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Batch: Hardware (Abdul Hamid Sir) 9:30am to 10:30am

Assignment

**Module 2 : Installation and Maintenance of Hardware and
Its**

Section 1: Multiple Choice

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

Ans: [b] Wear an anti-static wrist strap to prevent damage from electrostatic discharge.

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

Ans: [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)?

Ans: [a] Multimeter

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

Ans: [a] CMOS battery

Section 2: True or False

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

Ans: True

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

Ans: False

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

Ans: False

Section 3: Short Answer

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

Ans:

Steps to Install a New Graphics Card in a Desktop Computer:

1. Turn Off and Unplug the Computer

- Shut down your PC completely and unplug it from the power outlet. Disconnect all cables for safety.

2. Open the Computer Case

- Use a screwdriver to remove the side panel (usually the left side) of the computer case.

3. Locate the PCIe Slot

- Find the PCI Express (PCIe) x16 slot on the motherboard—this is where the graphics card will be installed.

4. Remove the Old Graphics Card (if any)

- If you're replacing an existing GPU, unscrew and carefully remove it from the PCIe slot. Be sure to release any clips holding it in place.

5. Insert the New Graphics Card

- Align the new graphics card with the PCIe x16 slot and gently but firmly press it down until it clicks into place. Secure it with screws at the rear bracket.

6. Connect Power Cables

- If your new graphics card requires extra power (6-pin or 8-pin connectors), connect the appropriate cables from your power supply.

7. Close the Computer Case

- Once the card is securely installed and powered, close the case and screw the side panel back on.

8. Reconnect and Power On

- Plug in your computer and connect your monitor to the new graphics card (usually via HDMI, DisplayPort, or DVI). Turn the PC on.

9. Install Graphics Card Drivers

- After booting into the operating system, download the latest drivers from the graphics card manufacturer's website (NVIDIA, AMD, etc.) and install them.

10. Restart and Verify Installation

- Restart your computer after installing drivers. Then go to Device Manager or use GPU monitoring software to verify that the new graphics card is recognized and functioning properly.

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

Ans:

What is RAID, and What Are Some Common RAID Configurations?

RAID stands for **Redundant Array of Independent Disks**. It is a method of storing the same data in different places on multiple hard drives to **increase speed, provide backup (data protection), or both**.

RAID helps keep your data safe in case one hard drive stops working and can also make your computer read and write data faster.

Common RAID Configurations:

1. RAID 0 (Striping):

- Data is split across two or more drives.
- **Faster performance but no backup.**
- If one drive fails, **all data is lost**.

2. RAID 1 (Mirroring):

- Data is copied (mirrored) to two drives.
- **Very safe** – if one drive fails, data is still on the other.
- Uses more storage (only half is usable).

3. RAID 5 (Striping with Parity):

- Needs at least 3 drives.
- Data and backup information (parity) are spread across all drives.
- **Good speed and backup** – can survive one drive failure.

4. RAID 6 (Double Parity):

- Similar to RAID 5 but safer – can handle **two** drive failures.
- Slower writing speed, but **more secure**.

5. RAID 10 (1+0):

- Combines RAID 1 and RAID 0.
- Fast and safe, but needs at least **4 drives**.
- Only half the total space can be used.

Section 4: Practical Application

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

Ans: DONE

Section 5: Essay






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

Ans:

Importance of Regular Maintenance for Computer Hardware:

Regular maintenance of computer hardware is essential to ensure that your system runs **smoothly, efficiently**, and has a **longer lifespan**. Just like a car or any other machine, your computer also needs proper care to prevent common issues such as **slowness, overheating, hardware failures, or data loss**.

Proper maintenance helps:

-  **Improve performance** – Keeps your system fast and responsive.
-  **Extend the life of components** – Prevents early damage to hardware.
-  **Prevent unexpected breakdowns** – Detects issues early before they become serious problems.
-  **Keep your system clean and cool** – Reduces risk of overheating.
-  **Save money on costly repairs or replacements** – Maintenance is cheaper than fixing broken hardware.

Examples of Maintenance Tasks:

 **Cleaning the Hardware:**

- Remove dust from the CPU, power supply, internal fans, keyboard, and vents using a soft brush or air blower.
 - Clean the screen with a microfiber cloth.
 - **Why it's important:** Dust buildup can cause overheating and damage internal parts, reducing performance or causing system failure.
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Checking and Replacing Cables:

- Inspect all power and data cables for signs of damage, fraying, or looseness.
 - Make sure all connections (USB, HDMI, power cords, etc.) are secure.
 - **Why it's important:** Loose or damaged cables can cause data transfer errors, short circuits, or system instability.
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Updating Drivers and BIOS:

- Regularly update your hardware drivers (graphics, sound, network, etc.) and motherboard BIOS.
 - Use official websites or trusted software for updates.
 - **Why it's important:** Updated drivers improve hardware performance, fix bugs, and ensure compatibility with new software or devices.
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Running Disk Cleanup and Defragmentation:

- Use built-in tools like “Disk Cleanup” to remove junk files and free up space.
- Run “Defragment and Optimize Drives” (for HDDs) to organize file data efficiently.

- **Why it's important:** It boosts speed and helps the hard drive read/write data faster. (Note: SSDs do not need defragmentation.)
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Checking and Replacing Batteries (Laptop or CMOS):

- For laptops, check battery health regularly and replace if it doesn't hold a charge.
 - Replace CMOS battery if system date/time resets frequently.
 - **Why it's important:** A healthy battery ensures reliable use and saves BIOS settings when the system is powered off.
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Monitoring Hardware Temperatures:

- Use tools like **HWMonitor**, **Speccy**, or BIOS settings to monitor CPU and GPU temperatures.
 - Ensure all fans are spinning and clean; apply thermal paste to the processor if needed.
 - **Why it's important:** Overheating can cause permanent damage to your processor, graphics card, and motherboard.
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Scanning for Hardware Issues:

- Use built-in diagnostics tools (like Windows Memory Diagnostic or CHKDSK).
- Use third-party software to check hard drive health (e.g., CrystalDiskInfo).
- **Why it's important:** Helps detect failing RAM, hard drives, or other components early to avoid data loss.

Backing Up Data:

- Regularly back up important files to an external drive, cloud service, or NAS (network-attached storage).
- Use automated backup tools to schedule backups.
- **Why it's important:** Protects your data from unexpected hardware failure, virus attacks, or accidental deletion.

Power Supply Check and Surge Protection:

- Use a reliable surge protector or UPS (uninterruptible power supply).
- Ensure your power supply unit (PSU) is working properly and not overheating.
- **Why it's important:** Protects your hardware from voltage spikes and sudden shutdowns.

Keyboard and Mouse Maintenance:

- Remove debris or dust from under keyboard keys and mouse sensors.
- Use isopropyl alcohol and cotton swabs for deeper cleaning.
- **Why it's important:** Ensures smooth functioning and prevents stuck keys or erratic mouse movement.

Internal Component Check (Advanced Users):

- Open the case and check for swollen capacitors, burnt smells, or unusual noises.

- Make sure all expansion cards (GPU, RAM, etc.) are properly seated.
 - **Why it's important:** Early signs of hardware failure can be spotted and fixed before causing system crashes.
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□ Using System Monitoring Tools:

- Software like **CPU-Z**, **GPU-Z**, **Speccy**, and **AIDA64** can give full details about hardware status.
- Monitor fan speeds, voltages, and performance benchmarks.
- **Why it's important:** Helps identify if any component is underperforming or close to failure.