**Topic: Storage devices**

** Assignment Level Basic**

1. What is storage device?

Ans : There are two type of storage first is primary storage and secondary storage .

2. Why we need storage device?

Ans : Storage need in devices because is each part on work is different and very hard to work and lot of communication,network,data are in that so does not work with data together so without storage is not be well work so that reasons is need storage in devices.

** Assignment Level Intermediate**

1. List out the types of storage devices?

Ans :There are 10 types of storage devices.

1. Hard Drive Disks

2. Floppy Disks

3. Tapes

4. Compact Discs (CDs)

5. DVD and Blu-ray Discs

6. USB Flash Drives

7. Secure Digital Cards (SD Card)s

8. Solid-State Drives (SSDs)

9. Cloud Storage

10.Punch Cards

2. Describe the working process of storage devices.

Ans : The disk (cartridge or media) coated with iron oxide stores the information and is inserted into the drive. The drive rotates the disk at high speed via motor.

** Assignment Level Advance**

1. Do a practical to Remove storage devices and reinstall it and make a gpt disk?

Ans : This information to follow that and practical on work.

Turn off the PC, and put in the Windows installation DVD or USB key.

Boot the PC to the DVD or USB key in UEFI mode.

From inside Windows Setup, press Shift+F10 to open a command prompt window.

Open the diskpart tool .

Identify the drive to reformat.

**Topic: ATA**

** Assignment Level Intermediate**

1. What is ATA?

Ans : ATA meaning is Advanced Technology Attachment.

** Assignment Level intermediate:**

1. Describe working of ATA?

Ans : ATA is working of the connects the storage devices like hard-drive,CD-ROM, and other drives to the motherboard.

** Assignment level Advanced:**

1. Do a practical to identify and install ATA cables?

Ans : There are some steps to follow that install a serial ATA .

Power down the computer.

Open the computer case.

Install the hard drive to the drive cage.

Connect the Serial ATA cable to the primary or secondary Serial ATA connector on the motherboard or PCI card.

Attach the other end of the Serial ATA cable to the hard drive.

**Topic: SATA**

 Assignment Level Basic

1.What is SATA?

Ans : SATA (Serial Advanced Technology Attachment) is a command and transport protocol that defines how data is transferred between a computer's motherboard and mass storage devices.

** Assignment Level Advance**

1. Describe the working of SATA?

Ans :Serial Advanced Technology Attachment (SATA) or Serial ATA cables are used to connect devices in computer cable assemblies, such as storage devices, for example. The SATA technology itself is a connecter interface primarily used for computer bus connections in storage applications.

2. Do a practical to identify sata?

Ans :There some step to follow by that identify to sata.

You have a SATA drive if you see SATA, S-ATA, or Serial-ATA. Instead, if you want to check physically, you need to check the connector pins. If you find 7 pins on your hard drive, it's a SATA drive.

3. Do a practical to install SATA?

Ans :This type of step follow to install SATA.

Power down the server blade.

Remove the server blade.

Remove the access panel.

Install the direct connect SATA cables. Connect the direct connect SATA cable to the drive cage backplane. Secure the captive screw. Connect the other end of the cable to the system board.

4. Where does SATA is used?

Ans : SATA is a command to used in traport protocol that defiens how data is transfeered between a computer's motherboard and mass storage devices,such as hard disk drives (HDDs),optical drives and solid-statedrives(SSDs).

Topic: SCSI

 Assignment Basic

1. What is SCSI?

Ans : A small computer systems interface (SCSI) is a standard interface for connecting peripheral devices to a PC.

2. WHy SCSI needed?

Ans : SCSI (Small Computer Systems Interface) is a smart bus, controlled with a microprocessor, that allows you to add up to 15 peripheral devices to the computer.

 Assignment level Intermediate:

1. What is the rpm of SCSI?

Ans : ibm scsi hdd,7200 RPM

2. Do a Practical to install scsi?

Ans :There are 7 step to follow by install in scsi.

SCSI ID – 0 thru 15 for Wide devices. Each device must have a unique SCSI ID.

SE I/O – No jumper so the device can multimode (default).

Motor Start – Disable motor start (default).

Delay Motor Start – Disable Delay motor start (default).

Write Protect – Write Protect Off (default).

Parity Check – Enable Parity check (default).

Terminator Power – Host adapter or other device provides term power (default).

Topic: Administrative tools

 Assignment Level Basis

1. What is administrative tools?

Ans : Administrative Tools is a folder in the Windows 10 Control Panel. These folders contain tools for system administrators and advanced users.

2. What is the use of administrative tools?

Ans : The programs can be used to schedule a test of your computer's memory, manage advanced aspects of users and groups, format hard drives, configure Windows services, change how the operating system starts, and much, much more.

 Assignment level Intermediate:

1. List out the administrative tools.

Ans :There are multi type of the adminstrative tools.

1.Component Services.

2.Computer Management.

3.Defragment and Optimize Drives.

4.Disk Cleanup.

5.Event Viewer.

6.iSCSI Initiator.

7.Local Security Policy.

8.ODBC Data Sources.

2. What is disk management tools.

Ans :Disk management tools are utility software that is used to manage data on disk by performing various functions on it.

 Assignment Level Advanced

1. Do a practical to delete a driver and reinstall it from administrative tools.

Ans :To uninstall a driver using the Device Manager, follow the belows steps :

1.Open the power menu using the win + X hotkey.

2.Choose Device Manager from the menu.

3.Double-click the category with the device driver you want to remove.

4.Right-click the device and choose uninstall device fromt he context menu.

2. Do a practical to delete a partition and again create it with administrative tool

Ans :To create and format a new partition(Volume)

1.Open Computer Management by selecting the Start button.

2.In the left pane, under Storage, select Disk Management.

3.Right-click an unallocated region on your hard disk, and then select New Simple Volume.

4.In the New Simple Volume Wizard, select Next.

3. Do a practical to create user with administrative tool.

Ans : This type of instruction to follow that create new administrative tools.

Go to Windows Start > Administrative Tools > Computer Management. The Computer Management window opens.

Expand Local Users and Groups.

Right-click the Users folder and select New User.

Complete the user details and click Create and Close.

Topic: Transferring Files

 Assignment level Basic

1. What is transferring Files?

Ans : The Transferring filles is to the exchange of data filles between computer systems.

2. What are the ways of transferring files?

Ans : The first is to set up a local area network (LAN) so that you can use on e PC to browser the hard drive of another PC. The second is to use software to transfer files via Wi-Fi. All major operating systems have built-in options to set up a home network.

 Assignment level Intermediate:

1. How do we transfer files from one system to another?

Ans :There are five most common methods.

1.Cloud storage or web data transfers.

2.SSD and HDD drives via SATA cables.

3.Basic cable transfer.

4.Use software to speed up your data transfer.

5.Transfer your data over Wi-Fi or LAN.

6.Using an external storage device or flash drives.

2. Types of file transferring media.

Ans : There are some brief description on these data transfer.

1.FTP (File Transfer Protocol)

2.HTTP (Hypertext Transfer Protocol)

3.FTPS (FTP over SSL)

4.HTTPS (HTTP over SSL)

5.SFTP (SSH File Transfer Protocol)

6.SCP (Secure Copy)

7.WebDAV (Web Distributed Authoring and Versioning)

8.WebDAVS

 Assignment level Advanced:

1. Do a practical to transfer files from one system to another via network?

Ans : There are some type of methods you have to use it .

1.Cloud storage or web data transfers.

2.SSD and HDD drives via SATA cables.

3.Basic cable transfer.

4.Use software to speed up your data transfer.

5.Transfer your data over Wi-Fi or LAN.

6.Using an external storage device or flash drives.

2. DO a practical to transfer data from one hard disk to another?

Ans: This type of instruction you have follow it and easier to transfer data.

1.Connect the old new hard drives to your computer.

2.Access the start menu and search for "Easy Transfer" from there.

3.Tap on "Windows Easy Transfer “menu from the result.

4.Follow the on-screen instruction to select the files you want to transfer from the old hard drive.

Topic: Windows Feature.

 Assignment Level Base

1. What is windows features?

Ans: Windows features is allowing the user to interact with the computer.

 Assignment level Intermediate

1. List out the windows features.

Ans: The major feature is starting menu, task manager, taskbar, content, file explorer, Ms Paint, Browser, control panel.

2. What is the use of IIS?

Ans: Internet Information Services, also known as IIS, is a Microsoft web server that runs on Windows operating system and is used to exchange static and dynamic web content with internet users.

 Assignment level Advance:

1. Do a practical to re install IIS with windows feature?

Ans: Open the Control Panel and go to Programs and Features and then click Enable or Disable Windows Features 1. 2. Search Internet Information Services and check the box 1 and click OK 2.

2. Do a practical to install dotnet framework 3.5 with Windows feature.

Ans : This type of step to have follow it.

Step 1: Find your SXS folder. This will be located within your Windows 10 ISO in the Sources folder.

Step 2: Run command to enable. NET

Step 3: Create batch file to run on multiple computers.

Step 4: Complete.

3. Do a practical to disable internet explorer in windows feature.

Ans : This type of step to have follow it.

Select Windows logo key+R.

In the Run, enter OptionalFeatures.exe, and then select OK.

In the Windows Features dialog box, clear the checkbox for the installed version of Internet Explorer.

Select OK.

Topic: Backup & Restore

 Assignment level Basic:

1. What is backup?

Ans :Backup refers to the copying and archiving of the data so that it may be used to restore the original version should data loss or corruption occur.

2. What is Restore?

Ans :

3. What is the need of backup

Ans :System Restore is a feature in Microsoft Windows that allows the user to revert their computer's state (including system files, installed applications, Windows Registry, and system settings) to that of a previous point in time, which can be used to recover from system malfunctions or other problems.

 Assignment level Intermediate.

1. What are the tools of backup?

Ans :There are more type of devices are available but most is useful this devices.

1. A shampoo. Users can easily use A shampoo, a powerful backup tool. · 2. Cobian Backup · 3. File Fort Backup · 4. Backup Maker · 5. Comodo Backup · 6.Rsync tools.

2. How do we restore?

Ans : This type of step to follow it.

Search Control Panel for Recovery, and select Recovery > Open System Restore > Next. Choose the restore point related to the problematic app, driver, or update, and then select Next > Finish.

3. How to create a restore point?

Ans :This type of step to follow it.

 Assignment level Advance:

1. Do a practical to create restore point.

Ans :In the search box on the taskbar, type Create a restore point, and select it from the list of results.

On the System Protection tab in System Properties, select Create.

Type a description for the restore point, and then select Create > OK.

2. Do a practical to restore from restore point?

Ans :This type of step to have follow it.

In the search box on the taskbar, type control panel, and then choose it from the list of results.

In the Control Panel search box, type recovery.

Select Recovery > Open System Restore.

In the Restore system files and setting box, select Next.

3. Do a practical to take backup from another system.

Ans :There are three type of way for backup.

1.Use an external hard drive.

2.Backup your files online.

3.Use a cloud storage service.

4.Back it up

Topic: Disk Management

 Assignment level Basic:

1. What is Disk management?

Ans: The disk management is a tool an operating system that helps users to manage and the organize the hard disk and other storage devices.

2. What is the use of disk management?

Ans: The Disk Management is using right-click (or long-press) the Start button and select Disk Management.

3. What are the merits of Disk management tool?

Ans: The disk management benefits is helps to increase the computer's effiency,persormance,security,and ease of backup.

 Assignment level Intermediate:

1. Where can we find the disk management tool?

Ans: To open Disk Management, right-click (or long-press) the Start button and select Disk Management.

2. List out the operations we can do with disk management tool?

Ans: Functions of Disk Management Tools

Disk Partitioning.

Disk Formatting.

Renaming a disk.

To shrink, extend or delete a disk partition.

To change the file system of a driver.

 Assignment level Advance:

1. Do a practical to create a new partition with disk management tool?

Ans: Open Computer Management by selecting the Start button. The select Control Panel > System and Security > Administrative Tools, and then double-click Computer Management. In the left pane, under Storage, select Disk Management. Right-click an unallocated region on your hard disk, and then select New Simple Volume.

2. Do a practical to convert from MBR to gpt from disk management tool

Ans: To complete the disk conversion by using Disk Management, follow these steps.

Back up or move the data on the MBR disk prior to conversion.

Delete all partitions and volumes on the MBR disk. ...

Select and hold (or right-click) the MBR disk to convert to the GPT format, and select Convert to GPT Disk.

3. Do a practical to create new partition from existing partition?

Ans: This type of step to follow that new create partition.

To create a new partition:

Open Disk Management. You can right-click My Computer, and go Manage > Storage > Disk Management to open it.

Right-click the partition you want to use to create new partition and select "Shrink Volume". ...

Right-click the unallocated space and select "New Simple Volume".

Topic: Device Management

 Assignment level Basic:

1. What is Device Management?

Ans: The Device management enable organizations to administer and maintain devices, including virtual machines, physical computers, mobile devices,and IoT device.

2. What is the need of device management?

Ans: The device management enables organizations to administer and maintain devices.

3. What are the benefits of Device management?

Ans: There are 7 types of benefits of mobile device management for business.

7 key benefits of mobile device management for businesses

Enhanced security. Using an MDM platform, you can protect the business data accessed by company devices.

Decreased downtime and deployment times.

Improved productivity.

Application control.

Optimized data collection.

Risk management.

Cost saving.

Leading MDM vendors.

 Assignment level Intermediate:

1. Where can we access device management?

Ans: Click the. (Start) button.

In the Start Menu, click Settings.

In the SETTINGS window, click Devices.

In the DEVICES screen, click Printers & scanners or Connected devices, and under the Related Settings category, click Device manager.

2. List out the devices connected to the device management.

Ans: This is type of step to follow that.

Type CMD in the search box and click Run as Administrator from the menu.

Enter the net view command to view devices connected to your network You will then see a list of devices connected to your network in the output.

 Assignment level Advance:

1. Do a practical to add a device with device management tool.

Ans: There are some type of step to follow that to add device with device management tool.

Sign in to your Google Admin console. ...

In the Admin console, go to Menu Devices Mobile and endpoints Settings. ...

Click Windows management setup.

To apply the setting to everyone, leave the top organizational unit selected. ...

Next to Windows device management, select Enabled.

2. Do a practical to delete a driver from the device management tool.

Ans: Open Start. Search for Disk Management. Select the drive with the partition you want to remove. Right-click (only) the partition you want to remove and select the Delete Volume option.

Topic: Physical security

 Assignment Level Basic

1. Why physical security needed?

Ans: Physical security is important because aims to protect people, property , and physical assets from any action or event that could lead to loss or damaged.

2. what is physical security?

Ans: physical security is the protection of personnel, hardware, software, networks and data from physical actions and events that could cause serious loss or damage to an enterprise agency or institution.

 Assignment Level Intermediate

1. list out the ways of physical security.

Ans: Physical security involves the use of multiple layers of independents system that can include CCTV surveillance, security, security guards, protective barriers, locks, access control, perimeter intrusion detection, deterrent systems ,fire protection.

2. How to protect system from malfunctioning due to electrical fluctuation?

Ans: The voltage stabilizers are devices that can help regulate the voltage in your home, thus preventing power surges from occurring.

Topic: Firewall settings

 Assignment level basic:

1. What is firewall?

Ans: A firewall is a network security device that monitors incoming and outgoing network traffic and decides whether to allow or block specific traffic based on a defined set of security rules.

2. Why is firewall needed?

Ans: The primary use of a firewall in networking is to secure the network from cyberattacks.

 Assignment level Intermediate:

1. What are the features of firewall?

Ans: This are features of firewall.

1. Unified Security Management. Organizations must cope with rapidly increasing network security complexity.

2. Threat Prevention.

3. Application and Identity-Based Inspection.

4. Hybrid Cloud Support.

5. Scalable Performance.

2. Describe types of firewalls?

Ans: There are five type of firewall.

* packet filtering firewall.
* circuit-level gateway.
* application-level gateway (aka proxy firewall)
* stateful inspection firewall.
* next-generation firewall (NGFW)

 Assignment level advance:

1. Do a practical to allow any desk through firewall.

Ans: Try to allow to any desk through firewall which can fix the error. To do open setting, go to privacy & security, and visit windows security. Here, you will find firewall & network protection. Now tap on allow an app through the firewall and go to change settings and select allow another app.

2. do a practical to turn off the services of firewall?

Ans: This type of step to follow turn Microsoft defender firewall on or off.

1. Select Start, then open Settings.
2. Select a network profile: Domain network, Private network, or public network.
3. Under Microsoft Defender Firewall, switch the setting to On. ...
4. To turn it off, switch the setting to Off.

3. Do a practical to block Ip messenger to access the network.

Ans: This type of step to follow that to block Ip address.

1. Find the IP address of a website you want to block.
2. In Windows Search, type Windows Firewall and select Windows Defender Firewall to open it.
3. Select Advanced settings.
4. Select Inbound Rules, then select New Rule.
5. Select Custom, then select Next.

Module 3 [Network Configuration]

Topic: Local area networking

 Assignment level Basic:

1. What is a Network?

Ans: A network consists of two or more computers that are linked in order to share resources, exchange files or other it called networks.

2. What is the Internet & Intranet?

Ans: The Internet is a vast network that connects computers all over the world. Through the Internet, people can share information and communicate from anywhere with an Internet connection.

 Assignment level Intermediate:

1. How many types of Networks do we use?

Ans: Mainly there are three types of computer networks LAN (local area network), WAN (wide area network), and MAN (Metropolitan area network).

2. Different between LAN & PAN?

 Assignment level advance:

1. Explain LAN?

Ans: A local area network (LAN) is a collection of devices connected together in one physical location, such as a building, office, or home. A LAN can be small or large, ranging from a home network with one user to an enterprise network with thousands of users and devices in an office or school.

2. What are different types of LAN devices?

Ans: These are the types of Local area networks and different types of devices.

* Peer to Peer (P2P) LAN
* Token ring LAN
* Token bus LAN
* Wired LAN
* Cloud-management LAN
* Public internet
* Wired end user devices
* Mobile end-user devices

Topic: Configured Network

 Assignment Level Basic

1. What is a configured network?

Ans: Network configuration is the process of assigning network settings, policies, flows, and controls. In a virtual network, it's easier to make network configuration changes because physical network devices appliances are replaced by software, removing the need for extensive manual configuration.

2. How do we configure the network?

Ans: These types of follows to configuration the network.

* Ip address-for identification.
* Password-for added security.
* Channel and band selection-to improve performance.
* Default gateway-to make the device visible to network management tools.
* Neighbor discovery-for added visibility.

 Assignment level Intermediate.

1.How to check the Ip address?

Ans: These type of follow to step and check Ip address.

Select Start > Settings > Network & Internet >Wi-Fi and then select the Wi-Fi network you’re connected to.

Under Properties, look for your IP address listed next to IPv4 address.

2.How to check the Ip address through CMD?

1. Ans: From the desktop, navigate through; Logo > type "cmd.exe" in the "Start Search" dialog box. A command prompt window will appear.
2. At the prompt, type "ipconfig". All IP information for all network adapters in use by Windows will be displayed.

3.How can we enter static address in network adapter?

Ans: These type of follow by the direction.

1. Select Internet Protocol Version 4 (TCP/IPv4) > and click Properties.
2. Select Use the following IP address. ...
3. Your Ethernet adapter is now configured with static IP 192.168.0.210 and the access point web interface is accessible at http://192.168.0.100.

 Assignment level Basic:

1. What is the difference between WEP and WPA?

Ans: WPA (Wi-Fi Protected Access) is a wireless security protocol released in 2003 to address the growing vulnerabilities of its predecessor, WEP. The WPA Wi-Fi protocol is more secure than WEP, because it uses a 256-bit key for encryption, which is a major upgrade from the 64-bit and 128-bit keys used by the WEP system

2. What is Wireless Network?

Ans: A wireless network refers to a computer network that makes use of Radio Frequency (RF) connections between nodes in the network. Wireless networks are a popular solution for homes, businesses, and telecommunications networks

 Assignment level Intermediate:

1. What is a wireless network connection?

Ans: A wireless network refers to a computer network that makes use of Radio Frequency (RF) connections between nodes in the network. Wireless networks are a popular solution for homes, businesses, and telecommunications networks.

2. What are the basic concepts of networking?

Ans: Switches, routers, and wireless access points are the essential networking basics. Through them, devices connected to your network can communicate with one another and with other networks, like the Internet. Switches, routers, and wireless access points perform very different functions in a network.

 Assignment level advance:

1. What do you need to know about networking?

Ans: Below are several core concepts in computer networking that a networking professional would be required to know:

* LAN vs. WAN.
* Clients and servers.
* DNS lookup & IP addresses.
* Ethernet.
* Default gateway.
* Routers and switches.

2. How do you explain computer networking?

Ans: Computer networking refers to interconnected computing devices that can exchange data and share resources with each other.

Topic: THE Internet

 Assignment level Basic:

1. What do you mean by the term URL?

Ans: A URL (Uniform Resource Locator) is a unique identifier used to locate a resource on the Internet. It is also referred to as a web address. URLs consist of multiple parts -- including a protocol and domain name -- that tell a web browser how and where to retrieve a resource.

End users use URLs by typing them directly into the address bar of a browser or by clicking a hyperlink found on a webpage, bookmark list, in an email or from another application.

2. Term which is used to see web pages is called what?

 Assignment level Intermediate:

1. In the Ethernet which topology is used?

Ans: Bus topology is used with Ethernet. The most used network topology is this one. Bus and star topologies, as well as coax, twisted-pair, or fibre optic cable, are options.

2. Set of rules and regulations while working on internet, which term is used?

Ans: Protocol are the rules that we follow while on the internet. In simplest of terms, Protocol is a set a rule devised for effective communication between two electronic devices

 Assignment level advance:

1. What do you mean by RAS?

Ans: Reliability, availability and serviceability (RAS) is a set of related attributes that must be considered when designing, manufacturing, purchasing and using a computer product or component. The term was first used by IBM to define specifications for its mainframes and originally applied only to hardware.

2. What are the main search engines to get more website URL on Internet?

Ans: Ther are more search engines are available.

* Google.
* Microsoft Bing.
* Yahoo.
* Baidu.
* Yandex.
* DuckDuckGo.
* Ask.com.
* Ecosia.

3. What does the PROTOCOL consist of?

Ans: protocol, in computer science, a set of rules or procedures for transmitting data between electronic devices, such as computers.

Topic: Virtualization

 Assignment level Basic:

1. What is Virtualization

Ans: Virtualization is a technology that allows multiple operating systems (OS) or applications to run on a single physical computer or server, sharing the underlying hardware resources. It creates a virtual or simulated environment, often referred to as a "virtual machine" (VM) or "container," which mimics the functionality of a physical computer.

There are different types of virtualizations, including:

1. \*\*Hardware Virtualization: \*\* This is the most common type of virtualization and involves the use of a hypervisor (a software or firmware layer) to create and manage multiple VMs on a single physical server. Each VM has its own isolated operating system and applications, which can run concurrently on the same hardware. Popular hypervisors include VMware vSphere/ESXi, Microsoft Hyper-V, and Xen.

2. \*\*Software Virtualization: \*\* This form of virtualization involves creating virtual instances of applications or software components rather than entire operating systems. It allows multiple versions of an application to run on the same system without conflicts. Examples include Java Virtual Machines (JVMs) for running Java applications and software containers like Docker.

3. \*\*Network Virtualization: \*\* Network virtualization abstracts network resources, allowing the creation of multiple virtual networks on top of a physical network infrastructure. This helps in isolating network traffic and simplifying network management.

4. \*\*Storage Virtualization: \*\* Storage virtualization abstracts physical storage resources and presents them as a single virtual storage pool. This enables more efficient utilization of storage capacity, data migration, and simplifies management.

Virtualization offers several benefits, including:

- \*\*Server Consolidation:\*\* It allows multiple virtual servers to run on a single physical server, reducing hardware costs and improving resource utilization.

- \*\*Isolation:\*\* VMs are isolated from each other, improving security and preventing software conflicts.

- \*\*Resource Allocation:\*\* Virtualization enables dynamic allocation of resources, allowing you to scale up or down based on demand.

- \*\*Disaster Recovery:\*\* VM snapshots and cloning make it easier to create backups and recover from system failures.

- \*\*Testing and Development:\*\* Virtual environments are ideal for testing new software or configurations without impacting production systems.

- \*\*Legacy Application Support:\*\* Older applications that may not run on modern hardware can be virtualized and run on newer servers.

Overall, virtualization is a fundamental technology in modern IT infrastructure, enabling greater flexibility, efficiency, and cost savings in data centers and cloud computing environments.

2. What is the Difference between Full Virtualization and Para Virtualization?

Ans: Full virtualization and paravirtualization are two different approaches to virtualization, each with its own set of characteristics and use cases. Here's a comparison of the two:

\*\*Full Virtualization:\*\*

1. \*\*Definition:\*\* In full virtualization, the virtualization layer, known as the hypervisor, simulates a complete and unmodified set of hardware, allowing unmodified guest operating systems to run on top of it.

2. \*\*Guest OS Compatibility:\*\* Full virtualization is designed to run unmodified guest operating systems. This means that you can install and run standard operating systems (e.g., Windows, Linux) without making any modifications to the OS itself.

3. Performance:Full virtualization typically has higher overhead compared to paravirtualization because it involves emulating hardware instructions that the guest OS expects to run directly on physical hardware. This emulation can result in some performance degradation, especially for CPU-intensive tasks.

4. Examples: Popular full virtualization hypervisors include VMware vSphere/ESXi, Microsoft Hyper-V, and Oracle VirtualBox.

Paravirtualization:

1. \*\*Definition:\*\* Paravirtualization is an alternative virtualization approach where the guest operating systems are aware that they are running in a virtualized environment and have been modified to communicate directly with the hypervisor, rather than assuming direct access to physical hardware.

2. \*\*Guest OS Compatibility:\*\* Paravirtualization requires modifications to the guest operating systems. These modifications enable the guest OS to communicate more efficiently with the hypervisor and share resources. As a result, not all operating systems can be used as guests in a para virtualized environment unless they have been specifically modified.

3. \*\*Performance:\*\* Paravirtualization generally offers better performance compared to full virtualization because it eliminates the need for emulating hardware instructions. The guest OS and the hypervisor can work together more efficiently, leading to lower overhead and improved performance.

4. \*\*Examples:\*\* Xen is a popular hypervisor that supports paravirtualization. The Xen hypervisor requires guest operating systems to be modified to take full advantage of paravirtualization.

\*\*Key Differences:\*\*

- \*\*Guest OS Modification:\*\* Full virtualization allows unmodified guest operating systems, while paravirtualization requires guest OS modifications.

- \*\*Performance:\*\* Paravirtualization typically offers better performance due to reduced overhead, whereas full virtualization may have higher overhead.

- \*\*Compatibility:\*\* Full virtualization supports a wider range of guest operating systems since it doesn't require modifications, while paravirtualization is limited to guest OSes that have been adapted for it.

- \*\*Isolation:\*\* Full virtualization provides stronger isolation between guest OSes because they are unaware of each other's presence. In paravirtualization, guest OSes have some awareness of each other and the hypervisor.

The choice between full virtualization and paravirtualization depends on factors like compatibility requirements, performance considerations, and the level of control and isolation needed in a virtualized environment.

 Assignment level Intermediate:

1. What is Hyper-visor?

Ans: A hypervisor, also known as a virtual machine monitor (VMM), is a software or hardware component that creates and manages virtual machines (VMs) in a virtualized environment. Its primary role is to abstract and control the physical hardware resources of a computer or server, allowing multiple guest operating systems to run concurrently on the same physical machine. The hypervisor creates a layer of abstraction between the hardware and the virtual machines, ensuring that each VM operates as if it has exclusive access to the underlying hardware resources.

There are two main types of hypervisors:

1. \*\*Type 1 Hypervisor (Bare-Metal Hypervisor):\*\* Type 1 hypervisors run directly on the physical hardware of the host system without the need for an underlying operating system. They provide better performance and security because they have direct control over the hardware. Examples of type 1 hypervisors include VMware vSphere/ESXi, Microsoft Hyper-V (when installed in standalone mode), and Xen.

2. \*\*Type 2 Hypervisor (Hosted Hypervisor):\*\* Type 2 hypervisors run on top of a host operating system. They are typically used for development, testing, or desktop virtualization scenarios. Type 2 hypervisors are less efficient than type 1 hypervisors because they have to go through the host OS to access hardware resources. Examples include Oracle VirtualBox and VMware Workstation.

Key functions of a hypervisor include:

- \*\*Resource Management:\*\* Hypervisors allocate CPU, memory, storage, and network resources to virtual machines, ensuring that they operate efficiently without interfering with each other.

- \*\*Isolation:\*\* Hypervisors provide strong isolation between virtual machines, preventing one VM from impacting the stability or security of others. This isolation is crucial for security and stability in a multi-tenant environment.

- \*\*Snapshot and Migration:\*\* Hypervisors often offer features like snapshotting (capturing the state of a VM at a particular moment) and live migration (moving a running VM from one physical host to another with minimal downtime) to enhance manageability and high availability.

- \*\*Resource Pooling:\*\* Hypervisors enable the pooling of physical resources, allowing for flexible and efficient allocation of resources based on the needs of virtual machines.

- \*\*Hardware Abstraction:\*\* Hypervisors abstract physical hardware, presenting virtual hardware to guest operating systems. This virtualization allows guest OSes to run unmodified while sharing physical resources.

Hypervisors play a crucial role in server virtualization, cloud computing, and data center management by maximizing hardware utilization, improving resource management, and enabling the consolidation of multiple workloads on a single physical server. They are a fundamental component in modern IT infrastructure.

2. What are different hypervisors available in Linux?

Ans: Linux provides several hypervisors or virtualization solutions that allow you to create and manage virtual machines (VMs) on Linux-based systems. These hypervisors can be broadly categorized into two main types: Type 1 (bare-metal) and Type 2 (hosted) hypervisors. Here are some of the popular hypervisors available for Linux:

\*\*Type 1 Hypervisors (Bare-Metal Hypervisors):\*\*

1. \*\*KVM (Kernel-based Virtual Machine):\*\* KVM is a Linux kernel module that turns the host system into a hypervisor. It allows you to run multiple virtual machines with various guest operating systems. KVM is well-integrated into the Linux kernel and is known for its performance and security. Tools like QEMU are often used in conjunction with KVM to manage virtual machines.

2. \*\*Xen:\*\* Xen is a mature and powerful open-source hypervisor that supports both paravirtualization and hardware-assisted virtualization. It provides a stable and efficient virtualization platform and is used by various cloud providers. Xen can be used as a standalone hypervisor or integrated into Linux distributions.

\*\*Type 2 Hypervisors (Hosted Hypervisors):\*\*

1. \*\*VirtualBox:\*\* Oracle VM VirtualBox is a popular open-source virtualization software that runs on Linux and other platforms. It is a type 2 hypervisor that allows you to create and manage VMs on your Linux desktop or server. VirtualBox is known for its user-friendly interface and support for a wide range of guest operating systems.

2. \*\*VMware Workstation:\*\* VMware Workstation is a commercial type 2 hypervisor that offers advanced features for creating and managing VMs on Linux desktop systems. It provides a user-friendly interface and is often used for software development and testing.

3. \*\*Virt-Manager:\*\* Virt-Manager is a graphical management tool for virtualization on Linux systems, primarily using KVM as the underlying hypervisor. It provides a user-friendly interface for creating and managing VMs and is commonly used on Linux desktops.

4. \*\*QEMU:\*\* While QEMU can also be used in conjunction with KVM for type 1 virtualization, it can be used as a standalone type 2 hypervisor as well. QEMU is a versatile emulator that can run a wide variety of guest operating systems on Linux.

These are some of the most commonly used hypervisors on Linux systems. The choice of a hypervisor depends on factors such as your specific use case, performance requirements, and whether you need a type 1 or type 2 hypervisor. Additionally, some Linux distributions may include their own virtualization solutions or tools to make it easier to manage virtual machines.

3. What is Virtualization and what are its types?

Ans: Virtualization is a technology that allows multiple virtual instances, such as virtual machines (VMs) or containers, to run on a single physical hardware platform. It abstracts and simulates the underlying physical resources, such as the CPU, memory, storage, and networking, to create isolated environments for running software applications and operating systems. The primary goal of virtualization is to improve resource utilization, enhance flexibility, and streamline management in computing environments.

There are several types of virtualization, each catering to different use cases and requirements:

1. \*\*Hardware Virtualization (Server Virtualization):\*\*

- \*\*Type 1 Hypervisor (Bare-Metal):\*\* This type of hypervisor runs directly on the physical hardware without the need for a host operating system. It provides high performance and isolation.

- \*\*Type 2 Hypervisor (Hosted):\*\* Type 2 hypervisors run on top of a host operating system. They are typically used for development and testing scenarios.

2. \*\*Operating System Virtualization (Containerization):\*\*

- \*\*Containers:\*\* Containers are lightweight, OS-level virtualization instances that share the host OS's kernel but have isolated user spaces. Docker and Kubernetes are popular containerization technologies.

- \*\*Linux Containers (LXC):\*\* LXC is a Linux-based OS virtualization method that offers a compromise between traditional virtualization and containers. It provides isolation at the OS level while sharing the kernel.

3. \*\*Application Virtualization:\*\*

- Application virtualization decouples software applications from the underlying OS and hardware, allowing them to run on various systems without installation. Examples include Wine (for running Windows applications on Linux) and Java Virtual Machines (JVMs).

4. \*\*Storage Virtualization:\*\*

- Storage virtualization abstracts physical storage resources and presents them as a single, manageable pool. It enables features like data migration, replication, and snapshotting.

5. \*\*Network Virtualization:\*\*

- Network virtualization abstracts network resources to create multiple virtual networks on a single physical network infrastructure. It is often used in software-defined networking (SDN) and cloud environments.

6. \*\*Desktop Virtualization (VDI - Virtual Desktop Infrastructure):\*\*

- Desktop virtualization allows multiple user desktop environments to run on a single server or cloud infrastructure. Users access their virtual desktops remotely.

7. \*\*Memory Virtualization:\*\*

- Memory virtualization technologies manage memory resources to improve efficiency and enable dynamic allocation of memory to virtual machines.

8. \*\*GPU Virtualization:\*\*

- GPU virtualization allows multiple virtual machines or applications to share the resources of a single physical GPU, which is crucial for graphics-intensive workloads, gaming, and AI/ML applications.

Each type of virtualization serves specific purposes and has its advantages and trade-offs. The choice of virtualization technology depends on factors such as performance requirements, resource management, isolation needs, and the nature of the workloads you want to run. Virtualization has become a fundamental component of modern IT infrastructure, enabling efficient resource utilization, scalability, and flexibility in various computing environments.

 Assignment level advance:

1. Name the components that are used in VMware infrastructure What are the benefits of Virtualization?

Ans: VMware provides a comprehensive virtualization and cloud computing infrastructure platform. It includes various components and products that work together to create a robust and flexible virtualization environment. Some of the key components and products in the VMware infrastructure are:

1. \*\*VMware vSphere:\*\* This is the core virtualization platform that includes several components:

- \*\*VMware ESXi:\*\* A bare-metal hypervisor that runs directly on the physical hardware.

- \*\*vCenter Server:\*\* Centralized management and monitoring of virtualized environments.

- \*\*vSphere Client:\*\* A web-based interface for managing virtual machines and infrastructure.

2. \*\*VMware vCenter Server:\*\* It is a central management platform for vSphere environments. It provides features like VM management, performance monitoring, and resource allocation.

3. \*\*VMware vSAN (Virtual Storage Area Network):\*\* Software-defined storage solution that aggregates local or direct-attached storage devices into a single, shared datastore, improving storage efficiency and performance.

4. \*\*VMware NSX:\*\* A network virtualization and security platform that enables the creation of virtual networks and micro-segmentation for enhanced security.

5. \*\*VMware Horizon:\*\* A virtual desktop infrastructure (VDI) solution that allows organizations to deliver virtualized desktops and applications to end-users.

6. \*\*VMware vRealize Suite:\*\* A set of cloud management tools for automating and managing cloud and infrastructure resources.

7. \*\*VMware Cloud Foundation:\*\* An integrated software stack that combines compute virtualization (vSphere), storage virtualization (vSAN), and network virtualization (NSX) to provide a complete hyper-converged infrastructure solution.

8. \*\*VMware Cloud Director:\*\* A cloud service delivery platform for service providers to manage and deliver cloud services to customers.

9. \*\*VMware Workspace ONE:\*\* A unified endpoint management and digital workspace platform for secure access to applications and data from any device.

10. \*\*VMware Tanzu:\*\* A portfolio of products and services for building, managing, and running containerized applications and Kubernetes clusters.

Benefits of VMware Infrastructure:

1. \*\*Resource Consolidation:\*\* VMware allows multiple virtual machines to run on a single physical server, optimizing hardware utilization and reducing costs.

2. \*\*Isolation and Security:\*\* Virtualization provides strong isolation between virtual machines, enhancing security and reducing the risk of conflicts.

3. \*\*Flexibility and Scalability:\*\* VMware environments are highly flexible and can scale up or down based on workload demands.

4. \*\*Disaster Recovery:\*\* VMware infrastructure supports features like VM snapshots, cloning, and replication for efficient backup and disaster recovery strategies.

5. \*\*Management and Automation:\*\* VMware tools and platforms offer centralized management and automation capabilities, simplifying IT administration.

6. \*\*High Availability:\*\* VMware infrastructure supports features like vMotion and Fault Tolerance for ensuring high availability of virtualized workloads.

7. \*\*Cost Savings:\*\* By reducing hardware requirements, improving resource utilization, and simplifying management, VMware can lead to cost savings in IT operations.

8. \*\*Performance:\*\* VMware offers tools for monitoring and optimizing the performance of virtualized environments.

9. \*\*Application Mobility:\*\* VMotion allows live migration of VMs across hosts without downtime, enabling maintenance and load balancing without service interruption.

10. \*\*Ecosystem and Support:\*\* VMware has a robust ecosystem of partners and a strong support system, making it a reliable choice for many enterprises.

VMware infrastructure is widely used in data centers and cloud environments to deliver efficient, reliable, and flexible IT solutions.

Module 4: Troubleshooting and Helpdesk

Topic: Troubleshoot security

 Assignment level Basic:

1. What is troubleshooting?

Ans: Troubleshooting is the process of identifying, diagnosing, and resolving problems or issues that arise in various systems, devices, software applications, or processes. It is a systematic and logical approach used to find the root causes of problems and implement solutions to restore normal functionality. Troubleshooting is a critical skill in IT, engineering, maintenance, and many other fields where systems or equipment need to operate reliably.

Here are the key steps involved in troubleshooting:

1. \*\*Identify the Problem:\*\* The first step is to clearly define and understand the problem or issue. This often involves gathering information from users, logs, error messages, or reports to determine what's going wrong.

2. \*\*Replicate the Issue:\*\* If possible, replicate the problem to ensure it can be consistently reproduced. Understanding when and how the issue occurs is essential for diagnosing it accurately.

3. \*\*Isolate the Cause:\*\* Once the problem is well-defined and reproducible, you need to identify the root cause. This may involve testing different components, configurations, or variables to pinpoint what's triggering the problem.

4. \*\*Gather Data:\*\* Collect relevant data, such as logs, error messages, system metrics, and user feedback, to aid in the diagnosis.

5. \*\*Generate Hypotheses:\*\* Formulate hypotheses about what might be causing the problem based on your initial analysis. These are educated guesses about what could be wrong.

6. \*\*Test Hypotheses:\*\* Test each hypothesis by making changes or adjustments to the system, software, or configuration. Observe the system's behavior to see if the problem is resolved or if it persists.

7. \*\*Iterate:\*\* If a hypothesis doesn't solve the problem, refine your hypotheses and continue testing until you find the solution.

8. \*\*Implement a Solution:\*\* Once you identify the root cause and verify a solution, implement the necessary changes or fixes to resolve the issue.

9. \*\*Verify and Test:\*\* After implementing a solution, thoroughly test the system to ensure the problem is indeed resolved and that no new issues have been introduced.

10. \*\*Document the Resolution:\*\* Document the problem, its root cause, and the steps taken to resolve it. This documentation can be valuable for future reference and for sharing knowledge with colleagues.

11. \*\*Preventive Measures:\*\* If applicable, consider implementing preventive measures to reduce the likelihood of the problem recurring. This might involve updating procedures, improving monitoring, or applying patches and updates.

Troubleshooting skills are highly valuable in many professions because they enable individuals to address technical or operational issues efficiently. These skills involve a combination of technical knowledge, critical thinking, problem-solving, and the ability to communicate effectively with others involved in the resolution process. Effective troubleshooting can lead to improved system reliability, reduced downtime, and enhanced user satisfaction.

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 Assignment level Intermediate:

1. Do a practical to change the password.

Ans: Change Your Computer Password (Windows):

* For Windows 10 and Windows 11:
  1. Press Ctrl + Alt + Delete and select "Change a password" from the menu.
  2. Follow the on-screen instructions to change your password.

Change Your Computer Password (Mac):

* For macOS:
  1. Open "System Preferences" from the Apple menu.
  2. Click on "Users & Groups."
  3. Select your user account.
  4. Click the "Change Password..." button and follow the prompts to change your password.

2. Do a practical to change the user account password.

Ans: Change Your Online Account Password (e.g., Email, Social Media):

* Typically, you can change online account passwords through the account's website or app. Here's a general procedure:
  1. Log in to your account.
  2. Navigate to the account settings or security section.
  3. Look for an option to change your password.
  4. Follow the provided instructions to set a new password.

 Assignment level advance:

1. How do you troubleshoot a computer?

Ans: Troubleshooting a computer involves a systematic approach to identifying and resolving problems or issues that affect its performance or functionality. Here's a general process for troubleshooting a computer:

1. \*\*Identify the Problem:\*\*

- Start by gathering information about the issue. Ask yourself and others using the computer what problems or symptoms they have encountered.

- Document error messages, unusual behavior, or any recent changes to the system that may be related to the problem.

2. \*\*Reproduce the Problem:\*\*

- Try to reproduce the issue to determine if it's consistent or intermittent. This helps confirm that you're troubleshooting the right problem.

- Note the exact steps or conditions that lead to the problem.

3. \*\*Check for Simple Solutions:\*\*

- Sometimes, the problem may have a straightforward solution. Check for common issues like loose cables, power interruptions, or a misconfigured setting.

- Restarting the computer can resolve many minor issues.

4. \*\*Update Software and Drivers:\*\*

- Ensure that the operating system, drivers, and software applications are up to date. Outdated software can lead to compatibility issues and vulnerabilities.

- Update drivers for hardware components such as graphics cards, network adapters, and peripherals.

5. \*\*Scan for Malware and Viruses:\*\*

- Run a full system scan using reputable antivirus and anti-malware software to check for infections. Remove any threats detected.

6. \*\*Check Hardware Components:\*\*

- Inspect hardware components for physical damage, loose connections, or overheating issues.

- Use built-in diagnostic tools or third-party software to check the health of hardware components like the hard drive, RAM, and CPU.

7. \*\*Review Event Logs:\*\*

- Check the system event logs (Event Viewer on Windows, syslog on Linux) for error messages or warnings that may provide clues about the issue.

- Investigate any recurring errors and try to identify their causes.

8. \*\*Isolate Software Issues:\*\*

- Boot the computer in safe mode (if available) to determine if the issue persists. Safe mode loads only essential drivers and system files, helping isolate software-related problems.

9. \*\*Test in a Clean Environment:\*\*

- Create a new user profile or account and test the computer with a fresh user environment. This can help determine if the issue is specific to a user's profile.

10. \*\*Use System Restore (Windows) or Time Machine (macOS):\*\*

- If the problem started after a significant software change, such as an update or installation, consider using system restore (Windows) or Time Machine (macOS) to revert to a previous system state.

11. \*\*Check for Software Conflicts:\*\*

- Disable or uninstall recently installed or suspicious software to check if they are causing conflicts or issues.

12. \*\*Monitor Resource Usage:\*\*

- Open task manager or a similar resource monitoring tool to check for high CPU, memory, or disk usage when the issue occurs. Identifying resource hogs can help pinpoint the problem.

13. \*\*Check for Overheating:\*\*

- Ensure that the computer is adequately cooled and not overheating. Clean dust from fans and heatsinks, and consider improving airflow if necessary.

14. \*\*Backup Data:\*\*

- Before attempting major repairs or system reinstalls, back up important data to prevent data loss.

15. \*\*Seek Expert Assistance:\*\*

- If you're unable to resolve the issue or suspect it's related to a hardware problem, consider seeking assistance from a professional technician or the computer manufacturer's support.

16. \*\*Document and Learn:\*\*

- Keep a record of your troubleshooting steps, including what worked and what didn't. This documentation can be valuable for future reference and for sharing knowledge.

Remember that troubleshooting can be a process of trial and error, and it may take time to identify and resolve complex issues. Patience, persistence, and a systematic approach are key to effectively troubleshooting computer problems.

2. How to troubleshoot common computer problems?

Ans: Troubleshooting common computer problems can often be done by following a systematic approach to identify and resolve issues. Here are steps to troubleshoot some of the most common computer problems:

\*\*1. Slow Computer Performance:\*\*

- Check for resource hogs: Open Task Manager (Ctrl+Shift+Esc on Windows or Activity Monitor on macOS) to identify processes using excessive CPU, memory, or disk resources. Close or end such processes.

- Scan for malware and viruses: Run a full system scan with updated antivirus and anti-malware software.

- Free up disk space: Delete unnecessary files, uninstall unused applications, and clear browser caches.

- Disable startup programs: Use the system configuration utility (msconfig on Windows) to prevent unnecessary programs from starting at boot.

\*\*2. Computer Freezing or Hanging:\*\*

- Check for overheating: Overheating can cause the computer to freeze. Ensure that fans and heatsinks are clean and functioning properly.

- Update drivers: Update graphics card and chipset drivers, as outdated drivers can lead to freezing issues.

- Scan for malware: Malware can also cause freezes, so perform a thorough malware scan.

\*\*3. Blue Screen of Death (BSOD) on Windows:\*\*

- Note the error message: When a BSOD occurs, note the error message and any error codes displayed.

- Search for error codes: Look up the error code online to find specific troubleshooting steps.

- Check for driver issues: Often, BSODs are caused by incompatible or outdated drivers. Update or roll back drivers as needed.

\*\*4. No Internet Connection:\*\*

- Check physical connections: Ensure that network cables are securely connected, and Wi-Fi routers are powered on.

- Restart the router and modem: Power cycle your network equipment by unplugging them for a few seconds and then plugging them back in.

- Reset network settings: In some cases, resetting network settings on your computer can resolve connectivity issues.

\*\*5. Computer Won't Start:\*\*

- Check power source: Ensure that the computer is plugged into a working power outlet and the power supply is functional.

- Inspect hardware connections: Re-seat RAM, graphics cards, and other components to ensure they are properly connected.

- Test with minimal hardware: Disconnect all unnecessary peripherals and components, including external drives and USB devices, to rule out hardware conflicts.

- Try Safe Mode: Boot into Safe Mode (F8 on Windows) to troubleshoot software or driver-related issues.

\*\*6. No Sound or Audio Problems:\*\*

- Check audio settings: Verify that the volume is not muted and audio levels are appropriately configured.

- Update audio drivers: Outdated or incompatible audio drivers can cause audio issues. Update or reinstall audio drivers.

- Check external connections: Ensure that speakers or headphones are properly connected to the correct audio port.

\*\*7. Printer Not Working:\*\*

- Check printer connections: Verify that the printer is properly connected to the computer and powered on.

- Update or reinstall drivers: Outdated or corrupted printer drivers can cause issues. Download and install the latest drivers from the manufacturer's website.

- Clear print queue: Sometimes, a stuck print job can prevent new print jobs from completing. Clear the print queue to resolve this.

\*\*8. Application Crashes:\*\*

- Check for updates: Ensure that the application and your operating system are up to date.

- Reinstall the application: Uninstall and reinstall the problematic application to address corrupted files or settings.

- Check for conflicting software: Other installed software or drivers may conflict with the application. Investigate and resolve any conflicts.

Remember to document the steps you take during troubleshooting, and don't hesitate to seek assistance from technical support or online communities if you're unable to resolve a problem on your own. Troubleshooting common computer problems often requires a combination of patience, technical knowledge, and systematic problem-solving.

3. Your computer turns on, but still doesn’t work?

Ans: If your computer turns on but still doesn't work, it can be frustrating, but there are several potential reasons for this issue. Here are some steps to diagnose and address the problem:

\*\*1. Check for Power and Display Issues:\*\*

- Ensure that the computer is receiving power. Check power cables, power outlets, and surge protectors or UPS (uninterruptible power supply) units.

- Verify that the monitor or display is also receiving power and properly connected to the computer. Check the monitor's power cable and video cable connections.

\*\*2. Listen for Beep Codes (Desktop Computers):\*\*

- Some desktop computers use beep codes to indicate hardware problems during startup. Listen for any beep codes during the boot process and consult your computer's documentation or motherboard manual to interpret them.

\*\*3. Test with Minimal Hardware:\*\*

- Disconnect all unnecessary peripherals and components, including external drives, USB devices, and expansion cards (e.g., graphics cards).

- Boot the computer with only essential components, such as the CPU, motherboard, RAM, and power supply, to rule out hardware conflicts.

\*\*4. Check for Display Issues:\*\*

- If the computer appears to be running but the screen remains blank, it could be a display issue. Try these steps:

- Test with a different monitor or display to rule out a faulty monitor.

- Check the video cable for damage or try a different cable.

- Ensure that the monitor is set to the correct input source (e.g., HDMI, VGA, DisplayPort).

- If you have a discrete graphics card, try connecting the monitor to the motherboard's video output (if available) to see if the issue is related to the graphics card.

\*\*5. Listen for Hard Drive Activity:\*\*

- During startup, listen for hard drive or SSD (solid-state drive) activity. If you hear the drive spinning or seeking data, it indicates that the storage device is functioning.

- If you don't hear any activity and suspect a storage issue, you may need to diagnose or replace the drive.

\*\*6. Check for Overheating:\*\*

- Overheating can cause a computer to shut down or fail to start properly. Ensure that the CPU and GPU fans are functioning, and there is proper airflow within the case.

- Clean dust from cooling components and ensure they are securely attached.

\*\*7. Test RAM (Memory) Modules:\*\*

- Faulty RAM modules can lead to startup problems. Try reseating the RAM modules in their slots or test with a different set of RAM if available.

- If you have multiple RAM modules installed, try booting the computer with each module individually to identify a faulty one.

\*\*8. Perform a CMOS Reset (Desktops):\*\*

- Resetting the computer's CMOS (Complementary Metal-Oxide-Semiconductor) settings to defaults can sometimes resolve startup issues. Consult your motherboard manual for instructions on how to reset the CMOS.

\*\*9. Consult the Manual and Manufacturer's Support:\*\*

- Review the user manual for your computer or motherboard to troubleshoot specific issues.

- Contact the computer manufacturer's technical support or consult online forums and communities for guidance if you're unable to resolve the problem.

If none of these steps resolve the issue, it may be a more complex hardware problem, such as a faulty power supply, motherboard, or CPU. In such cases, it's advisable to seek assistance from a professional technician or a qualified service centre for further diagnosis and repair.

Topic: OS Troubleshooting

 Assignment level Basic:

1. What are the basics of troubleshooting?

Ans: The basics of troubleshooting involve a systematic and logical approach to identifying and resolving problems or issues in various systems, devices, software, or processes. Whether you're troubleshooting a computer, network, appliance, or any other system, the following fundamental principles apply:

1. \*\*Identify the Problem:\*\*

- Begin by clearly defining the problem or issue. Gather information about the symptoms, error messages, and any recent changes or events that may be related.

2. \*\*Replicate the Issue:\*\*

- Try to reproduce the problem to determine if it's consistent or intermittent. Understanding when and how the issue occurs is essential for effective troubleshooting.

3. \*\*Check for Obvious Solutions:\*\*

- Before diving into complex troubleshooting, check for simple and common solutions. These may include checking physical connections, ensuring power sources, and verifying settings.

4. \*\*Isolate the Cause:\*\*

- Systematically narrow down the potential causes of the problem. Divide the system or process into smaller parts and test each part to identify where the issue originates.

5. \*\*Gather Information:\*\*

- Collect relevant data and information that can help diagnose the problem. This may include logs, error messages, system configurations, and user reports.

6. \*\*Generate Hypotheses:\*\*

- Formulate hypotheses or educated guesses about what might be causing the problem based on your initial analysis and gathered information.

7. \*\*Test Hypotheses:\*\*

- Test each hypothesis by making changes, adjustments, or interventions to the system or process. Observe the system's behavior to see if the problem is resolved or persists.

8. \*\*Iterate and Refine:\*\*

- If a hypothesis doesn't solve the problem, refine your hypotheses and continue testing until you find the solution. Be systematic and persistent in your approach.

9. \*\*Implement a Solution:\*\*

- Once you identify the root cause and verify a solution, implement the necessary changes or fixes to resolve the issue.

10. \*\*Verify and Test:\*\*

- After implementing a solution, thoroughly test the system to ensure the problem is indeed resolved and that no new issues have been introduced.

11. \*\*Document the Resolution:\*\*

- Document the problem, its root cause, the steps taken to resolve it, and the final solution. This documentation can be valuable for future reference and for sharing knowledge with colleagues.

12. \*\*Preventive Measures:\*\*

- If applicable, consider implementing preventive measures to reduce the likelihood of the problem recurring. This might involve updating procedures, improving monitoring, or applying patches and updates.

13. \*\*Learn and Improve:\*\*

- Reflect on the troubleshooting process and the lessons learned. Use this experience to enhance your troubleshooting skills for future issues.

14. \*\*Seek Help When Needed:\*\*

- If you're unable to resolve the problem on your own or if it involves specialized knowledge or equipment, don't hesitate to seek assistance from colleagues, experts, or technical support.

Remember that troubleshooting is not always straightforward, and it often requires patience, critical thinking, and persistence. The ability to systematically identify and resolve issues is a valuable skill in many fields, including IT, engineering, maintenance, and customer support.

2. Write down the steps of OS troubleshooting.

Ans: Troubleshooting issues related to an operating system (OS), such as Windows, macOS, or Linux, requires a systematic approach to identify and resolve problems that affect the computer's functionality. Here are the steps for troubleshooting OS-related issues:

1. \*\*Identify the Problem:\*\*

- Gather information about the issue. Ask the user or system administrator to describe the problem, noting any error messages, symptoms, or specific actions that trigger the issue.

2. \*\*Replicate the Issue:\*\*

- Try to reproduce the problem to ensure it's consistent. Understanding the circumstances under which the issue occurs is essential for diagnosis.

3. \*\*Check for Obvious Solutions:\*\*

- Before diving into in-depth troubleshooting, check for common and simple solutions, such as loose cables, power interruptions, or incorrect settings.

4. \*\*Isolate the Cause:\*\*

- Divide the problem into manageable parts to narrow down the potential causes. Determine whether the issue is hardware-related, software-related, or specific to the OS.

5. \*\*Gather Information:\*\*

- Collect relevant data, including error messages, logs, and system configurations. Access system logs and event viewers to review system events.

6. \*\*Check for Updates and Patches:\*\*

- Ensure that the OS is up to date with the latest updates, security patches, and service packs. Outdated software can lead to compatibility issues and vulnerabilities.

7. \*\*Scan for Malware and Viruses:\*\*

- Run a full system scan using reputable antivirus and anti-malware software to check for infections. Remove any threats detected.

8. \*\*Review Event Logs:\*\*

- Check the OS's event logs (Event Viewer on Windows, syslog on Linux) for error messages, warnings, or critical events that may provide clues about the issue.

9. \*\*Test in Safe Mode (Windows):\*\*

- Boot the computer in Safe Mode to load only essential drivers and system files. This can help identify if the problem is related to third-party software or drivers.

10. \*\*Check for Software Conflicts:\*\*

- Disable or uninstall recently installed or problematic software to check if they are causing conflicts or issues.

11. \*\*Recover Using System Restore (Windows) or Time Machine (macOS):\*\*

- If the issue started after a significant software change, such as an update or installation, consider using system restore (Windows) or Time Machine (macOS) to revert to a previous system state.

12. \*\*Check Disk and File System Integrity:\*\*

- Use built-in tools like CHKDSK (Windows) or fsck (Linux/macOS) to check and repair disk and file system errors.

13. \*\*Update or Roll Back Drivers:\*\*

- Ensure that hardware drivers, such as graphics, network, and chipset drivers, are up to date. Roll back drivers if new updates cause problems.

14. \*\*Repair or Reinstall the OS:\*\*

- As a last resort, consider repairing or reinstalling the OS. This may involve using OS installation media or recovery options provided by the OS.

15. \*\*Data Backup and Recovery:\*\*

- Before performing any major OS-related operations, back up important data to prevent data loss. Have a plan for data recovery if necessary.

16. \*\*Document the Resolution:\*\*

- Record the problem, its root cause, the steps taken to resolve it, and the final solution. Documentation is valuable for future reference and sharing knowledge.

17. \*\*Preventive Measures:\*\*

- Implement preventive measures, such as regular backups, system monitoring, and security best practices, to minimize the risk of future OS-related issues.

18. \*\*Seek Expert Assistance:\*\*

- If you're unable to resolve the issue or if it involves complex hardware or software problems, seek assistance from a professional technician or OS support resources.

These steps provide a systematic approach to troubleshooting OS-related issues. It's important to approach each issue with patience and a methodical mindset to identify and resolve problems effectively.

 Assignments level Advance:

1. Do a practical to repair OS.

Ans: Repairing an operating system (OS) often involves troubleshooting and fixing issues that affect its functionality. Here are some practical steps for repairing an OS:

For Windows OS:

1. Use System Restore:
   * System Restore allows you to revert the OS to a previous state when it was working correctly. To use it:
     + Open the Start menu, type "System Restore," and select "Create a restore point."
     + Click the "System Restore" button and follow the prompts to choose a restore point.
2. Use Windows Update:
   * Ensure that your Windows OS is up to date with the latest updates and security patches. Sometimes, updating the OS can resolve issues.
3. Check for Disk Errors:
   * Use the built-in CHKDSK utility to check and repair disk errors. Open a Command Prompt with administrative privileges and run: chkdsk /f
4. Use System File Checker (sfc):
   * The System File Checker tool scans and repairs corrupted or missing system files. Open a Command Prompt with administrative privileges and run: sfc /scannow
5. Check for Malware:
   * Run a full system scan with a reputable antivirus and anti-malware software to remove any infections.
6. Repair Windows with Installation Media:
   * If other methods fail, you can repair Windows using installation media (USB or DVD):
     + Boot from the installation media.
     + Select your language and keyboard preferences, then click "Repair your computer."
     + Follow the prompts to repair Windows or perform a clean installation while keeping your files.

For macOS:

1. Use Time Machine:
   * If you have Time Machine backups, you can restore your system to a previous state when it was working correctly.
   * Boot into macOS Recovery (hold down Command + R while restarting), then choose "Restore from Time Machine Backup."
2. Check for macOS Updates:
   * Ensure that your macOS is up to date by going to "System Preferences" > "Software Update" and installing any available updates.
3. Use Disk Utility:
   * Disk Utility can help repair disk and file system issues. Boot into macOS Recovery and select "Disk Utility" to perform repairs.
4. Reinstall macOS:
   * If other methods fail, you can reinstall macOS while keeping your data intact. Boot into macOS Recovery and select "Reinstall macOS."

For Linux OS (Ubuntu as an example):

1. Use Live CD/USB:
   * Boot into a live Linux environment using a bootable USB or CD/DVD.
   * Use tools like GParted to check and repair disk partitions, and fsck to check file system integrity.
2. Update and Upgrade:
   * Ensure your Linux distribution is up to date by running:

sqlCopy code

sudo apt-get update sudo apt-get upgrade

1. Use Recovery Mode (GRUB):
   * Access the GRUB menu during boot and choose the recovery mode option. From there, you can access various repair options.
2. Check for Package Issues:
   * Use package management tools like dpkg and apt-get to check for and repair broken or missing packages.
3. Repair Grub (Bootloader):
   * If your system won't boot due to Grub issues, you can repair Grub using boot-repair or by manually reinstalling Grub.

Always follow the specific procedures and commands relevant to your OS version and distribution. OS repair processes can vary based on the OS and the nature of the issue you're encountering. If you're unsure or uncomfortable with these procedures, consider seeking assistance from a professional or IT expert.

2. Do a practical to repair boot file.

Ans: Repairing the Windows Boot Manager (also known as the Windows Boot Loader) can be done using the Windows Recovery Environment. Here's a practical guide on how to repair the Windows Boot Manager if it's experiencing issues.

1. Boot from Windows Installation Media:

* Insert your Windows installation USB or DVD into your computer.
* Restart the computer and boot from the installation media. You may need to change the boot order in the BIOS/UEFI settings to prioritize the installation media.

2. Choose Language and Keyboard Preferences:

* When the Windows Setup screen appears, select your language, time, currency, and keyboard preferences, and then click "Next."

3. Access Repair Options:

* Click on "Repair your computer" at the bottom left corner of the screen.

4. Choose Troubleshoot:

* In the "Choose an option" screen, select "Troubleshoot."

5. Access Advanced Options:

* Select "Advanced options."

6. Use Command Prompt:

* In the "Advanced options" menu, select "Command Prompt."

7. Identify the Boot Drive:

* Use the following command to list the available drives and identify the drive letter of your Windows installation:

Copy code

diskpart list volume

* Note the drive letter assigned to your Windows partition (usually C:).

8. Repair the Boot Manager:

* In the Command Prompt, use the following commands to repair the Boot Manager:

bashCopy code

bootrec /fixboot bootrec /scanos bootrec /fixmbr bootrec /rebuildbcd

* These commands will scan for Windows installations, fix the Master Boot Record (MBR), and rebuild the Boot Configuration Data (BCD).

9. Confirm Repairs:

* After running the commands, you may receive messages indicating that the repairs were successful. Follow any on-screen prompts.

10. Exit Command Prompt and Restart: - Type exit in the Command Prompt to close it. - Select "Turn off your PC" from the Troubleshoot menu, or simply restart your computer.

11. Remove the Installation Media: - Eject the Windows installation USB or DVD from your computer.

12. Test the Boot: - Boot your computer normally and check if the Boot Manager issue has been resolved.

These steps should help repair the Windows Boot Manager and resolve boot-related issues. However, if the issue persists or you encounter additional problems during the repair process, it may be necessary to seek assistance from a professional or use more advanced troubleshooting methods.

 Topic: Recovery Assignment level Basic:

1. What is recovery?

Ans: In the context of computing and technology, "recovery" refers to the process of restoring a system, data, or software to a functional state after a failure, loss, or other adverse event. Recovery can involve different aspects, including data recovery, system recovery, and disaster recovery, each addressing specific scenarios and objectives:

1. Data Recovery:
   * Data recovery involves the retrieval of lost, damaged, or accidentally deleted data from storage devices such as hard drives, solid-state drives (SSDs), USB drives, and memory cards.
   * Common causes of data loss include hardware failures, accidental deletion, file system corruption, and software errors.
   * Data recovery tools and techniques are used to recover files and data from these situations.
2. System Recovery:
   * System recovery focuses on restoring a computer's operating system (OS) and system files to a functional state.
   * It is often used when the OS becomes corrupted or unstable due to issues like software conflicts, driver problems, or OS update failures.
   * System recovery can include operations like using system restore points, reinstalling the OS, or repairing the OS boot process.
3. Disaster Recovery:
   * Disaster recovery encompasses broader strategies and plans for ensuring the continuity of an organization's critical IT systems and data in the event of major disruptions or disasters.
   * Disasters can include natural disasters (e.g., hurricanes, earthquakes), hardware failures, cyberattacks, and other catastrophic events.
   * Disaster recovery planning involves creating backup systems, data redundancy, and contingency plans to minimize downtime and data loss in such situations.
4. Backup and Restore:
   * Backup and restore processes are integral to recovery. Regular backups of data and system configurations enable quick recovery in case of data loss or system failures.
   * Backup solutions include creating copies of data on separate storage media or in cloud services, allowing for data restoration when needed.
5. Business Continuity:
   * Business continuity planning involves strategies for maintaining essential business operations during and after disruptions, with an emphasis on recovery.
   * It includes disaster recovery planning but extends to overall business processes, ensuring that organizations can continue to function despite adverse events.
6. Data Migration and Import:
   * In some contexts, recovery may refer to the process of migrating or importing data and configurations from one system or application to another, ensuring data continuity when transitioning between technologies or platforms.

2. Why do we need recovery?

Ans: Recovery, in the context of computing and data management, is essential for several reasons:

1. \*\*Data Loss Prevention:\*\*

- Data loss can occur due to various reasons, including hardware failures, accidental deletion, software bugs, and malware infections. Recovery measures help prevent permanent data loss and enable the retrieval of valuable information.

2. \*\*System Stability and Availability:\*\*

- Systems and applications can become unstable or non-functional due to software conflicts, configuration errors, or updates gone wrong. Recovery processes restore system stability and availability.

3. \*\*Business Continuity:\*\*

- Organizations rely heavily on their IT systems and data to conduct business operations. Recovery plans and strategies are vital for minimizing downtime and ensuring that essential business functions can continue even in the face of disruptions or disasters.

4. \*\*Data Integrity and Reliability:\*\*

- Maintaining data integrity is crucial, especially for critical information and databases. Regular backups and recovery procedures help ensure data remains reliable and uncorrupted.

5. \*\*Protection Against Cyberattacks:\*\*

- Cyberattacks, such as ransomware or data breaches, can result in data loss or system compromise. Recovery processes help organizations recover from such attacks and restore their systems to a safe state.

6. \*\*Software and OS Failures:\*\*

- Software conflicts, operating system crashes, and update failures can render systems unusable. Recovery methods, including system restores and reinstallation, are necessary to address these issues.

7. \*\*Hardware Failures:\*\*

- Hardware components like hard drives, memory modules, and CPUs can fail unexpectedly. Data recovery and system recovery become essential when hardware issues occur.

8. \*\*Migration and Upgrades:\*\*

- When transitioning to new technologies or upgrading software and hardware, recovery methods can facilitate the transfer of data and configurations to the new environment, ensuring a smooth transition.

9. \*\*Compliance and Regulations:\*\*

- Many industries have regulatory requirements that mandate data retention and recovery capabilities. Compliance with these regulations is essential for avoiding legal and financial penalties.

10. \*\*Peace of Mind:\*\*

- Individuals and organizations alike benefit from the peace of mind that comes with knowing that data and systems can be restored in the event of unforeseen issues.

11. \*\*Cost Savings:\*\*

- Investing in recovery measures can save costs associated with data loss, downtime, and the need to rebuild systems from scratch.

12. \*\*Customer Trust and Reputation:\*\*

- For businesses, maintaining data integrity and continuity of services is crucial for earning and preserving customer trust and reputation.

In summary, recovery measures are a fundamental aspect of IT management and data protection. They serve to prevent data loss, ensure system availability, support business continuity, and safeguard against various threats and issues that can impact both individuals and organizations.

 Assignment level Intermediate:

1. list out the tools for recovery.

Ans: There are various tools available for data recovery, system recovery, and backup solutions, depending on your specific needs and the operating system you're using. Here's a list of some commonly used recovery tools and software:

\*\*Data Recovery Tools:\*\*

1. \*\*Recuva:\*\* A user-friendly tool for recovering deleted files from Windows computers.

2. \*\*TestDisk:\*\* A powerful open-source tool for recovering lost partitions and files on various platforms, including Windows, macOS, and Linux.

3. \*\*PhotoRec:\*\* A companion tool to TestDisk that specializes in recovering lost photos and multimedia files.

4. \*\*EaseUS Data Recovery Wizard:\*\* A versatile data recovery tool for Windows and macOS, capable of recovering files from various storage media.

5. \*\*Stellar Data Recovery:\*\* Offers data recovery solutions for Windows, macOS, and Linux, supporting a wide range of file formats and storage devices.

6. \*\*MiniTool Power Data Recovery:\*\* A Windows-based data recovery tool that can recover lost data from hard drives, SSDs, USB drives, and more.

\*\*System Recovery Tools:\*\*

7. \*\*Windows Recovery Environment (WinRE):\*\* Built-in recovery tools in Windows, including System Restore, Startup Repair, and Command Prompt for advanced troubleshooting.

8. \*\*macOS Recovery:\*\* Built-in recovery tools for macOS, including options to reinstall macOS, restore from Time Machine backups, and run Disk Utility.

9. \*\*Clonezilla:\*\* An open-source disk cloning and imaging tool for creating and restoring system backups on Linux and Windows systems.

10. \*\*AOMEI Backupper:\*\* A comprehensive backup and recovery tool for Windows, supporting system backup, disk cloning, and file-level recovery.

11. \*\*Acronis True Image:\*\* A popular backup and recovery solution for Windows and macOS, offering disk imaging, cloud backup, and data protection features.

\*\*Backup Solutions:\*\*

12. \*\*Windows Backup and Restore:\*\* Built-in backup and restore utility in Windows for creating and managing system image backups.

13. \*\*Time Machine:\*\* Apple's built-in backup solution for macOS, which creates automatic backups and allows for easy system restores.

14. \*\*Veeam Backup & Replication:\*\* An enterprise-level backup and recovery solution for virtualized environments, including VMware and Hyper-V.

15. \*\*Bacula:\*\* An open-source network backup solution for Linux, Unix, and Windows systems, offering features like data deduplication and scalability.

16. \*\*Cobian Backup:\*\* A free and user-friendly backup program for Windows that supports various backup methods, including full, differential, and incremental backups.

17. Duplicati: An open-source backup client for Windows, macOS, and Linux that supports multiple cloud storage providers and encryption.

18. rsync: A command-line utility for data synchronization and backup on Unix-based systems (Linux and macOS).

19. BackupPC: An open-source, web-based backup system for Unix-like systems, designed for network-based backup of multiple computers.

These tools and solutions offer various features and capabilities for data recovery, system recovery, and data backup. The choice of tool depends on your specific requirements, operating system, and the nature of the recovery or backup tasks you need to perform. Always ensure that you use reputable and trusted software when dealing with data recovery and system recovery to minimize the risk of data loss.

2. DO a practical to recover deleted file.

Ans: Recovering deleted files often involves using specialized software. Here's a practical guide on how to recover a deleted file using a popular file recovery tool called Recuva on a Windows computer:

Step 1: Download and Install Recuva

1. Open your web browser and go to the official Recuva website (<https://www.ccleaner.com/recuva>) to download the Recuva software.
2. Download the free version of Recuva and follow the installation instructions to install it on your computer.

Step 2: Run Recuva

1. Launch Recuva from your Start menu or desktop shortcut.
2. The Recuva Wizard will open. Click "Next" to proceed.

Step 3: Choose File Type and Location

1. In the Recuva Wizard, you'll be asked what type of files you want to recover. Select the appropriate option or leave it as "All Files" if you're not sure.
2. Click "Next."
3. On the next screen, you'll be asked where the file was located before deletion. Choose one of the following options:
   * "I'm not sure" if you're not certain about the location.
   * "In the Recycle Bin" if the file was in the Recycle Bin.
   * "In a specific location" if you know the directory where the file was stored.
4. Click "Next."

Step 4: Start the Scan

1. Click "Start" to begin the scanning process. Recuva will search for deleted files on the selected drive or location.
2. The scanning process may take some time, depending on the size of the drive and the number of deleted files.

Step 5: Review Scan Results

1. Once the scan is complete, Recuva will display a list of recoverable files in a window. The files are color-coded to indicate their recovery chances (green for excellent, yellow for acceptable, and red for poor).
2. Locate the deleted file you want to recover in the list. You can use the search bar and filters to narrow down the results.

Step 6: Recover the File

1. Select the checkbox next to the file you want to recover.
2. Click the "Recover" button in the lower-right corner of the Recuva window.
3. Choose a location where you want to save the recovered file. Do not save it to the same drive or location from which it was deleted to avoid overwriting data.
4. Click "OK" to begin the recovery process.

Step 7: Verify and Access the Recovered File

1. After the recovery is complete, you'll see a confirmation message. Click "OK."
2. Navigate to the location where you saved the recovered file and check to ensure it's intact and accessible.

Important Tips:

* Perform the recovery as soon as possible after the file deletion to prevent data overwriting.
* Avoid installing Recuva or saving recovered files to the same drive where the deleted file was located.
* If the initial scan doesn't find your file, you can try the "Deep Scan" option in Recuva, which performs a more thorough search.
* Regularly back up your important files to prevent data loss in the future.

3. Do a practical to recover the formatted file

Ans: Recovering files from a formatted drive can be more challenging than recovering deleted files, but it's still possible using specialized data recovery software. Here's a practical guide on how to recover formatted files using the Recuva software on a Windows computer:

Step 1: Download and Install Recuva

1. Open your web browser and go to the official Recuva website (<https://www.ccleaner.com/recuva>) to download the Recuva software.
2. Download the free version of Recuva and follow the installation instructions to install it on your computer.

Step 2: Run Recuva

1. Launch Recover from your Start menu or desktop shortcut.
2. The Recover Wizard will open. Click "Next" to proceed.

Step 3: Choose File Type and Location

1. In the Recover Wizard, you'll be asked what type of files you want to recover. Select the appropriate option or leave it as "All Files" if you're not sure.
2. Click "Next."
3. On the next screen, you'll be asked where the file was located before formatting. Choose one of the following options:
   * "I'm not sure" if you're not certain about the location.
   * "In a specific location" if you know the directory where the file was stored before formatting.
4. Click "Next."

Step 4: Specify the Drive to Scan

1. Select the drive that was formatted from the list of available drives. This is the drive from which you want to recover formatted files.
2. Click "Next."

Step 5: Start the Scan

1. Click "Start" to begin the scanning process. Recover will search for formatted files on the selected drive.
2. The scanning process may take some time, depending on the size of the drive and the number of formatted files.

Step 6: Review Scan Results

1. Once the scan is complete, Recover will display a list of recoverable files in a window. The files are color-coded to indicate their recovery chances (green for excellent, yellow for acceptable, and red for poor).
2. Locate the formatted files you want to recover in the list. You can use the search bar and filters to narrow down the results.

Step 7: Recover the Formatted Files

1. Select the checkbox next to the files you want to recover.
2. Click the "Recover" button in the lower-right corner of the Recover window.
3. Choose a location where you want to save the recovered files. Do not save them to the same drive or location from which they were formatted to avoid overwriting data.
4. Click "OK" to begin the recovery process.

Step 8: Verify and Access the Recovered Files

1. After the recovery is complete, you'll see a confirmation message. Click "OK."
2. Navigate to the location where you saved the recovered files and check to ensure they are intact and accessible.

Important Tips:

* Perform the recovery as soon as possible after formatting to maximize the chances of success.
* Avoid installing Recuva or saving recovered files to the same drive that was formatted.
* If the initial scan doesn't find your files, try the "Deep Scan" option in Recover for a more thorough search.
* Regularly back up your important files to prevent data loss in the future.

Remember that the success of formatted file recovery depends on several factors, and there are no guarantees. If Recover doesn't find your files or if they are too damaged, you may want to explore professional data recovery services, which may have advanced tools and techniques for recovery.

4. Do practical to recover data from the os Corrupted file.

Ans: Recovering data from a corrupted operating system (OS) typically involves creating a bootable environment on a separate drive or media and then using data recovery software from within that environment. Here's a practical guide on how to recover data from a corrupted OS:

Step 1: Create a Bootable Environment

1. Prepare a bootable USB drive or DVD with a live OS or recovery environment. You can use tools like Rufus (for Windows) or the dd command (for Linux) to create a bootable USB drive.
2. Insert the bootable USB drive or DVD into your computer.
3. Boot your computer from the bootable media. This may involve changing the boot order in the BIOS/UEFI settings. Consult your computer's manual or motherboard documentation for instructions on how to do this.

Step 2: Access the Recovery Environment

1. Once you boot into the live OS or recovery environment, you should have access to basic tools and file management.
2. Locate and access the storage drive where the corrupted OS is installed. It might be mounted automatically, or you may need to mount it manually.

Step 3: Use Data Recovery Software

1. To recover data from the corrupted OS drive, you'll need data recovery software. Popular options include TestDisk, PhotoRec, and foremost for Linux systems.
2. Install or run the data recovery software from within the live environment.
3. Configure the recovery software to scan the corrupted drive. You'll typically specify the drive or partition to scan, file types to recover, and other scanning options.
4. Start the data recovery scan. The software will analyze the drive and attempt to recover any recoverable files.

Step 4: Recover Data to External Media

1. After the scan is complete, the recovery software will display a list of recoverable files.
2. Select the files you want to recover and specify an external storage location (e.g., an external hard drive or another USB drive) to save the recovered files.
3. Start the recovery process. The software will copy the selected files to the external storage.

Step 5: Verify Recovered Data

1. Once the recovery is complete, verify that the recovered data is accessible and intact on the external storage.
2. Ensure that all the important files you intended to recover are present and accessible.

Step 6: Reinstall or Repair the OS

1. If you intend to continue using the same computer, you will need to reinstall or repair the OS on the corrupted drive to restore its functionality.
2. Depending on the OS (e.g., Windows, Linux, macOS), follow the appropriate installation or repair process. This typically involves booting from an OS installation media and following on-screen instructions.

Recovering data from a corrupted OS drive can be complex, and success depends on the extent of corruption and the condition of the drive. If the drive is physically damaged or severely corrupted, it may be necessary to consult a professional data recovery service. Additionally, it's important to maintain regular backups to prevent data loss in the future.

Topic: Hard Drive troubleshooting

 Assignment level Basic:

1. What is Hard troubleshooting?

Ans: Hard troubleshooting, also known as "difficult troubleshooting" or "challenging troubleshooting," refers to the process of identifying and resolving complex and often elusive problems or issues in a system, device, network, or software application. These issues are termed "hard" because they are not easily or immediately apparent and may require a deeper understanding of the system, advanced diagnostic techniques, and considerable expertise to pinpoint and fix.

Here are some characteristics of hard troubleshooting:

1. Obscure Symptoms: The symptoms of the problem may not be obvious or consistent, making it difficult to pinpoint the root cause.
2. Multiple Factors: Hard troubleshooting often involves dealing with multiple factors or variables that could contribute to the problem. These factors can interact in complex ways, making it challenging to isolate the issue.
3. Limited Information: In some cases, you may have limited or incomplete information about the system, making it harder to diagnose the problem accurately.
4. Uncommon Issues: The problem may be rare or unusual, requiring specialized knowledge or experience to recognize and address.
5. Time-Consuming: Resolving hard troubleshooting cases can be time-consuming and may involve a significant amount of trial and error.
6. Expertise Required: It often requires a high level of expertise and experience in the specific domain or technology involved.
7. Diagnostic Tools: You may need specialized diagnostic tools, software, or hardware to aid in the troubleshooting process.
8. Collaboration: Sometimes, hard troubleshooting requires collaboration with other experts or support teams to gather insights and solutions.

Examples of situations that might involve hard troubleshooting include:

* Debugging complex software errors or crashes that occur sporadically.
* Identifying and fixing intermittent hardware issues in a computer or network.
* Resolving compatibility problems between different software or hardware components.
* Investigating and mitigating performance bottlenecks in a complex system.
* Troubleshooting security breaches or cyberattacks on a network.

In such cases, it's essential to follow a systematic troubleshooting process, document your findings, and be persistent in your efforts to identify and resolve the underlying problem. Sometimes, solving hard troubleshooting cases can be intellectually rewarding and contribute significantly to your expertise in a particular field.

2. Why do we need Hard drive troubleshooting

Ans: Hard drive troubleshooting is necessary for several reasons, primarily because hard drives are a critical component of computers and storage systems, and when they encounter problems, it can result in data loss, system instability, and overall reduced functionality. Here are some reasons why hard drive troubleshooting is essential:

1. Data Preservation: Hard drives store valuable data, including documents, photos, videos, applications, and more. When a hard drive experiences issues, there's a risk of data loss. Troubleshooting helps identify and resolve problems to prevent data loss or recover data if possible.
2. System Functionality: The operating system and various software applications rely on the hard drive to function correctly. Problems with the hard drive can lead to system crashes, slow performance, and errors. Troubleshooting ensures the system operates smoothly.
3. Identify Hardware Issues: Hard drives can develop physical problems over time, such as bad sectors, motor failures, or controller issues. Troubleshooting helps pinpoint these hardware issues, enabling repairs or replacements.
4. Detecting Software Problems: Sometimes, hard drive issues are related to software, such as file system corruption, driver conflicts, or malware infections. Troubleshooting helps identify and resolve software-related problems.
5. Preventing Data Corruption: Hard drive errors can lead to data corruption, rendering files or the entire system unusable. Timely troubleshooting can prevent or mitigate data corruption issues.
6. Improving Performance: Troubleshooting can identify performance bottlenecks or issues that slow down the hard drive. Resolving these problems can lead to improved overall system performance.
7. Extending Lifespan: Early detection and resolution of hard drive issues can extend the lifespan of the drive, reducing the need for expensive replacements.
8. Security Concerns: Hard drive issues can also be related to security breaches, such as unauthorized access or malware infections. Troubleshooting helps identify and address security vulnerabilities.
9. Minimizing Downtime: In business or critical computing environments, hard drive failures can lead to downtime and productivity losses. Troubleshooting and proactive maintenance can minimize downtime.
10. Cost Savings: Repairing or replacing a hard drive can be expensive, especially in professional or enterprise settings. Troubleshooting can often resolve issues without the need for costly hardware replacements.

In summary, hard drive troubleshooting is essential for maintaining data integrity, ensuring system functionality, detecting hardware and software issues, preventing data loss, and minimizing downtime. Regular maintenance and proactive troubleshooting can help ensure the reliability and longevity of your storage devices.

 Assignment level Intermediate:

1. Do a practical to troubleshoot the digging sound.

Ans: If you are experiencing a "digging" or unusual sound coming from your computer or hard drive, troubleshooting the issue is essential to identify the cause and potentially resolve it. Here's a practical step-by-step guide to troubleshoot a digging sound:

1. **Backup Data (if possible):** Before you begin troubleshooting, if your computer or hard drive is making strange noises, it's crucial to back up any important data immediately. This is because unusual sounds can sometimes be indicative of a failing hard drive.
2. **Isolate the Sound Source:**
   * Try to pinpoint the source of the digging sound. Is it coming from the hard drive itself, the fan, or another component? Listen carefully to determine the location.
3. **Check for Loose Cables or Obstructions:**
   * Ensure that there are no loose cables or objects obstructing the cooling fans, which can sometimes create unusual noises. Also, check for any loose components inside the computer case.
4. **Examine the Hard Drive:**
   * If you suspect the sound is coming from the hard drive, consider opening your computer case (if you are comfortable doing so) and inspecting the hard drive.
   * Look for physical damage, loose connections, or any obvious issues with the hard drive.
5. **Run Diagnostic Tools:**
   * Many hard drive manufacturers provide diagnostic software that can help identify issues with the drive. Download and run the appropriate diagnostic tool for your hard drive model.
   * The diagnostic tool will typically check for bad sectors, errors, and other problems. Follow the tool's instructions and guidance for repairs if necessary.
6. **Check for Software Issues:**
   * Sometimes, software issues can cause unusual sounds. Ensure that your operating system and device drivers are up to date.
   * Run a malware scan to rule out any infections that might be causing the sound.
7. **Monitor Temperatures:**
   * Overheating components, including the hard drive, can produce unusual sounds. Use temperature monitoring software to check if your hard drive or other components are running excessively hot.
8. **Replace or Service the Hardware:**
   * If you identify a failing hard drive or any other malfunctioning hardware component, consider replacing or servicing it as necessary.
9. **Seek Professional Help:**
   * If you are unsure about any of the steps or if the sound persists after troubleshooting, it's advisable to seek professional assistance. A computer technician or hardware expert can provide a more in-depth assessment and repairs.
10. **Preventive Maintenance:**
    * After resolving the issue or replacing faulty components, perform regular preventive maintenance on your computer, including cleaning dust, checking for loose cables, and monitoring for any signs of hardware wear.

Remember that unusual sounds from a hard drive, especially clicking or grinding noises, can be indicative of a failing drive. If you suspect a hardware failure, it's essential to back up your data and replace the drive promptly to prevent data loss.

2. Do a practical to change the sata cable in hard drive.

Ans: Changing a SATA cable on a hard drive is a relatively straightforward task and can help resolve connectivity issues or replace a faulty cable. Here's a step-by-step practical guide to changing the SATA cable on a hard drive:

**Tools and Materials You Will Need:**

1. New SATA data cable (ensure it's compatible with your hard drive and motherboard).
2. Screwdriver (if your hard drive is mounted inside a computer case).

**Steps:**

1. **Prepare Your Workspace:**
   * Ensure you have a clean, well-lit workspace to work on your computer or hard drive.
2. **Power Down Your Computer:**
   * Shut down your computer and turn off the power supply if applicable.
3. **Disconnect Power Cables:**
   * Unplug the power cable from the back of your computer or disconnect the power source for the hard drive if it's external.
4. **Ground Yourself:**
   * To prevent electrostatic discharge, touch a grounded metal object or wear an anti-static wrist strap before handling any internal components.
5. **Open the Computer Case (if necessary):**
   * If the hard drive is inside a computer case, open the case according to your computer's manual. Typically, this involves removing side panels or a cover.
6. **Locate the Hard Drive:**
   * Identify the hard drive that you want to replace the SATA cable for. It will be connected to both the motherboard and the power supply.
7. **Disconnect the Old SATA Cable:**
   * Gently pull out the old SATA data cable from both the hard drive's SATA port and the motherboard's SATA port. If the cable is secured with a latch, press down on it to release it before pulling.
8. **Connect the New SATA Cable:**
   * Take your new SATA data cable and connect one end to the hard drive's SATA port and the other end to the motherboard's SATA port. Ensure a snug and secure connection, but don't force it.
9. **Secure the Cable:**
   * If your computer case has cable management options, use them to secure the new SATA cable and prevent it from interfering with airflow or other components.
10. **Close the Computer Case:**
    * If you had to open the computer case, reattach the side panels or cover and secure them in place.
11. **Reconnect Power Cables:**
    * Plug the power cable back into the computer or reconnect the power source for the hard drive if it's external.
12. **Power On Your Computer:**
    * Turn on your computer and check if the hard drive is detected in the BIOS or operating system. If it's recognized and works correctly, the cable replacement was successful.
13. **Test the Hard Drive:**
    * To ensure that the hard drive functions as expected, access files or perform any necessary tasks.

Changing a SATA cable is a simple procedure, but it can help resolve connectivity issues and improve the reliability of your storage device. Always handle internal components with care, and take precautions against static discharge to avoid damaging your hardware during the process.

Topic: Laptop, Printer, Video card Troubleshooting

 Assignments level Baic

1. What is the basic troubleshooting for printers?

Ans: Troubleshooting printers can be frustrating, but many common issues can be resolved by following some basic steps. Here's a general guide for troubleshooting printers:

1. **Check for Physical Issues**:
   * Ensure the printer is properly connected to power and turned on.
   * Check all cables and connections to ensure they are secure.
   * Make sure there is paper in the paper tray and that it's loaded correctly.
   * Ensure there's enough ink or toner in the cartridges.
2. **Printer Error Messages**:
   * Pay attention to any error messages or warning lights on the printer. These can provide valuable information about the issue.
3. **Restart the Printer**:
   * Sometimes, a simple restart can resolve minor glitches. Turn off the printer, wait for a minute, and then turn it back on.
4. **Check for Paper Jams**:
   * Open the printer and carefully inspect for any paper jams. If found, gently remove the jammed paper following the printer's instructions.
5. **Printer Software**:
   * Ensure that the printer drivers and software are up to date. You can usually find the latest drivers on the manufacturer's website.
6. **Print Queue**:
   * Clear any print jobs in the print queue that might be stuck. Sometimes, a pending print job can cause issues with new print jobs.
7. **Check for Connectivity Issues**:
   * If the printer is connected via USB, make sure the USB cable is in good condition. Try using a different USB port if available.
   * For network-connected printers, check the network connection and ensure the printer has a valid IP address.
8. **Restart Your Computer**:
   * Sometimes, issues may be on the computer's end. Restart your computer to refresh settings and connections.
9. **Test Print**:
   * Print a test page to see if the problem persists. You can usually do this from the printer's control panel or through the computer's printer settings.
10. **Update Firmware**:
    * Check if there's a firmware update available for your printer on the manufacturer's website. Updating the firmware can resolve software-related issues.
11. **Check for Low Ink or Toner**:
    * If your prints are coming out faded or with streaks, it could be due to low ink or toner. Replace the cartridges if necessary.
12. **Clean the Print Heads**:
    * Some printers have a utility to clean the print heads. Refer to your printer's manual for instructions on how to do this.
13. **Check for Compatibility Issues**:
    * Ensure that the document or file you're trying to print is compatible with your printer's capabilities. For example, not all printers can handle certain file formats or sizes.
14. **Hardware Inspection**:
    * If all else fails, you may need to inspect the printer for any physical issues or malfunctions. In such cases, consider contacting the manufacturer's support or a professional technician.

Remember to consult your printer's user manual for specific troubleshooting steps, as different printer models may have unique features and issues. Additionally, if you're unable to resolve the issue on your own, don't hesitate to seek assistance from the printer manufacturer's customer support or a qualified technician.

2. What are the basic troubleshooting for laptops?

Ans: Troubleshooting laptops can help resolve common issues and improve their performance. Here are some basic troubleshooting steps for laptops:

1. **Restart Your Laptop**:
   * Sometimes, a simple restart can resolve software-related issues. If your laptop is frozen or unresponsive, try a forced restart by holding down the power button for a few seconds.
2. **Check Power and Connections**:
   * Ensure that the laptop is properly connected to the power source and that the battery is charged. If you suspect a charging issue, check the power adapter and cable for damage.
3. **External Devices**:
   * Disconnect any external devices, such as USB drives, external hard drives, and peripherals, to see if they are causing the problem.
4. **Check for Error Messages**:
   * Pay attention to any error messages or warning lights on the laptop screen. These messages can provide clues about the issue.
5. **Run Built-In Diagnostics**:
   * Many laptops have built-in diagnostic tools. Access these tools to check for hardware issues, such as memory or hard drive problems. The specific method to access these diagnostics varies by laptop brand and model.
6. **Update Drivers and Software**:
   * Ensure that your laptop's operating system, drivers, and software are up to date. Manufacturers often release updates to fix bugs and improve performance.
7. **Scan for Malware and Viruses**:
   * Use reputable antivirus and anti-malware software to scan your laptop for malware and viruses. Remove any threats found.
8. **Check for Disk Space**:
   * Insufficient disk space can slow down your laptop. Delete unnecessary files and programs to free up space.
9. **Performance Monitoring**:
   * Use the Task Manager (Ctrl+Shift+Esc) on Windows or Activity Monitor on macOS to monitor system performance. Identify any resource-intensive processes or applications and close them if necessary.
10. **Overheating Issues**:
    * Laptops can overheat, which can lead to performance problems or shutdowns. Ensure that the laptop's vents are not blocked and that the internal fan is functioning correctly. Consider using a cooling pad if your laptop tends to overheat.
11. **Check for Physical Damage**:
    * Inspect the laptop for physical damage, such as cracks, loose connections, or spills. Physical damage can lead to various issues.
12. **Network Connection**:
    * If you're experiencing internet connectivity issues, check your Wi-Fi or Ethernet connection. Resetting your router or modem may also help.
13. **Battery Health**:
    * If you're having battery-related problems, such as short battery life or the laptop not charging properly, you may need to calibrate or replace the battery.
14. **Backup Data**:
    * If your laptop is experiencing severe issues, it's a good idea to back up your important data to an external storage device or cloud service before attempting any major troubleshooting or repairs.
15. **Restore or Reset**:
    * If all else fails and your laptop is still experiencing significant issues, you may consider performing a system restore (Windows) or a factory reset (Windows or macOS). This will restore your laptop to a previous working state or its original factory settings, respectively.

Always refer to your laptop's user manual or the manufacturer's website for specific troubleshooting instructions and resources tailored to your laptop's brand and model. If you're unable to resolve the issue on your own, consider seeking assistance from the laptop manufacturer's customer support or a professional technician.

 Assignments level Intermediate:

1. Do a practical to disassemble the laptop and change the corrupted ram.

Ans: Disassembling a laptop to upgrade or replace the RAM (Random Access Memory) can be a bit challenging, as laptops are compact and delicate devices. It's essential to be careful and follow safety precautions to avoid damaging your laptop or voiding your warranty. Here's a step-by-step guide to disassemble a laptop and change the corrupted RAM:

**Note**: Before you begin, check your laptop's warranty status. Opening the laptop may void the warranty, so proceed at your own risk. Additionally, ensure you have the correct replacement RAM module that is compatible with your laptop.

**Tools You'll Need**:

* A small Phillips-head screwdriver
* An antistatic wrist strap (optional but recommended)

**Steps**:

1. **Prepare Your Workspace**:
   * Work in a clean, well-lit area.
   * Place your laptop on a clean, non-static surface.
   * If you have an antistatic wrist strap, attach it to your wrist and ground yourself by touching a metal object or the laptop's metal frame to discharge any static electricity.
2. **Power Off and Unplug**:
   * Shut down your laptop completely and unplug it from the power source.
3. **Remove the Battery** (If Removable):
   * If your laptop has a removable battery, remove it. This step is crucial to ensure safety during the disassembly process.
4. **Locate the RAM Slot**:
   * Refer to your laptop's user manual or online resources to find the location of the RAM slot(s). Most laptops have a removable panel on the bottom that provides access to the RAM.
5. **Remove the Access Panel**:
   * Using the Phillips-head screwdriver, remove the screws securing the access panel. These screws are typically labeled with a small RAM or memory icon. Place the screws in a safe spot.
6. **Handle the RAM Modules with Care**:
   * Carefully release the retaining clips on each side of the existing RAM module(s). The RAM should pop up slightly when the clips are released.
   * Gently remove the RAM module(s) from the slots.
7. **Install the New RAM**:
   * Align the notches on the new RAM module with the notches in the RAM slot.
   * Insert the RAM module at a slight angle (usually about 45 degrees) into the slot.
   * Press down on the module until the retaining clips on each side snap into place and secure the RAM.
8. **Replace the Access Panel**:
   * Reattach the access panel and secure it with the screws you removed earlier.
9. **Reattach the Battery (If Removable)**:
   * If you removed the battery, reinsert it and secure it in place.
10. **Power On and Test**:
    * Power on your laptop and check if it recognizes the new RAM. You can check the RAM size in the system properties or Task Manager (on Windows) or "About This Mac" (on macOS).
11. **Check for Errors**:
    * If you encounter any errors or issues, double-check that the RAM module is correctly installed and compatible with your laptop.
12. **Dispose of Old RAM Safely**:
    * Properly dispose of the old, corrupted RAM module following local electronic waste disposal guidelines.

Remember that laptop designs can vary greatly, so these steps are general guidelines. Always refer to your laptop's specific user manual or online resources for detailed instructions and diagrams. If you are uncomfortable with the process or uncertain about your skills, it's advisable to seek assistance from a professional technician or a knowledgeable friend.

2. Do a practical to change the cartridge of the printer.

Ans: Changing a printer cartridge is a relatively straightforward process. Here's a step-by-step guide to help you replace the ink or toner cartridge in your printer:

**Note**: The specific steps may vary depending on your printer's make and model, so it's essential to consult your printer's user manual for precise instructions tailored to your device.

**Materials You'll Need**:

* Replacement ink or toner cartridge (compatible with your printer)
* Disposable gloves (optional)
* Paper towels or a clean cloth (for cleanup)

**Steps**:

1. **Prepare Your Workspace**:
   * Work in a clean, well-ventilated area, as some toner cartridges can release fine particles.
   * Ensure that your printer is turned on.
2. **Identify the Cartridge to Replace**:
   * Check your printer's display screen or refer to the printer's user manual to determine which cartridge needs replacement. Some printers have separate cartridges for black and color ink.
3. **Open the Printer Cover**:
   * Gently lift or open the printer cover or cartridge access door, exposing the ink or toner cartridges.
4. **Wait for the Carriage or Cartridge Holder to Move**:
   * In some printers, the cartridge carriage or holder will automatically move to a convenient access position. If it doesn't, consult your printer's manual for guidance on how to move it manually.
5. **Wear Disposable Gloves (Optional)**:
   * If you're concerned about getting ink or toner on your hands, you can wear disposable gloves for added protection.
6. **Remove the Old Cartridge**:
   * Grasp the old cartridge by its sides and carefully pull it out of its slot. Be cautious not to touch the print head or any sensitive components.
   * Place the old cartridge on a sheet of paper or a paper towel to catch any potential drips or spills.
7. **Prepare the New Cartridge**:
   * Remove the new cartridge from its packaging, following any instructions or seals provided.

3. Do a practical to change the processor fan.

Ans: Changing the processor (CPU) fan is a task that requires care and attention to detail to ensure the proper cooling of your CPU. Here's a step-by-step guide on how to change the CPU fan:

**Note**: Changing the CPU fan typically involves disassembling your computer, which can void warranties and should be done with caution. Make sure you have a compatible replacement CPU fan and thermal paste on hand.

**Materials You'll Need**:

* Replacement CPU fan (compatible with your CPU socket and computer case)
* Screwdriver (usually Phillips-head)
* Thermal paste (if not pre-applied on the new fan)

**Steps**:

1. **Prepare Your Workspace**:
   * Work on a clean, well-lit, and static-free surface.
   * Turn off your computer and unplug it from the power source.
   * Ground yourself by touching a metal object to discharge static electricity, or use an antistatic wrist strap.
2. **Open the Computer Case**:
   * Remove the side panel of your computer case. This typically involves removing a few screws securing the panel to the case.
3. **Locate the CPU Fan**:
   * Identify the CPU fan and heatsink assembly, which is usually situated directly above the CPU on the motherboard.
4. **Disconnect the Fan**:
   * Carefully disconnect the CPU fan's power cable from the motherboard. It's typically a small, 3- or 4-pin connector.
5. **Remove the Old CPU Fan**:
   * Depending on the design, the CPU fan may be attached using screws or clips. Remove any screws or unclip the fan from the heatsink.
   * Lift the old CPU fan and heatsink assembly away from the CPU. Be cautious not to damage the CPU or motherboard during this process.
6. **Clean the CPU and Heatsink**:
   * Use a lint-free cloth or a can of compressed air to clean the thermal paste residue from both the CPU and the heatsink. Ensure they are clean and free of dust.
7. **Apply Thermal Paste** (if not pre-applied):
   * If your new CPU fan does not have thermal paste pre-applied, apply a small, pea-sized amount of thermal paste to the center of the CPU.
   * Be careful not to over-apply, as too much thermal paste can be counterproductive.
8. **Install the New CPU Fan**:
   * Carefully attach the new CPU fan to the heatsink or mounting bracket.
   * Align the fan so that the airflow direction is correct (usually blowing air toward the heatsink).
   * Secure the CPU fan in place using screws or clips.
9. **Connect the Fan Cable**:
   * Reconnect the new CPU fan's power cable to the motherboard, ensuring it's securely attached.
10. **Close the Computer Case**:
    * Reattach the side panel of your computer case and secure it with the screws you removed earlier.
11. **Power On and Test**:
    * Turn on your computer and monitor the CPU temperature using monitoring software or BIOS settings.
    * Ensure that the new CPU fan is functioning correctly and that the CPU temperature remains within safe limits.
12. **Monitor for a Few Days**:
    * Keep an eye on your computer's temperature and performance for a few days to ensure everything is functioning as expected.

Changing the CPU fan can be challenging, especially if you're not experienced with computer hardware. If you're uncomfortable with this task, consider seeking assistance from a professional technician or someone experienced with computer hardware to ensure a successful replacement without damaging your CPU or motherboard.

4. Do a practical to check the laptop which is not starting up

Ans: Troubleshooting a laptop that won't start can be a process of elimination to identify the root cause. Here's a step-by-step guide to help you diagnose and potentially resolve the issue:

**Note**: Before you begin, make sure your laptop is unplugged and the battery is fully charged (if applicable). If you're uncomfortable with any of these steps, consider seeking assistance from a professional technician.

**Steps**:

1. **Check for Power**:
   * Ensure the laptop is properly plugged into a working power source. If it's not charging, try a different power outlet or power adapter.
2. **Remove External Devices**:
   * Disconnect any external devices, including USB drives, external hard drives, printers, and other peripherals. Sometimes, a faulty external device can prevent the laptop from starting.
3. **Perform a Hard Reset**:
   * If the laptop is unresponsive, perform a hard reset by holding the power button down for about 15-20 seconds. This can help clear any residual electrical charge and may resolve startup issues.
4. **Check for Display Issues**:
   * Verify if the laptop screen is completely black or if there is any error message or backlight activity. If there's no display at all, it could be a screen issue.
5. **Listen for Beep Codes or Diagnostic Lights**:
   * Some laptops have diagnostic LEDs or produce beep codes when there's a hardware issue. Check your laptop's user manual to interpret these codes and identify the problem.
6. **Test with an External Monitor**:
   * If you suspect a display issue, connect your laptop to an external monitor using the appropriate cable. If the external monitor displays an image, it could indicate a laptop screen problem.
7. **Check for Overheating**:
   * Overheating can cause a laptop to shut down or fail to start. Ensure the laptop's vents are clear of dust and debris, and the internal fan is functioning correctly.
8. **Reseat RAM and Storage Drives**:
   * Turn off the laptop, unplug it, and remove the battery (if possible).
   * Open the laptop to access the RAM and storage drive(s).
   * Carefully reseat (remove and reinstall) the RAM modules and storage drives. Ensure they are properly connected.
9. **Inspect for Physical Damage**:
   * Examine the laptop for physical damage, such as cracked or loose components. Pay attention to the power button and keyboard for any signs of damage.
10. **Try Safe Mode**:
    * If you see the Windows logo but the laptop won't boot into the operating system, try starting it in Safe Mode. To do this, repeatedly press the F8 key (or another key depending on your laptop) during boot-up.
11. **Reset BIOS/UEFI Settings**:
    * In some cases, resetting the BIOS/UEFI settings to default can resolve startup issues. Refer to your laptop's manual for instructions on how to do this.
12. **Attempt a System Restore or Repair**:
    * If your laptop runs Windows, you can try to perform a system restore or use repair tools from a Windows installation disc or USB drive.
13. **Consider Professional Help**:
    * If none of the above steps resolve the issue, it may be a more complex hardware problem or a motherboard failure. In such cases, it's advisable to seek assistance from a professional technician or the laptop manufacturer's support.

Keep in mind that laptop issues can be caused by various factors, including hardware and software problems. Diagnosing the specific issue may require patience and troubleshooting expertise, especially if the laptop does not display any error messages.

N+ Assignment

Module 5. Network Fundamentals and Building Networks

 Beginner Question

1. What is network?

Ans: A network is a collection of interconnected devices, such as computers, servers, smartphones, printers, and other hardware, that can communicate and share resources with each other. These devices are linked together by various means, including wired and wireless connections, to enable data and information exchange

1. **Local Area Network (LAN)**: A LAN typically covers a small geographic area, such as a single building or a group of nearby buildings. LANs are commonly used in homes and businesses for local connectivity.
2. **Wide Area Network (WAN)**: WANs span larger geographic areas, often connecting LANs across cities, states, or even countries. The internet itself is a global WAN.
3. **Metropolitan Area Network (MAN)**: A MAN covers a city or a large campus and connects multiple LANs within that area.
4. **Personal Area Network (PAN)**: A PAN is the smallest network type, typically involving devices like smartphones, laptops, and wearable devices connecting to each other over short distances, often via Bluetooth.
5. **Wireless LAN (WLAN)**: WLANs use wireless technology, such as Wi-Fi, to connect devices within a LAN without the need for physical cables.
6. **Virtual Private Network (VPN)**: A VPN is a secure network that uses encryption to connect remote users or offices to a larger network, such as a corporate LAN or the internet.
7. **Intranet and Extranet**: An intranet is a private network within an organization, while an extranet allows authorized external users to access specific parts of an organization's network.

Networks are a fundamental part of modern computing and communication, and they come in various forms to cater to different needs, whether it's connecting devices within a home, facilitating global internet communication, or supporting large-scale business operations.

2. List Common Network Components

Ans: Common network components are the building blocks of networks, whether they are small local area networks (LANs) or large-scale global networks like the internet. These components work together to enable data communication and the sharing of resources. Here's a list of some common network components:

1. **Router**: Routers are devices that connect different networks together, such as a home network to the internet. They determine the best path for data packets to travel between networks.
2. **Switch**: A network switch connects devices within a local network (LAN) and forwards data packets to their intended destinations based on their MAC addresses. Switches operate at the data link layer (Layer 2) of the OSI model.
3. **Hub**: Hubs are older and less intelligent than switches. They simply broadcast data to all connected devices within a network segment, leading to more network traffic and inefficiencies.
4. **Access Point (AP)**: Access points are used in wireless networks (Wi-Fi) to connect wireless devices, such as laptops and smartphones, to a wired network.
5. **Modem**: Modems (modulator-demodulator) are used to convert digital data from computers into analog signals for transmission over telephone lines or cable systems. They are essential for internet connectivity.
6. **Firewall**: Firewalls are security devices or software that protect networks by monitoring and controlling incoming and outgoing network traffic based on an organization's previously established security policies.
7. **Network Interface Card (NIC)**: A network interface card is a hardware component that enables a computer or device to connect to a network. It provides a unique MAC address for the device.
8. **Gateway**: A gateway serves as a bridge between different networks or network protocols, translating data between them to enable communication. For example, it can connect a local network to the internet.
9. **Proxy Server**: Proxy servers act as intermediaries between clients and servers, forwarding client requests and responses. They are often used for security, caching, and load balancing.
10. **Cable/DSL Modem**: These modems are specifically designed for high-speed internet connections via cable or DSL (Digital Subscriber Line) services.
11. **Load Balancer**: Load balancers distribute network traffic across multiple servers or paths to optimize performance, prevent server overload, and ensure high availability.
12. **Network Attached Storage (NAS)**: NAS devices are dedicated storage devices connected to the network, allowing users to store and access data from multiple devices over the network.
13. **Patch Panel**: Patch panels are used in data centers and network closets to manage network cables, allowing for easy reconfiguration and maintenance.
14. **DNS Server**: Domain Name System (DNS) servers translate human-readable domain names (e.g., [www.example.com](http://www.example.com/)) into IP addresses used for routing data over the internet.
15. **DHCP Server**: Dynamic Host Configuration Protocol (DHCP) servers automatically assign IP addresses to devices on a network, simplifying network configuration.
16. **Network Cables**: These include Ethernet cables (e.g., Cat5e, Cat6) for wired connections and fiber optic cables for high-speed data transmission over long distances.
17. **Network Hubs**: Network hubs are less common today but were used in the past to connect multiple devices within a network segment. They are not as efficient as switches.
18. **Power over Ethernet (PoE) Injector**: PoE injectors provide power and data to compatible devices (e.g., IP cameras and VoIP phones) over a single Ethernet cable.
19. **VoIP Gateway**: Voice over Internet Protocol (VoIP) gateways convert analog voice signals into digital data for transmission over IP networks.
20. **WAN Accelerator**: WAN accelerators optimize the performance of wide area network (WAN) connections by reducing latency and bandwidth usage.

These components work together to create functional and efficient networks, supporting a wide range of applications and services in both home and enterprise environments.

3. Add and configure loopback adaptor in network and sharing center

Ans: Adding and configuring a loopback adapter in the Network and Sharing Center is a useful technique for testing network configurations and applications without an actual physical network connection. Here are the steps to add and configure a loopback adapter in Windows:

**Note**: Loopback adapters are typically used for advanced network configurations and troubleshooting. Be cautious when making changes to your network settings, as they can affect network connectivity.

**Adding the Loopback Adapter**:

1. **Open Device Manager**:
   * Press **Windows + X** on your keyboard and select "Device Manager" from the menu that appears.
2. **View Hidden Devices**:
   * In Device Manager, click on "View" in the menu bar and select "Show hidden devices." This will reveal devices that are not currently connected or active.
3. **Add Legacy Hardware**:
   * In Device Manager, click on "Action" in the menu bar and select "Add legacy hardware."
4. **Welcome to the Add Hardware Wizard**:
   * Click "Next."
5. **Install Hardware Manually**:
   * Choose the option "Install the hardware that I manually select from a list (Advanced)" and click "Next."
6. **Select Hardware Type**:
   * Scroll down and select "Network adapters" and click "Next."
7. **Choose Manufacturer and Network Adapter**:
   * Scroll down the list of Manufacturers and select "Microsoft" on the left pane.
   * On the right pane, choose "Microsoft Loopback Adapter" and click "Next."
8. **Confirm Installation**:
   * Click "Next" to confirm the installation.
9. **Finish the Wizard**:
   * Click "Finish" to complete the installation process.

**Configuring the Loopback Adapter**:

1. **Open Network Connections**:
   * Press **Windows + R**, type **ncpa.cpl**, and press Enter. This will open the Network Connections window.
2. **Locate the Loopback Adapter**:
   * In the Network Connections window, you will see the newly added "Microsoft Loopback Adapter."
3. **Configure IP Address and Subnet Mask**:
   * Right-click on the "Microsoft Loopback Adapter" and select "Properties."
   * In the properties window, select "Internet Protocol Version 4 (TCP/IPv4)" and click the "Properties" button.
   * Choose the option to "Use the following IP address," and enter an IP address (e.g., 192.168.1.1) and subnet mask (e.g., 255.255.255.0) that are not already in use on your network.
   * Click "OK" to save the settings.

**Testing the Loopback Adapter**:

1. **Verify Configuration**:
   * Open a Command Prompt (cmd) and run the command **ipconfig**. You should see the loopback adapter with the IP address you configured.
2. **Test Network Applications**:
   * You can now use the loopback adapter for testing network applications, services, or configurations as if you were communicating with another networked device. For example, you can set up a web server on the loopback adapter's IP address and access it using a web browser.

Remember that the loopback adapter is isolated from physical network hardware, so it's an ideal tool for testing and development in a controlled environment. Be cautious when changing network settings, especially if you have an active network connection.

 Intermediate Question

1. Explain application of network

Ans: Networks have a wide range of applications across various domains and industries. They serve as the backbone for communication, data sharing, and resource access in today's interconnected world. Here are some key applications of networks:

1. **Internet and World Wide Web (WWW)**:
   * The internet itself is a massive global network. It enables people to access information, communicate through email and social media, conduct online research, and engage in e-commerce.
2. **Communication**:
   * Networks enable real-time communication through email, instant messaging, video conferencing, and voice over IP (VoIP) services like Skype and Zoom.
3. **Business Operations**:
   * In the business world, networks connect employees, offices, and remote workers. They facilitate file sharing, data storage, and collaborative tools like shared calendars and project management software.
4. **Cloud Computing**:
   * Cloud networks provide on-demand access to computing resources, allowing organizations to store data and run applications on remote servers.
5. **Data Centers**:
   * Data center networks support the storage and processing of vast amounts of data, providing services such as web hosting, cloud computing, and content delivery.
6. **Social Networking**:
   * Social media platforms like Facebook, Twitter, and LinkedIn rely on networks to connect users, share content, and facilitate communication.
7. **Entertainment and Streaming**:
   * Networks deliver streaming services for music, movies, TV shows, and online gaming, connecting users to vast libraries of content.
8. **Education**:
   * Educational institutions use networks to offer online courses, facilitate remote learning, and provide access to digital libraries and resources.
9. **Healthcare**:
   * Healthcare networks support electronic health records (EHRs), telemedicine, remote monitoring of patients, and the exchange of medical information between facilities.
10. **Transportation and Logistics**:
    * Networks are crucial for managing traffic, tracking shipments, and optimizing transportation routes in logistics and supply chain management.
11. **Smart Cities**:
    * Smart city networks connect various devices and sensors to improve urban infrastructure, including traffic management, waste management, and energy efficiency.
12. **Manufacturing (IoT)**:
    * The Internet of Things (IoT) relies on networks to connect and control devices and sensors in manufacturing, enabling automation and real-time monitoring.
13. **Banking and Finance**:
    * Financial institutions use networks for online banking, stock trading, secure transactions, and data protection.
14. **Defense and Security**:
    * Military and security agencies use secure networks for communication, surveillance, intelligence sharing, and cyber defense.
15. **Research and Science**:
    * Networks support collaborative research efforts, data sharing, and access to supercomputing resources in scientific fields.
16. **Agriculture (AgTech)**:
    * Networks facilitate data collection from sensors and drones, helping farmers monitor crops, manage resources, and improve agricultural practices.
17. **Energy and Utilities**:
    * Smart grid networks monitor and control the distribution of electricity and other utilities, optimizing efficiency and reliability.
18. **Environmental Monitoring**:
    * Environmental networks collect data from sensors and satellites to monitor climate change, weather patterns, and natural disasters.

Networks play a crucial role in nearly every aspect of modern life, enhancing efficiency, enabling innovation, and connecting people and devices across the globe. As technology continues to evolve, networks will continue to find new applications and expand their reach.

2. What do you mean by Node?

Ans : In the context of computer networks and information technology, a "node" refers to a device or data point on a network. Nodes are essential components that make up a network infrastructure and play various roles in facilitating communication and data exchange. Each node can be a distinct device or a specific point within a device. Here are some common examples of network nodes:

1. **Computer Devices**:
   * Personal computers, laptops, servers, workstations, and other computing devices are common network nodes. They can send, receive, and process data on a network.
2. **Networking Equipment**:
   * Routers, switches, access points, and other networking hardware devices are nodes that help route data packets and manage network traffic.
3. **Printers and Scanners**:
   * Network-connected printers and scanners are nodes that can be accessed and utilized by multiple users over the network.
4. **Smartphones and Tablets**:
   * Mobile devices like smartphones and tablets can function as network nodes, allowing users to access the internet and communicate with other devices.
5. **IoT Devices** (Internet of Things):
   * Various IoT devices, such as sensors, smart appliances, and connected industrial equipment, act as network nodes to collect and transmit data.
6. **Network Servers**:
   * File servers, web servers, email servers, and database servers are specialized nodes that provide specific services to network users.
7. **Network Switches**:
   * In the context of a switch, each port can be considered a node because it represents a connection point for a device.
8. **Access Points (APs)**:
   * In wireless networks, access points represent nodes that allow wireless devices to connect to the network.
9. **Virtual Machines (VMs)**:
   * Virtualized environments often consist of multiple virtual machines, each functioning as a network node with its own network interface.
10. **Network Hubs** (less common today):
    * In older network architectures, network hubs acted as simple nodes that broadcast data to all connected devices.
11. **Network Print Servers**:
    * Devices that manage and distribute print jobs to networked printers are considered nodes in the network.

Each node has its own unique address, such as an IP (Internet Protocol) address or a MAC (Media Access Control) address, which allows it to be identified and communicate with other nodes on the network. Nodes can send and receive data, participate in network protocols, and collaborate to enable various network services and functions. The collective behavior of these nodes forms the foundation of networked systems and services.

3. practice of simple file folder sharing

Ans: Sharing files and folders is a common task in both home and work environments, and it can be accomplished using various methods and tools, depending on your specific needs and the devices or operating systems involved. Here's a basic practice for sharing files and folders in a Windows environment:

**Sharing a Folder in Windows**:

1. **Select the Folder to Share**:
   * Choose the folder you want to share on your Windows computer. Right-click on the folder and select "Properties" from the context menu.
2. **Navigate to the Sharing Tab**:
   * In the folder's Properties window, go to the "Sharing" tab.
3. **Click on the "Share" Button**:
   * Click the "Share" button to open the File Sharing wizard.
4. **Choose with Whom to Share**:
   * In the "Choose people to share with" dialog, you can specify who you want to share the folder with. You can share it with specific users or groups by entering their names or by selecting them from the list.
5. **Set Permission Levels**:
   * After choosing the users or groups, you can set their permission levels. Windows provides three basic permission levels:
     + **Read**: Allows users to view files and subfolders within the shared folder but not make changes.
     + **Read/Write**: Allows users to view, modify, and create files and subfolders within the shared folder.
     + **Remove**: Allows users to view, modify, create, and delete files and subfolders within the shared folder.
   * Adjust the permissions as needed for each user or group.
6. **Click "Share"**:
   * Click the "Share" button to apply the sharing settings.
7. **Share Folder Path**:
   * You'll see the shared folder's network path displayed. Users on the network can access the shared folder by entering this path in the Windows File Explorer address bar (e.g., **\\computername\sharedfolder**).
8. **Close the Sharing Dialog**:
   * Close the sharing dialog and click "Apply" and "OK" in the Properties window to save the changes.

**Accessing the Shared Folder**:

To access the shared folder from another computer on the network:

1. Open File Explorer on the remote computer.
2. In the address bar, enter the network path of the shared folder (e.g., **\\computername\sharedfolder**).
3. You may be prompted to enter a username and password if the shared folder requires authentication. Enter the credentials of a user with permission to access the shared folder.
4. Once authenticated, you can browse and interact with the contents of the shared folder.

Keep in mind that the specific steps may vary slightly depending on the version of Windows you are using. Additionally, when sharing folders in a work or domain environment, your organization's network policies and security settings may affect the sharing process.

Always be mindful of security and only share folders with users or groups who need access. Additionally, consider setting up password protection and encrypting sensitive data within shared folders for added security.

 Advance Question

1. List types of devices

Ans: Devices encompass a wide range of physical hardware components and electronic gadgets designed to perform specific functions or tasks. Here is a list of various types of devices, categorized based on their primary functions and usage:

1. **Computing Devices**:
   * Personal Computers (Desktops and Laptops)
   * Workstations
   * Servers
   * Mainframes
   * Supercomputers
2. **Mobile Devices**:
   * Smartphones
   * Tablets
   * E-readers
   * Wearable Devices (e.g., smartwatches and fitness trackers)
3. **Peripheral Devices**:
   * Keyboards
   * Mice and Pointing Devices
   * Monitors and Displays
   * Printers (Inkjet, Laser, Dot Matrix)
   * Scanners
   * External Hard Drives
   * USB Flash Drives
4. **Networking Devices**:
   * Routers
   * Switches
   * Access Points
   * Modems
   * Network Adapters (NICs)
   * Firewalls
   * Load Balancers
5. **Storage Devices**:
   * Hard Disk Drives (HDD)
   * Solid-State Drives (SSD)
   * Optical Drives (CD/DVD/Blu-ray)
   * Network-Attached Storage (NAS)
   * Cloud Storage Services
6. **Audio and Video Devices**:
   * Headphones and Earphones
   * Microphones
   * Speakers
   * Webcams
   * Televisions
   * Home Theater Systems
   * Media Players
7. **Input and Output Devices**:
   * Barcode Scanners
   * Joysticks and Game Controllers
   * Digital Cameras and Camcorders
   * Graphics Tablets
   * Projectors
   * Voice Recognition Devices
8. **Home and Lifestyle Devices**:
   * Smart Home Devices (e.g., smart thermostats, lights, and locks)
   * Kitchen Appliances (e.g., smart refrigerators)
   * Home Security Systems
   * Home Automation Controllers
9. **Health and Fitness Devices**:
   * Fitness Trackers
   * Blood Pressure Monitors
   * Smart Scales
   * Medical Wearables
   * Health Monitoring Apps
10. **Gaming Devices**:
    * Gaming Consoles (e.g., Xbox, PlayStation)
    * Gaming PCs
    * Handheld Game Consoles (e.g., Nintendo Switch)
    * Gaming Keyboards and Mice
    * Virtual Reality (VR) Headsets
11. **Industrial and Scientific Devices**:
    * Control Systems
    * Sensors and Actuators
    * Laboratory Instruments
    * Analytical Equipment
    * Industrial Robots
12. **Navigation and GPS Devices**:
    * GPS Receivers
    * In-Car Navigation Systems
    * Handheld GPS Devices
    * GPS Apps on Mobile Devices
13. **Communication Devices**:
    * Landline Phones
    * Cordless Phones
    * VoIP Phones
    * Two-Way Radios
    * Satellite Phones
14. **Financial Devices**:
    * ATMs (Automated Teller Machines)
    * Point-of-Sale (POS) Terminals
    * Card Readers (e.g., credit card readers)
15. **Environmental and Weather Devices**:
    * Weather Stations
    * Air Quality Monitors
    * Soil and Water Quality Sensors
16. **Accessibility Devices**:
    * Screen Readers
    * Braille Displays
    * Adaptive Keyboards and Mice
    * Eye-Tracking Devices
17. **Security and Surveillance Devices**:
    * Security Cameras
    * Video Doorbells
    * Biometric Access Control Systems
    * Surveillance DVRs and NVRs
18. **Energy and Power Devices**:
    * Smart Meters
    * Uninterruptible Power Supplies (UPS)
    * Solar Panels and Inverters
    * Electric Vehicle (EV) Chargers

This list provides a broad overview of the many types of devices that exist in today's technological landscape. Each type of device serves specific functions, and they often work together to enable a wide range of applications and services in various industries and everyday life.

2. Explain types of router

Ans: Routers are networking devices that play a crucial role in directing data traffic between different networks, such as your local network and the internet. There are several types of routers, each designed for specific purposes and network environments. Here are some common types of routers:

1. **Home Router**:
   * Home routers are designed for residential use. They typically have a built-in modem (DSL, cable, fiber, etc.) to provide internet connectivity to the home. These routers often include Wi-Fi functionality to create a wireless local network for connecting devices like smartphones, laptops, and smart home devices.
2. **Wireless Router**:
   * Wireless routers, a subset of home routers, focus primarily on providing wireless connectivity within a home or small office. They enable Wi-Fi connections, allowing devices to connect to the internet and each other wirelessly.
3. **Enterprise Router**:
   * Enterprise routers are designed for larger-scale networks in businesses and organizations. They offer advanced features such as multiple WAN (Wide Area Network) connections, extensive security options, and the ability to handle a high volume of data traffic. Enterprise routers are typically used to connect multiple office locations or data centers.
4. **Core Router**:
   * Core routers are high-performance routers used within the core of large networks, such as those operated by internet service providers (ISPs) and data centers. They are responsible for routing data between different networks on a massive scale and ensuring high-speed, low-latency data transmission.
5. **Edge Router**:
   * Edge routers are positioned at the edge of a network and connect end-users or businesses to the wider internet. They handle the traffic entering or exiting a network, applying security policies and routing decisions.
6. **Branch Router**:
   * Branch routers are typically used in remote or branch office locations. They provide connectivity to the main corporate network and often include features like VPN (Virtual Private Network) support for secure communication with the central network.
7. **Virtual Router**:
   * Virtual routers are software-based routers that run on virtualization platforms. They are commonly used in cloud computing environments and data centers to route traffic between virtual machines (VMs) and physical networks.
8. **Multi-Service Router**:
   * Multi-service routers are designed to offer a wide range of services beyond basic routing, such as voice over IP (VoIP) support, virtual LAN (VLAN) management, and advanced security features.
9. **Peering Router**:
   * Peering routers are specialized routers used by internet exchange points (IXPs) to facilitate the exchange of traffic between different ISPs and network providers. They play a critical role in the global internet infrastructure.
10. **Residential Gateway**:
    * Residential gateways are devices that combine a router, modem, and often other services like voice over IP (VoIP) and IPTV (Internet Protocol Television). They are used by ISPs to provide bundled services to homes.
11. **Software-Defined Router**:
    * Software-defined routers are routers whose functionality is defined and controlled by software. They are highly flexible and can be reconfigured through software to meet specific network requirements.

The choice of router depends on the network's size, complexity, and specific needs. Home users typically use home or wireless routers, while businesses and ISPs rely on more advanced routers to manage larger and more complex networks. Core and edge routers are critical components of the internet infrastructure, ensuring global connectivity.

Top of Form

Topic: Types of Networks

 Beginner Question

1. What is Difference between a LAN, MAN, WAN?

Ans:

2. Common Network Components

 Intermediate Question

1. Explain Wide Area Network

2. Explain Network Backbone

3. Explain CAN

 Advance Question

1. Define Physical Network Topologies

2. Network Architecture: Peer-to-Peer

3. Point-to-multipoint network

Topic: Network Devices

 Beginner Question

1. Why we use Network and Devices

2. Explain Switch?

 Intermediate Question

1. Define list of cables in use of network

2. Explain Define Access point

3. Which types of transmission modes in computer network

4. Practice on Remote Desktop connection

5. Practice on remote assistance

 Advance Question

1. Explain Repeater and router

2. What is multiplexer?

3. Explain MODEM

4. Monitor "event viewer"

Topic: Install and configure DHCP, DNS

 Beginner Question

1. Explain DHCP Dynamic host configuration protocol

2. Application of DHCP with one example

 Intermediate Question

1. Explain Domain naming Services

2. Application of DNS with one example

Topic: Network Topologies

 Beginner Question

1. What are the 5 network topologies?

2. What is Internet topology?

3. What is protocol

 Intermediate Question

1. What is the most common network topology?

2. Explain star topology in networking?

 Advance Question

1. Explain Hybrid topology

2. What is physical and logical topology?

3. What are the types of logical topology?

Topic: OSI Model

 Beginner Question

1. What is OSI model explain?

2. List of Application layer protocol

3. How many types of protocols are there?

 Intermediate Question

1. What is the difference between TCP IP model and OSI model?

2. What is TCP IP networking?

 Advance Question

1. What is a wired Internet connection?

2. What are the disadvantages of wired networks? 3.How do I configure network

authentication?

3. Practice of Team viewer, Any Desk, Google Hangout, Skype, zoom

4. Download google chrome

5. configure "date and time" opting in control panel

Topic: TCP/IP

 Assignment level Basic:

1. What is TCP/IP?

2. What is the full form of TCP/IP?

 Assignment level Intermediate:

1. List out the types of IP

2. What is protocol?

3. DO a practical to set the tcp/ip in network adapter?

Topic: Cables

 Beginner Question

1. Types of cables and connectors?

2. Explain twisted pair cable and shielded twisted pair cable

 Intermediate Question

1. Which of these cables connect computers to monitors?

2. How do I connect to a shared printer?

 Advance Question

1. Which cable that is commonly used to connect a computer to a printer?

2. What are the different ports and connectors?

3. How do I connect my laptop to my printer without cable?

4. Application and brief explanation of fiber optic cable and Coaxial cable

5. Which of following operates at the 5GHz frequency range?

6. What frequency does 802.11g use?

7. What standard is compatible with 802.11a?

Topic: TCP/IP concepts - IPv6, IPv4

 Beginner Question

1. 1.What is the difference between IPv4 & IPv6? 2.Explain TCP/IP

2. Explain IPV6 Address with Address structure

3. Define IPV6 reserve address

4. Explain Difference between public ip and private ip

5. Create straight and cross cables and it's testing

 Intermediate Question

1. Brief explanation of ip Addresses

2. What is the advantage of IPv6 over IPv4?

3. Assign multiple IPv4 in single network adapter [lan card]

4. Assign simple IPv6 between two system and ping it.

5. Assign and configure simple IPv4 between systems

 Advance Question

1. 1.Which is faster IPv4 or IPv6? 2.What does TCP do?

2. Give security in sharing

3. Configure "Map network drive"

Topic: IP routing and Routing protocols

 Beginner Question

1. What Is Routing?

2. How Routing Starts Up?

 Intermediate Question

1. What Is Hybrid Routing Protocol?

2. What Are the Range of Ad Values?

3. What Is an Autonomous System?

 Advance Question

1. Define Static Routing?

2. Explain Dynamic Routing?

Topic: Switching and VLANS

 Beginner Question

1. What is VLAN?

2. Which two benefits of creating VLANs?

3. What is Dynamic VLAN?

4. What is Static VLAN?

 Intermediate Question

1. What is VLAN and INTERVLAN?

2. What is trunk port?

 Advance Question

1. How to configure Trunk port?

2. How to delete VLAN information from Switch?

Module 6. Network security, Maintenance and

Troubleshooting procedures

Topic: A SOHO Networks

 Beginner Question

1. What is SOHO network?

2. What does SOHO mean networking?

 Intermediate Question

1. How does a SOHO network work?

2. Issues with Soho Networking?

 Advance Question

1. How Small is the “S” in SOHO?

2. SOHO Routers vs. Home Routers?

Topic: NAT & PAT

 Beginner Question

1. What is NAT?

2. What is PAT?

3. Different between NAT & PAT?

 Intermediate Question

1. However, Will Nat work?

2. Explain NAT?

 Advance Question

1. What is different between Static & Dynamic NAT?

2. NAT stand for?

3. PAT stand for?

Topic: Authentication and Access Control

 Beginner Question

1. What Is Acl?

2. What Are Different Types of Acl?

 Intermediate Question

1. Explain Standard Access List?

2. Explain Extended Access List?

 Advance Question

1. What Is Wildcard Mask?

2. In Which Directions We Can Apply an Access List?

Topic: WAN Technologies

 Beginner Question

1. Fiber-optic communication

2. What is Leased Line

3. Explain Circuit switching

 Intermediate Question

1. Explain Packet Switching

2. What is difference between leased line and broadband?

3. How much is a 100mb Leased Line?

 Advance Question

1. Difference between a POTS line and a leased line?

2. What is the process of packet switching?

3. Difference between circuit switching and packet switching?

4. Practice on printer sharing

5. Use of IIS [ Via "add and remove" feature from control panel. "appwiz.cpl" command]

Topic: Communication technologies Cloud and Virtualization

 Beginner Question

1. What is virtualization?

2. What are two types of virtualization in cloud?

 Intermediate Question

1. What are the two types of virtualization?

2. What is VMware virtualization technology?

 Advance Question

1. What is the difference between cloud and virtualization?

2. What are the benefits of implementing virtualization in cloud computing?

Topic: Monitoring Tools

 Beginner Question

1. Why are network monitoring tools used?

2. Explain firewalls

 Intermediate Question

1. Explain core switches

2. Explain client systems

 Advance Question

1. What is network management?

2. Explain Event Viewer

3. Practice "parental control" or "family safety" option in control panel

Topic: Network Security, Network vulnerabilities

 Beginner Question

1. What are network vulnerabilities?

2. What are the types of network security attacks?

 Intermediate Question

1. What is virus in network security?

2. What is the difference between virus and antivirus?

 Advance Question

1. Who is vulnerable in network security?

2. How do you assess vulnerability?

3. What are the principles of network security?

4. What is a firewall to use for?

5. configure advanced firewall setting?

6. configure "date and time" opti

TERM-2 CCNA Assignment

Module 7 Network fundamentals

 Advance Question

1. Explain Network Topologies

2. Explain TCP/IP Networking Model

3. Explain LAN and WAN Network

4. Explain Operation of Switch

5. Describe the purpose and functions of various network devices

6. Make list of the appropriate media, cables, ports, and connectors to connect switches

to other

7. Define Network devices and hosts

8. What are Ethernet Standard (802.3) and Frame Formats?

 Intermediate Question

1. Comparison between UTP, MM and SM Ethernet Cabling

2. Make Cross cable

3. Make Straight-Through Cable

4. Differentiate between LAN/WAN operation and features

5. Explain ARP, ICMP and Domain name

6. Describe the components required for network and Internet communications

7. Explain Encapsulation and DE capsulation in OSI Reference model

8. Explain network segmentation and basic traffic management concepts

9. What is flow control and acknowledgment?

 Advance question

1. Use the OSI and TCP/IP models and their associated protocols to explain how data

Flows in a network

2. Identify and explain at layers 1, 2, 3, and 7 using a layered model approach

3. Explain CSMA/CD and CSMA/CA

4. Explain this frame and find layer

5. Draw and explain Cisco hierarchical model

6. Drawing of a typical wired and wireless enterprise LAN

7. Describe the uses of straight-through and crossover Ethernet cables

8. Explain Layer 2 and Layer 3 Switch

9. Identifying Collision and Broadcast Domains

10. Explain Spanning Tree Protocol

11. Explain uncast Multicast and Broadcast

12. Explain CAM (Content Addressable Memory)

13. Explain CAM (Ternary Content Addressable Memory)

14.Which command use of Show MAC TABLE?

Module 8 Network Access

 Beginner Question

1. Explain Switch

2. Explain Switch Boot Sequence

3. Explain Three Methods to access Switch Command Line Interface

4. Explain and Configuring the Cisco Internet Operating System

5. Explain Switch Port

6. Configure Basic Password Settings on a switch

7. Configure Line Password Settings on a switch

8. Configure Password Settings on a switch

9. Configure IPv4 on a switch

10.Verifying IPv4 on a switch

11.Explain Basic V LAN

12.Explain VTP

13.Explain CDP.

14.Identifying VLAN

15.Describe the basic operation of STP

16.Explain IPv4 subnetting.

17.What is subnet mask?

18.Explain binary decimal hexadecimal with example

19.Describe the Need for Public IPv4 and Private IP Addressing

20.Explain Subnet Prefix

21.Explain How to Connect Router with Switch

22.Explain Routing Basics with command

23.Configuration basic IP address in fig.

24.Create Static Routes

25.Verifying IP Routing

26.Explain EIGRP

27.Explain OSPF Basics

28.Explain OSPF Area

29.Explain DR/BR Selection

30.Explain OSPF

31.Explain Describe IPv6 addresses

32.What is 6to4 tunnel?

33.Explain Wireless Technology

34.Explain Basic Wireless Devices

35.Explain Wireless Security

36.Explain WPA or WPA2 Pre-Shared Key

 Intermediate Question

1. Explain Logging into a Switch

2. Explain Switch User Mode, Enable (Privileged) Mode and Global Configuration Mode

3. Gathering Switch Basic information

4. Explain SSH

5. Configure SSH Setting On a Switch

6. Explain Telnet Setting

7. Verifying Switch Interface Status

8. Configure VLAN

9. Verifying VLAN

10.Configure VLAN Trucking

11.Give Reasons for Using VLANs

12.Static VLANs

13.Dynamic VLANs

14.Brief explain STP Timer

15.Explain how Switches Calculate Their Root Cost

16.Configure STP on Switch

17.Verifying STP on a Switch

18.What is Port Security how to find Port with command?

19.Classified Default subnet mask for Class A, B, C, D

20.Explain Classless Inter-Domain Routin

21.How to define subnetting address of class A, B, C, D

22.Explain Classless and Class full Addressing

23.Details of VLSM (variable length Subnet Mask

24.Explain Static Routing

25.Explain Default Routing

26.Configuring IP routing

27.Configure VLAN Routing

28.Routing Protocol Metric

29.Explain how OSPF calculates the cost for a route

30.Define Benefits and Uses of IPv6

31.Define this IPV6 Address

32.Explain IPv6 Routing Protocols

33.Explain Wireless Access Points

34.Define IEEE 802.11 Transmissions

35.Explain Independent Basic Service Set (Ad Hoc)

36.Explain How to Secure Wireless Network

 Advance question

1. Setting administrative factions

2. Setting hostnames

3. Setting banners

4. Setting passwords

5. Viewing, saving, and erasing configurations

6. Configure an IP address on a switch

7. Configuring SSH

8. Configuring Telnet

9. Explain Layer 3 Switch

10.Describe Dynamic IP configuration with DHCP

11.Explain 802.1q Protocol

12.Explain the Switch Port Mode Command

13.Explain the Removing Command of VLAN

14.Describe Inter VLAN Routing

15.Explain Dynamic Routing

16.Explain routing loop

17.Configure and verify inter switch connectivity

18.Configure and Verify VLAN Trucking

19.Explain and configure PAGP

20.Configuring Ether Channel

21.Verifying Ether Channel

22.Explain PAGP and LACP

23.Configure and Verifying IPv4 Addressing and Subnetting

24.Explain the Network Address and Broadcast Address

25.Explain Classful Network

26.26. Practice Example #5B: 255.255.255.0 (/24)

27.27. Practice Example #2A: 255.255.240.0 (/20)

28.Given the no of hosts as 126, 50, 20 and 5 Find IP address and subnet

mask using class (192.168.1.0)

29.Explain this Network

30.Put right addressing in fig.

31.Explain Routed and Routable Protocol

32.Explain IGP

33.Explain Distance Vector, link state and Hydride

34.Explain and Verifying OSPFv2

35.Explain Wildcard Mask

36.Explain Address Types and Special Addresses

37.Configuring Cisco Routers with IPv6

38.Explain RIPng, EIGRPv6, OSPFv3

39.Creating a 6to4 tunnel

40.Explain 802.11 Committees and subcommittees

41.Explain Wireless Topologies

Module 9 CCNA -IP connectivity and IP services

 Beginner Question

1. Explain Perimeter, Firewall, and Internal Routers

2. Explain types of Access Lists

3. Explain Basic Concept of DHCP

4. Explain DHCP DORA Process

5. Explain the basic operation of NAT

6. Explain disadvantages of using NAT

 Intermediate Question

1. How to solved Mitigating Security Issues with ACLs

2. Explain Switch Port Security

3. Explain ACL with command

4. Explain DHCP Snooping and ARP Inspection

5. Explain DHCP Relay Agent

6. Types of Network Address Translation

7. Configuring Dynamic NAT

 Advance question

1. Write basic command of Standard Access Lists

2. Explain Telnet/SSH

3. Explain How to Configure DHCP

4. NAT Explain with Command

5. Explain with Command

6.Explain with Command

Module 10 CCNA - Security threat landscape

 Beginner Question

1. Explain Security Threat

2. What is mitigation Techniques?

 Intermediate Question

1. Explain DoS Attacks

2. Explain DDoS

3. Explain IP spoofing

 Advance Question

1. What is social Engineering Attack?

2. Explain Man-In-The Middle Attack

Module 11 CCNA -Automation and Programmability

 Beginner Question

1. Explain How Automation Impacts Network Management

2. Compare Traditional network with Controller based networking

3. Explain Virtualization

 Intermediate Question

1. Describe Characteristics of REST-based API

 Advance Question

1. Explain methods of Automation

2. Explain SDN

3. Explain DNA Center

4. Explain SD-Access and SD-WAN

TERM-3

Microsoft server Assignment

Module 12 Installation, Storage, and

Compute with Windows Server

Install Windows Servers 2016

1. Windows Server 2016 installation requirements

2. Describe Windows Server 2016 editions

3. From which menu we can add and remove server roles?

4. What is workgroup?

5. What is domain?

6. What is powershell ?

7. up gradation v/s migration

8. license and activation model

9. Precaution of up gradation

10. Migration limitation

11. What is the advantages of server core

12. What is Nano server

13. Purpose of Nano server

14. Compare GUI v/s core v/s Nano server

 Practical

1. Install server 2016 GUI

2. Install server 2016 server core

3. Assign dual IP address on lan card

4. Upgrade server 2012 to server 2016

5. Change computer name

6. install nano server

7. manage and configure a nano server

8. configure network in nano server

9. join nano server in domain

Storage solution

1. compare GPT and MBR

2. different between VHD and VHDX

3. what is SMB and NFS

4. what is sharing permission

5. what is NTFS permission

6. what is resource ownership

7. what is storage pool

8. what is basic disk and dynamic disk

9. what is simple volume , spanned volume

10. describe RAID 0 , RAID 1 , RAID 5, RAID 6 , RAID 1 0

11. describe DAS, NAS and SAN

12. what is iscsi initiator and target?

13. what is data duplication?

 Practical

1. share “data” a folder and give read / write permission to first user

2. share “data” folder and give read permission to another user

3. share a “data” folder create a file in that folder and remove inheritance

permission and give different ntfs permission to different user

4. configure RAID 1 and check redundancy

5. configure RAID 5 and check redundancy

6. configure iscsi target and iscsi initiator and allocate remote storage

7. configure data deduplication

Implement Hyper-V

1. what is virtualization

2. type of virtualization and compare it

3. Describe hyper v

4. what is remote management of hyper v

5. what is hyper v manager

6. what is virtual machine and nested virtualization

7. what is dynamic memory

8. what is NUMA

9. describe Virtual Machine functions

10. describe Hyper v functions

11. what is check point

12. hyper v networking—virtual nic , hyper v switch

13. hyper v storage---vhd ,vhdx , fixed size, dynamic expanding

 Practical

1. install hyper v and configure a virtual switch

2. install virtual machine and install windows 10

3. create a checkpoint

4. P4 create a virtual hdd (vhd) and attach to virtual machine

Windows containers

1. describe containers

2. what is docker?

3. hyper v containers and windows containers

 Practical

1. install windows container

2. install container in core server

3. install container in nano server

High availability

1. hyper v live migration

2. what is high availibilty?

3. what is cluster, quorum and witness?

4. describe cluster storage

5. what is NLB?

6. importance of network in Failover and NLB

7. describe node in cluster and its operation

 Practical

1. Install and configure failover cluster for hyper v

2. install and configure NLB for web server

Maintain and monitor server

1. need of updates

2. what is WSUSand importance of WSUS 3 WSUS architecture

3. 4synchronization of update, product and classification 5 wsus group

4. wsus port number and wsus policy

5. what is backup and restore 8 type of backup

6. difference between incremental and differential backup

7. what is full server backup

8. what is use of performance monitor

 Practical

1. install and configure wsus server

2. apply update to particular client group through wsus

3. Take customize backup of data

4. restore backup original location and also another location

5. backup schedule and check it.

6. take full backup

7. performance monitor of current process

8. performance monitor of cpu, memory

Module: 13 Networking with Windows Server

Installing and configure DNS server

1. Describe DNS operation

2. DNS query—Iterative and Recursive

3. what is forward lookup zone and its resource type

4. what is reverse lookup zone and its resource type

5. what is conditional forwarder

6. what is primary zone, secondary zone and stub zone

7. what is active directory integrated zone

8. primary server, secondary server, cache only server

9. what is aging and scavenging

10. what is MX record

 Practical

1. install active directory integrated dns

2. create secondary dns and zone transfer

3. create “A” record

4. create alias

5. create reverse lookupzone

6. make a pointer

7. apply conditional forwareder betwwen two different domain

8. nslookup command

DHCP

1. purpose of DHCP

2. what is DORA process?

3. what is authorised DHCP server?

4. describe scope, lease duration, DHCP option, exclude address

5. what is reservation?

6. what is dhcp relay agent?

7. describe ipconfig commnad

 Practical

1. install dhcp sever and make authorize

2. create a scope and check on client by ipconfig

3. dhcp database and take backup

4. dhcp failover

5. dhcp relay agent

6. dhcp filter

7. dhcp reservation

IPAM

1. what is IPAM and purpose of IPAM

2. why need dedicated server

3. policy for ipam sever

4. which service monitor and manage by IPAM

 Practical

1. Install IPAM

2. configure IPAM with six step

3. create dhcp scope using IPAM 4 create DNS zone

4. check monitoring of sevices

Remote connectivity and VPN

1. what is VPN?

2. type of VPN

3. tunneling protocol

4. authentication protocol

5. what is routing

 Practical

1. install routing and remote access

2. configure LAN routing

3. configure vpn connection (VPN client)

Network policy server

1. what is Radius server

2. what is authentication authorization and accounting

3. RADIUS server operation method and radius client

4. RADIUS port number

5. what is network policies (NPS)?

 Practical

1. P1 configure RADIUS for wireless client

2. confiure NPS for remote access

IPv4 addressing and IPv6 addressing

1. what is ip address?And type of ip address

2. class of ip address

3. public ip address and private ip address

4. what is static ip address, dhcp and APIPA

5. what is ipv6 address?

6. ipv6 dhcp process

7. what is NAT?

8. what id gateway address?

9. what is loopback address?

10. different type of ipv6 address

11. ipv6 tunnelling

 Practical

1. configure ipv6 address manually and test with ping

2. IPv6 address automatically

3. ping utility

4. ipconfig

5. tracert / traceroute

6. dhcpv6

DFS

1. what is DFS? And purpose of DFS

2. Define DFS namespace and DFS replication

3. what is folder target?

 Practical

1. install DFS namespace and replication

2. configure common namespace

3. configure replication and check

4. configure branch cache

Advance Network

1. what is SDN?

2. what is SCVMM?

Module: 14 Identity with Windows Server

Active directory domain services

1. what is domain controller?

2. describe forest, domain, tree, schema, OU, container, site, subnet,

3. partition, trust relationship

4. what is active directory?

5. what is global catalog server?

6. what is ADC AND RODC?

7. what is operation master role?

8. type of operation master role and describe all role.

9. difference between transferring and seizing role

10. password policy

11. what id profile and type of profile?

12. group nesting and scope, type of group

 Practical

1. install ADDS and create a new forest

2. give membership of pc to domain

3. create a ADC

4. create RODC and password replication

5. create a new site

6. create a new child domain

7. create a new tree

8. create a new user with GUI and CLI

9. create roaming profile

10. create OU and give delegation

11. create a group

12. transfer roles—PDC, RID , schema master ,

13. Doamin name master—

14. GUI and ntdsutil

15. IFM

Advance feature

1. describe account policy

2. describe account lockout policy

3. what is trust relationship

4. type of trust relationship describe all trust

5. what is site and subnet ?

 Practical

1. manage active directory offline

2. restore object of active directory from AD Recycle bin

3. backup active directory

4. manage active directory replication---repadmin DcDiag

5. create multiplae UPN suffix multidomain enviourment

6. configure trust between forest check with login

7. configure ADDS sites and subnet

Group Policy

1. what is group policy?

2. what is default policy? Default Domain and domain controller

3. what is user configuration and computer configuration

4. what is GPO?

5. define software setting, windows setting, and administrative templates

6. link GPO

7. delegation GPO management

8. inheritance policy

9. filtering

10. script, templates

 Practical

1. backup restore import and copy GPO

2. force group policy command

3. check group policy settings

4. configure folder redirection

5. software installation ---assign and publish

6. drive map through policy

Certification services

1. purpose of certification

2. certificate service and its role service –certificate authority, certificate enrolment policy

web service

3. standalone v/s enterprise CA

4. root CA and subordinate CA

5. describe certificate templates and how to use it

 Practical

1. install certiface services ---certifacte authority and web enrolment

2. issue certificate through web enrolment and make secure web site

3. self-signed certificate

4. mange certificate---using template and issue certificate for computer

5. backup CA

ADFS

1. what is federation services

2. ADFS service component

3. ADFS requirement

4. multifactor authentication

5. web application proxy

 Practical

1. Install ADFS service and configure between two trusted

organizations (relay party trust)

2. multifactor authentication

ADRMS

1. what is ADRMS

2. how to secure data and type of security 3 what is service account

 Practical

1. install ADRMS and secure data (different security apply)

Redhat Linux ServerAssignment

Module 15

Linux server - Understand and use essential tools

 Assignment Level Basic

1. Full form of bash.

2. What is bash shell.

3. What is the meaning of $ in terminal.

4. What is the meaning of # in terminal.

5. How many virtual console available in Linux 7.0 ?

6. What is file system hierarchy in linux?

7. What is “ / “ in linux?

8. What is the purpose of “ /etc “ ?

9. What is the purpose of “ /home “ ?

10.What is the Purpose of “ /boot “ ?

11.What is the use of man command?

12.What is the use of passwd command?

13.I want to search specific string in man, what should I do?

14.How to exit from man?

15.What is the use of “ pinfo “ command ?

16.What is the use of “sosreport “ command ?

17.By default location to store “ sosreprt “ is….

18.What is the use of “>file “command?

19.What is the use of “>>file “command?

20.What is the use of “2>file “command?

21.What is the use of “2>>file “command?

22.What is the use of “whereis “command?

23.What is the use of “echo “command?

24.What is the use of “tty “command?

25.What is the use of “| “and “tee “command in terminal?

26.What is the use of “vim “?

27.Give a list of “ vim modes “

28.What is “gedit “?

29.What is “ tar “ ?

30.I want to get backup of /etc directory, how do i wright down the command?

31.From which command, I extract .tar file ?

32.I want to see the content of .tar file, without extracting this, which command will help me33.I want to copy “ file1 “ on remote desktop computer, which command will help ?

34.Which command is used for remote synchronize?

35.What is ACL

36.Which command is used to view the ACL?

37.Ext3 and exe4 both file systems are supported the ACL, is true or false?

38.Which command is used to modify ACL

39.What is the use of “grep” command?

40.What happened if i use < grep -i -v ‘cat’ > command?

 Assignment Level Intermediate

1. What happed if I press “ctrl + alt + f1”

2. What happened if I press “ctrl + alt + f2” ?

3. What happened if I press “ctrl+alt+f3” ?

4. Short cut key to finish session in terminal

5. What is gnome in linux 7.0?

6. How many workspace are available in linux 7.0?

7. What is the purpose of “ /dev ” ?

8. What is absolute path ?

9. What is relative paths ?

10.What is the difference between “ls -l” and “ls -la” command ?

11.What is the use of “pwd” command?

12.What is the use of man command?

13.What is the use of passwd command?

14.I want to search specific string in man, what should I do?

15.How to exit from man?

16.What is the use of “ pinfo “ command ?

17.What is the use of “sosreport “ command ?

18.By default location to store “ sosreprt “ is….

 Assignment Level Advance

1. how do we switch workspace?

2. use of "passwd" is...

3. use of "head" and "tail" command is....

4. use of history command is....

5. which command is used to add new user

6. meaning of "tail -n 20" command is....

7. What is difference between “cd” and “cd ..” command?

8. Explain the command “ cp file1 file2”

9. What the use of below command rm

10.rm -r mv mkdir

11.Explain the command “ mkdir -p “

12.What happened if i use this command “ ls ab\* “ ?

Task: 1

1. Use Ctrl+Alt+f1 to Ctrl+Alt+f6

2. Change the password for student user from “student” to 55TurnK3y

3. Check only time in terminal

4. Check only date in terminal

5. Check last three line of “passwd” file

6. Check word count, line count, character count in “passwd” file

7. Check hidden files in “/” directory

8. Use “history “commands

9. Use < !command > and < !number > from history

 Task: 2

1. Your present working directory is “ /home/student/Desktop “

and with the help of relative path create “boss” directory in “ /tmp/hello/dir1 “

2. Find your present working directory

3. Create three directory [ dir1, dir2. Dir3 ]

4. Remove this three directory [ dir1, dir2, dir3

5. Create blank file in terminal

6. Use “cp” command

7. Use “mv” command

8. Use “rm” command

9. Use “rm –r” command

 Task: 3

1. View the “gedit” man page

2. Use “pinfo” command

3. Reading documentation in /usr/share/doc

4. Access customer portal using https://access.redhat.com/help

5. Create “sosreport”

 Task: 4

1. Redirect the output of “date” command to “/tmp/SavEd-timestamp

2. Delete Saved-timestamp file.

3. Send command output to file, and errors to different file.

4. Send output and errors to the same new, empty file

5. Run command, save output in a file, discard error messages.

6. Open and learn “ vimtutor “

7. Edit any file with “gedit “

8. Redirect a long listing of all content in student’s home directory,

including hidden directories and files, into a file named “

9. editing\_final\_lab.txt “

10.Remove the time column, but leave the month and day on all line

(block selection visual mode)

 Task: 5

1. Get backup of /etc

2. Create new directory “FoLDER”

3. Extract this new backup in FoLDER directory

4. Check the content of this new backup without extracting

5. Compress /etc

6. Check the size after compression

7. Graphically manage extract and compression

8. Create new file with vim . name “f1”

9. Copy this “f1” on remote desktops’s “/” directory

10.Create new file name 123 on “/”directory of desktop machine

11.Start server machine

12.Copy above /123 file on current system location

13.Use sftp command

 Task: 6

1. Assign Read, write, executable permission on directory “dir1” for user “u1”

2. Add user “u3” in group “red”

3. Assign Read, write, executable permission on directory “dir1” for group “red”

4. Create a new directory name “dir2”

5. Copy the permission of “dir1” to the new directory “dir2”

6. Remove only user’s ACL on “dir”1

7. Remove all ACL on “dir2”

 Task : 7

1. Create any file with the help of VIM

2. Replacing text in VIM

3. Copy and Paste any contents in VIM

4. Search any content in VIM

Module 16

Linux server - Operate running systems

 Assignment Level Basic to Advance

1. What is PID ?

2. What is PPID?

3. What is the use of “ ps “ command ?

4. What is the use of “ ps aux “ command ?

5. What is the use of “ tops “ command ?

6. Which command is used to change priority value ?

7. What is the use of “jobs” command ?

8. What is the use of grep command ?

9. What is system?

10.What is daemons?

11.I want to check the service status for” sshd”, which will help me?

12.How to stop and start services in terminal?

13.What is the use of openSSH ?

14.Which command is used to generate key in linux ?

15.Which command is used to copy ssh key?

16.How do we prohibit the root user from logging in using ssh?

17.How do we prohibit password authentication using ssh?

18.Where we find general logs ?

19.Where we find secure logs ?

20.Where we find mail log ?

21.Where we find scheduling logs?

22.Where we find booting logs?

23.What is the use of “lastb” command ?

24.Where we find general logs ?

25.Where we find secure logs ?

26.Where we find mail log ?

27.Where we find scheduling logs?

28.Where we find booting logs?

29.What is the use of “lastb” command ?

 Assignment Level Intermediate

1. Remote host is “NADIAD”, Remote user is “KAMAL,

how to access remote user via ssh? [ wright down the command]

2. What is the use of “w -f “command ?

3. What is “SSHS host keys “?

4. What is the default location for server’s public key in client side?

5. I want to fire “ls -l /etc” command on remote host “desktop”

[ wright down the command ]

6. What is the use of this command “ #journalctl --since today “

7. What is “ chronyd “?

8. Full form of NTP

9. Port number for NTP is…

10.I want to check timzone, which command will help me ?

11.How to set timezone? Give a comman….

 Task :1

1. Display all processes on display

2. In terminal, Determine the number of logical CPUs

3. Start and check any new job

4. Start any new job in background

5. Start any background job on foreground

6. Check running process

7. Check all running process under user

8. Kill any process via it’s PID

9. Change nice values for any new process

10.Change nice value for any running user

11.Check the status of sshd.service

12.Stop the servive of sshd.service

13.Start the service of sshd.service

14.Login in server vm

15.Display the status of “chronyd”

16.Restart “sshd.service”

 TASK: 3

1. Start desktop machine

2. Get remote access of server machine

3. Create new user in server name “user1”

4. From desktop machine,login “user1” of server user

5. Execute single command “hostname” , on remote host

(server), and as a remote user “user1”

6. Display a list of currently logged into the computer

7. Generate private-public ssh key with password

8. Import this key on remote host side

 Task: 4

1. Open general logs

2. Open secure message logs

3. Open only mail logs

4. Check scheduling logs

5. Check booting logs

6. See the info about “bad logging”

7. Check emperor logs

8. Check today’s temporary logs

9. Set new time zone

Module 17

Linux server - Configure local storage Assignment

 Level Basic to Advance

1. What is…

a. /dev/sda

b. /dev/sdb

c. /dev/sda1

d. /dev/sda2

e. /dev/vda

f. /dev/vda1

2. What is the use of “df “command?

3. From which command we get UUID of file system?

4. I want to use /dev/sdb1, which command will used? (wright down full argument)

5. Where we find all hardware info?

6. Which command is used to create MBR partition?

7. Which command is used to create GPT partition?

8. What is sda, sdb, sdc, sdb1, sdb2, sdb3?

9. What is the use of swap partition?

10.Explain LVM

11.Define following terms,

1. PV

2. VG

3. LV

12.From which command we can get information about LVM status?

 Task :1

1. Check current block details

2. Mount removable media

3. Unmount removable media

4. Create soft link

5. Create hard link

6. Show inode number of all files

7. Find a file is equal to 10 mb

8. Find a file which have more then 10 mb

9. Find directory list

10.Find file list

11.Find soft link list

 Task:2

1. Create a new partition with following requirements, Size 1G File type xfs

2. Create three primary partitions

3. Mount new partitions via UUID and LABLE

4. Create “swap” partition

 Task: 3

1. Create new LVM

2. Extend this new LVM

Module 18

Linux server - Manage user and Groups and

working with file systems

 Assignment Level Basic

1. What is default uid for root user ?

2. What is default uid for system user ?

3. What is the uid for normal users ?

4. How to add comment in user file?

5. From “ /etc/passwd “ which information will we gather ?

6. From “ /etc/shadow “ which information will we gather ?

7. From “ /etc/group “ which information will we gather ?

8. From “ /etc/gshadow “ which information will we gather ?

9. What is the meaning of + and – in file permission?

10.What is “ r “ “ w ” ‘ x “ in file permission

11.What is “ 4 “ “ 2 “ “1” in files permission

12.What is the use of umask?

13.What is default root permission for directory?

 Assignment Level Intermediate

1. How to assign another new home directory for new user?

2. Command to check group membership of any user

3. What happened if I use “ su – “ command ?

4. Which command is used to delete any user with its home directory?

5. How to add new user without home directory ?

6. Command to assign account expiry to the user ?

7. Command to add a new group …

8. What is default root permission for file?

9. What is the default umask for root?

10.What is the default umask for student?

11.Which command is used to set user ownership?

12.Which command is used to set group ownership?

 Assignment Level Advance

1. I have on user with the name of KAMAL, Now, I want to add this user in the group name Nwhich command will used?

2. What is the difference between “ usermod -G “ and “ usermod -aG “

3. What is the meaning of “ -1 “ in password state information?

4. Which command tis used to remove the password of any user?

5. What is the use of “ gpasswd “ ?

6. Command to change password policy

7. What is use of “ sudo “

8. Command to reset virtual machine

9. How to change user and group ownership on same time

10.Command to change user permission on directory

11.List of special permission in Linux 7.0 is……

12.What happened if i used this command…?[ #chmod u+s /user/bin/vim ]

13.What happened if i used this command…. [ #chmod g+s /data ]

 Task: 1

1. Find details about current logged-in user.

2. Show all processes on terminal

3. Create primary group

4. Create supplementary group

5. Find groups details and list on terminal P6. Find user details and list on terminal.

6. Use “sudo”

7. View the last 5 lines of the “ /var/log/messages “

8. Add a new user with name “ NuPuR “

9. Remove this user and user’s home directory

10.Create new supplementary group name is “ whEEL “

11.Create a new user with name “ ELviS “

12.Add / Append a user to a supplementary group

13.Restrict / Lock login access for “ ELviS “ user

14.Create a new user name “ LiNuX without home directory

15.Create a new user name “ RedHat “ with new home directory “

16./etc/HatRed

17.Create a new user with two(2) days expiry

18.Remove password for “ ELviS “ user

19.Check user password policy for “ LiNuX “ user

 Task :2

1. Login from “LiNuX” user

2. Create new directory on desktop name is "FoLdEr”

3. Change group ownership from LiNuX to root on “FoLdEr” directory

4. Create new file on /etc/ with name “ FiLe”

5. Check permissions of above file

6. Login from “student” user

7. Create new directory on students home with name “file1”

8. Remove read and write permission for group and other on above file “file1”

9. Add execute permission for everyone on “file2”

10.Set Read,write,execute for USER

11.Set Read and execute for GROUP

12.Set No permission for other on “Directory1”

13.Create new group name “ateam” , And add two new user in this group

“andy” and “alice”, set password is “password”

14.Login from root and root home directory

15.Create a new directory in “/home” name is “ateam-text”

16.Change the group ownership of the ateam-text directory to “ateam”.

17.Ensure the permission of ateam-text allows group members to create

Module 19

Linux server - Deploy, configure, and maintain systems

Assignment

 Level Basic to Advance

1. What is RPM package manager?

2. What is “ yum “

3. I want to check all list of available packages, which command will help

4. From which command, we register with RedHat satellite ?

5. What is the use of repo file?

6. what is “at”

7. Where we find “atd” daemon?

8. Which command is used to get an overview of the pending jobs for user?

9. Which command is used to remove a scheduled job?

10.What is the use of ‘crontab -l’ command?

11.What is the use of ‘crontab -r’ command?

12.What is bootloader?

13.is the bootloader in linux 7.0

14.What is POST?

15.Full form of POST

16.Full form of MBR

17.What is kickstart

18.What is the use of “url” in kickstart file?

19.Who allowed the graphical installation to be viewed remotely via VNC?

20.Which command is used in kickstart for clear the specified partitions before installation?

21.Which command is ignoring the specified disks when installing?

22.I want to configure kickstart graphically, what should I do?

23.How to check the syntax of kickstart configuration file ?

 Task:1

1. Run command to register with RedHat satellite( noworry if not registered

2. Show all available packages

3. Check particular yum packagers

4. Check a file, which is responsible for password

5. Check all file which is created in yum

6. Install “vsftpd.x86\_64”

7. Show all configuration file of “vsftpd”

8. Check script file of “vsftpd”

9. Create repo file

10.Install new kernel

 Task: 2

1. Set text base logins only

2. Set Graphical and text base logins

3. Recover root password

4. Repairbootloader

 Task: 3

1. Install all httpd package

2. Open kickstart configuration graphically

3. Configure new kickstart file

4. Show full configuration of new kickstart file

5. Validate new kickstart file

6. All http on firewall

7. Reload firewall.

8. Start and restart http

9. Install new foundation using new kickstart file

Module :20

Linux server - Manage basic networking & Security

 Assignment Level Basic

1. Full form of “ ping “

2. What is the use of “ ping “ command ?

3. What is the meaning of “prefix” is ?

4. Which protocol is used in PING ?

5. Port number of ICMP ?

6. What is network ID and broadcast ID in IP range ?

7. What is gateway ?

8. What is SeLinux?

9. Wright down the list of SELINUX modes and their uses

10.In which mode, reboot is required after modification?

11.What is SeLinux Booleans

12.Which command is used to check the selinux contents

13.What is firewall ? why we use

14.What is firewall?

15.Which command is used for graphically manage firewall?

16.Which command is used for command line manage firewall?

17.What is the use of “ –get-default-zone “ ?

 Assignment Level Intermediate to Advance

1. Which command is used to manage IP addressing in inux 7.0 ?

2. By default which name will assign to network card in RHEL ?

3. Which command is used to add/create a new network connection?

4. From which command is used to show the network connection?

 Task: 1

1. Open graphically IP management

2. Check current lan cpnnection

3. Add new cpnnection name “KAMAL”

4. Connect “eth0” to this new connection “KAMAL”

5. Up the new connection “KAMAL”

6. Show the info about the new connection

7. Assign and append new IP on new connection “KAMAL”

8. Reload the conenctions

9. Again create new connection with same name “KAMAL”

10.Delete both new connections one by one.

11.Assign new hostname

12.Restart the NetworkManager

 Task :2

13.Check current selinux mode

14.Change selinux mode into “permissive”

15.Change selinux mode into “Enforcing”

16.Start server machine.

17.Change the default selinux mode to permissive via VIM

18.Check selinux contents on process

19.Install httpd.services

20.Check selinux contents on /var/www/html

21.Create new .html file in /var/www/html

22.Open this file in firefox and check is accessible or not

23.Delete this .html file

24.Create new .html file on desktop

25.Move this file in /var/www/html

26.Now, open this file and check is accessible or not

27.Update selinux contents on this files

28.See the status of all booleans

29. “ON” the booleans of httpd\_use\_nfs

30.Get a list of only modified Boolean

31.Get details of all selinux logs

 Task:3

1. Show current default zone ?

2. Show all firewall zone

3. Get list of services which is running in current zone

4. Show the all profile of all zone

5. Remove ssh services

6. Reload the firewall

7. Add ssh services in firewall

8. Graphicallymanagethefirewall

Module 21

Linux server -deployment of network services

 Assignment Level Basic to Adanvce

1. What is KVM?

2. What is Virtualization?

3. What are the key benefits of virtualization?

4. For building RHEL virtualizations which two packages are required?

5. What is nested virtualization?

6. Full form of LDAP is

7. What is LDAP?

8. Which package is used for graphically access ldap configuration

9. Explain is NFS

10.Explain SMB

11.What is the use of autofs?

12.What is DNS?

13.What is postfix mail server?

14.What is iscsi storage

 Task: 1

1. Install qemu-kvm qemu-img

2. nstall “virt-manager” , “ libvirt “ , “ libvirt-python “ , “ python-virtinst “ , “ linvirt-client”

3. Create new virtual machine

4. Create LDAP client

5. Create NFS shared directory

6. Do Automounting NFS

7. Create SMB shared directory

8. Mount and use SMB shared directory

9. Configuration of DNS Server

10.Postfix configuration

11.MARIADB configuration

TERM-4

Ethical Hacking Assignment

Module 27 Foundation

1. Difference between hardware and software.

2. Define IP address range and private address range.

3. Explain Network protocol and Port number.

4. Explain Types of Network Devices

Module 28: Information Gathering

1. What are the types of hacker?

2. Explain in brief - Ethical hacking and cyber security.

3. Explain Foot printing Methodology

4. Find basic information using Google advance search operator and Pipl search

5. Find vulnerability tool and check open port and service.

Module 29: Hacking and System Malware

1. What are the different types of hacking methods?

2. Explain Types of Password Attacks

3. Explain Password Cracking Tools: pwdump7

4. Explain Types of Steganography with QuickStego

5. Perform Practical on key logger tool.

 Malware

1. Define Types of Viruses.

2. Create virus using Http Rat Trojan tool.

3. Explain any one Antivirus with example.

Module 30:

Web server and application base Attacks

1. Explain MAC spoofing and Email spoofing

2. Perform practical of MITM tool and social engineering Tool

3. Explain Kali linux tool SYN Flooding Attack using Metasploit

4. Find online email encryption service

5. Types of Firewall

6. Explain Evading Firewalls

 Web Based Hacking

1. What is Session Hijacking Explain with Techniques?

2. Find DoS/DDoS Attack Tools

3. Explain SYN Flooding Attack with example

4. List of Web App Hacking Methodology

5. SQL Injection Methodology

6. Explain sql injection with any tool

Module 31: Wireless and android hacking

1. Wireless Terminologies

2. Types of Wireless Antenna

3. How to secure your mobile phone

4. List of Android Phones Security Tools

5. Perform practical Android phone hacking