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DEPARTMENT OF COMPUTER ENGINEERING

COMPUTER HARDWARE AND NETWORKING PRACTICAL (4052640)

LAB MANUAL

NAME :

REG NO :

SEM/YEAR :

EX NO: 01 **HARD DISK DRIVES**

DATE:

Aim:

a) To install hard disk
b) To configure CMOS setup
c) To partition and format hard disk
d) To identify master/slave/IDE devices
e) To practice scan disk, disk cleanup, disk defragment, virus detecting and rectifying software
f) Creating System restore points in windows for system recovery.

Procedure:

a) Install hard disk.

The hard disk drive is used to store large amount of data permanently. Hard disk interface cables are SATA or IDE interface cablesare used to connect disk with computer system.

Step 1: Unplug your computer and switch off the power supply.
Step 2: Wait several seconds after turning off the power supply and then open the computer case.
Step 3: Locate the hard drive bay on the front of the computer
Step 4: Find the cables that came with your hard drive.
Step 5: Set the drive jumper to the master setting if you are installing an IDE drive.
Step 6: Put the side panel back on the computer and secure it with the screws

b) Configure CMOS setup.

The CMOS setup utility is used to setup the hardware configuration of your computer's motherboard.

Step 1: Restart your computer
Step 2: Press F10 or DEL at startup. If this fails, see manual.

- Go to auto detects hard drives.
- Ensure that it detects your new hard drive.
- If it doesn't detect the drive, go back and make sure the cables are inserted tightly.

Step 3: Choose boot tab using LEFT arrow key.
Step 4: Change first bootable disk as Hard disk drive using + and - keys.
Step 5: After choose press F10 for save and exit.

c) Create partition and format a hard disk partition

Disk partitioning is the act of dividing a hard disk drive (HDD) into multiple logical storage units referred to as partitions.

Create partition using windows XP CD

Step 1: Insert the Windows XP CD-ROM into your CD-ROM drive.
Step 2: At the Welcome to Setup page, press ENTER to continue.
Step 3: Press F8 to accept the Windows XP Licensing Agreement.
Step 4: If an existing Windows XP installation is detected, you will be prompted to repair it. At this point hit the ESC key (do notrepair).
Step 5: The screen will now list all existing partitions and un-partitioned space for each hard disk. Use the cursor/arrow keys tochoose where to create the new partition. Press D to delete an existing partition or press C to create a new partition in un- partitioned space.

Format a Hard Disk

Disk formatting is the process of preparing a data storage device such as a hard disk drive, solid-state drive, floppy disk or USBflash drive for initial use.

Step 1: Prepare the hard disk according to the manufacturer's instructions
Step 2: Determine the kind of file system that you want to use
Step 3: If the hard disk already contains data, back it up

Step 4: Configure your computer to start from the CD or DVD drive using BIOS utility.
Step 5: At the Welcome to Setup page, press ENTER to continue.
Step 6: Press F8 to accept the Windows XP Licensing Agreement.
Step 7: If an existing Windows XP installation is detected, you will be prompted to repair it. At this point hit the ESC key (do not repair).
Step 8: Select specified partition and press F to format the disk.

d) Identifying a master/slave/IDE drives:

Master and slave settings on IDE hard drives are designed so you can put two drives on a single IDE cable. One acts as the master or main drive and the other is the slave.
Step 1: Examine the stickers on the hard drives for a master/slave pin out diagram. This diagram is usually near the pins or nearthe hard drive serial number.
Step 2: Locate the pins on the back of the hard drive, usually beside the power plug. The number of pins varies. Some models have eight or ten pins in two rows and others may have only three pins.
Step 3: Compare the location of the jumper with the pin settings in the diagram. One setting indicates a slave and the other indicates a master.

e) Practice with scan disk, disk cleanup, disk de-fragmenter, virus detecting and rectifying software. Scan disk:

ScanDisk is a diagnostic utility is used to detect and (if possible) recover from physical errors on the disk.
Procedure:
Step 1: Open my computer.
Step 2: Select and right click the particular partition (C, D, E, etc).
Step 3: Choose properties, press tools tab and check now button.

f) Disk cleanup:

Disk Cleanup (cleanmgr.exe) is computer maintenance. This utility first searches and analyzes the hard drive for files that are nolonger of any use, and then removes the unnecessary files.

- Compression of old files
- Temporary Internet files
- Temporary Windows files

Procedure:
Step 1: Choose RUN from start menu.
Step 2: Type cleanmgr.exe and enter.
Step 3: Choose partition to clean a disk.

g) Disk de-fragmenter: Disk Defragmenter is a utility is used to increase access speed by rearranging files stored on a disk to occupy contiguous storage locations, a technique called defragmentation.

Procedure:
Step 1: Open my computer.
Step 2: Select and right click the particular partition (C, D, E, etc).
Step 3: Choose properties, press tools tab and defragment now button.

h) Virus detecting and rectifying software: Virus detecting and rectifying software such as Avast, avira, and etc. it is used to detect and rectify a viruses from your computer.

Procedure:
Step 1: Open any antivirus software (Ex Avira).
Step 2: Enable my computer option in check box.
Step 3: After selection, press scan button.

i) Creating System restore points in windows for system recovery.

Procedure:
Step 1: Open the Settings app and go to the System

Step 2: From the system page open the About tab, then go to the right side under Related Settings.

Step 3: Click Advanced System Settings. This opens the System Properties window.

Step 4: From there, go to the System Protection This has all the system restore settings.

Step 5: To create a manual system restore point click the button labeled Create… and then give it a name that will help identify what the point is for.

Step 6: Then click Create.

j) Recover with a system restore point:

Procedure:

Step 1: Open the Settings app and go to the System

Step 2: From the system page open the About tab and then go to the right side under Related Settings.

Step 3: Click Advanced System Settings. This opens the System Properties window.

Step 4: From there, go to the System Protection

Step 5: Click the button labeled System Restore. A window will open with the option to use the most recent automatic restorepoint or to select a different point.

Step 6: Click next and then Finish to start the restore.

Result:

Thus the hard disk installed and formatted, CMOS configuration done, master/slave/IDE drives identified and scan disk, defragment etc practiced**.**

EX: 02 **OPTICAL DRIVES**

DATE:

Aim:

a) To install and configure a DVD writer and blu ray writer

b) To record blank DVD and blu ray disk

a) Install a DVD Writer and a Blu-ray Disc writer:

A DVD writer is an optical drive that can read as well as write DVD disks. It support different disc's are CD-R, DVD-R, DVD-RW. Blu-Ray Disc Writer is an optical drive that can read as well as write DVD disks. It support different discs such as CD-R, DVD-R, DVD-RW, BD- R (25 KB), BD-RW.

Procedure

Step 1: Remove your computer's case cover.
Step 2: Select the IDE/SATA configuration at the back panel of your DVD /Blu-Ray Writer.
Step 3: Fix the DVD /Blu-Ray Writer into the open bay.
Step 4: Attach the IDE/SATA cable by matching the Pin at the back of your DVD / Blu- Ray write.
Step 5: Connect the power cable to the socket at the back of the DVD burner.
Step 6: Put the case cover back into place and secure it with any screws that had been removed earlier.

Configure a DVD Writer and a Blu-ray Disc writer:

Step 1: switch on the system
Step 2: after installation, the operating system itself automatically configures this drive as DVD /Blu-Ray Writer without use ofdriver software.
Step 3: finally check device manager the devices are automatically configured or not.

B) Recording a Blank DVD and Blu-ray Disc:

To record a Blank DVD and Blu-ray Disc so many software's are available in market that are DVD Burner, Blu-ray Disc Burner, startsmart and Nero 2012, etc.

Recording a Blank DVD:

Step 1: Insert the dual-layer DVD into your drive.
Step 2: Open Nero Start Smart/Nero Express.
Step 3: choose Data DVD option from Nero template.
Step 4: Add data (Audio, Video, etc) to write on a disc.
Step 5: Check your available space.
Step 6: Name your disc (If required).
Step 7: Click Burn to begin burning the disc.

Recording a Blank Blu-ray Disc:

Step 1: Insert the blu ray disc into your drive.
Step 2: Open Nero Start Smart 2013.
Step 3: choose Blu-Ray Data Disc option from Nero template.
Step 4: Add data (Audio, Video, etc) to write on a disc.
Step 5: Check your available space.
Step 6: Name your disc (If required).
Step 7: Click Burn to begin burning the disc.

Result:

Thus the DVD and blu-ray drives installed, configured and recording done.

EX: 03 **PRINTERS**

DATE:

Aim:

a) To install and configure dot matrix printer and laser printer.

b) To troubleshoot the above printers.

Procedure:

a) i) To install and configure dot matrix printer.

Step 1: Connect the printer to parallel port of the motherboard and power cable to Ac.

Step 2: Switch on the system and printer.

Step 3: Insert the drive disk in the CD drive. Step 4: Click start and select settings.

Step 5: Select printers and double click add printers.

Step 6: Click next until a list of model, manufactured and click next.

Step 7: Select the correct printer model, manufacturer and click next.

Step 8: Follow the instructions on the computer system.

Step 9: After installation restart the system and check the printer.

a) ii) To install and configure laser printer.

Step 1: Connect the printer to parallel port or USB port of the motherboard and power cable to Ac.

Step 2: Switch on the system and printer.

Step 3: Insert the drive disk in the CD drive.

Step 4: Click start and select settings.

Step 5: Select printers and double click add printers.

Step 6: Click next until a list of model, manufactured and click next.

Step 7: Select the correct printer model, manufacturer and click next.

Step 8: Follow the instructions on the computer system.

Step 9: After installation restart the system and check the printer.

b) Trouble Shooting Dot Matrix Printer

Problem- printer does not function

Solution:

- Check the AC supply. if not proper fix it properly. Check the fuses, if necessary replace it.
- Check the power light is ON. Check the ON_LINE connection, cable connections and try again.
- If the printer is still not working, try a self test printing.

Problem- The printer does not print during self test

Solution:

- Check the manual for the proper selection of combination of switches for self test.
- Power on the printer and try self test.
- If the printer is not printing, the problem is with the cable connecting the print head and the mother board control

Problem - printer not ready error message displayed

Solution:

- All printers must be installed properly before using it. each printer has its own installation software and it comes along with the printer. if it is not installed properly, the printers will not print correctly.

Problem - Carriage does not move

Solution:

- Carriage carries print head .this is driven by a stepper motor controlled by two sensors namely home and run out sensor.
- if there is a problem with the sensor, then the drive motor may not get proper control signals from the mother board.
- Check the drive supply voltage, data cables and electronics circuits.

Troubleshooting of laser printer:

Problem- strains of small round black dots appear on the front or back side of the page

Solution:

- Check the type of the paper used by referring the media guidelines required for the printer using printer manual anduse the prescribed paper
- Clean the toner cartridge
- If still the problem exits it is better to replace the toner cartridge

Problem- a blank page is printed

Solution:

- Make sure the sealing tape from the toner cartridge is removed before the cartridge is installed.
- Check the toner, it may be empty.

Result:

Thus the printers are successfully installed, configured and troubleshooting studied.

Ex: 04 **SCANNER, WEBCAM AND BIOMETRIC DEVICES**

DATE:

Aim:

a) To install, configure and trouble shoot a scanner
b) To install, configure and trouble shoot a webcam
c) To install, configure and trouble shoot a bio-metric devices

Procedure:

a) To install, configure and trouble shoot a scanner

Step 1: Installation and configuration of scanner
Step 2: Click start and open control panel.
Step 3: From control panel window choose printers and other hardware.
Step 4: From printers and other hardware window select scanner
Step 5: From the left pan of scanner window select add an imaging device.
Step 6: From the next scanner installation wizard select next.
Step 7: From the next window select have a disk button if you are having installation CD.
Step 8: If you choose have disk button insert the installation CD.

Trouble shooting the scanner

Problem – scanner fails to scan
Solution

- Check all the cables and see all are properly inserted in the ports of both scanner and computer.
- Look the power display most scanners maintains a green light during operation, if not there may be a power issue, check power cables.
- Disconnect all other devices connected to the computer, the computer may not have the ability to handle more than one external devices. After disconnecting all devices try scanning if not re-install device drivers software's.

Problem - The scanner image is distorted.
Solution

- Clean the scanner class over which the scanning item is placed and scan it again.
- Make sure that the item being scanned is lying flat over the scanner glass.

Problem - cannot scan multiple pages.

Solution

- Position each image at least in inch apart from adjacent image.
- Make sure that the application software supports scanning multiple pages.

b) To install, configure and trouble shoot webcam

Step 1: Switch off the computer and connect the webcam.
Step 2: When the computer is switched on, it detects the webcam and displays new hardware found dialog box.
Step 3: Insert the installation CD.
Step 4: Choose the install option.
Step 5: After completing installation close the window and restart the computer.
Step 6: Test the webcam by the option given in the driver software.

Trouble shooting webcam

Problem – web cam is not capturing images

Solution

- Make sure that USB connector in the webcam is connected properly. If not connect it properly.
- Turn off the computer and unplug the webcam. Then turn on the computer and plug in the web cam and see whetherthe detects the web cam. If not re-install the webcam driver and restart the computer.

Problem – The captured image is not clear.

Solution

- Adjust the focusing lens on the webcam by turning it in forward and backward. If not connect it properly.
- Make sure that light will not fall directly on the web camera.

c) To install, configure and troubleshoot bio-metric device

Step 1: Installation and configuration of bio-metric device (finger print scanner)
Step 2: Insert a driver CD into the CD drive.
Step 3: Connect the bio-metric devices to the USB port on the computer.
Step 4: Do not let the system select the driver automatically.
Step 5: Select “install from a list or specific location “and then click “Next”.
Step 6: Click on “browse”.
Step 7: Point to the CD, find and click on the software folder and click “ok”.
Step 8: Click “finish” to complete the installation.

Troubleshoot finger print sensor

Problem – No fingerprint device is present, enrollment option is not available or error message displayed stating “connect afinger print sensor”

Solution

- Confirm the finger print sensor is recognized by the operating system.
- Select start -> control panel -> system -> hardware -> device manager. The fingerprint device will be located under.
- Confirm biometric entry exist, and has no yellow question mark indicating unknown device, no red line through the listing, when double clicked general tab displays “device is working properly

Result:

Thus the scanner, webcam and bio-metric devices were installed, configured and troubleshooted.

EX: 05 **NETWORK CABLES**

DATE:

Aim:

To do the following cabling works in network.

a) Cable crimping b) Standard cabling c) Cross cabling d) Testing the crimped cable using a tester.

a. Cable crimping

Requirements

1. Cat 5 unshielded twisted pair cable
2. RJ 45 connector -2
3. RJ 45 crimping tool

Procedure

Step 1: Trim about an inch of the outer insulation at the end of the cat 5 cable, careful not to scrape their surface insulation.

Step 2: Untwist the pairs of wires straighten them out, and arrange them according to the color code.

Step 3: Cut the ends of with the crimping tool.

Step 4: Hold the wires flat in the right hand, pick the RJ 45 connector and insert the cable in the connector, and press down the connector using crimping tool.

Step 5: Repeat the procedure at the other end of the cable.

b) Standard cabling

Standard cabling or crimping method is used to connect computer to device, for example star topology.

Procedure

Step 1: Remove the covering of CAT 5 cable.

Step 2: Straight the eight wires of the cable.

Step 3: Using crimping tool cutter cut at the ends of wires, so that they are of same length.

Step 4: Arranging the wires in order to color code.

Step 5: insert the arranged cable in the RJ 45 connectors with clip pointing down exactly.

Step 6: in crimping tool insert the head of RJ 45 connectors and crimp hardly.

Step 7: repeat the same steps other end of the cable.

c) Cross cabling

Cross cabling or crimping is used to connect computer to computer, for example bus topology.

Procedure

Step 1: Remove the covering of CAT 5 cable.

Step 2: Straight the eight wires of the cable.

Step 3: Using crimping tool cutter cut at the ends of wires, so that they are of same length.

Step 4: Arranging the wires in order to color code.

Step 5: insert the arranged cable in the RJ 45 connectors with clip pointing down exactly.

Step 6: In crimping tool insert the head of RJ 45 connectors and crimp hardly.

Step 7: And the other end of the color code is different

- Wire that is on 1st number of A side should be on 3rd number of B side and vice versa.
- Wire that is on 2nd number of A side should be on 6th number of B side and vice versa.

d) Testing the crimped cable using a tester.

Step 1: Plug one end of the cable into the Ethernet port on the cable tester.

Step 2: Plug the other end of the cable into the other Ethernet port on the cable tester.

Step 3: switch on the tester.

- In the standard cabling, both ends display a LED in sequentially.
- In the crossover cabling, similar to above cabling but pin1 and pin 3 are swapped, as are pin 2 and 6.

Step 4: Switch off the tester.

Result:

Thus different types are cabling are done and tested**.**

EX: 06A **CONFIGURE TCP/IP**

DATE:

AIM:

To Configure Host IP, Subnet Mask and Default Gateway in a system in LAN (TCP/IP Configuration).

Procedure:

Steps to configure IP address, Subnet mask and Default Gateway:

1. Click on the Start button and select Control Panel then Network and Internet Connections.
2. Click Network and Internet Connections.
3. Right click on the Local Area Connection icon and select Properties.
4. Select Internet Protocol (TCP/IP).
5. Click on the Properties button.
6. Uncheck that Obtain an IP address automatically and Obtain DNS server address automatically and put IP, Subnet mask and Default Gateways.
7. Click on the advanced button and select the DNS tab in the Advanced TCP/IP Settings window.
8. Ensure that Register this connection's addresses in DNS is not selected.
9. Click OK then Close to close all boxes.

Result:

Configuration of IP Address in a system in LAN (TCP/IP Configuration) and Configuration to establish interconnection between systems have been done successfully.

EX: 06B **DEBUG THE NETWORK ISSUES**

DATE:

AIM:

To configure Internet connection and use IPCONFIG, PING / Tracert and Netstat utilities to Debug the Network issues.

PROCEDURE:

IP CONFIG - To display the basic TCP/IP configuration for a computer. □o to the command prompt and type the command.

C:\>ipconfig

PING - its main purpose is to determine whether we can reach another computer from our computer.

C:\> ping <ip address> .,(Ex: c:\> ping 10.1.4.1)

TRACERT - It displays a list of all the routers that a packet must go from the computer where tracert is run to any other computer on theinternet.

C:\> tracert www.google.co.in

NETSTAT - It is used to display list of active connections.

C:\> netstat

Result:

Thus configure Internet connection and use IPCONFIG, PING / Tracert and Netstat utilities to Debug the Network issues have been done successfully.

Ex: 07a

Router, Hub and Switch

AIM:

To perform the interface PCs using connectivity devices

1. Hub
2. Switch
3. Router

HARDWARE REQUIREMENT:

- UTP cable with standard crimped jack on both sides.
- Systems with windows XP.
- Hub
- Router
- Switch

DESCRIPTION:

INTERFACE PCs USING HUB

Step 1: Take three systems with LAN card and windows XP Os.
Step 2: Name the three systems as system1, system2, system3.
Step 3: Turn on the three systems. Change the computer name and d workgroup of three systems by the following steps.
Step 4: Take three UTP cable with standard crimped jack on both sides.
Step 5: Connect one end of UTP cable to LAN card of system1and another end to first port of the Hub.
Step 6: Follow the step 5 for both system2 and system3
Step 7: Connect the power cable of the Hub to power supply and turn on the Hub.
Step 8: If the above steps had done perfectly means a message will displayed on left side corner of desktop. The message is local area network connection is connected successfully 10kbps.

INTERFACE PCs USING SWITCH

Step 1: Take three systems with LAN card and windows XP Os.
Step 2: Name the three systems as system1, system2, system3.
Step 3: Turn on the three systems. Change the computer name and d workgroup of three systems by the following steps.
Step 4: Take three UTP cable with standard crimped jack on both sides.
Step 5: Connect one end of UTP cable to LAN card of system1and another end to first port of the switch.
Step 6: Follow the step 5 for both system2 and system3
Step 7: Connect the power cable of the switch to power supply and turn on the switch.
Step 8: If the above steps had done perfectly means a message will displayed on left side corner of desktop. The message is local area network connection is connected successfully 100kbps.

INTERFACE PCs USING ROUTER

ROUTER

Generally routers are used to connect several networks together.
In router we can internet connection also.

Step 1: Consider N1, N2, and N3 as a network we want to connect together
Step 2: For connecting three networks together one port has to be free in each network switch.
Step 3: Take UTP cable with standard crimped jack on both end.
Step 4: Connect one end of the cable to router and another end to network switch N1.
Step 5: Follow the step 5 to connect the networks N2 and N3.
Step 6: If we want to connect internet to network systems means connect the cable form ADSL router to router ports.
Step 7: After configuring the IP address we can able to share files from the whole network.

RESULT:

Thus the LAN connections using the device Hub, switch and router were established successfully.

EX NO: 07B **WIRED AND WIRELESS NIC**

DATE:

Aim:

To Install and Configure Wired and Wireless NIC and transfer files between systems in LAN and Wireless LAN between twosystem in a LAN.

Procedure:

1. Install the network card:

   Disconnect all cables connected to the computer and open the case. Locate an available PCI slot (white slots) and insert the network card and secure the card with the screw that came with it. Once the adapterhas been installed and secured close the computer case, connect all the cables and turn it on.
2. After installing the adapter driver it should be working find, now let's configure the card for use on a network.
3. Click on the Start button and select Settings then Control Panel.
4. Double click on the System icon
5. Click on the Hardware tab.
6. Click on Device Manager.
7. You will see a list of devices installed in your computer.
8. If necessary, click on the + sign next to Network Adapters to expand the list.
9. Ensure that there is no yellow exclamation mark (!) next to the Network Adapter. This indicates a possible problemwith the card or configuration.
10. Double click on your network driver (e.g. NE2000 Compatible).
11. In the Device Status box you should see the message:

    "This Device is working correctly."
12. If you do not see this message or if there is no Network Adapter displayed, then your Ethernet card will probablyneed configuring.

Result:

Installation and configuration of Wired and Wireless (remotely) NIC and transfer files between systems in LAN and Wireless LAN between two systems in a LAN have been done successfully.

EX: 08 FTP CONFIGURATION AND NETWORK PRINTER INSTALLATION

DATE:

Aim:

To transfer file between systems in LAN using ftp configuration, install print server and share the printer.

Procedure:

Install the FTP service under windows server 2003 server

Step 1: Start the Control Panel and choose Add/Remove Program and hit enter.

Step 2: Open Add/Remove Windows Components.

Step 3: Select Application Server, then click details.

Step 4: Select Internet Information Service (IIS), then click details.

Step 5: Select File Transfer Protocol (FTP) service check box, then click ok->next.

Step 6: Insert the Windows Server 2003 Server CD-ROM into the computers CD-ROM drive.

Step 7: click ok

Step 8: After completing the installation click finish.

Creating folder

After setting up an FTP server, create folder by the following path.

C:\Inetpub\ftproot.

For example, name the new folder Ftpfiles, so that the path of the folder is

C:\Inetpub\ftproot\Ftpfiles.

Configure FTP

Step 1: Control panel -> Administrative Tools menu.

Step 2: Select internet information service.

Step 3: Open the node for the computer, and then open the FTP sites node. Right-click the default FTP sites node.

Step 4: Click New and then click virtual directory and click Next. In the virtual Directory Creation Wizard, specify an alias that users can use to get to the FTP folder created. The Name Can be anything we like. Then type or browse to path of the directory. Step 5: From C:\Inetpub\ftproot\Ftpfiles and specify the access permission and click Next to finish.

Access ftp folder from server to local (win xp) system

Step 1: Go to Start -> Run

Step 2: Then type ftp://10.1.4.200

Installation of windows server 2003 print server

Step 1: Click start -> Administrative Tools and click configure your server wizard.

Step 2: Click Next.

Step 3: Click Print server in the server role box and then click Next.

Step 4: On the printers and printer driver's page, click the types of windows clients that the print server will support.

Step 5: Click Next.

Step 6: On the "Add printer wizard welcome" page click Next.

Step 7: Click local printer attached to this computer, click to clear the automatically detect and install my plug and play printer check box and click Next.

Step 8: Click the port of the printer and click Next.

Step 9: Check the printer make and model and click Next.

Step 10: Accept the default name of the printer or provide different name and click Next. Sharing printer in network

Step 11: Click start -> printer and faxes.

Step 12: Right click the printer just installed and click sharing.
Step 13: Click share this printer and then gives the share name for the printer.
Step 14: Click ok to close the printer properties.
Step 15: Close the printers and faxes wizard.

Result:

Thus FTP is configured, print server installed and shared.

PART-B

EX: 01 **Windows 2008 / 2013 Server**

DATE:

Aim:
To install windows 2008 / 2013 server.

Procedure:

1. Insert the installation for windows server 2008 R2
2. After the installer run the install windows screen appears.
3. Enter the language and other preferences. Click next.
4. Click install now, then setup begins.
5. After setup the installer prompts to select an operating system.
6. Select windows server 2008 R2 enterprise and click next.
7. Read and select accept the license terms and click next.
8. The installer asks the types of installation and click custom installation.
9. The installer asks the disk location information make the selection and click next, then installation begins.
10. The installer prompts to change the password and enter password and retype password and click next.
11. After you click on the confirmation screen the operating system prepares your desktop
12. The windows server 2008 R2 installation has been finished.

Result:

Thus the windows server 2008 R2 was installed successfully.

EX: 02 **DHCP SERVER**

DATE:

Aim:

To install and configure DHCP server.

Procedure:

Install DHCP server.

1. From the windows server 2002 window right click my computer and select server manager from the menu.
2. Select add roles in the server manager.
3. Select the DHCP server and click next.

Configure DHCP server.

1. To configure DHCP server, click add a small windows appear.
2. In this window give the starting and ending IP address depending on the number of clients we are connecting to the server, then give the subnet mask default gateway, subnet type and select active this scope. Finally click ok.
3. Then click next and click install
4. After few seconds the DHCP server will be installed
5. Click close to close the installer window

Result:

Thus the DHCP server was installed and configured.

EX: 03 **MAIL SERVERS**

DATE:

Aim:
To install and configure mail server.

Procedure:

Install SMTP mail server:

1. Click start and select run from the menu. Enter servermanager.mscin the dialogue box and click ok.
2. Click the features on the left side of the screen window. A menu appears click add features.
3. Select SMTP server and click next and click add required role services and click next.
4. Click install to complete installation and click close.

Configure SMTP mail server:

- To configure SMTP click start and select run. Enter inetmgr6 in the dialogue box and click ok.
- Right click SMTP virtual devices and select properties.
- Click access tab and click connections.
- Select only the list below and click add and enter 127.0.01 as IP address and click ok
- Click relay button and enter 127.0.01 as IP address and click ok
- Click messages tab and enter an email address where non delivery reports are sent. Also configure bad mail directory and click delivery tab.
- Click advanced button and enter fully qualified domain name of SMTP server. Click check DNS button to check the name resolves successfully. Click ok.
- To check the existence of the given host name and run nslookup in the command prompt.
- Finally open the command prompt and run the command given below to set SMTP service as automatic.

C:\users/admin>sc config "smtpsvc" start = auto [sc] change service config. SUCCESS.

  - To check whether the server is running or not, run the command below,

C:\users/admin>SC query "smtpre"; fine"RUNNING"

Result:

Thus the mail server was installed and configured successfully.

Ex: 04 **ACTIVE DIRECTORY SERVICES.**

DATE:

Aim:

To create an active directory domain on windows server 2016.

Procedure:

- Login to your windows server and start the server manager.
- Navigate to the local server tab and select manager -> add roles and features from the command menu at the top right of the window.
- Click next. The wizard will proceed to the installation type option.
- Select the roe based or feature-based installation type.
- Click next. The select destination server panel is displayed.
- By default, the server to apply the installation should already be selected. Confirm that the intended server has been selected from the server pool (or select the desired server) and click next. The select server roles panel is displayed.
- Click the active directory domain services checkbox to activate it as the role to use with the server.
- Click next. The required features list is displayed.
- Click add features to add the required features to the server, the select features panel is displayed.
- Optionally select any additional feature that may be required for your server.
- Click next. The confirm installation selections panel is displayed.
- If all selections are correct, click install.
- Wait for the installation process to finish successfully, and then click close to close the wizard.

4b)

Aim:

To create the logon script and group permissions.

Procedure:

The logon script is the file that does the actual action. It could be almost any action, as noted above. So we will start by creating that script. The default location for the logon scripts is the NETLOGON share, which, by default, is shared on all domain controllers in an active directory forest and is located in the following folder

%SystemRoot%\SYSVOL\sysvol\<domain DNS name>\scripts

Where %SystemRoot% is usually "C:\Windows" and <domain DNS name> is the DNS name of the domain, similar to "Petri.local". this folder, which is a part of the SYSVOL special folder, is replicated to all the domain controllers in the domain.

1. Create the logon script and give it the appropriate name (for example: logon.bat, logon.cmd, logon.vbs, etc.) the script can use ANY name, just make sure you know what that name is and give it the right file extension type.
2. Make sure that the script runs and performs the required action when it is manually run (double click on it).

3. Copy the logon script (CTRL + C).
4. Paste the logon script in the NETLOGON share on one of the domain controllers. The NETLOGON share is located in the following path: c:\windows\sysvol\sysvol\dpmain name\scripts

GROUP PERMISSIONS:

1. Open active directory users and computers from the administrative tools folder
2. Expand the domain tree; locate the OU where the user is located.
3. Right click the user object, select Properties.
4. In the profile tab, locate the logon script box.
5. In the logon script box type the name of the script from step #2. You DO NOT need to enter the path, since it is located in the NETLOGON share. Make sure you enter the full name (i.e. logon.bat or logon.vbs etc.)
6. Click ok.

Result:

Thus the Installation and configuration of Active directory Services is completed successfully.

EX: 05 **DNS SERVER**

DATE:

Aim:

To install and configure DNS server.

Procedure:

a. Installing DNS Server

1. Open server manager. To open server manager, click start and then click server manager.
2. Under roles summary, click add roles.
3. On before you begin, click next.
4. On confirm installation selections, click install.
5. On DNS server, click next.
6. On installation results, click close.

b. Configuring DNS Server

1. Open server manager, click tools and click DNS.
2. Create DNS zones for the same DNS domain names that were hosted on the DNS servers before the critical malfunction. For more information, see add a forward lookup zone.
3. Configure the DNS data as it existed before the critical malfunction.
4. Ensure that the parent DNS zone contains delegation resource records (name server (NS) and glue host (A) resource records) for the child zone that is hosted on this DNS server.
5. After you configure DNS, you can speed up registration of the NETLOGON records

   At the command prompt, type the following command, and then press ENTER:

   net stop netlogon

6. Type the following command, and then press ENTER:

   net start netlogon

Result:

Thus the Installation and configuration of DNS Server is completed successfully.

EX: 06 **RED HAT LINUX USING GRAPHICAL MODE & VM WARE**

DATE:

Aim:

a) To install Red Hat Linux using Graphics mode.
b) To install Red Hat Linux using VM Ware

Procedure:

a) To install Red Hat Linux using Graphics mode.

1. Insert Red hot Linux using DVD into the system.
2. Select the language and key board type from the next two windows and click next.
3. Select "use free space on select device and create default layout" and the "Review and modify partitioning layout" to create partitions and click next.
4. Click new to partition such as /home, /var, etc.
5. Select /home in the mount point and choose ext3 as the file system type. Give the need size and click ok.
6. Click new and select swap from file system type to create swap partition.
7. Give the network settings and select the time zone.
8. Give the root password and click next.
9. Click next to begin installation process and click reboot from the next window.
10. To configure the Linux, click yes I agree to the license agreement and click forward.
11. Next configure the firewall, kdump, sound card and date time setting and click forward.
12. Now the Linux OS is ready to use.

b) To install Red Hat Linux using VM Ware.

1. Insert the Red hat Enterprise Linux CD-ROM in the CD-ROM drive.
2. Power on the virtual machine to start installing Red Hat Enterprise Linux.
3. Follow the prompts to complete the installation.
4. Set the storage location for installation. In INSTALLATION SUMMARY screen, in the STORAGE session area, Select INSTALLATION DESTINATION.
5. Change the base Environment and select add-ons to install. In INSTALLATION SUMMARY screen ,in the SOFTWARE session area, click SOFTWARE SELECTION. RHEL includes Open VMware tools. The default Base Environment is minimal install, which only has basic functionality.
6. For minimal install and virtualization host environments, open VMware tools is not available during installation. After RHEL installation, to install open VMware tools, using root privileges, run the command:
   # yum install open-vm-tools
7. For other types of basic environments, to install open VMware tools, select the guest agents add-on.
8. If the add-on is not listed, the base environment already includes open VMware tools and install it by default.
9. Click done.
10. Click begin installation to continue.
11. Set root password and create new users, as needed, in the CONFIGURATION screen.

Result:

Thus the Red Hat Linux using graphics mode and VMWare was installed successfully.

EX: 07 **PACKET SNIFFING TOOLS**

DATE:

Aim:
To installation of various open source packet sniffing tools and inspect packets in Linux.

Procedure:

Packet sniffer tools required: **tcpdump**

tcpdump is a most powerful and widely used command-line packets sniffer or package analyzer tool which is used to capture or filter **TCP/IP** packets that are received or transferred over a network on a specific interface. it is available under most of the **Linux/Unix-based** operating system. Tcpdump also gives us an option to save captured packets in a file for future analysis. It saves the file in a **pcap** format, that can be viewed by tcpdump command or an open-source GUI-based tool called Wireshark (Network Protocol Analyzer) that reads tcpdump **pcap** format files.

a) How to install tcpdump in linux
Many linux distributions already shipped with the **tcpdump** tool, if in case you don't have it on a system, you can install it using either of the following commands.

```
$ sudo apt-get install tcpdump        [On Debian, Ubuntu and Mint]
$ sudo yum install tcpdump            [On RHEL/CentOS/Fedora and Rocky Linux/AlmaLinux]
$ sudo emerge -a sys-apps/tcpdump     [On Gentoo Linux]
$ sudo pacman -S tcpdump              [On Arch Linux]
$ sudo zypper install tcpdump         [On OpenSUSE]
```

GETTING STARTED WITH TCPDUMP COMMAND EXAMPLES

1. Capture packets from specific interface
   The command screen will scroll up until you interrupt and when we execute the **tcpdump** command it will captures from all the interfaces, however with –i switch only capture from the desired interface.
2. Capture only N number of packets
   When you run the **tcpdump** command it will capture all the packets for the specific interface, until you **hit** the cancel button.
   But using –c option, you can capture a specified number of packets. The below example will only capture **6** packets.
3. Print Captured packets in ASCII
   The below **tcpdump** command with the option –A display the package in **ASCII** format. It is a character-encoding scheme format.
4. Display available interfaces
   To list the number of available interfaces on the system, run the following command with –D option.
5. Display captured packets in HEX and ASCII
   The following command with option –XX capture the data of each packet, including its link level header in **HEX** and **ASCII** format.
6. Capture and save packets in a file
   As we said, that **tcpdump** has a feature to capture and save the file in a **–pcap** format, to do this just execute the command with –w option.
7. Read capture packets file
   To read and analyze captured packet **0001.pcap** file use the command with –r option.
8. Capture IP Address packets
   To capture packets for a specific interface, run the following command with option –n.
9. Capture only TCP packets
   To capture packets based on **TCP** port, run the following command with option **tcp.**
10. Capture packets from specific port

Let's say you want to capture packets for specific port 22, execute the below command by specifying port number **22**.

11. Capture packets from source IP
    To capture packets from source **IP,** say you want to capture packets for **192.168.0.2.**
12. Capture packets from destinations IP
    To capture packets from destination **IP ,** say you want to capture packets fro **50.116.66.139**.

b) Packet inspection

By default tcpdump, capture only the packet headers. However, sometimes you may need to inspect the content of the packets.

tcpdump allows you to print the content of the packets in ASCII and HEX.

The –A option tells tcpdump to print each packets in ASCII and –x in HEX:

$ sudo tcpdump -n –A

To show the packet's contents in both HEX and ASCII use the –x option:

$ sudo tcpdump -n -X

Result:

Thus the installation of Packet Sniffing tools in Linux completed successfully.