.**
2. **Open the case** by removing the side panel.
3. **Locate the PCIe slot** on the motherboard.
4. **Remove the expansion slot cover** at the back of the case.
5. **Insert the graphics card** into the PCIe slot and ensure it clicks into place.
6. **Secure the card** with screws.
7. **Connect power cables** from the power supply (if required).
8. **Close the case** and secure the side panel.
9. **Reconnect and power on the computer.**
10. **Install drivers** for the new card.
11. **Test the card** to ensure proper functionality.

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

**RAID (Redundant Array of Independent Disks)** is a data storage technology that combines multiple physical disk drives into a single logical unit for the purpose of improving performance, reliability, or both. The disks work together, and depending on the RAID configuration, RAID can provide fault tolerance, increase performance, or both.

* **RAID 0 (Striping)**: Boosts performance by spreading data across multiple disks. No redundancy.
* **RAID 1 (Mirroring)**: Duplicates data across disks for fault tolerance. Uses 50% of storage.
* **RAID 5 (Striping with Parity)**: Balances performance and redundancy, requiring at least 3 disks. Can recover from one disk failure.
* **RAID 6 (Double Parity)**: Like RAID 5 but can tolerate two disk failures.
* **RAID 10 (Striping + Mirroring)**: Combines RAID 0's speed and RAID 1's redundancy. Needs at least 4 disks.

RAID setups vary depending on the desired balance of performance and fault tolerance

**Section 4: Practical Application**

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

1. **Turn off and unplug the computer**  
   Ensure the computer is completely powered off and disconnected from the power supply.
2. **Open the computer case**  
   Use a screwdriver to remove the screws on the side panel of the case and slide it off to access the internal components.
3. **Locate the CPU fan**  
   The CPU fan is mounted on top of the CPU heatsink, which is attached to the motherboard.
4. **Disconnect the fan cable**  
   Unplug the CPU fan's power cable from the motherboard (usually a 3- or 4-pin connector labeled "CPU\_FAN").
5. **Remove the existing CPU fan and heatsink**  
   Release the clips or screws that hold the CPU fan and heatsink in place. Different fans may have different mounting mechanisms:
   * **Clip mechanism**: Push down on the clips and release them.
   * **Screw mechanism**: Unscrew the screws securing the heatsink to the motherboard.
6. **Clean the CPU and heatsink**  
   If you’re reusing the heatsink, clean off the old thermal paste from the CPU and the bottom of the heatsink using isopropyl alcohol and a lint-free cloth.
7. **Apply new thermal paste**  
   Apply a small pea-sized amount of thermal paste to the center of the CPU surface.
8. **Install the new CPU fan and heatsink**  
   If the new fan comes with a heatsink, install it by positioning it over the CPU and securing it with screws or clips. Make sure it sits evenly on the CPU to ensure proper heat dissipation.
9. **Connect the new fan cable**  
   Plug the new fan’s power cable into the "CPU\_FAN" header on the motherboard.
10. **Close the case and power on the computer**  
    Replace the side panel, reconnect the power cable, and turn on the computer. Verify that the new fan is running and cooling properly.

After installation, monitor the CPU temperature to ensure everything is functioning correctly.

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

Regular maintenance of computer hardware is essential for ensuring optimal performance, extending the lifespan of components, and preventing potential malfunctions. Neglecting hardware upkeep can lead to slower system performance, overheating, hardware failure, and data loss. Below are key reasons why maintenance is important, followed by examples of specific tasks

* **Dust Cleaning**: Remove dust from fans and vents to prevent overheating.
* **Fan and PSU Checks**: Ensure cooling systems and power supply work properly.
* **Thermal Paste Replacement**: Reapply to maintain effective cooling.
* **Hard Drive Maintenance**: Defragment and check for errors.
* **RAM and System Health Monitoring**: Test memory and track temperatures.
* **Peripheral Cleaning**: Clean external devices like keyboards and mice.
* **Battery Care**: For laptops, maintain healthy battery charge levels.