**ASSIGNMENT – 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?** 
   1. **Ensure the computer is plugged in to prevent electrostatic discharge.**
   2. **Wear an anti-static wrist strap to prevent damage from electrostatic discharge.**
   3. **Work on carpeted surfaces to prevent slipping.**
   4. **Use magnetic tools to handle components more easily.**

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

1. **What is the purpose of thermal paste during CPU installation?** 
   1. **To insulate the CPU from heat.**
   2. **To provide mechanical support for the CPU.**
   3. **To improve thermal conductivity between the CPU and the heat sink.**
   4. **To prevent the CPU from overheating.**

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

1. **Which tool is used to measure the output voltage of a power supply unit (PSU)?** 
   1. **Multimeter**
   2. **Screwdriver**
   3. **Pliers**
   4. **Hex key**

**Answer:** (a) Multimeter

1. **Which component is responsible for storing BIOS settings, such as date and time, even when the computer is powered off?** 
   1. **CMOS battery**
   2. **CPU**
   3. **RAM**
   4. **Hard drive**

**Answer:** (a) CMOS battery

# SECTION 2: TRUE OR FALSE

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

**Answer:** True

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

**Answer:** False

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

**Answer:** False

# SECTION 3: SHORT ANSWER

1. **Describe the steps involved in installing a new graphics card in a desktop computer.**
   * **Answer:**
     + Turn off the computer and disconnect it from the power source. oRemover the side panel of the computer case to access the internal components. oAlign the new card with the PCIe slot and press it firmly until it clicks into place. Secure it with screws. oAttach necessary power connectors from the PSU to the graphics card. oClose the case. oStart the computer, download, and install the latest drivers for the new graphics card from the manufacturer’s website.

1. **What is RAID, and what are some common RAID configurations?**
   * **Answer:** Redundant Array of Independent Disks is a data storage technology that combines multiple drives into a single logical unit to improve performance, provide redundancy, or both.
   * **Common RAID Configurations:**
     + RAID 0: Striping without redundancy; improves performance but offers no fault tolerance.
     + RAID 1: Mirroring; duplicates data across two drives for redundancy.
     + RAID 5: Striping with parity; requires at least three drives, offers fault tolerance, and balances performance and redundancy.
     + RAID 10(1+0): Combines mirroring and striping; provides high performance and fault tolerance but requires a minimum of four drives.

# SECTION 4: PRACTICAL APPLICATION

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

 **Answer:**

 **Gather Tools and Materials**: You'll need a new CPU fan, a screwdriver (typically Phillips), thermal paste, and possibly an anti-static wrist strap.

 **Power Off and Unplug**: Shut down your computer, unplug it from the power source, and disconnect all peripherals.

 **Open the Case**: Remove the side panel of your computer case. This usually requires removing a few screws at the back.

 **Locate the CPU Fan**: The CPU fan is mounted on top of the CPU, which is located on the motherboard.

 **Disconnect the Fan**: Unplug the power connector of the current CPU fan from the motherboard.

 **Remove the Old Fan**: Depending on the model, you may need to unscrew or unlatch the fan. Be gentle to avoid damaging the motherboard.

 **Clean the CPU Surface**: Use a clean cloth and some isopropyl alcohol to remove any old thermal paste from the CPU surface.

 **Apply New Thermal Paste**: Apply a small, pea-sized amount of thermal paste to the center of the CPU. This helps in heat transfer.

 **Install the New Fan**: Carefully place the new CPU fan onto the CPU, aligning it with the mounting brackets or screws. Secure it in place.

 **Reconnect the Fan**: Plug the power connector of the new fan into the appropriate header on the motherboard.

 **Close the Case**: Replace the side panel of your computer case and secure it with screws.

 **Reconnect and Test**: Plug in your computer, reconnect peripherals, and power it on. Check to ensure the new fan is running smoothly.

# SECTION 5: ESSAY

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

**Answer:**

1. **Preventing Hardware Failure:** Regular maintenance can help identify and fix potential issues before they lead to hardware failure, thus extending the lifespan of your components.
2. **Optimizing Performance:** Keeping your hardware clean and well-maintained ensures that it operates at peak efficiency, providing better performance and reliability.
3. **Enhancing Security:** Regular maintenance includes updating firmware and drivers, which can protect your system from security vulnerabilities.
4. **Cost Savings:** Proactive maintenance can prevent costly repairs or replacements down the line.

Here are some common maintenance tasks you can perform:

* **Cleaning:** Dust and debris can accumulate inside your computer, causing overheating and damage. Use compressed air to clean out the dust from fans, vents, and other components.
* **Checking Connections:** Ensure all cables and connections are secure. Loose cables can lead to performance issues or hardware malfunctions.
* **Updating Firmware and Drivers**: Regularly update your BIOS/UEFI firmware and drivers to ensure compatibility and security.
* **Running Diagnostics:** Use diagnostic tools to check the health of your hardware components, such as the hard drive, RAM, and power supply.
* **Reapplying Thermal Paste:** Over time, thermal paste can dry out and lose its effectiveness. Reapply thermal paste to the CPU to maintain optimal heat transfer.
* **Backing Up Data:** Regularly back up your important data to prevent loss in case of hardware failure.
* **Defragmenting Hard Drives:** For traditional hard drives (not SSDs), defragmenting can help improve read/write speeds by organizing data more efficiently.
* **Monitoring Temperatures:** Use software to monitor the temperatures of your CPU, GPU, and other components to ensure they are operating within safe limits.