

Contestant Number: _____

Time: _____

Rank: _____



Network Administration Using Cisco (315)

REGIONAL 2025

CONCEPT KNOWLEDGE:

Multiple Choice (50 @ 2 points each) _____ (100 points)

Test Time: 60 minutes

Multiple Choice Questions

Directions: Identify the letter of the choice that best completes the statement or answers the question.

1. A network administrator wants to configure a switch port to forward traffic to only specific MAC addresses. Which feature should be enabled on the switch port?
 - A. VLAN
 - B. Port Security
 - C. Trunking
 - D. VTP
2. How do routers maintain up-to-date routing information in dynamic routing?
 - A. By manual configuration
 - B. By periodic updates from neighboring routers
 - C. By using static routes only
 - D. By random selection
3. How does a switch determine the correct port to forward data to based on the destination MAC address?
 - A. By using ARP requests
 - B. By using IP addresses
 - C. By consulting the routing table
 - D. By learning MAC addresses from incoming frames
4. How does a switch forward data within a network?
 - A. By using IP addresses
 - B. By using MAC addresses
 - C. By using domain names
 - D. By using port numbers
5. If a network administrator wants to secure remote access to a router using SSH, which command should be used to generate RSA keys on the router?
 - A. `ssh key generate rsa`
 - B. `crypto key generate rsa`
 - C. `generate ssh key`
 - D. `rsa generate key`
6. In a LAN environment, if a switch receives a frame with a destination MAC address not in its MAC address table, what action will the switch take?
 - A. Flood the frame out of all ports except the incoming port
 - B. Drop the frame
 - C. Send an ARP request
 - D. Forward the frame to the default gateway

7. In a mesh network topology, how many links are required to connect n devices?
 - A. $n-1$
 - B. $n(n-1)/2$
 - C. $2n$
 - D. n^2
8. In a network environment, what is the primary role of VLAN trunking between switches?
 - A. To carry traffic for multiple VLANs
 - B. To encrypt all network traffic
 - C. To block unauthorized access
 - D. To prioritize network traffic
9. In a network with multiple VLANs, which device is responsible for inter-VLAN routing?
 - A. Switch
 - B. Router
 - C. Firewall
 - D. Hub
10. In a network, if a device wants to obtain an IP address automatically, which protocol should it use?
 - A. DNS
 - B. DHCP
 - C. SNMP
 - D. HTTP
11. In IPv6, what is the function of the Anycast address compared to Unicast and Multicast addresses?
 - A. Anycast addresses represent a group of devices sharing the same address
 - B. Anycast addresses are unique to every device on the network
 - C. Anycast addresses enable communication with the nearest device in a group
 - D. Anycast addresses are used for broadcasting messages to all devices
12. In IPv6, what is the primary function of the Unique Local address?
 - A. To provide a unique address space for private networks
 - B. To manage network traffic based on IP addresses
 - C. To secure the router from unauthorized access
 - D. To enable communication between VLANs
13. In IPv6, what is the purpose of the Link-Local address?
 - A. To communicate within the same subnet
 - B. To secure the router from unauthorized access
 - C. To manage network traffic based on IP addresses
 - D. To encrypt data transmission over the network

14. In IPv6, what is the size of the address space compared to IPv4?
- A. Larger
 - B. Smaller
 - C. Equal
 - D. Variable
15. In IPv6, what is the total number of bits used in an IPv6 address?
- A. 32 bits
 - B. 64 bits
 - C. 128 bits
 - D. 256 bits
16. In networking, what is the function of a repeater?
- A. To connect multiple networks together
 - B. To divide a network into separate collision domains
 - C. To amplify and regenerate signals
 - D. To forward data between different networks
17. In TCP/IP model, which layer is responsible for ensuring data integrity through sequencing and acknowledgment of data segments?
- A. Network Layer
 - B. Transport Layer
 - C. Application Layer
 - D. Internet Layer
18. In the TCP/IP model, which layer is responsible for establishing, maintaining, and terminating connections between applications?
- A. Network Layer
 - B. Transport Layer
 - C. Application Layer
 - D. Internet Layer
19. In the TCP/IP model, which layer is responsible for logical addressing, routing, and path determination?
- A. Data Link Layer
 - B. Transport Layer
 - C. Network Layer
 - D. Physical Layer
20. In the TCP/IP model, which layer is responsible for physical addressing and transmission of data over the network medium?
- A. Data Link Layer
 - B. Transport Layer
 - C. Network Layer
 - D. Physical Layer

21. Scenario: A company wants to separate its finance department's network traffic from other departments for security reasons. Which technology should be implemented to achieve this segregation?
- A. VLAN
 - B. NAT
 - C. ACL
 - D. DNS
22. Scenario: A network administrator configures a default gateway on a device. Which type of route does this represent in routing?
- A. Direct Route
 - B. Static Route
 - C. Default Route
 - D. Dynamic Route
23. Scenario: A network administrator needs to allocate a group address for multicasting purposes in an IPv6 network. Which type of address should be used for this purpose?
- A. Unicast
 - B. Multicast
 - C. Broadcast
 - D. Anycast
24. Scenario: A network administrator needs to assign a unique IPv6 address to each device on the network. Which type of address should be used for this purpose?
- A. Unicast
 - B. Multicast
 - C. Broadcast
 - D. Anycast
25. Scenario: A network administrator needs to configure a switch to handle multiple VLANs efficiently. Which configuration step is essential to allow the switch to forward traffic between VLANs?
- A. Create a VLAN interface
 - B. Enable trunking on the switch ports
 - C. Implement a VLAN access list
 - D. Configure a VLAN routing protocol
26. Scenario: A network administrator needs to extend VLANs across multiple switches in a network. Which protocol should be configured to accomplish this task efficiently?
- A. VLAN Trunking Protocol (VTP)
 - B. Network Address Translation (NAT)
 - C. Access Control List (ACL)
 - D. Domain Name System (DNS)

27. Scenario: A switch is connected to multiple other switches to create a single logical network. What feature is used to achieve this connection?
- A. VLAN
 - B. Port Security
 - C. Trunking
 - D. VTP
28. Scenario: An organization is planning to implement a protocol that allows IPv6 hosts to discover routers on the link. Which protocol should be enabled for this functionality?
- A. ARP
 - B. DHCPv6
 - C. ICMPv6
 - D. Router Advertisement
29. Scenario: An organization requires separate broadcast domains for different departments while using a single physical switch. Which technology should be implemented to achieve this segregation?
- A. VLAN
 - B. NAT
 - C. VPN
 - D. DNS
30. Scenario: An organization wants to implement a feature in IPv6 that provides automatic address configuration for hosts. Which mechanism should they deploy for this purpose?
- A. DHCPv6
 - B. ARP
 - C. ICMP
 - D. SLAAC
31. Scenario: In a LAN/WAN design, a network administrator wants to ensure secure remote access to the network. Which technology should be implemented for this purpose?
- A. VPN
 - B. VLAN
 - C. NAT
 - D. ACL
32. Scenario: In a LAN/WAN design, a router is used to connect multiple networks and determine the best path for data transmission. What function does the router perform in this scenario?
- A. NAT
 - B. Switching
 - C. Routing
 - D. VLAN

33. What is a characteristic of dynamic routing protocols?
- A. Routes are manually configured
 - B. Less prone to network failures
 - C. Best suited for small networks
 - D. Requires constant manual updates
34. What is a characteristic of static routing?
- A. Automatically adapts to network changes
 - B. Requires manual configuration of routes
 - C. Best choice for large networks
 - D. Uses complex algorithms for routing
35. What is the function of a MAC address in networking?
- A. To forward data packets between different networks
 - B. To determine the best path for data transmission
 - C. To uniquely identify devices on a network
 - D. To manage network bandwidth
36. What is the primary function of a router in a network?
- A. To forward data packets between different networks
 - B. To connect devices within a local network
 - C. To amplify and regenerate signals
 - D. To determine the best path for data transmission
37. What is the primary function of Network Address Translation (NAT) in a network?
- A. To secure the router from unauthorized access
 - B. To translate private IP addresses to public IP addresses
 - C. To manage VLANs on the router
 - D. To exchange routing information with other routers
38. What is the primary function of VLAN pruning in a network infrastructure?
- A. To optimize bandwidth by limiting VLAN traffic
 - B. To encrypt all network traffic
 - C. To filter incoming traffic
 - D. To manage DHCP requests
39. What is the primary purpose of configuring a default gateway on a device in a network?
- A. To forward packets to the correct destination within the same network
 - B. To provide a backup route in case of network failures
 - C. To connect devices within a local network
 - D. To enable communication with devices in other networks

40. What is the purpose of a firewall in a network?
- A. Connect different networks together
 - B. Filter and block unauthorized access
 - C. Amplify network signals
 - D. Provide physical support for network devices
41. What is the purpose of a hub in a network?
- A. To connect devices in a local network
 - B. To forward data based on MAC addresses
 - C. To amplify and regenerate signals
 - D. To determine the best path for data transmission
42. What is the purpose of subnetting in networking?
- A. To reduce network congestion
 - B. To create smaller broadcast domains
 - C. To increase network security
 - D. To improve network performance
43. What is the purpose of the Router Advertisement message in IPv6 networks?
- A. To assign IPv6 addresses to hosts
 - B. To secure the router from unauthorized access
 - C. To manage network traffic based on IP addresses
 - D. To inform hosts about router presence and address configuration
44. What is the purpose of VLAN tagging in network communication?
- A. To identify VLAN membership of Ethernet frames
 - B. To encrypt all network traffic
 - C. To filter outgoing traffic
 - D. To prioritize network traffic
45. What type of routing table entry is created manually by a network administrator in static routing?
- A. Dynamic routes
 - B. Direct routes
 - C. Indirect routes
 - D. Static routes
46. When configuring a router, what is the purpose of setting up routing protocols such as OSPF or EIGRP?
- A. To secure the router from unauthorized access
 - B. To establish trunks between routers
 - C. To exchange routing information with other routers
 - D. To manage VLANs on the router

47. When configuring a switch, what is the purpose of setting up port security?
- A. To enable communication between VLANs on different switches
 - B. To secure switch ports from unauthorized access
 - C. To manage network bandwidth
 - D. To divide a network into separate broadcast domains
48. When configuring IPv6 addresses, what is the significance of the EUI-64 format?
- A. It incorporates the MAC address into the IPv6 address
 - B. It encrypts data transmission over the network
 - C. It secures the router from unauthorized access
 - D. It manages network traffic based on IP addresses
49. When designing LAN/WAN networks, what is the purpose of implementing Spanning Tree Protocol (STP)?
- A. To prevent network loops and ensure a loop-free topology
 - B. To secure switch ports from unauthorized access
 - C. To encrypt data transmission over public networks
 - D. To manage network bandwidth
50. When designing LAN/WAN networks, what is the purpose of implementing Virtual Private Networks (VPNs)?
- A. To secure switch ports from unauthorized access
 - B. To enable communication between VLANs
 - C. To encrypt data transmission over public networks
 - D. To manage network bandwidth