6Networking career deve0lopment program.

**Assignment Module 2: Installation and maintenance of hardware and its component**

**Section 1: multiple choice**

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

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

**2. What is the purpose of thermal paste during CPU installation?**

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

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

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.**

* True

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

* False

While a POST error can sometimes indicate a CPU problem, it can also point to issues with other components like:

Motherboard: Faulty chipset, memory slots, or other components.

RAM: Faulty memory modules.

Power Supply: Insufficient or unstable power.

BIOS: Corrupted BIOS settings.

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

* False

Improper removal of a USB drive can:

Corrupt data: Files being written to the drive may become incomplete or damaged.

Damage the drive: Can cause physical damage to the drive's internal components.

System instability: Can cause the operating system to become unstable or crash.

**Section 3: Short Answer**

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

* Installing a New Graphics Card

Step 1: Preparation

Power Down: Turn off your computer and unplug the power cable.

Ground Yourself: Touch a metal part of the computer case to discharge any static electricity.

Open the Case: Carefully open your computer's case using the appropriate tools.

Step 2: Remove the Old Graphics Card (if applicable)

Locate the old graphics card in the PCI-E slot.

Carefully remove the screws holding the card in place.

Gently release the retention clip on the PCI-E slot.

Pull the card straight out of the slot.

Step 3: Install the New Graphics Card

Align the new graphics card with the PCI-E slot on the motherboard.

Carefully insert the card into the slot at an angle.

Push the card firmly into the slot until it locks into place.

Secure the card with the screws you removed earlier.

Step 4: Connect Power Cables (if necessary)

If your new graphics card requires additional power, connect the necessary power cables from your power supply unit (PSU) to the card.

Step 5: Close the Case and Power On

Close your computer's case securely.

Plug the power cable back in.

Turn on your computer.

Step 6: Install Drivers

Once your computer boots up, install the latest drivers for your new graphics card from the manufacturer's website.

Visual Guide:

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

RAID (Redundant Array of Independent Disks)

RAID is a technology that combines multiple hard drives into a single logical unit for improved performance, fault tolerance, or both. Common RAID configurations include:

RAID (Striping):

Purpose: Increased performance by spreading data across multiple drives.

Fault Tolerance: None. Data loss occurs if any drive fails.

RAID 1 (Mirroring):

Purpose: Data redundancy by creating an exact copy of data on two drives.

Fault Tolerance: High. Data remains accessible if one drive fails.

RAID 5 (Striped with Parity):

Purpose: Combines data striping and parity information across multiple drives.

Fault Tolerance: Tolerates the failure of one drive.

RAID 10 (RAID 1+0):

Purpose: Combines mirroring and striping for both performance and fault tolerance.

Fault Tolerance: Tolerates the failure of one drive in each mirrored pair

**Section 4: Practical Application**

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

Replacing a CPU Fan in a Desktop Computer

Warning: Working inside your computer can expose you to static electricity, which can damage components. Always ground yourself by touching a metal part of the computer case before handling any components.

Tools Needed:

Phillips-head screwdriver

Anti-static wrist strap (optional but recommended)

Thermal paste (if replacing the fan with a new one)

Compressed air (optional for cleaning)

New CPU fan (if applicable)

Steps:

Turn off and unplug the computer. Disconnect all peripherals (mouse, keyboard, monitor, etc.).

Open the computer case. Locate the screws holding the side panel in place and remove them. Carefully slide off the side panel.

Locate the CPU and its fan. The CPU is usually located near the centre of the motherboard. The fan is typically mounted directly on top of it.

Unplug the fan's power connector. This is usually a small 2-pin or 3-pin connector.

Unplug the fan's motherboard connector. This is usually a 3-pin or 4-pin connector.

Remove the fan. There are usually clips or screws holding the fan in place. Carefully detach the fan from the heatsink.

Clean the heatsink. Use compressed air to remove any dust or debris from the heatsink fins. Do not touch the CPU directly.

(Optional) Apply new thermal paste. If you are installing a new fan, apply a small pea-sized amount of thermal paste to the centre of the CPU.

Install the new fan (if applicable). Align the mounting holes and secure the fan to the heatsink.

Reconnect the fan's connectors. Plug the fan's power connector and motherboard connector back into their respective sockets.

Replace the side panel. Carefully slide the side panel back into place and secure it with the screws.

Reconnect peripherals and power. Plug in the power cord and all peripherals.

Turn on the computer. Check that the fans are spinning and that the computer boots up normally

**Section 5: Essay**

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

Importance of Regular Maintenance for Computer Hardware

Regular maintenance is crucial for ensuring your computer hardware functions optimally, extends its lifespan, and prevents costly repairs. Just like a car needs regular oil changes and tune-ups, your computer hardware requires attention to keep it running smoothly.

Key benefits of regular maintenance:

**Improved Performance:** Dust accumulation, overheating, and software clutter can slow down your computer. Regular cleaning and optimization can significantly boost performance.

**Enhanced Stability:** Maintenance helps identify and resolve potential issues before they escalate into major problems, reducing the risk of system crashes and data loss.

**Longer Lifespan:** By addressing potential issues proactively, you can extend the lifespan of your hardware components and avoid premature replacements.

**Cost Savings:** Regular maintenance can prevent costly repairs by catching problems early on. It's much cheaper to clean a dusty fan than to replace a fried motherboard.

**Data Protection:** A well-maintained system is less likely to experience unexpected crashes, which can lead to data loss. Regular backups are also a vital part of maintenance.

Examples of Maintenance Tasks:

**Cleaning:** Regularly clean the inside of your computer case to remove dust buildup. Use compressed air to blow out dust from fans, heat sinks, and other components.

**Temperature Monitoring:** Keep an eye on your CPU and GPU temperatures. If they are running too hot, consider adding more fans or improving airflow.

Software Updates: Install the latest operating system updates and security patches to address vulnerabilities and improve performance.

**Disk Cleanup:** Regularly delete temporary files, unused programs, and other junk files to free up disk space and improve performance.

Disk Defragmentation: (For traditional hard drives) Rearrange fragmented files to improve read/write speeds and overall performance.

**Backups:** Regularly back up important files to an external hard drive, cloud storage, or other reliable media.