

Computer Networks

TCP/IP and Network Architecture Quiz

Instructions:

- Answer all questions.
- For Questions 1–5, choose the best option.
- For Questions 6–8, mark True or False.
- For Questions 9–10, write detailed answers with diagrams where helpful.

1. Which layer of the OSI model is responsible for routing packets between networks?
 - (A) Data Link Layer
 - (B) Network Layer
 - (C) Transport Layer
 - (D) Session Layer
2. TCP provides reliable data transfer through:
 - (A) Broadcasting to all nodes
 - (B) Acknowledgments and retransmissions
 - (C) Connectionless communication
 - (D) Fixed packet sizes only
3. What is the primary function of DNS?
 - (A) Encrypting network traffic
 - (B) Translating domain names to IP addresses
 - (C) Assigning IP addresses dynamically
 - (D) Routing packets across networks
4. Which protocol operates at the Transport Layer and provides connectionless, unreliable service?
 - (A) TCP
 - (B) UDP
 - (C) IP

- (D) HTTP
5. A subnet mask of 255.255.255.0 (/24) allows for how many usable host addresses?
- (A) 256
 - (B) 254
 - (C) 255
 - (D) 128
6. ARP (Address Resolution Protocol) maps IP addresses to MAC addresses. (True/False)
7. HTTP/2 requires the use of TLS encryption for all communications. (True/False)
8. A switch operates at the Network Layer and makes forwarding decisions based on IP addresses. (True/False)
9. Compare and contrast TCP and UDP. Discuss their characteristics, use cases, and explain why certain applications prefer one protocol over the other.
10. Explain the TCP three-way handshake process. Describe each step and the purpose of the SYN, SYN-ACK, and ACK messages. What happens if a packet is lost during this process?