INDEX

11.	To store the files in Cloud using Google drive and sync files using google sync.			

Lab In charge

Identify various internal and external slots in the mother board and clean them with Brush

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

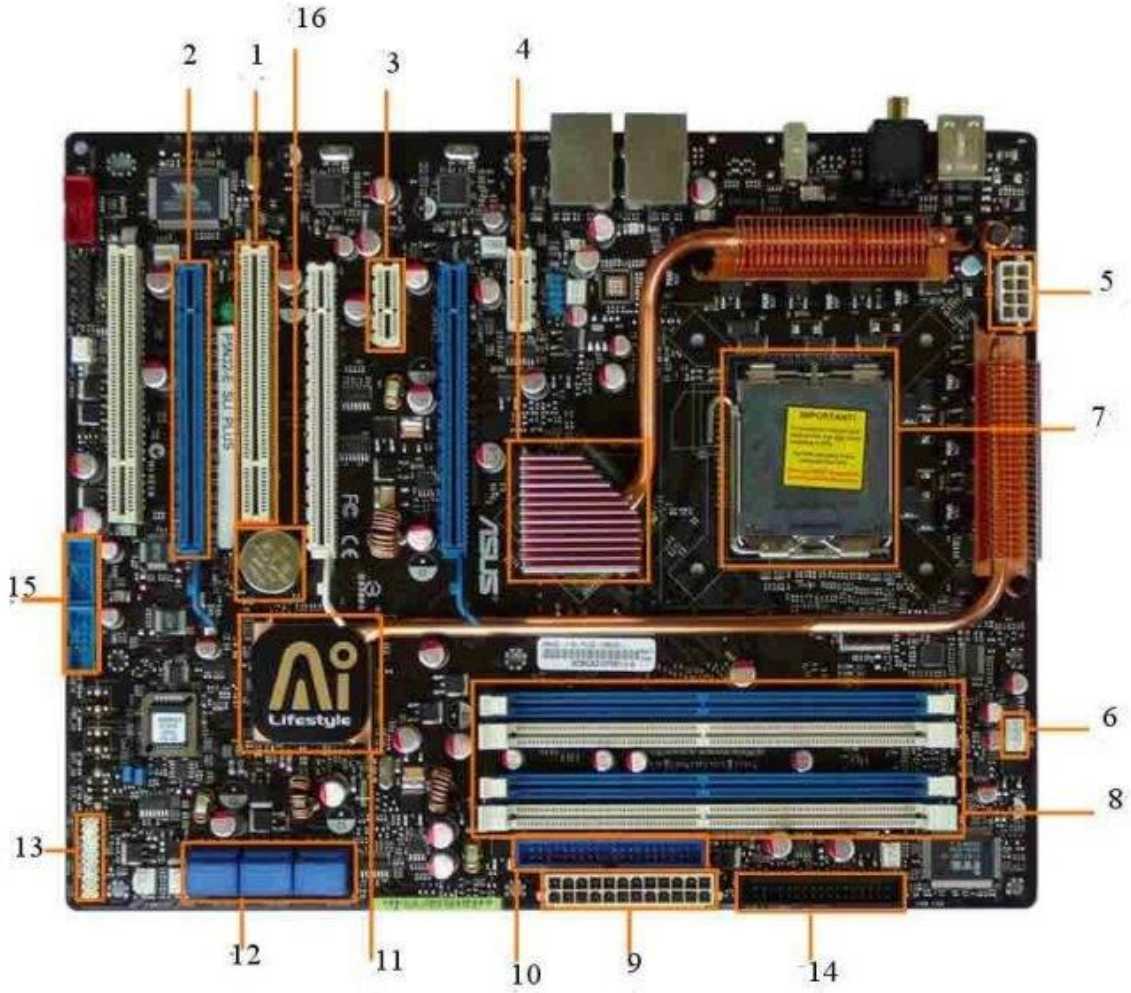
_____

3.Equipment Required: _____

_____

Theory:

Motherboard Layout: -



1. **PCI SLOT (Peripheral Component Interconnect):** PCI slots are used to insert or install Add-on card, such as LAN cards, Sound cards, Capture cards and TV tuner card. There are usually anywhere from 1 to 6 PCI slots available on the motherboard (above board has 2 PCI slots) they have decreased in number and are being replaced by the PCI Express 1x slots.

2. **PCI-E 16x Slots:** the most common slot for Graphics card PCI Express 16x slots provides 16 separate lanes or data transfer. These are 16x allows up to 4 GB/s of peak bandwidth per direction, and up to 8 GB/s concurrent bandwidth.

3. **PCI-E 1x Slot :** Single slot – In the PCIe 1.x generation, each lane (1x) carries 250 MB/s compared to 133 MB/s for the PCI slots. These can be used for expansion cards such as sound cards, or Ethernet Cards.

4. **Northbridge:** This allows communication between the CPU and the system memory and PCI-E slots. It is a focal Point of Motherboard and it is also called as Memory Controller Hub.

5. **ATX 12V 2X and 4 Pin Power Connection :** This is one of two power connections that supply power to the. Motherboard This connection will come from your power Supply.

6. **CPU-Fan Connection:** This is where the CPU fan will connect. Using this connection over one of the power supply will allow the motherboard to control the speed of the fan, based on the CPU temperature

7. **Socket:** This is where the CPU will plug in. The orange bracket that is surrounding it is used for high end heat sinks. It helps to support the weight of the heat sink.

8. **DIMM slots:** DIMM's are by far and away the most used memory types in today's computer. They vary in speeds and standards however and they need to match up to what your motherboard has been designed to take. The four standards of DIMM's being used at the moment are SDR (single Data Rate), DDR(Double Data Rate), DDR2 and DDR3. The speeds of memory can vary between 66Mhz to 1600Mhz.

9. **ATX Power Connector:** This is the second of two power connections. This is the main power connection for the motherboard, and comes from the Power Supply.

10.IDE Connectors or PATA Connectors: IDE full form is Integrated Device Electronics. it supports IDE devices, such as Hard disks and CD and DVD drives. Most drives today come with SATA connections.

11. Southbridge: This is the controller for components such as the PCI slots, onboard audio, and USB connections.

12.SATA Connections: SATA full form is Serial Advanced Technology Attachment. These are connect with serial ATA devices, such as Hard disk drives and CD or DVD drives.

13. Front panel Connections: This is where we will hook in the connections from the case. These are mostly the different lights on the case, such as power on, hard drive activity etc.

14. FDD Connections: The FDD is the Floppy Disk controller. Floppy Drive Connector is used to connect floppy drives. It supports two floppy drives.

15. External USB Connections: There are usually a couple of these ports located on each motherboard used for connecting pen drives and external hard drives, like Ipods or Mp3 players.

16.CMOS battery : This is the motherboard's battery, which is used to power the south bridge and the BIOS to save the setting, data and time.

RESULT:- Hence, we identified various internal & External slots in the motherboard & clean then with brush.

To practice inserting and removing RAM with care

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Procedure:

1. First, shutdown your computer and unplug all of the cables connected to it.
2. Then remove the size of the computer case so you can access the motherboard.
3. The RAM slots are adjacent to the CPU socket look for the big heat sink at the top of the motherboard and you'll see either 2 (or) 4 memory slots next to it.
4. In case of a motherboard with your RAM slots it's possible you'll want to install your first RAM stick into the slot 2, which isn't next to the slot 1. If you have a third stick ,it would go into slot 3, which will actually be b/w slot 1& slot 2,.finally, a fourth stick would go into slot 4.
5. Once you know where your RAM needs to go, you're ready to installing. Each RAM slot will have 2 small chips at either side. Press these down to open them. They don't need to move very far, so don't use to much force.
6. RAM Sticks are keyed, which means they have a gap in connector that will ensure you can only insert them one way.

7. With your RAM lined up, gently press it down into the slot when the RAM stick is fully depressed, the locking tabs at each side should click back into place once they you're all set
8. Finally, close up your computer case, plug everything back in , & turn on your computer It may take a couple of restarts of your computer motherboard to recognize & adjust to the new memory you've installed.

Precautions :-

1. Make sure the computer is unplugged
2. Make sure to use a static free work area when beginning any component change in your computer
3. Always touch the metal chassis of your computer to ground yourself.

RESULT:- Hence, we practiced inserting & removing RAM with care.

To measure the output voltage of SMPS

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

SMPS parts and connectors

Power-IN

The power-IN connector as shown in the figure is the input for MAINS supply. A power cable is inserted here, the other end of which is connected to mains supply. The input supply gets converted to DC supply.

Power-OUT

The power-OUT connector is connected directly to the Power-IN connector from inside the supply unit. It supplies the same AC supply that is fed to power-IN socket. The power-OUT connector is used to give supply to monitors or any display unit.

FAN

If you look at the back side of Computer-SMPS, you will find a FAN at the right side. The FAN as you can see, blows the air out and is only used to dissipate the internal heat from the SMPS since the switching is done at high frequencies which create a lot of heat inside

ATX connector

As you can see in the image, it is a 24-pin female connector which is used to supply DC supply to the motherboards. Various color-coded wires connect to this connector and each colored wire supplies distinct DC voltage which is explained in the chart below.

WIRE COLOUR	DC VOLTAGE

ATX-12V connector

Latest SMPS power supplies are accompanied by an extra 4-pin connector which supplies 12 volts to energize the central processing unit and other components of the motherboard

WIRE COLOUR	DC VOLTAGE

AT connectors

Earlier motherboards used to support AT connectors (6-pin each) also called P8 and P9 connectors to supply power to these motherboards.

WIRE COLOUR	DC VOLTAGE

Molex Connectors:

There are multiple 4-pin connectors that draw out from the SPMS unit. These connectors are used to supply DC power to various peripherals of computer like a floppy disk drive, hard disk drive or DVD-writers.

WIRE COLOUR	DC VOLTAGE

SATA-output connector

To feed the power to latest SATA hard drives, these connectors are used.

WIRE COLOUR	DC VOLTAGE

RESULT: - Hence, we measured voltage on different connectors at different test points and switching signals of SMPS.

To Disassemble & Assemble a Computer

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

2.Objective of the Experiment: _____

3.Equipment Required: _____

_____

Procedure to Disassemble a computer

Step 1: Detach the power cable:

The disassembling of the computer system starts with externally Connected device detachment. Make sure the Computer System is turned off, if not than successfully shut down the system and then start detaching the external devices from the Computer System. It includes removing the power cable from electricity Switchboard, then remove the Cable from SMPS from the back of the CPU cabinet. Do not start the disassembling without detaching the power cable from the computer System. Now remove the remaining external device like keyboard, mouse, monitor, printer or Scanner from the back of CPU Cabinet.

Step 2: Remove the cover:

The Standard way of removing tower cases used to be to undo the screws on the back of the case, slide the Cover back about an inch and lift it off. The screwdrivers as Per the type of screws are required to do the task.

step 3: Remove the Adapter Cards:

Make sure if the card has any cables or wires that might be attached and decide if it would be easier to remove them before or after you remove the card. Remove the screw if any that holds the card in place. Grab the Cards by its edges, front and back and gently rock it lengthwise to release it.

Step 4: Remove the drives

Removing drives is easier. There can be possibly three types of drives present in your computer system, Hard disk, drive, co/ DVD / Blu-ray drives, floppy disk drives (almost absolute now a day). They usually have a power connector and a data Cable attached from the device to a controller card or a Connecter on the motherboard CD/DVD/Blu-ray drive may have an analog cable Connected to the Sound Card for direct audio output.

The power may be attached using one of two Connectors a molex Connector or a Berg Connector for the drive. The molex Connector may require to be wiggled slightly from to side and apply gently pressure outwards.

The berg connector may just pull out or it may have a small fab which has to be lifted with a screwdriver. Now pull data Cable off from the drive as well as mother board Connector. The hard disk drive and CD/DVD driver have two types of data cables IDE and SATA cables. The IDE cable needs better care white being removed as it may cause the damage to drive Connecter pins. Gently wiggle the cable Sideway and remove it. The SATA Cables Can be removed easily by pressing the lab and pulling the Connector Straight back. Now remove the screws and slide the drive out the back of the bay.

Step 5: Remove the memory module

Memory modules are mounted on the motherboard as the chips that can be damaged by manual force it applied improperly. Be careful and handle the chip only by the edges. SIMM's and DIMM's are removed in the different way.

SIMM: Gently push back the metal tabs while holding the SIMM chip in the socket. Till the SIAM Chip away from the tabs until a 45%. angle. It will now lift out of the Socket Put SIMM in a safe place.

DIMM: There are plastic tabs on the end of the DIMM Sockets. Press the tabs down and away from the socket. The DIMM will lift Slightly. Now grab it by the edges. and place is safely. Do not let the chips get dust to get.

Step 6 Remove the power Supply

The power supply is attached into tower cabinet at the top back end of the tower. Make sure the power connector is detached from the switchboard. Start-removing the Power Connector including CPU fan power connector, Cabinet fan, the front panel of cabinet power buttons and all the remaining drives if not detached yet. Now remove the Screws of SMPS from the back of the cabinet and the SMPS can be detached from the tower cabinet,

Step 7 Remove the motherboard

Before removing all the connectors from the motherboard make sure your memorize the connectors for assembling the computer if required, as that may require connecting the connectors at its place. Remove the screws from the back of the motherboard and you will be able to detach Pt from the cabinet. Now remove the CPU fan from the motherboard. The heat sink will be visible now, which can be removed by the Pulling the tab upward. finally, the processor is visible now, which can be removed by the plastic tab which can be pulled back one stretching it Side way.

Procedure to assemble a computer

The assembling of the computer system is exactly the opposite of disassembling operation. Before starting assembling the computer System, make sure you have the screws and a Screwdriver for those.

Step 1: Mount the processor

The first step for assembling the computer system starts with mounting the processor on the processor socket of the motherboard. To mount the process, you don't need to apply any force. The special 22 (zero insertion force) sockets are usually used to prevent any damage to the processor Pins. Once the processor is mounted, the heat sink will be attached on top of the processor. The CPU fan is also attached on top of the heat sink.

Skep 2: fix the Motherboard in the tower case

Now the motherboard is to be fixed vertically in the tower case and the screws are fixed from behind of the motherboard.

step 3: Connect the power Supply

Now line up the power supply at the top back end of the cabinet and screw it. The power connectors for motherboard power supply and CPU fan power supply are to be Connected. If the cabinet Coding FAN is required then it is to be screwed and the back and grill of the Cabinet and its power connector is to be connected from

Step4: Install the Driver

Install the CD/DVD drives at the top front end of the Cabinet and screw it. Install the hard disk drive and floppy disk drive below CD/DVD drive and screw it.

Make sure once Screw there is no vibration in either of the CD/DVD hard disk or floppy disk drives.

Step 5: Connect Cables

Now Select the approximate data cable and Connect one end of the cable to its drive socket and other end at its appropriate Connector on the motherboard for SATA hard disk drive or co/DVD drives used SATA cable and its power, Cable, else use IPT data cable. Do the proper Jumper Settings as the usage requirement.

Step 6: Mount the memory modules

It is time now to mount the memory modules on the motherboard by aligning the RAM to its socket on the motherboard and press it downward. Make sure the side tab are fixed into the RAM I have to press a bit.

Step 7: Install the Internal Cards

Install the internal cards to its Sockets and attach the

Cables or power cables to it. The selection of right socket or slot is required as per the type of Socket.

Step 8: Cover the Tower

Cover the tower by placing it and pressing towards a front sick and screw it.

Step 9: Connect the external Devices and Power

Connect the external devices with CPU at its appropriate socket. It includes mouse and keyboard at PS2 OR USB Connectors. Monitor at the video o/p socket. Connect the power cable to the back of towers in SMPS. Plug in power cable to the electric board.

Precautions:

- Shutdown the computer system before the commencement of the process.
- Remove all the interfaces of the devices connected with the cabinet.
- Perform the task at the duty, non-humid area to prevent environmental problem.
- If you are inexperienced, take a picture of the inside assembly of the cabinet. So that you can attach the thing at the right place at the time of reassembly,
- keep all the screw properly and fix all them at the appropriate place.

RESULT: Hence, we disassemble & Assemble a computer successfully.

Changing CMOS setup

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Method-1: BIOS MENU

By operating the BIOS menu and finding the default settings option, you can reset the BIOS directly from this menu.

To do so, follow these steps: -

1. Restart your computer.
2. Note the key that you need to press at the first screen. This key press the BIOS menu or "setup" utility.
   Find the option to reset the BIOS settings. This option is usually collect any one of the following.
   - Load default.
   - Load safe defaults.
   - Load BIOS default.
   - Load default settings.
   - Load setup default.
   - Load [or] get default values.

Method-2: Clear the Jumper

Your computer's motherboard has a special jumper that can clear the BIOS, several settings and reset them to their original values.

By clearing the jumpers, you can also reset the password for the BIOS menu.

To do so, follow these steps:

- Shut down your computer.
- Flip the power switch so that the computer receives no power.
- Make sure your grounded static discharges can damage your computer.
- On the motherboard. Find a jumper that's named like any of the following [These jumper is usually placed near the CMOS battery]
    1. CLEAR CMOS.
    2. CLEAR.
    3. CLR CMOS.
    4. CLR PWO
- Set the jumper to the CLR position
- Power on & start your computer
- Once your PC has booted, turn it back off. Move the CLR jumper back to its original position. Otherwise, each time you select reboot your settings, [and clock] will automatically reset.

Method-3: Replace the CMOS Battery

If the method #2 hello doesn't work [your computer doesn't have the mentioned jumper] you can also try to remove and replace the CMOS battery. This method works if your computer has a CMOS battery. Not all motherboards have that battery.

To reset the BIOS by replacing the CMOS following steps instead:

- Shut down your computer.
- Remove the power cord to make sure that your computer receives no power.
- Make sure your grounded static discharges may damage your computer.
- Find the battery on your motherboard and remove it.
- Wait up to 10 minutes.
- Put the battery back in.
- Power on your computer.

Result: - Hence, we changed the CMOS setup.

Install windows operating system

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

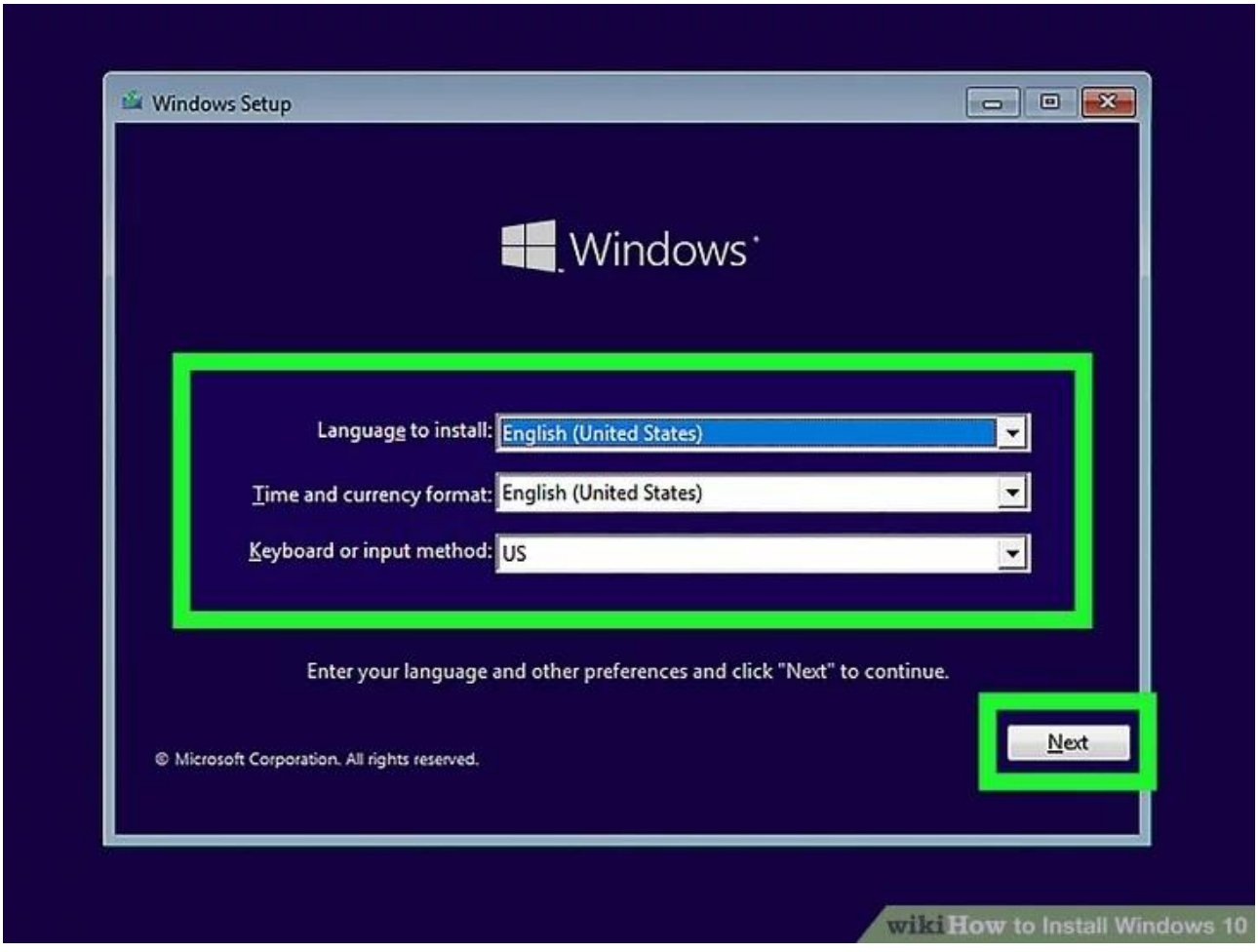
3.Equipment Required: _____

_____

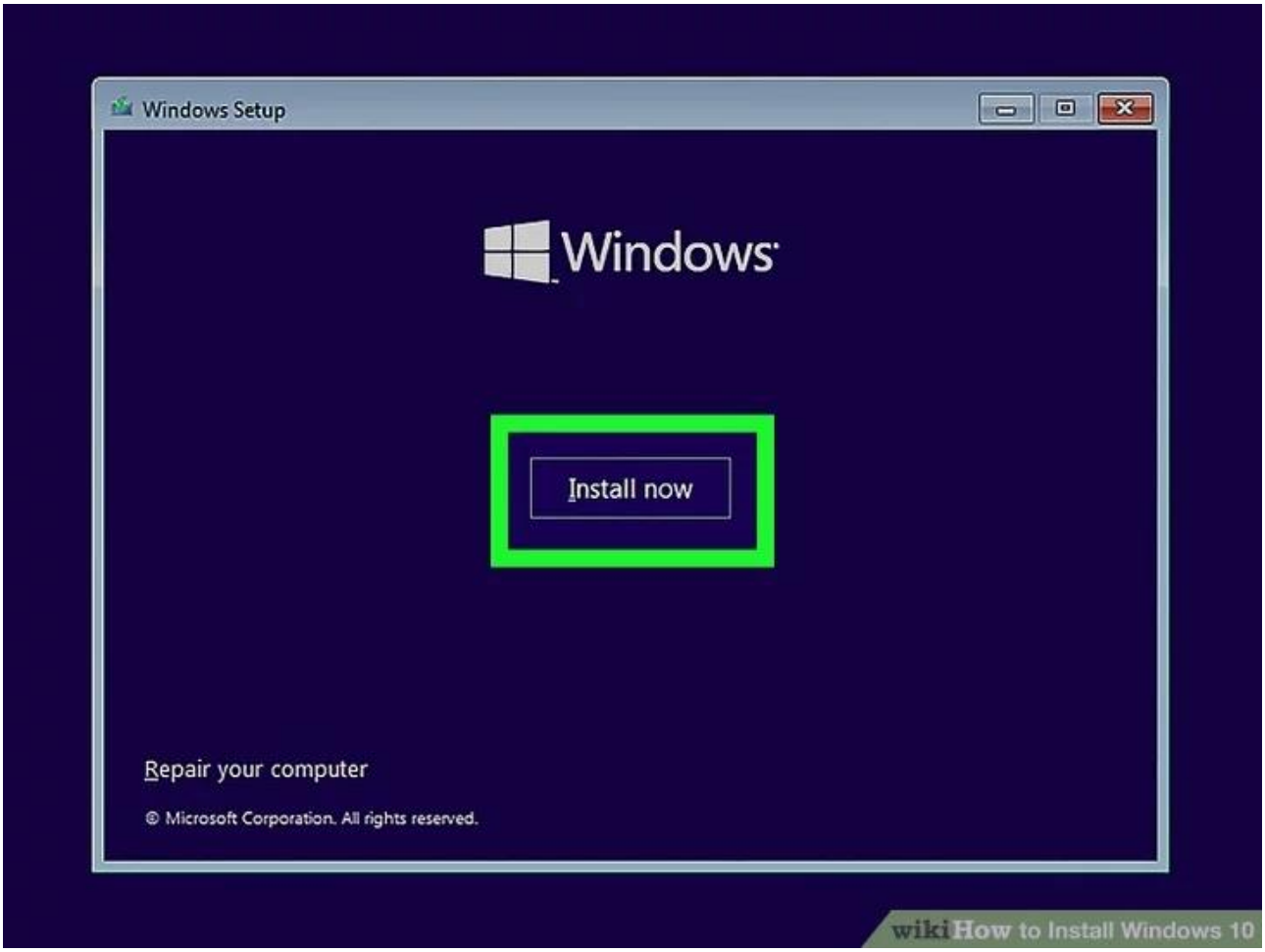
Step 1: - play Windows 7 DVD in your DVD-ROMs Drive and start your PC. Windows 7 will start to boot up and you will get the following screen with the rotating progress bar.

- Acer and Asus: F2 or Del
- Dell: F2 or F12
- HP: ESC or F10
- Lenovo: F1, F2, or Fn + F2
- Lenovo ThinkPads: Enter + F1.
- MSI: DEL
- Microsoft Surface Tablets: Press and hold the volume-up button.
- Samsung and Toshiba: F2
- Sony: F1, F2, or F3

Step 2: - the next Screen allows you to set up your language, time and currency format, keyboard or input method. Choose your required settings and click next to continue.



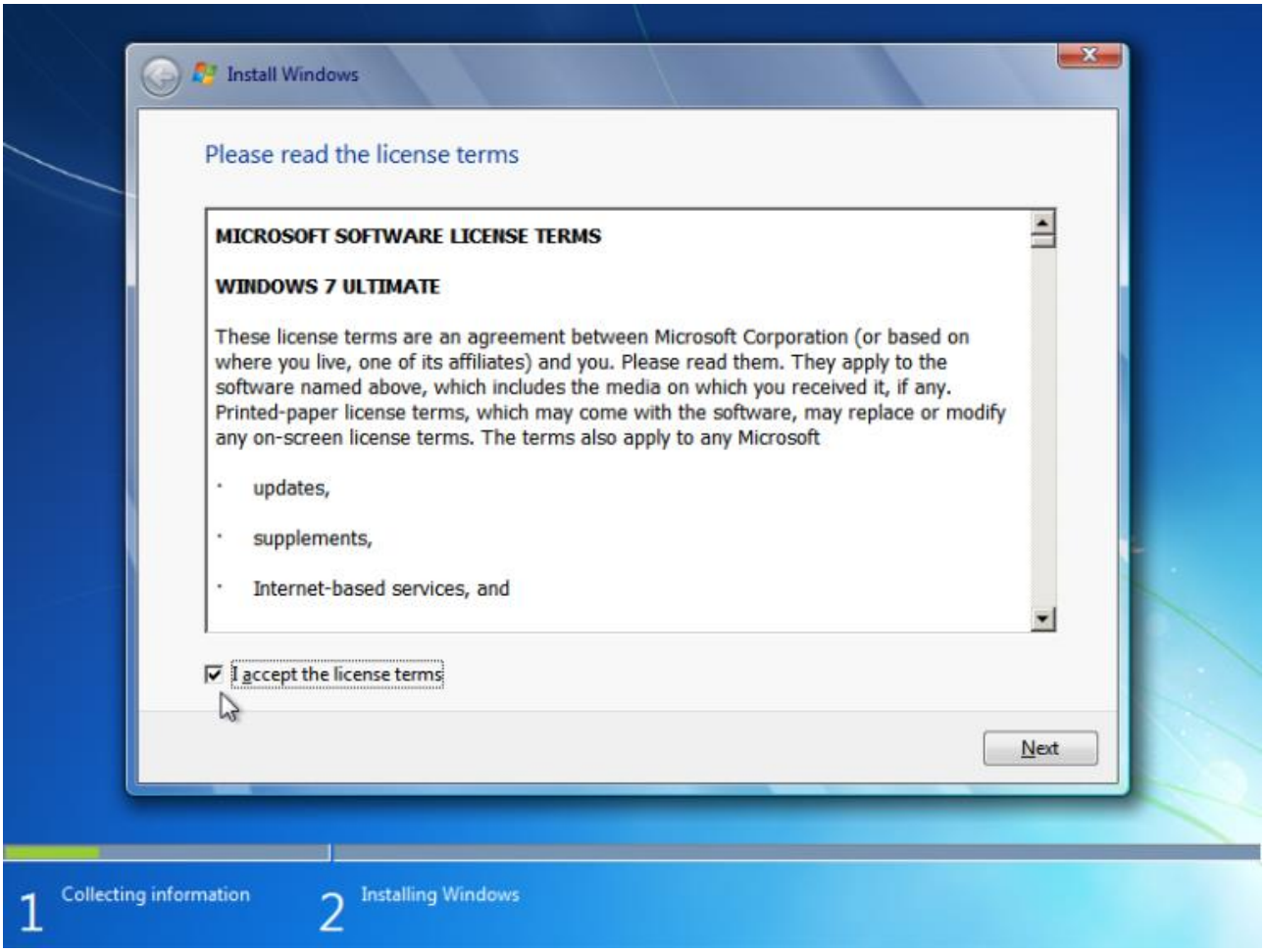
Step 3: - the next screen allows you to install or repair Windows 7. Since we are doing a clean install we will click on “install now”



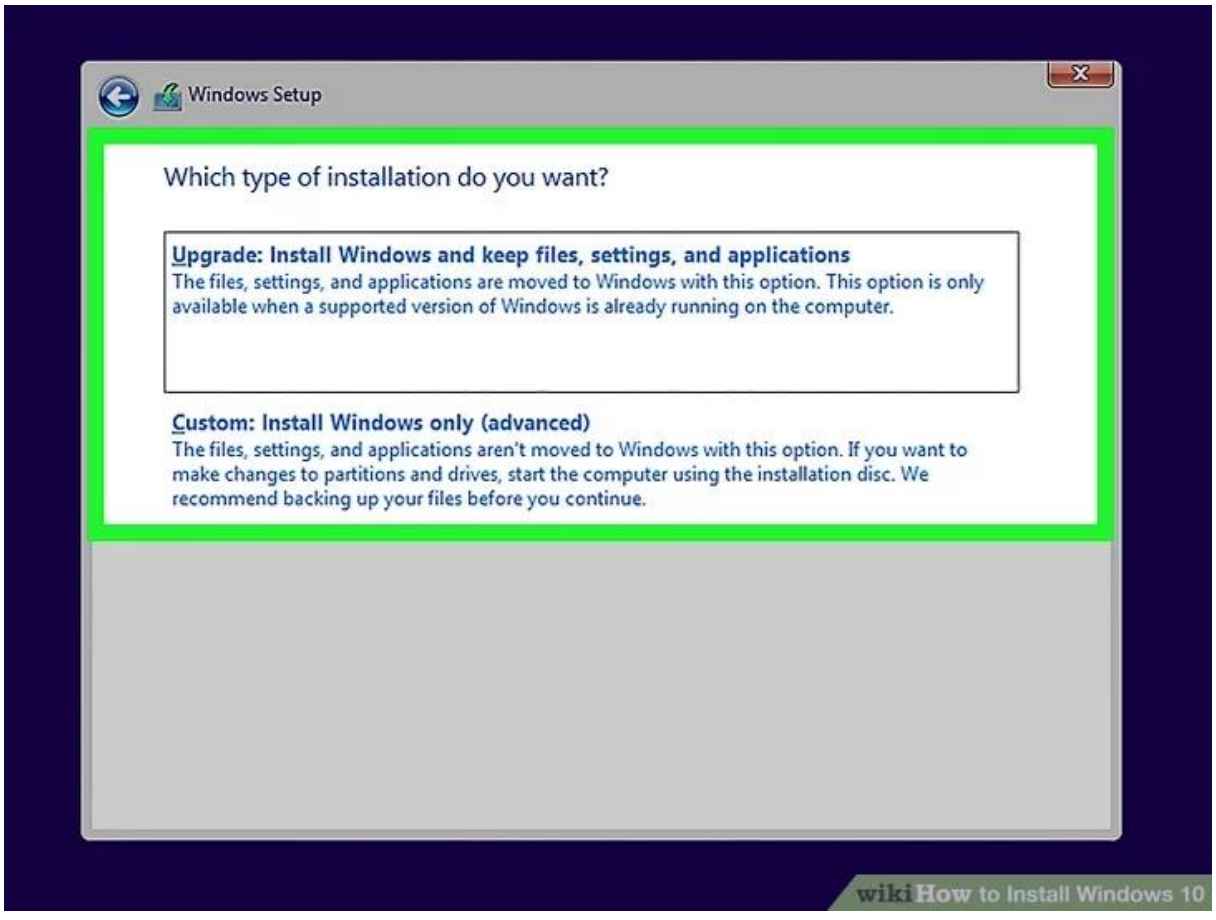
Step 4: - the setup process starts as shown.

Step 5: - At this stage you need to type your product key that came with your copy of Windows 7. Click next Once you’ve entered the product key correctly.

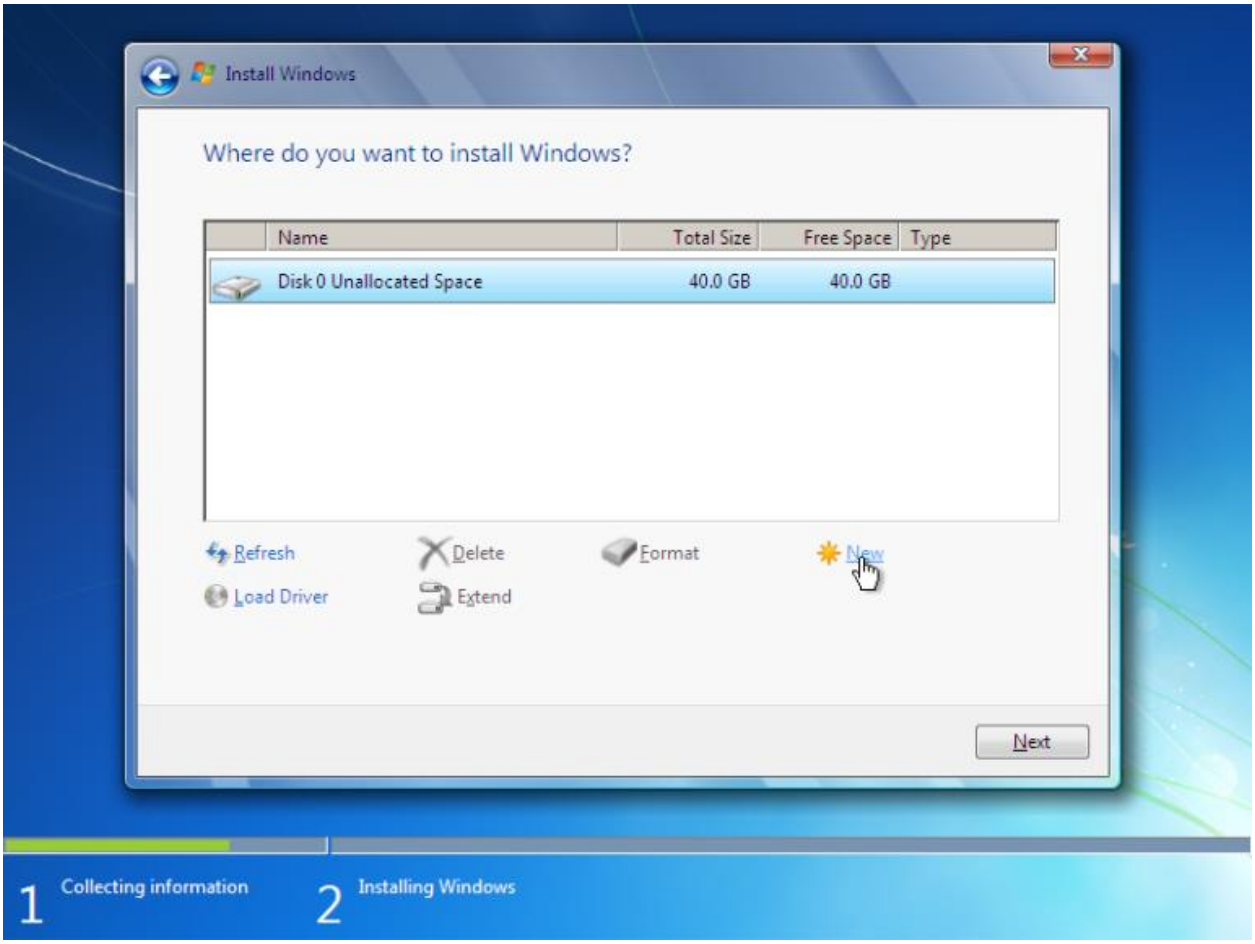
Step 6: - Read the license terms and tick. I accept license terms, then click next to continue.



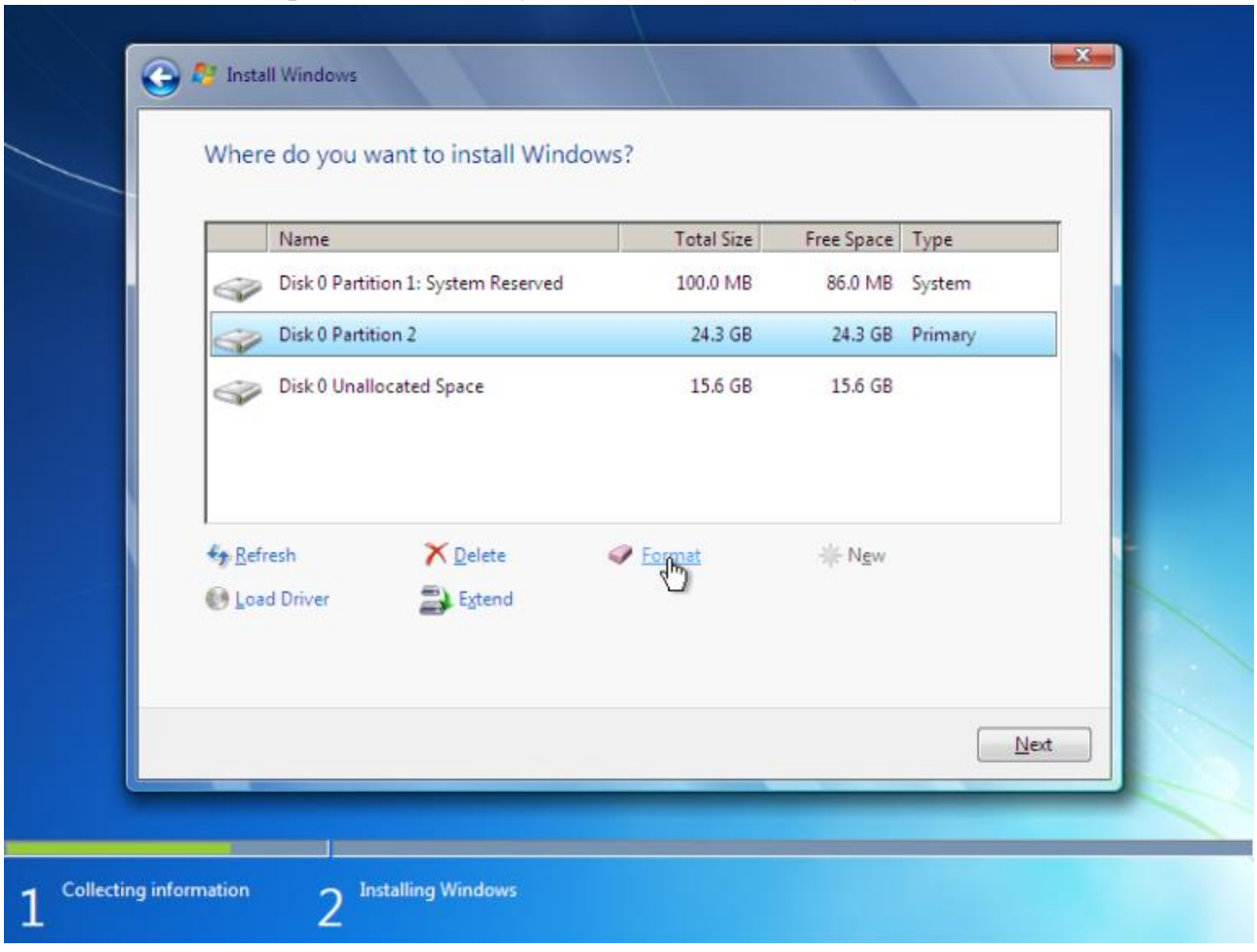
Step 7: - choose the type of installation you want. Since you are doing a clean install, you need to click on custom



Step 8: - If you want to partition an existing drive then click new. Choose the size of the partition and click apply.

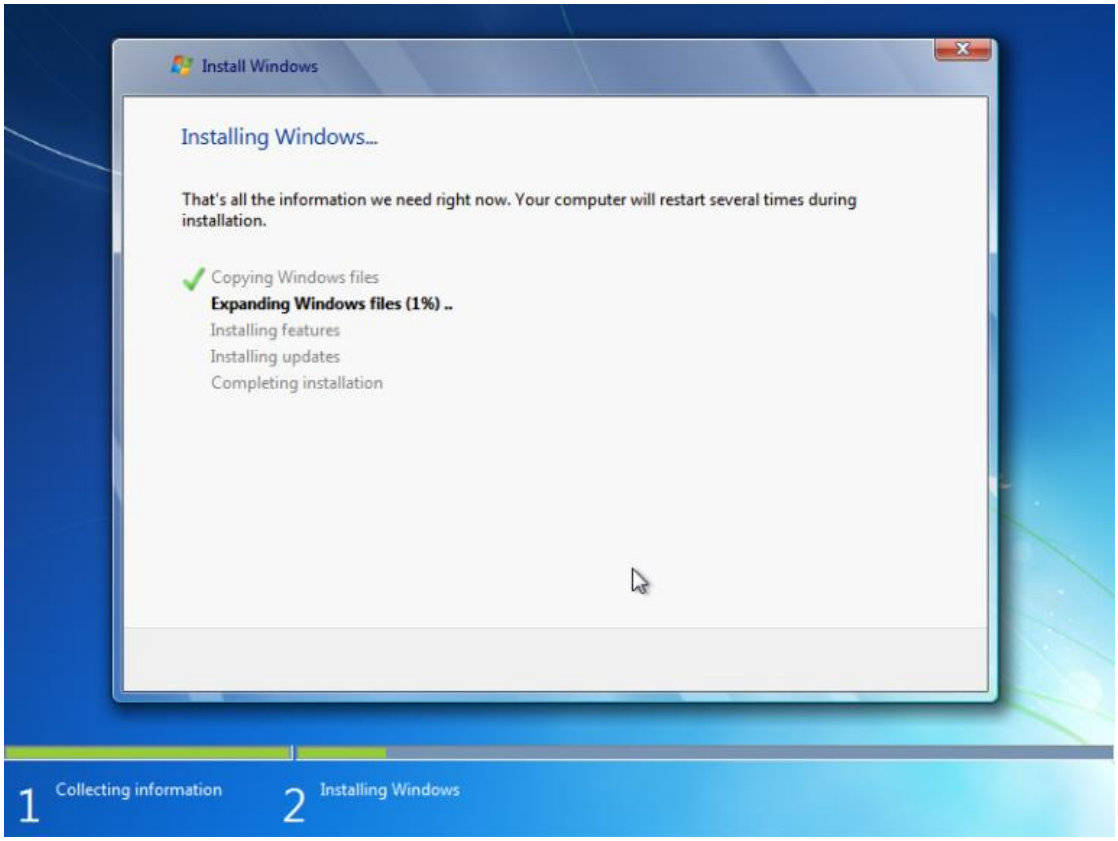


Step 9: - click OK to create the partition. Windows will create additional system partition which you don't have to worry about.

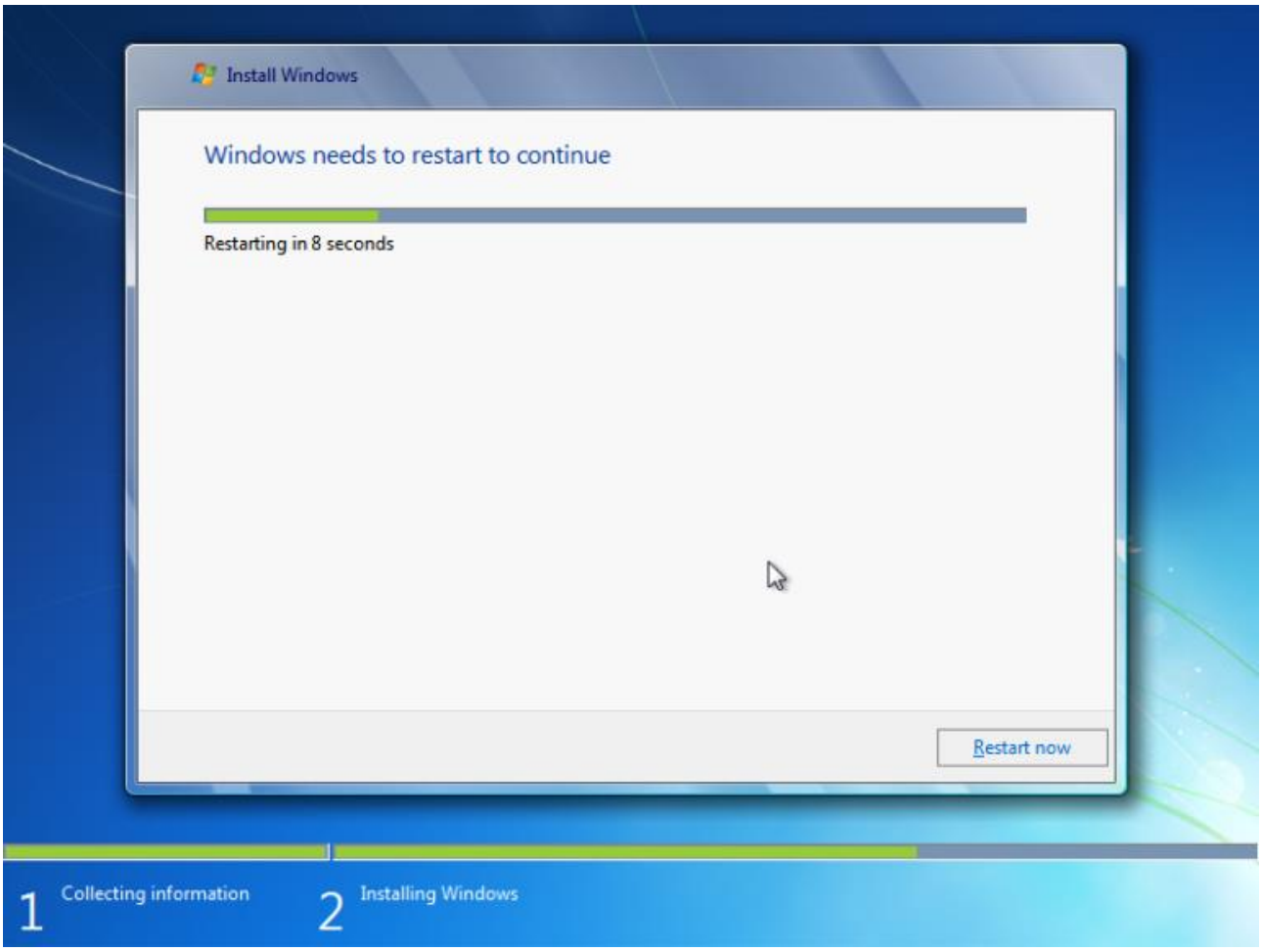


Step 10: - choose where you would like to install Windows 7 and click NEXT.

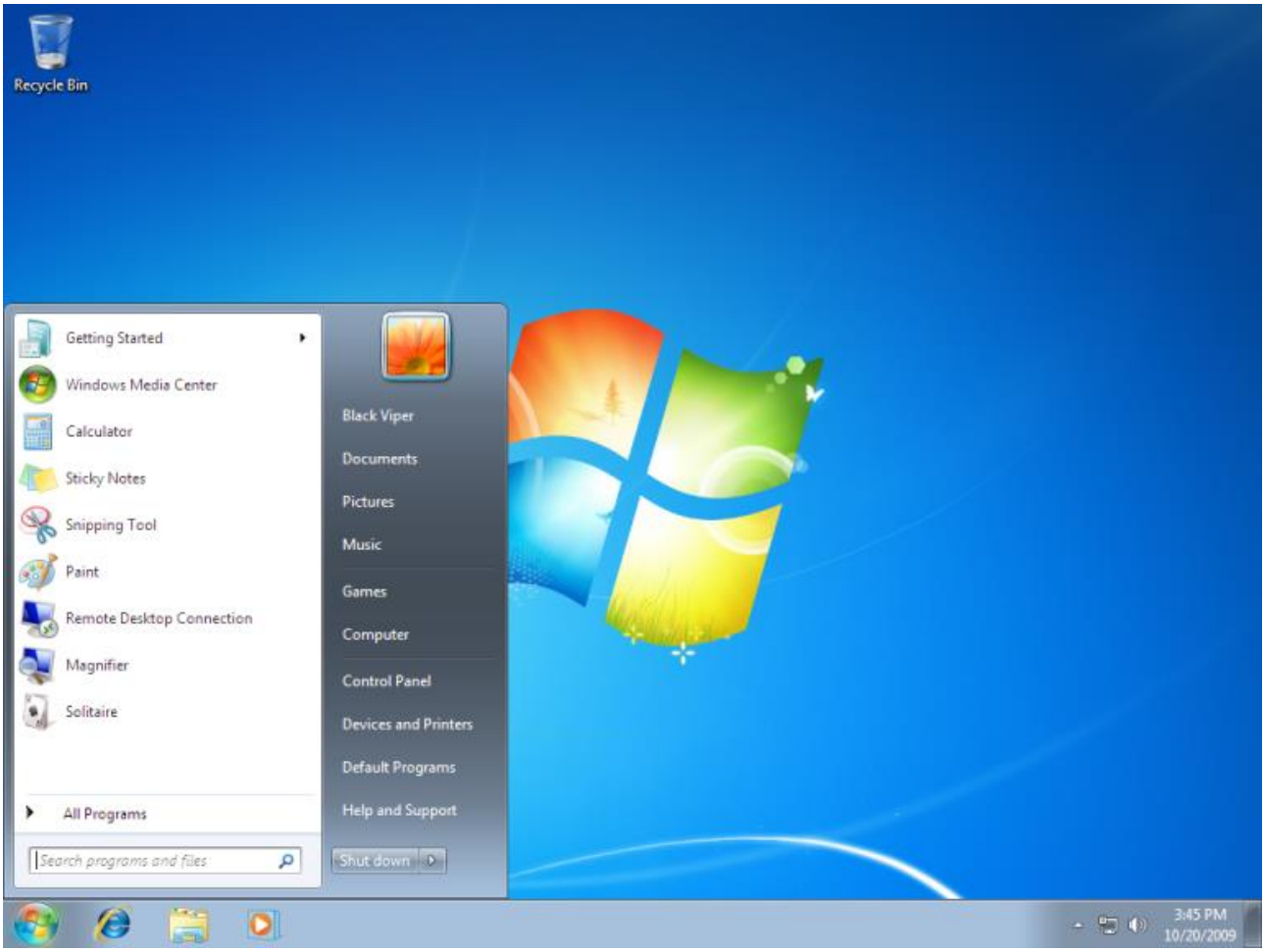
Step 11: - now windows start installing in the selected drive.



Step 12: - after some time it will ask RESTART Now click on it.



Step 13: - Now the installation of WINDOWS-7 completed.



Result: - Hence, We successfully installed Windows operating system.

Verify the functions of control panel settings

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Procedure:

This area is the central location from which aspects of the windows 10 operating system can be managed. There are three views that can be used to display items in the Control panel.

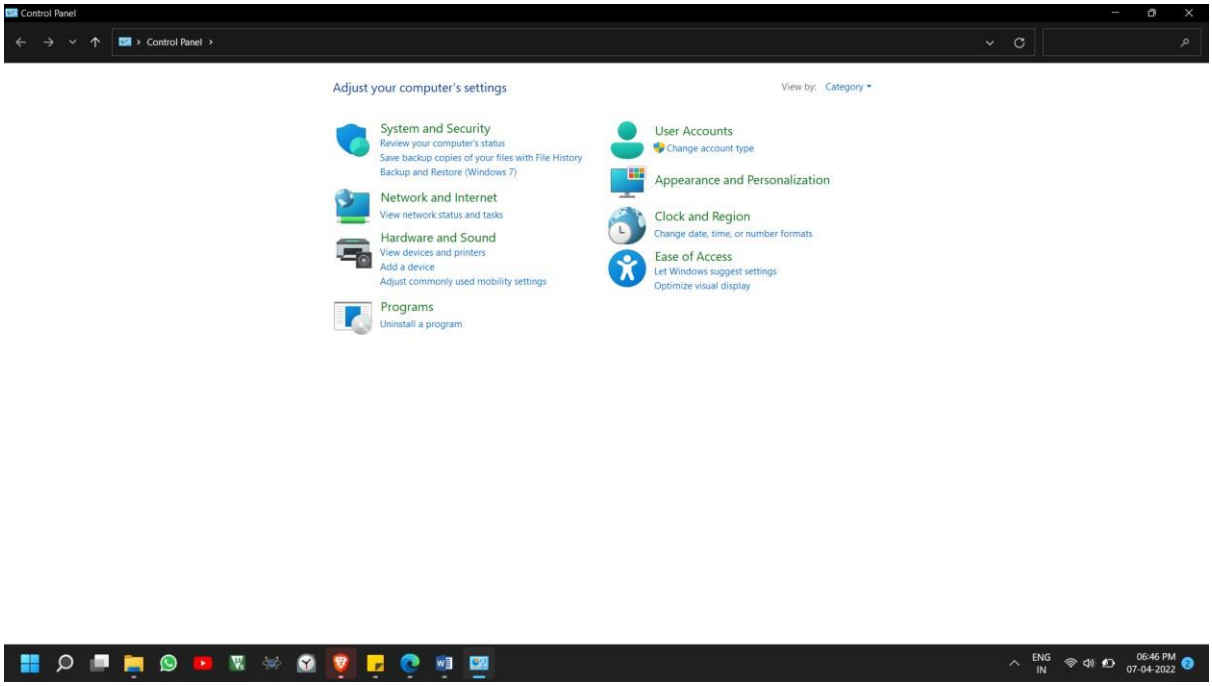
Category – In this view, Control panel items are divided into eight categories. links to most common tasks are available under the category name

Large Icons – when this option is selected, the all control panel items window will display.

A list of all the control panel items will display

Small Icons – when this option is selected, the all control panel items window

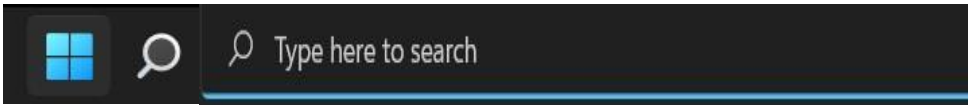
A list of all Control panel items will display



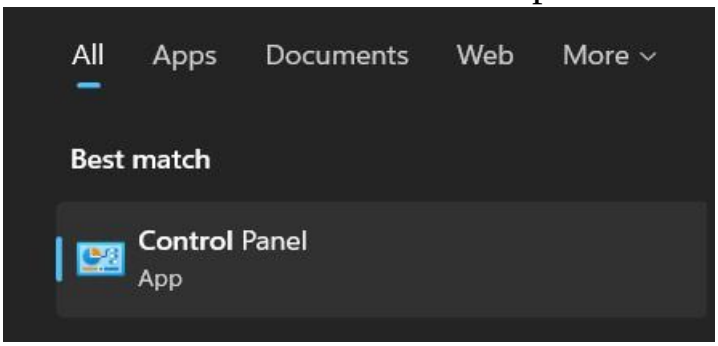
The most common tasks within each category are listed below the category name. within the control panel category, clicking subcategory opens that item's window; Clicking it ask jumps to a specific command center available from the item's window. **Taskbar and Navigation Options:**

This area is used to make changes as to how items appear on the Taskbar or the Start Menu.

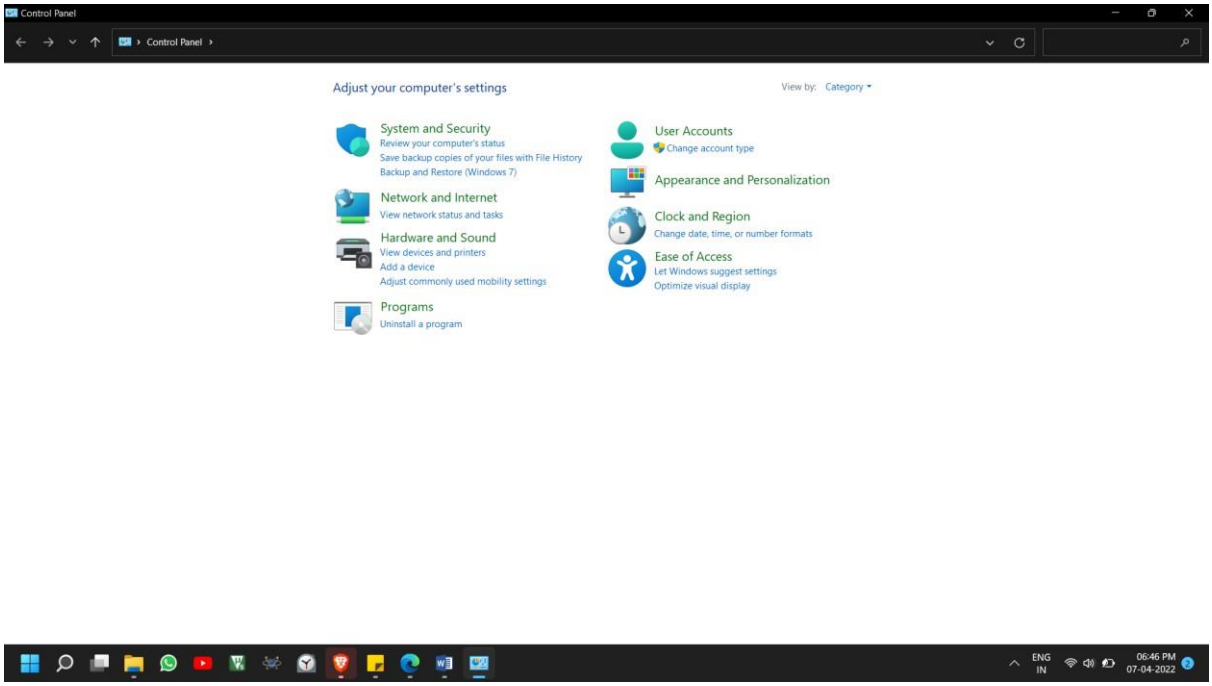
- In the search box to the right of the start button input **control panel**.



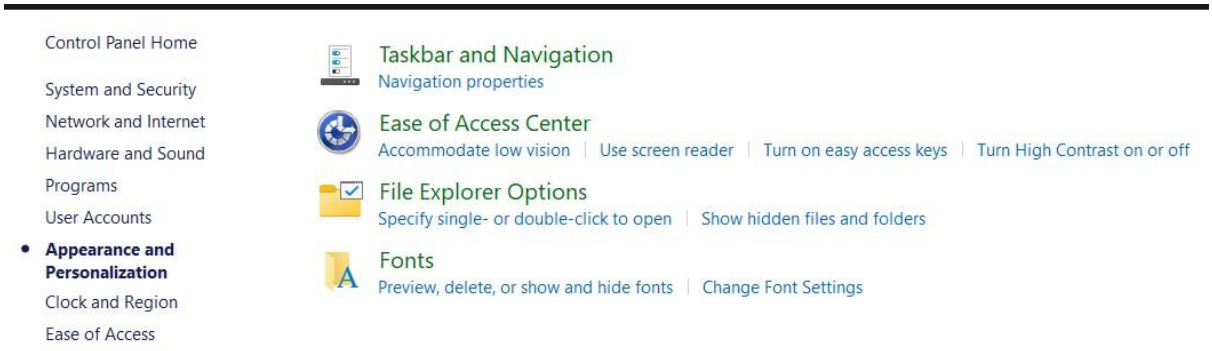
- Click the **Control Panel** link at the top of the **start menu.**



- The **control panel** window will display



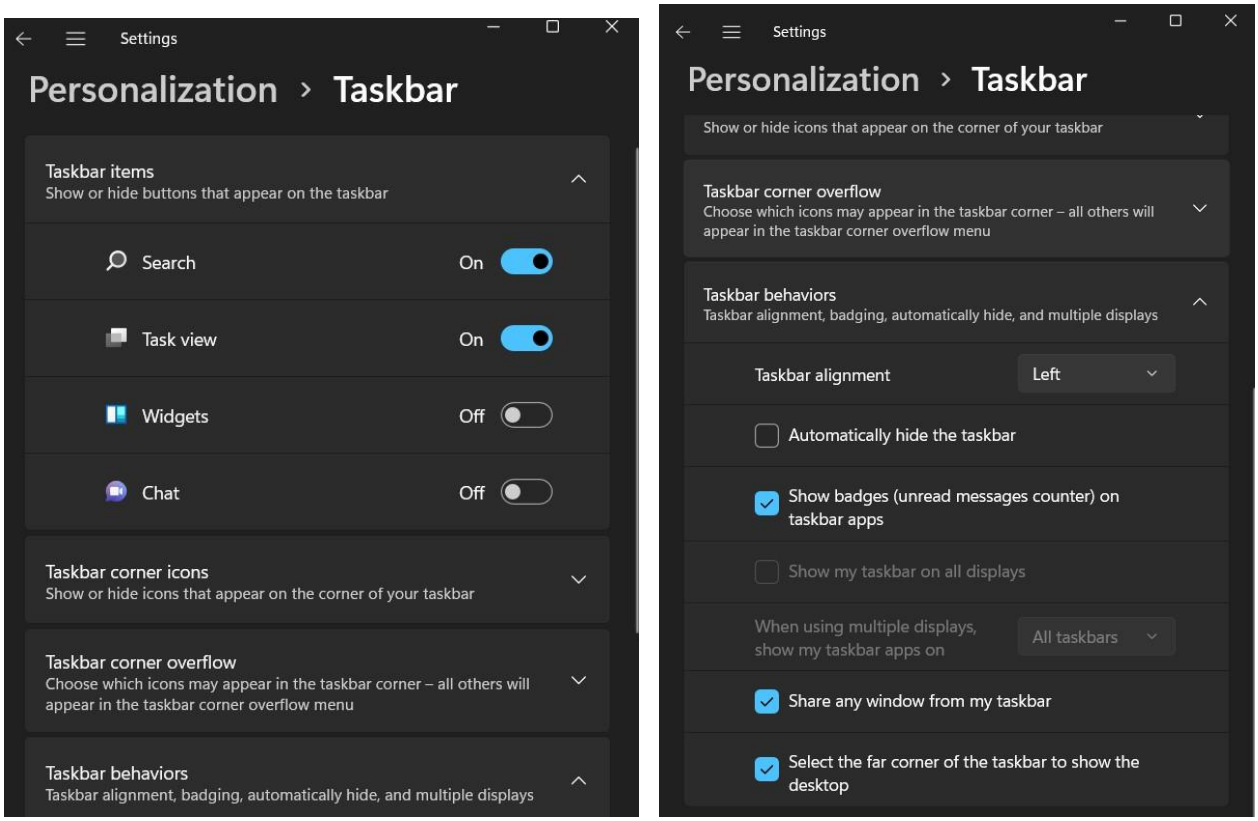
- Click the **Appearance and personalization** link.
- The **Appearance and personalization** window will display



- Click **Taskbar and Navigation**
- The **Taskbar and start menu properties** dialog box will display.

Taskbar

- Click the **Taskbar** link in the left frame of the window.



- The **Taskbar** windows will display.
- Select either **On** or **Off** for any of the following options.
    - Lock the taskbar
    - Automatically hide the taskbar in Table mode.
    - Use small taskbar buttons
    - Use peek to preview the desktop when our move your mouse
    - Replace Command prompt with windows power shell
    - Show badges on taskbar buttons
- Select the location for the taskbar on the screen on the screen.The options are left,Right,bottom,or Top.
- Specify whether or not to combine Taskbar buttons. The option are:
    - Always, hide lables
    - When taskbar is full

- Never

➢ Under **Notification:**

- Select which icons appears on the taskbar- A list of icons will display.
- Turn system icons on or off – A list of icons will display

➢ Under **Multiple Displays:** Select whether or not to **show taskbar on all displays.**

➢ if **On** is selected ,select from the following two items.

- Show Taskbar buttons on
- Combine buttons on other Taskbars

Start:

➢ The **start** window will display.

➢ Select either **On** or **Off** for any of the following options.

- Show more tiles on start.
- Show app list in Start menu.
- Show recently added apps.
- Show most used apps.
- Occasionally show suggestions in start.
- Use start full screen.
- Show recently opened items in jump list On start or the taskbar.

➢ Click the **show which folders appear on start** Link to select from a list of folders such as File Explorer, settings, or documents.

Configure power options:

Introduction

Windows provides the following plans to help you manage your computer's power.

- **Balanced –** this plan offers full performance when it is needed. It saves power during periods of inactivity. This is the best power plan for most people.
- **Power saver –** with this plan, power is saved by reducing system performance and screen brightness. This plan can help laptops users get the most from a single battery charge.

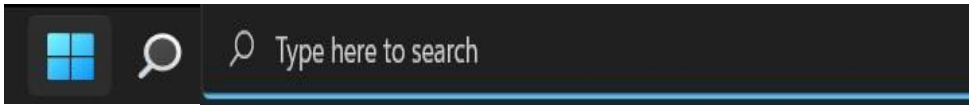
- **High performance –** to maximize screen brightness and increase the computer's performance in some circumstance Use this plan. This plan uses a lot more energy and will reduce the amount of time that a laptop battery lasts between charges.

This power plans define how the computer uses power. All of the plans determine how long the computer will remain idle before the display is turned off. And the computer is placed in sleep mode. When working on a portable computer that is running on battery power, the power saver plan will increase the length of time the battery charge lasts. The default settings are defined in the following table.

Power Plan	Turn off Display	Activate sleep Mode
Balanced	10 minutes	30 minutes
Power saver	5 minutes	15 minutes
High performance	15 minutes	Never

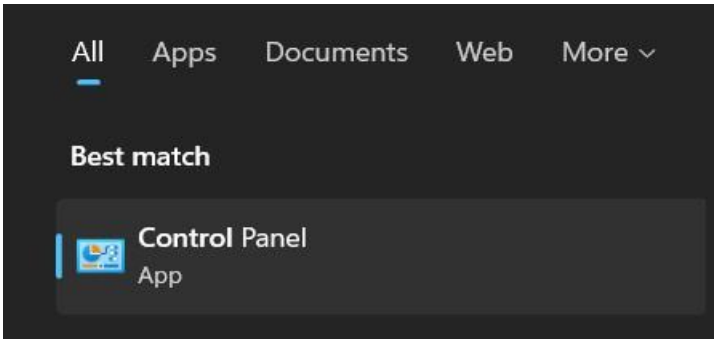
If the built-in Power saver plans don't meet your needs. A custom power plan can be created.

Access power options:



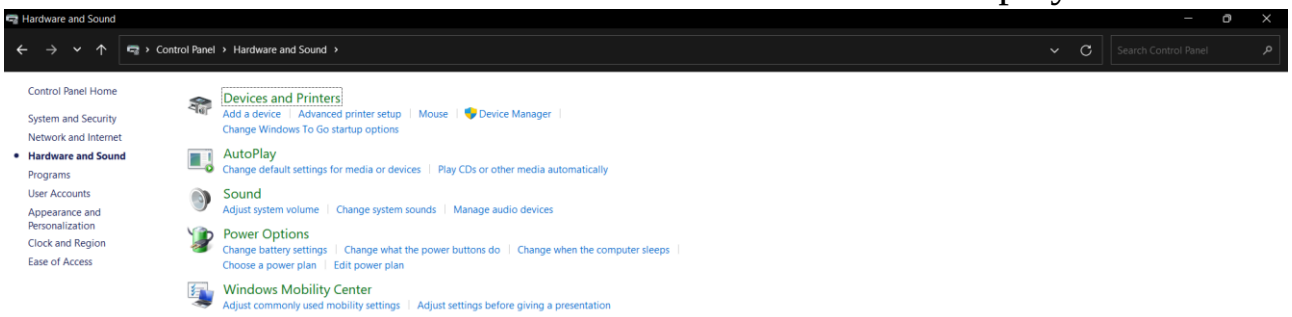
In the **search** box to the right of the **start button** input **control panel.**

- Click the **control panel**, click at the top of the **Start menu.**

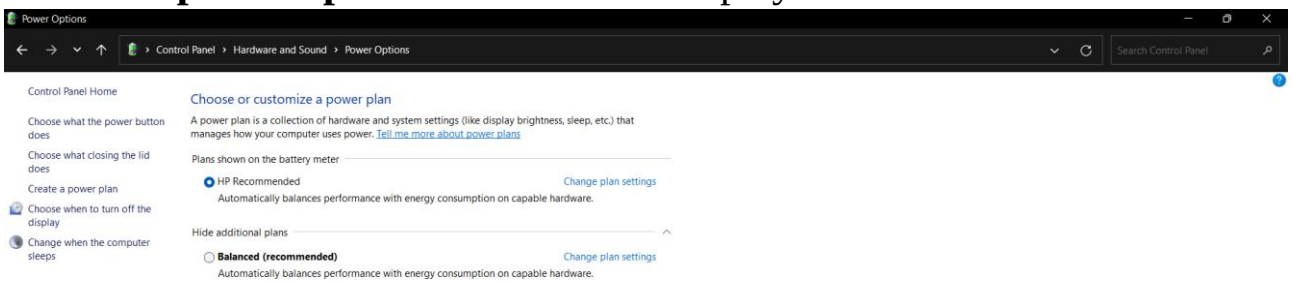


Choose what power button does

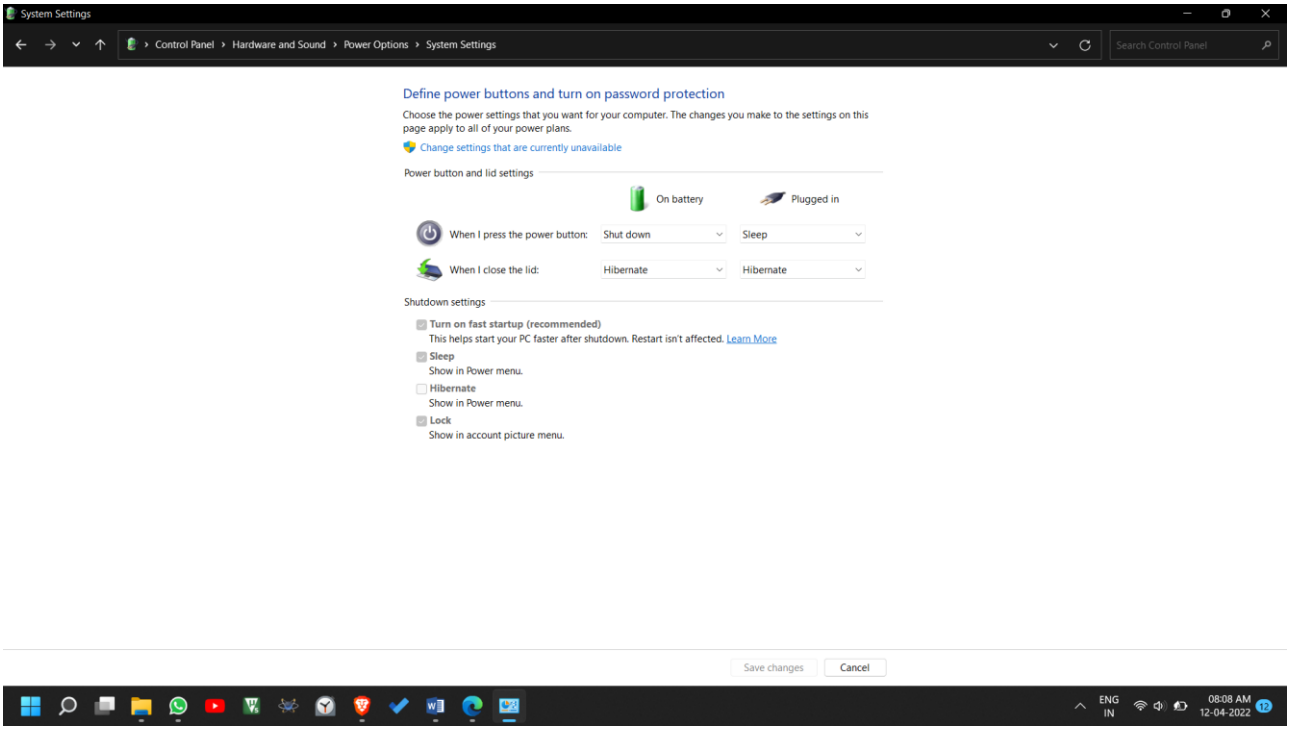
- Click the hardware and sound link.
- The hardware and sound window will display.



- Click the **power options** link.
- The **power options** window will display.

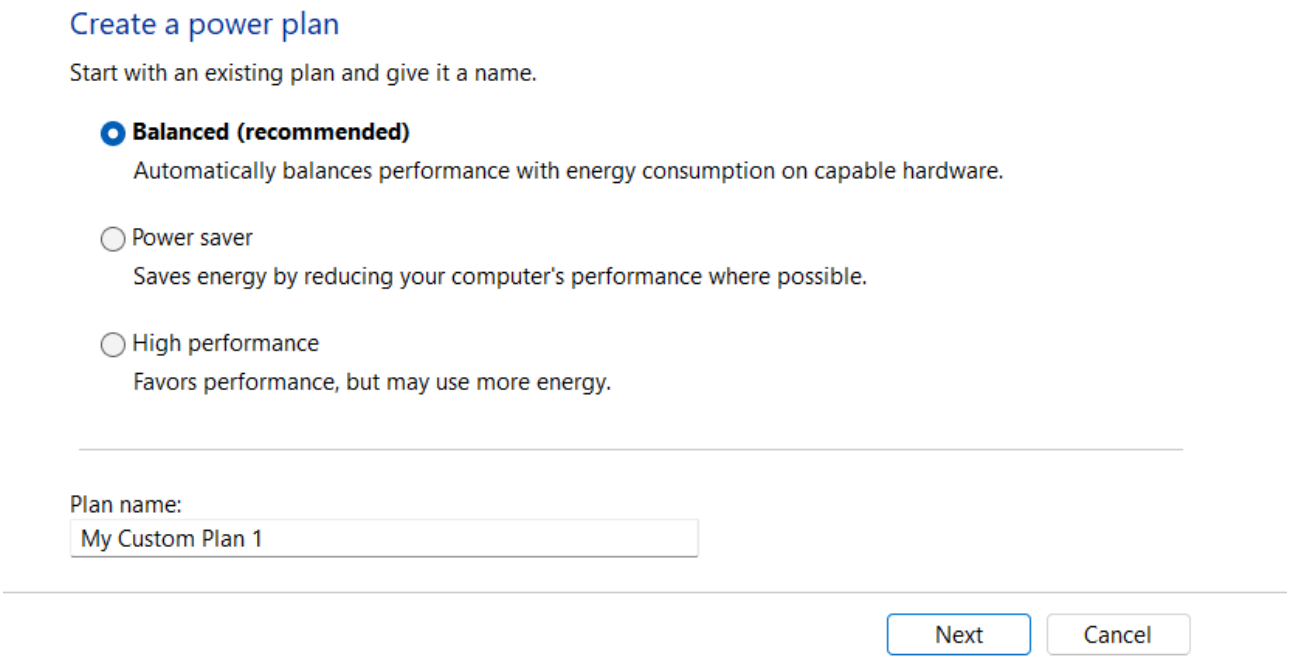


- click **choose what the power button does.**
- The **define power buttons** window will display. (See illustration on next page).
- Under **power and sleep buttons and lid settings**, select how power should work when the battery or when the computer is plugged in the following options.
    - ➢ When I press the power button.
    - ➢ When I press the sleep button.
    - ➢ When I close the lid.
- Click the **change settings that are currently unavailable**, to activate the options under shutdown settings.
- **When all the changes have been made, click the save Chinese button.**

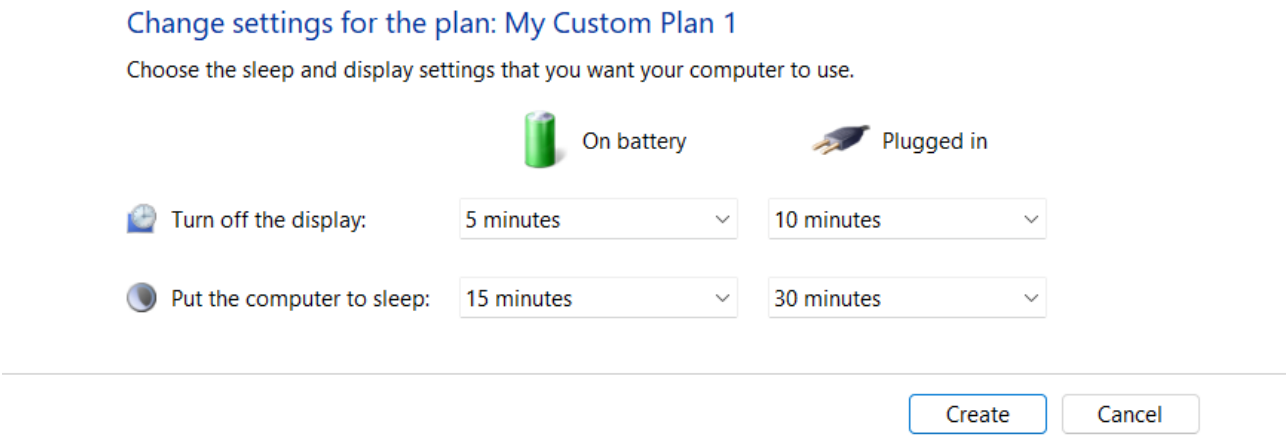


Create a power plan

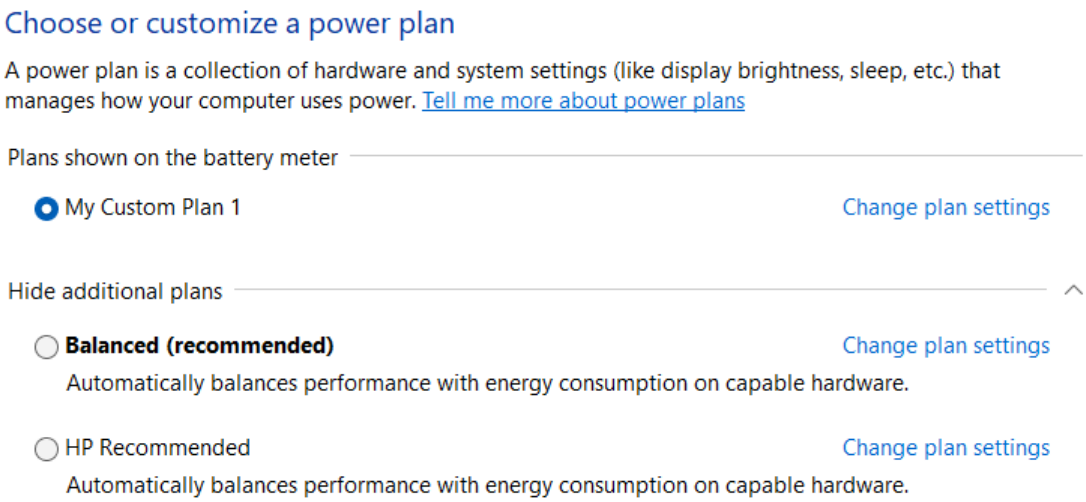
- In the left frame of this window, click the **create a power plan** link.
- The **create a power plan** window will display.



- In this window, click one of the plans.
- Click the **Next** button.
- The **change settings of for the plan** window will display.

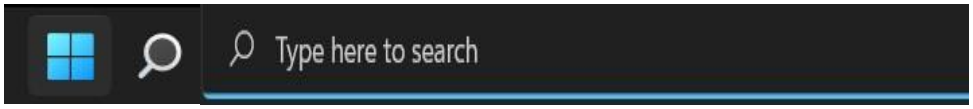


- Select the **sleep and display** settings for your computer.
- Click the **create** button.
- The **choose or customize a power plan** window will display.



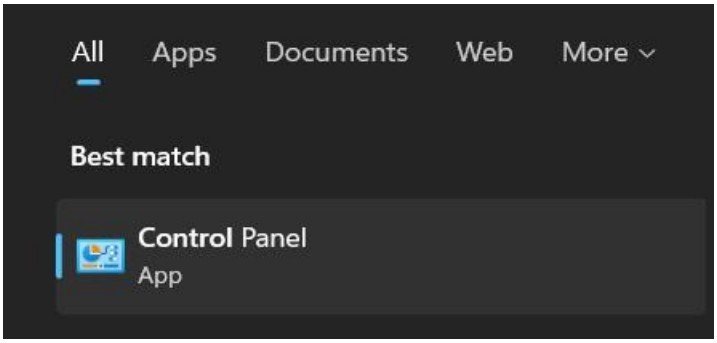
- Select the plan that is to be used.
- Click the **change plan settings** on Sling to make changes to the plan.

<u>Clock, Language and Region</u>

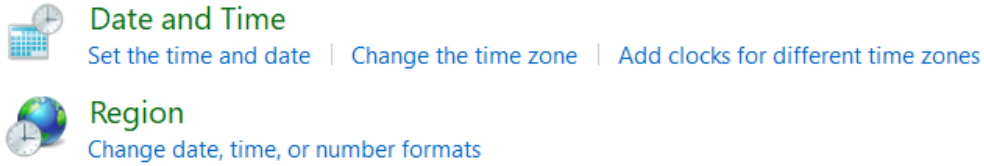


In the **search** box to the right of the **start button** input **control panel.**

Click the **control panel**, click at the top of the **Start menu.**

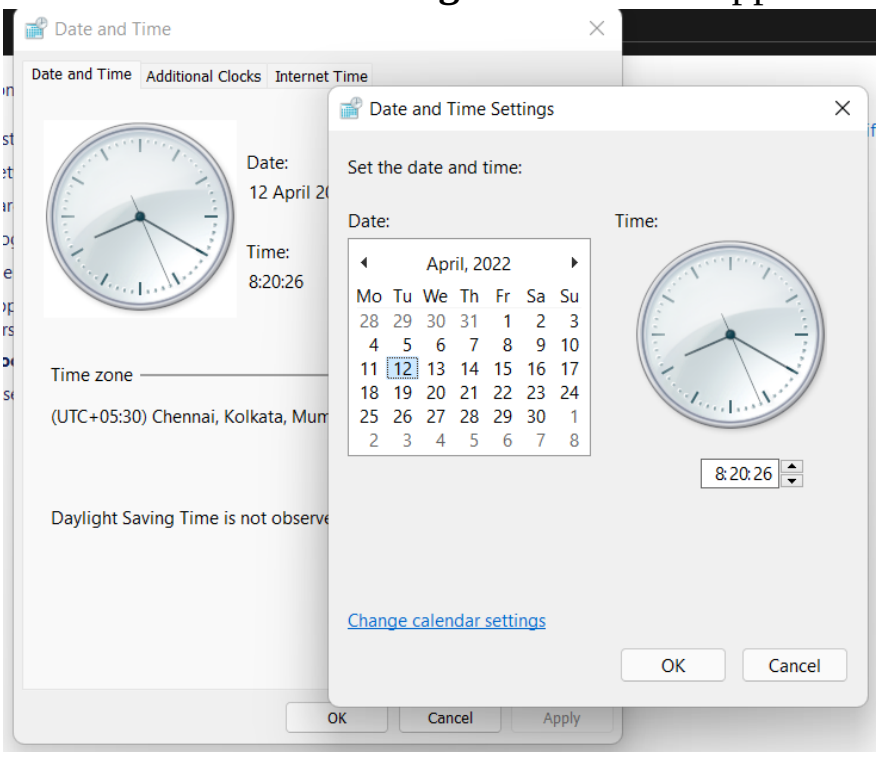


- The control panel window will display.
- Click the **clock, language, and region** link.
- The **clock, language, and region** window will display.



Change date

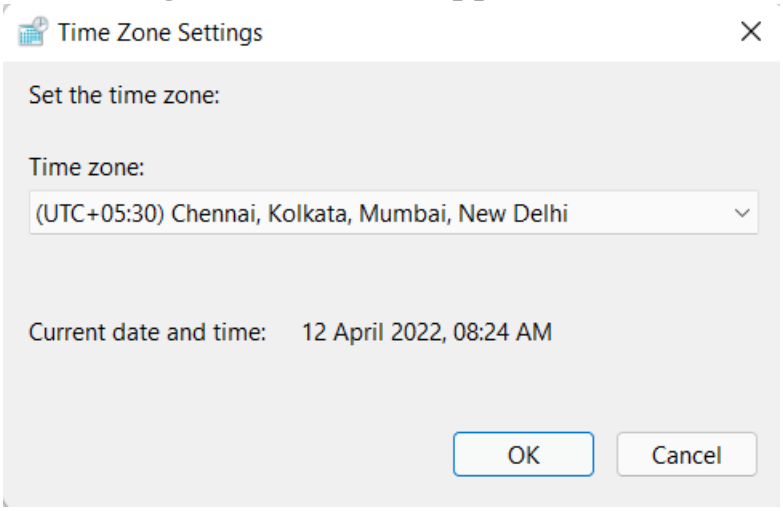
- Click the **date and time** link.
- The **date and time** dialog box will appear.
- Click the **change date and time** button.
- The **date and time settings** window will appear.



- Make any desired changes to the **date and time**.
- Click the OK button to exit the **date and time settings** window.
- Click OK the second time to close the **date and time** window.

Change Time Zone

- To change the time zone, click the **change time zone** button.
- The **time zone settings** window will appear.

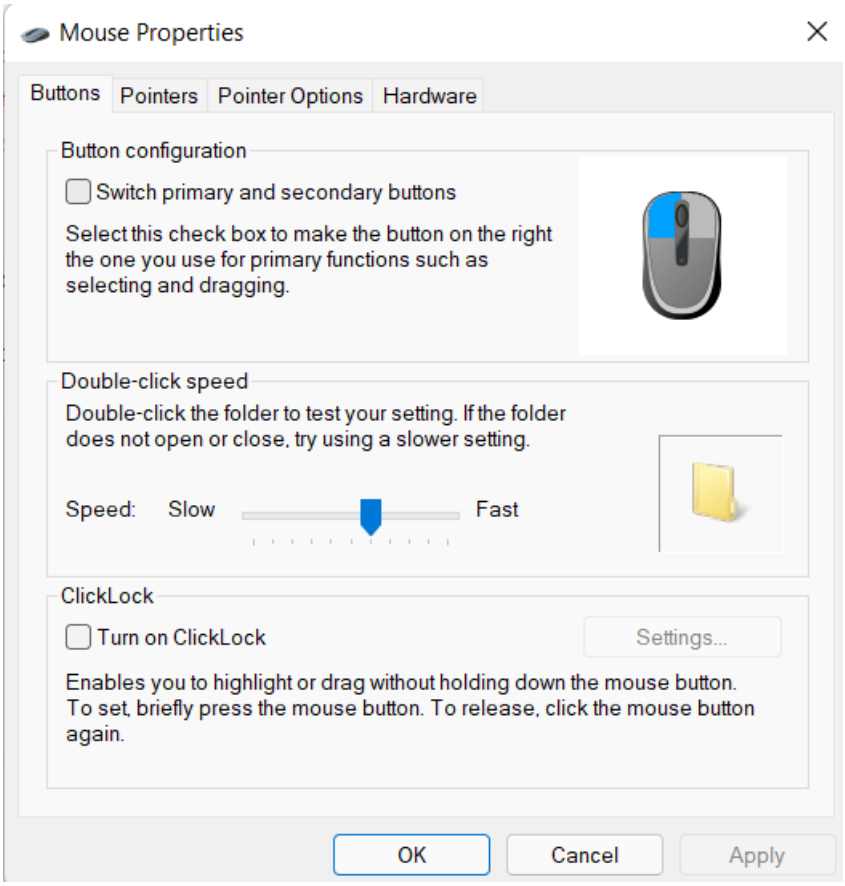


- Use a list to select a time zone.
- Choose whether or not to **automatically adjust clock to the daylight-saving time.**
- Click the OK button.

Modify Muse Settings

It is possible to customize the computer mouse in a variety of ways. For instance, you can swap the functions of your mouse buttons, make the mouse pointer more visible and alter the scroll speed of the mouse wheel.

- Open the control panel.
- Tap the hardware and sound link.
- Under devices and printers, click the mouse link.
- The most properties dialog box should display.

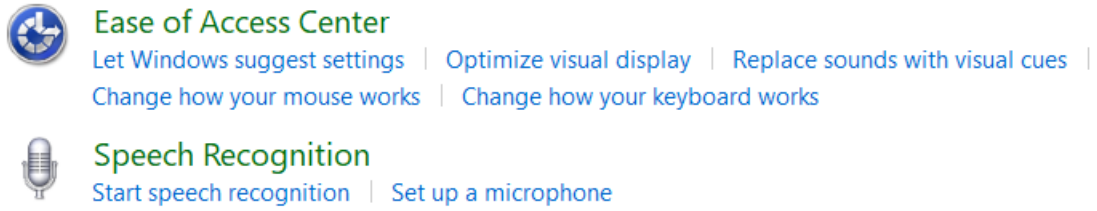


- Select the option to change from the list below.
  - **Buttons-** use this tab to change what happens when the button is clicked.
  - **Pointers-** to change the appearance of the pointer that are used for different tasks, use this tab.
  - **Pointer options-** to change the speed and other options of the mouse pointers, use this step.
  - **Wheel-** use this tab to change how the mouse acts when the wheel is used.
  - **Hardware-** to change the properties of the installed mouse, use this tab.
- When all the desired changes have been made, click **OK.**

Easy of access

This area is used to set up the Windows program for use by people with special needs.

- Open the **control panel.**
- Click the **easy of access** link.



- The **easy of access center** window will display.
- Click the link for the **easy of access center.**
- Try out some of the options available in this window, such as magnifier, on screen, keyboard, narrator and high contrast.
- Scroll down the page to view additional options for the people with Special needs.

Result: - Hence, We verified the functions of control panel settings.

To prepare the UTP cable for cross and direct connections
Using crimping tool

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

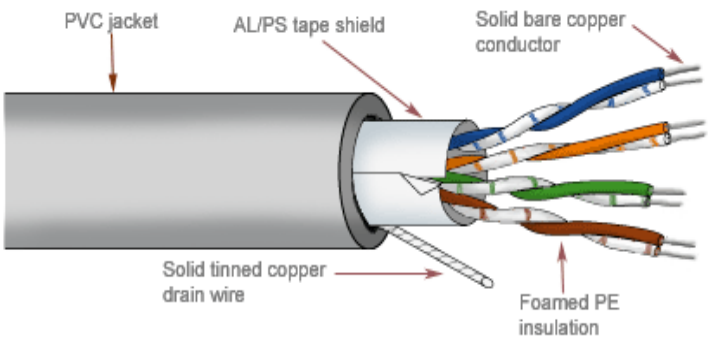
Theory:

1. UTP stands for Unshielded Twisted Pair cable. UTP cable is a 100 ohm copper cable that consists of 2 to 1800 unshielded twisted pairs surrounded by an outer jacket.

2. They have no metallic shield. This makes the cable small in diameter but unprotected against electrical interference. The twist helps to improve its immunity to electrical noise

3. A network crimping tool is a tool designed to crimp or connect a connector to the end of a cable.

4. For example, network cables and phone cables are created using a crimping tool to connect the RJ45 and RJ-11 connectors to the end of the cable.



Unshielded twisted pair cable

RJ-11 (6-pin) and RJ-45 (8-pin) Crimping Tool

Straight Cable:

1. You usually use straight cable to connect different type of devices. This type of cable be used most of the time and can be used to:

- Connect a computer to a switch/hub's normal port.
- Connect a computer to a cable/DSL modem's LAN port.
- Connect a router's WAN port to a cable/DSL modem's LAN port.
- Connect a router's LAN port to a switch/hub's uplink port. (Normally used for expanding network).

Connect 2 switches/hubs with one of the switch/hubs using an uplink port and the other one using normal port.

2. If you need to check how straight cable looks like, it's easy. Both side (side A and side B) cable have wire arrangement with same colour.

Pin.no	Side A colour	Side B colour
1.	Orange-white	Orange-white
2.	orange	orange
3.	Green-white	Green-white
4.	Blue	Blue
5.	Blue-White	Blue-white
6.	Green	Green
7.	Brown-white	Brown-white
8.	Brown	Brown

Crossover Cable:-

1. Sometimes you will use crossover cable, it's usually used to connect same type of devices. A crossover cable can be used to:

- Connect 2 computers directly.
- Connect a router's LAN port to a switch/hub's normal port. (Normally used for expanding network).
- Connect 2 switches/hubs by using normal port in both switches/hubs.

2.In you need to check how crossover cable looks like, both side

(side A and side B) of cable have wire arrangement with following different colour.

Pin.no	Side A colour	Side B colour
1.	Orange-white	Green-white
2.	Orange	Blue
3.	Green-white	Orange-white
4.	Blue	Brown-white
5.	Blue-white	Brown
6.	Green	Orange
7.	Brown-white	Blue
8.	Brown	Blue-white

RESULT: Hence, we prepared the UTP cable for cross connection & direct connections using crimping tool

Transfer files between system in LAN

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Procedure:

Install the Ethernet cards in both the systems and prepare cross cable and connect both the systems with help of cable by inserting Rj-45 connectors in Ethernet port (back side of the CPU)

1. Go to the windows button select control panel.

2. On control panel select network and internet option.

3. In that open network and sharing center and select local area connections.

4. In local area connection right click go to properties.

5.in properties select TCP/IPv4

6. in that enter the following IP address 192. 168. 1.20 I'm subnet market 255.255.255.0

7. After click on okay and close it

8. Go to my computer select drive. do you want to share on it give the right click and point to share with advanced sharing.

9. in advanced Sharing select the checkbox

10. On the same lab go to Permissions select weather we want only read or write or read write whatever it may be and click on it ok.

11. In the same tab go to security select everyone

12. if there is no everyone click on hot button in the click on advance arrow click on find no. in find now select everyone one after that click all OK.

13. the above process is repeated at another computer and give the different IP address letters take it as 192. 168. 1. 21

14. now check the connections by using ping command

15. if we get correct response start sharing files between 2 systems

Result: Hence we transferred files between systems in LAN

Test then Network using ipconfig, ping tracert and netstat commands

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

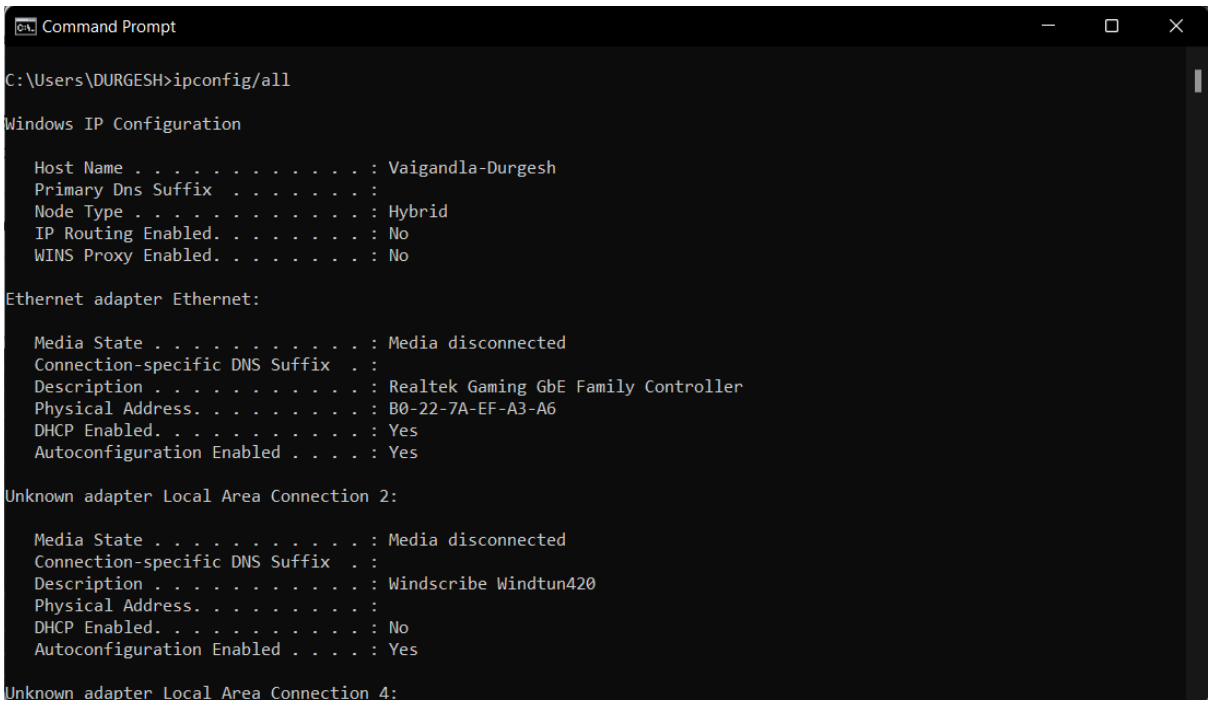
_____

Ipconfig:

The “ipconfig” displays the current information about your network such as your IP and Mac address, and the IP address of your router. It can also display information about your DHCP and DNS servers. let’s see the basic output of “ipconfig”.

Depending on your network connection type, different output for different connection. for example, if you are connected to the network using Ethernet (you plug in your network cable to the RJ45 jack), you'll see IP information in the "Ethernet adapter" section. In our case we are connected to the WiFi [wireless] connection So we Our information there. I our case the local [IPv4] of our computer is 192.168.100.10. We also see the subnet mask. [255.255.255.0] which we can use to find the network address. We also see the default gateway IP [192.168.100.1], which is our router.

However, we don't see DHCP and DNS information. to see detailed information we see use the "/all" switch together with "ipconfig" command [ipconfig/all].



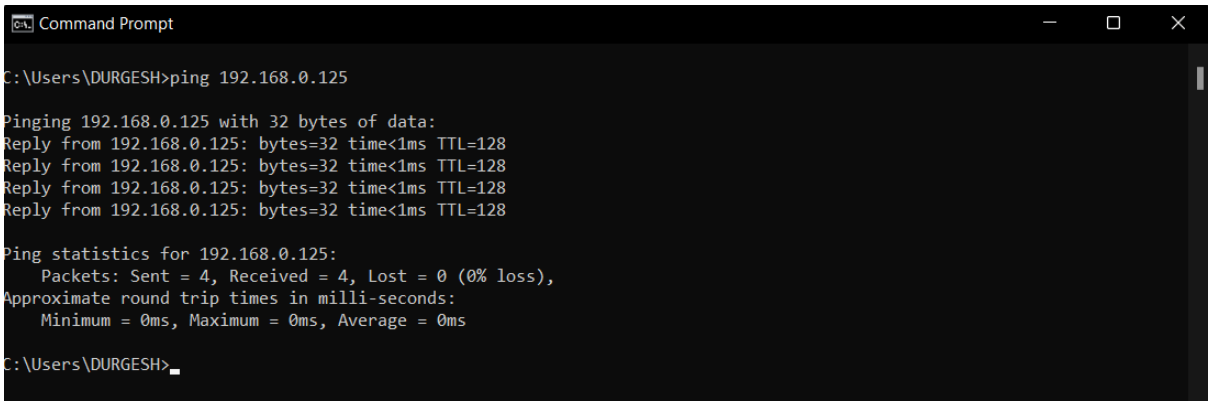
This time there's much more information present. The IP address, the subnet mask, and the Default gateway address is still here, but this time you can also see your DHCP server and DNS server. In our case the DHCP IP address is the same as router address, Which means that DHCP server is currently residing on the router. DNS server is also the same as router address, which means it is also DNS server.

Ping:

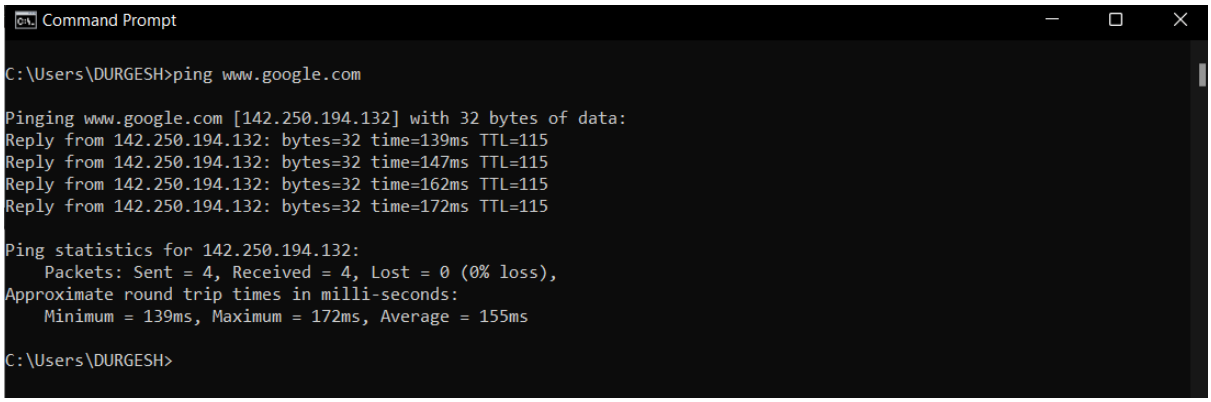
The "Ping" Command allows you to send a signal to another device and if the device is active, It will send a response back to the sender. The "ping" command is a subset of the ICMP [Internet control message protocol], and it uses what is called "echo request". So, when you ping a device you send out an

echo request, and if the device you pinged is active or online, you get an echo response.

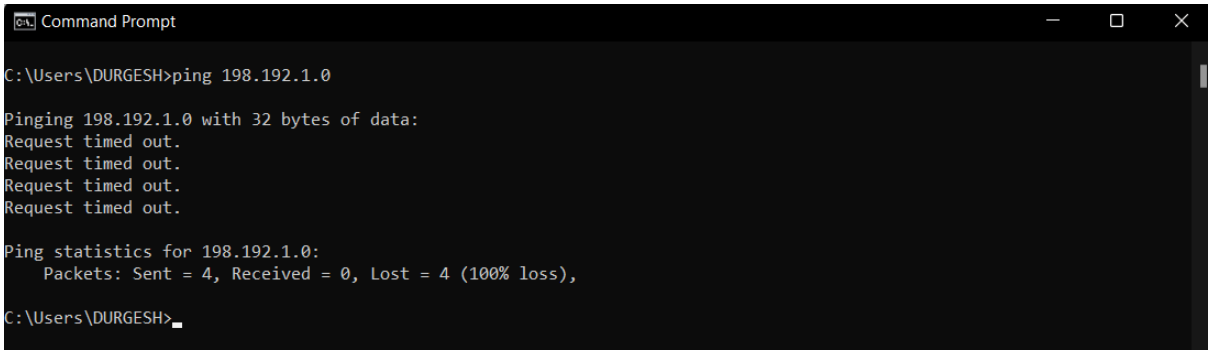
For example. If your local computer has Internet connectivity issue. You can try to ping your router. If you get no response, then you know that the router is what is giving your problems. Let's ping our router IP. Which is 192.168.0.125 in our example, And let's analyse the printout.



What happens is we send out for packets to the destination Send the destination response back with the same 4 packets. We sent out 32 bytes of data and we got back 32 bytes of data and we got back in 0 milliseconds average. From this we see that the device is alive and see the connection stability [4 of 4 packets received] let us ping www.google.com. And see what happens.



We got a similar printout, However, since we use it domain name. We know see the resolved IP address of www.google.com. We sent out 32 bytes of data. But because Google server is far away it took. 155 milliseconds to send and receive 4 packets from Google. We sent and received 4 packets, so the connection was stable. Finally, let's bring a device that doesn't exist.

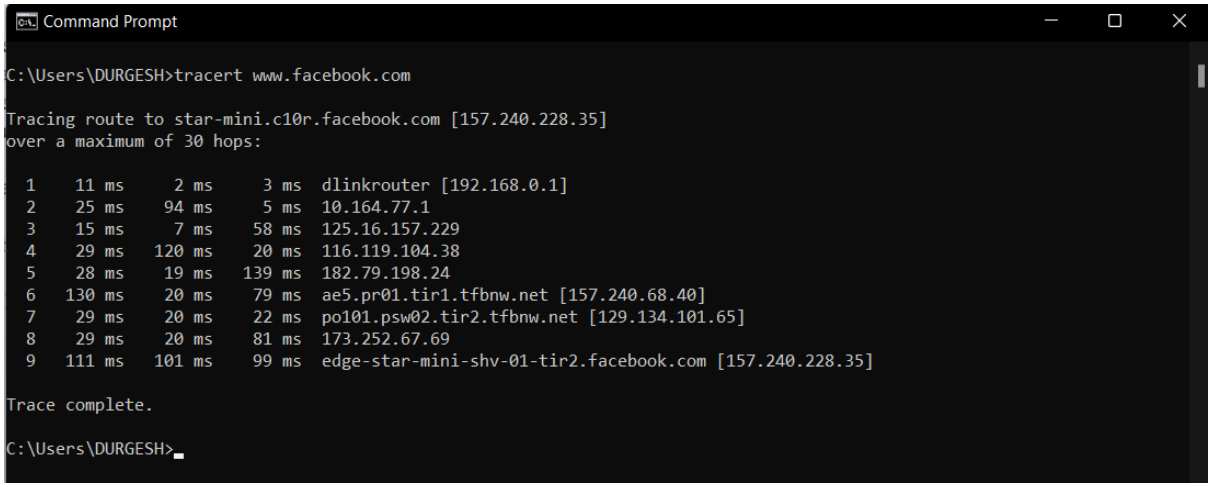


We get a request timed out response. This is going to yield the same kind of present if a device wasn't working. As you can see at the summary. we sent four and received zero, So it was 100% lost. That means the system you are trying to reach is not connected to the network.

Tracert:

This command lets you see all steps a packet takes to destination. For example, if we send the packet to www.google.com, it actually goes through a couple of routers to reach the destination. The packet will go first to your router and then It will go to all kinds of different routers before it reaches Google servers. We can also use the term "HOPS" instead of routers. Let's run the command and see what kind of result we get.

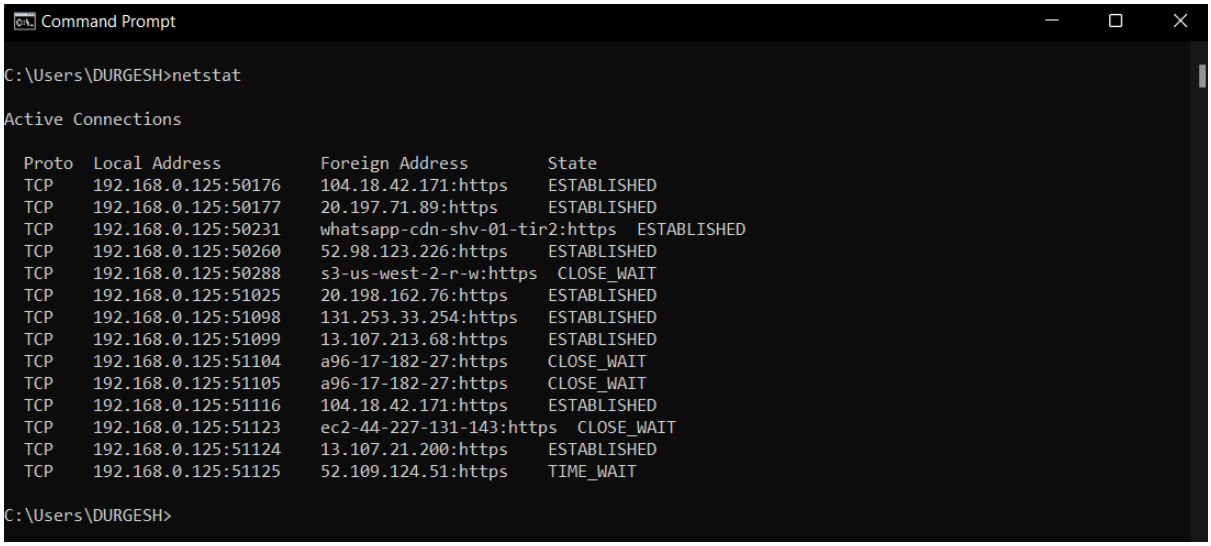
We have traced the router to www.facebook.com and we are getting a list of reach of routers that we are hitting at the end, we see the IP address for facebook.com servers, so that race is complete. In our case, we have 9 HOPS before we actually reached the intended server. The first router that we hit was our own router [We can tell by the IP address 192.168.0.1]



Netstat:

On Windows 10, Netstat, [network statistics] has been around for a long time and its command line tool that you can use in command prompt to display

statistics for all networks connections. It allows you to understand, open and connected ports to monitor and troubleshooting network problem for system or applications when using the tool, you can list active networks, [incoming and outgoing] connections and listening throats. You can view network adapter statistics as well as static ticks for protocols [such as IPv4 and IPv6] You can even display the current routing table and much more.



Result:- Hence, we tested the N/W using ipconfig, ping, tracert, & netstat commands.

Store the files in cloud using Google drive

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

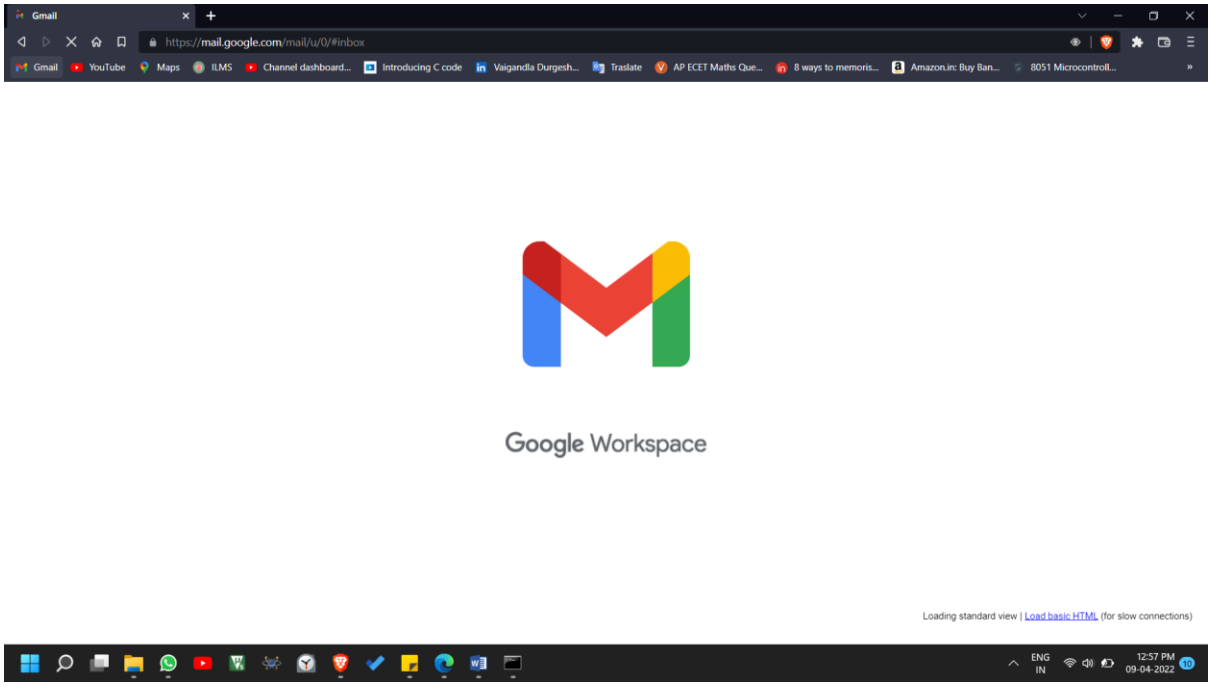
_____

3.Equipment Required: _____

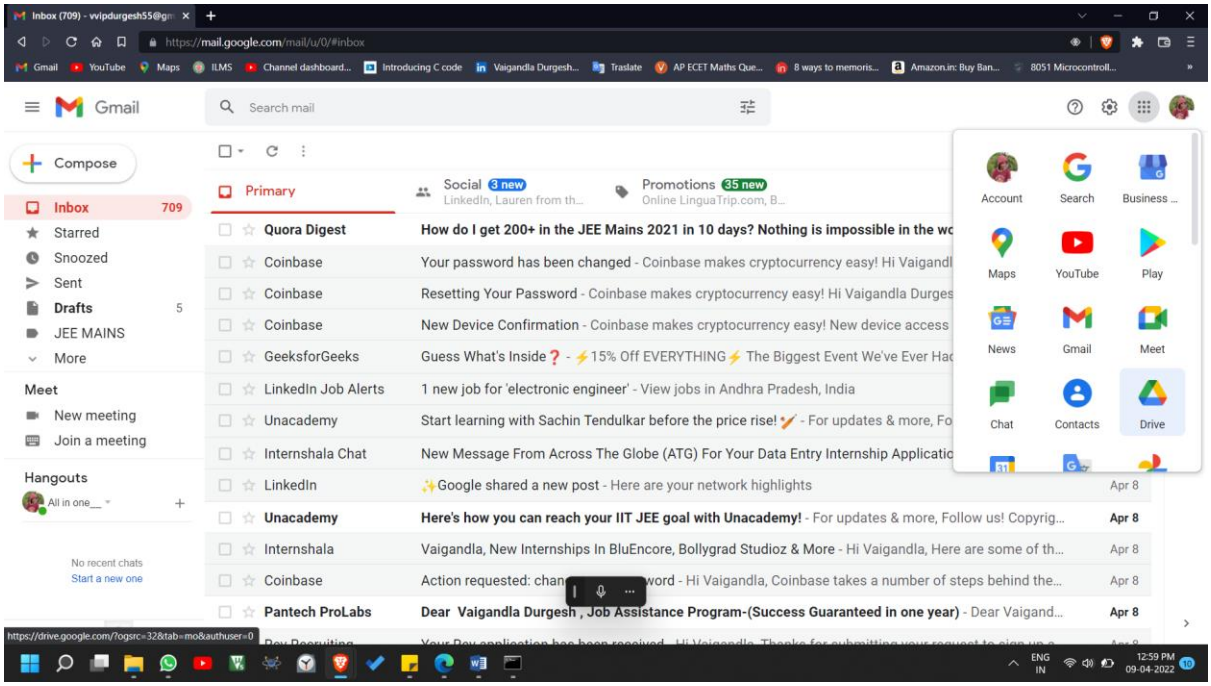
_____

Procedure:

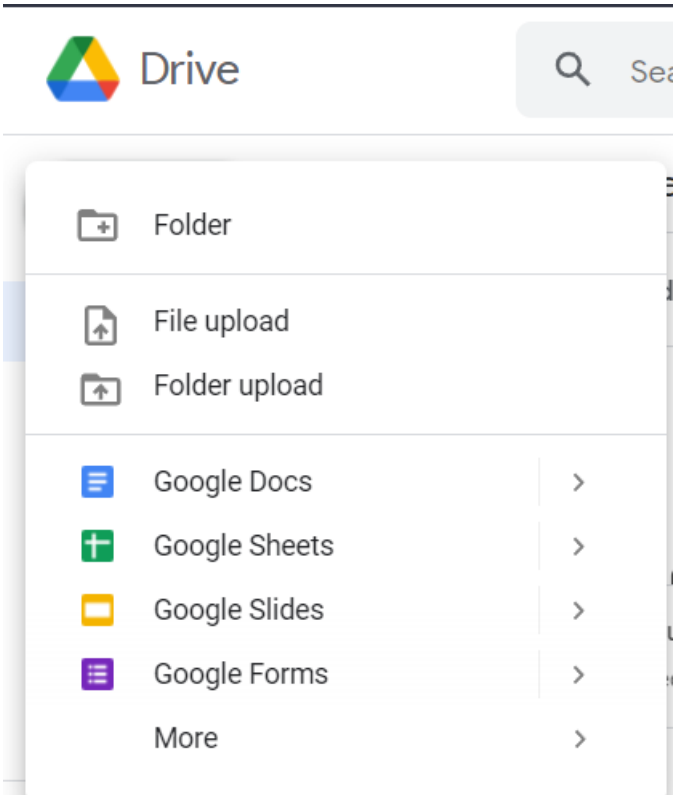
1.Login to your Google account.



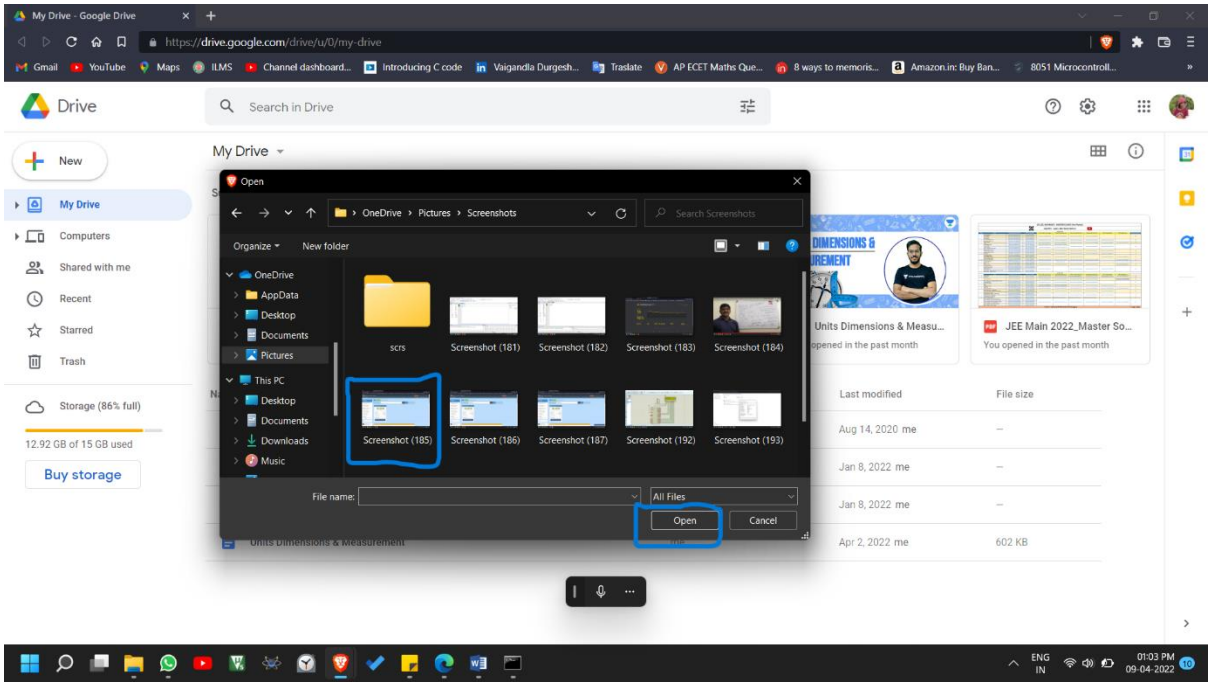
2.In that select Drive



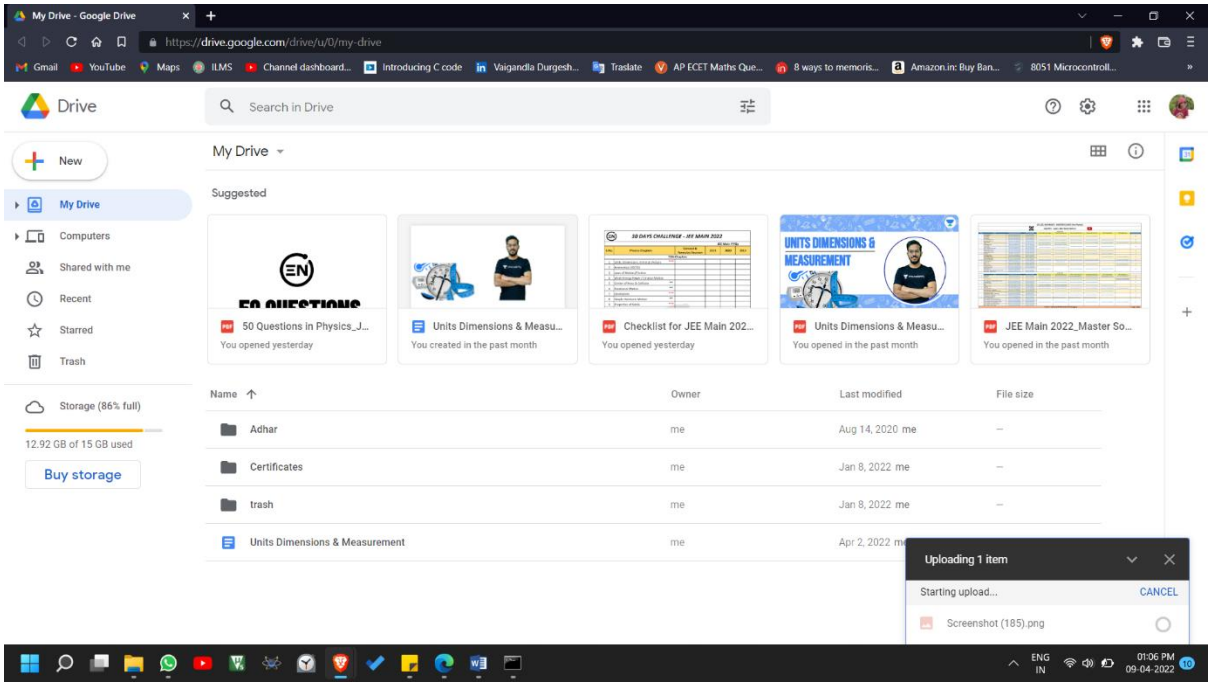
3.Select either File Upload or Folder Upload



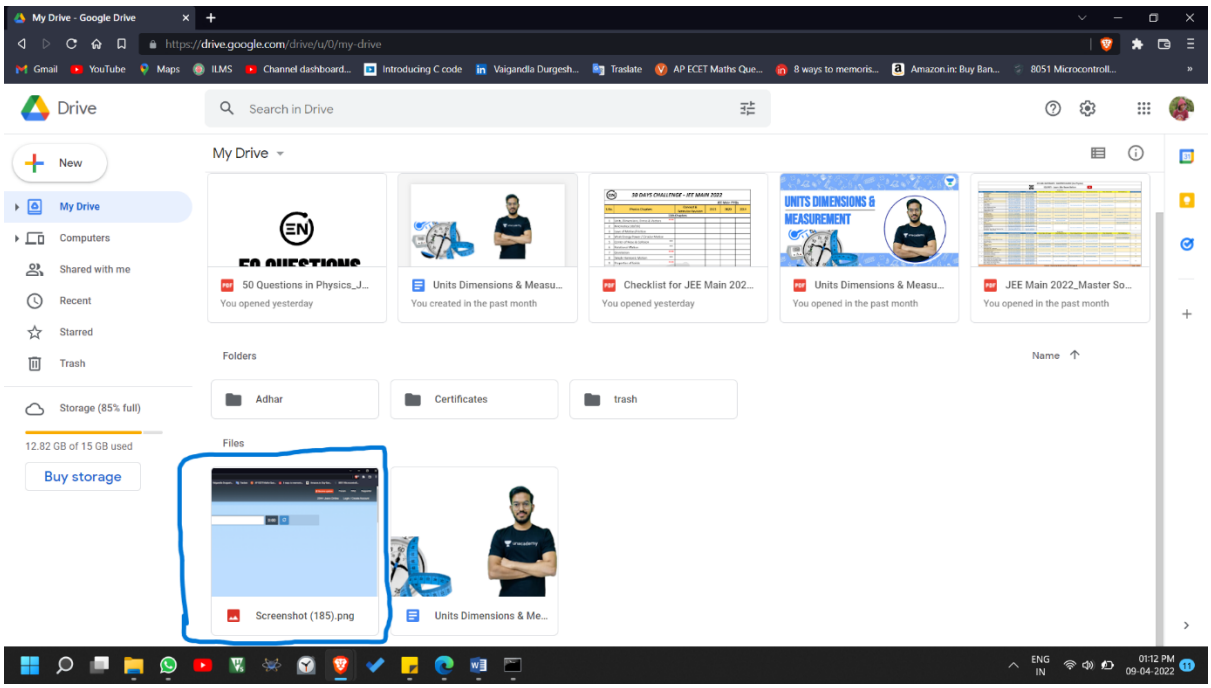
4.Now, browse and select the desired files/folder.



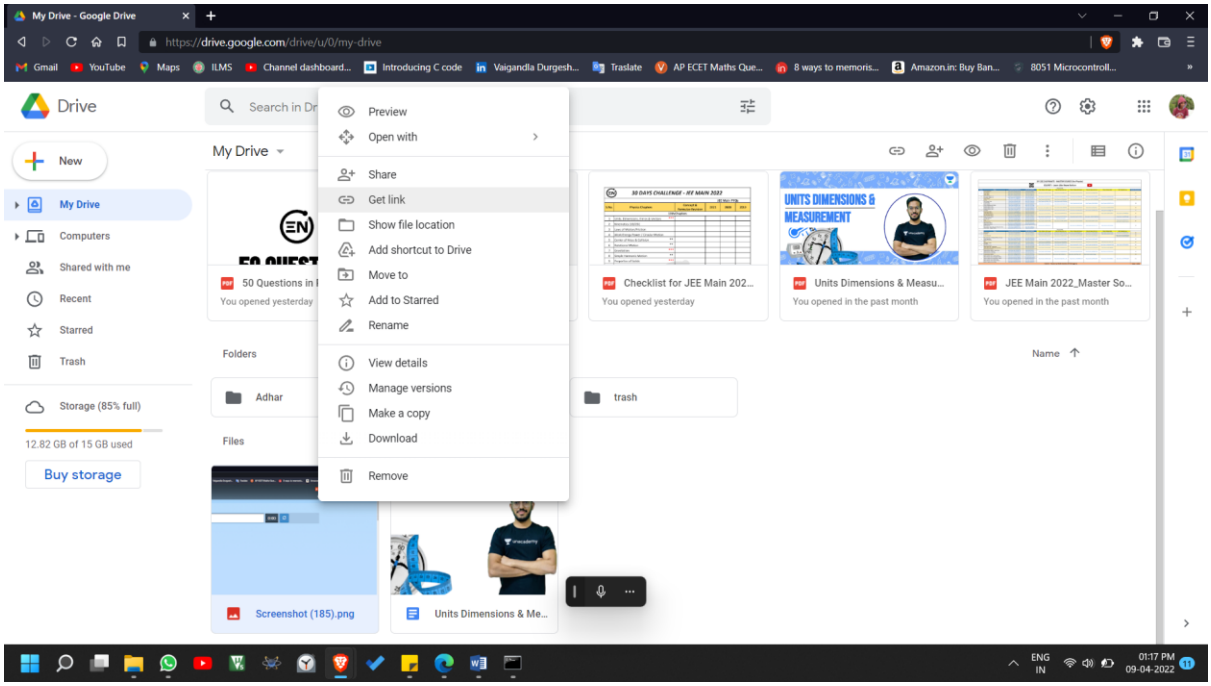
5.Wait while the files is getting uploaded.



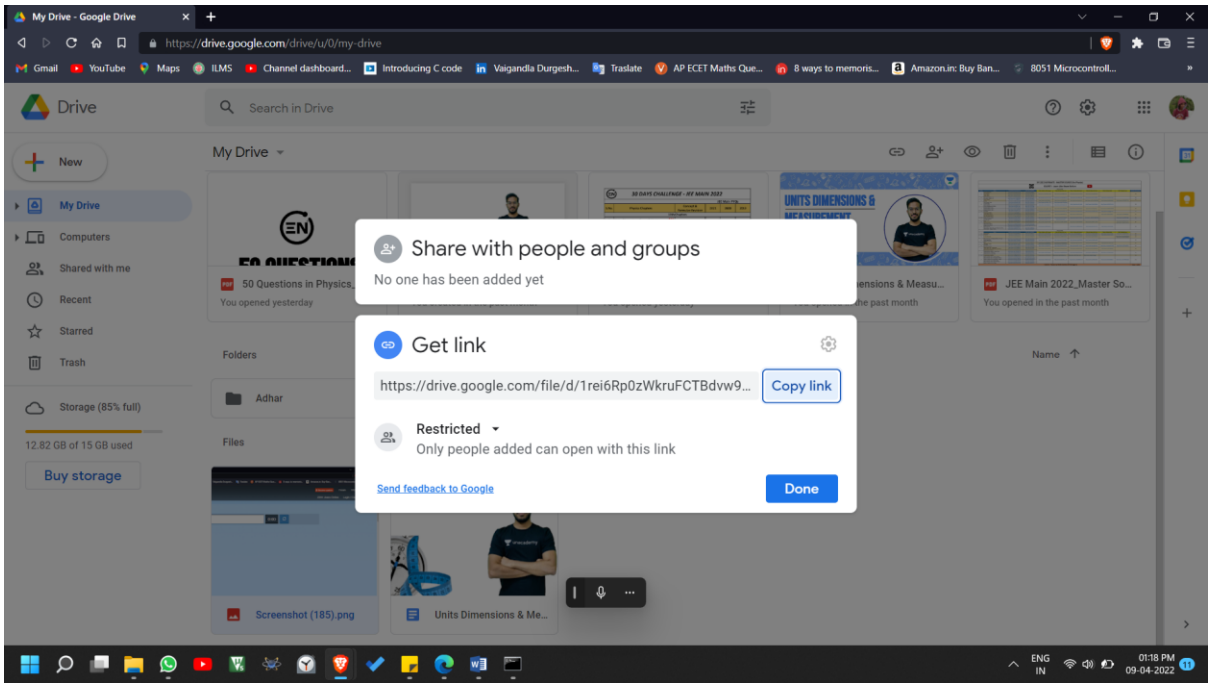
6.when the files get successfully saved on the google drive, You can view it there.



7.Now want to share the file, click on it and click in GETLINK you will get link and we can share it with whoever wants it.



8.Now copy the link and share it, so that others can access the file.



RESULT:- Hence, we stored the files in cloud using Google drive.

STUDY OF MICROWAVE COMPONENTS

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Task:

Identify the following Microwave components

1.<u>Rectangular waveguide</u>:–

Rectangular waveguide are the one of the earliest type of transmission lines. A rectangular waveguide support TM and TE chat. Modes but not TEM waves, because we can't define a unique voltage since there is only one conductor in a rectangular waveguide.

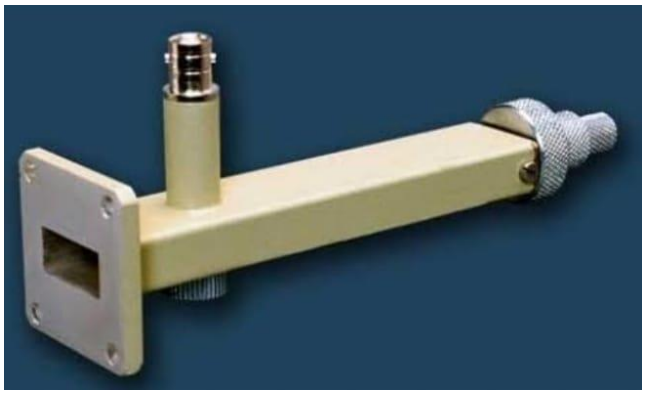
2.Fixed attenuators:–

Fixed attenuators are meant for inserting a known attenuation in a waveguide system. These are useful for isolation of waveguide circuits, padding and extending the range of measuring equipment.

3.Tunable probe:–

Tunable probe helps in detecting the low frequency square wave modulated microwave signal. It is made by the crystal diode mounted in the transmission line.

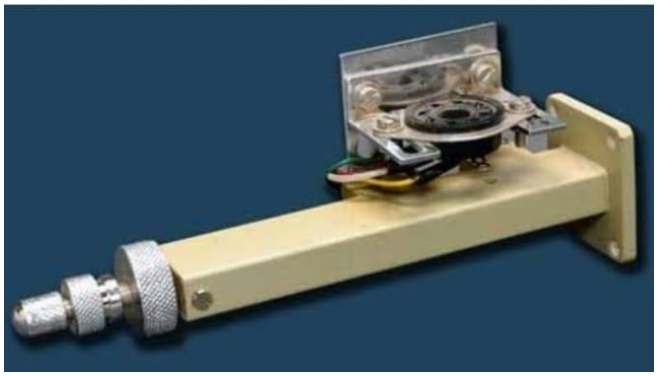
4.Waveguide detector mount[tunable]:–



Tunable detector mount is simple and easy to use instrument for detecting microwave power through suitable detectors. It consists of a detector crystal

mounted in a section of a waveguide and shorting plunger for matching purpose.

5.klystron mount:–



It is a waveguide of suitable length having octal based on the board wall of the waveguide for mounting the klystron tube. It consists of movable short at one end of the waveguide to the direct the microwave energy generated by the klystron tube.

6.Circulators:–

Circulators are matched 3 port devices and these are meant for allowing microwave energy to flow in clockwise direction with negligible loss. But almost no transmission in the anticlockwise direction.

7.Slide screw tuners:–

Slide screw tuners used for impedance matching in the transmission tube. A tuning screw attached with a microwave along with the carriage helps in the impedance matching.

8.<u>Multihole directional couplers</u>:–

Multihole directional couplers are used for sampling a part of microwave energy for monitoring purpose and for measuring reflections and impedance. This consists of a section of waveguide within addition of a second parallel section of waveguide thus making it a 4 port network.

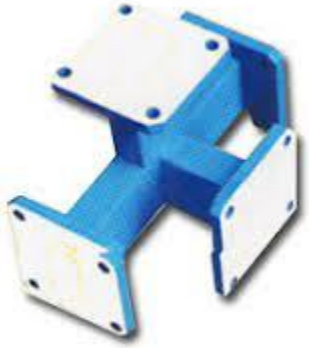
9.<u>E-plane tee</u>:–

E-plane tee are series type T-junction and consists of three section of waveguide joined together in order to divide or compare power levels.The signal entering the first port of this T-junction will be equally dividing at second and third ports are same magnitude but in opposite phase.

10.<u>H-plane tee</u>:–

H-plane tee are shunt type T-junction for use in conjunction with VSWR meters, frequency meters and other detector devices. The signal fed through first port of H-plan tee will be equally divide in magnitude at second and third ports but in same phase.

11.<u>Magic tee</u>:–



A magic tee or hybrid tee is a 4-port waveguide tee that is a combination of an E-plane and H-plane waveguide tee. These tee's are employed in balanced mixers AFC circuits & impedance measurements circuits e.t.c.

12.<u>Movable short</u>:–

Movable short consists of a section of waveguide hanged on one end and terminated with a movable shorting plunger on the other end. By means of this non-contacting type plunger, a reflection co-efficient of almost unity may be obtained.

13.Matched termination:–

The matched termination are used to terminate the waveguide transmission line operating at the low average power and are also used in the measurement of reflection coefficient. Widely used for whenever the matched load is required, the loads are carefully designed to absorb all the applied power and VSWR of matched termination is low.

14.Pyramidal waveguide horn antenna:–

Pyramidal waveguide horn antenna consists of waveguide joined to pyramidal section, fabricated from brass sheet. The pyramidal section shapes the energy to concentrate in a specified beam.

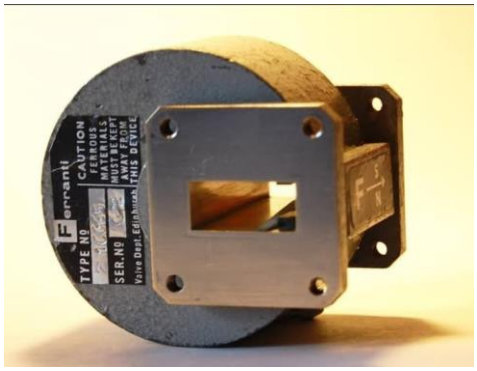
15.<u>Gunn oscillator</u>:–

Gunn oscillators are solid state microwave energy generations. These consists of waveguide cavity hanged on one end and micrometer driven plunger fitted on the other end. Play Gun diode is mounted inside the waveguide with BNC(F) Connector for DC bias.

16.<u>PIN modulators</u>:–

PIN modulators are designed to modulate the CW o/p of gunn oscillators. It is operated by the square pulses derived from the UHF(F) Connector of the gunn power supply. These consists of a pin diode mounted inside a section of waveguide,hanged on its both end.

17.<u>Isolators</u>:–



The 3 ports circulators is connected into isolators by terminating one of us its port into matched load. These will work over the frequency range of circulator. These are well matched devices offering a low forward insertion loss and high reverse isolation.

Result:–

To identify and note down the specifications of various networking devices & Cables, Jacks , Connectors, tools etc used in local area networks

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Theory:-

HUB: -

1. HUB is a centralized device that connects multiple devices in a single LAN network.
2. When HUB receives the data signals from a connected device on any of its port, except that port, it forwards those signals to all the other connected devices from the remaining ports.

3. Usually. HUB has one more uplink ports that are used to connect it with another hub.
4. There are two types of the HUB
    - Passive HUB:- It forwards data signals in the same format in which it receives them. It does not change the data signal in any manner.
    - Active HUB:- It also works same as the passive hub works but before forwarding the data signal amplifies them. Due to this Added feature back to Hub is also known as the repeater.

MAU & PATCH PANEL: -

Mau and Patch panel looks like the hub but they are different.

MAU is the sibling of HUB for the token ring network

Difference b/w HUB and MAU patch panel are the following: -

I. HUB is used for the network while the MAU is used for the token ring network.
II. HUB creates logically star topology while MAU creates logically ring topology.
III. Patch panel is used to organize the UTP cables systematically. It doesn't interfere in the data signals.

Bridge: -

Bridge is used to divide a large network into smaller segments. Basic functions of the bridge are following: -

1. Breaking large networks into smaller segments.
2. Connecting different media types such as connect UTP with fiber optic.
3. Connecting different network architectures such as connects Ethernet with the token ring.
4. A bridge can connect two different types of media or network architecture, but it cannot connect to different types of networks.
5. Bridge requires the same network layer protocol in all segments. 6. There are three types of bridges:- 1.Local Bridge
   2.Remote Bridge
   3.Wireless Bridge

Local Bridge: -

1. This Bridge connect two LAN segments directly.
2. In Ethernet implementation, it is known as the Transparent bridge.
3. In token ring network it is called the source rated bridge.

Remote Bridge: -

This bridge connects with another bridge over the WAN link.

Wireless Bridge: -

This bridge connects with another bridge without using wire. It uses radio signals for the connectivity.

Switch: -

1. Just like a bridge.Switch is also used to connect the multiple devices together in a LAN segment.
2. Basically a Switch is the upgraded version of the bridge besides providing all the functionalities of bridge, it also offers several additional features.
3. The biggest advantage of switch is that it makes switching decisions in hardware by using application specific integrated circuits. [ASICs].
4. Unlike the generic processor that we use in our PC, ASICS are the specialized processors built only to perform very few particular tasks.
5. Usually the ASICS in the switches have a single task and that is the switching the frames as fast as possible.
6. An ASIC occupied switch perform this task Fast, for example, an entry level Catalyst Switch 2960 can process 27 M frames per second.

Modem: -

1. In simple language, a modem is the device that is used to connect with the Internet. Technically it is the device that enables the digital data to be transmitted over the telecommunication lines**.**
2. A telecom company uses entirely different data transmission technology from the technology that a PC uses for the data transmission.
3. A modem understand both technologies. It changes the technology that a PC uses in the technology with Telecom Company understands.
4. It enables communication between the PC and the Telecom Company office.

Gateway: -

1. Gateway is used to forward the packets which are generated from the local host or network and but intended for the remote network.
2. If the data packet does not find its destination address in the local network, then it takes the help of the Gateway device to find the destination address in the remote network.
3. A gateway device known as the path of the remote destination address.
4. If required. It also changes the encapsulation of the packet so it can travel through over the other networks to get its destination addresses. Examples of gateways
    - Email gateway:- translates SMTP email in standard X400 format before forwarding.
    - GSNW gateway:- It allows Windows clients to access resources from the network server.
    - PAD Gateways:- provides connectivity between LAN network and next 25 network.

Router:-

1. The router connects the different network segments.
2. It switches the data packets between those networks which are either located in the different logical segments or built with the different network layers.
3. When a router receives the data packet on any of its interface, it checks the destination address of that packet and based on the destination and risk it forwards that data packet from the interface which is connected with the destination address.
4. To forward a data packet to its destination router keeps the records of connected networks.
5. These records are maintained in a database table known as the routing table can be built statistically or dynamically

   Basically routers are used

   - To connect in different network segments.
   - To connect different network protocols such as IP and IPX.
   - To connect to several small networks into a large network.
   - Move to break a large network into smaller networks.
   - To connect to different media types such as UTP and fiber optical.
   - To connect to different network architectures such as a token ring and Internet.
   - To connect LAN network with Telecom company office.

- To access DSL services [known as DSL router].

Proxy:-

1. Proxy is used to hide the internal network from the external world. It can be dedicate device or can be an application software.
2. Once it is configured, all communication goes through it. Since external devices can't access internal devices directly, they can't tamper with the Internet devices.

Transceiver: -

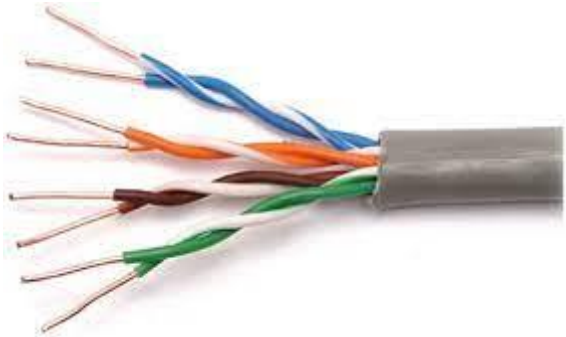
1. Transceiver is a small device that has the capability of receiving and sending both type of signal analogue and digital.
2. Usually it is inbuilt network interface card but it is also available as an individual device.
3. It detects the type of signal from the network wire and connects the passing signal correctly.
4. For example, A transceiver is attached with a device that transmits signal in digital form. Now suppose this device is connected with the network wire. That uses analogue form for data transmission.
5. In this case, Transceiver converts digital signal in the analogue signals before placing them in the network wire.

To identify the specifications of various cables: -

STP [shielded twisted pair]:-

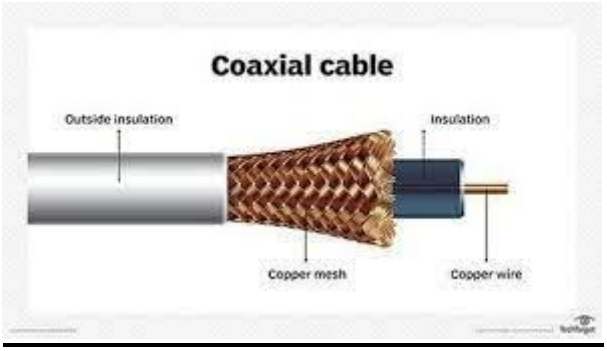
1. This cable has a conductive braided or foil casing for each pair and theoretically offers very good protection from interface and crosstalk. It was commonly used for token ring networks.
2. Shielded twisted pair is rarely used due to fact that the potential performance increase over UTP is not worth the much greater cost of STP.
3. STP, which is limited to 100 metres length, is used in token ring networks and for IBM mainframe and minicomputers environment.
4. There is no standard for it, since token ring networks do not require STP, it is used less and less. These are a few reasons for this.
    - Higher cost due to greater complexity for the Cabling and connectors.
    - Larger size and less flexibility of the cabling.
    - Longer installation time.

UTP[unshielded twisted pair]:-



1. UTP is the most commonly used type for networking cable.
2. UTP cables are often called " Ethernet cables" after ethernet, the most common data networking stranded that utilizes UTP cables not the most reliable.
3. In contrast to FTP and STP cabling. UTP cable is not surrounded by any shielding.
4. It is the primary wire type of telephone usage and is very common for computer networking, especially in patch cables or temporary network connections due to the high flexibility of the cables.

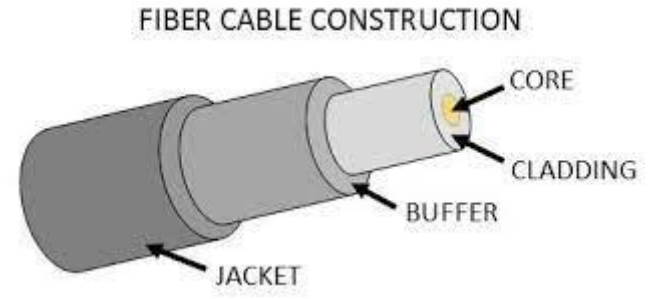
Coaxial cable:-



1. Coaxial cable is an electrical cable consisting of a round connecting wire surrounded by an insulating spacer, are surrounded by a spherical conducting sheath, and usually surrounded by a final insulating layer.
2. Most common use of Coaxial cable today is in standard cable team.

3. If you have the chance to examine a table, you will find it has a fairly simple design.
4. Copper conductor lies in the center of the cable, which is surrounded by insulation.
5. A braided or mesh outer covering surrounds the insulation. This is also a conductor.
6. A PVC plastic jacket encases the covering. The cable is designed to carry a high frequency or broadband signal as a high frequency transmission line.
7. Because the electromagnetic field carrying signal exists only in the space between the inner and outer conductors. It cannot interfere with the other interference from external electromagnetic fields.

SMF[Single mode fiber]optic cable:-



1. Single mode optical fiber is an optical fiber in which only the lowest order band mode can propagate at the wavelength of interest.
2. Single mode fibers are best at retaining the fidelity of each light pulse over longer distances and exhibit no dispersion caused by multiple spatial modes.
3. Thus, more information can be transmitted per unit. Giving single mode fibers a higher bandwidth in comparison with multimode fibers.
4. A typical single mode optical fiber has a core radius of 5-10 micro meters and cladding radius of 120 micrometers.

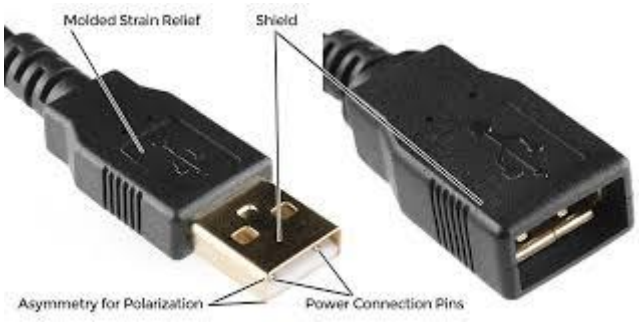
5. Currently, data rates of up to 10 GB/second are possible at a distance of over 60 kilometres with commercially Available Transceivers.
6. Equipment for single mode fiber is more expensive than equipment for multimode optical fiber, but the signal mode fiber itself is usually cheaper in bulk.

MMF[multimode fiber]optical fiber:-

1. Multimode optical fiber is a type of optical fiber mostly used for communication over short distances. Example within a building.
2. It can carry 1 GB/second for a typical building distances. The actual maximum speed depends upon the distance.
3. It is easier to connect to than signal mode optical fiber, but it's limit on speed.
4. Multimode fiber has a large center Core that single mode fiber, which allows to support more than one propagation mode or path within the fiber.
5. Typical transmission speed/distances limits are 100 Mbps up to 2 kilometres [100 BASE-FX], 1Gbps for distance upto 500-600m [1000 BASE-LX;1000 BASE-SX], & 10Gbps for distance upto 300m[10GBASE-SR].

Types of network jacks in a network:-

USB[Universal serial bus]:-



1. USB is a computer standard design to eliminate the guesswork in connecting peripherals to a PC.
2. It is expected to replace serial and parallel ports.
3. A single USB port can be used to connect up to 127 peripheral devices such as mice, modem, keyboard, Digital cameras, Printers, scanners, MP3 players and many more.
4. I will be also supports plug and play installation and hot plugging.
   - USB 1.1 standard supported data transfer rates of 12 Mbps
   - USB 2.0 specifications defines a new high speed transfer rate of 480 Mbps.
5. USB 2.0 is fully compatible with USB 1.1 and users with the same cables and connectors. USB has with 2 connector types.
6. The first is type A, This connector, connects to the PC's USB port.
7. The second is Type B, This connector for connecting to the relevant peripheral.
8. Whereas the type A connector is truly standard, the Type B connector could be changed and size etc with individual peripheral meaning they require their own unique cables.

RJ-11[registered Jack]:-

1. Standard telephone cable connectors RJ-11 has 4 wires.
2. RJ-11 is acronym for registered Jack-11, a 4 or 6 wire connectors Primarily used to connect telephone equipment.

RJ-45[registered Jack]:-

1. The acronym for registered Jack-45 is RJ 45.
2. RJG-45 Connector is a 8 wire connector that is commonly used to connect computer to a local area network. [LAN] particular Ethernet LANs.
3. Although they are slightly larger than the more commonly used RJ 11 connectors, RJ 45 connectors can be used to connect to some types of telephone equipment.

F-Type:-

1. The F connector is a type of RF connector commonly used for cable and universally for satellite television.
2. They are also used for cable TV connection in DOCSIS cable modems, usually with RG- 6 tri-shield cable.
3. The F connector is inexpensive yet has good performance up to 1GHZ. One reason for its low cost is that it uses. The center wire of Co axial cable as the pin of the male connector.
4. The male connector body is typically crimped onto the exposed outer braid. Female connectors have a 3/8- 32 thread.
5. Most male connectors have a matching threaded connecting ring. Through push on version are also available.

ST[Straight Tip]and SC[Subscriber connector or Standard connector]

1. Fiber networking segments always required to fiber cables.

I. One for transmitting data, one for receiving.

II. Each end of a fiber cable is fitted with a plug that can be inserted into a network adapter hub or switch.

III. In the ‘NA’ most cables uses Square SC connectors. That slides and locks into place when inserted into a node or connected to another fiber cables. Europeans use a round ST connector instead.

Fiber LC[Local Connector]: -

1. These connectors are used for single mode and multimode fiber optical cables.
2. FC connectors offer extremely precious positioning of fiber optical cable with respect to the Transmitter’s optical source emitters and the receiver’s optical detector.
3. FC connectors future a position locatable notch and a threaded receptacles.

MT-RJ[Mechanical transfer registered jack]:-

1. MT- RJ connectors are used with single mode and multi mode fiber optic cables.
2. The MT- RJ connectors are constructed with a plastic housing and provide for accurate alignment via their metal guide pins and plastic ferrules.

3. Used for Gigabit Ethernet to connect to modules with MT- RJ interfaces, Use multimode fiber optic cable.

<u>Types of Connectors:</u>-

Blind mate Connector:-

- Blind mate connector ensure that even when your line of sight to the making characters is limited on the physical access to the mating connector area inhabitated you can see safely and easily mate them.

D-Sub Connector:-

- D-sub connectors are named after their distinctive D shaped metal shell and they are used in a variety of applications.

Hot Swap Connectors:-

- Hot Swap connector, allow technicians to safely add or remove or replace components under load without shutting down the entire system or risking damage to the equipment.

IP67 Connectors:-

- IP67 connector prevent the ingress of dust or water, making them perfect for our harsh environment and more rugged applications.

Military Connectors:-

- Military connectors are designed to meet the military high Standards in regard to durability, Reliability and precision and they serve specific functions within the equipment of the armed forces.

Modular Connectors:-

- Modular Connectors can be configured to fit a customer's goals and applications requirements by using pre-existing building blocks to arrange unique contact arrangements.

Power Connectors:-

- Power connectors deliver electronic devices electrical power from either an AC or DC source.
- In addition to the power contact, signal contact clusters are used for system control and communication.

Press-fit Connectors:-

- Press fit connectors are designed to press through a PCB plated through holes. [PTH] versus being Soldered.

Space Connectors:-

- Space connectors with their low out-gassing, non-magnetism and extreme reliability can withstand the extremely harsh environmental conditions that characterize the spaceflight environment.

<u>Tools:</u>-

Crimping tool:-

i A crimping tool is one of the most crucial network connecting tools.
ii In order to connect a connecter to the cable, you will need a tool to crimp or connect.
iii Known as the crimping tool. This tool is used to connect RJ- 45, RJ-11 and other connectors to the end of the cable.
iv Some crimping tools have a built in wire cutter near the hands. This wire cutter can be used to cut a phone cable or a cat-5 cable.

Network Cable tester:-

i One of the problems with wired networks is that when they cease to the work, troubleshooting may be little more difficult as compared to wireless network.
ii The network cable tester is a useful device that allows you to check continuity of the cable to figure out if the signal is strong enough to get through to the network.
iii This helps to eliminate cable connectivity issues while troubleshooting the problems.

Coaxial Compression tool:-

i The coaxial cable is the cable that includes the outer metal that does that does the conducting.
ii A central conducting core ensures that the metal insulated’
iii High frequency signals are transmitted through this coaxial line.
iv A coaxial compression tool is a useful device that uses connectors properly compression the coaxial cable.

- The side of the cable wire will enable you to know which type of cable it is.

To identify and note down the specifications of various networking devices & Cables, Jacks , Connectors, tools etc used in local area networks

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

_____

2.Objective of the Experiment: _____

_____

3.Equipment Required: _____

_____

Theory:-

HUB: -

1. HUB is a centralized device that connects multiple devices in a single LAN network.
2. When HUB receives the data signals from a connected device on any of its port, except that port, it forwards those signals to all the other connected devices from the remaining ports.

3. Usually. HUB has one more uplink ports that are used to connect it with another hub.
4. There are two types of the HUB
    - Passive HUB:- It forwards data signals in the same format in which it receives them. It does not change the data signal in any manner.
    - Active HUB:- It also works same as the passive hub works but before forwarding the data signal amplifies them. Due to this Added feature back to Hub is also known as the repeater.

MAU & PATCH PANEL: -

Mau and Patch panel looks like the hub but they are different.

MAU is the sibling of HUB for the token ring network

Difference b/w HUB and MAU patch panel are the following: -

I. HUB is used for the network while the MAU is used for the token ring network.
II. HUB creates logically star topology while MAU creates logically ring topology.
III. Patch panel is used to organize the UTP cables systematically. It doesn't interfere in the data signals.

Bridge: -

Bridge is used to divide a large network into smaller segments. Basic functions of the bridge are following: -

1. Breaking large networks into smaller segments.
2. Connecting different media types such as connect UTP with fiber optic.
3. Connecting different network architectures such as connects Ethernet with the token ring.
4. A bridge can connect two different types of media or network architecture, but it cannot connect to different types of networks.
5. Bridge requires the same network layer protocol in all segments. 6. There are three types of bridges:- 1.Local Bridge
   2.Remote Bridge
   3.Wireless Bridge

Local Bridge: -

1. This Bridge connect two LAN segments directly.
2. In Ethernet implementation, it is known as the Transparent bridge.
3. In token ring network it is called the source rated bridge.

Remote Bridge: -

This bridge connects with another bridge over the WAN link.

Wireless Bridge: -

This bridge connects with another bridge without using wire. It uses radio signals for the connectivity.

Switch: -

1. Just like a bridge.Switch is also used to connect the multiple devices together in a LAN segment.

2. Basically a Switch is the upgraded version of the bridge besides providing all the functionalities of bridge, it also offers several additional features.
3. The biggest advantage of switch is that it makes switching decisions in hardware by using application specific integrated circuits. [ASICs].
4. Unlike the generic processor that we use in our PC, ASICS are the specialized processors built only to perform very few particular tasks.
5. Usually the ASICS in the switches have a single task and that is the switching the frames as fast as possible.
6. An ASIC occupied switch perform this task Fast, for example, an entry level Catalyst Switch 2960 can process 27 M frames per second.

Modem: -

1. In simple language, a modem is the device that is used to connect with the Internet. Technically it is the device that enables the digital data to be transmitted over the telecommunication lines**.**
2. A telecom company uses entirely different data transmission technology from the technology that a PC uses for the data transmission.
3. A modem understand both technologies. It changes the technology that a PC uses in the technology with Telecom Company understands.
4. It enables communication between the PC and the Telecom Company office.

Gateway: -

1. Gateway is used to forward the packets which are generated from the local host or network and but intended for the remote network.
2. If the data packet does not find its destination address in the local network, then it takes the help of the Gateway device to find the destination address in the remote network.
3. A gateway device known as the path of the remote destination address.
4. If required. It also changes the encapsulation of the packet so it can travel through over the other networks to get its destination addresses. Examples of gateways
    - Email gateway:- translates SMTP email in standard X400 format before forwarding.
    - GSNW gateway:- It allows Windows clients to access resources from the network server.
    - PAD Gateways:- provides connectivity between LAN network and next 25 network.

Router:-

1. The router connects the different network segments.
2. It switches the data packets between those networks which are either located in the different logical segments or built with the different network layers.
3. When a router receives the data packet on any of its interface, it checks the destination address of that packet and based on the destination and

risk it forwards that data packet from the interface which is connected with the destination address.

4. To forward a data packet to its destination router keeps the records of connected networks.
5. These records are maintained in a database table known as the routing table can be built statistically or dynamically

   Basically routers are used

   - To connect in different network segments.
   - To connect different network protocols such as IP and IPX.
   - To connect to several small networks into a large network.
   - Move to break a large network into smaller networks.
   - To connect to different media types such as UTP and fiber optical.
   - To connect to different network architectures such as a token ring and Internet.
   - To connect LAN network with Telecom company office.
   - To access DSL services [known as DSL router].

Proxy:-

1. Proxy is used to hide the internal network from the external world. It can be dedicate device or can be an application software.
2. Once it is configured, all communication goes through it. Since external devices can't access internal devices directly, they can't tamper with the Internet devices.

Transceiver: -

1. Transceiver is a small device that has the capability of receiving and sending both type of signal analogue and digital.
2. Usually it is inbuilt network interface card but it is also available as an individual device.
3. It detects the type of signal from the network wire and connects the passing signal correctly.
4. For example, A transceiver is attached with a device that transmits signal in digital form. Now suppose this device is connected with the network wire. That uses analogue form for data transmission.
5. In this case, Transceiver converts digital signal in the analogue signals before placing them in the network wire.

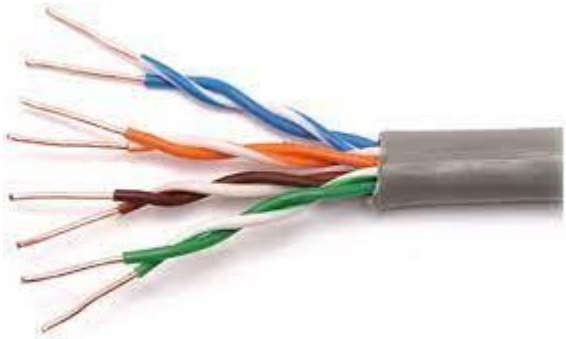
To identify the specifications of various cables: -

STP [shielded twisted pair]:-

1. This cable has a conductive braided or foil casing for each pair and theoretically offers very good protection from interface and crosstalk. It was commonly used for token ring networks.
2. Shielded twisted pair is rarely used due to fact that the potential performance increase over UTP is not worth the much greater cost of STP.
3. STP, which is limited to 100 metres length, is used in token ring networks and for IBM mainframe and minicomputers environment.
4. There is no standard for it, since token ring networks do not require STP, it is used less and less. These are a few reasons for this.

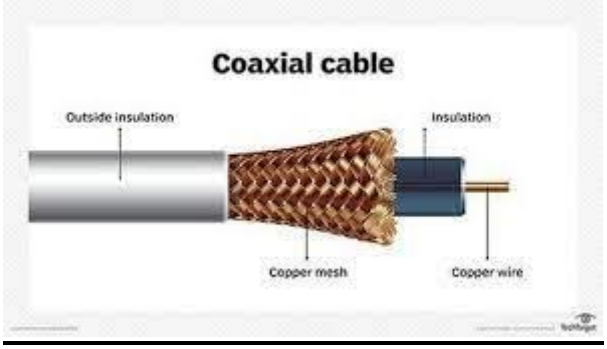
- Higher cost due to greater complexity for the Cabling and connectors.
- Larger size and less flexibility of the cabling.
- Longer installation time.

UTP[unshielded twisted pair]:-



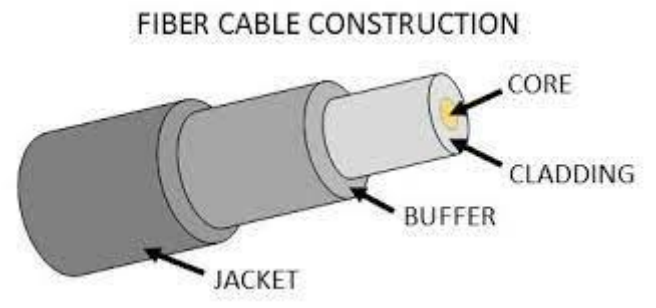
1. UTP is the most commonly used type for networking cable.
2. UTP cables are often called " Ethernet cables" after ethernet, the most common data networking stranded that utilizes UTP cables not the most reliable.
3. In contrast to FTP and STP cabling. UTP cable is not surrounded by any shielding.
4. It is the primary wire type of telephone usage and is very common for computer networking, especially in patch cables or temporary network connections due to the high flexibility of the cables.

Coaxial cable:-



1. Coaxial cable is an electrical cable consisting of a round connecting wire surrounded by an insulating spacer, are surrounded by a spherical conducting sheath, and usually surrounded by a final insulating layer.
2. Most common use of Coaxial cable today is in standard cable team.
3. If you have the chance to examine a table, you will find it has a fairly simple design.
4. Copper conductor lies in the center of the cable, which is surrounded by insulation.
5. A braided or mesh outer covering surrounds the insulation. This is also a conductor.
6. A PVC plastic jacket encases the covering. The cable is designed to carry a high frequency or broadband signal as a high frequency transmission line.
7. Because the electromagnetic field carrying signal exists only in the space between the inner and outer conductors. It cannot interfere with the other interference from external electromagnetic fields.

SMF[Single mode fiber]optic cable:-



1. Single mode optical fiber is an optical fiber in which only the lowest order band mode can propagate at the wavelength of interest.
2. Single mode fibers are best at retaining the fidelity of each light pulse over longer distances and exhibit no dispersion caused by multiple spatial modes.
3. Thus, more information can be transmitted per unit. Giving single mode fibers a higher bandwidth in comparison with multimode fibers.
4. A typical single mode optical fiber has a core radius of 5-10 micro meters and cladding radius of 120 micrometers.
5. Currently, data rates of up to 10 GB/second are possible at a distance of over 60 kilometres with commercially Available Transceivers.
6. Equipment for single mode fiber is more expensive than equipment for multimode optical fiber, but the signal mode fiber itself is usually cheaper in bulk.

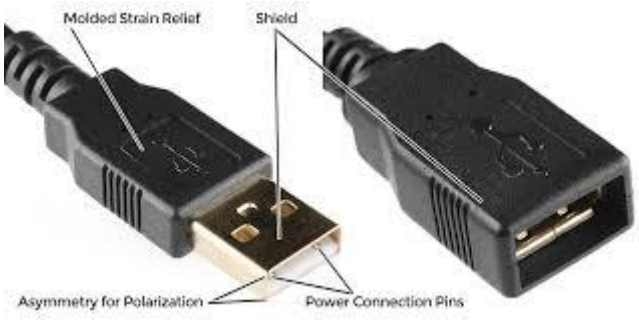
MMF[multimode fiber]optical fiber:-

1. Multimode optical fiber is a type of optical fiber mostly used for communication over short distances. Example within a building.
2. It can carry 1 GB/second for a typical building distances. The actual maximum speed depends upon the distance.
3. It is easier to connect to than signal mode optical fiber, but it’s limit on speed.

4. Multimode fiber has a large center Core that single mode fiber, which allows to support more than one propagation mode or path within the fiber.
5. Typical transmission speed/distances limits are 100 Mbps up to 2 kilometres [100 BASE-FX], 1Gbps for distance upto 500-600m [1000 BASE-LX;1000 BASE-SX], & 10Gbps for distance upto 300m[10GBASE-SR].

Types of network jacks in a network:-

USB[Universal serial bus]:-



1. USB is a computer standard design to eliminate the guesswork in connecting peripherals to a PC.
2. It is expected to replace serial and parallel ports.
3. A single USB port can be used to connect up to 127 peripheral devices such as mice, modem, keyboard, Digital cameras, Printers, scanners, MP3 players and many more.
4. I will be also supports plug and play installation and hot plugging.
    - USB 1.1 standard supported data transfer rates of 12 Mbps
    - USB 2.0 specifications defines a new high speed transfer rate of 480 Mbps.
5. USB 2.0 is fully compatible with USB 1.1 and users with the same cables and connectors. USB has with 2 connector types.
6. The first is type A, This connector, connects to the PC's USB port.

7. The second is Type B, This connector for connecting to the relevant peripheral.
8. Whereas the type A connector is truly standard, the Type B connector could be changed and size etc with individual peripheral meaning they require their own unique cables.

RJ-11[registered Jack]:-

1. Standard telephone cable connectors RJ-11 has 4 wires.
2. RJ-11 is acronym for registered Jack-11, a 4 or 6 wire connectors Primarily used to connect telephone equipment.

RJ-45[registered Jack]:-

1. The acronym for registered Jack-45 is RJ 45.
2. RJG-45 Connector is a 8 wire connector that is commonly used to connect computer to a local area network. [LAN] particular Ethernet LANs.

3. Although they are slightly larger than the more commonly used RJ 11 connectors, RJ 45 connectors can be used to connect to some types of telephone equipment.

F-Type:-

1. The F connector is a type of RF connector commonly used for cable and universally for satellite television.
2. They are also used for cable TV connection in DOCSIS cable modems, usually with RG- 6 tri-shield cable.
3. The F connector is inexpensive yet has good performance up to 1GHZ. One reason for its low cost is that it uses. The center wire of Co axial cable as the pin of the male connector.
4. The male connector body is typically crimped onto the exposed outer braid. Female connectors have a 3/8- 32 thread.
5. Most male connectors have a matching threaded connecting ring. Through push on version are also available.

ST[Straight Tip]and SC[Subscriber connector or Standard connector]

1. Fiber networking segments always required to fiber cables.

I. One for transmitting data, one for receiving.
II. Each end of a fiber cable is fitted with a plug that can be inserted into a network adapter hub or switch.
III. In the ‘NA’ most cables uses Square SC connectors. That slides and locks into place when inserted into a node or connected to another fiber cables. Europeans use a round ST connector instead.

Fiber LC[Local Connector]: -

1. These connectors are used for single mode and multimode fiber optical cables.
2. FC connectors offer extremely precious positioning of fiber optical cable with respect to the Transmitter’s optical source emitters and the receiver’s optical detector.
3. FC connectors future a position locatable notch and a threaded receptacles.

MT-RJ[Mechanical transfer registered jack]:-

1. MT- RJ connectors are used with single mode and multi mode fiber optic cables.

2. The MT- RJ connectors are constructed with a plastic housing and provide for accurate alignment via their metal guide pins and plastic ferrules.
3. Used for Gigabit Ethernet to connect to modules with MT- RJ interfaces, Use multimode fiber optic cable.

<u>Types of Connectors:</u>-

Blind mate Connector:-

- Blind mate connector ensure that even when your line of sight to the making characters is limited on the physical access to the mating connector area inhabitated you can see safely and easily mate them.

D-Sub Connector:-

- D-sub connectors are named after their distinctive D shaped metal shell and they are used in a variety of applications.

Hot Swap Connectors:-

- Hot Swap connector, allow technicians to safely add or remove or replace components under load without shutting down the entire system or risking damage to the equipment.

IP67 Connectors:-

- IP67 connector prevent the ingress of dust or water, making them perfect for our harsh environment and more rugged applications.

Military Connectors:-

- Military connectors are designed to meet the military high Standards in regard to durability, Reliability and precision and they serve specific functions within the equipment of the armed forces.

Modular Connectors:-

- Modular Connectors can be configured to fit a customer's goals and applications requirements by using pre-existing building blocks to arrange unique contact arrangements.

Power Connectors:-

- Power connectors deliver electronic devices electrical power from either an AC or DC source.
- In addition to the power contact, signal contact clusters are used for system control and communication.

Press-fit Connectors:-

- Press fit connectors are designed to press through a PCB plated through holes. [PTH] versus being Soldered.

Space Connectors:-

- Space connectors with their low out-gassing, non-magnetism and extreme reliability can withstand the extremely harsh environmental conditions that characterize the spaceflight environment.

<u>Tools:</u>-

Crimping tool:-

i A crimping tool is one of the most crucial network connecting tools.
ii In order to connect a connecter to the cable, you will need a tool to crimp or connect.
iii Known as the crimping tool. This tool is used to connect RJ- 45, RJ-11 and other connectors to the end of the cable.
iv Some crimping tools have a built in wire cutter near the hands. This wire cutter can be used to cut a phone cable or a cat-5 cable.

Network Cable tester:-

i One of the problems with wired networks is that when they cease to the work, troubleshooting may be little more difficult as compared to wireless network.
ii The network cable tester is a useful device that allows you to check continuity of the cable to figure out if the signal is strong enough to get through to the network.
iii This helps to eliminate cable connectivity issues while troubleshooting the problems.

Coaxial Compression tool:-

i The coaxial cable is the cable that includes the outer metal that does that does the conducting.
ii A central conducting core ensures that the metal insulated’
iii High frequency signals are transmitted through this coaxial line.
iv A coaxial compression tool is a useful device that uses connectors properly compression the coaxial cable.

- The side of the cable wire will enable you to know which type of cable it is.

Result:– Specifications of various networking devices & Cables, Jacks , Connectors, tools etc used in local area networks are identified.

SHARE THE PRINTER IN A NETWORK

Name of the student: -		Date of Experiment:
PIN: -	Branch: -	
Institution: -		Experiment: -

1.Title of the Experiment: _____

_____

2.Objective of the Experiment: _____

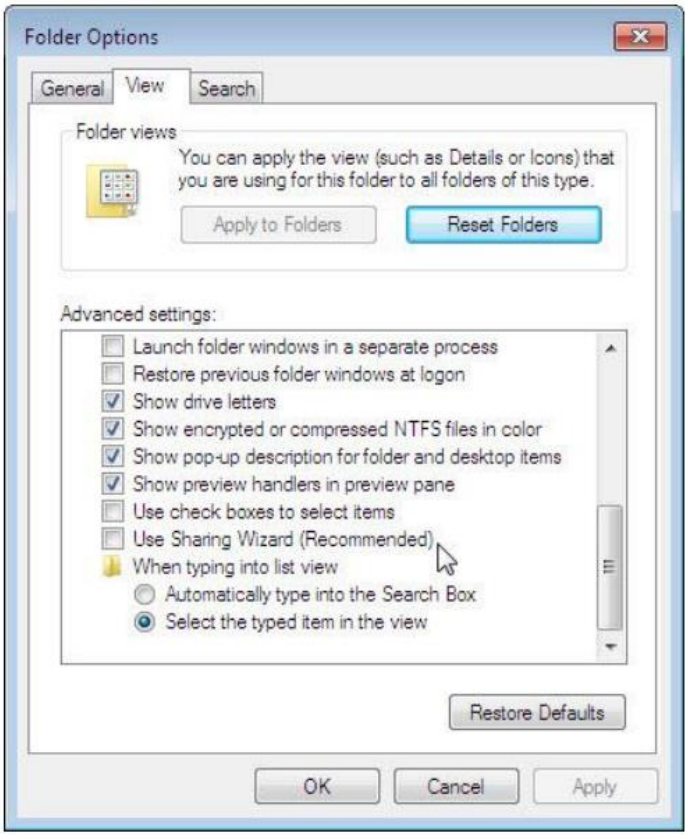
_____

3.Equipment Required: _____

_____

Step–1

Log on to the computer with the printer connected, click **Start > Computer > Tools > Folder options > View**, and then uncheck **Use Sharing Wizard (Recommended)** if it is checked.



Click ok.

Step–2

Click **start>control panel>network and sharing center>chose homegroup and sharing options>change advanced sharing settings.**

The change sharing options for different network profiles screen appears.

For the current profile, scroll down to **Password protected sharing** and then check **Turn off password protected sharing**.

Click **Save changes.**

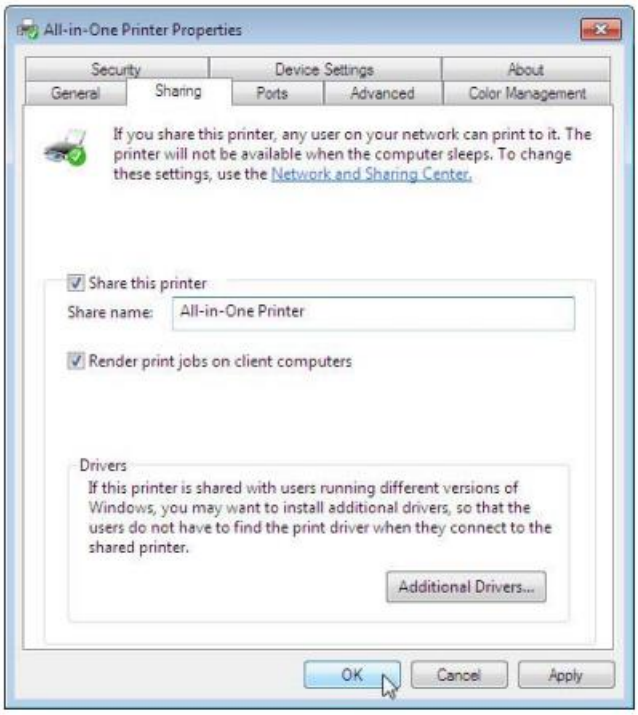
Close any open windows

Step-3

Click **Start > Control Panel > View devices and printers**.

Right-click the printer, and then select **Printer properties.**

The “Printer Properties” window opens.



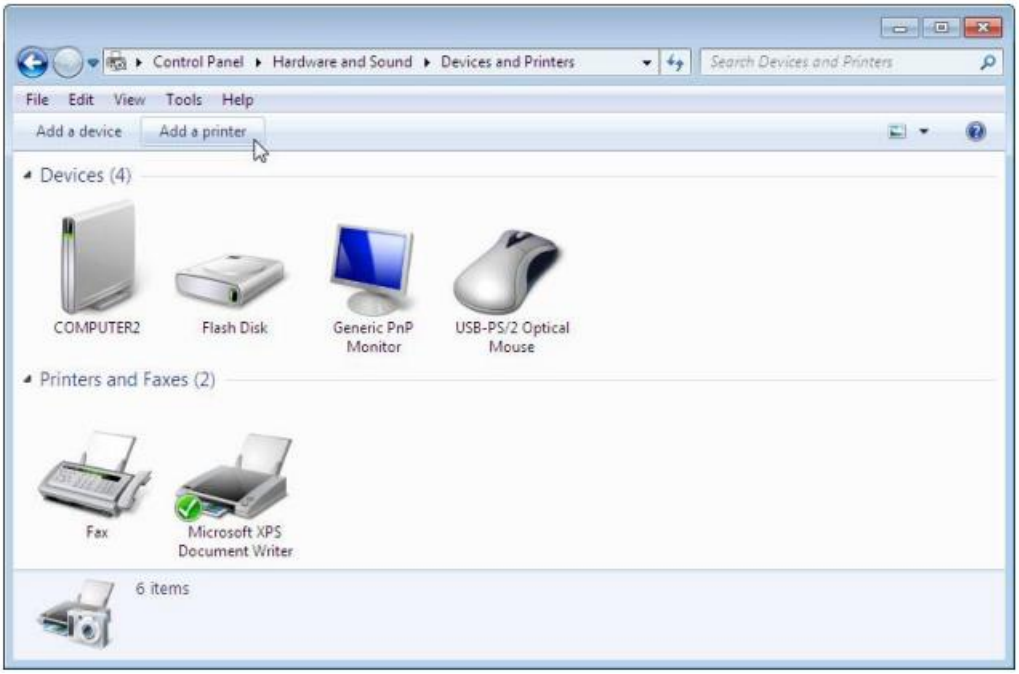
Click the **Sharing** tab.

Select **Share this printer**. Name the new share **All-in-One Printer**, and then click **OK**.

Step-4

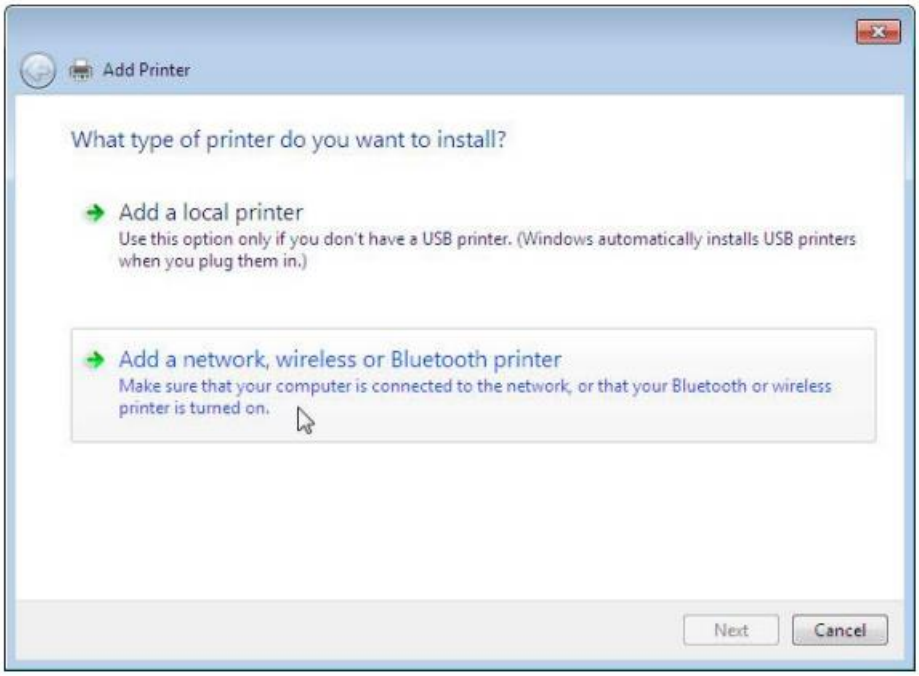
Log on to the computer without the printer connected.

Click **Start > Control Panel > View devices and printers.**

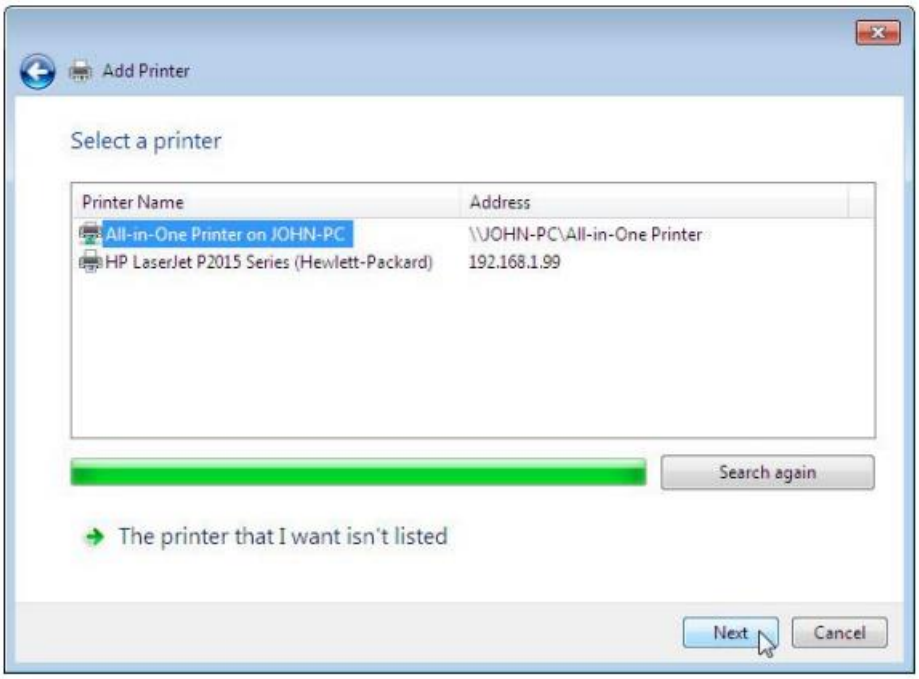


Add a printer

The “add printer” windows appears.

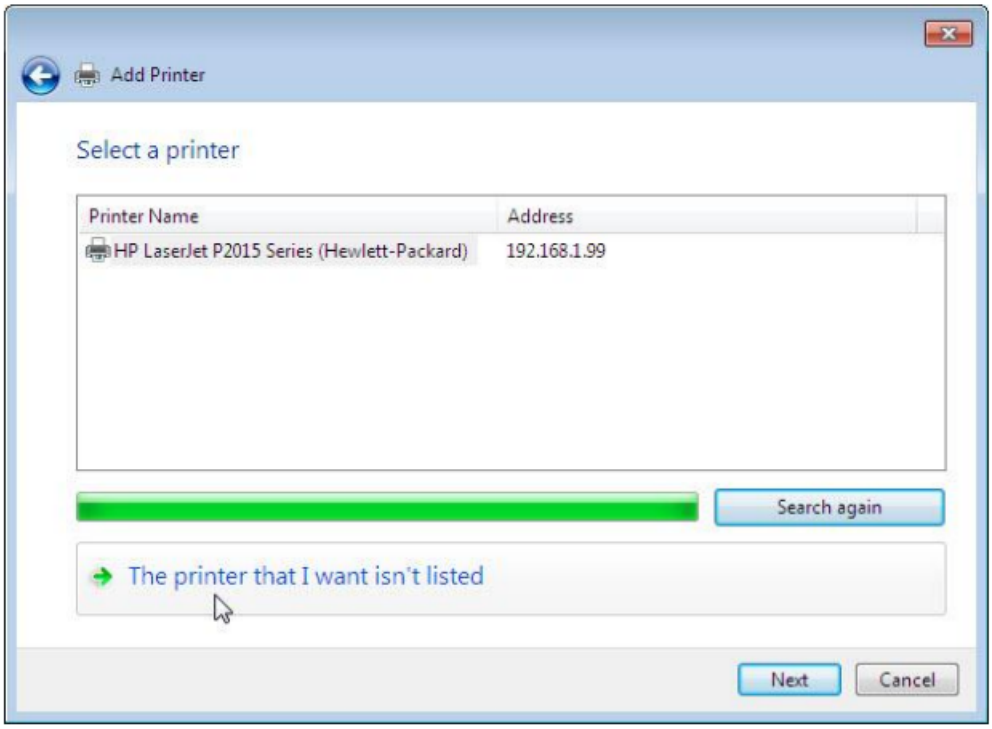


Click a **Add network, wireless or Bluetooth printer**.
The “Searching for available Printers” screen appears.
When all printers are discovered, the “Select a printer” screen appears.
If displayed in the search list, select **Printer on Computer name.**

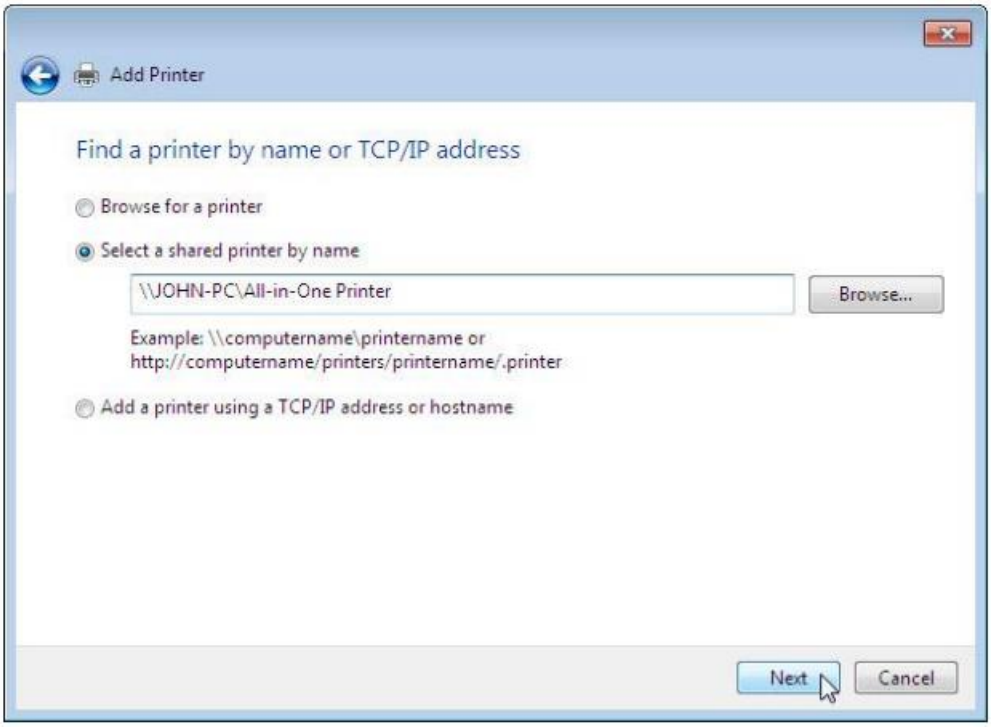


Click **next.**

or to find a printer by name or TCP/IP address, select **the printer that I want isn't listed**



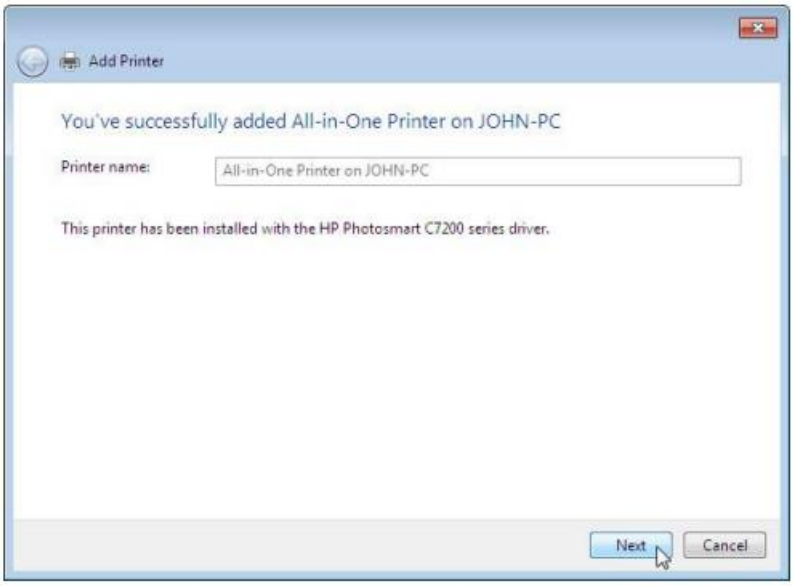
Select the radio button **Select a shared printer by name** and type **\\computername\printer**, where computer name is the name of the computer with the connected printer and printer is the name of the printer.



Click NEXT.

If prompted to install drivers, click Install drivers.

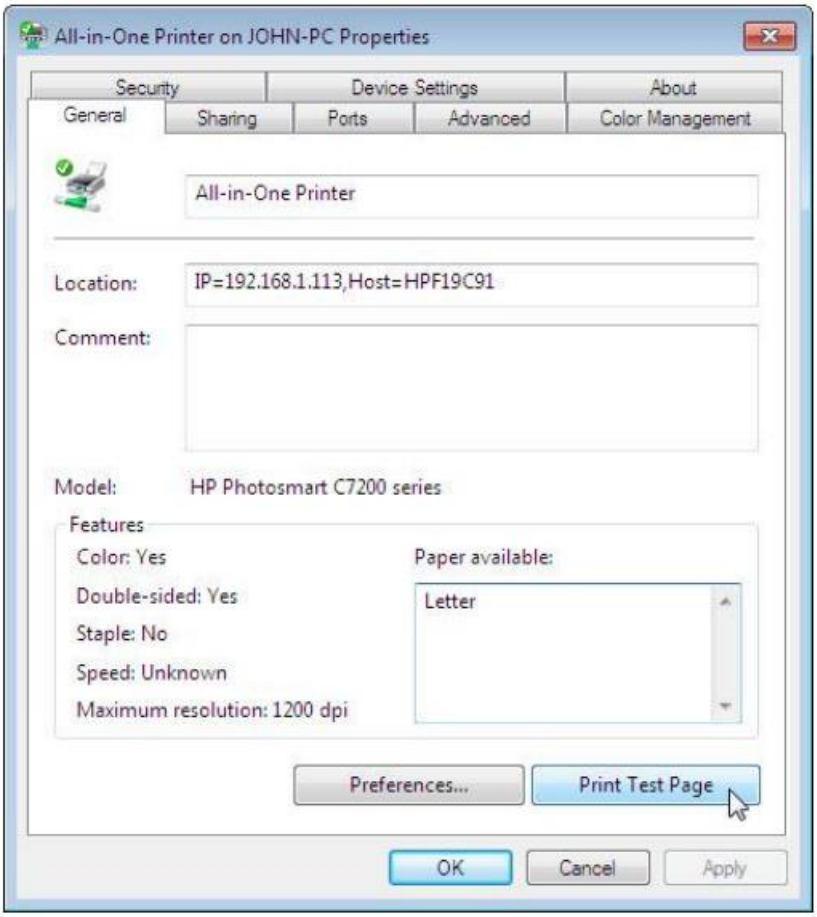
If User Account Control appears, click **Continue.**
The "You've successfully added a printer" screen appears.



After the printer successfully install, click Next.
Click **Finish** to close the "Add printer" window.

Step–5

In the devices and printers window, right-click the printer, and select **Printer properties.**



Click print Test page.

Result– Successfully shared a printer in a network.