Repeated Questions (10):

1. What is Data Communication? (Repeated twice)
2. What is Topology? (Repeated twice)
3. What is ISDN? (Repeated twice)
4. What is Gateway? (Repeated twice)
5. What is Ethernet? (Repeated twice)
6. What is Multiplexing? (Repeated twice)
7. What is Router? (Repeated twice)
8. What is Modem? (Repeated twice)
9. What is TCP/IP? (Repeated twice)
10. What is Bridge? (Repeated twice)

Repeated Questions (10):

1. **What is Data Communication?**
    - The process of transferring data between devices through a transmission medium.
    - Involves sending, receiving, and processing data.
    - Data can be in the form of text, audio, or video.
    - Uses both wired (e.g., cables) and wireless (e.g., radio waves) channels.
2. **What is Topology?**
    - Refers to the layout or structure of a network.
    - Defines how devices and nodes are interconnected.
    - Types of topologies include bus, star, ring, mesh, and hybrid.
    - Affects performance, scalability, and fault tolerance of a network.
3. **What is ISDN?**
    - Integrated Services Digital Network (ISDN) is a set of communication standards.
    - Provides digital transmission for voice, video, and data over traditional telephone networks.
    - Supports high-speed internet and clear digital communication.
    - Divided into Basic Rate Interface (BRI) and Primary Rate Interface (PRI).
4. **What is Gateway?**
    - A device or software that connects different networks, often with different protocols.
    - Translates data between different network formats or communication methods.
    - Operates at multiple layers (e.g., network layer, transport layer).
    - Used in bridging between LANs and WANs or different types of networks.
5. **What is Ethernet?**
    - A widely used networking technology for local area networks (LANs).
    - Operates on IEEE 802.3 standards and supports high-speed data transmission.
    - Uses frames to transmit data across wired connections.
    - Commonly runs on twisted pair cables or fiber optics.
6. **What is Multiplexing?**
    - The process of combining multiple signals into one transmission channel.
    - Types include Time Division Multiplexing (TDM) and Frequency Division Multiplexing (FDM).
    - Helps utilize the available bandwidth more efficiently.
    - Used in telephone lines, internet connections, and satellite communication.
7. **What is Router?**
    - A networking device that forwards data packets between networks.
    - Operates at the network layer (Layer 3) of the OSI model.

- Determines the best path for data to travel using routing tables.
- Essential in directing traffic on the internet and within large networks.

8. **What is Modem?**
    - A device that modulates and demodulates digital data to analog signals for transmission.
    - Allows internet access over telephone lines by converting digital data into analog signals.
    - Acts as an interface between the local computer or router and the internet.
    - Used for both dial-up and broadband internet connections.
9. **What is TCP/IP?**
    - Transmission Control Protocol/Internet Protocol (TCP/IP) is the suite of protocols for the internet.
    - TCP handles data transmission, ensuring reliability and error-checking.
    - IP deals with addressing and routing data packets.
    - Forms the foundational protocols for communication over the internet.
10. **What is Bridge?**
    - A network device that connects two or more segments of a local area network (LAN).
    - Operates at the data link layer (Layer 2) to filter traffic and reduce congestion.
    - Can segment large networks to improve performance.
    - Often used to connect networks using different technologies or media.

40 Unique Questions:

1. **What is meant by Data Communication?**
    - The transmission of data between devices.
    - It involves sending, receiving, and processing data.
    - Data can be transmitted through various media like wires or air.
    - The communication is typically done through electronic signals.
2. **Define Analog data.**
    - Continuous data represented by a varying signal.
    - Used for signals like sound and light.
    - Has infinite possible values within a range.
    - Examples include audio, video, and radio signals.
3. **What is Topology?**
    - The physical or logical layout of a network.
    - Types include bus, star, ring, mesh, and hybrid.
    - Influences data flow, performance, and cost.
    - It dictates the ease of managing and scaling a network.
4. **What is Modem?**
    - A device that modulates and demodulates signals for data transmission.
    - Converts digital signals to analog and vice versa.
    - Enables communication over telephone lines.
    - Used in dial-up connections and broadband services.
5. **Define: Half-Duplex.**
    - Communication mode where data flows in one direction at a time.
    - Devices take turns sending and receiving data.
    - Used in walkie-talkies and older network systems.
    - Example: A traditional telephone line.
6. **Define: Error control.**
    - Mechanisms to detect and correct errors in transmitted data.
    - Ensures data integrity during communication.
    - Can involve techniques like checksums and parity bits.
    - Helps improve reliability in data transfer.
7. **Define: ATM Layer.**
    - Part of the ATM (Asynchronous Transfer Mode) network architecture.
    - Handles cell-based data transmission.
    - Responsible for routing, switching, and traffic management.

- Provides high-speed, low-latency connections for multimedia data.

8. **What is packet switching?**
    - A method of breaking down data into smaller packets for transmission.
    - Each packet is sent independently through the network.
    - Packets may take different paths and are reassembled at the destination.
    - Used in networks like the internet.
9. **Define: Gateway.**
    - A device or software that connects different networks.
    - Translates communication protocols between the networks.
    - Can be used for network security, filtering, and routing.
    - Operates at various layers of the OSI model.
10. **Define: Bridge.**

- A network device that connects two or more segments of a LAN.
- Helps reduce traffic by segmenting a network.
- Operates at the data link layer.
- Can filter traffic to improve network performance.

11. **Define the term 'Modern'.**

- A device that converts digital data to analog signals (modulation) and vice versa (demodulation).
- Facilitates internet connection over telephone lines.
- Typically used for dial-up and broadband connections.
- Operates at the physical layer of the OSI model.

12. **Name the two major categories of Transmission Media.**

- Guided media (e.g., cables, fiber optics).
- Unguided media (e.g., wireless communication, radio waves).
- Guided media is physically confined.
- Unguided media transmits signals through the air.

13. **What is Ethernet?**

- A widely used LAN technology for networking devices.
- Uses protocols like IEEE 802.3 for communication.
- Operates on a bus or star topology.
- Transmits data in frames over twisted pair cables or fiber optics.

14. **What is Multiplexing?**

- A technique to combine multiple signals into one transmission.
- Types include Time Division Multiplexing (TDM) and Frequency Division Multiplexing (FDM).
- Helps optimize the use of transmission media.
- Widely used in telecommunications and networking.

15. **What is Packet?**

- A small unit of data transmitted across a network.
- Contains header information (e.g., source, destination) and data.
- Packets are routed independently and reassembled at the destination.
- Used in packet-switched networks.

16. **What is a Switch?**

- A networking device that connects multiple devices on a LAN.
- Operates at the data link layer to forward packets based on MAC addresses.
- Helps reduce collisions and improves network efficiency.
- Can operate on Layer 3 (network layer) in some cases (Layer 3 switches).

17. **What is Router?**

- A device that forwards data packets between networks.
- Operates at the network layer (Layer 3) of the OSI model.
- Determines the best path for data to travel across networks.
- Used in both LANs and wide-area networks (WANs).

18. **What is a protocol?**

- A set of rules for data exchange between devices.
- Specifies how data is formatted, transmitted, and received.
- Examples include TCP/IP, HTTP, FTP, and SMTP.
- Ensures compatibility and communication between different systems.

19. **Write the types of serial transmission.**

- Simplex: Data flows in one direction only.
- Half-Duplex: Data flows in both directions but not simultaneously.
- Full-Duplex: Data flows in both directions simultaneously.
- Asynchronous and Synchronous: Types of transmission timing.

20. **What is meant by switching?**

- The process of directing data from its source to the destination.

- Involves connecting devices in a network to enable communication.
- Types include circuit switching, packet switching, and message switching.
- Vital for network traffic management.

21. **Define: message switching.**

- A switching technique where the entire message is sent to the next hop.
- The message is stored and forwarded.
- Typically used in older network systems.
- Less efficient compared to packet switching due to large delays.

22. **What is an ATM cell?**

- A fixed-size unit of data used in ATM (Asynchronous Transfer Mode).
- Contains 53 bytes, with 48 bytes of payload and 5 bytes of header.
- Used for efficient data transmission over high-speed networks.
- Enables quality of service (QoS) for multimedia communications.

23. **Define: Connectionless services.**

- A type of communication where there is no established connection between sender and receiver.
- Each packet is sent independently.
- No guarantee of delivery or order of arrival.
- Examples include UDP (User Datagram Protocol).

24. **What is Application Layer?**

- The topmost layer in the OSI model.
- Provides network services directly to user applications.
- Examples include HTTP, FTP, and DNS.
- Facilitates communication between software applications.

25. **What are the components of Data Communication system?**

- Message: The information being communicated.
- Sender: The device that sends the data.
- Receiver: The device that receives the data.
- Transmission medium: The path through which data travels.

26. **What is MAN?**

- A Metropolitan Area Network.

- Covers a larger area than a LAN but smaller than a WAN.
- Typically used to connect buildings or campuses within a city.
- Uses technologies like fiber optics or wireless.

27. **Define Error Detection.**

- Techniques used to identify errors in data transmission.
- Common methods include checksums, parity bits, and cyclic redundancy checks (CRC).
- Ensures data integrity during transmission.
- Often used with error correction techniques.

28. **What are Digital Networks?**

- Networks that transmit data in digital form (binary signals).
- Can carry voice, video, and data over digital lines.
- More efficient and reliable compared to analog networks.
- Examples include the internet and cellular networks.

29. **What is TCP/IP Network?**

- A network that uses the Transmission Control Protocol (TCP) and Internet Protocol (IP).
- The foundation of the internet and most modern networks.
- Provides reliable, packet-switched communication.
- Ensures data delivery and correct order.

30. **What is Broadband?**

- A high-speed internet connection that provides wide bandwidth.
- Supports multiple data types, including voice, video, and internet.
- Can use technologies like DSL, fiber optics, and satellite.
- Provides high data transfer rates.

31. **What is Layered protocol?**

- A network communication approach that divides tasks into layers.
- Each layer handles a specific function in the communication process.
- Common in the OSI (Open Systems Interconnection) model.
- Examples include the TCP/IP stack and OSI model.

32. **What is meant by routing?**

- The process of determining the best path for data to travel across networks.
- Involves network routers to direct data packets.

- Routing tables are used to store information about network paths.
- Essential for WAN and large-scale networks.

33. **Mention the characteristics of data communication.**

- Accuracy: Ensures data is correctly transmitted.
- Speed: Data transfer rate is important for efficiency.
- Security: Protects data from unauthorized access.
- Reliability: Ensures the data is delivered without error.

34. **What is Full duplex?**

- A communication mode where data flows in both directions simultaneously.
- Used in devices like telephones and network interfaces.
- Provides efficient communication and faster data exchange.
- Common in modern communication systems.

35. **What is unguided Media?**

- Transmission media that does not use physical wires or cables.
- Examples include radio waves, microwaves, and infrared.
- Common in wireless communication.
- Has a limited range compared to guided media.

36. **What are message switching?**

- A method where entire messages are stored and forwarded.
- Less efficient compared to packet switching.
- Introduces more delays due to storing and forwarding.
- Used in older communication systems.

37. **What are Modems?**

- Devices that modulate and demodulate digital data to analog signals.
- Allow data transmission over telephone lines.
- Used in dial-up and broadband internet connections.
- Convert digital data to a format suitable for analog transmission.

38. **What is WWW?**

- The World Wide Web, a system of interconnected documents and resources.
- It uses HTTP and browsers for access.
- Contains websites and services available over the internet.

- Functions as an information-sharing platform.

39. **What is ISDN?**

- Integrated Services Digital Network, a set of communication standards.
- Provides digital transmission of voice, video, and data.
- Uses existing telephone lines but offers higher speeds than traditional analog.
- Offers services like data transmission, voice, and fax.

40. **What is the Application Layer?**

- The top layer of the OSI model.
- Interfaces directly with end-user applications.
- Handles functions like file transfer, email, and web browsing.
- Common protocols: HTTP, FTP, SMTP.