# COMPUTER NETWORKS

## BRANCH:-CSE

## SEMESTER – THIRD

***These important questions have been prepared using your previous exam papers (PYQs), verified concepts, and additional reference from trusted online academic sources.***
***For deeper understanding, please refer to your class notes as well.***



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## 1️⃣ HIGH & LONG IMPORTANT QUESTIONS

1. Explain the OSI Reference Model with a neat diagram. Discuss the function and responsibility of each of the seven layers in detail.
2. Explain the TCP/IP Networking Model with a neat diagram. Compare the TCP/IP Model and OSI Model in detail.
3. Explain the various causes of Transmission Impairment: Attenuation, Distortion, and Noise. What remedies can be used to reduce them?
4. Differentiate between Analog Signals and Digital Signals.
5. Describe various Network Topologies (Star, Bus, Ring, Mesh) with neat diagrams. Discuss their advantages and disadvantages.

    - ❖ Addressing, Routing, and Transport Layer

6. Explain IPv4 Addressing. Describe IP Classes (A, B, C) and the rules for grouping IP addresses.
7. Explain the need for Subnetting and CIDR. Solve a numerical problem to find Subnet Mask, Network Address, and Host Range.
8. Why do we need IPv6? Explain its features and address representation. Compare IPv4 and IPv6.
9. Explain the working and features of TCP and UDP. Provide a detailed comparison between TCP and UDP.

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## 2 IMPORTANT & SHORT QUESTIONS

10. What is DHCP? Explain how a DHCP Server assigns IP addresses. Differentiate between Static and Dynamic IP assignment.
11. What is VLAN (Virtual LAN)? Explain its need and benefits in a network.
12. Define a MAC Address. Explain the working process of the ARP (Address Resolution Protocol).
13. What is NAT (Network Address Translation)? Explain its operation and purpose.
14. Differentiate between Static Routing and Dynamic Routing. Define Default Gateway and the role of an IP Routing Table.
15. Differentiate between a Hub and a Switch based on collision and broadcast domains. What are the functions of a Router and a Firewall?
16. Explain the three layers of Hierarchical Network Design (Access, Distribution, Core) and their functions.
17. Write short notes on DNS. Explain the complete DNS Resolution process.
18. Define Bandwidth, Throughput, Latency, and Jitter. Differentiate between them.
19. Differentiate between POP3 and IMAP4. Explain the role of SMTP in email delivery.

## 3 "AA BHI SAKTA HAI" QUESTIONS (Low Probability but Smart Picks)

20. Explain the Structured Troubleshooting Methods: Bottom-Up and Top-Down approaches.
21. Explain the purpose and output of the commands: ping, tracert/pathping, and nslookup.
22. Differentiate between Straight-Through and Crossover UTP Cable Pinouts. State when each type is used.
23. What is a SOHO (Small Office/Home Office) Network? Discuss its design, components, and common challenges.
24. Compare Telnet and SSH. Why is SSH preferred for secure remote access?
25. Draw and label the basic structure of an Ethernet Frame.
26. Differentiate between Parallel and Serial Transmission.

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