

**Hardware Networking**

**Installation and Maintenance of**

**Hardware and Its components**

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# Assignment: Installation and Maintenance of Hardware and Its Components

**Topic: User Management**

**Assignment Level Basic**

1. **What is user management?**
   * User management is the process of managing user accounts and access rights within a system or network. It involves creating, modifying, and deleting user accounts, as well as assigning permissions and roles to ensure security and proper access control.
2. **Why is user management needed?**
   * User management is essential for:
     + **Security**: Ensuring that only authorized users have access to sensitive information and resources.
     + **Accountability**: Tracking user activities and maintaining logs for auditing purposes.
     + **Efficiency**: Streamlining the process of granting and revoking access as needed.
     + **Compliance**: Meeting regulatory requirements and organizational policies.

**Assignment Level Intermediate**

1. **Where can we access the user management?**
   * User management can be accessed through:
     + **Operating System Settings**: For example, in Windows, you can access it via the Control Panel or Settings app.
     + **Administrative Tools**: Such as Active Directory Users and Computers in Windows Server.
     + **Web-based Interfaces**: For cloud services like Microsoft Azure or Google Workspace.
     + **Command Line Tools**: Using commands like useradd, usermod, and userdel in Linux.
2. **What are the features of user management?**
   * **User Creation and Deletion**: Adding new users and removing inactive or unauthorized users.
   * **Password Management**: Setting and resetting passwords.
   * **Role Assignment**: Assigning roles and permissions based on user responsibilities.
   * **Access Control**: Granting or restricting access to resources.
   * **Audit Trails**: Keeping logs of user activities for monitoring and auditing.
   * **Group Management**: Organizing users into groups for easier management.

**Assignment Level Advance**

1. **Do a practical to create a user from user management.**
   * **Windows**:
     1. Open **Control Panel**.
     2. Go to **User Accounts**.
     3. Click on **Manage another account**.
     4. Select **Add a new user in PC settings**.
     5. Follow the prompts to create a new user.
   * **Linux**:
     1. Open a terminal.
     2. Use the command: sudo adduser username.
     3. Follow the prompts to set up the new user.
2. **Do a practical to change the password of the administrator from the user management tool.**
   * **Windows**:
     1. Open **Control Panel**.
     2. Go to **User Accounts**.
     3. Click on **Manage another account**.
     4. Select the **Administrator account**.
     5. Click on **Change the password** and follow the prompts.
   * **Linux**:
     1. Open a terminal.
     2. Use the command: sudo passwd root.
     3. Enter the new password when prompted.

**Topic: File and Folder Permission**

**Assignment Level Basic**

1. **What is file folder permission?**
   * File and folder permissions are settings that determine who can read, write, or execute a file or folder. These permissions help protect data from unauthorized access and modifications.
2. **What is the use of file and folder permission?**
   * **Security**: Protecting sensitive data from unauthorized access.
   * **Data Integrity**: Preventing accidental or malicious modifications.
   * **Access Control**: Ensuring that only authorized users can access certain files or folders.

**Assignment Level Intermediate**

1. **Write down the steps to give a folder read-only permission.**
   * **Windows**:
     1. Right-click on the folder.
     2. Select **Properties**.
     3. Go to the **Security** tab.
     4. Click on **Edit**.
     5. Select the user or group.
     6. Check the **Read** box under **Allow**.
     7. Click **Apply** and then **OK**.
   * **Linux**:
     1. Open a terminal.
     2. Use the command: chmod -R 444 /path/to/folder.
2. **Write a step to give a file only admin permission.**
   * **Windows**:
     1. Right-click on the file.
     2. Select **Properties**.
     3. Go to the **Security** tab.
     4. Click on **Edit**.
     5. Select the **Administrators** group.
     6. Check the **Full control** box under **Allow**.
     7. Click **Apply** and then **OK**.
   * **Linux**:
     1. Open a terminal.
     2. Use the command: chown root:root /path/to/file.
     3. Use the command: chmod 700 /path/to/file.

**Assignment Level Advance**

1. **Do a practical to give the folder permission of read-only in network.**
   * **Windows**:
     1. Right-click on the folder.
     2. Select **Properties**.
     3. Go to the **Sharing** tab.
     4. Click on **Advanced Sharing**.
     5. Check **Share this folder**.
     6. Click on **Permissions**.
     7. Select the user or group.
     8. Check the **Read** box under **Allow**.
     9. Click **Apply** and then **OK**.
   * **Linux**:
     1. Open a terminal.
     2. Use the command: chmod -R 444 /path/to/folder.
     3. Configure the network share using samba or NFS.
2. **Do a practical to change the ownership of the folder and the subfolders in it.**
   * **Windows**:
     1. Right-click on the folder.
     2. Select **Properties**.
     3. Go to the **Security** tab.
     4. Click on **Advanced**.
     5. Click on **Change** next to the owner.
     6. Enter the new owner’s name and click **Check Names**.
     7. Click **OK**.
     8. Check **Replace owner on subcontainers and objects**.
     9. Click **Apply** and then **OK**.
   * **Linux**:
     1. Open a terminal.
     2. Use the command: sudo chown -R newowner:newgroup /path/to/folder.

**Topic: Install OS**

**Assignment Level Basic**

1. **What is OS?**
   * An Operating System (OS) is software that manages computer hardware and software resources and provides common services for computer programs. It acts as an intermediary between users and the computer hardware.
2. **What are the types of OS?**
   * **Desktop OS**: Windows, macOS, Linux.
   * **Mobile OS**: Android, iOS.
   * **Server OS**: Windows Server, Linux Server distributions.
   * **Embedded OS**: Used in devices like routers, smart TVs, etc.

**Assignment Level Intermediate**

1. **Do a practical to create a bootable pendrive for Kali Linux.**
   * Download the Kali Linux ISO from the official website.
   * Use a tool like **Rufus**:
     1. Insert the USB drive.
     2. Open Rufus.
     3. Select the USB drive.
     4. Select the Kali Linux ISO.
     5. Click **Start** and follow the prompts.
2. **Do a practical to create a bootable pendrive for Windows 7.**
   * Download the Windows 7 ISO from the official website.
   * Use a tool like **Rufus**:
     1. Insert the USB drive.
     2. Open Rufus.
     3. Select the USB drive.
     4. Select the Windows 7 ISO.
     5. Click **Start** and follow the prompts.
3. **Do a practical to create a bootable pendrive for macOS Mojave with Unibeast.**
   * Download the macOS Mojave installer from the App Store.
   * Use **Unibeast**:
     1. Insert the USB drive.
     2. Open Unibeast.
     3. Follow the prompts to select the macOS Mojave installer and the USB drive.
     4. Click **Create** and follow the prompts.

**Assignment Level Advance**

1. **Do a practical to install Kali Linux.**
   * Boot from the Kali Linux USB drive.
   * Follow the installation prompts to partition the disk, set up the user, and complete the installation.
2. **Do a practical to install Windows 10.**
   * Boot from the Windows 10 USB drive.
   * Follow the installation prompts to partition the disk, set up the user, and complete the installation.
3. **Do a practical to install macOS X.**
   * Boot from the macOS USB drive.
   * Follow the installation prompts to partition the disk, set up the user, and complete the installation.

**Topic: Clean Install**

**Assignment Level Basic**

1. **What is clean install?**
   * A clean install is the process of installing an operating system on a computer by completely erasing the existing OS and all data on the hard drive. This ensures a fresh start with no leftover files or settings from previous installations.

**Assignment Level Intermediate**

1. **What is the process for clean install?**
   * **Backup Data**: Save important files to an external drive or cloud storage.
   * **Create Installation Media**: Use a USB drive or DVD with the OS installation files.
   * **Boot from Installation Media**: Restart the computer and boot from the USB or DVD.
   * **Format the Hard Drive**: During installation, choose to format the drive to erase all data.
   * **Install the OS**: Follow the on-screen instructions to install the new OS.
   * **Set Up the OS**: Configure settings, create user accounts, and install necessary drivers and software.
2. **What are the benefits of clean install?**
   * **Improved Performance**: Removes old files and settings that can slow down the system.
   * **Eliminates Malware**: Erases any viruses or malware present on the system.
   * **Resolves Issues**: Fixes software problems and conflicts.
   * **Fresh Start**: Provides a clean slate for new installations and configurations.

**Assignment Level Advance**

1. **Do a clean installation of Windows XP**
   * Insert the Windows XP installation CD and restart the computer.
   * Boot from the CD by pressing any key when prompted.
   * Follow the on-screen instructions to delete existing partitions and create a new one.
   * Format the partition using the NTFS file system.
   * Proceed with the installation by following the prompts.
2. **Do a clean installation of Windows 8**
   * Create a bootable USB drive with the Windows 8 installation files.
   * Insert the USB drive and restart the computer.
   * Boot from the USB drive by selecting it in the boot menu.
   * Follow the on-screen instructions to delete existing partitions and create a new one.
   * Format the partition and proceed with the installation.

**Topic: Upgrade Installation**

**Assignment Level Basic**

1. **What is upgrade installation?**
   * An upgrade installation is the process of installing a new version of an operating system over an existing one, preserving user data, settings, and installed applications.
2. **What is the benefit of upgrade installation?**
   * **Preserves Data**: Keeps existing files, settings, and applications.
   * **Less Downtime**: Faster than a clean install as it doesn’t require reinstalling everything.
   * **Improved Features**: Provides access to new features and improvements of the new OS version.

**Assignment Level Intermediate**

1. **Write down the steps of upgrade installation.**
   * **Backup Data**: Save important files to an external drive or cloud storage.
   * **Check Compatibility**: Ensure the current system meets the requirements for the new OS.
   * **Download Installation Files**: Obtain the upgrade files from the official source.
   * **Run the Installer**: Launch the installer and follow the on-screen instructions.
   * **Choose Upgrade Option**: Select the option to upgrade the existing OS.
   * **Complete Installation**: Follow the prompts to complete the upgrade process.

**Assignment Level Advance**

1. **Do a practical to upgrade from Windows 8 to Windows 10**
   * Download the Windows 10 Media Creation Tool from the Microsoft website.
   * Run the tool and select “Upgrade this PC now”.
   * Follow the on-screen instructions to download and install Windows 10.
   * Choose to keep personal files and apps during the installation process.
   * Complete the installation and set up Windows 10.

**Topic: Partition & Formatting**

**Assignment Level Basic**

1. **What is partitioning?**
   * Partitioning is the process of dividing a hard drive into separate sections, each of which can be managed independently.
2. **What is partition?**
   * A partition is a logical division of a hard drive that acts as a separate storage unit.
3. **What is format?**
   * Formatting is the process of preparing a partition for use by an operating system, which involves setting up a file system.

**Assignment Level Intermediate**

1. **Do a Practical of MBR partition.**
   * Open Disk Management in Windows.
   * Right-click on the unallocated space and select “New Simple Volume”.
   * Follow the wizard to create a new partition and choose MBR (Master Boot Record) as the partition style.
2. **Do a Practical of GPT partition.**
   * Open Disk Management in Windows.
   * Right-click on the unallocated space and select “New Simple Volume”.
   * Follow the wizard to create a new partition and choose GPT (GUID Partition Table) as the partition style.

**Assignment Level Advance**

1. **Do a practical using CMD.**
   * Open Command Prompt as an administrator.
   * Use diskpart to manage partitions:
     + list disk
     + select disk X (replace X with the disk number)
     + create partition primary
     + format fs=ntfs quick
2. **Convert a partition to GPT by CMD.**
   * Open Command Prompt as an administrator.
   * Use diskpart:
     + list disk
     + select disk X (replace X with the disk number)
     + clean
     + convert gpt
3. **Format a partition using CMD.**
   * Open Command Prompt as an administrator.
   * Use diskpart:
     + list volume
     + select volume X (replace X with the volume number)
     + format fs=ntfs quick

**Topic: Transferring Files**

**Assignment Level Basic**

1. **What is transferring files?**
   * Transferring files is the process of moving or copying files from one location to another.
2. **What are the ways of transferring files?**
   * **USB Drives**: Using external storage devices.
   * **Network**: Transferring files over a local network or the internet.
   * **Cloud Storage**: Using services like Google Drive, OneDrive, or Dropbox.
   * **Direct Cable**: Using cables like Ethernet or USB for direct transfer.

**Assignment Level Intermediate**

1. **How do we transfer files from one system to another?**
   * **Using USB Drives**: Copy files to a USB drive from one system and then transfer them to another system.
   * **Over a Network**: Share files over a local network using shared folders or network drives.
   * **Using Cloud Storage**: Upload files to a cloud storage service and then download them on another system.
2. **Types of file transferring media.**
   * **USB Drives**: Portable storage devices.
   * **External Hard Drives**: Larger capacity portable storage.
   * **Network Cables**: Ethernet cables for direct connection.
   * **Cloud Services**: Online storage platforms.
   * **Bluetooth**: Wireless transfer for small files.

**Assignment Level Advanced**

1. **Do a practical to transfer files from one system to another via network.**
   * **Windows**:
     1. Right-click on the folder you want to share.
     2. Select **Properties**.
     3. Go to the **Sharing** tab.
     4. Click on **Advanced Sharing**.
     5. Check **Share this folder**.
     6. Set permissions and click **OK**.
     7. Access the shared folder from another system via the network.
2. **Do a practical to transfer data from one hard disk to another.**
   * **Using Disk Cloning Software**:
     1. Connect both hard disks to the computer.
     2. Use software like **Clonezilla** or **Macrium Reflect**.
     3. Follow the software instructions to clone the data from one hard disk to another.

**Topic: Administrative Tools**

**Assignment Level Basic**

1. **What are administrative tools?**
   * Administrative tools are a set of utilities provided by an operating system to manage and configure system settings, monitor performance, and perform administrative tasks.
2. **What is the use of administrative tools?**
   * **System Management**: Configure and manage system settings.
   * **Performance Monitoring**: Track system performance and resource usage.
   * **Security Management**: Manage security settings and user permissions.
   * **Troubleshooting**: Diagnose and fix system issues.

**Assignment Level Intermediate**

1. **List out the administrative tools.**
   * **Event Viewer**: View system logs and events.
   * **Task Scheduler**: Schedule tasks to run automatically.
   * **Performance Monitor**: Monitor system performance.
   * **Computer Management**: Access various administrative tools.
   * **Disk Management**: Manage disk partitions and volumes.
   * **Services**: Manage system services.
   * **Local Security Policy**: Configure security policies.
   * **Group Policy Editor**: Manage group policies.
2. **What is disk management tool?**
   * The disk management tool is a utility that allows users to manage disk drives and partitions. It can be used to create, delete, format, and resize partitions, as well as assign drive letters and manage disk space.

**Topic: Windows Feature**

**Assignment Level Base**

1. **What are Windows Features?**
   * Windows Features are built-in tools and services in the Windows operating system.
   * They can be turned on or off to add or remove functionality.

**Assignment Level Intermediate**

1. **List out the Windows Features:**
   * Internet Information Services (IIS)
   * .NET Framework 3.5
   * Hyper-V
   * Windows Subsystem for Linux
   * Windows Defender Application Guard
   * Telnet Client
   * SMB 1.0/CIFS File Sharing Support
   * Windows Sandbox
2. **What is the use of IIS?**
   * IIS (Internet Information Services) is a web server for hosting websites and web applications.
   * It supports HTTP, HTTPS, FTP, FTPS, and SMTP.
   * Used for deploying and managing web applications.

**Assignment Level Advanced**

1. **Practical to Reinstall IIS:**
   * Open “Control Panel” > “Programs” > “Turn Windows features on or off”.
   * Uncheck “Internet Information Services” and click “OK”.
   * Restart your computer.
   * Go back to “Turn Windows features on or off”.
   * Check “Internet Information Services” and click “OK”.
2. **Practical to Install .NET Framework 3.5:**
   * Open “Control Panel” > “Programs” > “Turn Windows features on or off”.
   * Check “.NET Framework 3.5 (includes .NET 2.0 and 3.0)”.
   * Click “OK” and follow the prompts to install.
3. **Practical to Disable Internet Explorer:**
   * Open “Control Panel” > “Programs” > “Turn Windows features on or off”.
   * Uncheck “Internet Explorer 11”.
   * Click “OK” and restart your computer.

**Topic: Backup & Restore**

**Assignment Level Basic**

1. **What is Backup?**
   * Backup is the process of copying data to protect it from loss or damage.
2. **What is Restore?**
   * Restore is the process of returning data from a backup to its original or a new location.
3. **What is the Need of Backup?**
   * To protect data from accidental deletion, hardware failure, or malware.
   * To ensure data can be recovered in case of loss.

**Assignment Level Intermediate**

1. **What are the Tools of Backup?**
   * Windows Backup and Restore
   * File History
   * System Image Backup
   * Third-party tools like Acronis, Recuva
2. **How Do We Restore?**
   * Use the backup tool to select the backup file.
   * Follow the prompts to restore the data to its original or new location.
3. **How to Create a Restore Point?**
   * Open “Control Panel” > “System and Security” > “System”.
   * Click “System Protection” > “Create”.
   * Enter a description and click “Create”.

**Assignment Level Advanced**

1. **Practical to Create Restore Point:**
   * Follow the steps in “How to Create a Restore Point”.
2. **Practical to Restore from Restore Point:**
   * Open “Control Panel” > “System and Security” > “System”.
   * Click “System Protection” > “System Restore”.
   * Follow the prompts to restore your system to a previous state.
3. **Practical to Take Backup from Another System:**
   * Use a network or external drive to copy data from another system.
   * Use backup software to create a backup file.
4. **Practical to Take Backup with Recuva Backup Tool:**
   * Download and install Recuva.
   * Open Recuva and select the files to backup.
   * Follow the prompts to create a backup file.

**Topic: Disk Management**

**Assignment Level Basic**

1. **What is Disk Management?**
   * Disk Management is a Windows utility for managing hard drives and partitions.
2. **What is the Use of Disk Management?**
   * To create, delete, format, and resize partitions.
   * To assign drive letters and paths.
3. **What are the Merits of Disk Management Tool?**
   * Easy to use graphical interface.
   * Built-in tool, no need for third-party software.
   * Supports various disk operations.

**Assignment Level Intermediate**

1. **Where Can We Find the Disk Management Tool?**
   * Right-click on “Start” > “Disk Management”.
   * Or, open “Control Panel” > “Administrative Tools” > “Computer Management” > “Disk Management”.
2. **List Out the Operations We Can Do with Disk Management Tool:**
   * Create and delete partitions.
   * Format partitions.
   * Change drive letters and paths.
   * Shrink and extend volumes.
   * Convert disks between MBR and GPT.

**Assignment Level Advanced**

1. **Practical to Create a New Partition:**
   * Open “Disk Management”.
   * Right-click on unallocated space and select “New Simple Volume”.
   * Follow the prompts to create a new partition.
2. **Practical to Convert from MBR to GPT:**
   * Open “Disk Management”.
   * Right-click on the disk and select “Convert to GPT Disk”.
   * Note: This will delete all partitions on the disk.
3. **Practical to Create New Partition from Existing Partition:**
   * Open “Disk Management”.
   * Right-click on an existing partition and select “Shrink Volume”.
   * Enter the amount to shrink and click “Shrink”.
   * Right-click on the new unallocated space and select “New Simple Volume”.
   * Follow the prompts to create a new partition.

**Topic: Device Management**

**Assignment Level Basic**

1. **What is Device Management?**
   * Device Management is the process of managing hardware devices connected to a computer.
   * It involves installing, updating, and troubleshooting device drivers.
2. **What is the Need of Device Management?**
   * To ensure all hardware devices work correctly.
   * To update drivers for better performance and security.
   * To troubleshoot and fix hardware issues.
3. **What are the Benefits of Device Management?**
   * Improved device performance.
   * Enhanced security through updated drivers.
   * Reduced hardware issues and downtime.

**Assignment Level Intermediate**

1. **Where Can We Access Device Management?**
   * Right-click on “Start” and select “Device Manager”.
   * Or, open “Control Panel” > “Device Manager”.
2. **List Out the Devices Connected to the Device Management:**
   * Display adapters
   * Network adapters
   * Sound, video, and game controllers
   * Disk drives
   * Keyboards
   * Mice and other pointing devices
   * Universal Serial Bus (USB) controllers

**Assignment Level Advanced**

1. **Practical to Add a Device with Device Management Tool:**
   * Open “Device Manager”.
   * Click “Action” > “Add legacy hardware”.
   * Follow the wizard to add a new device.
2. **Practical to Delete a Driver from the Device Management Tool:**
   * Open “Device Manager”.
   * Find the device you want to delete.
   * Right-click on the device and select “Uninstall device”.
   * Confirm the uninstallation.

**Topic: Physical Security**

**Assignment Level Basic**

1. **Why is Physical Security Needed?**
   * To protect hardware from theft, damage, and unauthorized access.
   * To ensure the safety of data stored on physical devices.
2. **What is Physical Security?**
   * Physical Security involves measures to protect hardware, software, and data from physical threats.
   * Includes locks, surveillance, and environmental controls.

**Assignment Level Intermediate**

1. **List Out the Ways of Physical Security:**
   * Using locks and security cables for devices.
   * Installing surveillance cameras.
   * Implementing access control systems.
   * Using environmental controls like fire suppression systems.
2. **How to Protect System from Malfunctioning Due to Electrical Fluctuation?**
   * Use Uninterruptible Power Supplies (UPS).
   * Install surge protectors.
   * Ensure proper grounding of electrical systems.

**Topic: Firewall Settings**

**Assignment Level Basic**

1. **What is a Firewall?**
   * A firewall is a network security system that monitors and controls incoming and outgoing network traffic.
   * It acts as a barrier between a trusted network and an untrusted network.
2. **Why is a Firewall Needed?**
   * To protect against unauthorized access.
   * To prevent cyber attacks and malware.
   * To control and monitor network traffic.

**Assignment Level Intermediate**

1. **What are the Features of a Firewall?**
   * Packet filtering
   * Stateful inspection
   * Proxy service
   * Network address translation (NAT)
   * Virtual Private Network (VPN) support
2. **Describe Types of Firewall:**
   * **Hardware Firewalls:** Physical devices that filter traffic between networks.
   * **Software Firewalls:** Programs installed on computers to control traffic.
   * **Network Firewalls:** Protect entire networks.
   * **Host-based Firewalls:** Protect individual devices.

**Assignment Level Advanced**

1. **Practical to Allow AnyDesk Through Firewall:**
   * Open “Control Panel” > “Windows Defender Firewall”.
   * Click “Allow an app or feature through Windows Defender Firewall”.
   * Find “AnyDesk” in the list and check both “Private” and “Public”.
   * Click “OK”.
2. **Practical to Turn Off the Services of Firewall:**
   * Open “Control Panel” > “Windows Defender Firewall”.
   * Click “Turn Windows Defender Firewall on or off”.
   * Select “Turn off Windows Defender Firewall” for both private and public networks.
   * Click “OK”.
3. **Practical to Block IP Messenger to Access the Network:**
   * Open “Control Panel” > “Windows Defender Firewall”.
   * Click “Advanced settings”.
   * Select “Outbound Rules” and click “New Rule”.
   * Choose “Program” and click “Next”.
   * Browse to the IP Messenger executable file and click “Next”.
   * Select “Block the connection” and click “Next”.
   * Choose when to apply this rule (Domain, Private, Public) and click “Next”.
   * Name the rule and click “Finish”.