

Contestant ID: _____

Time: _____

Rank: _____



NETWORK ADMINISTRATION USING CISCO (315)

REGIONAL 2026

CONCEPT KNOWLEDGE:

Multiple Choice (50 @ 2 points each)

_____ (100 points)

Test Time: 60 minutes

GENERAL GUIDELINES.

Failure to follow any of these rules may result in disqualification:

1. **Submission Requirements:** Contestants must submit this test booklet along with any printouts.
2. **Permitted Items:** Only the equipment, supplies, and materials specified for this event are allowed in the testing area. Previous BPA tests and sample tests (whether handwritten, photocopied, or typed) are not permitted.
3. **Electronic Devices:** Electronic devices will be monitored according to ACT standards.

Multiple Choice Questions

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

1. What layer of the OSI model is responsible for routing decisions?
 - A. Application
 - B. Network
 - C. Data Link
 - D. Transport

2. Which routing protocol is an example of a link-state routing protocol?
 - A. RIP
 - B. OSPF
 - C. Static
 - D. BGP

3. Which network topology connects all devices to a single central hub or switch?
 - A. Bus
 - B. Ring
 - C. Star
 - D. Mesh

4. Which device operates at the Data Link layer of the OSI model?
 - A. Router
 - B. Switch
 - C. Hub
 - D. Repeater

5. Which layer of the OSI model is responsible for error detection and correction?
 - A. Application Layer
 - B. Transport Layer
 - C. Data Link Layer
 - D. Physical Layer

6. A router receives a packet with a destination IP address. Which routing method will the router use based on learned routes to forward the packet?
 - A. Static Routing
 - B. Dynamic Routing
 - C. Default Routing
 - D. Direct Routing

7. In a hybrid network topology, which combination of network types is commonly used to take advantage of both centralized management and high redundancy?
 - A. Ring and Bus
 - B. Star and Mesh
 - C. Bus and Tree
 - D. Star and Ring
8. Which network topology provides the highest level of fault tolerance and redundancy?
 - A. Mesh Topology
 - B. Bus Topology
 - C. Ring Topology
 - D. Star Topology
9. A router uses multiple routes with different metrics to distribute traffic to the same destination network. Which routing method is being used?
 - A. Equal-cost Multi-path Routing
 - B. Unequal-cost Multi-path Routing
 - C. Default Routing
 - D. Static Routing
10. Which network topology connects each device to a central hub or switch, creating a point-to-point connection?
 - A. Mesh Topology
 - B. Bus Topology
 - C. Star Topology
 - D. Ring Topology
11. 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
12. Which network component amplifies and regenerates signals to extend the length of the network?
 - A. Hub
 - B. Router
 - C. Switch
 - D. Repeater

13. Scenario: A network where each device is connected to two other devices, forming a circular pathway for data is an example of which network topology?
- A. Mesh Topology
 - B. Ring Topology
 - C. Star Topology
 - D. Bus Topology
14. How does a router make packet forwarding decisions in dynamic routing?
- A. Based on static routes only
 - B. Based on the lowest metric only
 - C. Based on the routing table and dynamic routing protocols
 - D. Based on a random selection
15. Which network topology uses a central device like a hub to connect all devices in a star-like fashion?
- A. Mesh Topology
 - B. Ring Topology
 - C. Star Topology
 - D. Bus Topology
16. Scenario: A router is using the OSPF routing protocol. What type of routing algorithm does OSPF use?
- A. Link-State
 - B. Distance-Vector
 - C. Path-Vector
 - D. Hybrid
17. In a mesh network topology consisting of 5 devices, how many connections are there between each device in the network?
- A. 0
 - B. 1
 - C. 2
 - D. 10
18. Which network topology uses a central trunk cable to connect all devices in a linear fashion?
- A. Mesh Topology
 - B. Ring Topology
 - C. Star Topology
 - D. Bus Topology

19. Which device connects multiple devices in a local area network and forwards data based on MAC addresses?
- A. Router
 - B. Switch
 - C. Hub
 - D. Repeater
20. An organization designs its network using a combination of star and mesh topologies to take advantage of both centralized management and high fault tolerance. What type of network topology is this an example of?
- A. Mesh Topology
 - B. Ring Topology
 - C. Star Topology
 - D. Hybrid Topology
21. Scenario: A network where multiple devices are connected directly to each other without a central device is an example of which network topology?
- A. Mesh Topology
 - B. Ring Topology
 - C. Star Topology
 - D. Bus Topology
22. Which network topology connects devices in a closed loop where data travels in only one direction?
- A. Mesh Topology
 - B. Ring Topology
 - C. Star Topology
 - D. Bus Topology
23. A router is configured to forward packets between networks based on IP addresses using a protocol of RIP, OSPF or EIGRP. What type of routing is being performed by the router?
- A. Dynamic Routing
 - B. Static Routing
 - C. Default Routing
 - D. Direct Routing
24. When configuring a switch, which feature allows the switch to automatically learn MAC addresses by monitoring incoming traffic?
- A. VLAN
 - B. Port Security
 - C. Trunking
 - D. MAC Address Learning

25. What is the purpose of configuring VLANs on a switch?
- A. To divide a network into separate broadcast domains
 - B. To secure switch ports from unauthorized access
 - C. To establish trunks between switches
 - D. To manage network bandwidth
26. In router configuration, what is the purpose of setting up access control lists (ACLs)?
- A. To determine the best path for data transmission
 - B. To prevent unauthorized access to the router
 - C. To configure dynamic routing protocols
 - D. To manage network traffic based on IP addresses
27. Scenario: A switch port is configured to allow traffic from multiple VLANs. Which feature should be enabled on the switch port?
- A. VLAN
 - B. Port Security
 - C. Trunking
 - D. VTP
28. A network administrator wants to configure a router to forward or block traffic based on specific rules, such as IP addresses or protocols. Which feature should be set up on the router to accomplish this?
- A. MAC Address Learning
 - B. Access Control Lists
 - C. VTP
 - D. Trunking
29. When configuring a switch, what is the purpose of setting up trunking between switches?
- A. To divide a network into separate broadcast domains
 - B. To enable communication between multiple VLANs on a single link
 - C. To secure switch ports from unauthorized access
 - D. To manage network bandwidth
30. A small branch office network only has one path to reach all external networks. The network administrator wants to configure the router so that all traffic destined for unknown networks are sent to a specific next-hop address. What type of route should be configured?
- A. Dynamic Routing
 - B. Static Routing
 - C. Default Routing
 - D. Direct Routing

31. A network administrator wants to configure a switch port to only allow traffic from specific MAC addresses. Which feature should be enabled on the switch port?
- A. VLAN
 - B. Port Security
 - C. Trunking
 - D. VTP
32. Scenario: A switch is configured to forward traffic between devices within the same VLAN. What feature enables this communication on the switch?
- A. VLAN
 - B. Port Security
 - C. Trunking
 - D. VTP
33. A network administrator wants to configure a router to forward packets between networks based on the MAC address of the destination device. What type of routing is being performed by the router?
- A. Dynamic Routing
 - B. Static Routing
 - C. Layer 3 Switching
 - D. Layer 2 Switching
34. When configuring a router, what is the purpose of setting up DHCP (Dynamic Host Configuration Protocol)?
- A. To translate private IP addresses to public IP addresses
 - B. To enable communication between VLANs on different switches
 - C. To assign IP addresses automatically to devices on the network
 - D. To manage network bandwidth
35. Scenario: A switch port is configured to only allow traffic from a specific VLAN. Which feature should be enabled on the switch port?
- A. VLAN
 - B. Port Security
 - C. Trunking
 - D. VTP
36. What is the significance of configuring SNMP on network devices?
- A. To determine the best path for data transmission
 - B. To monitor and manage network devices remotely
 - C. To secure the router from unauthorized access
 - D. To manage VLANs on the router

37. A network administrator wants to simplify VLAN management across multiple switches by ensuring VLAN configurations are consistently distributed from a central switch. Which protocol should be configured to achieve this?
- A. STP (Spanning Tree Protocol)
 - B. VTP (VLAN Trunking Protocol)
 - C. DHCP (Dynamic Host Configuration Protocol)
 - D. CDP (Cisco Discovery Protocol)
38. When configuring ACLs for IPv4, what is the primary purpose of specifying permit or deny statements?
- A. To determine the best path for data transmission
 - B. To secure the router from unauthorized access
 - C. To manage network traffic based on IP addresses
 - D. To enable communication between VLANs
39. Scenario: A network administrator wants to restrict access to a specific server based on IP addresses. Which feature should be configured on the router?
- A. NAT
 - B. ACL
 - C. Trunking
 - D. VTP
40. What is the purpose of Access Control Lists (ACLs) in IPv4 configuration?
- A. To translate private IP addresses to public IP addresses
 - B. To manage network traffic based on IP addresses
 - C. To secure the router from unauthorized access
 - D. To exchange routing information with other routers
41. A network administrator wants internal devices with private IP addresses to access the internet using a single public IP address. Which technology should be implemented to achieve this?
- A. OSPF
 - B. VLAN
 - C. DHCP
 - D. NAT
42. What is the primary function of VLANs in LAN design?
- A. To translate private IP addresses to public IP addresses
 - B. To divide a network into separate broadcast domains
 - C. To manage network traffic based on IP addresses
 - D. To secure the router from unauthorized access

43. What is the significance of implementing Quality of Service (QoS) in network design?
- A. To secure the router from unauthorized access
 - B. To prioritize network traffic based on specific criteria
 - C. To manage VLANs on the router
 - D. To exchange routing information with other routers
44. When configuring ACLs for IPv4, what is the purpose of defining inbound and outbound rules
- A. To secure the router from unauthorized access
 - B. To manage network traffic based on IP addresses
 - C. To enable communication between VLANs
 - D. To determine the best path for data transmission
45. A network administrator notices that redundant switch links in a LAN are causing broadcast storms and multiple frame copies. Which protocol should be implemented to prevent these switching loop issues?
- A. ACL
 - B. VLAN (Virtual Local Area Network)
 - C. STP (Spanning Tree Protocol)
 - D. OSPF
46. A user sends an HTTP request to a web server on a remote network. During encapsulation for this request, what information is added to the address field of a frame to indicate the destination?
- A. the network domain of the destination host
 - B. the MAC address of the default gateway
 - C. the IP address of the default gateway
 - D. the MAC address of the destination host
47. Why do we use named ACLs instead of numbered ACLs when setting up IPv4 access lists?
- A. To secure the router from unauthorized access
 - B. Are readable and allow for change without deleting everything
 - C. To determine the best path for data transmission
 - D. To enable communication between VLANs
48. Scenario: A company is transitioning from IPv4 to IPv6 to accommodate the growing number of devices on their network. Which type of address does IPv6 use to facilitate this transition period?
- A. Unicast
 - B. Multicast
 - C. Anycast
 - D. Transition

49. What is the primary reason for the introduction of IPv6?
- A. Exhaustion of IPv4 addresses
 - B. Faster data transmission
 - C. Improved security protocols
 - D. Enhanced Quality of Service
50. What is the purpose of Neighbor Discovery Protocol (NDP) in IPv6 networks?
- A. To identify the network portion of an IP address
 - B. To secure the router from unauthorized access
 - C. To manage network traffic based on IP addresses
 - D. To facilitate address resolution and router discovery