Assignment - 1

Subject - computer Networks &
TOPIC ..... Internet protocols ..... DATE .....

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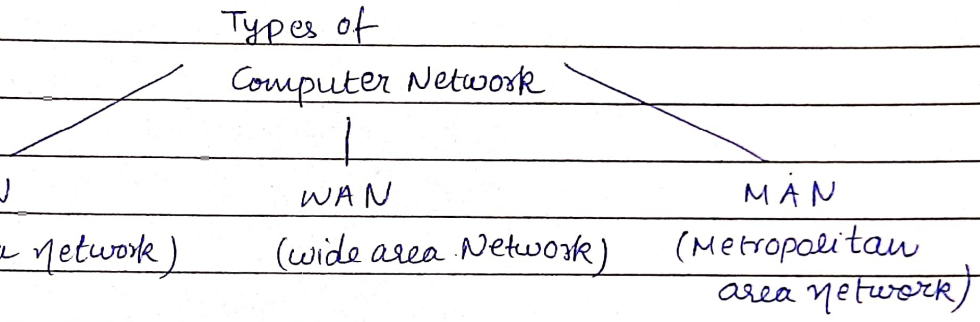
B.tech {AI & DS} Section - S11

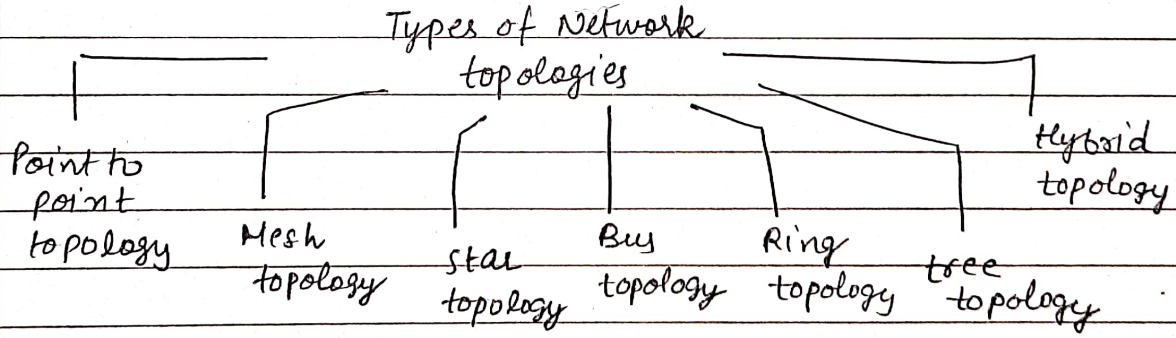
Ques 1. what is computer network ? Explain various topologies used in networking ?

Ans 1. computer network is a system that connects numerous independent computers in order to share information (data) and resources.

computer network is a collection of two or more computer systems that are linked together. It can be established using cable or wireless media.



Network topology -
arrangement of network that comprises nodes & connecting lines via sender and reciever is referred to as "network topology"



Point to point topology - It works on the functionality of sender & Reciver. It is simplest communication between the nodes

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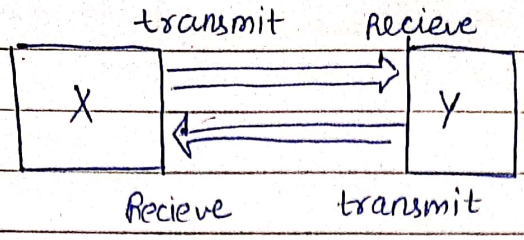
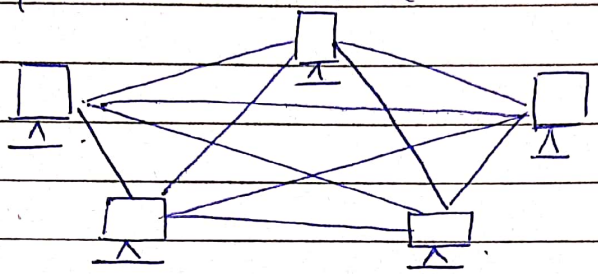
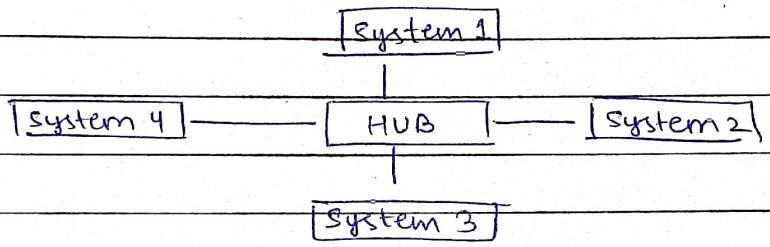


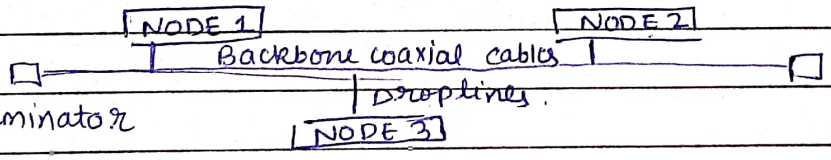
Mesh topology - Every device is connected to another device via particular channel.



Star topology - All devices are connected to a single hub through a cable. which is central node.



Bus topology - It is a network type in which every computer and network device is connected to a single cable which is bi-directional.



Ring topology - it forms a Ring connecting devices with exactly two neighbouring devices. The data flows in one direction i.e., it is unidirectional.

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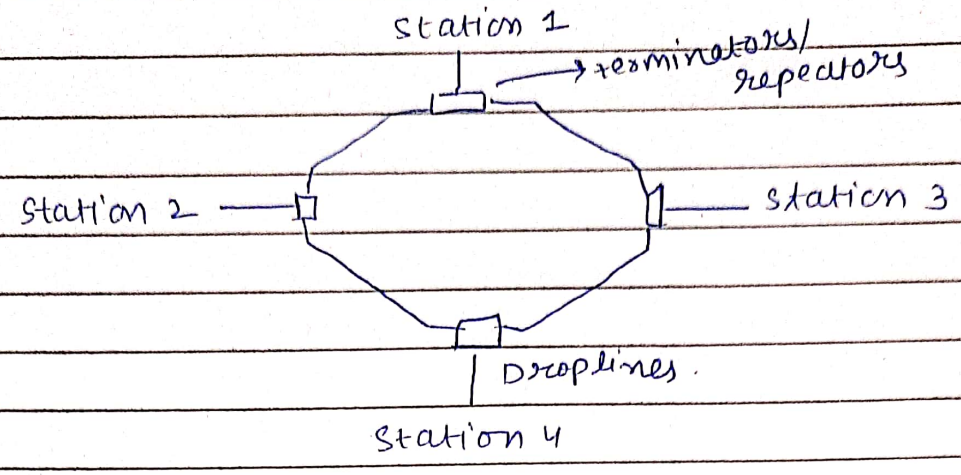
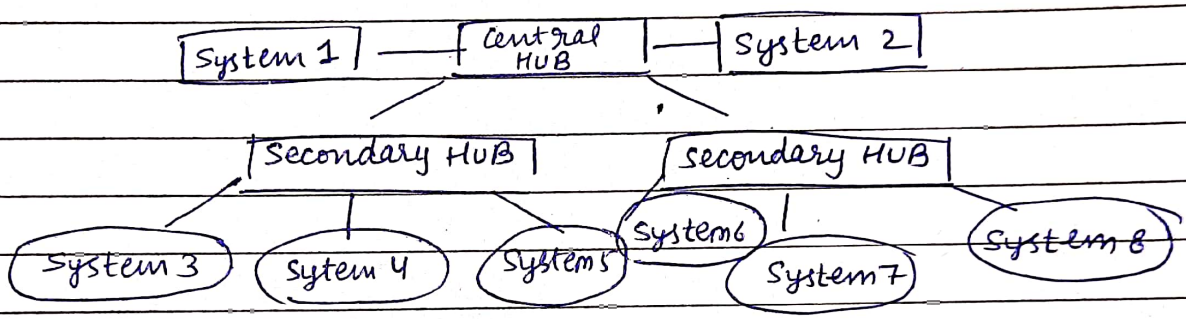
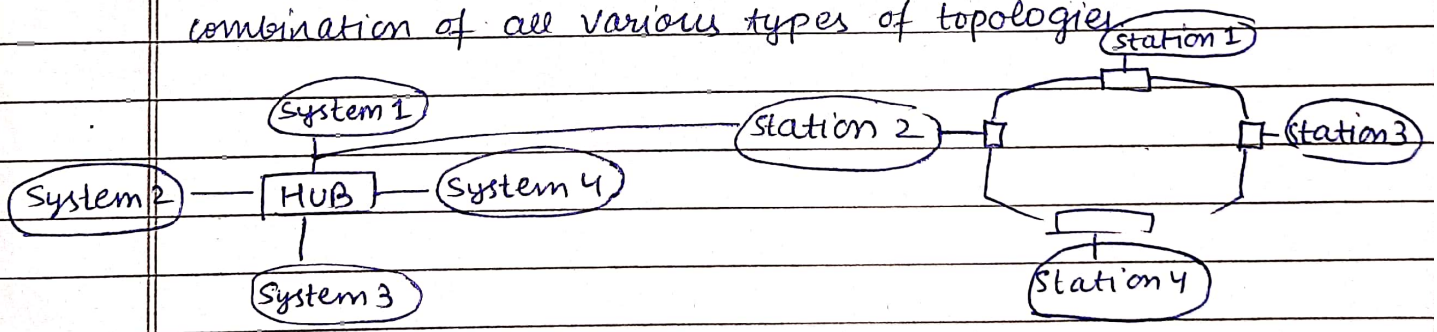


Tree topology - It is variation of the star topology. This topology has hierarchial flow of Data



Hybrid topology -
combination of all various types of topologies



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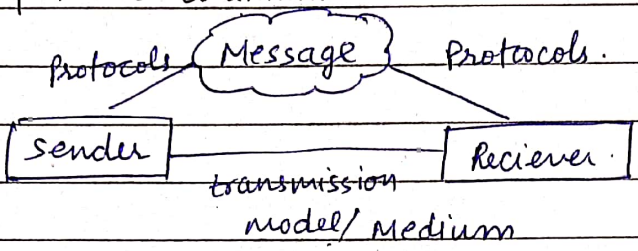
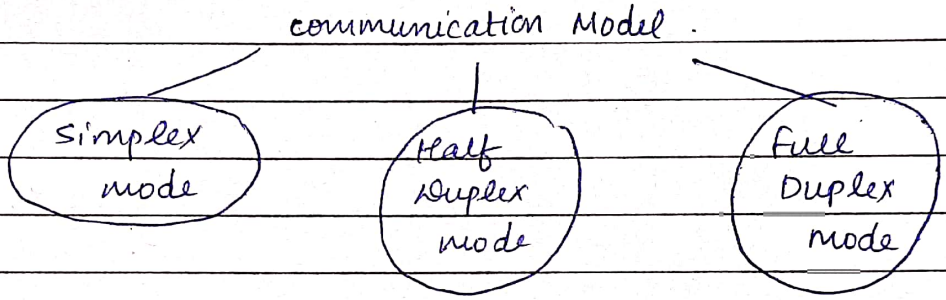
Ques2 what are Different communication model in networking? Explain?

communication - defined as a process in which more than one computer transfers information, instructions to Each other for Sharing resources. or It can be defined as the process or act in which we can recieve or send the data.

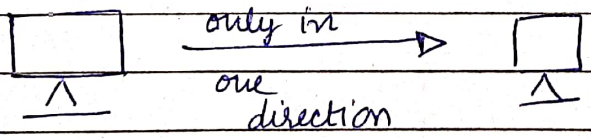
Components of Data communication -





Simplex

- communication is unidirectional, i.e., the data flows in one direction
- Device can only send data but can't Recieve the Data or it can recieve data but can't send the data.
- It is used in Business field as in sales that do not require any corresponding reply Ex- Radio channel/station.
- advantage → It can utilize Entire Bandwith of communication channel.
- disadvantage → No inter communication between devices.



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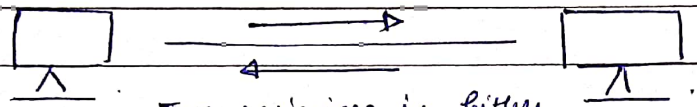
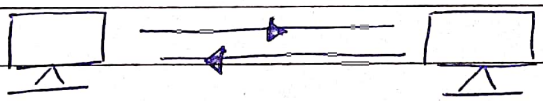
Half Duplex mode-

- Direction can be Reserved ie., station can transmit & recieve the Data as well.
- Message flow in both the directions, but not at same time.
- Entire Bandwith of communication channel is utilized in one direction at a time.
- walkie-talkie is the Example of Half duplex mode.
- advantage - Both device can send & recieve the data.
- Disadvantage - During the period when device sending the Data, other has to wait which cause delay.



Transmission in Either direction but not simultaneously.

Full Duplex method -



- communication is Bi-directional i.e., data flow in Both directions.
- Both the stations can recieve & send the message simoltaneously.
- It is fastest mode of communication.
- Example → Telephone network.
- Advantages: Both station can send & Recieve the message at same time.
- Disadvantages → No directed path exists between devices.

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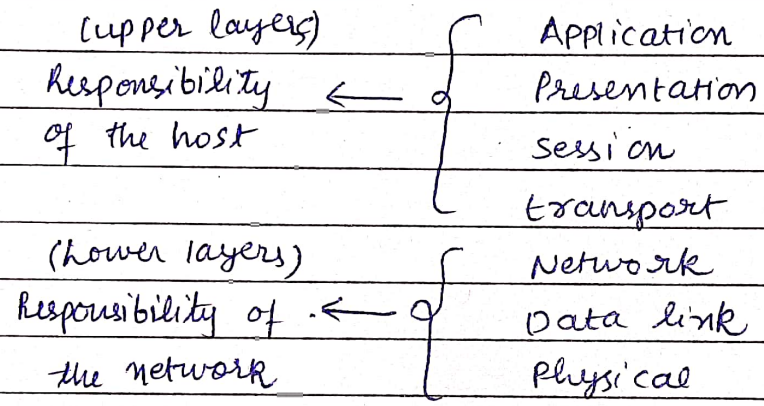
Ques3 what is OSI Model ? Explain its all layers briefly ?

OSI → open system Interconnection.

- OSI is an Reference model which describes how information form a Software application. in one computer moves through a physical medium to the software application in another computer.
- It contains 7 layer. all of which performs a particular network function.
- OSI model divides the whole task into 7 smaller & manageable tasks. where Each layer assigned a particular task.



→ upper layer deals with the application Related issues, which are implemented in Software only.

→ Lower layer deals with transport issue.

Physical layer -

It provides a physical medium through which bits are transmitted.

Data link -

It is used for Error free transfer or Data frame.

Network -

It is Responsible for moving the Packets from Source to Destination.

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Transport - It provides reliable massage delivery from process to process.

Session -
It is used to Establish mannage & terminate the session.

Presentation -
It is Responsible for translation, compressions Encryption.

Application -
This layer provide the service to the user.

Question: what is TCP/IP model? Explain in brief?

TCP IP stands for transmission control protocol/Internet Protocol. It is set of protocols or rules & procedures that governs communication among computers on the Internet.

TCP/IP is commonly used standard for transmitting data over networks. or it is the suite of communication protocols which connect network devices on internet or used to interconnect network devices on the Internet.

TCP → It allows applications to create channels of communications across a network. It allows a message to be divided into smaller packets before they are transmitted over the internet & then assembled in Right manner at designation address.

- It Ensure Reliable transmission of Data
- It checks Error in packets & Request for Retransmission

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IP: It tells the packets the address & the route so, that they Reach the right destination. It is like a line of workers passing coal from a mine to a mining cart.

TCP/IP model layer -

standard layered protocol suite comprises a set of Rules & procedures, is divided into 4 layers, on basis of functionality.

↳ application layer - It includes all the protocols required to communicate directly with the End users. It includes HTTP (Hypertext transfer protocol), FTP (File Transfer protocol), DHCP (Dynamic Host configuration protocol)

↳ The transport layer - Ensures the transmission of correct message or data in proper order. It utilizes UDP (user Datagram protocol) and TCP.

↳ The network access layer - offers the functionalities to Build & handle packets of information.

↳ The internet layer - It performs two Basic functions routing & addressing by using IP (Internet protocol) It tells how the packets are to be Sent to destination.

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Quess Difference between OSI & TCP/IP ?

	OSI	TCP/IP
1.	OSI stands for - "open System Interconnection."	It stands for "Transmission control Protocol"
2.	It is used as a communication gateway between the network & the End of user.	It consists of standard protocols that lead to development of an internet. It is a communication Protocol that provides the connection among the hosts.
3.	This model based on vertical approach.	This model is based on Horizontal approach.
4.	The network layer provides both connection oriented & Connectionless service.	It provides only connectionless service.
5.	It consists of 7 layer.	It consists of 4 layers.
6.	The usage of this model is low.	The usage of this model is high.
7.	protocols are hidden & can be Easily Replaced when technology changes.	Protocols can't be Easily updated.
8.	Session and presentation layers are a part of OSI model.	There is no session and presentation layer in the TCP model.