Introduction to Computer Networks

MCQs and Short Questions

1. What is the primary objective of computer networks?

a) Increase computational power **b) Enable resource sharing and data communication**

c) Enhance graphic capabilities d) Improve software development

2. Which device is used to connect multiple networks and direct data packets between them?

a) Switch b) Hub

c) Router d) Modem

3. Which layer of the OSI model is responsible for node-to-node data transfer and error detection?

a) Physical Layer **b) Data Link Layer**

c) Network Layer d) Transport Layer

4. What is the function of the Domain Name System (DNS)?

a) Assign IP addresses dynamically **b) Translate domain names to IP addresses**

c) Secure data communication d) Monitor network traffic

5. Which method of data transmission uses a dedicated communication path?

a) Packet Switching **b) Circuit Switching**

c) Full-Duplex d) Half-Duplex

6. What is encapsulation in the context of network communication?

a) Converting data into a secure format **b) Wrapping data with protocol information**

c) Monitoring network traffic d) Translating domain names to IP addresses

7. Which protocol is used for reliable data transfer in the TCP/IP model?

a) HTTP b) FTP

c) TCP d) UDP

8. What is the main purpose of a firewall in network security?

a) Convert data into a secure format b) Monitor and control network traffic

b) Assign IP addresses **d) Translate domain names**

9. Which network topology connects all devices to a central hub?

a) Ring b) Mesh

c) Bus **d) Star**

10. What is a key benefit of using computer networks in businesses?

a) Increase computational power **b) Enable resource sharing and efficient communication**

c) Enhance graphic capabilities d) Improve software development

11. A computer network is a system of:

a) Linked devices and computers b) Only mobile phones

c) Only printers d) None of these

12. Which of the following is a small network?

a) WAN **b) LAN**

c) MAN d) Internet

13. What does WAN stand for?

a) Wide Area Network b) World Area Network

c) Wireless Area Network d) Web Area Network

14. Which of the following connects a computer to the Internet?

a) Switch b) Router/Firewall

c) Modem d) Server

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15. A device that connects multiple nodes in a network and forwards data is called:

a) Modem **b) Switch**

c) Router d) Server

16. Which of the following is an example of a node in a computer network?

a) Desktop PC b) Laptop

c) Smartphone **d) All of the above**

17. What does PAN stand for?

a) Personal Area Network b) Public Access Network

c) Primary Application Node d) Protected Access Net

18. Bluetooth connection between a smartphone and a wireless headset is example of:

a) LAN b) WAN

c) MAN **d) PAN**

19. What is the typical range of a PAN?

a) A few kilometers b) Entire city

c) A few meters d) Several countries

20. Connecting devices within a limited area like a home, school, or office is example of:

a) LAN b) WAN

c) MAN d) PAN

21. Wi-Fi is an example of a:

a) Wired connection **b) Wireless connection**

c) Switch connection d) Router connection

22. The Internet is called:

a) A Local Area Network b) A type of packet

c) Network of Networks d) A type of switch

23. In a network, the file is divided into small units called:

a) Links **b) Packets**

c) Nodes d) Signals

24. In packet switching, the final destination is identified by:

a) MAC address **b) IP address**

c) Domain name d) Switch address

25. Which of the following is a primary objective of computer networks?

a) Data deletion **b) Resource sharing**

c) File encryption d) Data compression

26. Sharing a single printer among multiple computers is an example of:

a) Data communication **b) Resource sharing**

c) Connectivity and collaboration d) Routing

27. Tools like Zoom and Microsoft Teams are used for:

a) Resource sharing **b) Data communication**

c) Packet switching d) Network routing

28. Cloud-based services like Google Drive enable:

a) Connectivity and collaboration b) Data compression

c) Packet splitting d) Resource duplication

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29. The World Wide Web (WWW) was invented by Tim Berners-Lee in:

a) 1979 **b) 1989**

c) 1999 d) 2005

30. Data communication involves the exchange of data between:

a) Sender and receiver b) Two switches

c) Two servers only d) Routers only

31. Which of the following is not a key component of data communication?

a) Sender b) Message

c) Switch d) Protocol

32. The device that sends the data is called:

a) Message b) Protocol

c) Receiver **d) Sender**

33. In data communication, the sender is also called:

a) Sink b) Destination

c) Target **d) Source**

34. The device that receives data is called:

a) Sender **b) Receiver**

c) Switch d) Protocol

35. In data communication, the receiver is also called:

a) Transmitter b) deliverer

c) Sink d) Source

36. The actual content of data being communicated is called:

a) Protocols **b) Message**

c) Sender d) Medium

37. A set of rules for data communication

a) Protocols b) Message

c) Sender d) Medium

38. Which of the following is not a networking device?

a) Hub b) Switch

c) Protocol d) Router

39. A switch works on which OSI model layer?

a) Layer 1 (Physical layer) **b) Layer 2 (Data Link layer)**

c) Layer 3 (Network layer) d) Layer 4 (Transport layer)

40. Which address switch uses to forward data packets?

a) IP address **b) MAC address**

c) Domain name d) Protocol address

41. The first time a switch receives data, it __.

a) Forwards data to the exact destination b) Deletes the data if it doesn't know the address

c) Broadcasts data to all connected devices d) Sends data back to the sender

42. What does SIM stand for?

a) Subscriber Internet Module **b) Subscriber Identity Module**

c) System Identity Manager d) Secure Internet Mode

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43. What is the main role of a SIM card in a mobile device?

a) To store photos and videos
b) To connect only to Wi-Fi networks
c) To identify and authenticate the subscriber
d) To speed up the processor of the device

44. What is the main job of a router?

a) To store data permanently
b) To find the best path for data packets
c) To connect only wireless devices
d) To replace SIM cards in mobile phones

45. What do Access Points use _____ to transmit data?

a) Electric wires
b) Optical fibers
c) Radio waves
d) Sound waves

46. What is the role of an Access Point in a network?

a) To repair computers
b) To work as a printer
c) To increase storage capacity
d) To connect wireless devices to a wired network

47. Modern Access Points can connect:

a) Only one device
b) A maximum of five devices
c) Hundreds of devices simultaneously
d) Only wired devices

48. In a Bus Topology, all devices share:

a) Separate cables for each device
b) A single communication line called a bus
c) Wireless signals only
d) A printer connection

49. Each device in a network is called a:

a) Server
b) Hub
c) Node
d) Switch

50. In a Star Topology, each node communicates through:

a) Switch or hub
b) A main cable
c) A printer
d) Wireless signals only

51. What role does the hub play in a Star Topology?

a) Stores data permanently
b) Acts as a printer
c) Connects only one device
d) Works as a data flow repeater

52. The hub in a LAN always:

a) Saves data
b) Encrypts data
c) Broadcasts data
d) Deletes data

53. In a Ring Topology data can travels:

a) In both directions at the same time
b) Directly from one device to another
c) Only through the hub
d) In one direction at same time

54. In a Mesh Topology, each device is connected to:

a) Only one central hub
b) A single main cable
c) Every other device
d) Only the server

55. which of the following topology provides high redundancy and reliability:

a) BUS
b) STAR
c) RING
d) MESH

56. In Simplex communication, data transmission is:

a) Bidirectional
b) Random
c) Both directions at the same time
d) Unidirectional

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57. Which of the following is an example of Simplex communication?

a) Two-way radios
b) Telephone call
c) Keyboard sending input to a computer
d) Video conferencing

58 Devices can either send or receive data, but only in one direction is called:

a) Simplex communication
b) Half Duplex communication
c) Full Duplex communication
d) all of these

59. In Half-Duplex communication, data transmission can occur:

a) In both directions, but not at the same time
a) Only in one direction
c) In both directions simultaneously
d) Only when devices are connected with fiber optics

60. Which of the following is an example of Half-Duplex communication?

a) A teacher writing on a chalkboard
b) A walkie-talkie conversation
c) Keyboard to computer
d) Video streaming

61. Full-Duplex communication allows data transmission:

a) Only in one direction
b) In both directions, but not at the same time
c) Simultaneously in both directions
d) Randomly in any direction

62. Which of the following is an example of Full-Duplex communication?

a) Walkie-talkie
b) Keyboard to computer
d) Television broadcast
d) Telephone conversation

63. In Full-Duplex communication, both devices can:

a) Only send data
b) Only receive data
c) Transmit and receive data simultaneously
d) Stay idle at the same time

64. Modern telephones use:

a) Full-Duplex
b) Half-Duplex
c) Simplex
d) Bus topology

65. Which protocol provides faster but less reliable data transfer?

a) TCP
b) UDP
c) IP
d) DHCP

66. How many layers does the OSI Model have?

a) 5
b) 6
c) 7
d) 8

67. Which is the first layer of the OSI Model?

a) Data Link Layer
b) Physical Layer
c) Network Layer
d) Transport Layer

68. The Physical Layer is responsible for:

a) Managing applications
b) Error detection and correction
c) Sending data bits through a physical medium
d) Routing data between networks

69. Which is the second layer of the OSI Model?

a) Network Layer
b) Transport Layer
c) Data Link Layer
d) Session Layer

70. The _____ Layer is responsible for Error detection, correction, and node-to-node transport:

a) Physical
b) Data Link
c) Application
d) Network

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71. The _____ Layer is responsible for determining the best path for data transfer between networks

a) Physical
b) Data Link
c) Application
d) Network

72. Which network security method monitors and controls incoming and outgoing traffic?

a) Antivirus software
b) Encryption
c) Router
d) Firewall

73. The _____ Layer ensures data is transferred safely and reliably, with error checking:

a) Physical
b) Data Link
c) Transport
d) Network

74. Which protocol is used by the Transport Layer for reliable data transfer?

a) HTTP
b) FTP
c) TCP
d) SMTP

75. ___ Layer is responsible for establishing, maintaining, and terminating connections between devices:

a) Physical
b) Session
c) Transport
d) Network

76. The Presentation Layer is responsible for:

a) Determining the best path for data
b) Managing sessions between devices
c) Translating, formatting, and encrypting data
d) Controlling flow of traffic

77. _____ Layer is the closest to the end user:

a) Application
b) Session
c) Transport
d) Network

78. Which of the following services are provided by the Application Layer?

a) IP addressing
b) Web browsing, email, and file transfer
c) Error correction
d) Data encryption only

79. Approximately how many unique addresses are possible with IPv4?

a) 4.3 million
b) 4.3 billion
c) 43 billion
d) Unlimited

80. Which of the following represents the total number of IPv4 addresses?

a) 2^8
b) 2^{16}
c) 2^{32}
d) 2^{64}

81. In the example IPv4 address (172.16.254.1), each number or group represents:

a) 8 bits
b) 16 bits
c) 32 bits
d) 4 bytes combined

82. The total IPv4 address length is:

a) 16 bits (2 bytes)
b) 24 bits (3 bytes)
c) 32 bits (4 bytes)
d) 64 bits (8 bytes)

83. How many bits does an IPv6 address use?

a) 32 bits
b) 64 bits
c) 256 bits
d) 128 bits

84. Which of the following is a protocol used to transfer web pages over the internet?

a) FTP
b) HTTP
c) SMTP
d) DNS

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85. What does DNS stand for?

a) Domain Numbering Service
b) Data Network System
c) Domain Name System
d) Digital Network Service

86. Translates domain names into IP addresses is called:

a) DNS
b) FTP
c) DHCP
d) HTTP

87. What does DHCP stand for?

a) Data Host Control Protocol
b) Domain Host Configuration Protocol
c) Dynamic Host Configuration Protocol
d) Digital Hypertext Communication Protocol

88. Automatically assign IP addresses to devices is a function of:

a) DNS
b) FTP
c) DHCP
d) HTTP

89. Firewalls are used to:

a) Store data safely
b) Monitor and control network traffic
c) Encrypt passwords
d) Speed up browsing

90 What does a Denial of Service (DoS)?

a) Encrypts data for secure transfer
b) Network or Machine become not available
c) Repairs broken network connections
d) Translates IP addresses into domain names

91. Converting data into a secure format is called:

a) Firewall
b) Encryption
c) Antivirus
d) Protocol

92. What is decryption?

a) Lock data permanently
b) Changing numbers into letters
c) Converting encrypted data back to its original form
d) Compressing files

93. The computer network in your school lab that connects all computers is an example of:

a) MAN
b) LAN
c) WAN
d) Internet

94. A MAN (Metropolitan Area Network) usually covers an area of up to:

a) 5 kilometers
b) 10 kilometers
c) 50 kilometers
d) 100 kilometers

95. Which type of network connects multiple LANs within a city or a large campus?

a) WAN
b) MAN
c) PAN
d) VPN

96. The Internet is example of:

a) LAN
b) PAN
c) MAN
d) WAN

97. A Campus Area Network (CAN) connects:

a) Multiple WANs across the globe
b) Multiple LANs within a limited geographical area
c) Computers using Bluetooth only
d) Satellites and servers worldwide

98. The Internet Protocol (IP) is mainly responsible for:

a) Translating domain names
b) Addressing and routing data packets
c) Encrypting data
d) Detecting malware

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Q1. Define Computer Network.

A computer network is a system of interconnected computers and devices that communicate and share resources.

Q2. What is the objective/purpose of Computer Network?

The primary objectives of computer networks are to enable resource sharing, data communication, and connectivity between devices.

Q3. What are the primary components of Network?

Primary Components of Networks are Nodes, Links, Switches, Router, and Protocols.

Q4. What is Node/Host?

The end device that is connected to the network, such as computer, printer, smartphone etc.

Q5. What is the role or purpose of switch in network?

A switch is a network device that connects multiple devices (like computers, printers, and servers) within a Network (LAN).

Q6.What is the difference between Switch and Hub?

Switch	Hub
A switch is a network device that connects multiple devices within a Network. It first time broadcast data and after that it unicast data.	A Hub is a network device that connects multiple devices within a Network. Is always broadcast data.

Q7. What is the role or purpose of Router?

A router is a device that connects different networks together and direct data packets between them.

Q8. What is meant by data communication?

Data communication refers to exchange of data between sender and receiver through communication medium.

Q9. What are the components of Data Communication?

The components of data communication are Sender, Receiver, Message, Protocol, and Transmission Medium.

Q10. Who is sender?

Sender is a device which initiate communication process or which send data. It is also called transmitter or source.

Q11. What is receiver?

Receiver is a device which receives data. It is also called sink or destination.

Q12. What is message?

Message is a sort of information which being communicated. Message can be text, audio, video or combination of these.

Q13. What is protocol?

Protocols are sets of rules and procedure that manage data communication. e.g protocols are TCP/IP, HTTP, FTP and SMTP.

Q14. Define communication channel / transmission medium.

Transmission medium is a physical path that connects sender and a receiver. It is used to transmit data. It can be wire or wireless.

Q15. What is the role of Access Point?

An Access Point (AP) is a network device that allows wireless devices to connect to a wired network.

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Q16. Differentiate packet switching and circuit switching?

Packet switching	Circuit switching
Message is broken into small packets, each sent independently through the network	A dedicated communication path is established between sender and receiver for entire session

Q17. Define Network topology?

The physical arrangement of different devices in a computer network is called network topology.

Q18. Define Bus topology.

In a Bus topology, all devices share a single common communication line called a bus. Each device is connected to this central cable; this cable is called backbone of Bus topology.

Q19. Define Star topology.

In a Star topology, all devices are connected to a central device called hub or switch. The hub acts as a repeater for data flow.

Q20. Define Ring topology.

A Ring topology, each device is connected exactly to two other devices, forming ring. Data can travel in both directions (clockwise or anticlockwise) passing through each device.

Q21. Define Mesh topology.

In a Mesh topology, each device is connected to every other device. This provides high redundancy and reliability.

Q22. How many transmission modes in which data can travels?

Data can travel in three primary modes, simplex, half-duplex and full-duplex modes.

Q23. Define simplex communication mode.

In Simplex communication, data transmission is unidirectional, meaning it flows in only one direction. A device can either send or receive data in this communication.

Q24. Differentiate Half-Duplex and Full-Duplex communication mode.

Half-Duplex	Full-Duplex
In Half-Duplex communication, data transmission can occur in both directions, but not simultaneously.	In Full-Duplex communication, data transmission can occur in both directions simultaneously.

Q25. What is an IP Address?

IP stands for internet protocol address which unique identifiers assign to device connected to the internet.

Q26. Define OSI Model.

Open system interconnection model is a framework used to understand how different networking protocols interact. It has 7 layers within a specific function.

Q27. Define Physical Layer.

Physical layer transmits raw bits over a physical medium like cables, radio waves etc.

Q28. Define Data Link Layer.

Data Link layer handles node to node data transfer, error deduction and correction. e.g Ethernet, MAC address. It ensures error-free data transmission from physical layer.

Q29. Define Network Layer.

The network layer is responsible for transferring data between different networks. It determines the best path to travel from source to destination.

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Q30. Define Transport Layer.

The transport layer uses the TCP to ensure reliable data transfer between source and destination and also manages data flow control and error checking.

Q31. Define Session Layer.

Session Layer manages sessions between applications. It established maintains and terminates connection between devices.

Q32. Define Presentation Layer.

Presentation layer translate data formats, encryption and compression to ensure system understand each other.

Q33. Define Application Layer.

Application Layer is the closest to the end user. It provides network services directly to applications, such as email, web browsing, and file transfer.

Q34. What is meant by Packets?

When you send message over internet, its breaks into smaller pieces called packets.

Q35. What is the difference between IP-V4 and IP-V6?

IP-V4	IP-V6
Consist of four groups separate by dot (.) Each group contains decimal value from 0 to 255 Size of each group is 8 bits or 1 byte. Total size of IP-V4 is 32 bits or 4 bytes. IP-V4 has approximately 4.3 billion unique addresses Example: **192.168.10.25**	Consist of eight groups separate by colon (:) Each group contains four hexadecimal digits. Size of each group is 16 bits or 2 bytes. Total size of IP-V6 is 128 bits or 16 bytes. IP-V6 has almost limitless number of unique addresses Example: **26B:56:7F:AB:93:24B:200E:827A**

Q36. Differentiate DNS and DHCP.

DNS	DHCP
Domain Name System translate domain name into IP address.	Dynamic Host Configuration Protocol automatically assigns IP addresses to devices on a network

Q37. Differentiate TCP and UDP.

TCP	UDP
Transmission Control Protocol ensures reliable data transfer between sender and receiver.	User Datagram Protocol provide faster but less reliable communication between sender and receiver

Q38. Differentiate HTTP and FTP.

HTTP	FTP
HTTP stands for hypertext transfer protocol is used for transferring web pages between client and web server	FTP stands for file transfer protocol is used for transferring files from host to remote computer.

Q39. Differentiate Firewall and Encryption.

Firewall	Encryption
Firewalls are security system that monitor and control incoming and outgoing network traffic on predetermined security rules.	Encryption is the process of encoding data in such a way that only authorized person can read it.

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Q40. How does encapsulation ensures secure communication in a network?

The actual contents of message are hidden inside the header of each layer with help of protocol that why encapsulation ensure the secure communication in a network.

Q41. Explain the importance of encryption in network security.

Encryption is important because it allows you to secure data from illegal accesses when it transfers.

Q42. What are the advantages of star topologies in a network?

- Star topology is easy to install and reconfigure.
- If there is some problem in cable then only respective computer gets disconnected from network instead of whole network down.

Q43. What is the difference between LAN & WAN?

LAN	WAN
A LAN (Local Area Network) is a network that connects computers and devices within a limited area, such as school, home or office building.	A WAN (Wide Area Network) covers a large geographical area, connection LANs and MANs. The internet is a example of WAN.

Q44. Define PAN.

PAN (Personal Area Network) is a network that connect personal devices such smartphones, tablets, and laptop within short range. Bluetooth connection is example of PAN.

Q45. Define MAN.

MAN (Metropolitan Area Network) is a network that spans a city or large campus connecting multiple LANs together.

Q46. Define CAN.

CAN (Campus Area Network) is a network that connects multiple LANs within a limited geographical area, such as university campus.

Q47. Differentiate Internet and Intranet.

Internet	Intranet
A global network that connects millions of computers worldwide for public use. Or network of networks is called internet.	A private network within an organization accessible for only authorized users of an organization.

Q48. What are the common threats to network security?

Malware, Phishing, Denial of service attacks and Man-in-Middle attacks are common threats to network security.

Q49. What is DoS attack?

A DoS (Denial of service) is a cyber-attack to make a machine or network resources unavailable.

Q50. What is Cipher Text?

Conversion of data to an unreadable format is called cipher text.

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