Time - 1 Hour   Max. Marks-15

NOTE - (i) Answer all questions.

(ii) Marks carried by a question is indicated against it.

Q.1. Describe any two guided transmission media used for data communication.   [5 marks]

Ans. Guided Media - This is a type of transmission media that uses a cabling system that guides the data signals along a specific path. The data signals are bound by the cabling system.

1. <u>Twisted pair</u>-

- It consists of two conductors (copper) and each with its own plastic insulation.

- One wire is used to carry signals to the receiver and other for the ground reference.

- Twisting decreases the cross-talk interference between adjacent pairs in a cable.

- They carry only analog signals.

- Data rates of several Mbps is common.

- Spans distances of several kilometers.

- Good and low-cost communication.

Types of Twisted pair wire — • shielded Twisted pair (STP)
                                        • Unshielded Twisted pair (UTP)

<u>Uses</u>- • Useful in telephone lines to provide data and voice channel.

- Used by DSL to provide high data rate connections.

- In LAN.

2. <u>Co-axial Cable</u>-

- Coaxial cable carries signals of higher frequency ranges than those in twisted pair cable.

- Instead of having two wires, coax has a central core conductor of solid or stranded wire.
- The outer metallic wrapping serves both as a shield against noise and as the second conductor, which completes the circuit.
- This outer conductor is also enclosed in an insulating sheath, and the whole cable is protected by a plastic cover.
- Co-axial cable has superior frequency characteristics compared to twisted pair and can be used for both analog and digital signalling.
- Co-axial cables are used for both baseband and broadband communication.

Base-Band Coaxial - The term base band indicates digital transmission

BroadBand Coaxial - The term broad band refers to analog transmission over coaxial cable.

Uses

- Used in analog telephone networks.
- Used in digital telephone networks.
- cable TV Networks.

2. Explain Internet working and write names of networking models used for this. **[4 Marks]**

Ans. Internet working is the practice of connecting a computer network with other networks through the use of gateways that provide a common method of routing information packets b/w the networks. The resulting system of interconnected networks is called an internet work, or an internet.

- Internet working started as a way to connect disparate types of networking technology, but it becomes widespread through the developing need to connect two or more local area networks via some sort of wide area network.

- The definition of an internetwork today includes the connection of other types of computer networks such as personal area Network.

- Another type of interconnection of networks often occurs within enterprises at the Link Layer of the networking model, i.e. at the hardware-centric layer below the level of the TCP/IP logical interfaces.
- The internet protocol is designed to provide an unreliable packet service across the N/w. The architecture avoids intermediate network elements maintaining any state of the N/w. Instead, this function is assigned to the endpoints of each comm. system.
- To transfer data reliably, applications must utilize an appropriate Transport Layer protocol, such as TCP, which provides a reliable stream. Some applications use a simpler, connection-less transport protocol, User Datagram Protocol (UDP), for tasks which do not require reliable delivery of data or that require real-time service such as video-streaming or voice chat.

Networking models - Two architectural models are commonly used to describe the protocols and methods used in internet working.

- The open system Interconnection (OSI) Reference model. It provides a rigorous description for layering protocol functions from the under-lying hardware to the software interface concepts in user applications
- The Internet protocol Suite (TCP/IP model). It is designed to conform to the OSI model and does not refer to it in any of the normative specifications in requests for comment and internet standards.

Q.3. Write short Note on —

(i) LAN   (ii) Star topology.   [3+3 = 6 Marks]

Ans. (1) LAN — A Local Area Network (LAN) is usually privately owned and links the device in a single office, building or campus.
- Depending on the needs of an organization and the types of technology used, a LAN can be as simple as two PCs and a printer in someone's home office; or it can be extend throughout

a company and include audio and video peripherals.
currently, LAN size is limited to a few kilometers (2-10 KM).

LANs are designed to allow resources to be shared between personal computers or workstations. The resources to be shared can include hardware (e.g. a printer), software (e.g. an application program), or data.

LAN will use only one type of transmission medium. The most common LAN topologies are bus, ring and star.
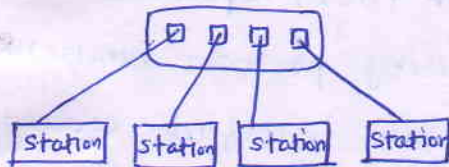
Early LANs had data rates in the 4 to 16 megabits per second (Mbps) range. Today, however, speeds are normally 100 or 1000 Mbps.

<u>Advantages of LAN</u> - speed, cost, security, E-mail, Resource sharing.

<u>Disadvantages of LAN</u> - Expensive to install, File server may fail, cables may break, Requires administrative Time.

ns.

ii) <u>Star topology</u> - In a star topology, each device has a dedicated point-to-point link only to a central controller, usually like a hub. The devices are not directly linked with one another.

- Unlike a mesh topology, a star topology does not allow direct traffic b/w devices. The controller acts as an exchange. If one device wants to send data to another, it sends the data to the controller, which then relays the data to the other connected device.
- A star topology is less expensive than a mesh topology.
- Each device needs only one link and one I/o port to connect it to any number of others.
- If one link fails, only that link is affected. All other links remain active.
- A star requires less cable than a mesh.
- High speed LAN's often use a star topology with a central hub.

दिव्या पारीक
(दिव्या पारीक)
प्रवक्ता