COMPUTER

◆ 1. Network as a System

Q1. What is a computer network?
A: A computer network is a system where multiple devices such as computers, smartphones, or printers are connected to share data and work together.

Q2. What are nodes in a network?
A: Nodes are devices like computers, printers, or phones that are part of a network.

Q3. What are links in a network?
A: Links are the connections (wired or wireless) between nodes in a network.

Q4. What is the role of a switch in a network?
A: A switch connects multiple devices and forwards data only to the specific device that needs it.

Q5. What does a router do?
A: A router connects different networks and finds the best path to send data to its destination.

◆ 2. Objectives of Computer Networks

Q6. What are the main objectives of a computer network?
A: The three main objectives are:

1. **Resource Sharing** – sharing printers or files.
2. **Data Communication** – sending messages, emails, or video calls.
3. **Collaboration** – working together using online tools.

◆ 3. Components of Data Communication

Q7. What is data communication?
A: It is the process of sending and receiving data between two devices.

Q8. Name five components of data communication.
A:

1. **Sender** – sends the data

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2. **Receiver** – receives the data
3. **Message** – the actual data sent
4. **Protocol** – rules for communication
5. **Medium** – the path (e.g., Wi-Fi or cables)

◆ 4. Networking Devices

Q9. What is a switch?
A: A switch is a device that connects devices in a network and sends data only to the correct device using MAC addresses.

Q10. What is a router?
A: A router connects different networks and directs data packets to their destination using routing tables.

Q11. What is an access point?
A: An access point connects wireless devices to a wired network using radio signals.

◆ 5. Network Topologies

Q12. What is a network topology?
A: It is the arrangement of devices (nodes) in a network.

Q13. What is bus topology?
A: In bus topology, all devices are connected to a single central cable.

Q14. What is star topology?
A: In star topology, all devices are connected to a central switch or hub.

Q15. What is ring topology?
A: In ring topology, each device connects to two other devices forming a circular path.

Q16. What is mesh topology?
A: In mesh topology, every device connects to every other device, making it very reliable.

◆ 6. Transmission Modes

Q17. What are transmission modes?
A: They are ways data travels between devices.

Q18. What is simplex communication?
A: Data flows in only one direction (e.g., keyboard to computer).

Q19. What is half-duplex communication?
A: Data flows in both directions, but only one side can send at a time (e.g., walkie-talkies).

Q20. What is full-duplex communication?
A: Data flows in both directions at the same time (e.g., phone calls).

◆ 7. OSI Model

Q21. What is the OSI Model?
A: The OSI Model is a 7-layer structure used to understand how data travels in a network.

Q22. Name the 7 layers of the OSI Model.
A:

1. Physical
2. Data Link
3. Network
4. Transport
5. Session
6. Presentation
7. Application

Q23. What does the Physical Layer do?
A: It handles the actual physical connection using cables or wireless.

Q24. What is the role of the Data Link Layer?
A: It checks and corrects errors and ensures smooth data flow between devices.

Q25. What does the Network Layer do?
A: It finds the best route for data to travel.

Q26. What is the Transport Layer responsible for?
A: It makes sure data is delivered completely and without errors.

Q27. What is the Session Layer?
A: It manages the connection (session) between two devices.

Q28. What does the Presentation Layer do?
A: It translates, encrypts, or compresses the data.

Q29. What is the role of the Application Layer?
A: It provides services to the user like email, web browsing, or file transfer.

◆ 8. IPv4 and IPv6

Q30. What is IPv4?
A: IPv4 is an older version of the Internet Protocol using 32-bit addresses.

Q31. What is IPv6?
A: IPv6 is the newer version with 128-bit addresses, allowing for many more unique devices.

◆ 9. Protocols and Network Services

Q32. What is a protocol?
A: A protocol is a set of rules for communication between devices.

Q33. What does DNS do?
A: DNS changes website names (like www.google.com) into IP addresses.

Q34. What does DHCP do?
A: DHCP automatically gives IP addresses to devices on a network.

◆ 10. Network Security

Q35. What is network security?
A: Network security protects data and prevents unauthorized access to networks.

Q36. What is a firewall?
A: A firewall is a security system that blocks unwanted traffic.

Q37. What is encryption?
A: Encryption changes data into a secure code that only authorized users can read.

Q38. What are common network threats?
A:

- Malware
- Phishing
- Denial of Service (DoS)
- Man-in-the-middle attacks

◆ 11. Types of Networks

Q39. What is a PAN (Personal Area Network)?
A: A small network for personal devices like phones and headphones.

Q40. What is a LAN (Local Area Network)?
A: A network in a small area like a school or office.

Q41. What is a MAN (Metropolitan Area Network)?
A: A network that covers a city or large campus.

Q42. What is a WAN (Wide Area Network)?
A: A network that connects devices across countries or globally (e.g., the internet).

Q43. What is a CAN (Campus Area Network)?
A: A network connecting different buildings in a campus or business park.

◆ 12. Real-World Applications

Q44. How are networks used in business?
A: Businesses use networks for sharing files, communication, and data storage.

Q45. How are networks used in education?
A: Schools use networks for online learning, accessing study material, and exams.

Q46. How are networks used in healthcare?
A: Hospitals use networks to store and share patient records and do remote checkups.