SNS COLLEGE OF ENGINEERING

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AN AUTONOMOUS INSTITUTION

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Network Layer

1. **What is the primary function of the Network Layer?**
   - A) Error detection and correction
   - B) Data encapsulation and framing
   - C) Routing and forwarding of packets
   - D) Session establishment and maintenance

   Answer: C) Routing and forwarding of packets

2. **Which layer of the OSI model is responsible for logical addressing?**
   - A) Data Link Layer
   - B) Transport Layer
   - C) Network Layer
   - D) Application Layer

   Answer: C) Network Layer

3. **What type of addressing does the Network Layer use?**
   - A) MAC addressing
   - B) IP addressing
   - C) Port addressing
   - D) VLAN addressing

   Answer: B) IP addressing

4. **Which protocol is commonly used for routing packets across different networks?**
   - A) HTTP
   - B) FTP
   - C) IP
   - D) ARP

   Answer: C) IP

5. **What is the main purpose of the Internet Protocol (IP)?**
   - A) To provide error checking
   - B) To establish a connection between devices
   - C) To provide logical addressing and routing of packets
   - D) To manage data flow

Answer: C) To provide logical addressing and routing of packets

IP Addressing

6. **What are the two main versions of IP addresses used in networking?**
   - A) IPv2 and IPv3
   - B) IPv4 and IPv6
   - C) IPv5 and IPv6
   - D) IPv4 and IPv8

   Answer: B) IPv4 and IPv6

7. **What is the length of an IPv4 address?**
   - A) 64 bits
   - B) 128 bits
   - C) 32 bits
   - D) 48 bits

   Answer: C) 32 bits

8. **What is the length of an IPv6 address?**
   - A) 64 bits
   - B) 128 bits
   - C) 32 bits
   - D) 48 bits

   Answer: B) 128 bits

9. **Which IPv4 address class is used for multicast communication?**
   - A) Class A
   - B) Class B
   - C) Class C
   - D) Class D

   Answer: D) Class D

10. **What is the purpose of a subnet mask in IPv4 addressing?**
    - A) To define the network portion and the host portion of an IP address
    - B) To provide a unique identifier for each network device
    - C) To encrypt data packets
    - D) To manage routing tables

    Answer: A) To define the network portion and the host portion of an IP address

Routing and Forwarding

11. **Which routing protocol is classified as an Interior Gateway Protocol (IGP)?**
    - A) BGP
    - B) OSPF
    - C) EIGRP
    - D) RIP

    Answer: B) OSPF

12. **What is the main purpose of the Routing Information Protocol (RIP)?**
    - A) To manage IP address allocation
    - B) To provide dynamic routing updates
    - C) To handle error correction
    - D) To encrypt routing information

    Answer: B) To provide dynamic routing updates

13. **Which routing protocol uses a link-state algorithm?**
    - A) RIP
    - B) OSPF
    - C) BGP
    - D) EIGRP

    Answer: B) OSPF

14. **What is the main difference between Distance Vector and Link-State routing protocols?**
    - A) Distance Vector protocols use routing tables, while Link-State protocols use a database of network topology.
    - B) Link-State protocols use routing tables, while Distance Vector protocols use a database of network topology.
    - C) Distance Vector protocols use encryption, while Link-State protocols do not.
    - D) Link-State protocols are slower than Distance Vector protocols.

    Answer: A) Distance Vector protocols use routing tables, while Link-State protocols use a database of network topology.

15. **What does the term "routing table" refer to?**
    - A) A table that stores encryption keys
    - B) A table that maps IP addresses to MAC addresses
    - C) A table used by routers to determine the best path for forwarding packets
    - D) A table that tracks active connections

    Answer: C) A table used by routers to determine the best path for forwarding packets

IP Addressing and Subnetting

16. **What is the purpose of CIDR (Classless Inter-Domain Routing)?**
    - A) To support only Class A and Class B addresses
    - B) To allocate IP addresses more efficiently by allowing variable-length subnet masking
    - C) To increase the size of the IP address space
    - D) To provide a new IP addressing scheme

    Answer: B) To allocate IP addresses more efficiently by allowing variable-length subnet masking

17. **How many bits are used for the network portion in a Class C IPv4 address?**
    - A) 16 bits
    - B) 24 bits
    - C) 32 bits
    - D) 8 bits

    Answer: B) 24 bits

18. **What is the purpose of Network Address Translation (NAT)?**
    - A) To assign IP addresses to network devices
    - B) To convert private IP addresses to a public IP address and vice versa
    - C) To encrypt data packets
    - D) To manage routing tables

    Answer: B) To convert private IP addresses to a public IP address and vice versa

19. **Which type of NAT allows multiple devices on a local network to share a single public IP address?**
    - A) Static NAT
    - B) Dynamic NAT
    - C) Port Address Translation (PAT)
    - D) NAT64

    Answer: C) Port Address Translation (PAT)

20. **What is a default gateway?**
    - A) A device that forwards packets between different networks
    - B) An IP address used for internal routing
    - C) A server that provides DNS services
    - D) A device that connects a local network to an external network

    Answer: D) A device that connects a local network to an external network

Protocols and Standards

21. **Which protocol is used for discovering devices on a local network and resolving their IP addresses to MAC addresses?**
    - A) DHCP
    - B) ARP
    - C) ICMP
    - D) PPP

    Answer: B) ARP

22. **What does the acronym ICMP stand for?**
    - A) Internet Control Message Protocol
    - B) Internet Communication Message Protocol
    - C) Integrated Control Messaging Protocol
    - D) Interconnected Control Management Protocol

    Answer: A) Internet Control Message Protocol

23. **What is the primary purpose of ICMP?**
    - A) To route packets between networks
    - B) To provide error reporting and diagnostic functions
    - C) To manage IP address assignments
    - D) To handle data encryption

    Answer: B) To provide error reporting and diagnostic functions

24. **Which ICMP message is used to test connectivity between two devices?**
    - A) Echo Request
    - B) Destination Unreachable
    - C) Time Exceeded
    - D) Redirect

    Answer: A) Echo Request

25. **What is the purpose of the Internet Control Message Protocol (ICMP) "Time Exceeded" message?**
    - A) To indicate a packet was lost
    - B) To signal that a packet has been discarded because it exceeded its Time to Live (TTL) value
    - C) To report an unreachable destination
    - D) To provide diagnostic information

    Answer: B) To signal that a packet has been discarded because it exceeded its Time to Live (TTL) value

Advanced Routing Concepts

26. **Which protocol is used to exchange routing information between different autonomous systems?**
    - A) OSPF
    - B) EIGRP
    - C) BGP
    - D) RIP

    Answer: C) BGP

27. **What is the purpose of a route summarization?**
    - A) To provide detailed routing information
    - B) To reduce the size of routing tables by consolidating multiple routes into a single summary route
    - C) To increase the accuracy of routing updates
    - D) To encrypt routing information

    Answer: B) To reduce the size of routing tables by consolidating multiple routes into a single summary route

28. **What does the term “route aggregation” refer to in networking?**
    - A) The process of combining multiple IP addresses into a single network address
    - B) The process of dividing a large network into smaller subnets
    - C) The process of distributing routing updates to multiple routers
    - D) The process of increasing network speed

    Answer: A) The process of combining multiple IP addresses into a single network address

29. **Which algorithm is commonly used by OSPF for calculating the shortest path?**
    - A) Bellman-Ford
    - B) Dijkstra's
    - C) Floyd-Warshall
    - D) A*

    Answer: B) Dijkstra's

30. **What is a "routing loop"?**
    - A) A situation where data packets continuously circulate between routers without reaching their destination
    - B) A mechanism to handle network congestion
    - C) A feature that speeds up data transmission
    - D) A process for error detection

    Answer: A) A situation where data packets continuously circulate between routers without reaching their destination

Security and Management

31. **What is the purpose of IPsec (Internet Protocol Security)?**
    - A) To provide error detection and correction
    - B) To encrypt and authenticate IP packets
    - C) To manage routing tables
    - D) To handle network congestion

    Answer: B) To encrypt and authenticate IP packets

32. **Which feature of IPsec ensures that data has not been tampered with?**
    - A) Encryption
    - B) Integrity check
    - C) Authentication
    - D) Compression

    Answer: B) Integrity check

33. **What does the acronym VPN stand for?**
    - A) Virtual Public Network
    - B) Virtual Private Network
    - C) Verified Public Network
    - D) Variable Private Network

    Answer: B) Virtual Private Network

34. **Which protocol is commonly used in conjunction with IPsec for securing VPN connections?**
    - A) TCP
    - B) UDP
    - C) GRE
    - D) FTP

    Answer: C) GRE

35. **What is the primary goal of using Quality of Service (QoS) in a network?**
    - A) To provide encryption for network traffic
    - B) To prioritize certain types of traffic and ensure optimal performance
    - C) To manage IP address assignments
    - D) To route packets between networks

    Answer: B) To prioritize certain types of traffic and ensure optimal performance

Network Layer Technologies

36. **Which protocol is used to obtain an IP address dynamically?**

- A) ARP
- B) DHCP
- C) ICMP
- D) SNMP

Answer: B) DHCP

37. **What does the acronym DHCP stand for?**
    - A) Dynamic Host Configuration Protocol
    - B) Dynamic Host Control Protocol
    - C) Direct Host Communication Protocol
    - D) Distributed Host Configuration Protocol

    Answer: A) Dynamic Host Configuration Protocol

38. **Which protocol is used to map IP addresses to MAC addresses?**
    - A) DHCP
    - B) ARP
    - C) ICMP
    - D) DNS

    Answer: B) ARP

39. **What is the role of DNS (Domain Name System) in networking?**
    - A) To convert IP addresses to domain names
    - B) To manage IP address assignments
    - C) To provide encryption for data packets
    - D) To route packets between networks

    Answer: A) To convert IP addresses to domain names

40. **Which DNS record type is used to map a domain name to an IP address?**
    - A) MX
    - B) CNAME
    - C) A
    - D) TXT

    Answer: C) A

Troubleshooting and Diagnostics

41. **Which command is used to test connectivity between two network devices using ICMP?**
    - A) ping
    - B) traceroute
    - C) netstat

- D) ifconfig

Answer: A) ping

42. **What does the "traceroute" command do?**
    - A) It measures the time taken for packets to travel to a destination
    - B) It displays the path that packets take to reach their destination
    - C) It monitors network traffic in real time
    - D) It configures IP addresses

    Answer: B) It displays the path that packets take to reach their destination

43. **Which command displays the routing table on a Windows system?**
    - A) route print
    - B) netstat -r
    - C) ipconfig
    - D) arp -a

    Answer: A) route print

44. **What does the command "netstat -r" show?**
    - A) Active network connections and their status
    - B) The routing table
    - C) Network interface statistics
    - D) IP configuration details

    Answer: B) The routing table

45. **What is the purpose of the command "ipconfig /all"?**
    - A) To display all network interface configurations
    - B) To test network connectivity
    - C) To display active network connections
    - D) To show the routing table

    Answer: A) To display all network interface configurations

Advanced Topics

46. **Which protocol uses path vector routing to maintain routing information?**
    - A) OSPF
    - B) EIGRP
    - C) BGP
    - D) RIP

    Answer: C) BGP

47. **What does the acronym MPLS stand for?**
    - A) Multi-Protocol Layer Switching
    - B) Multi-Protocol Label Switching
    - C) Multi-Path Layer Switching
    - D) Managed Protocol Label Switching

    Answer: B) Multi-Protocol Label Switching

48. **What is the primary advantage of MPLS?**
    - A) It increases the size of IP address space
    - B) It provides high-speed data transfer and traffic engineering
    - C) It handles encryption of network traffic
    - D) It manages IP address assignments

    Answer: B) It provides high-speed data transfer and traffic engineering

49. **What is the primary role of a gateway in networking?**
    - A) To manage network traffic
    - B) To connect different networks and perform protocol translation
    - C) To encrypt data packets
    - D) To assign IP addresses to devices

    Answer: B) To connect different networks and perform protocol translation

50. **Which protocol allows devices to discover and communicate with each other over IPv6 networks?**
    - A) IPv4
    - B) ARP
    - C) NDP (Neighbor Discovery Protocol)
    - D) DHCP

    Answer: C) NDP (Neighbor Discovery Protocol)

These questions provide a broad overview of the Netw