

## **Module 2: Installation and Maintenance of Hardware and Its Components - Assignment**

### **Section 1: Multiple Choice**

- 1. Which of the following precautions should be taken before working on computer hardware?**

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?**

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)?**

Answer: a) Multimeter

- 4. Which component is responsible for storing BIOS settings, such as date and time, even when the computer is powered off?**

Answer: a) CMOS battery

### **Section 2: True or False**

- 5. When installing a new hard drive, it is essential to format it before use.**

Answer: True

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

Answer: False

- 7. It is safe to remove a USB flash drive from a computer without ejecting it first.**

Answer: False

### **Section 3: Short Answer**

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

Steps:

1. Preparation:

- Power off the computer and unplug it from the electrical outlet o  
Press the power button to discharge residual electricity
- Wear an anti-static wrist strap

## 2. Remove Old Card :

- Open the computer case
- Locate the existing graphics card
- Disconnect any power cables from the card
- Unscrew the bracket securing the card
- Release the PCIe slot retention clip
- Carefully remove the old card

## 3. Install New Card:

- Align the new graphics card with the PCIe x16 slot
- Firmly press down until the retention clip clicks
- Secure the card with screws to the case bracket
- Connect required PCIe power cables from the PSU

## 4. Final Steps:

- Close the case
- Reconnect power and peripherals
- Power on the computer
- Install the latest drivers from the manufacturer's website

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

RAID (Redundant Array of Independent Disks) is a technology that combines multiple hard drives into a single logical unit for data redundancy, performance improvement, or both.

Common RAID Configurations:

### • RAID 0 (Striping):

- Data is split across multiple drives

- Improves performance
- No redundancy - if one drive fails, all data is lost
- Requires minimum 2 drives
- **RAID 1 (Mirroring):**
  - Data is duplicated on two or more drives
  - Provides redundancy
  - No performance gain for writes
  - Requires minimum 2 drives
- **RAID 5 (Striping with Parity):**
  - Data and parity information distributed across all drives
  - Can survive one drive failure
  - Good balance of performance and redundancy
  - Requires minimum 3 drives

## Section 4: Practical Application

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

Step-by-Step Process:

1. **Safety Preparation:**
  - Power off and unplug the computer
  - Discharge static electricity
  - Wear anti-static wrist strap
  - Open the computer case
2. **Remove Old Fan:**
  - Disconnect the fan power cable from the motherboard (usually labeled CPU\_FAN)
  - Identify the fan mounting mechanism (clips, screws, or push pins)
  - For clip mounts: gently release clips in a diagonal pattern
  - For screw mounts: unscrew in a criss-cross pattern

- Carefully lift the heatsink/fan assembly
- 3. Clean the CPU:**
- Remove old thermal paste from CPU surface using isopropyl alcohol (90% or higher) and lint-free cloth
  - Ensure surface is completely clean and dry
- 4. Install New Fan:**
- Apply a small amount (pea-sized) of thermal paste to the center of the CPU
  - Align the new heatsink/fan assembly with mounting holes
  - Secure using mounting mechanism (clips or screws in criss-cross pattern)
  - Ensure even pressure on all corners
- 5. Final Steps:**
- Connect fan power cable to CPU\_FAN header
  - Verify secure installation
  - Close case
  - Power on and verify fan operation in BIOS

## Section 5: Essay

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

Regular hardware maintenance is crucial for ensuring optimal computer performance, extending component lifespan, and preventing costly failures.

#### **Importance of Regular Maintenance:**

- **Performance Optimization** Regular maintenance prevents performance degradation caused by dust accumulation, thermal issues, and software conflicts. Clean components operate at optimal temperatures, maintaining processing speeds.
- **Extended Hardware Lifespan** Proper maintenance can significantly extend the life of computer components. Keeping systems clean and cool reduces stress on electronic components, preventing premature failure.

- **Cost Savings** Preventive maintenance is far less expensive than replacing failed components or recovering lost data. Regular checks can identify potential issues before they become critical.
- **Data Protection** Regular backups and drive health monitoring protect against data loss from hardware failures.

## **Key Maintenance Tasks:**

### Physical Cleaning:

- Clean dust from fans, heatsinks, and air vents every 3-6 months
- Use compressed air to remove dust from internal components
- Clean monitor screens and peripherals
- **Thermal Management**
- Monitor CPU and GPU temperatures
- Replace thermal paste every 2-3 years
- Ensure proper airflow with correctly positioned fans
- Verify all fans are functioning properly

### Storage Maintenance:

- Run disk cleanup utilities to remove temporary files
- Defragment HDDs (not SSDs) quarterly
- Check drive health using S.M.A.R.T. monitoring tools
- Verify backup systems are functioning

### Software Maintenance:

- Update drivers regularly
- Update BIOS/UEFI when necessary (with caution)
- Remove unnecessary startup programs
- Run antivirus and anti-malware scans
- **Cable Management:**
- Organize cables to improve airflow
- Check for loose connections
- Replace damaged cables
- **Power Supply:**
- Test voltage outputs annually

- Clean dust from PSU (if design allows)
- Verify adequate wattage for components