Chapter-5 : Data Communication & Computer Network

1) Differentiate between star and ring topology.

⇒ Star topology and ring topology are two types of network ~~config~~ topologies used in computer networks. Each topology defines how the nodes, or computers, within the network are connected to each other and the network itself.
The differences between star topology and ring topology are:

Star Topology	Ring Topology
1) All computers / nodes are connected to central host directly.	1) All computers / nodes are interconnected to each other.
2) It has no connection between nodes.	2) It has connection between all the nodes.
3) Failure of node doesn't affect the entire network.	3) Failure of node affects the entire network.
4) Data from all devices passes through the central node.	4) Data travels from one device to another in a sequential manner.
5) Easier to troubleshoot.	5) Difficult to troubleshoot.
6) Easier to add and remove nodes.	6) Difficult to add and remove nodes.
7) It is expensive.	7) It is cheaper than star topology.
8) It can handle large number of nodes than ring topology.	8) It cannot handle large number of nodes than star topology
9) Data access rate is faster.	9) Data access rate is slower.

2) Differentiate between client server and peer to peer architecture.

⇒ Client server and peer-to-peer (P2P) architecture are two fundamentals models for organizing network communication and resource sharing. Each model has its own set of characteristics, advantages and disadvantages, making them suitable for different types of applications for environment.
The differences between them are :

Client server architecture	Peer to peer architecture
1) In Client-server Network, clients and server are differentiated.	1) In peer to peer network, servers are not differentiated.
2) Centralized server is used to store data.	2) Each peer has its own data.
3) Client requests for service and server responds with a service.	3) Each node can request for services and provide services.
4) Access time for a service is higher.	4) Service requesting node does not need to wait long.
5) Expensive than peer-to-peer network.	5) Less expensive than client server network.
6) It focuses on exchanging information.	6) It concentrate on connectivity.
7) It is used by both small and large network.	7) It is generally suited for small networks.

3) Differentiate between LAN, MAN and WAN.

=> The differences between LAN, MAN and WAN are:

	LAN	MAN	WAN
1)	LAN stands for Local Area Network.	MAN stands for Metropolitan Area Network.	WAN stands for Wide Area Network.
2)	LAN's ownership is private.	MAN's ownership can be private or public.	Ownership of WAN might not be owned by one organization.
3)	The transmission speed of LAN is high.	The transmission speed of MAN is average.	The transmission speed of WAN is low.
4)	Easier to design and maintain.	Difficult to design and maintain than LAN.	Difficult to design and maintain than MAN and LAN.
5)	Low setup cost.	Moderate setup cost.	High setup cost.
6)	It is more secure.	It is less secure than LAN.	It is less secure than LAN and MAN.
7)	It covers small area.	It covers moderate area.	It covers large area.
8)	Used in office buildings, schools, homes etc.	Used in universities, city wide government networks.	Used in Multinational corporations, large scale research networks.

4) Define transmission media. Explain its types.

⇒ Transmission media is a communication channel that carries the information from sender to receiver. It is a physical path between the sender and receiver in data communication. Transmission Media is of two types: Guided and Unguided Media.

Guided Media

It is defined as the physical medium through which the signals are transmitted. It is also known as Bounded Media. Types of Guided Media:

1) Twisted Pair Cable: It is a physical media made up of a pair of cables twisted with each other. It consists of two insulated copper wires arranged in a regular spiral pattern. Its types are shielded and unshielded Twisted Pair cable. STP allows the higher data transmission rate and has higher capacity than UTP. UTP can be used for high speed LAN.

2) Coaxial Cable: It is very commonly used transmission media. It has higher frequency compared to Twisted Pair cable. Coaxial cable provides higher bandwidth and has better shielding as compared to twisted pair cable.

3) Fibre Optic: It uses electrical signals for communication. It holds the optical fibres coated in plastic that are used to send the data by pulses of light. It provides faster data transmission than copper wire.

UnGuided Media

An unguided media transmits the electromagnetic waves without using any physical medium. Therefore, it is also known as wireless transmission. In unguided media, air is the media through which the electromagnetic energy can flow easily. It is broadly ~~cate~~ classified into three categories:

1) Radio waves: Radio waves are the ~~unidirectional~~ electromagnetic waves that are transmitted in all the direction of free space. Radio waves are omnidirectional i.e. the signals are propagated in all the direction. An example of radio wave is FM radio.

2) Microwave: Microwave transmission refers to the technique of transmitting information over a microwave link. It have a higher frequency than radio waves. It is widely used for long distance telephone communication, mobile phones etc.

3) Satellite: It is a physical object that revolves around the earth at a known height. Satellite communication is more reliable nowadays as it offers flexibility than cable and fibre optic systems. Its coverage is high.