Q1. Which layer of the OSI model is responsible for path determination and logical addressing?

A. Data Link
B. Network
C. Transport
D. Session

Q2. Ethernet operates primarily at which layer of the OSI model?

A. Physical
B. Network
C. Application
D. Transport

Q3. Which wireless standard operates at 2.4 GHz and offers up to 54 Mbps?

A. 802.11a
B. 802.11b
C. 802.11g
D. 802.11n

Q4. A router operates at which OSI layer?

A. Layer 2
B. Layer 3
C. Layer 4
D. Layer 5

Q5. What is the maximum cable length for a standard Ethernet (100Base-TX) segment?

A. 50 meters
B. 100 meters
C. 500 meters
D. 1 km

Q6. Which device reduces collision domains in an Ethernet LAN?

A. Hub
B. Switch
C. Bridge
D. Repeater

Q7. Wi-Fi uses which type of communication?

A. Guided media
B. Unguided radio waves
C. Fiber optic
D. Duplex cable

Q8. The TCP protocol belongs to which OSI layer?

A. Session
B. Application
C. Transport
D. Presentation

Q9. Which address identifies a device on an Ethernet LAN?

A. IP address
B. MAC address
C. Subnet mask
D. Port number

Q10. Which internetworking device separates broadcast domains?

A. Hub
B. Switch
C. Router
D. Repeater

◇ MEDIUM LEVEL (15 Questions)

Q11. Which OSI layer ensures data integrity through flow control and error control mechanisms?

A. Transport
B. Network
C. Data Link
D. Presentation

Q12. The CSMA/CD mechanism is used in which Ethernet type?

A. Full-duplex Ethernet
B. Token Ethernet
C. Wireless LAN
D. Half-duplex Ethernet

Q13. Which protocol is responsible for dynamic assignment of IP addresses?

A. ARP
B. DHCP
C. DNS
D. ICMP

Q14. In wireless networks, which encryption method is considered the weakest?

A. WPA3
B. WPA2
C. WPA
D. WEP

Q15. What does the term "fragmentation" refer to in networking?

A. Breaking data into packets
B. Splitting a broadcast domain
C. Breaking frames into bits
D. Reassembling packets at the receiver

Q16. Ethernet frames use which method to detect errors?

A. Checksum
B. CRC
C. Parity bit
D. Hashing

Q17. Which OSI layer provides data format translation and encryption?

A. Application
B. Transport
C. Presentation
D. Session

Q18. 802.11n increases Wi-Fi speed using which technique?

A. Channel bonding
B. Token passing
C. CSMA/CD
D. Frequency shifting

Q19. The process of mapping an IP address to a MAC address is done by:

A. DHCP
B. ARP
C. ICMP
D. RARP

Q20. VLANs logically segment a network at which layer?

A. Layer 1
B. Layer 2
C. Layer 3
D. Layer 4

Q21. Which routing protocol uses hop count as its metric?

A. OSPF
B. BGP
C. RIP
D. EIGRP

Q22. In wireless networking, what is an SSID?

A. Encryption key
B. Network name
C. IP address pool
D. Antenna type

Q23. Which of the following is a feature of Ethernet switches?

A. Flooding all traffic to all ports always
B. Collision detection
C. MAC address learning
D. Token passing

Q24. The Data Link layer is divided into two sublayers: LLC and _____.

A. PAP
B. MAC
C. ARP
D. RARP

Q25. What is the purpose of CSMA/CA in wireless networks?

A. Increase bandwidth
B. Recover from collisions
C. Avoid collisions
D. Reduce channel width

◇ HARD LEVEL (15 Questions)

Q26. In IPv6, which address type supports communication to all devices in a group?

A. Anycast
B. Unicast
C. Broadcast
D. Multicast

Q27. Which OSI layer is responsible for establishing, managing, and terminating connections between applications?

A. Network
B. Transport
C. Session
D. Presentation

Q28. Which modulation technique is widely used in modern 802.11 wireless standards for high throughput?

A. DSSS
B. FHSS
C. OFDM
D. CSMA/CD

Q29. Which Ethernet standard supports 10 Gbps using fiber optic?

A. 10GBase-T
B. 10GBase-SR
C. 10Base-F
D. 1000Base-SX

Q30. In internetworking, which protocol is used for error reporting and diagnostic functions?

A. ARP
B. ICMP
C. TCP
D. RIP

Q31. How does a switch handle a frame with an unknown destination MAC address?

A. Drops the frame
B. Sends only to routers
C. Floods it to all ports except the receiving port
D. Waits for ARP resolution

Q32. Which wireless frequency band offers greater range but lower throughput?

A. 2.4 GHz
B. 3.6 GHz
C. 5 GHz
D. 60 GHz

Q33. MPLS improves internetworking performance by using which technique?

A. Packet flooding
B. Label switching
C. Static routing
D. Token passing

Q34. What is the MTU (Maximum Transmission Unit) of standard Ethernet?

A. 1024 bytes
B. 1500 bytes
C. 2048 bytes
D. 4096 bytes

Q35. In the OSI model, segmentation and reassembly occur at which layer?

A. Application
B. Transport
C. Network
D. Data Link

Q36. A wireless network experiencing multipath interference would benefit most from:

A. Channel bonding
B. MIMO technology
C. Increased SSID count
D. CSMA/CD

Q37. Which routing algorithm uses a link-state database and Dijkstra's algorithm?

A. RIP
B. BGP
C. OSPF
D. EIGRP

Q38. What does the Spanning Tree Protocol prevent in Ethernet networks?

A. IP duplication
B. Frame fragmentation
C. Broadcast storms
D. Channel interference

Q39. Which Wi-Fi security mechanism uses a 4-way handshake?

A. WEP
B. WPA/WPA2
C. Open Authentication
D. MAC filtering

Q40. In an enterprise wireless architecture, what is the role of a Wireless LAN Controller (WLC)?

A. Handles IP assignment
B. Centralized AP management and RF control
C. Controls CSMA/CD
D. Performs data encryption only