**Assignment-2**

* ***Installation and Maintenance of Hardware and its Components.***
* ***Section-1: multiple Choice***

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

**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?

**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)?

**Answer:(a)** Multimeter.

1. Which component is responsible for storing BIOS setting, such as date and time, even when the computer is powered off?
   * **Answer:(a)** CMOS battery

* ***Section-2: True or False***

1. When installing a new hard drive, it is essential to format it before use?

**Answer:** True

1. A POST (Power-On Self-Test) error indicates a problem with the CPU?

**Answer:** true

1. 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 graphic card in a desktop computer?

**Answer:**

1. **Power Down and Unplug: turn** off the computer and unplug all cables.
2. **Open the case:** Remove the screws or use the latch to open the computer case.
3. **Remove Existing Card(if applicable):** If there’s an old graphic card, remove its retaining screw and gently pull it out of the PCI express slot.
4. **Insert the New Card:** Align the new graphic card with the PCI express slot and firmly press it into place.
5. **Secure the Card:** Use a screw to secure the card to the case.

**Connect Power Cables.** If the new card requires additional power, connect the appropriate power cables from the power supply.

1. **Close the Case:** put the side panel back on and secure it with screws or the latch.
2. **Reconnect and boot Up:** Plug the computer back into the power source, connect the monitor to the new graphic card, and turn the computer on.
3. What is Raid, and what are some common RAID configurations?

**Answer:**  RAID (Redundant Array of Independent Disks) is a technology that combines multiple physical disk drives into a single logical unit for the purpose of data redundancy, performance improvement, or both. RAID can be implemented via hardware of software.

**Common RAID configurations include:**

1. **RAID 0 (Striping):**

* **Description:** Data is split across multiple disks, which improves performance.
* **Advantage:** High read and write speeds.
* **Disadvantages:**  No redundancy, if one drive fails, all data is lost.
* **Use Case:** High-performance applications where data loss is not a critical issue.

1. **RAID 1 (Mirroring):**

* **Description:** Data and parity information are striped across three or more disks.
* **Advantages:** Good balance between performance, storage efficiency, and redundancy.
* **Disadvantage:** Write performance can be slower due to parity calculation; if one drive fails, data can be reconstructed from the parity information, but performance is degraded during this process.
* **Use Case:** Systems requiring a balance of performance, capacity, and fault tolerance.

1. **RAID 5 (Striping with Parity):**

* **Description:** Data and parity information are striped across three or more disks.
* **Advantages:** Good balance between performance, storage efficiency, and redundancy.
* **Disadvantages:** Write performance can be slower due to parity calculation; if one drive fails, data can be reconstructed from the parity information, but performance is degraded during this process.
* **Use Case:** Systems requiring a balance of performance, capacity, and fault tolerance.
* ***Section 4: Practical Application***

1. Demonstrate how to replace a CPU fan in a desktop computer?

**Answer: DONE IN LAB**

* ***Section 5: Essay***

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

**Answer:** Regular maintenance for computer hardware is crucial to ensure optimal performance, longevity, and reliability of a computer system.

* Importance of Regular Maintenance

1. **Improved Performance:**

* Over time, dust and debris can accumulate inside a computer, causing it to overheat and slow down. Regular cleaning helps maintain proper airflow and cooling, ensuring that components run efficiently.
* Fragmented data and cluttered files can bog down a system. Regular defragmentation and disk cleanup can enhance the speed and responsiveness of a computer.

1. **Data Integrity and Security:**

* Regular backups are essential to protect against data loss due to hardware failure, malware, or accidental deletion. Ensuring that backup system is functioning correctly is a key maintenance task.
* Maintaining up-to-data antivirus and anti-malware software protects against security threats that can compromise data integrity and system functionality.

1. **Extended Lifespan:**

* Proper maintenance can significantly extend the lifespan of hardware components. For instance, regularly cleaning fans and heat sinks prevents overheating, which can damage the CPU and GPU over time.
* Ensuring that power supplies and other critical components are operating within safe parameters can prevent premature failure.
* **Examples of Maintenance Tasks:**
* **Cleaning and Dust Removal:** Dust accumulates inside the computer case, on fans, and heat sinks, obstructing airflow and causing overheating. Regularly opening the case and using compressed air to remove dust can keep the system cool and running smoothly.
* **Checking and Replacing Components:** Periodically inspecting hardware components, such as RAM, hard drives, and power supplies, for signs of wear of failure is important. Replacing components before they fail can prevent downtime and data loss.
* **Updating Software and Firmware:** Keeping the operating system, drivers, and firmware updated ensures compatibility with new application and devise, improves performance, and enhances security.
* **Disk Maintenance:** Performing regular disk cleanups to remove temporary files, system caches, and other unnecessary data can free up space and improve system performance.