LAB 1:-

NAME: MUNIB UL HASSAN
ROLL NO :2019-CS-037
SECTION :5A

Q.1) Difference between network and networking?

Answer 1:-

The main difference between network and networking **is that network is** a collection of computing devices connected via a communication medium to exchange information and resources while **networking is** the practice of creating, maintaining, securing and troubleshooting the **network**.

Q.2) Components of data communication model?

Answer 2:-

Five components of data communication system

- **Message:** The message is the information (data) to be communicated.
- **Sender**: The **sender** is the device that sends the data message.
- **Receiver**: The **receiver** is the device that receives the message.
- **Transmission medium**: The transmission **medium** is the physical path by which a message travels from **sender** to **receiver**.
- Set of rules **(Protocol)**

Q.3) Does analogue conversation take place in source as transmitter?

Answer 3:-

Al Through it is possible to analogue conversation to take place in source as transmitter. A conversion is a point at which network trouble can occur an opportunity for error and distortion to be introduced. Therefore ideally we want to move forward towards an end-to-end environment.

Q.4) Give an example of data communication model?

Answer 4:-

For example:-

A common **example of data communications** is a computer connected to the Internet via a Wi-Fi connection, which uses a wireless medium to send and receive **data** from **one** or more remote servers.

Q.5) What is Peer-to-Peer network?

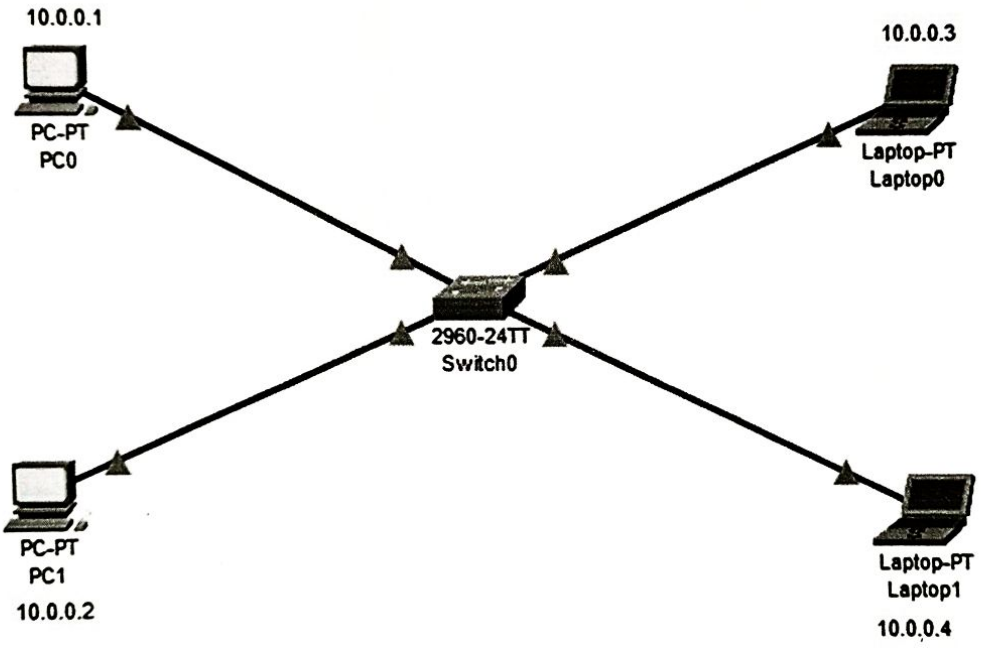
Answer 5:-

A **peer-to-peer network** is one in which two or more PCs share files and access to devices such as printers without requiring a separate server computer or server software.

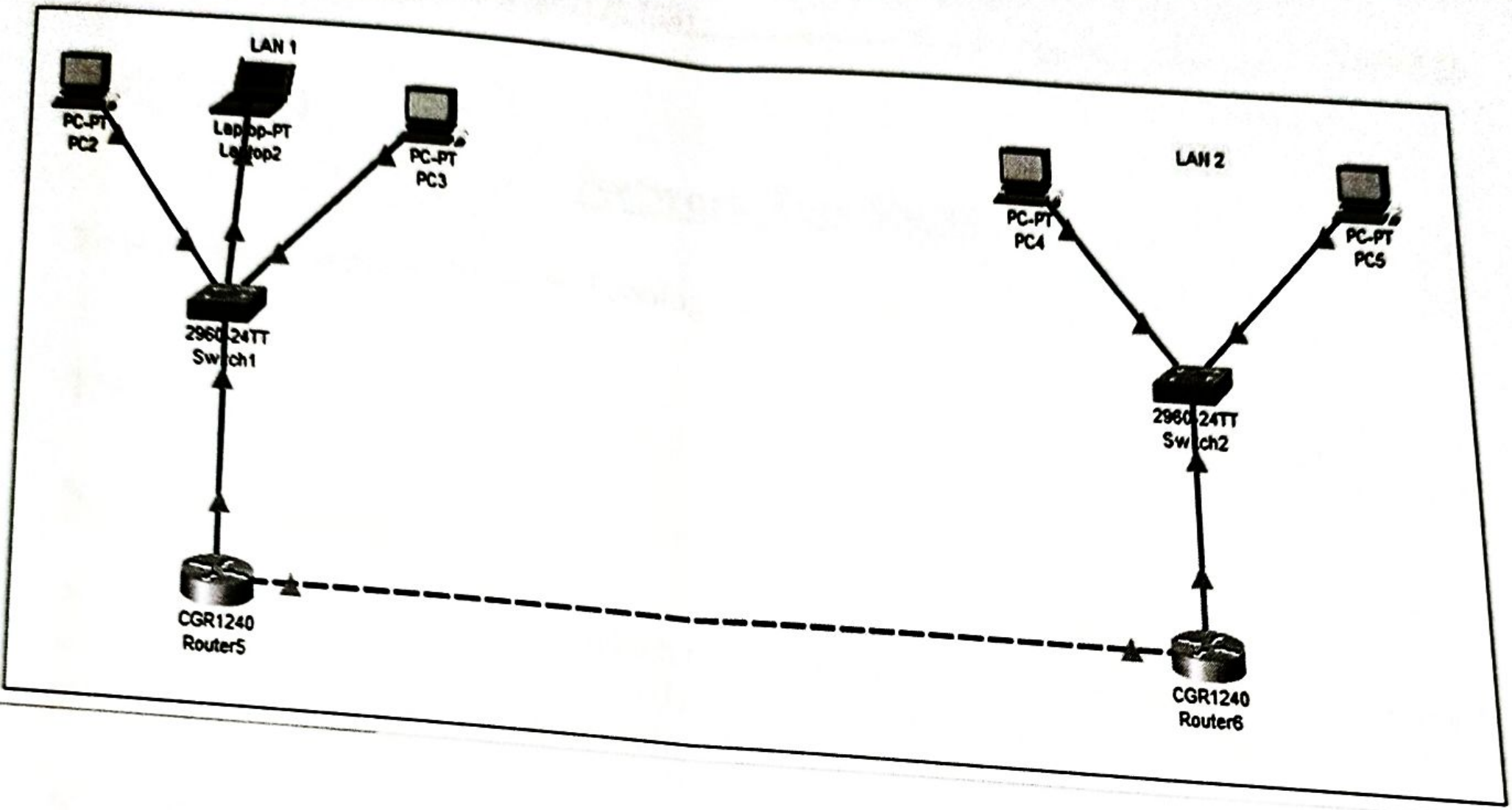
Q.6) Build LAN & WAN environment using Packet Tracer?

Answer 6:-

LAN (Local Area Network) Environment



WAN (Wide Area Network)


LAN 1
PC-PT
PC2
Laptop-PT
Laptop2
PC-PT
PC3
2960-24TT
Switch1
CGR1240
Router5
LAN 2
PC-PT
PC4
PC-PT
PC5
2960-24TT
Switch2
CGR1240
Router6

LAB 2:-

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ROLL NO :2019-CS-037
SECTION :5A

(1) What is difference between partial and full mesh topology?

Partial-Mesh Topology :-

A **partial-mesh topology** is also a **mesh topology** similar to full-**mesh topology**. ... In **partial-mesh topology**, some of the devices are connected to many devices together, but other devices are connected only to one or two devices.

Full Mesh Topology:-

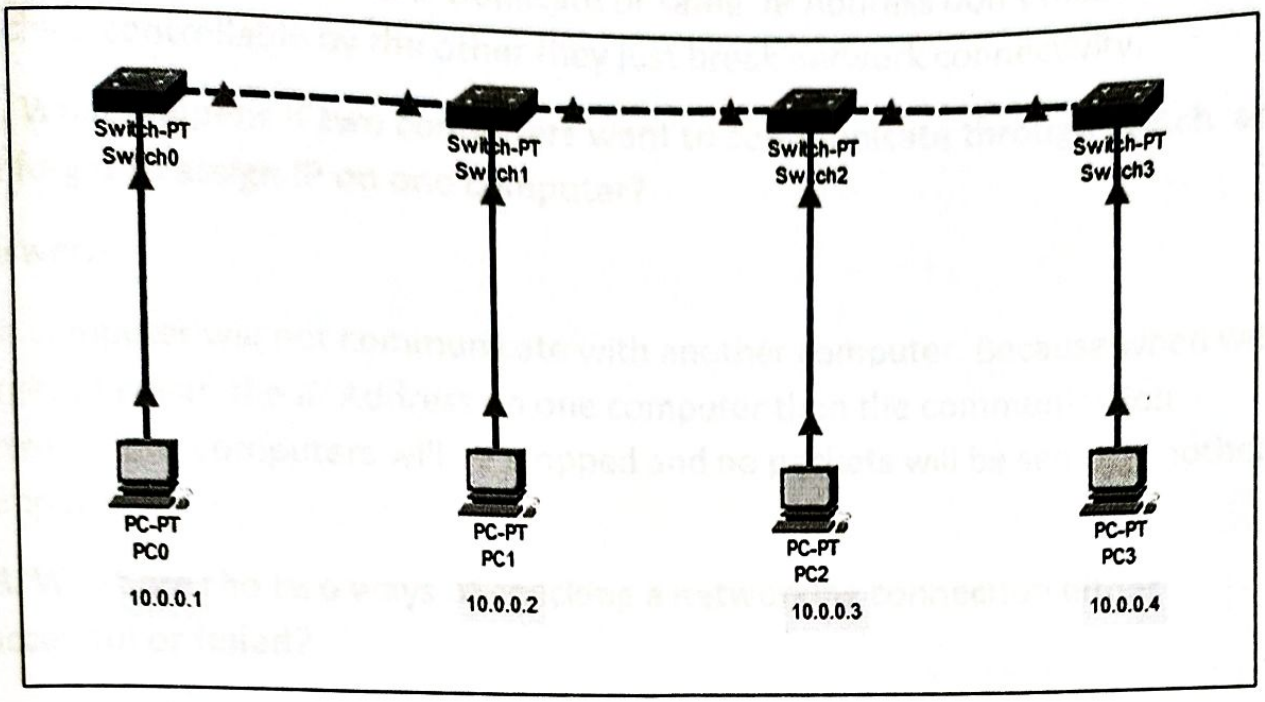
With a full mesh, each node is directly connected to every other node. This enables a message to be sent along many individual routes.

For **Example:-**

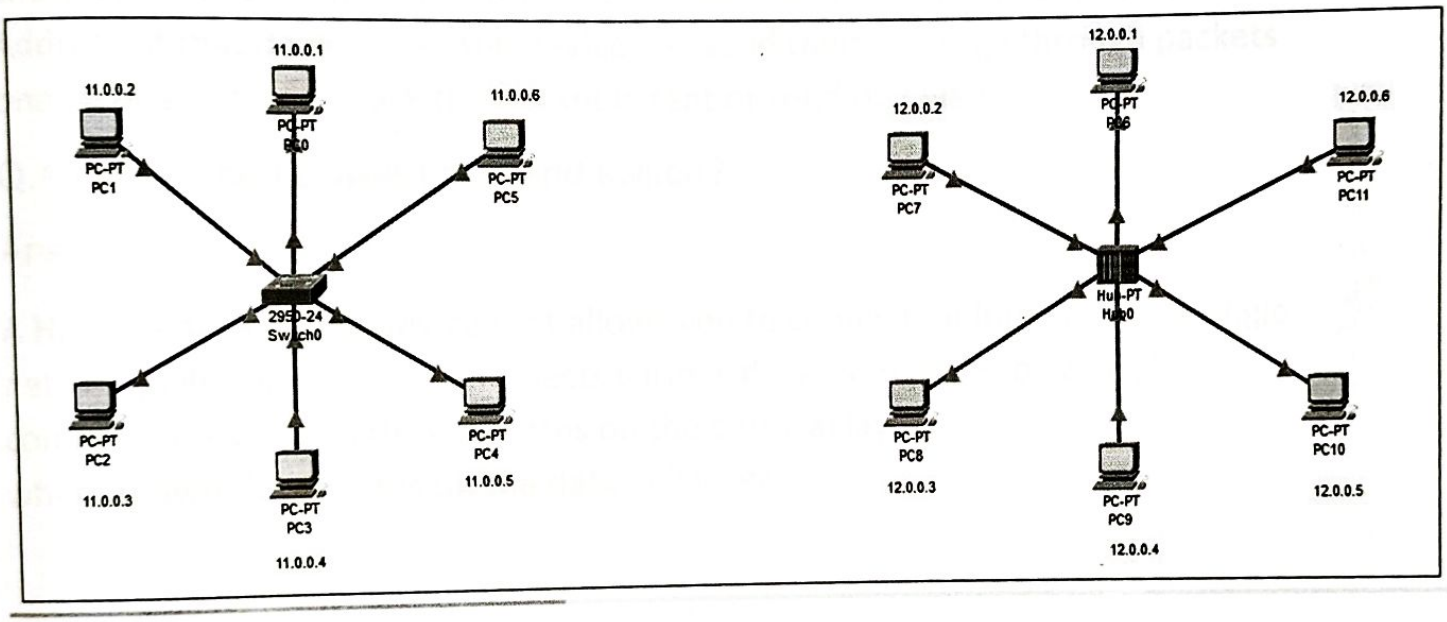
Tennis nets and football goals. In **Mesh** Network **Topology** each Network Node has a point-to-point connection to all other Nodes present in the whole Computer Network. This means that there are dedicated links between each pair of Network Devices.

(2) Design Bus and Star Topology environment using Packet Tracer?

Bus Topology



Star Topology Using Switch And Hub



Q1. If two computer belongs to the same network so either we should assign same class IP or different class IP? If we assign same IP address than why ?

Answer:-

An **IP** Address is always combined with a subnet mask and it is the Subnet Mask that determines which part of the **IP** Address that belongs to the **IP** Network And Which Part that belongs to the host address. So if both subnets are identical then

IPs are on the same subnets. Duplicate or same IP Address don't make one machine controllable by the other they just break network connectivity.

Q2. What happens if two computers want to communicate through switch and we forget to assign IP on one computer?

Answer:-

The computer will not communicate with another computer. Because when we forget to assign the **IP** Address on one computer then the communication between two computers will be stopped and no **packets** will be sent to another computer.

Q3. What are the two ways of checking a networking connection either successful or failed?

Answer:-

There are two types of checking the networking connection .The First one is we check command prompt. In command prompt we will write **PING** than **IP** Address of that device then the device will send their messege through packets one by one and will check the packet is sent or sending failed.

Q.4)Difference between hub and switch?

Answer:-

A **Hub is** a networking device that allows you to connect multiple PCs to a single network, whereas a **Switch** connects various devices together on a single computer network. A **Hub** operates on the physical layer, whereas **Switch** operates on the data link layer.

Q.1) What is the significance of twisting in twisted pair copper wires?

Answer:

Twisted pairs are made up of two insulated copper wires that are twisted together. The twisting is done to help cancel exterior electromagnetic interference.

Q.2) What is the difference between unshielded and shielded twisted pair wires?

Answer:

Shielded twisted pair cable (STP) has the individual pairs of wires wrapped in foil, which are then wrapped again for double protection. Unshielded twisted pair cable (UTP) has each pair of wires twisted together. Those wires are then wrapped in tubing without any other protection.

Q.3) What is the difference between guided and unguided medium?

Answer:

The key difference between guided and unguided media is that guided media uses a physical path or conductor to transmit the signals whereas, the unguided media broadcast the signal through the air.

Q.4) What are the application of fiber optics, twisted pair and coaxial cables?

Answer:

OPTICAL FIBER:

Optical fiber is used by many telecommunications companies to transmit telephone signals, Internet communication, and cable television signals.

TWISTED PAIR:

Twisted-pair cable is a type of cabling that is used for telephone communications and most modern Ethernet networks.

COAXIAL CABLES:

Its applications include feedlines connecting radio transmitters and receivers to their antennas, computer network (e.g., Ethernet) connections, digital audio (S/PDIF), and distribution of cable television signals.

Q.5) What is the position of transmission media in OSI model?

Answer:

The transmission media is available in the lowest layer of the OSI reference model, i.e., Physical layer.

Q.6) Just name the components of optical fiber cables?

Answer:

FIBER OPTIC CABLE CONTAINS THREE BASIC COMPONENTS:

The core: which carries the light signals;
The cladding: which surrounds the core with a lower refractive index and contains the light;
The coating: which protects the fragile core and cladding within it.

Q.7) What is the usage of straight and cross over cables?

Answer:

Straight-through cables are primarily used for connecting unlike devices.

Crossover cables are use for connecting unlike devices alike devices.

Exercises:

Q.1) What do you understand by logical addressing?

Answer:
The logical address is virtual address as it does not exist physically, therefore, it is also known as Virtual Address. This address is used as a reference to access the physical memory location by CPU.

Q.2) Why we divide the range of ip address from 0 to 255 in classes?

Answer:
Each byte, or 8-bit segment of the address, is divided by a period and typically expressed as a number 0-255. Even though these numbers are typically expressed in decimal to aid in human comprehension, each segment is usually referred to as an octet to express the fact that it is a representation of 8 bits.

Q.3) Difference between unicasting & multicasting? Give its example.

Answer:

UNICASTING:
In Unicasting, the data traffic flows from a single source node to a single destination node on the network. It is a 'one-to-one' type of data transmission between the sender and receiver.

MULTICASTING:
Multicast is a kind of transmission type in which a single source communicates a message to a group of devices.

Q.4) What is CIDR or slash notation. Give the maximum and minimum range of each class.

Answer:

Classless Inter-Domain Routing is a method for allocating IP addresses and for IP routing.

Class A	Class B	Class C	Class D	Class E
0.0.0.0 - 127.255.255.255	128.0.0.0 - 191.255.255.255	192.0.0.0 - 223.255.255.255	224.0.0.0 - 239.255.255.255	240.0.0.0 - 255.255.255.255

Q.5) What is broadcast addressing?

Answer:
A broadcast address is a network address used to transmit to all devices connected in a network

Q.6) Perform subnet on following ip 195.176.5.0/28.

Answer:

Binary Subnet Mask: 11111111. 11111111. 11111111. 11110000
IP Class: C
Binary Id: 11000011.10110000.00000101.00000000
CIDR Notation: /28
Subnet ask: 255.255.255.240

Q.7) find the subnet mask only of the following ip address:

a) 192.168.60.20/28 b)202.50.6.7/26 c) 215.54.7.80/29

Answer:

a.

Binary Subnet Mask: 11111111. 11111111. 11111111. 11110000
IP Class: C
Binary Id: 11000000.10101000.00111100.00010100
CIDR Notation: /28
Subnet ask: 255.255.255.240

b.

Binary Subnet Mask: 11111111. 11111111. 11111111. 11000000
IP Class: C
Binary Id: 11001010.00110010.00000110.00000111
CIDR Notation: /26
Subnet ask: 255.255.255.192

c.

Binary Subnet Mask: 11111111. 11111111. 11111111. 11111000
IP Class: C
Binary Id: 11010111.00110110.00000111.01010000
CIDR Notation: /29
Subnet ask: 255.255.255.240

checking messages and ping command.

Exercises:

Q1. What happens if we connect PC directly to the router without using switch in between the two devices i.e. PC's and router?

The PC is able to send data on every PC connected in the same network

Q2. What do you understand by the term **Default-Gateway IP?** why we need to assign this?

Default gateway ip is the ip which is required to send data from one PC to another PC of different network.

Q.3. Can we implement V-LAN by using router on stick?

Yes, it is possible to implement-
V-lan by using router on switch
since all devices connected to
each other

Q.3. Explain the function of this command "Router(config-if)#"

Answer:

This command enters you to the router interface mode. Example router(config-if)# ip address 192.168.1.5 255.255.255.0. sets the IP address and subnet mask for the specified GE interface

EXERCISES:

Q.1) For each of the following networks, discuss the consequences if the connection fails.

1. Five devices are arranged in mesh topology?
2. Five devices are arranged in star topology (not counting hub/switch)?
3. Five devices are arranged in bus topology?
4. Five devices are arranged in mesh topology?

Answer:

Data transfer /Communication between Nodes is not affected because alternative path (connection) always presented in Mash Topology.

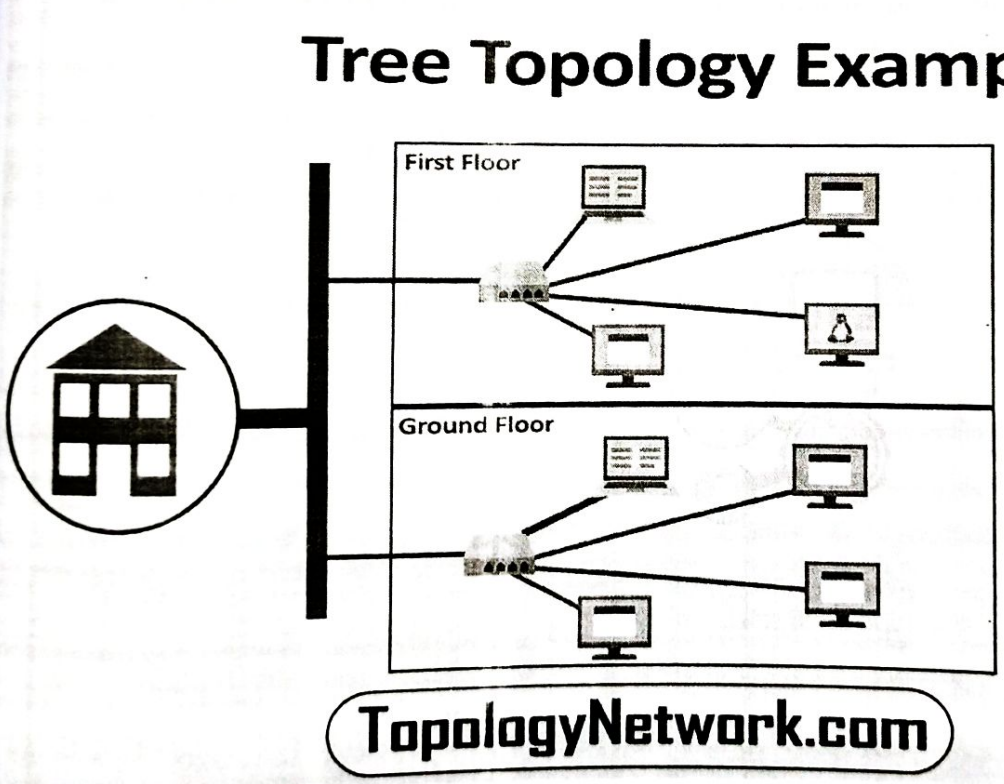
Data transfer between Nodes is affected in the Star Topolgy , because all the node connected with centralize System(Host)

In Bus Topology All the Nodes connected with a single line so all circuit is fail if any node is drop.

Q2.) what do you mean by tree topology?

Answer:

A tree topology is a special type of structure where many connected elements are arranged like the branches of a tree.



Q.3) Why we use router in this network?

Answer:

Routers carry out two basic functions—they select a path between networks, and they securely transmit information packets across that path toward an intended destination.

Q.4) PC1 is configured with default gateway address. PC2 is not configured with a default gateway. What would happen if PC1 pings PC2.

Answer:

For a PC of any network there must be a default gateway in order to send and received any data. So, in this case PC1 is configured by default gateway but PC2 is not configured by default gateway so PC1 cannot ping PC2 because there is no path available for ping address.

Q.5) Define network topology?

Answer:

Network topology refers to the physical or logical layout of a network.

There are two types of network topologies: physical and logical.

1. **Physical topology** emphasizes the physical layout of the connected devices and nodes, while the
2. **logical topology** focuses on the pattern of data transfer between network nodes

EXERCISES:

Q1. What is DCE and DTE?

DCE stands for data communication equipment.
DTE stands for data terminal equipment.
DTE is typically either a dump terminal or the serial port on a computer/workstation.
DCE is typically a modem, DSU/CSU, or other piece of data communication equipment.

Q.2 Write Example of devices that are DTE and DCE?

Example of DTE: Computers, printers, routers, etc

Example of DCE: modem, ISDN adapters, satellite and network, interface cards, etc.

Q.3) Why we use router in our network?

A router recieved and sends data on Computer network.

Q.4) What is clock rate?

It is the frequency at which the clock generator of a process can generate pulses, which are used for synchronize the operations of its components.

Q.5) What is Gateway?

A network hardware used in telecommunication for telecommunications network that allows data to flow from one discrete network to another.

Q.6) Does it necessary to use serial cable for connecting routers? Explain with reason.

we mostly use serial links b/w multiple routers to propated config data b/c the

Q.7) What are the difference between fast Ethernet and serial cable?

Fast ethernet uses ethernet technolog like twisted pair.

Serial interfaces use time domain multiplexing (TDM) and use clock speed to synchronize.