

40 MCQs from LANs (04-LANs.pdf - First 60 Slides)

1. **What is the primary purpose of the preamble in an Ethernet frame?**
 - a. Error detection
 - b. Synchronize sender and receiver clocks
 - c. Store the destination MAC address
 - d. Indicate frame priority

Answer: b

2. **Which protocol is used for collision detection in traditional Ethernet?**
 - a. CSMA/CA
 - b. CSMA/CD
 - c. ARP
 - d. VLAN

Answer: b

3. **What is the size of a MAC address in bytes?**
 - a. 4
 - b. 6
 - c. 8
 - d. 10

Answer: b

4. **In CSMA/CD, after a collision is detected, stations use:**
 - a. Exponential backoff
 - b. Fixed waiting time
 - c. Priority scheduling
 - d. Token passing

Answer: a

5. **A switch forwards frames based on:**
 - a. IP addresses
 - b. MAC addresses
 - c. Port numbers
 - d. VLAN tags

Answer: b

6. **What is the broadcast MAC address?**
 - a. 00:00:00:00:00:00
 - b. FF:FF:FF:FF:FF:FF
 - c. 11:11:11:11:11:11

d. 01:00:5E:00:00:00

Answer: b

7. **Which field in an Ethernet frame indicates the higher-layer protocol (e.g., IPv4)?**

- a. Preamble
- b. Type
- c. CRC
- d. Destination address

Answer: b

8. **Full-duplex operation in Ethernet eliminates:**

- a. MAC addresses
- b. Collisions
- c. VLANs
- d. Broadcast domains

Answer: b

9. **What is the purpose of VLAN trunking?**

- a. Connect devices in the same collision domain
- b. Carry traffic for multiple VLANs over a single link
- c. Assign IP addresses dynamically
- d. Encrypt data frames

Answer: b

10. **Which protocol adds a VLAN tag to Ethernet frames?**

- a. 802.1Q
- b. 802.11
- c. ARP
- d. ICMP

Answer: a

11. **In VLANs, an access port is used to connect:**

- a. Two switches
- b. A switch to a router
- c. End devices (e.g., PCs)
- d. Multiple VLANs

Answer: c

12. **What is the default VLAN ID?**

- a. 0
- b. 1

- c. 100
- d. 4096

Answer: b

13. Which device is required for inter-VLAN communication?

- a. Hub
- b. Layer 2 switch
- c. Layer 3 switch or router
- d. Repeater

Answer: c

14. In a wireless LAN, CSMA/CA is used instead of CSMA/CD because:

- a. Wireless uses fiber optics
- b. Collision detection is impractical
- c. Higher data rates
- d. No MAC addresses

Answer: b

15. Which IEEE standard defines Wi-Fi 6?

- a. 802.11ac
- b. 802.11ax
- c. 802.11n
- d. 802.11be

Answer: b

16. What is the primary purpose of the 4-Way Handshake in WPA3?

- a. Assign IP addresses
- b. Establish encryption keys
- c. Fragment data
- d. Resolve MAC addresses

Answer: b

17. In 802.11, a BSS without an AP is called:

- a. ESS
- b. Ad-hoc network
- c. Trunked network
- d. VLAN

Answer: b

18. Which field in an 802.11 frame contains the BSSID?

- a. Address 1

- b. Address 2
- c. Address 3
- d. Address 4

Answer: c

19. What is the role of a WLAN Controller in centralized architecture?

- a. Manage AP configurations
- b. Assign IP addresses
- c. Fragment packets
- d. Encrypt VLAN traffic

Answer: a

20. Which authentication method uses a pre-shared key (PSK)?

- a. 802.1X
- b. WPA3-Personal
- c. EAP
- d. RADIUS

Answer: b

21. What does the "More Fragments" (MF) flag indicate in an IP datagram?

- a. No more fragments
- b. Additional fragments follow
- c. Error in fragmentation
- d. Encryption is enabled

Answer: b

22. Which VLAN port type carries tagged frames?

- a. Access port
- b. Trunk port
- c. Hybrid port
- d. Native port

Answer: b

23. In 802.11, passive scanning involves:

- a. Sending probe requests
- b. Listening for beacon frames
- c. Fragmenting data
- d. Encrypting traffic

Answer: b

24. Which protocol resolves IP addresses to MAC addresses?

- a. DNS
- b. ARP
- c. DHCP
- d. ICMP

Answer: b

25. The primary purpose of a subnet mask is to:

- a. Encrypt data
- b. Differentiate network and host portions of an IP address
- c. Assign VLAN IDs
- d. Detect collisions

Answer: b

26. Which device operates at Layer 2 of the OSI model?

- a. Router
- b. Switch
- c. Hub
- d. Firewall

Answer: b

27. What is the maximum data rate of 802.11ac (Wi-Fi 5)?

- a. 54 Mbps
- b. 600 Mbps
- c. 3.47 Gbps
- d. 10 Gbps

Answer: c

28. Which field in the IPv4 header ensures packets don't loop indefinitely?

- a. TTL
- b. Protocol
- c. Checksum
- d. Fragment offset

Answer: a

29. In Ethernet, the term "jam signal" is used to:

- a. Start transmission
- b. Announce a collision
- c. Assign VLANs

d. Encrypt frames

Answer: b

30. Which address is reserved for IPv4 loopback?

a. 192.168.0.1

b. 127.0.0.1

c. 10.0.0.1

d. 172.16.0.1

Answer: b

31. What is the purpose of ARP?

a. Resolve domain names to IPs

b. Resolve IPs to MACs

c. Assign IP addresses

d. Fragment packets

Answer: b

32. Which VLAN configuration allows dynamic port assignment?

a. Port-based

b. MAC-based

c. Protocol-based

d. IP-based

Answer: b

33. What does the "TTL" field in an IP header represent?

a. Time to live in seconds

b. Maximum hops before discard

c. Encryption key

d. Fragment size

Answer: b

34. Which IEEE standard defines Wi-Fi 7?

a. 802.11ax

b. 802.11be

c. 802.11ac

d. 802.11n

Answer: b

35. In 802.11, the ESSID is equivalent to:

a. BSSID

b. Network name (SSID)

- c. MAC address
- d. IP subnet

Answer: b

36. Which protocol is used for error reporting in IP networks?

- a. ARP
- b. ICMP
- c. DHCP
- d. DNS

Answer: b

37. What is the default subnet mask for 192.168.1.0/24?

- a. 255.0.0.0
- b. 255.255.255.0
- c. 255.255.0.0
- d. 255.255.255.128

Answer: b

38. Which field in an Ethernet frame is used for error detection?

- a. Preamble
- b. CRC
- c. Type
- d. Source address

Answer: b

39. In a switched network, each port is a:

- a. Collision domain
- b. Broadcast domain
- c. VLAN
- d. Subnet

Answer: a

40. Which authentication method is used in enterprise WLANs?

- a. WPA3-Personal
- b. 802.1X/EAP
- c. PSK
- d. SAE

Answer: b

50 MCQs from IP Part 1 (05-IP-part1.pdf)

1. Which field in the IPv4 header identifies the protocol of the payload?
 - a. TTL
 - b. Protocol
 - c. Checksum
 - d. Fragment offset

Answer: b

2. What is the maximum size of an IPv4 datagram?
 - a. 1500 bytes
 - b. 65,535 bytes
 - c. 1024 bytes
 - d. 9000 bytes

Answer: b

3. Fragmentation in IPv4 occurs when:
 - a. The TTL expires
 - b. The datagram exceeds the MTU
 - c. Checksum fails
 - d. The DF flag is set

Answer: b

4. Which flag in the IPv4 header indicates "Don't Fragment"?
 - a. MF
 - b. DF
 - c. TTL
 - d. Protocol

Answer: b

5. The subnet mask 255.255.255.0 corresponds to a prefix length of:
 - a. /24
 - b. /16
 - c. /32
 - d. /8

Answer: a

6. How many usable hosts are in a /28 subnet?
 - a. 16
 - b. 14
 - c. 30

d. 32

Answer: b

7. **Which IP address range is reserved for private networks?**

- a. 172.32.0.0/12
- b. 192.168.0.0/16
- c. 169.254.0.0/16
- d. 224.0.0.0/4

Answer: b

8. **What is the loopback address in IPv4?**

- a. 10.0.0.1
- b. 127.0.0.1
- c. 192.168.1.1
- d. 169.254.1.1

Answer: b

9. **Which protocol dynamically assigns IP addresses?**

- a. ARP
- b. DHCP
- c. ICMP
- d. NAT

Answer: b

10. **What is the purpose of NAT?**

- a. Fragment packets
- b. Map private IPs to a public IP
- c. Resolve MAC addresses
- d. Encrypt data

Answer: b

11. **Which ICMP message type indicates "Time Exceeded"?**

- a. Echo Reply
- b. Destination Unreachable
- c. TTL Expired
- d. Redirect

Answer: c

12. **The broadcast address for 192.168.1.0/24 is:**

- a. 192.168.1.1
- b. 192.168.1.255

- c. 192.168.1.0
- d. 192.168.255.255

Answer: b

13. Which field in the IPv4 header is decremented at each router?

- a. Protocol
- b. TTL
- c. Checksum
- d. Fragment offset

Answer: b

14. The network address for 10.20.30.40/24 is:

- a. 10.20.30.0
- b. 10.20.30.255
- c. 10.20.0.0
- d. 10.0.0.0

Answer: a

15. Which protocol maps IP addresses to MAC addresses?

- a. DNS
- b. ARP
- c. DHCP
- d. ICMP

Answer: b

16. A /30 subnet supports how many usable hosts?

- a. 2
- b. 4
- c. 6
- d. 8

Answer: a

17. Which IPv4 address is a Class A private address?

- a. 172.16.0.0
- b. 10.0.0.0
- c. 192.168.0.0
- d. 169.254.0.0

Answer: b

18. The header checksum in IPv4 covers:

- a. Entire datagram

- b. Header only
- c. Payload only
- d. Fragment offset

Answer: b

19. Which IP address is a limited broadcast address?

- a. 192.168.1.255
- b. 255.255.255.255
- c. 10.255.255.255
- d. 127.0.0.1

Answer: b

20. What is the purpose of the "Identification" field in IPv4?

- a. Indicate protocol
- b. Reassemble fragments
- c. Set TTL
- d. Assign priority

Answer: b

21. Which subnet mask corresponds to /27?

- a. 255.255.255.0
- b. 255.255.255.224
- c. 255.255.255.128
- d. 255.255.255.240

Answer: b

22. The first usable host in 192.168.0.128/25 is:

- a. 192.168.0.0
- b. 192.168.0.1
- c. 192.168.0.129
- d. 192.168.0.128

Answer: c

23. Which protocol is used for router signaling and error reporting?

- a. ARP
- b. ICMP
- c. DHCP
- d. DNS

Answer: b

24. In NAT, PAT refers to:

- a. Port Address Translation
- b. Private Address Translation
- c. Protocol Address Table
- d. Packet Arrival Time

Answer: a

25. Which IPv4 option records the route of a packet?

- a. Timestamp
- b. Record Route
- c. Loose Source Routing
- d. Strict Source Routing

Answer: b

26. How many bits are in an IPv4 address?

- a. 16
- b. 32
- c. 64
- d. 128

Answer: b

27. The subnet 172.16.0.0/12 includes which IP range?

- a. 172.16.0.0 to 172.31.255.255
- b. 172.0.0.0 to 172.255.255.255
- c. 172.16.0.0 to 172.16.255.255
- d. 172.16.0.0 to 172.16.15.255

Answer: a

28. Which field ensures a datagram is not forwarded indefinitely?

- a. Protocol
- b. TTL
- c. Checksum
- d. Fragment offset

Answer: b

29. The MTU for Ethernet is typically:

- a. 1500 bytes
- b. 65,535 bytes
- c. 9000 bytes

d. 512 bytes

Answer: a

30. Which IP address is public?

a. 10.1.1.1

b. 172.16.1.1

c. 192.168.1.1

d. 203.0.113.1

Answer: d

31. The host part of 192.168.1.100/24 is:

a. 192.168.1

b. 100

c. 192

d. 168.1.100

Answer: b

32. Which command shows the ARP cache?

a. arp -a

b. ipconfig

c. tracert

d. ping

Answer: a

33. What is the purpose of the "Flags" field in IPv4?

a. Set priority

b. Control fragmentation

c. Assign TTL

d. Indicate protocol

Answer: b

34. Which address is a directed broadcast for 10.20.30.0/24?

a. 10.20.30.255

b. 10.255.255.255

c. 255.255.255.255

d. 10.20.30.0

Answer: a

35. What is the broadcast address for subnet 192.168.1.128/25?

a. 192.168.1.128

b. 192.168.1.255

- c. 192.168.1.127
- d. 192.168.255.255

Answer: b

36. Which address is a private IP?

- a. 172.32.0.1
- b. 10.0.0.1
- c. 169.254.0.1
- d. 192.169.1.1

Answer: b

37. PAT (Port Address Translation) is used to:

- a. Map multiple private IPs to a single public IP using ports
- b. Assign IP addresses dynamically
- c. Encrypt data packets
- d. Fragment IP datagrams

Answer: a

38. An ICMP Echo Request is used by:

- a. ARP
- b. Ping
- c. Traceroute
- d. DHCP

Answer: b

39. The fragment offset field in IPv4 is measured in units of:

- a. 1 byte
- b. 8 bytes
- c. 16 bytes
- d. 32 bytes

Answer: b

40. If the IHL field in an IPv4 header is 6, the header length is:

- a. 6 bytes
- b. 24 bytes
- c. 20 bytes
- d. 30 bytes

Answer: b

41. Which field in the IPv4 header is used for QoS parameters?

- a. TTL

- b. Protocol
- c. Type of Service (TOS)
- d. Identification

Answer: c

42. When a host needs a MAC address, it sends a(n):

- a. ICMP request
- b. ARP request
- c. DHCP request
- d. DNS query

Answer: b

43. The address 169.254.0.0/16 is reserved for:

- a. Loopback
- b. Link-local addresses
- c. Multicast
- d. Private networks

Answer: b

44. Which multicast address range is reserved for IPv4?

- a. 224.0.0.0/4
- b. 10.0.0.0/8
- c. 192.168.0.0/16
- d. 172.16.0.0/12

Answer: a

45. A host with IP 192.168.2.5/24 sends a packet to 192.168.3.10. Where is it sent?

- a. Directly to the host
- b. To the default gateway
- c. To the broadcast address
- d. Dropped

Answer: b

46. Which protocol is used by routers to send error messages?

- a. ARP
- b. ICMP
- c. DHCP
- d. DNS

Answer: b

47. The network address for 172.16.32.0/20 is:

- a. 172.16.0.0
- b. 172.16.32.0
- c. 172.16.16.0
- d. 172.16.32.0

Answer: b

48. Which IPv4 header field is used to prevent infinite loops?

- a. Protocol
- b. TTL
- c. Checksum
- d. Identification

Answer: b

49. What is the maximum number of hosts in a /29 subnet?

- a. 8
- b. 6
- c. 4
- d. 2

Answer: b

50. Which ICMP message is sent when a router cannot forward a packet?

- a. Echo Reply
- b. Destination Unreachable
- c. Redirect
- d. Time Exceeded

Answer: b