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Practice Questions

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1. What is the prefix for the following IPv6 address: 2001:0db8:85a3::8a2e:0370:7334 / 48?

- A. 2001:0db8:: / 48
- B. ::8a2e:0370:7334 / 48
- C. ::8a2e:0370:: / 48
- D. 2001:0db8:85a3:: / 48

2. Which statement correctly explains a characteristic of a fiber-optic point-to-point network?

- A. It relies on CSMA/CA for collision avoidance.
- B. It provides a dedicated communication path between two devices.
- C. It only supports simplex communication.
- D. It uses hubs to share bandwidth among connected devices.

3. What are three disadvantages of using wireless connections for connecting remote branch offices to the main office network? (Choose three.)

- A. Bandwidth limitations
- B. Ease of installation
- C. Interference
- D. Security

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4. Which of the following has the highest data transmission rate?

- A. 5 GHz Wi-Fi
- B. CAT6 Ethernet cable
- C. Fiber optic cable
- D. CAT5 Ethernet cable



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5. Which two statements accurately describe the characteristics of IPv6 unique local addresses? (Choose two.)

- A. They are globally routable.
- B. They are not routable on the global Internet.
- C. They start with the prefix FC00::/7.
- D. They begin with FF00.

6. Which two statements are true about Network Address Translation (NAT)? (Choose two.)

- A. NAT conserves global address space by using a single public IP address for multiple devices.
- B. NAT adds a layer of security by concealing internal IP addresses.
- C. NAT requires a separate authentication server.
- D. NAT implements SAE to protect against eavesdropping during IP address translation.

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7. An administrator needs to adjust the default VLAN idle timeout setting on a Cisco switch. In which section of the switch's GUI can they find the Idle Timeout field to make this change?

- A. Management
- B. Security
- C. QoS
- D. Interface Settings

8. Which three VLAN membership types are considered static rather than dynamic? (Choose three.)

- A. VLAN by RADIUS
- B. Access VLAN
- C. Voice VLAN
- D. Management VLAN

9. Which four fields are included in an EAPOL frame used in 802.1X authentication? (Choose four.)

- A. Packet Body Length
- B. Packet Body
- C. Checksum
- D. Protocol Version



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10. Which feature is supported by OSPF but not by RIP?

- A. Flat network design
- B. Hierarchical network design
- C. Hop count
- D. Distance vector routing

11. What are three benefits of implementing wireless LANs (WLANs)? (Choose three.)

- A. Provides mobility to users.
- B. Reduces cabling costs.
- C. Faster data transmission speeds compared to wired LANs.
- D. Higher security without configuration.

12. In a typical enterprise network, where would you most likely place the DHCP server to ensure efficient IP address allocation to client devices?

- A. Access Layer
- B. Distribution Layer
- C. Data Center
- D. Core Layer

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13. Which VLAN tagging standard allows for up to 4094 VLANs and is defined in IEEE 802.1Q?

- A. VTP
- B. RSTP
- C. 802.1w
- D. 802.1Q

14. What are three settings that must be configured on a router's interface to ensure proper network access? (Choose three.)

- A. Subnet mask
- B. Default gateway
- C. DNS server
- D. SMTP server



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15. What are three of the configuration options available when setting up a VLAN on a Cisco switch through its CLI? (Choose three.)

- A. State
- B. Interface
- C. Name
- D. MTU Size

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16. Which two statements accurately describe a network setup where Ansible has been used to automate configuration on all-new switches? (Choose two.)

- A. All links between switches are Layer 2 links.
- B. All switches are used as Layer 3 switches.
- C. Each switch is assigned an IP address and acts as a router.
- D. All switches use the OSPFv2 routing protocol.

17. Which two sentences accurately describe the role of APIs in software-defined networking (SDN)? (Choose two.)

- A. They enable the controller's data and functions to be used by applications and business logic.
- B. They connect the SDN controller to applications and business logic.
- C. They connect the controller to network devices.
- D. They are used to program the data plane.

18. Which feature of Cisco DNA Center allows for automated configuration changes based on policy adjustments?

- A. Encrypted traffic analysis
- B. Plug and Play
- C. Network time travel
- D. Path trace

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19. In the context of network programmability, which of the following represents the plane responsible for executing commands that adjust the behavior of network devices?

- A. Management
- B. Application
- C. Control
- D. Data

20. Which two sentences accurately describe characteristics of infrastructure automation tools? (Choose two.)

- A. Chef uses HashiCorp Configuration Language (HCL) for defining infrastructure.
- B. Ansible uses YAML as its configuration format.
- C. Terraform uses HashiCorp Configuration Language (HCL) for defining infrastructure.
- D. Puppet uses YAML as its configuration format.

21. What is the wildcard mask for a subnet with a prefix length of /30?

- A. 0.0.0.3
- B. 0.0.0.15
- C. 0.0.0.255
- D. 0.0.0.7

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22. Which command is used to enable EIGRP routing on a router?

- A. hostname eigrp 1
- B. router eigrp 1
- C. network eigrp 1
- D. router-id eigrp 1

23. Which command configures a static IPv6 address on an interface?

- A. ip address 2020::10/64
- B. ipv6 address ::/0
- C. ip address 192.168.1.1/24
- D. ipv6 address 2020::10/64



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24. Which routing protocol uses bandwidth as its metric to determine the best path?

- A. EIGRP
- B. IGRP
- C. OSPF
- D. RIP

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25. Which two lines of output from the 'show ip interface brief' command indicate that an interface is administratively down? (Choose two.)

- A. GigabitEthernet0/1 10.1.1.1 YES manual up up
- B. FastEthernet0/0 unassigned YES unset administratively down down
- C. GigabitEthernet0/0 unassigned YES unset administratively down down
- D. Vlan1 192.168.1.1 YES NVRAM up up

26. An administrator runs the "show ip eigrp neighbors" command and receives the output shown below. In this output, a neighbor with a Q-value of 0 indicates that the neighbor is in the Established state, while any non-zero Q-value indicates the neighbor is not yet fully established. Based on the table provided, how many neighbors are not in the Established state? Address Interface Hold Uptime SRTT RTO Q Seq 10.1.1.2 Gi0/1 13 00:01:23 150 9 4626 10.1.1.3 Gi0/1 12 00:01:25 150 6 4627 10.1.1.4 Gi0/1 11 00:01:24 150 0 4625 10.1.1.5 Gi0/1 14 00:01:29 150 3 4628

- A. 3
- B. 4
- C. 7
- D. 3

27. Which security concept determines the identity of a device trying to connect to a network?

- A. Device Authorization
- B. Device Accounting
- C. Device Automation
- D. Device Authentication

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28. Router R1 has an interface Fa0/1 connected to a network with a trusted NTP server and interface Fa0/2 connected to untrusted hosts. All ports are in VLAN 20. Which two commands should be included when configuring the router for NTP Authentication? (Choose two.)

- A. ntp authentication-key 1 md5 <password>
- B. ntp authenticate
- C. show ntp associations
- D. ntp access-group

29. Which four practices enhance network security? (Choose four.)

- A. Use VPNs for remote access.
- B. Implement network segmentation.
- C. Disable VPNs for remote access.
- D. Implement strong firewall rules.

30. Which type of software is specifically designed to identify and exploit vulnerabilities in computer systems?

- A. Vulnerability
- B. Threat
- C. Mitigation technique
- D. Exploit



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Answer Key & Explanations

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1. D — 2001:0db8:85a3:: / 48

To identify the prefix (subnet ID) in an IPv6 address with a prefix length that is divisible by 4, take the prefix length and divide it by 4 to find the number of hex digits that are in the prefix. Then, change all hex digits after that and change them to 0. If the prefix length is 48, then the first 12 digits are in the prefix.

2. B — It provides a dedicated communication path between two devices.

Answer: It provides a dedicated communication path between two devices. A fiber-optic point-to-point network creates a direct communication link between two devices, ensuring high-speed data transfer with minimal interference. This is different from shared media networks, where multiple devices share the same communication medium.

3. A — Bandwidth limitations

Using wireless connections to connect remote branch offices can be convenient, but it comes with several drawbacks. One major drawback is interference, since wireless signals can be easily affected by other devices and obstacles, leading to poor performance. Security is another significant issue because wireless signals can be intercepted more easily than wired connections, increasing the risk of data breaches. Bandwidth limitations are also a common problem, as wireless networks often cannot support as much data throughput as wired connections. However, ease of installation is an advantage of using wireless technology, because it requires less physical infrastructure.

4. C — Fiber optic cable

Answer: Fiber optic cable Fiber optic cables can transmit data at speeds of up to 100 Gbps and beyond, depending on the technology used. Ethernet over twisted pair cables (e.g., CAT5, CAT6) typically support speeds up to 1 Gbps or 10 Gbps. 4G wireless technologies generally support data rates up to 100 Mbps, while 5 GHz Wi-Fi can reach up to 1 Gbps. However, these technologies are still slower compared to fiber optic cables.

5. B — They are not routable on the global Internet.

IPv6 unique local addresses are used for local communication within a site or organization and are not routable on the global Internet. They start with the prefix FC00::/7. Unique local addresses are analogous to IPv4 private addresses.

6. A — NAT conserves global address space by using a single public IP address for multiple devices.

Network Address Translation (NAT) is a method used to remap IP address spaces by modifying network address information in IP header packets while they are in transit. There are several types of NAT, such as static, dynamic, and PAT (Port Address Translation). NAT can conserve global addresses by enabling multiple devices on a local network to access the internet using a single public IP address. It also adds a layer of security by concealing internal IP addresses.

7. A — Management

Answer: Management The Management tab includes settings for user sessions, idle timeouts, and other



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administrative controls. The Enable Idle Timeout checkbox should be enabled before setting the value for it. Security is for setting up access controls and authentication. QoS is for traffic prioritization. Interface Settings deal with configuration of network interfaces. Logs are for viewing system logs and events.

8. B — Access VLAN

VLAN memberships can be assigned in a static or dynamic manner. Static VLAN memberships are explicitly assigned to devices or ports by network administrators and remain fixed unless manually changed. The types 'Access VLAN', 'Voice VLAN', and 'Management VLAN' are examples of static VLAN memberships. Dynamic VLAN membership, such as 'VLAN assigned by VMPS' and 'VLAN by RADIUS', is automatically assigned based on criteria like user credentials or MAC address.

9. A — Packet Body Length

An EAPOL (Extensible Authentication Protocol over LAN) frame consists of four key fields. The Protocol Version field specifies the version of the EAPOL protocol being used. The Type field indicates the type of EAPOL packet. The Packet Body Length field specifies the length of the packet body. The Packet Body field contains the actual data of the EAPOL message. The Checksum field is not part of the EAPOL frame.

10. B — Hierarchical network design

Answer: Hierarchical network design OSPF (Open Shortest Path First) supports hierarchical network design through the use of areas, which allows for better scalability and management. RIP (Routing Information Protocol), on the other hand, uses a flat network design and does not support hierarchical structures. Other features of OSPF include the use of Link State routing and a more complex and efficient algorithm compared to the distance-vector routing used by RIP.

11. A — Provides mobility to users.

Implementing a WLAN has several benefits, including simplifying the addition of new devices, providing mobility to users, and reducing cabling costs. While WLANs can be fast, they are generally not faster than wired LANs. Additionally, without proper configuration, they are typically less secure than wired networks.

12. D — Core Layer

Answer: Core Layer In enterprise network design, the DHCP server is typically placed in the core layer to ensure reliable and efficient IP address management. This allows the server to handle requests from various subnets effectively. Placing the DHCP server in the distribution or access layer can introduce inefficiencies and potential points of failure.

13. D — 802.1Q

Answer: 802.1Q The IEEE 802.1Q standard allows for VLAN tagging, enabling up to 4094 VLANs in a network. 802.1D is the original standard for Ethernet bridging. VTP (VLAN Trunking Protocol) manages VLAN configuration across switches, but does not define VLAN tagging itself. RSTP is defined in IEEE 802.1w, which provides rapid convergence for spanning tree protocol.

14. A — Subnet mask

A router's interface needs to be configured with an IP address, subnet mask, and default gateway to ensure proper network access.

15. A — State

Three of the available configuration options when setting up a VLAN on a Cisco switch through its CLI are Name, MTU Size, and State. Interface is configured under a different context.



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16. B — All switches are used as Layer 3 switches.

When using Ansible for network automation, the configurations are generally pushed to devices in a uniform manner. In this scenario, each switch is configured to operate in a Layer 3 mode to efficiently route data. This ensures all switches have IP addresses and act as routers, providing more streamlined network management. Additionally, it is typical for each switch to implement a common routing protocol such as BGP.

17. A — They enable the controller's data and functions to be used by applications and business logic.

In software-defined networking (SDN), APIs (Application Programming Interfaces) play a critical role in facilitating communication between different architectural layers. The northbound APIs (NB APIs) connect the SDN controller to applications and business logic. This enables higher-level programs to utilize network data and services. The southbound APIs (SB APIs) link the controller to the physical and virtual network devices, enabling the controller to instruct and manage the data plane functions.

18. B — Plug and Play

Answer: Plug and Play Plug and Play is a feature of Cisco DNA Center that allows for automated configuration changes based on policy adjustments. Network time travel is a feature that lets an administrator see past client performance to compare it to current use. Path trace discovers the path that packets take to their destination based on routing tables. Client 360 gives a comprehensive view of a client's health status. Encrypted traffic analysis lets administrators detect threats in encrypted traffic.

19. C — Control

Answer: Control The control plane is responsible for executing commands that dynamically alter the behavior of network devices by controlling data paths and establishing routing. The data plane focuses on the actual forwarding of packets. The management plane is involved in managing device configuration and network policies. The application plane is not commonly used terminology in network programmability.

20. B — Ansible uses YAML as its configuration format.

Infrastructure automation tools help streamline the deployment, configuration, and management of infrastructure. Ansible uses YAML as its configuration format. Terraform uses HashiCorp Configuration Language (HCL) for defining infrastructure. Both tools aim to improve consistency and efficiency in managing large-scale environments.

21. A — 0.0.0.3

Answer: 0.0.0.3 A prefix length of /30 leaves 2 bits for host addresses. In a wildcard mask, each bit of the subnet mask is inverted. For a /30 subnet mask (255.255.255.252), the wildcard mask is 0.0.0.3.

22. B — router eigrp 1

Answer: router eigrp 1. The command "router eigrp 1" is used to enable EIGRP routing on a router. It specifies the routing protocol (EIGRP) and the autonomous system number (1). The "network" command associates an IP address with the EIGRP process, but does not enable it. The "router-id" command is used to specify the router ID in other routing protocols. The "hostname" command sets a hostname for the device.

23. D — ipv6 address 2020::10/64

Answer: ipv6 address 2020::10/64 The command "ipv6 address 2020::10/64" is used to configure a static IPv6 address on an interface. It includes the IPv6 address and prefix length. The command "ip address 2020::10/64" is incorrect because it uses the "ip" keyword, which is for IPv4 addresses. The command "ipv6 address ::/0" is invalid because it sets an inappropriate prefix length of 0. The command "ip address



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192.168.1.1/24" is entirely an IPv4 configuration.

24. C — OSPF

Answer: OSPF OSPF (Open Shortest Path First) uses bandwidth as its metric to determine the best path. Specifically, it considers the cumulative bandwidth of the route links. RIP uses hop count as its metric. EIGRP and IGRP use a combination of metrics including bandwidth, delay, load, and reliability known as K values.

25. B — FastEthernet0/0 unassigned YES unset administratively down down

The 'show ip interface brief' command provides a quick overview of the device's interfaces, their IP addresses, and their operational status. An interface that is administratively down is indicated by the 'administratively down' status in the 'Status' column and the 'down' state in the 'Protocol' column.

26. D — 3

Answer: 3. A Q-value of 0 indicates the neighbor is in the Established state. Neighbors with non-zero Q-values (10.1.1.2, 10.1.1.3, and 10.1.1.5) are not in the Established state.

27. D — Device Authentication

Answer: Device Authentication Device Authentication is the process of verifying the identity of a device attempting to connect to a network. Common methods include certificates and digital signatures. Device Authorization concerns what a device is allowed to access. Device Accounting is about tracking what a device did on the network. Device Automation is not related to security concepts for controlling user access.

28. A — ntp authentication-key 1 md5 <password>

To use NTP Authentication, it has to be configured for the VLAN. The first command to run is "ntp authentication-key 1 md5 <password>" which specifies the key ID, authentication type, and password. The second command is "ntp authenticate" to enable authentication on the router. The "show ntp associations" command displays NTP associations. The "ntp access-group" command is used to control NTP access based on ACLs. The "switchport trunk encapsulation dot1q" command is used to configure trunk encapsulation on a switch interface.

29. A — Use VPNs for remote access.

There are multiple practices that can fortify network security. Implementing strong firewall rules helps in preventing unauthorized access. Regularly updating network devices ensures protection against vulnerabilities. Using VPNs for remote access adds another layer of security. Network segmentation divides the network into sections to limit the impact of security breaches. Disabling unused ports and services reduces the attack surface. Consistent monitoring and logging of network activity aid in early detection of malicious behavior.

30. D — Exploit

Answer: Exploit An exploit is a piece of software or code that is used to take advantage of a vulnerability in a computer system. It can be in the form of scripts, malware, or other malicious tools designed to perform unauthorized actions. A vulnerability is a weakness in a system that can be exploited. A threat is any potential malicious actor who might use an exploit against a vulnerability. A mitigation technique refers to any strategy or method used to prevent or reduce the damage of a threat or exploitation.



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