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Exam	**200-301 Exam**
Title	**Cisco Certified Network Associate Exam**
Version	**16.5**
Product Type	**803 Q&A with explanations**

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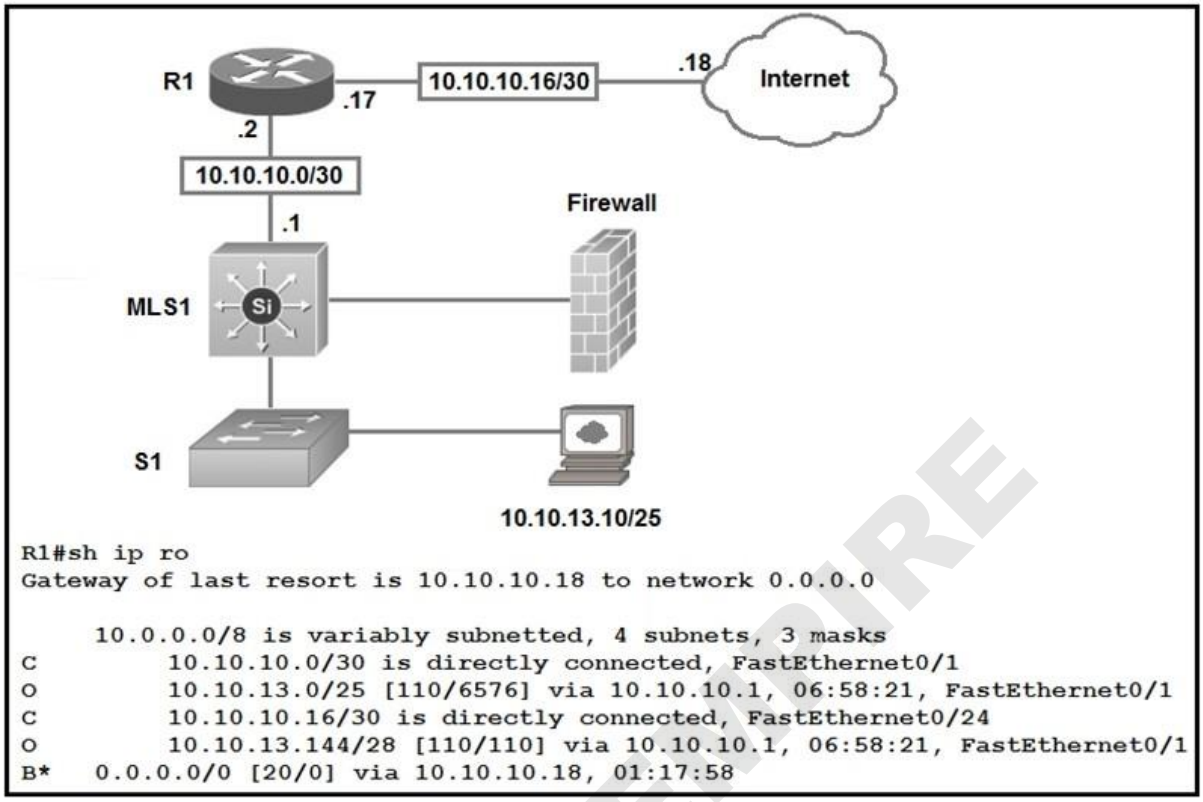
Exam A

QUESTION 1



Refer to the exhibit. Which type of route does R1 use to reach host 10.10.13.10/32?

A. default route
B. network route
C. host route
D. floating static route

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 2

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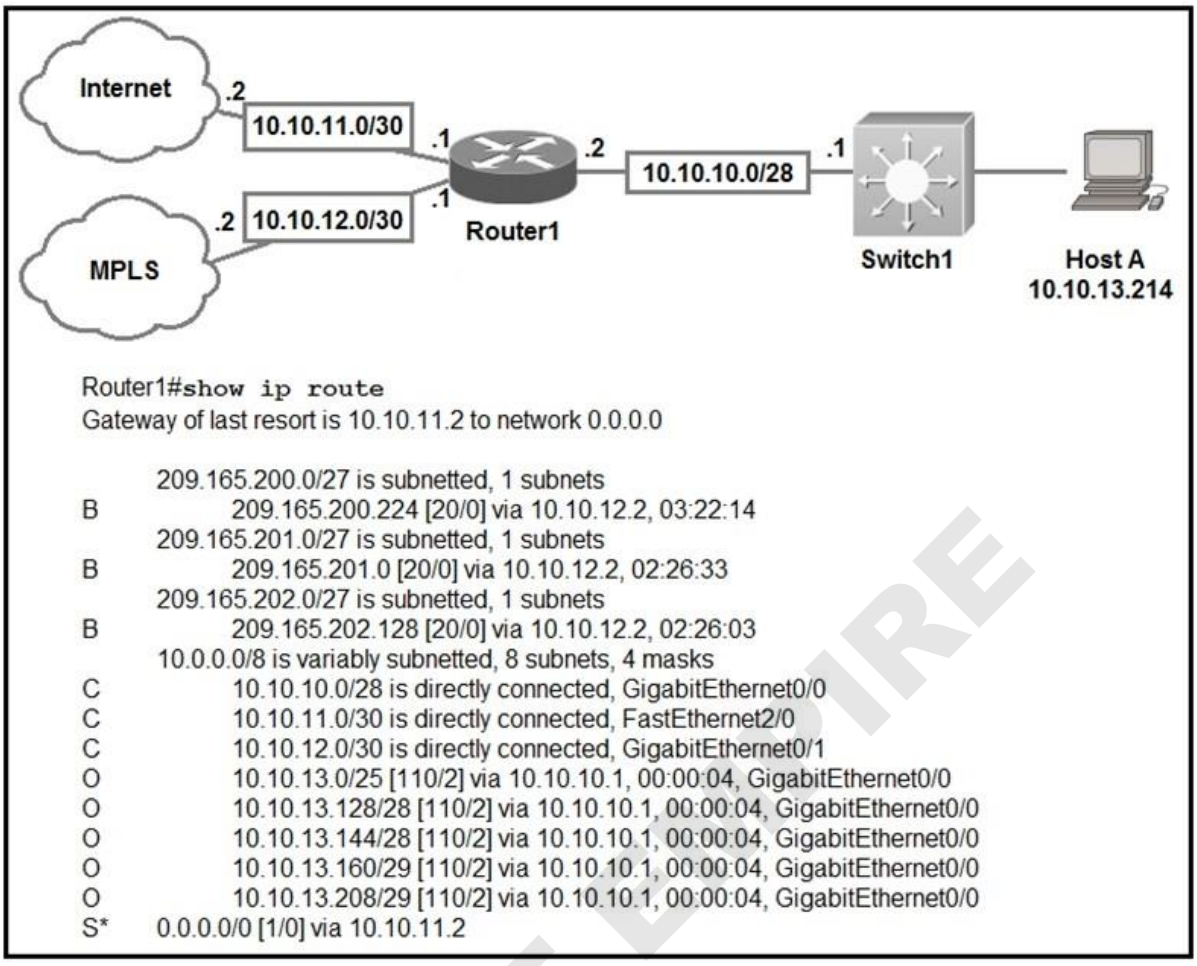

Refer to the exhibit. Which prefix does Router1 use for traffic to Host A?

A. 10.10.10.0/28
B. 10.10.13.0/25
C. 10.10.13.144/28
D. 10.10.13.208/29

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
The prefix with “longest prefix” will be matched first, in this case is “/29”.

QUESTION 3
DRAG DROP

Drag and drop the descriptions of file-transfer protocols from the left onto the correct protocols on the right.

Select and Place:

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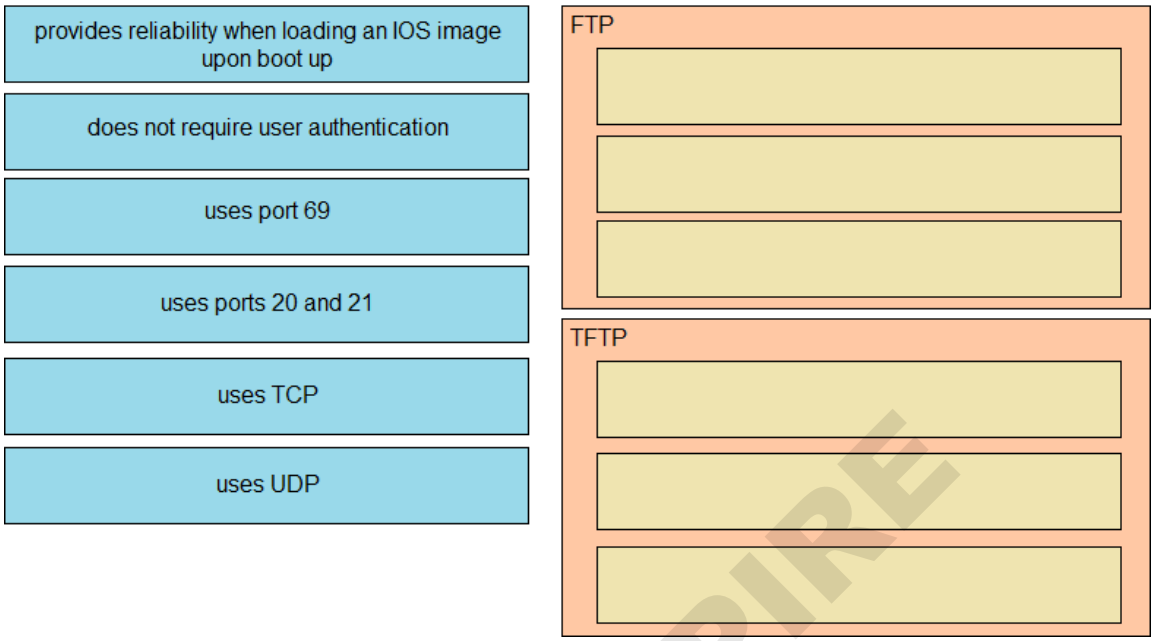
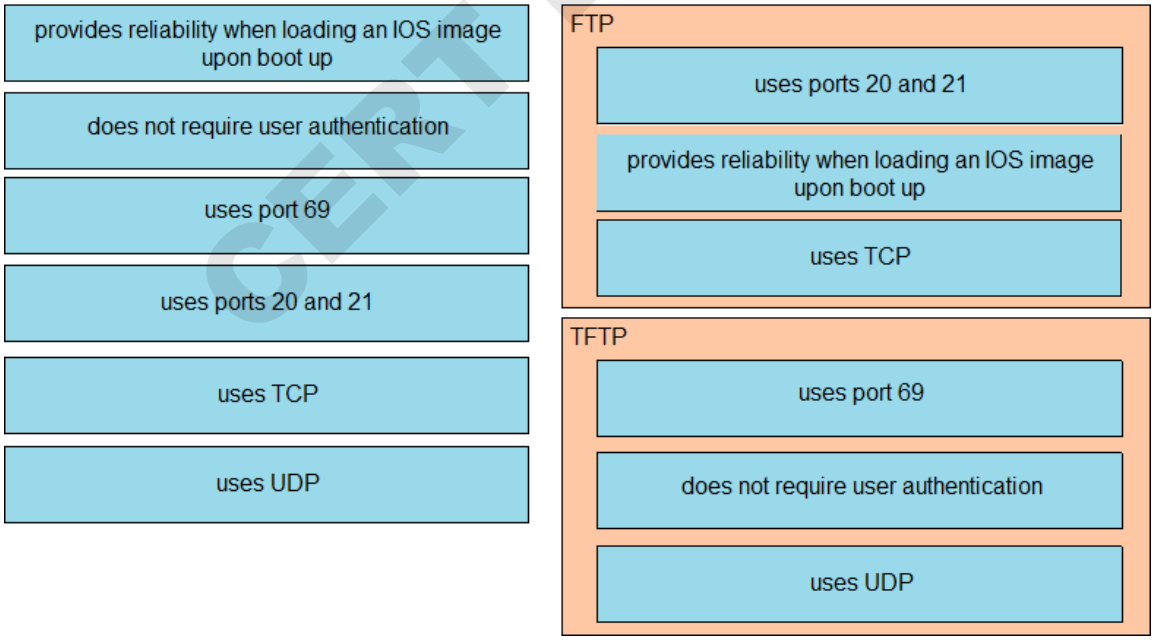
Answer Area



Correct Answer:

Answer Area



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Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 4
A frame that enters a switch fails the Frame Check Sequence. Which two interface counters are incremented? (Choose two.)

A. input errors
B. frame
C. giants
D. CRC
E. runts

Correct Answer: AD
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
Whenever the physical transmission has problems, the receiving device might receive a frame whose bits have changed values. These frames do not pass the error detection logic as implemented in the FCS field in the Ethernet trailer. The receiving device discards the frame and counts it as some kind of input error. Cisco switches list this error as a CRC error. Cyclic redundancy check (CRC) is a term related to how the FCS math detects an error.

The “input errors” includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts.

The output below show the interface counters with the “show interface s0/0/0” command:

```
Router#show interface s0/0/0
Serial0/0/0 is up, line protocol is up
  Hardware is M4T
  Description: Link to R2
  Internet address is 10.1.1.1/30
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  --output omitted--
  5 minute output rate 0 bits/sec, 0 packets/sec
     268 packets input, 24889 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     251 packets output, 23498 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

QUESTION 5
DRAG DROP

Drag and drop the IPv4 network subnets from the left onto the correct usable host ranges on the right.

Select and Place:

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Answer Area

172.28.228.144/18	172.28.228.1 - 172.28.229.254
172.28.228.144/21	172.28.224.1 - 172.28.231.254
172.28.228.144/23	172.28.228.129 - 172.28.228.254
172.28.228.144/25	172.28.228.145 - 172.28.228.150
172.28.228.144/29	172.28.192.1 - 172.28.255.254

Correct Answer:

Answer Area

172.28.228.144/18	172.28.228.144/23
172.28.228.144/21	172.28.228.144/21
172.28.228.144/23	172.28.228.144/25
172.28.228.144/25	172.28.228.144/29
172.28.228.144/29	172.28.228.144/18

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Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:

This subnet question requires us to grasp how to subnet very well. To quickly find out the subnet range, we have to find out the increment and the network address of each subnet. Let's take an example with the subnet 172.28.228.144/18:

From the /18 (= 1100 0000 in the 3rd octet), we find out the increment is 64. Therefore the network address of this subnet must be the greatest multiple of the increment but not greater than the value in the 3rd octet (228). We can find out the 3rd octet of the network address is 192 (because 192 = 64 * 3 and 192 < 228) -> The network address is 172.28.192.0. So the first usable host should be 172.28.192.1 and it matches with the 5th answer on the right. In this case we don't need to calculate the broadcast address because we found the correct answer.

Let's take another example with subnet 172.28.228.144/23 -> The increment is 2 (as /23 = 1111 1110 in 3rd

octet) -> The 3rd octet of the network address is 228 (because 228 is the multiply of 2 and equal to the 3rd octet) -> The network address is 172.28.228.0 -> The first usable host is 172.28.228.1. It is not necessary but if we want to find out the broadcast address of this subnet, we can find out the next network address, which is 172.28.(228 + the increment number).0 or 172.28.230.0 then reduce 1 bit -> 172.28.229.255 is the broadcast address of our subnet. Therefore the last usable host is 172.28.229.254.

QUESTION 6
How do TCP and UDP differ in the way that they establish a connection between two endpoints?

A. TCP uses the three-way handshake, and UDP does not guarantee message delivery.
B. TCP uses synchronization packets, and UDP uses acknowledgment packets.
C. UDP provides reliable message transfer, and TCP is a connectionless protocol.
D. UDP uses SYN, SYN ACK, and FIN bits in the frame header while TCP uses SYN, SYN ACK, and ACK bits.

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 7
Which 802.11 frame type is Association Response?

A. management
B. protected frame
C. action
D. control

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
There are three main types of 802.11 frames: the Data Frame, the Management Frame and the Control Frame. Association Response belongs to Management Frame. Association response is sent in response to an association request.

Reference: https://en.wikipedia.org/wiki/802.11_Frame_Types

QUESTION 8
In which way does a spine-and-leaf architecture allow for scalability in a network when additional access ports are required?

A. A spine switch and a leaf switch can be added with redundant connections between them.
B. A spine switch can be added with at least 40 GB uplinks.
C. A leaf switch can be added with connections to every spine switch.
D. A leaf switch can be added with a single connection to a core spine switch.

Correct Answer: C
Section: Network Fundamentals
Explanation

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Explanation/Reference:
Explanation:
Spine-leaf architecture is typically deployed as two layers: spines (such as an aggregation layer), and leaves (such as an access layer). Spine-leaf topologies provide high-bandwidth, low-latency, nonblocking server-to-server connectivity.

Leaf (aggregation) switches are what provide devices access to the fabric (the network of spine and leaf switches) and are typically deployed at the top of the rack. Generally, devices connect to the leaf switches. Devices can include servers, Layer 4-7 services (firewalls and load balancers), and WAN or Internet routers. Leaf switches do not connect to other leaf switches. In spine-and-leaf architecture, every leaf should connect to every spine in a full mesh.

Spine (aggregation) switches are used to connect to all leaf switches and are typically deployed at the end or middle of the row. Spine switches do not connect to other spine switches.

Reference: https://www.cisco.com/c/en/us/products/collateral/switches/nexus-9000-series-switches/guide-c07-733228.html

QUESTION 9
Which statement identifies the functionality of virtual machines?

A. The hypervisor communicates on Layer 3 without the need for additional resources.
B. Each hypervisor can support a single virtual machine and a single software switch.
C. The hypervisor can virtualize physical components including CPU, memory, and storage.
D. Virtualized servers run most efficiently when they are physically connected to a switch that is separate from the hypervisor.

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 10
Which command automatically generates an IPv6 address from a specified IPv6 prefix and MAC address of an interface?

A. **ipv6 address dhcp**
B. **ipv6 address 2001:DB8:5:112::/64 eui-64**
C. ipv6 address autoconfig
D. ipv6 address 2001:DB8:5:112::2/64 link-local

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
The “ipv6 address autoconfig” command causes the device to perform IPv6 stateless address auto-configuration to discover prefixes on the link and then to add the EUI-64 based addresses to the interface. Addresses are configured depending on the prefixes received in Router Advertisement (RA) messages. The device will listen for RA messages which are transmitted periodically from the router (DHCP Server). This RA message allows a host to create a global IPv6 address from:
- Its interface identifier (EUI-64 address)
- Link Prefix (obtained via RA)

Note: Global address is the combination of Link Prefix and EUI-64 address

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QUESTION 11
When configuring IPv6 on an interface, which two IPv6 multicast groups are joined? (Choose two.)

A. 2000::/3
B. 2002::5
C. FC00::/7
D. FF02::1
E. FF02::2

Correct Answer: DE
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
When an interface is configured with IPv6 address, it automatically joins the all nodes (FF02::1) and solicited-node (FF02::1:FFxx:xxxx) multicast groups. The all-node group is used to communicate with all interfaces on the local link, and the solicited-nodes multicast group is required for link-layer address resolution. Routers also join a third multicast group, the all-routers group (FF02::2).

Reference:
https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ipv6/configuration/xe-3s/ipv6-xe-36s-book/ip6-multicast.html

QUESTION 12
DRAG DROP

```
[root@HostTest ~]# ip route
default via 192.168.1.193 dev eth1  proto static
192.168.1.0/26 dev eth1  proto kernel  scope link src 192.168.1.200  metric 1

[root@HostTime ~]# ip addr show eth1
eth1:  mtu 1500 qdisc pfifo_fast qlen 1000
   link/ether 00:0C:22:83:79:A3 brd ff:ff:ff:ff:ff:ff
   inet 192.168.1.200/26 brd 192.168.1.255 scope global eth1
   inet6 fe80::20c:29ff:fe89:79b3/64 scope link
   valid_lft forever preferred_lft forever
```

Refer to the exhibit. Drag and drop the networking parameters from the left onto the correct values on the right.

Select and Place:

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Answer Area

default gateway	00:0C:22
host IP address	00:0C:22:83:79:A3
NIC MAC address	192.168.1.193
NIC vendor OUI	192.168.1.200
subnet mask	255.255.255.192

Correct Answer:

Answer Area

default gateway	NIC vendor OUI
host IP address	NIC MAC address
NIC MAC address	default gateway
NIC vendor OUI	host IP address
subnet mask	subnet mask

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Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
The “ip route” and “ip addr show eth1” are Linux commands.
- “ip route”: display the routing table
- “ip addr show eth1”: get depth information (only on eth1 interface) about your network interfaces like IP Address, MAC Address information

QUESTION 13
What is the default behavior of a Layer 2 switch when a frame with an unknown destination MAC address is received?

A. The Layer 2 switch forwards the packet and adds the destination MAC address to its MAC address table.
B. The Layer 2 switch sends a copy of a packet to CPU for destination MAC address learning.

C. The Layer 2 switch floods packets to all ports except the receiving port in the given VLAN.
D. The Layer 2 switch drops the received frame.

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
If the destination MAC address is not in the CAM table (unknown destination MAC address), the switch sends the frame out all other ports that are in the same VLAN as the received frame. This is called flooding. It does not flood the frame out the same port on which the frame was received.

QUESTION 14
An engineer must configure a /30 subnet between two routes. Which usable IP address and subnet mask combination meets this criteria?

A. interface e0/0
description to XX-AXXX:XXXXX
ip address 10.2.1.3 255.255.255.252
B. interface e0/0
description to XX-AXXX:XXXXX
ip address 192.168.1.1 255.255.255.248
C. interface e0/0
description to XX-AXXX:XXXXX
ip address 172.16.1.4 255.255.255.248
D. interface e0/0
description to XX-AXXX:XXXXX
ip address 209.165.201.2 225.255.255.252

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

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QUESTION 15
Which network allows devices to communicate without the need to access the Internet?

A. 172.9.0.0/16
B. 172.28.0.0/16
C. 192.0.0.0/8
D. 209.165.201.0/24

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
This question asks about the private ranges of IPv4 addresses. The private ranges of each class of IPv4 are listed below:

Class A private IP address ranges from 10.0.0.0 to 10.255.255.255
Class B private IP address ranges from 172.16.0.0 to 172.31.255.255

Class C private IP address ranges from 192.168.0.0 to 192.168.255.255

Only the network 172.28.0.0/16 belongs to the private IP address (of class B).

QUESTION 16

```
Router(config)#interface GigabitEthernet 1/0/1
Router(config-if)#ip address 192.168.16.143 255.255.255.240
Bad mask /28 for address 192.168.16.143
```

Refer to the exhibit. Which statement explains the configuration error message that is received?

A. It belongs to a private IP address range.
B. The router does not support /28 mask.
C. It is a network IP address.
D. It is a broadcast IP address.

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 17
Which IPv6 address type provides communication between subnets and cannot route on the Internet?

A. link-local
B. unique local
C. multicast
D. global unicast

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
A IPv6 Unique Local Address is an IPv6 address in the block FC00::/7. It is the approximate IPv6 counterpart of the IPv4 private address. It is not routable on the global Internet.

Note: In the past, Site-local addresses (FEC0::/10) are equivalent to private IP addresses in IPv4 but now they are deprecated.

Link-local addresses only used for communications within the local subnet. It is usually created dynamically using a link-local prefix of FE80::/10 and a 64-bit interface identifier (based on 48-bit MAC address).

QUESTION 18
Which IPv6 address block sends packets to a group address rather than a single address?

A. 2000::/3
B. FC00::/7
C. FE80::/10
D. FF00::/8

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Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
FF00::/8 is used for IPv6 multicast and this is the IPv6 type of address the question wants to ask.

FE80::/10 range is used for link-local addresses. Link-local addresses only used for communications within the local subnetwork (automatic address configuration, neighbor discovery, router discovery, and by many routing protocols). It is only valid on the current subnet. It is usually created dynamically using a link-local prefix of FE80::/10 and a 64-bit interface identifier (based on 48-bit MAC address).

QUESTION 19
What are two reasons that cause late collisions to increment on an Ethernet interface? (Choose two.)

A. when Carrier Sense Multiple Access/Collision Detection is used
B. when one side of the connection is configured for half-duplex
C. when the sending device waits 15 seconds before sending the frame again
D. when a collision occurs after the 32nd byte of a frame has been transmitted
E. when the cable length limits are exceeded

Correct Answer: BE
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
A late collision is defined as any collision that occurs after the first 512 bits (or 64th byte) of the frame have been transmitted. The usual possible causes are full-duplex/half-duplex mismatch, exceeded Ethernet cable length limits, or defective hardware such as incorrect cabling, non-compliant number of hubs in the network, or a bad NIC.

Late collisions should never occur in a properly designed Ethernet network. They usually occur when Ethernet cables are too long or when there are too many repeaters in the network.

Reference: https://www.cisco.com/en/US/docs/internetworking/troubleshooting/guide/tr1904.html

QUESTION 20
What is a benefit of using a Cisco Wireless LAN Controller?

A. It eliminates the need to configure each access point individually.
B. Central AP management requires more complex configurations.
C. Unique SSIDs cannot use the same authentication method.
D. It supports autonomous and lightweight APs.

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 21
Which action is taken by switch port enabled for PoE power classification override?

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A. If a monitored port exceeds the maximum administrative value for power, the port is shutdown and err-disabled.
B. When a powered device begins drawing power from a PoE switch port, a syslog message is generated.
C. As power usage on a PoE switch port is checked, data flow to the connected device is temporarily paused.
D. If a switch determines that a device is using less than the minimum configured power, it assumes the device has failed and disconnects it.

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
PoE monitoring and policing compares the power consumption on ports with the administrative maximum value (either a configured maximum value or the port's default value). If the power consumption on a monitored port exceeds the administrative maximum value, the following actions occur:
- A syslog message is issued.
- The monitored port is shut down and error-disabled.
- The allocated power is freed.

Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst6500/ios/12-2SX/configuration/guide/book/power_over_ethernet.pdf

QUESTION 22
What occurs to frames during the process of frame flooding?

A. Frames are sent to all ports, including those that are assigned to other VLANs.
B. Frames are sent to every port on the switch that has a matching entry in MAC address table.
C. Frames are sent to every port on the switch in the same VLAN except from the originating port.
D. Frames are sent to every port on the switch in the same VLAN.

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 23
Which function does the range of private IPv4 addresses perform?

A. allows multiple companies to each use the same addresses without conflicts
B. provides a direct connection for hosts from outside of the enterprise network
C. ensures that NAT is not required to reach the Internet with private range addressing
D. enables secure communications to the Internet for all external hosts

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 24

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Which action must be taken to assign a global unicast IPv6 address on an interface that is derived from the MAC address of that interface?

A. explicitly assign a link-local address
B. disable the EUI-64 bit process
C. enable SLAAC on an interface
D. configure a stateful DHCPv6 server on the network

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 25
Several new coverage cells are required to improve the Wi-Fi network of an organization. Which two standard designs are recommended? (Choose two.)

A. 5GHz provides increased network capacity with up to 23 nonoverlapping channels.
B. 5GHz channel selection requires an autonomous access point.
C. Cells that overlap one another are configured to use nonoverlapping channels.
D. Adjacent cells with overlapping channels use a repeater access point.
E. For maximum throughput, the WLC is configured to dynamically set adjacent access points to the channel.

Correct Answer: CE
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 26
How do TCP and UDP differ in the way they provide reliability for delivery of packets?

A. TCP does not guarantee delivery or error checking to ensure that there is no corruption of data, UDP provides message acknowledgement and retransmits data if lost.
B. TCP provides flow control to avoid overwhelming a receiver by sending too many packets at once, UDP sends packets to the receiver in a continuous stream without checking.
C. TCP is a connectionless protocol that does not provide reliable delivery of data; UDP is a connection-oriented protocol that uses sequencing to provide reliable delivery.
D. TCP uses windowing to deliver packets reliably; UDP provides reliable message transfer between hosts by establishing a three-way handshake.

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 27
What are two differences between optical-fiber cabling and copper cabling? (Choose two.)

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A. A BNC connector is used for fiber connections
B. The glass core component is encased in a cladding
C. The data can pass through the cladding
D. Light is transmitted through the core of the fiber
E. Fiber connects to physical interfaces using RJ-45 connections

Correct Answer: BD
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 28
How does CAPWAP communicate between an access point in local mode and a WLC?

A. The access point must not be connected to the wired network, as it would create a loop
B. The access point must be connected to the same switch as the WLC
C. The access point must directly connect to the WLC using a copper cable
D. The access point has the ability to link to any switch in the network, assuming connectivity to the WLC

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 29
Which IPv6 address block forwards packets to a multicast address rather than a unicast address?

A. 2000::/3
B. FC00::/7
C. FE80::/10
D. FF00::/12

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 30
What is the difference regarding reliability and communication type between TCP and UDP?

A. TCP is reliable and is a connectionless protocol; UDP is not reliable and is a connection-oriented protocol.
B. TCP is not reliable and is a connectionless protocol; UDP is reliable and is a connection-oriented protocol.
C. TCP is not reliable and is a connection-oriented protocol; UDP is reliable and is a connectionless protocol.
D. TCP is reliable and is a connection-oriented protocol; UDP is not reliable and is a connectionless protocol.

Correct Answer: D
Section: Network Fundamentals
Explanation

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Explanation/Reference:

QUESTION 31
What are two descriptions of three-tier network topologies? (Choose two.)

A. The distribution layer runs Layer 2 and Layer 3 technologies
B. The network core is designed to maintain continuous connectivity when devices fail
C. The access layer manages routing between devices in different domains
D. The core layer maintains wired connections for each host
E. The core and distribution layers perform the same functions

Correct Answer: AB
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 32
Which type of IPv6 address is publicly routable in the same way as IPv4 public addresses?

A. multicast
B. unique local
C. link-local
D. global unicast

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 33
What is the expected outcome when an EUI-64 address is generated?

A. The interface ID is configured as a random 64-bit value
B. The characters FE80 are inserted at the beginning of the MAC address of the interface
C. The seventh bit of the original MAC address of the interface is inverted
D. The MAC address of the interface is used as the interface ID without modification

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 34
A corporate office uses four floors in a building.
- Floor 1 has 24 users.
- Floor 2 has 29 users.
- Floor 3 has 28 users.

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- Floor 4 has 22 users.

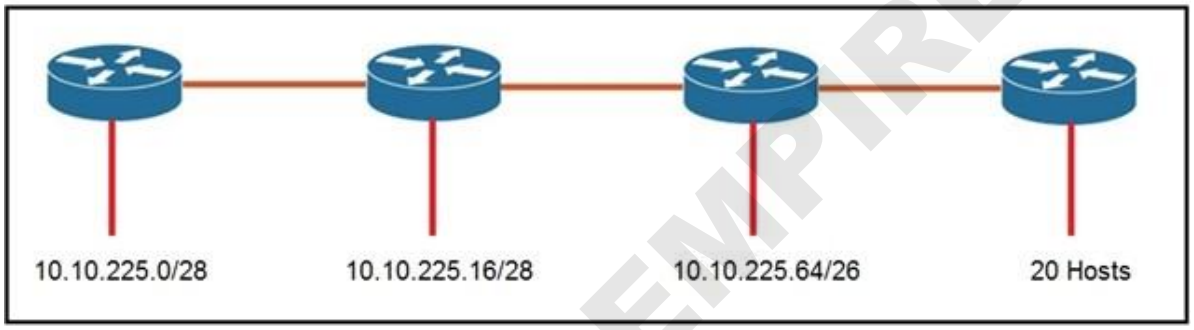
Which subnet summarizes and gives the most efficient distribution of IP addresses for the router configuration?

A. 192.168.0.0/24 as summary and 192.168.0.0/28 for each floor
B. 192.168.0.0/23 as summary and 192.168.0.0/25 for each floor
C. 192.168.0.0/25 as summary and 192.168.0.0/27 for each floor
D. 192.168.0.0/26 as summary and 192.168.0.0/29 for each floor

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 35



Refer to the exhibit. An engineer must add a subnet for a new office that will add 20 users to the network. Which IPv4 network and subnet mask combination does the engineer assign to minimize wasting addresses?

A. 10.10.225.48 255.255.255.240
B. 10.10.225.32 255.255.255.240
C. 10.10.225.48 255.255.255.224
D. 10.10.225.32 255.255.255.224

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 36
What is a characteristic of spine-and-leaf architecture?

A. Each link between leaf switches allows for higher bandwidth.
B. It provides greater predictability on STP blocked ports.
C. It provides variable latency.
D. Each device is separated by the same number of hops.

Correct Answer: D
Section: Network Fundamentals

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Explanation

Explanation/Reference:

QUESTION 37
An office has 8 floors with approximately 30-40 users per floor. What command must be configured on the router Switched Virtual Interface to use address space efficiently?

A. **ip address 192.168.0.0 255.255.0.0**
B. **ip address 192.168.0.0 255.255.254.0**
C. **ip address 192.168.0.0 255.255.255.128**
D. **ip address 192.168.0.0 255.255.255.224**

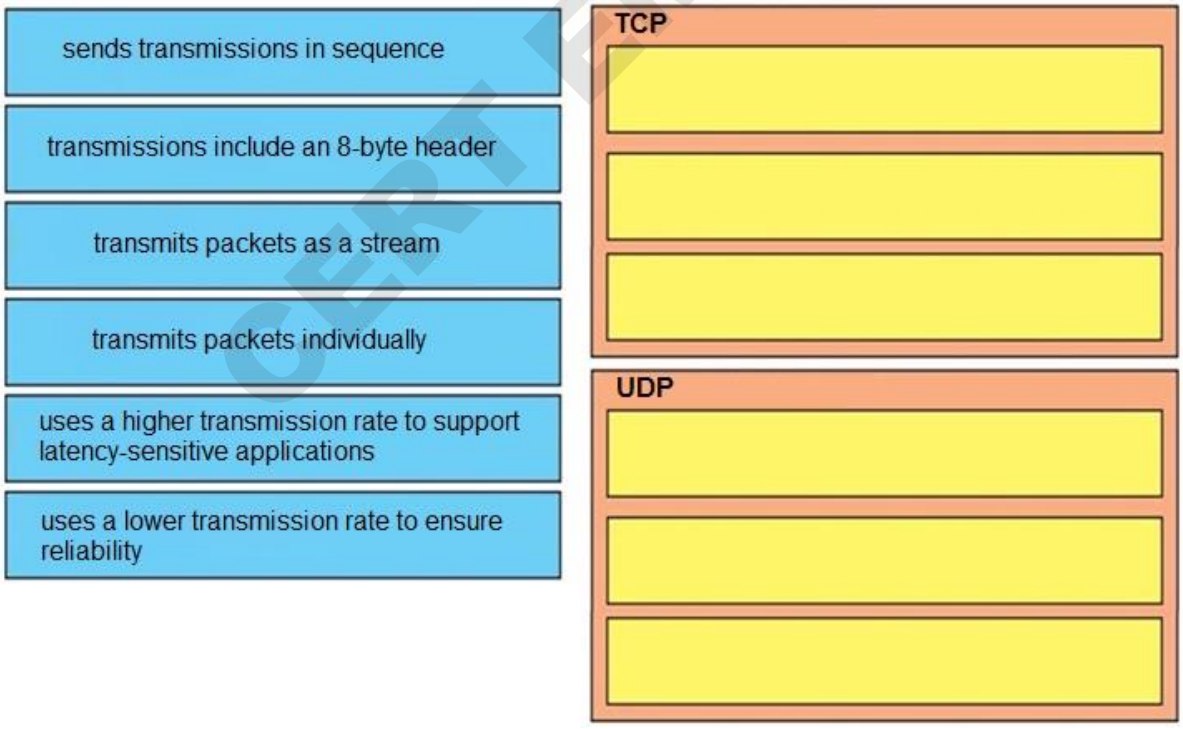
Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 38
DRAG DROP

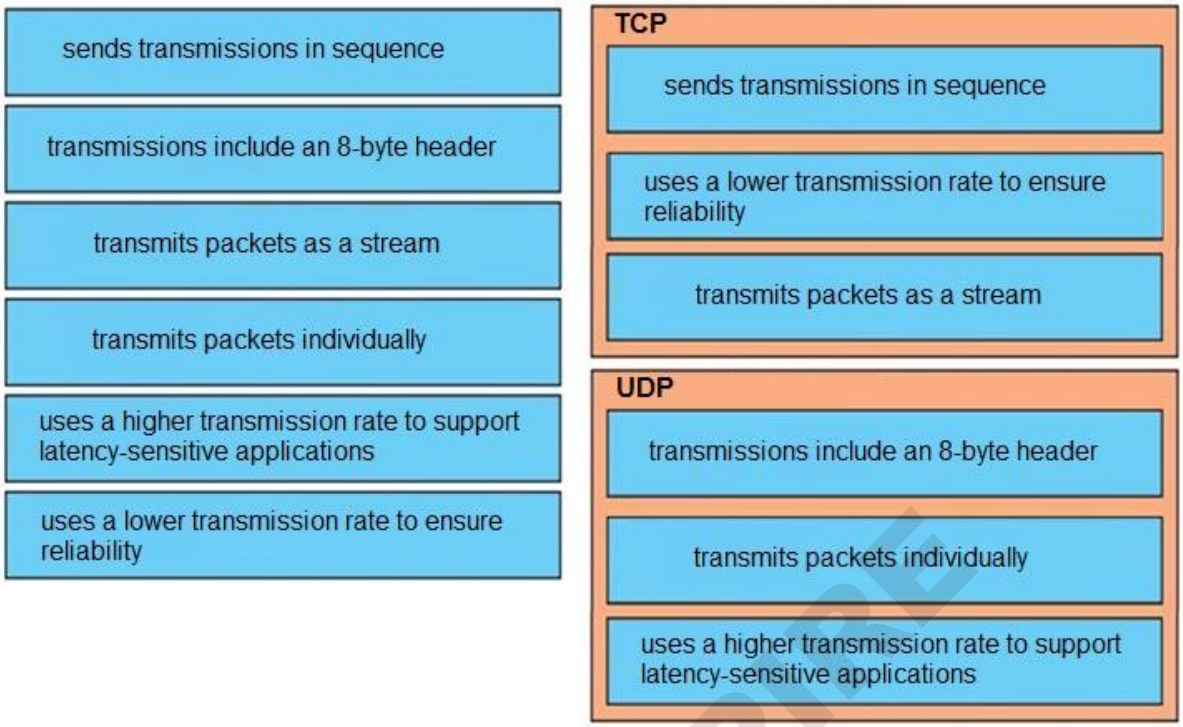
Drag and drop the descriptions of IP protocol transmissions from the left onto the IP traffic types on the right.

Select and Place:



Correct Answer:

CERT EMPIRE



Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 39
A device detects two stations transmitting frames at the same time. This condition occurs after the first 64 bytes of the frame is received. Which interface counter increments?

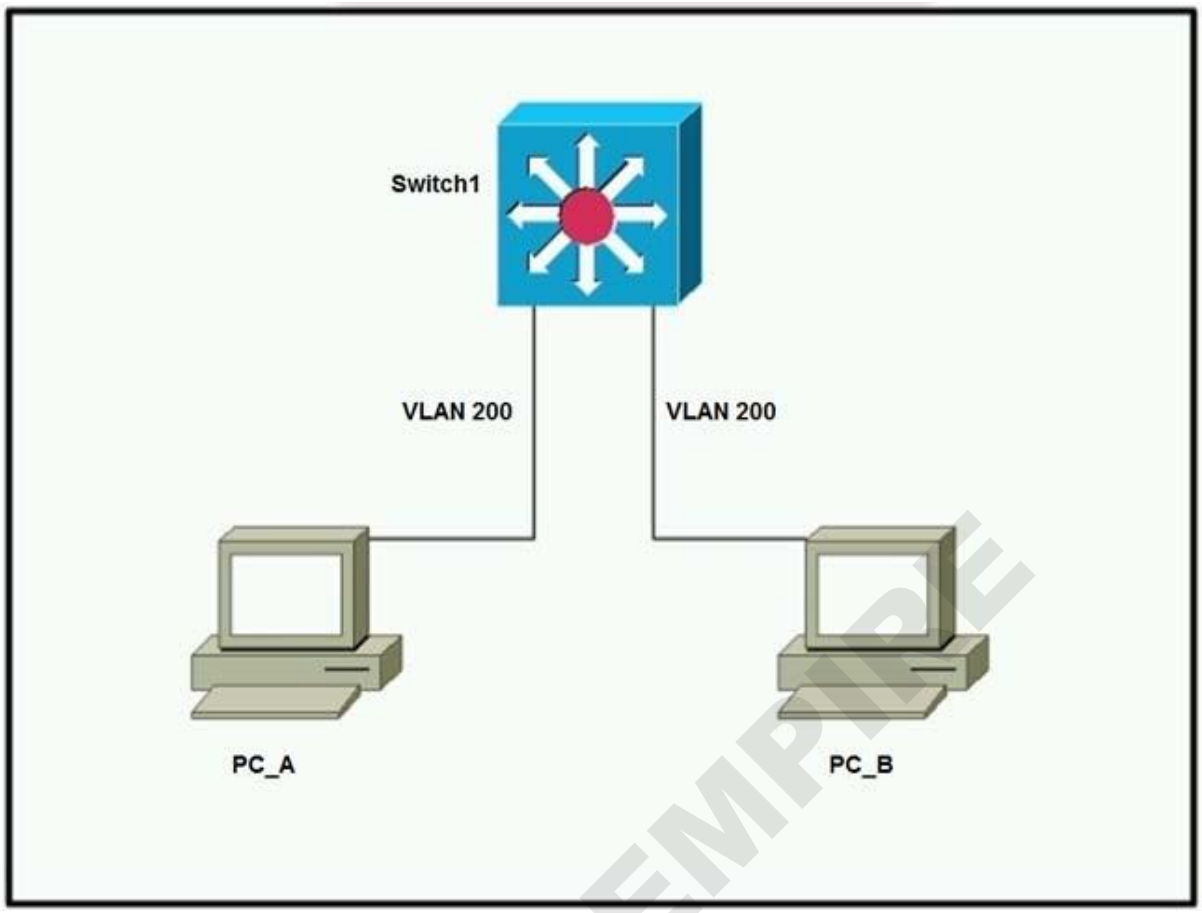
A. runt
B. collision
C. late collision
D. CRC

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 40

CERT EMPIRE



Refer to the exhibit. Which outcome is expected when PC_A sends data to PC_B?

A. The source MAC address is changed.
B. The destination MAC address is replaced with ffff.ffff.ffff.
C. The source and destination MAC addresses remain the same.
D. The switch rewrites the source and destination MAC addresses with its own.

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 41
Using direct sequence spread spectrum, which three 2.4-GHz channels are used to limit collisions?

A. 5, 6, 7
B. 1, 2, 3
C. 1, 6, 11
D. 1, 5, 10

Correct Answer: C
Section: Network Fundamentals
Explanation

CERT EMPIRE

Explanation/Reference:

QUESTION 42
How do TCP and UDP differ in the way they guarantee packet delivery?

A. TCP uses retransmissions, acknowledgment, and parity checks, and UDP uses cyclic redundancy checks only
B. TCP uses two-dimensional parity checks, checksums, and cyclic redundancy checks, and UDP uses retransmissions only
C. TCP uses checksum, acknowledgements, and retransmissions, and UDP uses checksums only
D. TCP uses checksum, parity checks, and retransmissions, and UDP uses acknowledgements only

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 43
A wireless administrator has configured a WLAN; however, the clients need access to a less congested 5-GHz network for their voice quality. What action must be taken to meet the requirement?

A. enable Band Select
B. enable DTIM
C. enable RX-SOP
D. enable AAA override

Correct Answer: A
Section: Network Fundamentals
Explanation

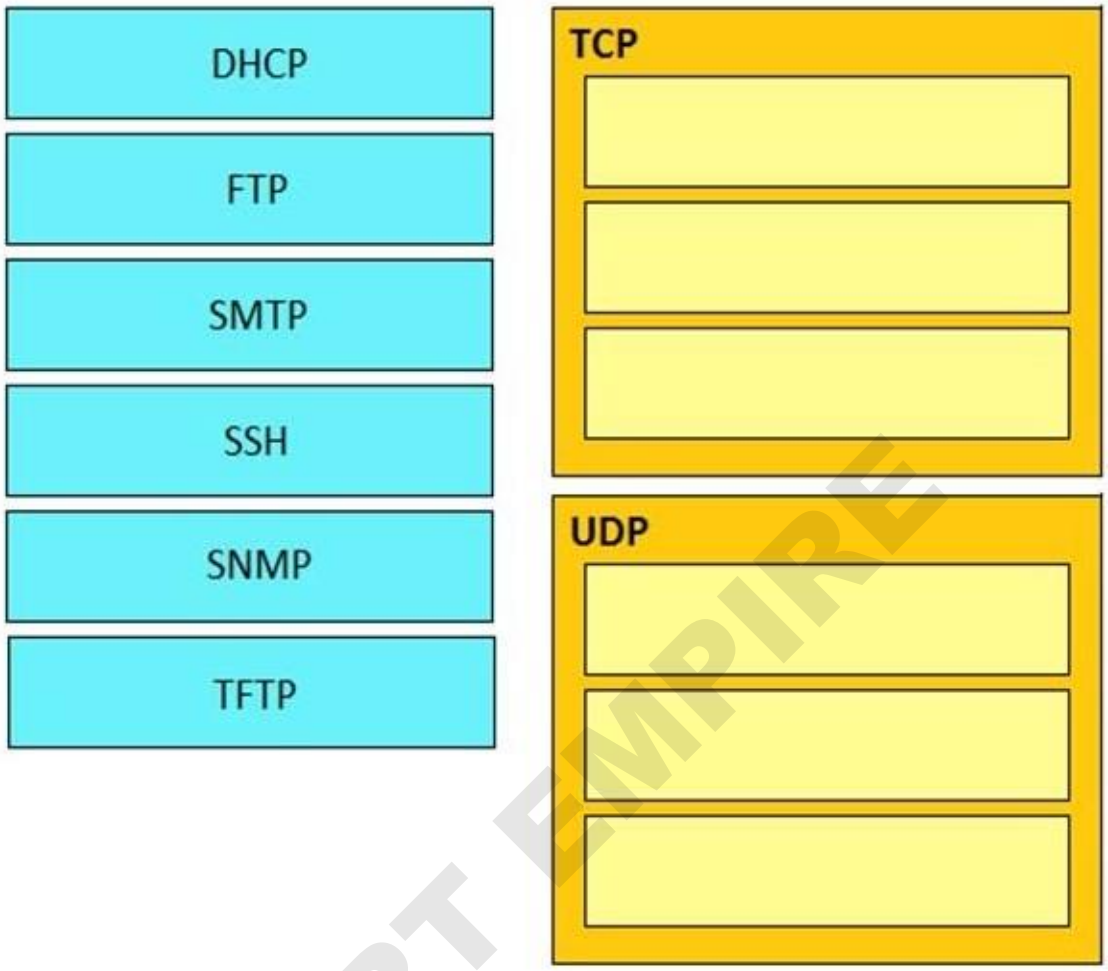
Explanation/Reference:

QUESTION 44
DRAG DROP

Drag and drop the application protocols from the left onto the transport protocols that is uses on the right.

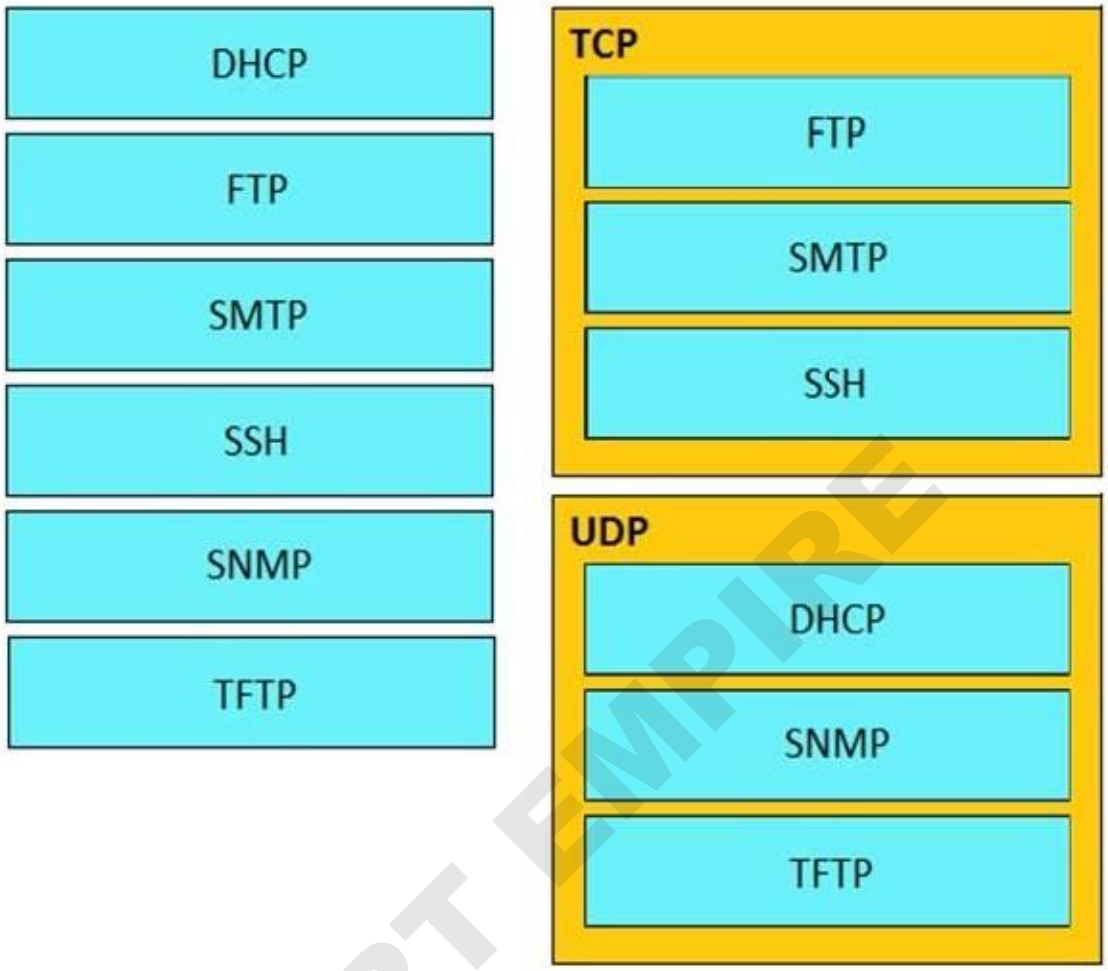
Select and Place:

CERT EMPIRE



CERT EMPIRE

Correct Answer:



CERT EMPIRE

Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 45
What is the destination MAC address of a broadcast frame?

A. 00:00:0c:07:ac:01
B. ff:ff:ff:ff:ff:ff
C. 43:2e:08:00:00:0c
D. 00:00:0c:43:2e:08
E. 00:00:0c:ff:ff:ff

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 46
For what two purposes does the Ethernet protocol use physical addresses?

A. to uniquely identify devices at Layer 2
B. to allow communication with devices on a different network
C. to differentiate a Layer 2 frame from a Layer 3 packet
D. to establish a priority system to determine which device gets to transmit first
E. to allow communication between different devices on the same network
F. to allow detection of a remote device when its physical address is unknown

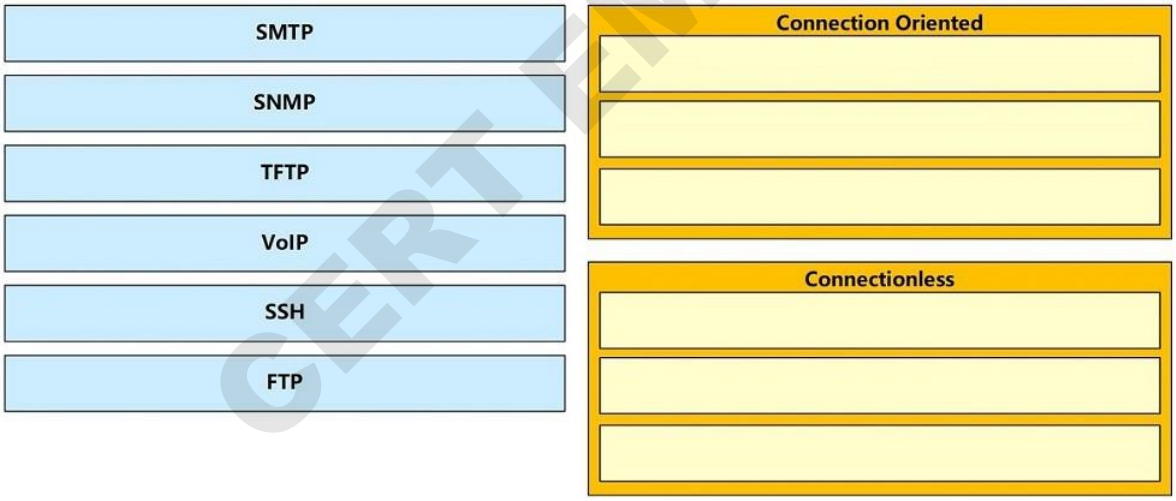
Correct Answer: AE
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 47
DRAG DROP

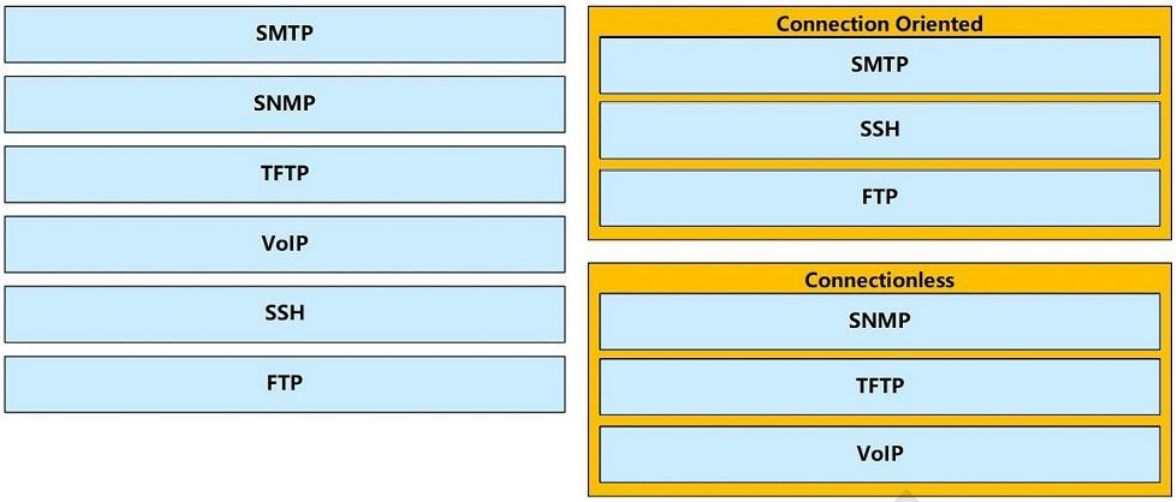
Drag and drop the networking parameters from the left on to the correct values on the right.

Select and Place:



Correct Answer:

CERT EMPIRE



Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
SSH uses TCP port 22 while SNMP uses UDP port 161 and 162.

QUESTION 48
Which component of an Ethernet frame is used to notify a host that traffic is coming?

A. start of frame delimiter
B. Type field
C. preamble
D. Data field

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
Preamble is a 7 Byte field in the Ethernet frame which helps to receiver to know that it is an actual data (Ethernet Frame) and not some random noise in the transmission medium. It acts like a doorbell telling about the incoming data.

QUESTION 49
You are configuring your edge routers interface with a public IP address for Internet connectivity. The router needs to obtain the IP address from the service provider dynamically.
Which command is needed on interface FastEthernet 0/0 to accomplish this?

A. ip default-gateway
B. ip route
C. ip default-network
D. ip address dhcp
E. ip address dynamic

Correct Answer: D
Section: Network Fundamentals

CERT EMPIRE

Explanation

Explanation/Reference:

QUESTION 50
Which two statements about the purpose of the OSI model are accurate? (Choose two.)

A. Defines the network functions that occur at each layer
B. Facilitates an understanding of how information travels throughout a network
C. Changes in one layer do not impact other layer
D. Ensures reliable data delivery through its layered approach

Correct Answer: AB
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 51
Which three statements about MAC addresses are correct? (Choose three.)

A. To communicate with other devices on a network, a network device must have a unique MAC address
B. The MAC address is also referred to as the IP address
C. The MAC address of a device must be configured in the Cisco IOS CLI by a user with administrative privileges
D. A MAC address contains two main components, the first of which identifies the manufacturer of the hardware and the second of which uniquely identifies the hardware
E. An example of a MAC address is 0A:26:B8:D6:65:90
F. A MAC address contains two main components, the first of which identifies the network on which the host resides and the second of which uniquely identifies the host on the network

Correct Answer: ADE
Section: Network Fundamentals
Explanation

Explanation/Reference:

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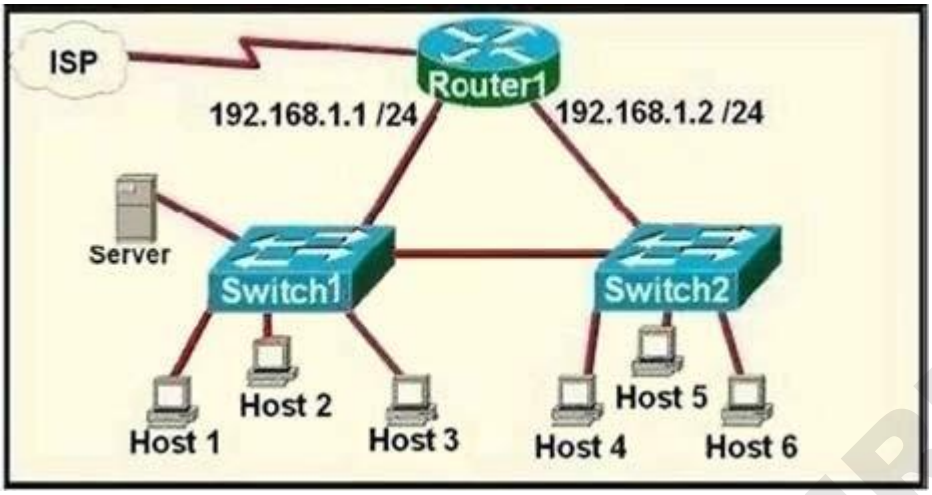
QUESTION 52
Which technique can you use to route IPv6 traffic over an IPv4 infrastructure?

A. NAT
B. 6 to 4 tunneling
C. L2TPv3
D. dual-stack

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 53
Refer to the exhibit. A network technician is asked to design a small network with redundancy. The exhibit represents this design, with all hosts configured in the same VLAN. What conclusions can be made about this design?



A. This design will function as intended.
B. Spanning-tree will need to be used.
C. The router will not accept the addressing scheme.
D. The connection between switches should be a trunk.
E. The router interfaces must be encapsulated with the 802.1Q protocol.

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
Each interface on a router must be in a different network. If two interfaces are in the same network, the router will not accept it and show error when the administrator assigns it.

QUESTION 54
Which two statements are true about the command ip route 172.16.3.0 255.255.255.0 192.168.2.4? (Choose two.)

A. It establishes a static route to the 172.16.3.0 network.
B. It establishes a static route to the 192.168.2.0 network.
C. It configures the router to send any traffic for an unknown destination to the 172.16.3.0 network.
D. It configures the router to send any traffic for an unknown destination out the interface with the address 192.168.2.4.
E. It uses the default administrative distance.
F. It is a route that would be used last if other routes to the same destination exist.

Correct Answer: AE
Section: Network Fundamentals
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 55
What are two benefits of private IPv4 IP addresses? (Choose two.)

A. They are routed the same as public IP addresses.
B. They are less costly than public IP addresses.
C. They can be assigned to devices without Internet connections.
D. They eliminate the necessity for NAT policies.
E. They eliminate duplicate IP conflicts.

Correct Answer: BC
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 56
What are two benefits that the UDP protocol provide for application traffic? (Choose two.)

A. UDP traffic has lower overhead than TCP traffic
B. UDP provides a built-in recovery mechanism to retransmit lost packets
C. The CTL field in the UDP packet header enables a three-way handshake to establish the connection
D. UDP maintains the connection state to provide more stable connections than TCP
E. The application can use checksums to verify the integrity of application data

Correct Answer: AE
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 57
Which two goals reasons to implement private IPv4 addressing on your network? (Choose two.)

A. Comply with PCI regulations
B. Conserve IPv4 address
C. Reduce the size of the forwarding table on network routers
D. Reduce the risk of a network security breach
E. Comply with local law

Correct Answer: BD
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 58
Which WAN access technology is preferred for a small office / home office architecture?

A. broadband cable access

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B. frame-relay packet switching
C. dedicated point-to-point leased line
D. Integrated Services Digital Network switching

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 59
Which two WAN architecture options help a business scalability and reliability for the network? (Choose two.)

A. asychronous routing
B. single-homed branches
C. dual-homed branches
D. static routing
E. dynamic routing

Correct Answer: AC
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 60
What is the binary pattern of unique ipv6 unique local address?

A. 00000000
B. 11111100
C. 11111111
D. 11111101

Correct Answer: B
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
A IPv6 Unique Local Address is an IPv6 address in the block FC00::/7, which means that IPv6 Unique Local addresses begin with 7 bits with exact binary pattern as 1111 110 -> Answer B is correct.
Note: IPv6 Unique Local Address is the approximate IPv6 counterpart of the IPv4 private address. It is not routable on the global Internet.

QUESTION 61
Which two options are the best reasons to use an IPV4 private IP space? (Choose two.)

A. to enable intra-enterprise communication
B. to implement NAT
C. to connect applications
D. to conserve global address space
E. to manage routing overhead

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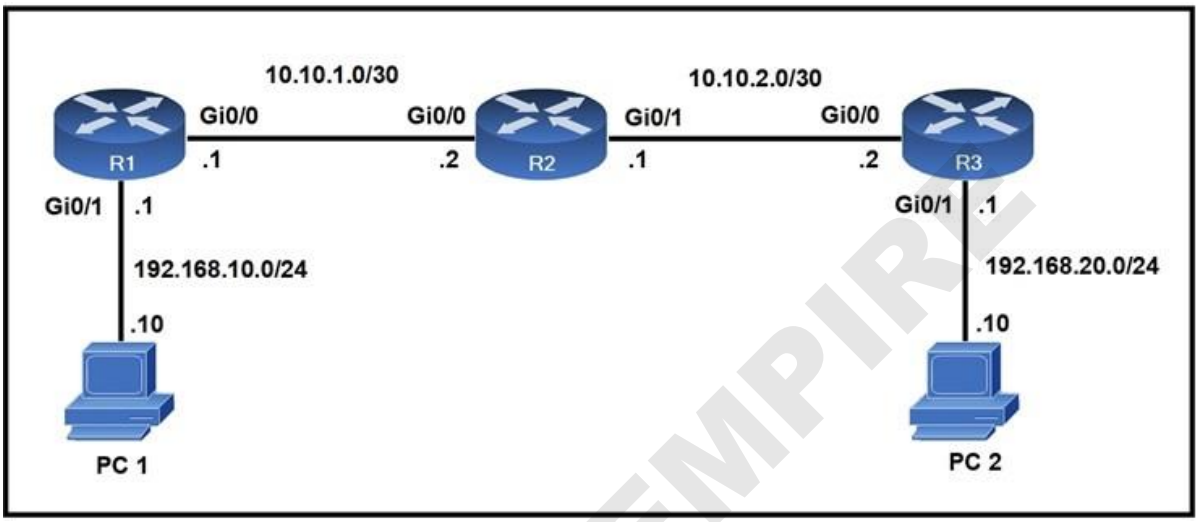
Correct Answer: AD
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 62
Refer to the exhibit. When PC1 sends a packet to PC2, the packet has which source and destination IP address when it arrives at interface Gi0/0 on router R2?



A. source 192.168.10.10 and destination 10.10.2.2
B. source 192.168.20.10 and destination 192.168.20.1
C. source 192.168.10.10 and destination 192.168.20.10
D. source 10.10.1.1 and destination 10.10.2.2

Correct Answer: C
Section: Network Fundamentals
Explanation

Explanation/Reference:
Explanation:
The source and destination IP addresses of the packets are unchanged on all the way. Only source and destination MAC addresses are changed.

QUESTION 63
What is the same for both copper and fiber interfaces when using SFP modules?

A. They support an inline optical attenuator to enhance signal strength
B. They accommodate single-mode and multi-mode in a single module
C. They provide minimal interruption to services by being hot-swappable
D. They offer reliable bandwidth up to 100 Mbps in half duplex mode

Correct Answer: C
Section: Network Fundamentals
Explanation

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Explanation/Reference:

QUESTION 64
What are two functions of a server on a network? (Choose two.)

A. handles requests from multiple workstations at the same time
B. achieves redundancy by exclusively using virtual server clustering
C. housed solely in a data center that is dedicated to a single client
D. runs the same operating system in order to communicate with other servers
E. runs applications that send and retrieve data for workstations that make requests

Correct Answer: AE
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 65
Which function is performed by the collapsed core layer in a two-tier architecture?

A. enforcing routing policies
B. marking interesting traffic for data policies
C. applying security policies
D. attaching users to the edge of the network

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 66
What is the primary function of a Layer 3 device?

A. to transmit wireless traffic between hosts
B. to analyze traffic and drop unauthorized traffic from the Internet
C. to forward traffic within the same broadcast domain
D. to pass traffic between different networks

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 67
Which two functions are performed by the core layer in a three-tier architecture? (Choose two.)

A. Provide uninterrupted forwarding service
B. Inspect packets for malicious activity
C. Ensure timely data transfer between layers

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D. Provide direct connectivity for end user devices
E. Police traffic that is sent to the edge of the network

Correct Answer: AC
Section: Network Fundamentals
Explanation

Explanation/Reference:
Reference: https://www.mcmcse.com/cisco/guides/hierarchical_model.shtml

QUESTION 68
What is a recommended approach to avoid co-channel congestion while installing access points that use the 2.4 GHz frequency?

A. different nonoverlapping channels
B. one overlapping channel
C. one nonoverlapping channel
D. different overlapping channels

Correct Answer: A
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 69
A manager asks a network engineer to advise which cloud service models are used so employees do not have to waste their time installing, managing, and updating software that is only used occasionally. Which cloud service model does the engineer recommend?

A. infrastructure-as-a-service
B. platform-as-a-service
C. business process as service to support different types of service
D. software-as-a-service

Correct Answer: D
Section: Network Fundamentals
Explanation

Explanation/Reference:

QUESTION 70
What are two functions of a Layer 2 switch? (Choose two.)

A. acts as a central point for association and authentication servers
B. selects the best route between networks on a WAN
C. moves packets within a VLAN
D. moves packets between different VLANs
E. makes forwarding decisions based on the MAC address of a packet

Correct Answer: CE
Section: Network Fundamentals
Explanation

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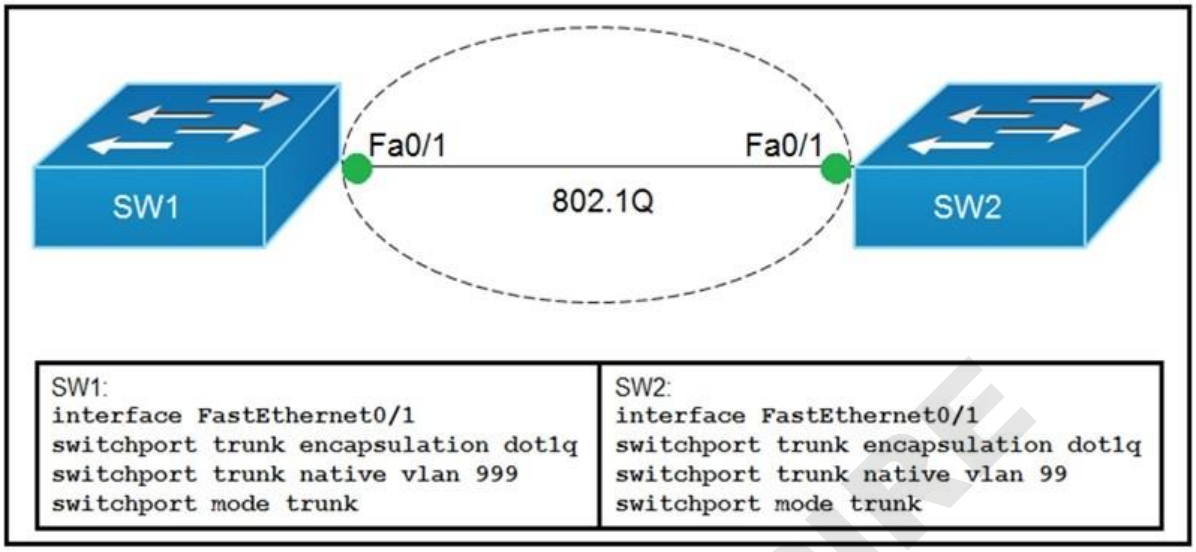
Explanation/Reference:

QUESTION 71



Refer to the exhibit. Which action do the switches take on the trunk link?

A. The trunk does not form, and the ports go into an err-disabled status.
B. The trunk forms, but the mismatched native VLANs are merged into a single broadcast domain.
C. The trunk forms, but VLAN 99 and VLAN 999 are in a shutdown state.
D. The trunk does not form, but VLAN 99 and VLAN 999 are allowed to traverse the link.

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
The trunk still forms with mismatched native VLANs and the traffic can actually flow between mismatched switches. But it is absolutely necessary that the native VLANs on both ends of a trunk link match; otherwise a native VLAN mismatch occurs, causing the two VLANs to effectively merge. For example with the above configuration, SW1 would send untagged frames for VLAN 999. SW2 receives them but would think they are for VLAN 99 so we can say these two VLANs are merged.

QUESTION 72
What is the primary effect of the **spanning-tree portfast** command?

A. It immediately enables the port in the listening state.
B. It immediately puts the port into the forwarding state when the switch is reloaded.
C. It enables BPDU messages.
D. It minimizes spanning-tree convergence time.

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3560/software/release/12-2_55_se/configuration/guide/3560_scg/swstpopt.html

QUESTION 73
Which result occurs when PortFast is enabled on an interface that is connected to another switch?

A. Root port choice and spanning tree recalculation are accelerated when a switch link goes down.
B. After spanning tree converges, PortFast shuts down any port that receives BPDUs.
C. VTP is allowed to propagate VLAN configuration information from switch to switch automatically.
D. Spanning tree may fail to detect a switching loop in the network that causes broadcast storms.

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Enabling the PortFast feature causes a switch or a trunk port to enter the STP forwarding-state immediately or upon a linkup event, thus bypassing the listening and learning states.

Note: To enable portfast on a trunk port you need the trunk keyword “spanning-tree portfast trunk“

QUESTION 74
Which QoS Profile is selected in the GUI when configuring a voice over WLAN deployment?

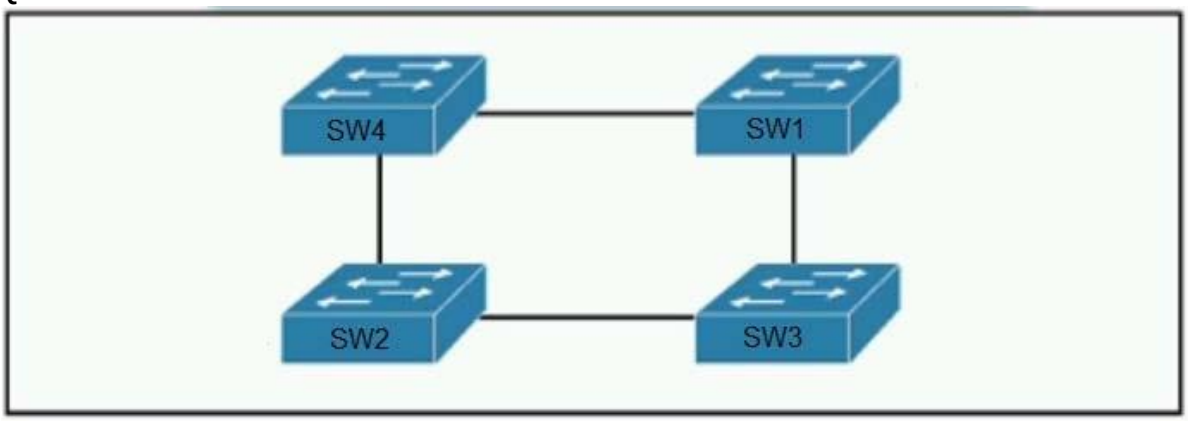
A. Platinum
B. Bronze
C. Gold
D. Silver

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Cisco Unified Wireless Network solution WLANs support four levels of QoS: Platinum/Voice, Gold/Video, Silver/Best Effort (default), and Bronze/Background.

Reference: https://www.cisco.com/c/en/us/td/docs/wireless/controller/7-4/configuration/guides/consolidated/b_cg74_CONSOLIDATED/b_cg74_CONSOLIDATED_chapter_01010111.html

QUESTION 75



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Refer to the exhibit. Which switch in this configuration will be elected as the root bridge?

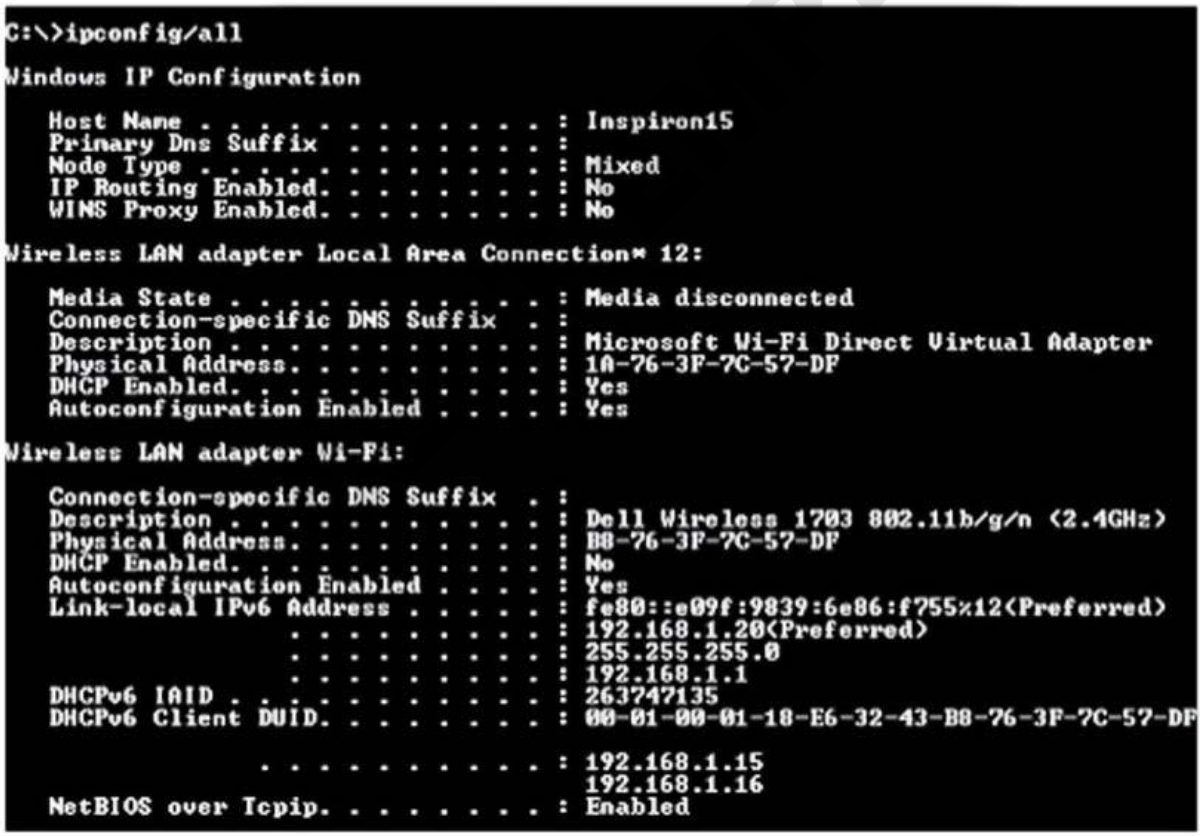
SW1: 0C:E0:38:41:86:07
SW2: 0C:0E:15:22:05:97
SW3: 0C:0E:15:1A:3C:9D
SW4: 0C:E0:18:A1:B3:19

A. SW1
B. SW2
C. SW3
D. SW4

Correct Answer: C
Section: Network Access
Explanation

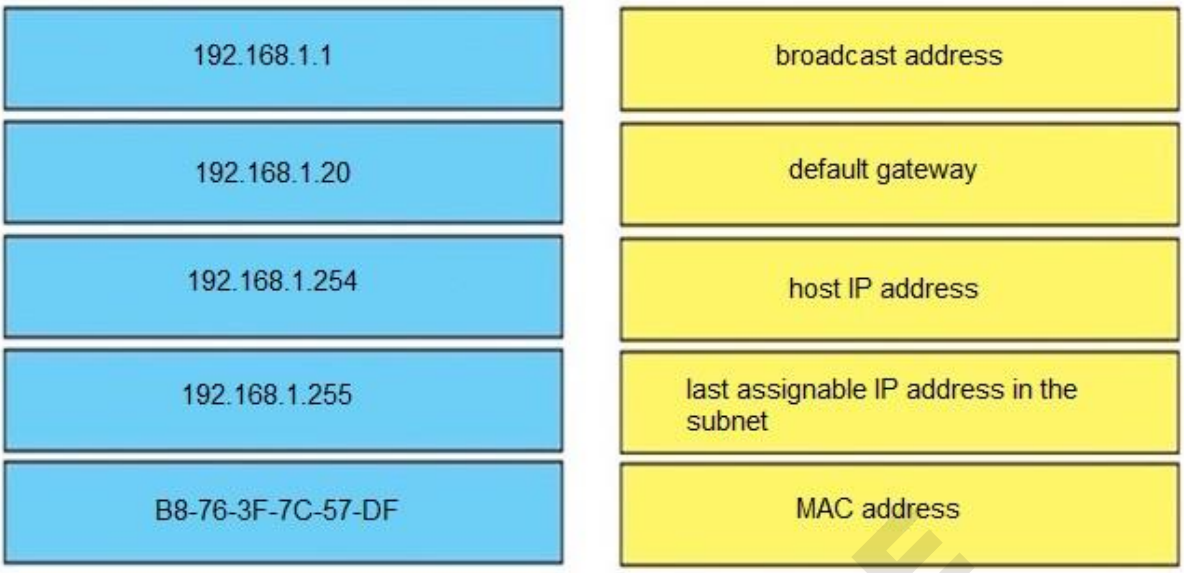
Explanation/Reference:

QUESTION 76
DRAG DROP



Refer to the exhibit. An engineer is tasked with verifying network configuration parameters on a client workstation to report back to the team lead. Drag and drop the node identifiers from the left onto the network parameters on the right.

Select and Place:



Correct Answer:



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Section: Network Access
Explanation

Explanation/Reference:

QUESTION 77
An engineer needs to configure LLDP to send the port description time length value (TLV). Which command sequence must be implemented?

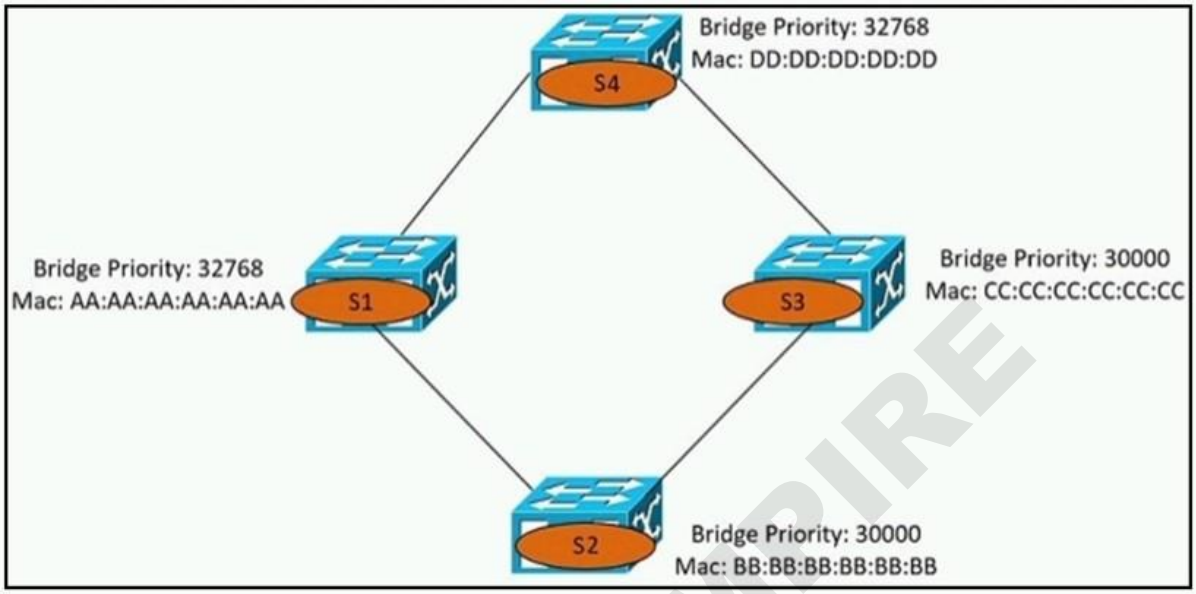
A. switch(config-if)#**lldp port-description**
B. switch#**lldp port-description**
C. switch(config-line)#**lldp port-description**
D. switch(config)#**lldp port-description**

Correct Answer: D

Section: Network Access
Explanation

Explanation/Reference:

QUESTION 78



Refer to the exhibit. Which switch becomes the root bridge?

A. S1
B. S2
C. S3
D. S4

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 79
Which configuration ensures that the switch is always the root for VLAN 750?

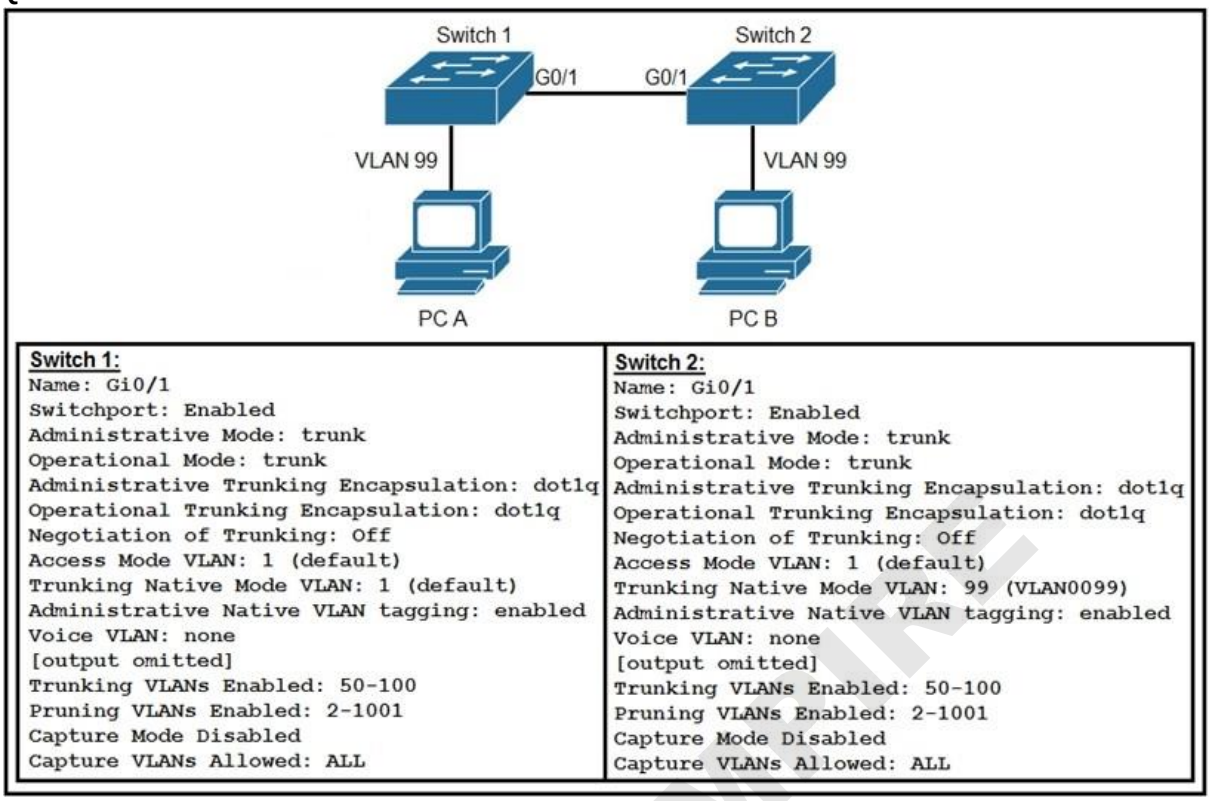
A. Switch(config)#**spanning-tree vlan 750 priority 38418607**
B. Switch(config)#**spanning-tree vlan 750 priority 0**
C. Switch(config)#**spanning-tree vlan 750 root primary**
D. Switch(config)#**spanning-tree vlan 750 priority 614440**

Correct Answer: C
Section: Network Access
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 80



Switch 1:

```
Name: Gi0/1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
[output omitted]
Trunking VLANs Enabled: 50-100
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
```

Switch 2:

```
Name: Gi0/1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 99 (VLAN0099)
Administrative Native VLAN tagging: enabled
Voice VLAN: none
[output omitted]
Trunking VLANs Enabled: 50-100
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
```

Refer to the exhibit. After the switch configuration, the ping test fails between PC A and PC B. Based on the output for switch 1, which error must be corrected?

A. The PCs are in the incorrect VLAN.
B. All VLANs are not enabled on the trunk.
C. Access mode is configured on the switch ports.
D. There is a native VLAN mismatch.

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 81
DRAG DROP

Drag and drop the WLAN components from the left onto the correct descriptions on the right.

Select and Place:

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Answer Area

access point	device that manages access points
virtual interface	device that provides Wi-Fi devices with a connection to a wired network
dynamic interface	used for out of band management of a WLC
service port	used to support mobility management of the WLC
wireless LAN controller	applied to the WLAN for wireless client communication

Correct Answer:

Answer Area

access point	wireless LAN controller
virtual interface	access point
dynamic interface	service port
service port	virtual interface
wireless LAN controller	dynamic interface

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Section: Network Access
Explanation

Explanation/Reference:
Explanation:
The service port can be used management purposes, primarily for out-of-band management. However, AP management traffic is not possible across the service port. In most cases, the service port is used as a “last resort” means of accessing the controller GUI for management purposes. For example, in the case where the system distribution ports on the controller are down or their communication to the wired network is otherwise degraded.

A dynamic interface with the Dynamic AP Management option enabled is used as the tunnel source for packets from the controller to the access point and as the destination for CAPWAP packets from the access point to the controller.

The virtual interface is used to support mobility management, Dynamic Host Configuration Protocol (DHCP) relay, and embedded Layer 3 security such as guest web authentication. It also maintains the DNS gateway host name used by Layer 3 security and mobility managers to verify the source of certificates when Layer 3

web authorization is enabled.

Reference: https://www.cisco.com/c/en/us/td/docs/wireless/controller/8-5/config-guide/b_cg85/ports_and_interfaces.html

QUESTION 82
Which unified access point mode continues to serve wireless clients after losing connectivity to the Cisco Wireless LAN Controller?

A. local
B. mesh
C. flexconnect
D. sniffer

Correct Answer: C
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
In previous releases, whenever a FlexConnect access point disassociates from a controller, it moves to the standalone mode. The clients that are centrally switched are disassociated. However, the FlexConnect access point continues to serve locally switched clients. When the FlexConnect access point rejoins the controller (or a standby controller), all clients are disconnected and are authenticated again. This functionality has been enhanced and the connection between the clients and the FlexConnect access points are maintained intact and the clients experience seamless connectivity. When both the access point and the controller have the same configuration, the connection between the clients and APs is maintained.

Reference: https://www.cisco.com/c/en/us/td/docs/wireless/controller/7-4/configuration/guides/consolidated/b_cg74_CONSOLIDATED/b_cg74_CONSOLIDATED_chapter_010001101.html

QUESTION 83

```
Router#
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S -Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
                  D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID      Local Interface Holdtime  Capability  Platform   Port ID
10.1.1.2       Gig 37/3        176          R I      CPT 600    Gig 36/41
10.1.1.2       Gig 37/1        174          R I      CPT 600    Gig 36/43
10.1.1.2       Gig 36/41       134          R I      CPT 600    Gig 37/3
10.1.1.2       Gig 36/43       134          R I      CPT 600    Gig 37/1
10.1.1.2       Ten 3/2         132          R I      CPT 600    Ten 4/2
10.1.1.2       Ten 4/2         174          R I      CPT 600    Ten 3/2
```

Refer to the exhibit. Which command provides this output?

A. show ip route
B. show cdp neighbor
C. show ip interface
D. show interface

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 84
Which mode must be used to configure EtherChannel between two switches without using a negotiation protocol?

A. active
B. on
C. auto
D. desirable

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
The Static Persistence (or “on” mode) bundles the links unconditionally and no negotiation protocol is used. In this mode, neither PAgP nor LACP packets are sent or received.

QUESTION 85
Which mode allows access points to be managed by Cisco Wireless LAN Controllers?

A. bridge
B. lightweight
C. mobility express
D. autonomous

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
A Lightweight Access Point (LAP) is an AP that is designed to be connected to a wireless LAN (WLAN) controller (WLC). APs are “lightweight,” which means that they cannot act independently of a wireless LAN controller (WLC). The WLC manages the AP configurations and firmware. The APs are “zero touch” deployed, and individual configuration of APs is not necessary.

QUESTION 86
Which two values or settings must be entered when configuring a new WLAN in the Cisco Wireless LAN Controller GUI? (Choose two.)

A. QoS settings
B. IP address of one or more access points
C. SSID
D. profile name
E. management interface settings

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Correct Answer: CD
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 87
Which command is used to specify the delay time in seconds for LLDP to initialize on any interface?

A. lldp timer
B. lldp tlv-select
C. lldp reinit
D. lldp holdtime

Correct Answer: C
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
- lldp holdtime seconds: Specify the amount of time a receiving device should hold the information from your device before discarding it
- lldp reinit delay: Specify the delay time in seconds for LLDP to initialize on an interface
- lldp timer rate: Set the sending frequency of LLDP updates in seconds

Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3560/software/release/12-2_55_se/configuration/guide/3560_scg/swlldp.html

QUESTION 88

```
SW2
vtp domain cisco
vtp mode transparent
vtp password ciscotest
interface fastethernet0/1
   description connection to sw1
   switchport mode trunk
   switchport trunk encapsulation dot1q
```

Refer to the exhibit. How does SW2 interact with other switches in this VTP domain?

A. It transmits and processes VTP updates from any VTP clients on the network on its trunk ports.
B. It processes VTP updates from any VTP clients on the network on its access ports.
C. It receives updates from all VTP servers and forwards all locally configured VLANs out all trunk ports.
D. It forwards only the VTP advertisements that it receives on its trunk ports.

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
The VTP mode of SW2 is transparent so it only forwards the VTP updates it receives to its trunk links without

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processing them.

Reference: https://www.cisco.com/c/en/us/support/docs/lan-switching/vtp/10558-21.html

QUESTION 89

```
SW1#sh lacp neighbor
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode       P - Device is in Passive mode

Channel group 35 neighbors

Partner's information:

              LACP port                        Admin  Oper   Port    Port
Port    Flags Priority   Dev ID          Age   key    Key    Number  State
Et1/0   SP    32768      aabb.cc80.7000   8s   0x0    0x23   0x101   0x3C
Et1/1   SP    32768      aabb.cc80.7000   8s   0x0    0x23   0x102   0x3C
```

Refer to the exhibit. Based on the LACP neighbor status, in which mode is the SW1 port channel configured?

A. mode on
B. active
C. passive
D. auto

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
From the neighbor status, we notice the “Flags” are SP. “P” here means the neighbor is in Passive mode. In order to create an Etherchannel interface, the (local) SW1 ports should be in Active mode. Moreover, the “Port State” in the exhibit is “0x3c” (which equals to “00111100″ in binary format). Bit 3 is “1” which means the ports are synchronizing -> the ports are working so the local ports should be in Active mode.

QUESTION 90
Two switches are connected and using Cisco Dynamic Trunking Protocol. SW1 is set to Dynamic Auto and SW2 is set to Dynamic Desirable. What is the result of this configuration?

A. The link becomes an access port.
B. The link is in an error disabled state.
C. The link is in a down state.
D. The link becomes a trunk port.

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 91

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A Cisco IP phone receives untagged data traffic from an attached PC. Which action is taken by the phone?

A. It drops the traffic.
B. It allows the traffic to pass through unchanged.
C. It tags the traffic with the native VLAN.
D. It tags the traffic with the default VLAN.

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Untagged traffic from the device attached to the Cisco IP Phone passes through the phone unchanged, regardless of the trust state of the access port on the phone.

Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960/software/release/12-2_40_se/configuration/guide/scg/swvoip.pdf

QUESTION 92
Which design element is a best practice when deploying an 802.11b wireless infrastructure?

A. allocating nonoverlapping channels to access points that are in close physical proximity to one another
B. disabling TCP so that access points can negotiate signal levels with their attached wireless devices
C. configuring access points to provide clients with a maximum of 5 Mbps
D. setting the maximum data rate to 54 Mbps on the Cisco Wireless LAN Controller

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 93
Refer to the exhibit. The network administrator wants VLAN 67 traffic to be untagged between Switch 1 and Switch 2, while all other VLANs are to remain tagged. Which command accomplishes this task?

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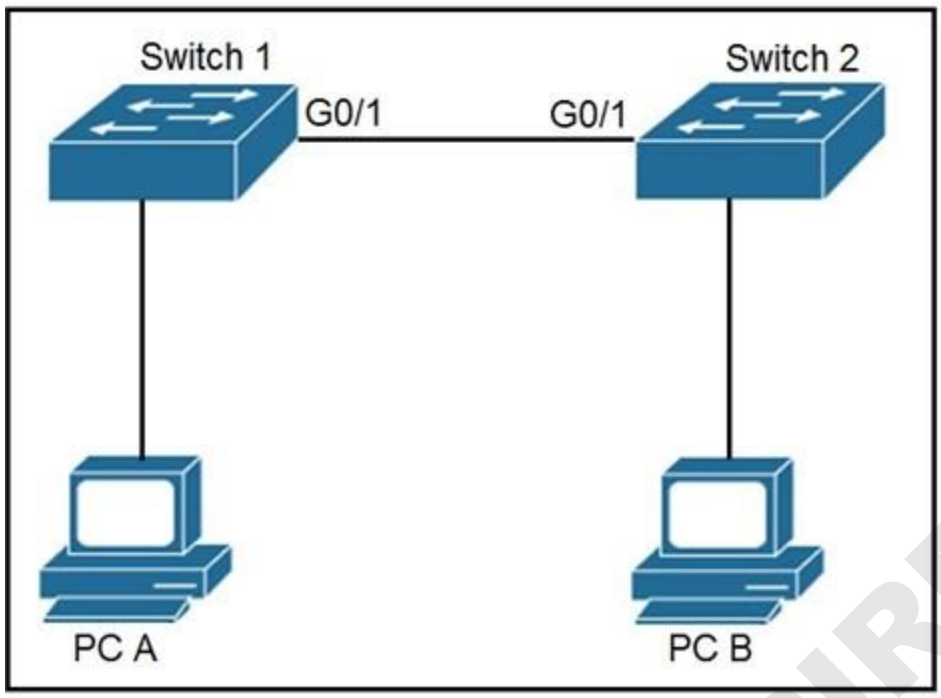

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A. switchport access vlan 67
B. switchport trunk allowed vlan 67
C. switchport private-vlan association host 67
D. switchport trunk native vlan 67

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 94
Which two command sequences must be configured on a switch to establish a Layer 3 EtherChannel with an open-standard protocol? (Choose two.)

A. interface GigabitEthernet0/0/1
channel-group 10 mode auto
B. interface GigabitEthernet0/0/1
channel-group 10 mode on
C. interface port-channel 10
no switchport
ip address 172.16.0.1 255.255.255.0
D. interface GigabitEthernet0/0/1
channel-group 10 mode active
E. interface port-channel 10
switchport
switchport mode trunk

Correct Answer: DE
Section: Network Access

Explanation

Explanation/Reference:

QUESTION 95
Refer to the exhibit. Which two commands when used together create port channel 10? (Choose two.)

```
Switch#show etherchannel summary
 [output omitted]

Group        Port-channel        Protocol            Ports
-------------+-------------------+-------------------+-------------------------------
10           Po10(SU)            LACP                Gi0/0(P)     Gi0/1(P)
20           Po20(SU)            LACP                Gi0/2(P)     Gi0/3(P)
```

A. int range g0/0-1
channel-group 10 mode active
B. int range g0/0-1
channel-group 10 mode desirable
C. int range g0/0-1
channel-group 10 mode passive
D. int range g0/0-1
channel-group 10 mode auto
E. int range g0/0-1
channel-group 10 mode on

Correct Answer: AC
Section: Network Access
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 96
Refer to the exhibit. An administrator is tasked with configuring a voice VLAN. What is the expected outcome when a Cisco phone is connected to the GigabitEthernet 3/1/4 port on a switch?

```
interface GigabitEthernet3/1/4
 switchport voice vlan 50
!
```

A. The phone and a workstation that is connected to the phone do not have VLAN connectivity.
B. The phone sends and receives data in VLAN 50, but a workstation connected to the phone sends and receives data in VLAN 1.
C. The phone sends and receives data in VLAN 50, but a workstation connected to the phone has no VLAN connectivity.
D. The phone and a workstation that is connected to the phone send and receive data in VLAN 50.

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 97
Refer to the exhibit. Which action is expected from SW1 when the untagged frame is received on the GigabitEthernet0/1 interface?

```
SW1#show run int gig 0/1
interface GigabitEthernet0/1
 switchport access vlan 11
 switchport trunk allowed vlan 1-10
 switchport trunk encapsulation dot1q
 switchport trunk native vlan 5
 switchport mode trunk
 speed 1000
 duplex full
```

A. The frame is processed in VLAN 1
B. The frame is processed in VLAN 11
C. The frame is processed in VLAN 5
D. The frame is dropped

Correct Answer: C
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 98
Which command is used to enable LLDP globally on a Cisco IOS ISR?

A. lldp run
B. lldp enable
C. lldp transmit
D. cdp run
E. cdp enable

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Link Layer Discovery Protocol (LLDP) is an industry standard protocol that allows devices to advertise, and discover connected devices, and there capabilities (same as CDP of Cisco). To enable it on Cisco devices, we have to use this command under global configuration mode:

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Sw(config)# lldp run

QUESTION 99
Which command should you enter to configure an LLDP delay time of 5 seconds?

A. lldp timer 5000
B. lldp holdtime 5
C. lldp reinit 5000
D. lldp reinit 5

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
- lldp holdtime seconds: Specify the amount of time a receiving device should hold the information from your device before discarding it
- lldp reinit delay: Specify the delay time in seconds for LLDP to initialize on an interface
- lldp timer rate: Set the sending frequency of LLDP updates in seconds

Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3560/software/release/12-2_55_se/configuration/guide/3560_scg/swlldp.html

QUESTION 100
In a CDP environment, what happens when the CDP interface on an adjacent device is configured without an IP address?

A. CDP becomes inoperable on that neighbor
B. CDP uses the IP address of another interface for that neighbor
C. CDP operates normally, but it cannot provide IP address information for that neighbor
D. CDP operates normally, but it cannot provide any information for that neighbor

Correct Answer: C
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Although CDP is a Layer 2 protocol but we can check the neighbor IP address with the “show cdp neighbor detail” command. If the neighbor does not has an IP address then CDP still operates without any problem. But the IP address of that neighbor is not provided.

QUESTION 101
DRAG DROP

Drag and drop the benefits of a Cisco Wireless Lan Controller from the left onto the correct examples on the right.

Select and Place:

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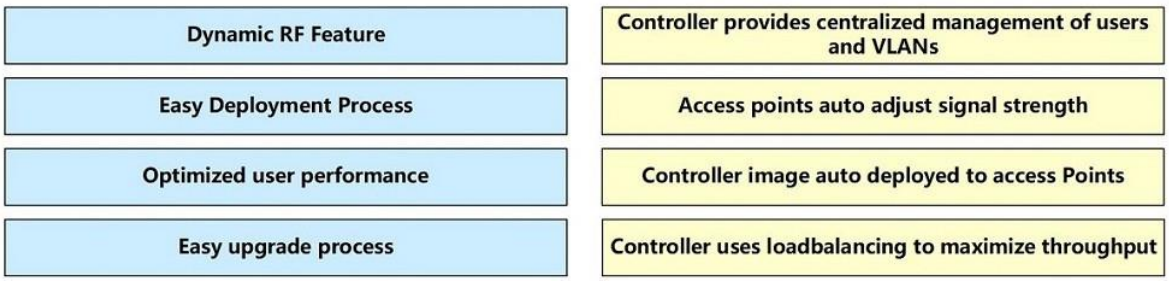
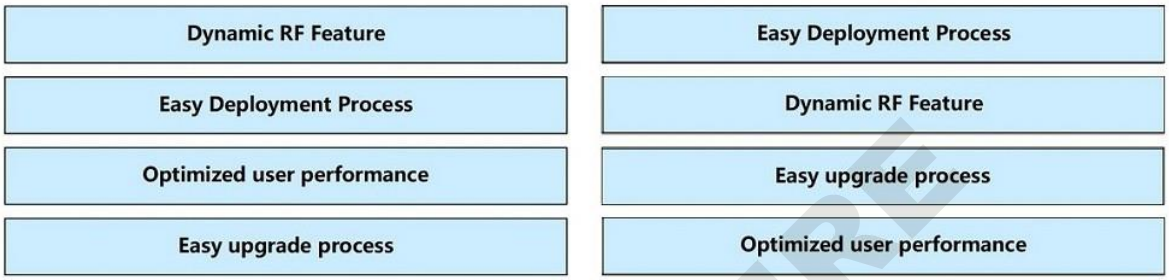


Correct Answer:



Section: Network Access
Explanation

Explanation/Reference:

QUESTION 102
When configuring an EtherChannel bundle, which mode enables LACP only if a LACP device is detected?

A. Passive
B. Desirable
C. On
D. Auto
E. Active

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
The LACP is Link Aggregation Control Protocol. LACP is an open protocol, published under the 802.3ad.
The modes of LACP are active, passive or on. The side configured as “passive” will waiting the other side that should an Active for the Etherchannel to be established.
PAgP is Port-Aggregation Protocol. It is Cisco proprietary protocol. The mode are On, Desirable or Auto. Desirable – Auto will establish an EtherChannel.

An example of how to configure an Etherchannel:
SwitchFormula1>enable
SwitchFormula1#configure terminal
SwitchFormula1(config)# interface range f0/5 -14
SwitchFormula1(config-if-range)# channel-group 13 mode ?
active Enable LACP unconditionally
auto Enable PAgP only if a PAgP device is detected

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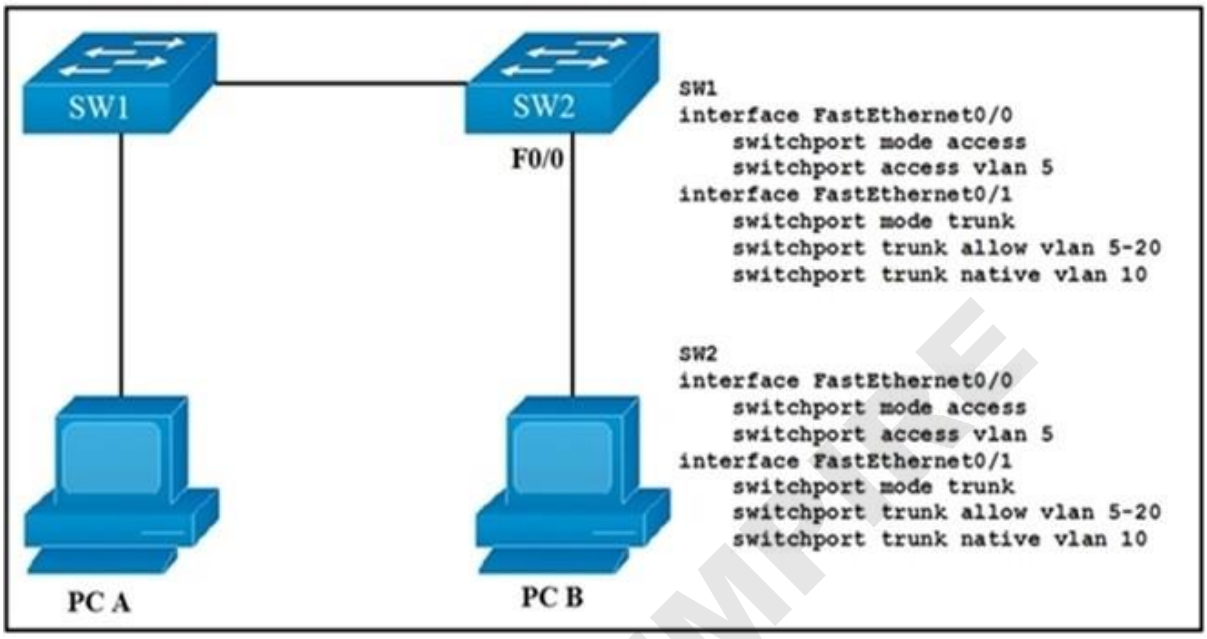
desirable Enable PAgP unconditionally
on Enable Etherchannel only
passive Enable LACP only if a LACP device is detected

QUESTION 103
Refer to the exhibit. Which VLAN ID is associated with the default VLAN in the given environment?



A. VLAN 1
B. VLAN 5
C. VLAN 10
D. VLAN 20

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 104
Which two VLAN IDs indicate a default VLAN? (Choose two.)

A. 0
B. 1
C. 1005
D. 1006
E. 4096

Correct Answer: BC
Section: Network Access
Explanation

Explanation/Reference:
Explanation:

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VLAN 1 is a system default VLAN, you can use this VLAN but you cannot delete it. By default VLAN 1 is use for every port on the switch.
Standard VLAN range from 1002-1005 it's Cisco default for FDDI and Token Ring. You cannot delete VLANs 1002-1005. Mostly we don't use VLAN in this range.

QUESTION 105
Which two pieces of information about a Cisco device can Cisco Discovery Protocol communicate? (Choose two.)

A. the native VLAN
B. the trunking protocol
C. the VTP domain
D. the spanning-tree priority
E. the spanning tree protocol

Correct Answer: AC
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 106
After you deploy a new WLAN controller on your network, which two additional tasks should you consider? (Choose two.)

A. deploy load balancers
B. configure additional vlans
C. configure multiple VRRP groups
D. deploy POE switches
E. configure additional security policies

Correct Answer: AE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 107
Refer to the exhibit. How will switch SW2 handle traffic from VLAN 10 on SW1?

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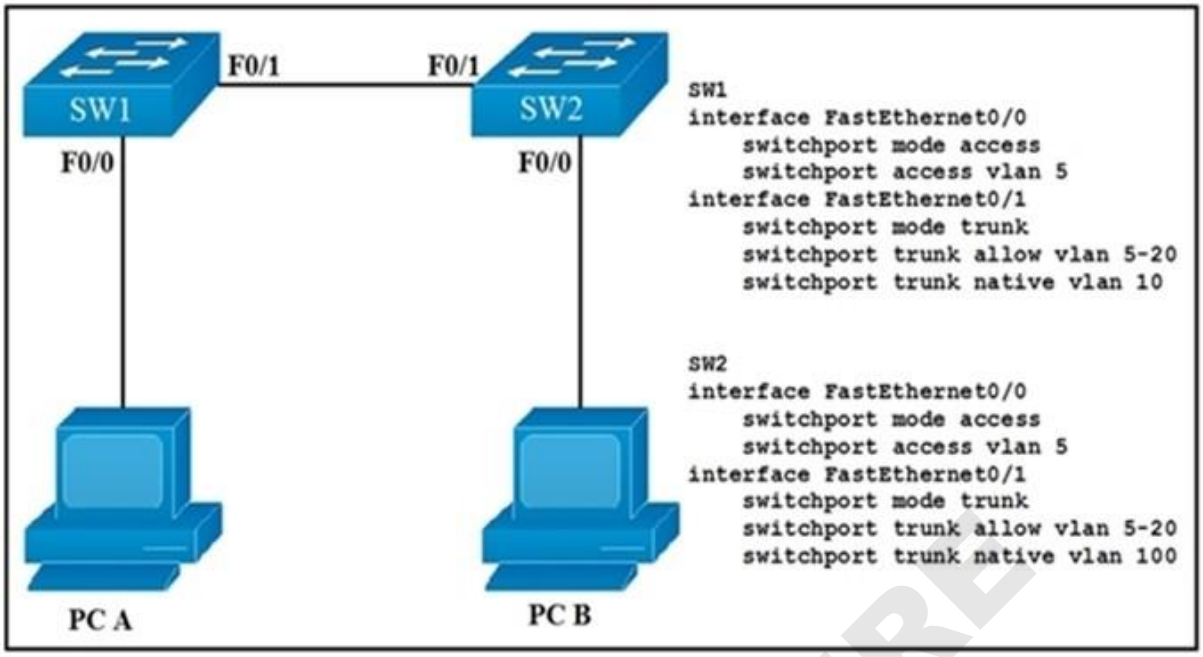

A. It sends the traffic to VLAN 10.
B. It sends the traffic to VLAN 100.
C. It drops the traffic.
D. It sends the traffic to VLAN 1.

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Since SW-1 is configured native VLAN is VLAN10, so traffic coming out of VLAN-10 is untagged, & goes directly to SW-2 Native VLAN: VLAN100, due to VLAN mismatch.

QUESTION 108
Which two commands can you use to configure an actively negotiate EtherChannel? (Choose two.)

A. channel-group 10 mode on
B. channel-group 10 mode auto
C. channel-group 10 mode passive
D. channel-group 10 mode desirable
E. channel-group 10 mode active

Correct Answer: DE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 109
How does STP prevent forwarding loops at OSI Layer 2?

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A. TTL
B. MAC address forwarding
C. Collision avoidance
D. Port blocking

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 110
Which two statements about VTP are true? (Choose two.)

A. All switches must be configured with the same VTP domain name
B. All switches must be configured to perform trunk negotiation
C. All switches must be configured with a unique VTP domain name
D. The VTP server must have the highest revision number in the domain
E. All switches must use the same VTP version

Correct Answer: AE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 111
Which type does a port become when it receives the best BPDU on a bridge?

A. The designated port
B. The backup port
C. The alternate port
D. The root port

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 112
Which value can you modify to configure a specific interface as the preferred forwarding interface?

A. The interface number
B. The port priority
C. The VLAN priority
D. The hello time

Correct Answer: B
Section: Network Access
Explanation

CERT EMPIRE

Explanation/Reference:

QUESTION 113
Which statement about Cisco Discovery Protocol is true?

A. It is a Cisco-proprietary protocol.
B. It runs on the network layer.
C. It can discover information from routers, firewalls, and switches.
D. It runs on the physical layer and the data link layer.

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 114
What are two reasons a network administrator would use CDP? (Choose two.)

A. to verify the type of cable interconnecting two devices
B. to determine the status of network services on a remote device
C. to obtain VLAN information from directly connected switches
D. to verify Layer 2 connectivity between two devices when Layer 3 fails
E. to obtain the IP address of a connected device in order to telnet to the device
F. to determine the status of the routing protocols between directly connected routers

Correct Answer: DE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 115
What are two benefits of using VTP in a switching environment? (Choose two.)

A. It allows switches to read frame tags.
B. It allows ports to be assigned to VLANs automatically.
C. It maintains VLAN consistency across a switched network.
D. It allows frames from multiple VLANs to use a single interface.
E. It allows VLAN information to be automatically propagated throughout the switching environment.

Correct Answer: CE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 116
Which three statements are typical characteristics of VLAN arrangements? (Choose three.)

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A. A new switch has no VLANs configured.
B. Connectivity between VLANs requires a Layer 3 device.
C. VLANs typically decrease the number of collision domains.
D. Each VLAN uses a separate address space.
E. A switch maintains a separate bridging table for each VLAN.
F. VLANs cannot span multiple switches.

Correct Answer: BDE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 117
On a corporate network, hosts on the same VLAN can communicate with each other, but they are unable to communicate with hosts on different VLANs. What is needed to allow communication between the VLANs?

A. a router with subinterfaces configured on the physical interface that is connected to the switch
B. a router with an IP address on the physical interface connected to the switch
C. a switch with an access link that is configured between the switches
D. a switch with a trunk link that is configured between the switches

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
Different VLANs can't communicate with each other, they can communicate with the help of Layer3 router. Hence, it is needed to connect a router to a switch, then make the sub-interface on the router to connect to the switch, establishing Trunking links to achieve communications of devices which belong to different VLANs.

QUESTION 118
Which statement about LLDP is true?

A. It is a Cisco proprietary protocol.
B. It is configured in global configuration mode.
C. The LLDP update frequency is a fixed value.
D. It runs over the transport layer.

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 119
What is a function of Wireless LAN Controller?

A. register with a single access point that controls traffic between wired and wireless endpoints
B. use SSIDs to distinguish between wireless clients
C. send LWAPP packets to access points

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D. monitor activity on wireless and wired LANs

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 120
Which technology is used to improve web traffic performance by proxy caching?

A. WSA
B. Firepower
C. ASA
D. FireSIGHT

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 121
What criteria is used first during the root port selection process?

A. local port ID
B. lowest path cost to the toot bridge
C. lowest neighbor's bridge ID
D. lowest neighbor's port ID

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 122
Which statement about VLAN configuration is true?

A. The switch must be in VTP server or transparent mode before you can configure a VLAN
B. The switch must be in config-vlan mode before you configure an extended VLAN
C. Dynamic inter-VLAN routing is supported on VLAN2 through VLAN 4064
D. A switch in VTP transparent mode save the VLAN databases to the running configuration only

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 123

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Refer to the exhibit. What two conclusions should be made about this configuration? (Choose two.)

```
SW1#show spanning-tree vlan 30

VLAN0030
Spanning tree enabled protocol rstp
Root ID     Priority        32798
            Address         0025.63e9.c800
            Cost            19
            Port            1 (FastEthernet 2/1)
            Hello Time      2 sec
            Max Age         30 sec
            Forward Delay   20 sec

[Output suppressed]
```

A. The root port is FastEthernet 2/1
B. The designated port is FastEthernet 2/1
C. The spanning-tree mode is PVST+
D. This is a root bridge
E. The spanning-tree mode is Rapid PVST+

Correct Answer: AE
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 124
A network engineer must create a diagram of a multivendor network. Which command must be configured on the Cisco devices so that the topology of the network can be mapped?

A. Device(config)#lldp run
B. Device(config)#cdp run
C. Device(config-if)#cdp enable
D. Device(config)#flow-sampler-map topology

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 125
How do AAA operations compare regarding user identification, user services, and access control?

A. Authorization provides access control, and authentication tracks user services
B. Authentication identifies users, and accounting tracks user services

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C. Accounting tracks user services, and authentication provides access control
D. Authorization identifies users, and authentication provides access control

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 126
What is difference between RADIUS and TACACS+?

A. RADIUS logs all commands that are entered by the administrator, but TACACS+ logs only start, stop, and interim commands.
B. TACACS+ separates authentication and authorization, and RADIUS merges them.
C. TACACS+ encrypts only password information, and RADIUS encrypts the entire payload.
D. RADIUS is most appropriate for dial authentication, but TACACS+ can be used for multiple types of authentication.

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 127
What is a difference between local AP mode and FlexConnect AP mode?

A. Local AP mode creates two CAPWAP tunnels per AP to the WLC
B. Local AP mode causes the AP to behave as if it were an autonomous AP
C. FlexConnect AP mode fails to function if the AP loses connectivity with the WLC
D. FlexConnect AP mode bridges the traffic from the AP to the WLC when local switching is configured

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 128
The SW1 interface g0/1 is in the down/down state. Which two configurations are valid reasons for the interface condition? (Choose two.)

A. There is a protocol mismatch
B. There is a duplex mismatch
C. The interface is shut down
D. The interface is error-disabled
E. There is a speed mismatch

Correct Answer: CD
Section: Network Access
Explanation

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Explanation/Reference:

QUESTION 129
How will Link Aggregation be implemented on a Cisco Wireless LAN Controller?

A. The EtherChannel must be configured in “mode active”.
B. When enabled, the WLC bandwidth drops to 500 Mbps.
C. To pass client traffic, two or more ports must be configured.
D. One functional physical port is needed to pass client traffic.

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:
Reference: https://www.cisco.com/c/en/us/td/docs/wireless/controller/8-2/config-guide/b_cg82/b_cg82_chapter_010101011.html

QUESTION 130
Which two conditions must be met before SSH operates normally on a Cisco IOS switch? (Choose two.)

A. IP routing must be enabled on the switch.
B. A console password must be configured on the switch.
C. Telnet must be disabled on the switch.
D. The switch must be running a k9 (crypto) IOS image.
E. The **ip domain-name** command must be configured on the switch.

Correct Answer: DE
Section: Network Access
Explanation

Explanation/Reference:
Reference: https://www.cisco.com/c/en/us/support/docs/security-vpn/secure-shell-ssh/4145-ssh.html

QUESTION 131

```
Atlanta#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Atlanta(config)#aaa new-model
Atlanta(config)#aaa authentication login default local
Atlanta(config)#line vty 0 4
Atlanta(config-line)#login authentication default
Atlanta(config-line)#exit
Atlanta(config)#username ciscoadmin password adminadmin123
Atlanta(config)#username ciscoadmin privilege 15
Atlanta(config)#enable password cisco123
Atlanta(config)#enable secret testing1234
Atlanta(config)#end
```

Refer to the exhibit. Which password must an engineer use to enter the enable mode?

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A. adminadmin123
B. cisco123
C. default
D. testing1234

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
If neither the enable password command nor the enable secret command is configured, and if there is a line password configured for the console, the console line password serves as the enable password for all VTY sessions -> The “enable secret” will be used first if available, then “enable password” and line password.

QUESTION 132
Which state does the switch port move to when PortFast is enabled?

A. blocking
B. listening
C. learning
D. forwarding

Correct Answer: D
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 133
Which protocol prompts the Wireless LAN Controller to generate its own local web administration SSL certificate for GUI access?

A. RADIUS
B. HTTPS
C. TACACS+
D. HTTP

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
You can protect communication with the GUI by enabling HTTPS. HTTPS protects HTTP browser sessions by using the Secure Sockets Layer (SSL) protocol. When you enable HTTPS, the controller generates its own local web administration SSL certificate and automatically applies it to the GUI. You also have the option of downloading an externally generated certificate.
Reference: https://www.cisco.com/c/en/us/td/docs/wireless/controller/8-0/configuration-guide/b_cg80/b_cg80_chapter_011.html

QUESTION 134
An engineer must configure interswitch VLAN communication between a Cisco switch and a third-party switch. Which action should be taken?

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A. configure DSCP
B. configure IEEE 802.1q
C. configure ISL
D. configure IEEE 802.1p

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Explanation:
VLAN trunking offers two options, ISL and 802.1Q. ISL is Cisco proprietary while 802.1Q is standards based and supported by multiple vendors.

QUESTION 135
An engineer requires a switch interface to actively attempt to establish a trunk link with a neighbor switch. What command must be configured?

A. switchport mode trunk
B. switchport mode dynamic desirable
C. switchport nonegotiate
D. switchport mode dynamic auto

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:
Reference: https://www.ciscopress.com/articles/article.asp?p=2181837&seqNum=8#:~:text=switchport%20mode%20dynamic%20auto%3A%20Makes,to%20trunk%20or%20desirable%20mode.&text=switchport%20mode%20dynamic%20desirable%3A%20Makes,link%20to%20a%20trunk%20link.

QUESTION 136
Refer to the exhibit. After the election process, what is the root bridge in the HQ LAN?

Switch 1: 0C:E0:38:81:32:58
Switch 2: 0C:0E:15:22:1A:61
Switch 3: 0C:0E:15:1D:3C:9A
Switch 4: 0C:E0:19:A1:4D:16

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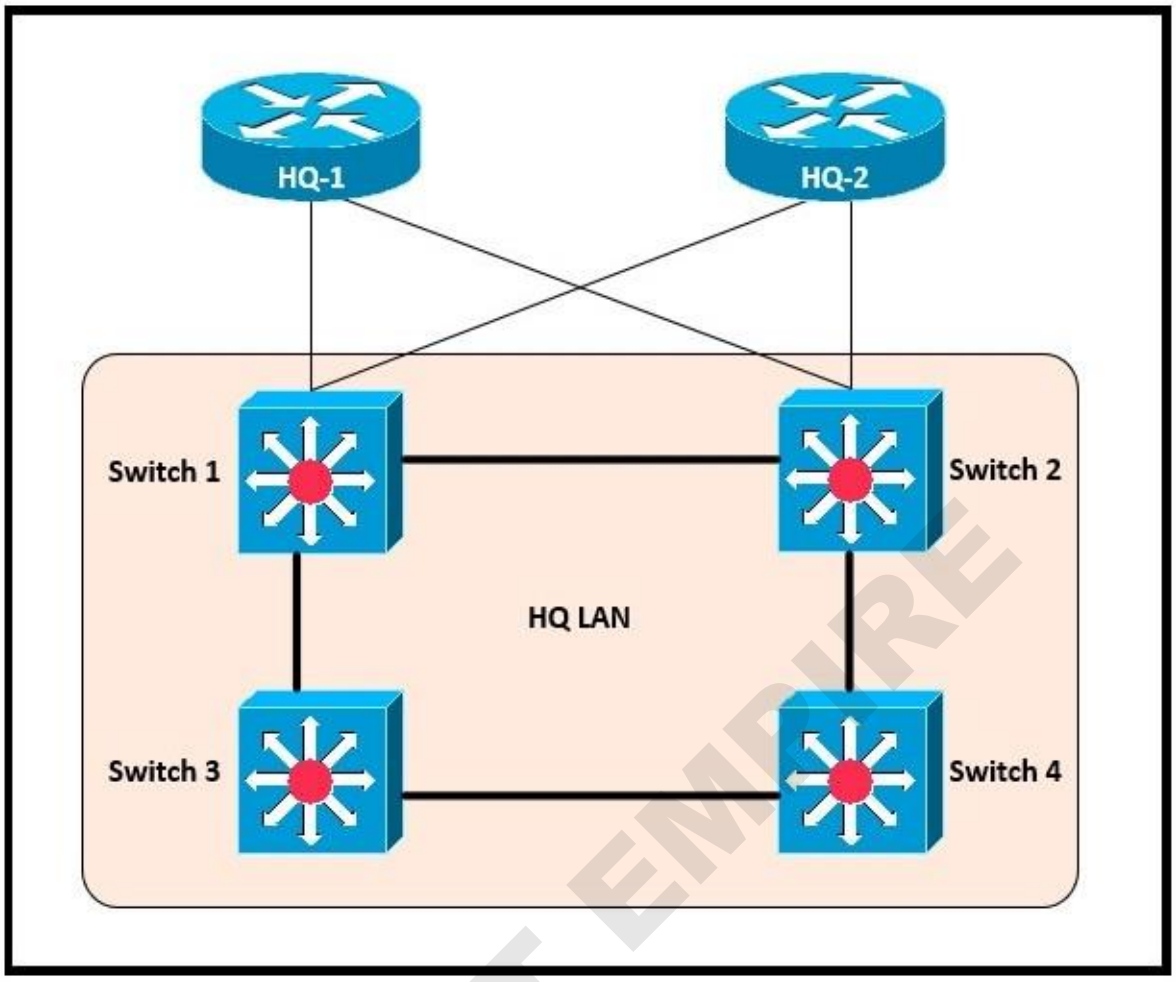

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A. Switch 1
B. Switch 2
C. Switch 3
D. Switch 4

Correct Answer: C
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 137
An engineer must establish a trunk link between two switches. The neighboring switch is set to trunk or desirable mode. What action should be taken?

A. configure switchport nonegotiate
B. configure switchport mode dynamic desirable
C. configure switchport mode dynamic auto
D. configure switchport trunk dynamic desirable

Correct Answer: C

Section: Network Access
Explanation

Explanation/Reference:

QUESTION 138
Which spanning-tree enhancement avoids the learning and listening states and immediately places ports in the forwarding state?

A. BPDUfilter
B. PortFast
C. Backbonefast
D. BPDUguard

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 139
How does the dynamically-learned MAC address feature function?

A. The CAM table is empty until ingress traffic arrives at each port
B. Switches dynamically learn MAC addresses of each connecting CAM table.
C. The ports are restricted and learn up to a maximum of 10 dynamically-learned addresses
D. It requires a minimum number of secure MAC addresses to be filled dynamically

Correct Answer: A
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 140
When using Rapid PVST+, which command guarantees the switch is always the root bridge for VLAN 200?

A. spanning-tree vlan 200 priority 614440
B. spanning-tree vlan 200 priority 0
C. spanning-tree vlan 200 root primary
D. spanning-tree vlan 200 priority 38813258

Correct Answer: B
Section: Network Access
Explanation

Explanation/Reference:

QUESTION 141
Refer to the exhibit. Which configuration issue is preventing the OSPF neighbor relationship from being established between the two routers?

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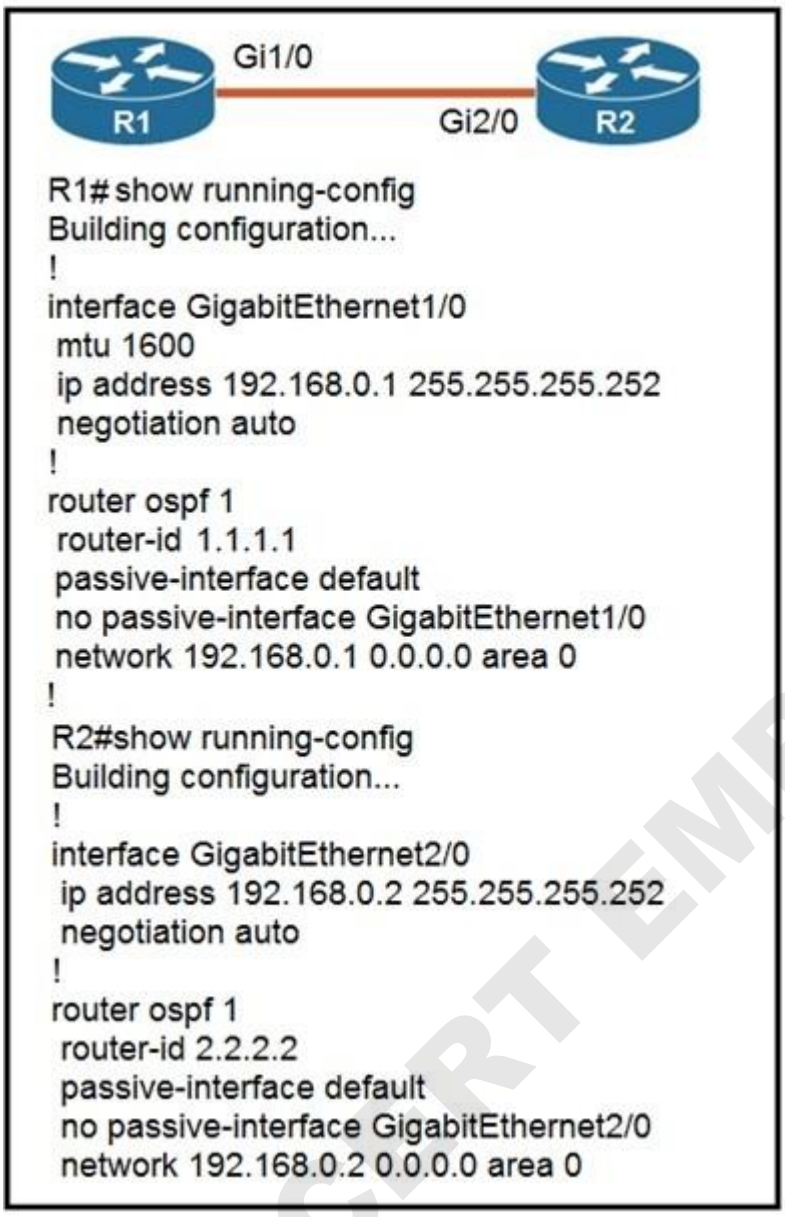

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A. R1 has an incorrect **network** command for interface Gi1/0.
B. R2 should have its **network** command in area 1.
C. R1 interface Gi1/0 has a larger MTU size.
D. R2 is using the **passive-interface default** command.

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 142
Refer to the exhibit. Router R1 is running three different routing protocols. Which route characteristic is used by the router to forward the packet that it receives for destination IP 172.16.32.1?

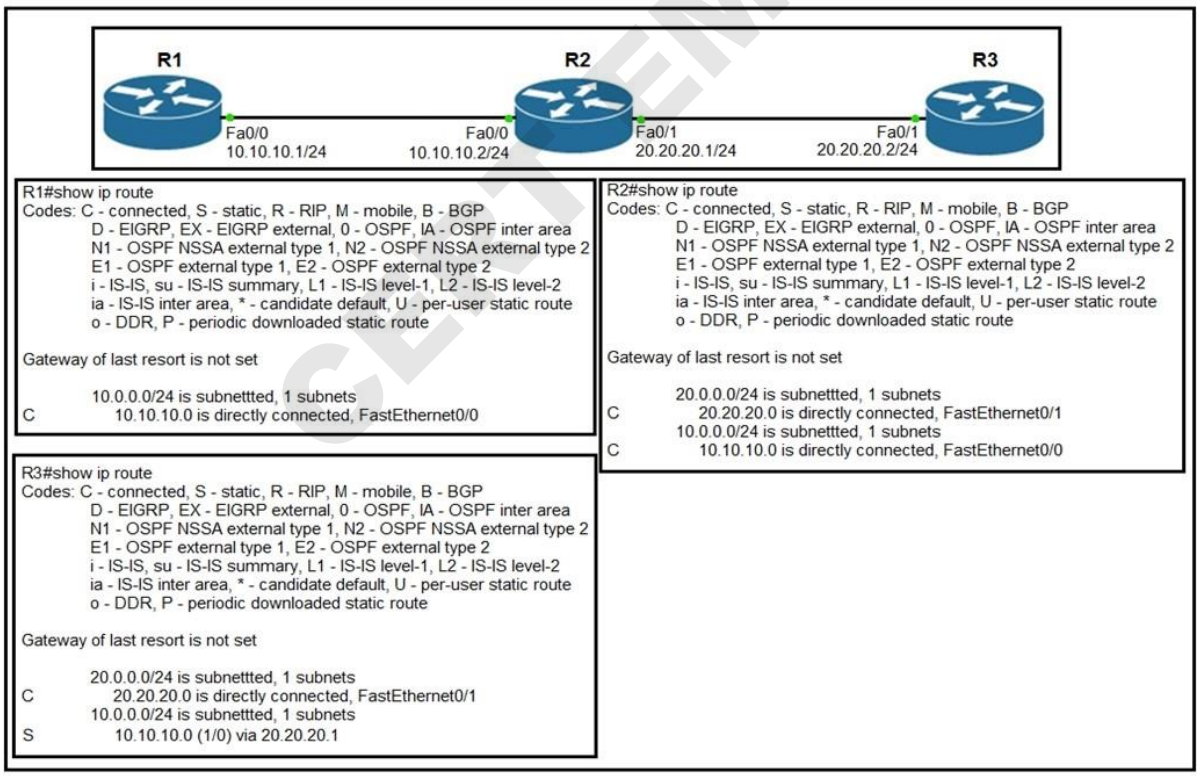
```
R1# show ip route
....
D       172.16.32.0/27      [90/2888597172] via 20.1.1.1
O       172.16.32.0/19      [110/292094] via 20.1.1.10
R       172.16.32.0/24      [120/2] via 20.1.1.3
```

A. longest prefix
B. administrative distance
C. cost
D. metric

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 143
Refer to the exhibit. Router R1 Fa0/0 cannot ping router R3 Fa0/1. Which action must be taken in router R1 to help resolve the configuration issue?



A. set the default gateway as 20.20.20.2
B. configure a static route with Fa0/1 as the egress interface to reach the 20.20.2.0/24 network
C. configure a static route with 10.10.10.2 as the next hop to reach the 20.20.20.0/24 network
D. set the default network as 20.20.20.0/24

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Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 144
By default, how does EIGRP determine the metric of a route for the routing table?

A. It uses the bandwidth and delay values of the path to calculate the route metric.
B. It uses a default metric of 10 for all routes that are learned by the router.
C. It counts the number of hops between the receiving and destination routers and uses that value as the metric.
D. It uses a reference bandwidth and the actual bandwidth of the connected link to calculate the route metric.

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 145
Router R1 must send all traffic without a matching routing-table entry to 192.168.1.1. Which configuration accomplishes this task?

A. R1#**Config t**
R1(config)#**ip routing**
R1(config)#**ip route default-route 192.168.1.1**
B. R1#**Config t**
R1(config)#**ip routing**
R1(config)#**ip route 192.168.1.1 0.0.0.0 0.0.0.0**
C. R1#**Config t**
R1(config)#**ip routing**
R1(config)#**ip route 0.0.0.0 0.0.0.0 192.168.1.1**
D. R1#**Config t**
R1(config)#**ip routing**
R1(config)#**ip default-gateway 192.168.1.1**

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 146
A packet is destined for 10.10.1.22. Which static route does the router choose to forward the packet?

A. ip route 10.10.1.0 255.255.255.240 10.10.255.1
B. ip route 10.10.1.20 255.255.255.252 10.10.255.1
C. ip route 10.10.1.16 255.255.255.252 10.10.255.1
D. ip route 10.10.1.20 255.255.255.254 10.10.255.1

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Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 147

```
EIGRP: 192.168.12.0/24
RIP: 192.168.12.0/27
OSPF: 192.168.12.0/28
```

Refer to the exhibit. How does the router manage traffic to 192.168.12.16?

A. It chooses the EIGRP route because it has the lowest administrative distance.
B. It load-balances traffic between all three routes.
C. It chooses the OSPF route because it has the longest prefix inclusive of the destination address.
D. It selects the RIP route because it has the longest prefix inclusive of the destination address.

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 148
What are two reasons for an engineer to configure a floating static route? (Choose two.)

A. to enable fallback static routing when the dynamic routing protocol fails
B. to route traffic differently based on the source IP of the packet
C. to automatically route traffic on a secondary path when the primary path goes down
D. to support load balancing via static routing
E. to control the return path of traffic that is sent from the router

Correct Answer: AC
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 149

```
R1# show ip route

D       192.168.10.0/24     [90/2679326] via 192.168.1.1
R       192.168.10.0/27     [120/3] via 192.168.1.2
O       192.168.10.0/23     [110/2] via 192.168.1.3
i L1    192.168.10.0/13     [115/30] via 192.168.1.4
```

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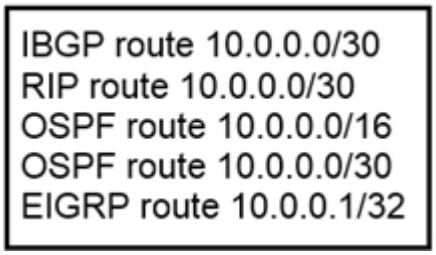
Refer to the exhibit. How does router R1 handle traffic to 192.168.10.16?

A. It selects the IS-IS route because it has the shortest prefix inclusive of the destination address
B. It selects the RIP route because it has the longest prefix inclusive of the destination address
C. It selects the OSPF route because it has the lowest cost
D. It selects the EIGRP route because it has the lowest administrative distance

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 150



Refer to the exhibit. A router received these five routes from different routing information sources. Which two routes does the router install in its routing table? (Choose two)

A. OSPF route 10.0.0.0/30
B. IBGP route 10.0.0.0/30
C. OSPF route 10.0.0.0/16
D. EIGRP route 10.0.0.1/32
E. RIP route 10.0.0.0/30

Correct Answer: AD
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 151

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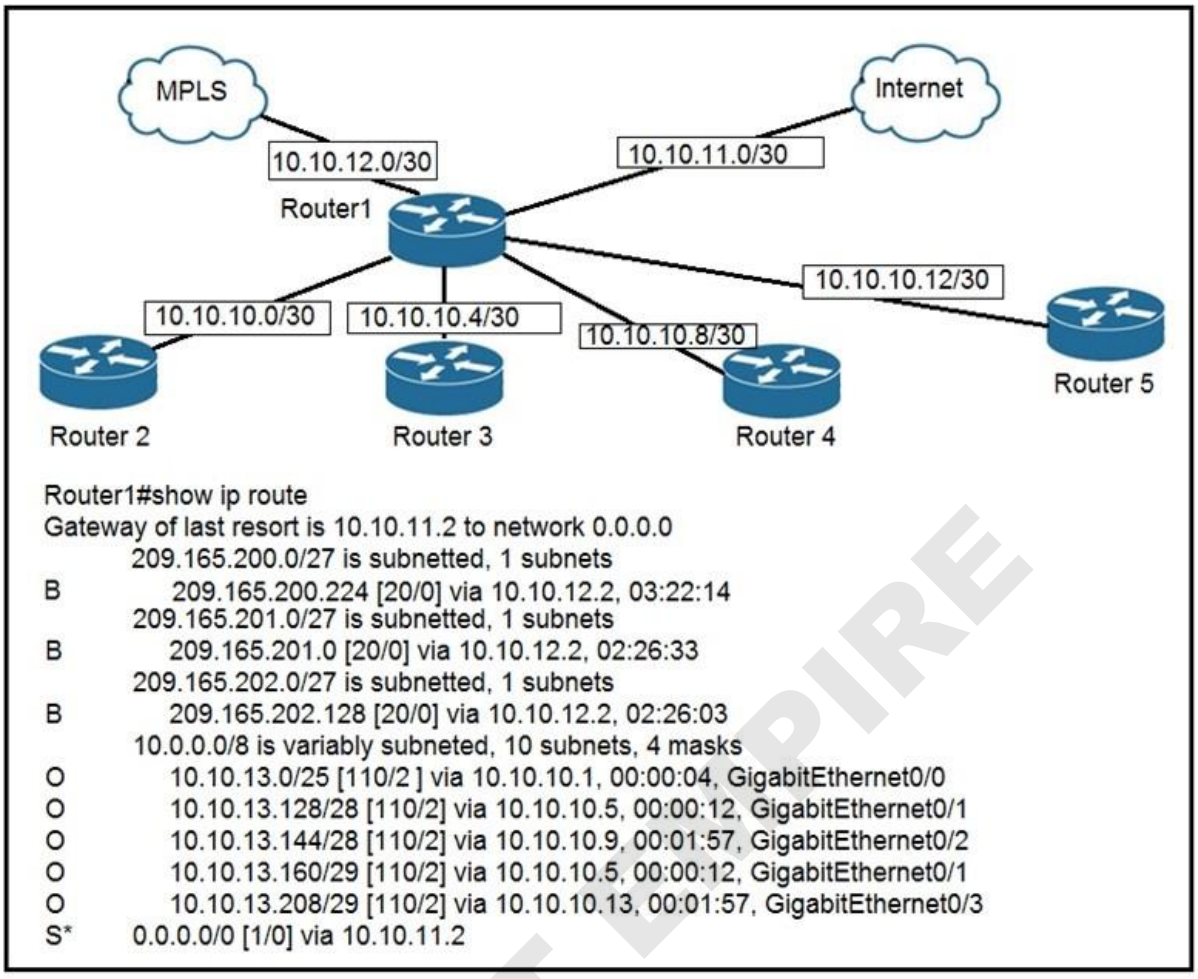


```
Router1#show ip route
Gateway of last resort is 10.10.11.2 to network 0.0.0.0
      209.165.200.0/27 is subnetted, 1 subnets
B        209.165.200.224 [20/0] via 10.10.12.2, 03:22:14
      209.165.201.0/27 is subnetted, 1 subnets
B        209.165.201.0 [20/0] via 10.10.12.2, 02:26:33
      209.165.202.0/27 is subnetted, 1 subnets
B        209.165.202.128 [20/0] via 10.10.12.2, 02:26:03
      10.0.0.0/8 is variably subnetted, 10 subnets, 4 masks
O        10.10.13.0/25 [110/2 ] via 10.10.10.1, 00:00:04, GigabitEthernet0/0
O        10.10.13.128/28 [110/2] via 10.10.10.5, 00:00:12, GigabitEthernet0/1
O        10.10.13.144/28 [110/2] via 10.10.10.9, 00:01:57, GigabitEthernet0/2
O        10.10.13.160/29 [110/2] via 10.10.10.5, 00:00:12, GigabitEthernet0/1
O        10.10.13.208/29 [110/2] via 10.10.10.13, 00:01:57, GigabitEthernet0/3
S*    0.0.0.0/0 [1/0] via 10.10.11.2
```

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Refer to the exhibit. To which device does Router1 send packets that are destined to host 10.10.13.165?

A. Router2
B. Router3
C. Router4
D. Router5

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 152
R1 has learned route 10.10.10.0/24 via numerous routing protocols. Which route is installed?

A. route with the next hop that has the highest IP
B. route with the lowest cost
C. route with the lowest administrative distance
D. route with the shortest prefix length

Correct Answer: C

Section: IP Connectivity
Explanation

Explanation/Reference:

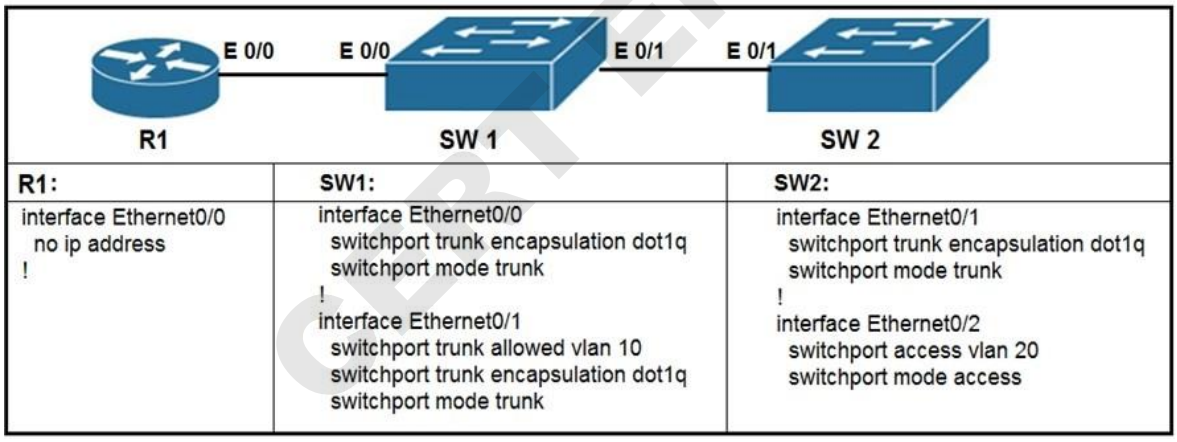
QUESTION 153
Which two minimum parameters must be configured on an active interface to enable OSPFV2 to operate? (Choose two.)

A. OSPF process ID
B. OSPF MD5 authentication key
C. OSPF stub flag
D. IPv6 address
E. OSPF area

Correct Answer: AE
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 154
Refer to the exhibit. What commands are needed to add a subinterface to Ethernet0/0 on R1 to allow for VLAN 20, with IP address 10.20.20.1/24?



R1:	SW1:	SW2:
interface Ethernet0/0 no ip address !	interface Ethernet0/0 switchport trunk encapsulation dot1q switchport mode trunk ! interface Ethernet0/1 switchport trunk allowed vlan 10 switchport trunk encapsulation dot1q switchport mode trunk	interface Ethernet0/1 switchport trunk encapsulation dot1q switchport mode trunk ! interface Ethernet0/2 switchport access vlan 20 switchport mode access

A. R1(config)#interface ethernet0/0
R1(config)#encapsulation dot1q 20
R1(config)#ip address 10.20.20.1 255.255.255.0
B. R1(config)#interface ethernet0/0.20
R1(config)#encapsulation dot1q 20
R1(config)#ip address 10.20.20.1 255.255.255.0
C. R1(config)#interface ethernet0/0.20
R1(config)#ip address 10.20.20.1 255.255.255.0
D. R1(config)#interface ethernet0/0
R1(config)#ip address 10.20.20.1 255.255.255.0

Correct Answer: B
Section: IP Connectivity

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Explanation

Explanation/Reference:

QUESTION 155

```
R1#show ip interface brief
Interface              IP-Address      OK? Method  Status                Protocol
FastEthernet0/0        unassigned      YES NVRAM   administratively down down
GigabitEthernet1/0     192.168.0.1     YES NVRAM   up                    up
GigabitEthernet2/0     10.10.1.10      YES manual  up                    up
GigabitEthernet3/0     10.10.10.20     YES manual  up                    up
GigabitEthernet4/0     unassigned      YES NVRAM   administratively down down
Loopback0              172.16.15.10    YES manual
```

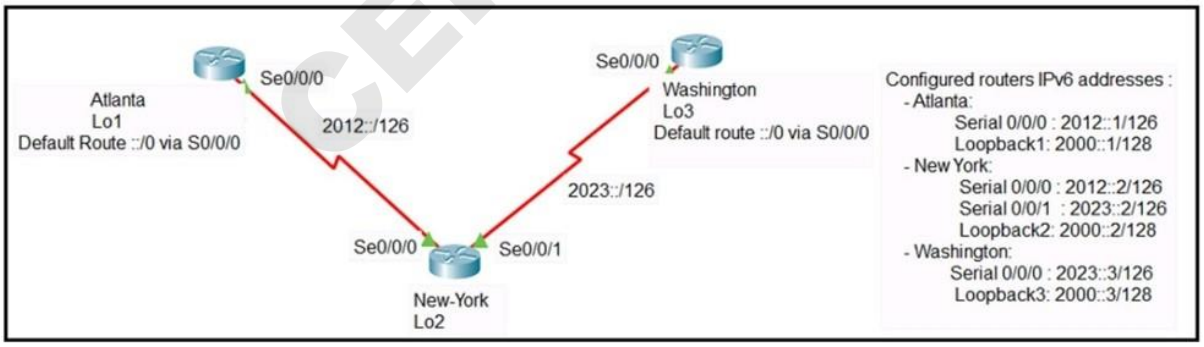
Refer to the exhibit. What does router R1 use as its OSPF router-ID?

A. 10.10.1.10
B. 10.10.10.20
C. 172.16.15.10
D. 192.168.0.1

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
OSPF uses the following criteria to select the router ID:
1. Manual configuration of the router ID (via the “router-id x.x.x.x” command under OSPF router configuration mode).
2. Highest IP address on a loopback interface.
3. Highest IP address on a non-loopback and active (no shutdown) interface.

QUESTION 156



Refer to the exhibit. The loopback1 interface of the Atlanta router must reach the loopback3 interface of the Washington router. Which two static host routes must be configured on the New York router? (Choose two.)

A. ipv6 route 2000::3/128 s0/0/0
B. ipv6 route 2000::1/128 s0/0/1
C. ipv6 route 2000::1/128 2012::1
D. ipv6 route 2000::1/128 2012::2
E. ipv6 route 2000::3/128 2023::3

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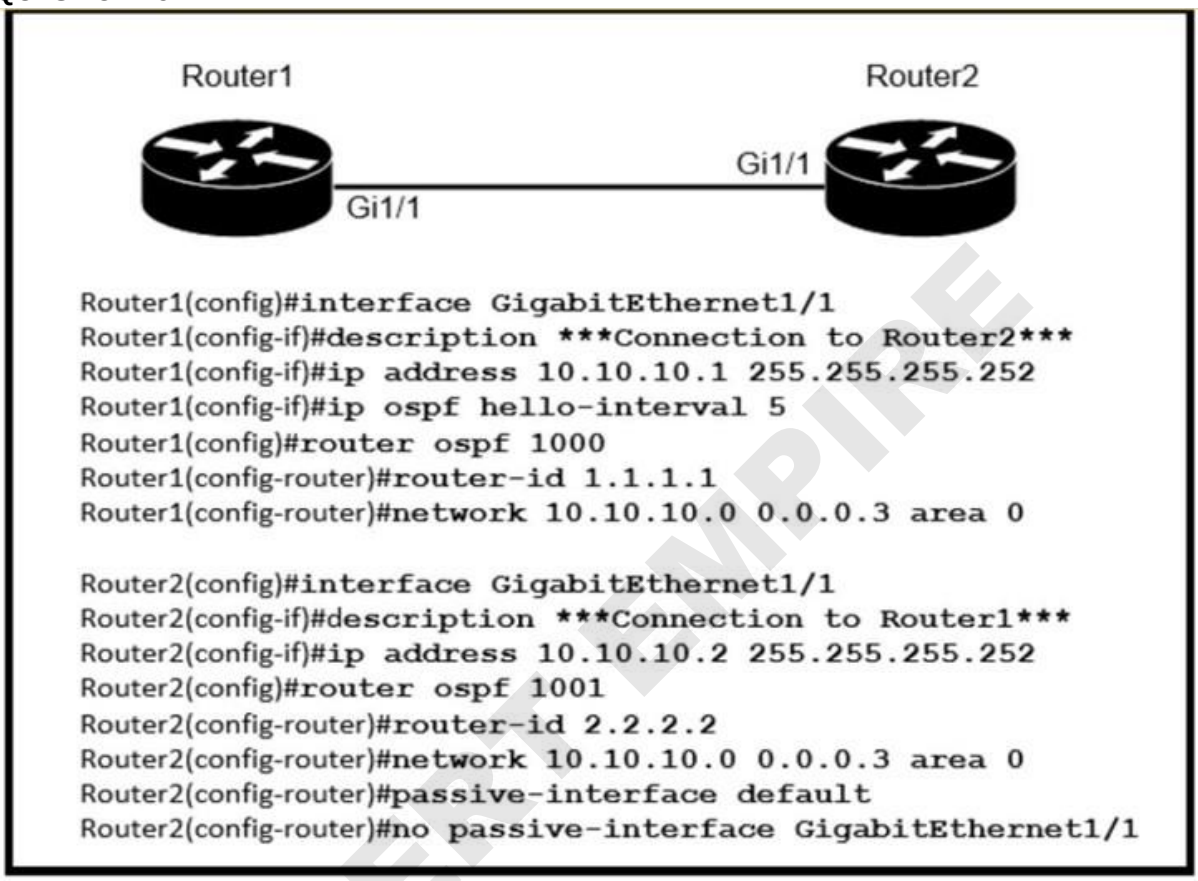
Correct Answer: CE
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 157




```
Router1(config)#interface GigabitEthernet1/1
Router1(config-if)#description ***Connection to Router2***
Router1(config-if)#ip address 10.10.10.1 255.255.255.252
Router1(config-if)#ip ospf hello-interval 5
Router1(config)#router ospf 1000
Router1(config-router)#router-id 1.1.1.1
Router1(config-router)#network 10.10.10.0 0.0.0.3 area 0

Router2(config)#interface GigabitEthernet1/1
Router2(config-if)#description ***Connection to Router1***
Router2(config-if)#ip address 10.10.10.2 255.255.255.252
Router2(config)#router ospf 1001
Router2(config-router)#router-id 2.2.2.2
Router2(config-router)#network 10.10.10.0 0.0.0.3 area 0
Router2(config-router)#passive-interface default
Router2(config-router)#no passive-interface GigabitEthernet1/1
```

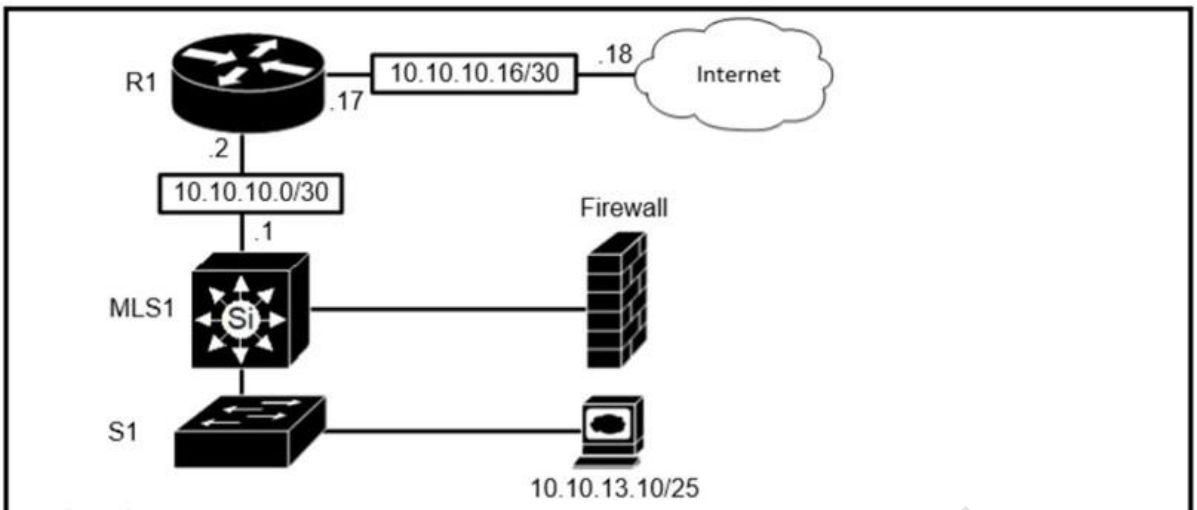
Refer to the exhibit. After the configuration is applied, the two routers fail to establish an OSPF neighbor relationship. What is the reason for the problem?

A. The OSPF process IDs are mismatched
B. The network statement on Router1 is misconfigured
C. Router2 is using the default hello timer
D. The OSPF router IDs are mismatched

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 158




```
R1#sh ip ro
Gateway of last resort is 10.10.10.18 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C       10.10.10.0/30 is directly connected, FastEthernet0/1
O       10.10.13.0/25 [110/6576] via 10.10.10.1, 06:58:21, FastEthernet0/1
C       10.10.10.16/30 is directly connected, FastEthernet0/24
O       10.10.13.144/28 [110/110] via 10.10.10.1, 06:58:21, FastEthernet0/1
B*   0.0.0.0/0 [20/0] via 10.10.10.18, 01:17:58
```

Refer to the exhibit. Which route type is configured to reach the Internet?

A. floating static route
B. host route
C. network route
D. default route

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 159

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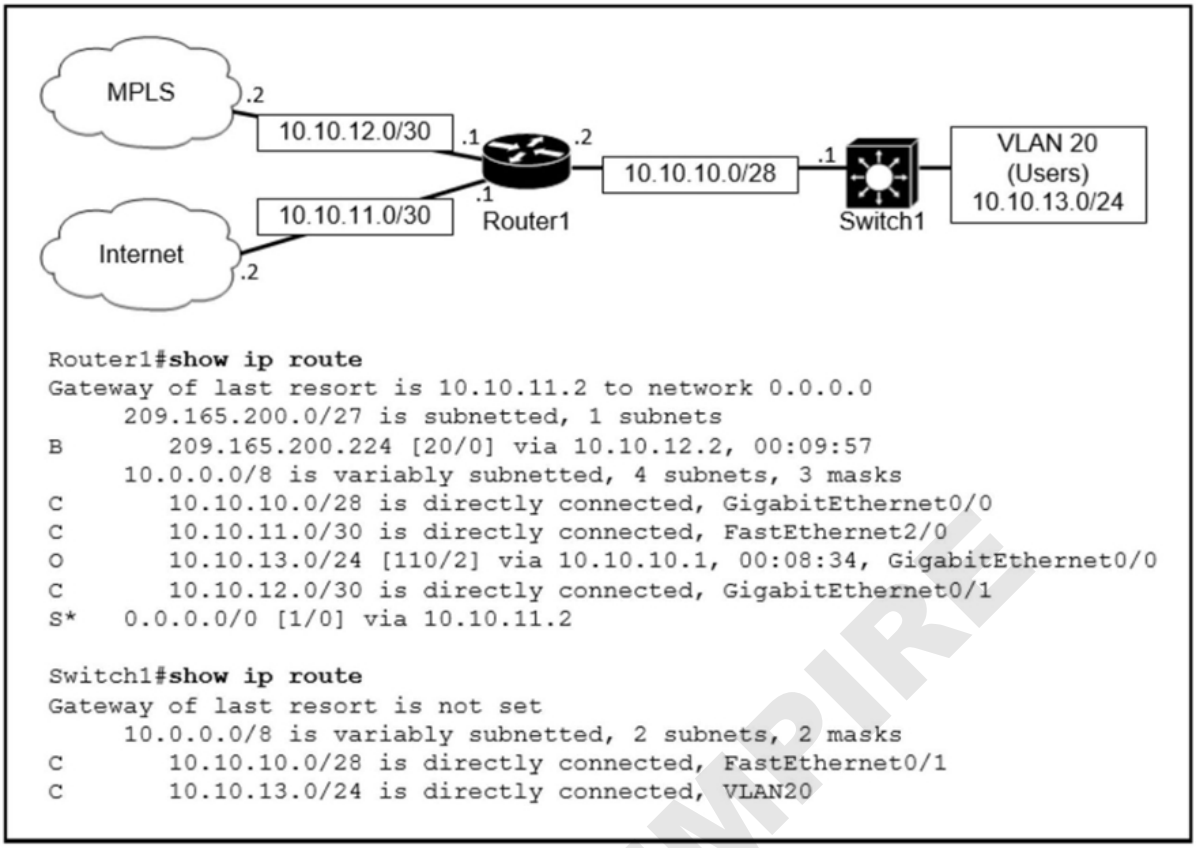


```
Router1#show ip route
Gateway of last resort is 10.10.11.2 to network 0.0.0.0
     209.165.200.0/27 is subnetted, 1 subnets
B       209.165.200.224 [20/0] via 10.10.12.2, 00:09:57
     10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C       10.10.10.0/28 is directly connected, GigabitEthernet0/0
C       10.10.11.0/30 is directly connected, FastEthernet2/0
O       10.10.13.0/24 [110/2] via 10.10.10.1, 00:08:34, GigabitEthernet0/0
C       10.10.12.0/30 is directly connected, GigabitEthernet0/1
S*   0.0.0.0/0 [1/0] via 10.10.11.2

Switch1#show ip route
Gateway of last resort is not set
     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.10.10.0/28 is directly connected, FastEthernet0/1
C       10.10.13.0/24 is directly connected, VLAN20
```

Refer to the exhibit. Which path is used by the router for Internet traffic?

A. 209.165.200.0/27
B. 0.0.0.0/0
C. 10.10.13.0/24
D. 10.10.10.0/28

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 160
When OSPF learns multiple paths to a network, how does it select a route?

A. For each existing interface, it adds the metric from the source router to the destination to calculate the route with the lowest bandwidth.
B. It counts the number of hops between the source router and the destination to determine the route with the lowest metric.
C. It divides a reference bandwidth of 100 Mbps by the actual bandwidth of the exiting interface to calculate the route with the lowest cost.
D. It multiplies the active K values by 256 to calculate the route with the lowest metric.

Correct Answer: C
Section: IP Connectivity

CERT EMPIRE

Explanation

Explanation/Reference:

QUESTION 161
When a floating static route is configured, which action ensures that the backup route is used when the primary route fails?

A. The administrative distance must be higher on the primary route so that the backup route becomes secondary.
B. The **default-information originate** command must be configured for the route to be installed into the routing table.
C. The floating static route must have a lower administrative distance than the primary route so it is used as a backup.
D. The floating static route must have a higher administrative distance than the primary route so it is used as a backup

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 162

```
Designated Router (ID) 10.11.11.11, Interface address 10.10.10.1
Backup Designated router (ID) 10.3.3.3, Interface address 10.10.10.3
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
oob-resync timeout 40
Hello due in 00:00:08
Supports Link-local Signaling (LLS)
Cisco NSF helper support enabled
IETF NSF helper support enabled
Index 1/1/1, flood queue length 0
Next 0x0(0)/0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 6
Last flood scan time is 0 msec, maximum is 1 msec
Neighbor Count is 3, Adjacent neighbor count is 3
Adjacent with neighbor 10.1.1.4
Adjacent with neighbor 10.2.2.2
Adjacent with neighbor 10.3.3.3 (Backup Designated Router)
Suppress hello for 0 neighbor(s)
```

Refer to the exhibit. The **show ip ospf interface** command has been executed on R1. How is OSPF configured?

A. A point-to-point network type is configured.
B. The interface is not participating in OSPF.

C. The default Hello and Dead timers are in use.
D. There are six OSPF neighbors on this interface.

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
From the output we can see there are Designated Router & Backup Designated Router for this OSPF domain so this is a broadcast network (point-to-point and point-to-multipoint networks do not elect DR & BDR).

By default, the timers on a broadcast network (Ethernet, point-to-point and point-to-multipoint) are 10 seconds hello and 40 seconds dead. The timers on a non-broadcast network are 30 seconds hello 120 seconds dead.

From the line "Neighbor Count is 3", we learn there are four OSPF routers in this OSPF domain.

Reference: https://www.cisco.com/c/en/us/support/docs/ip/open-shortest-path-first-ospf/13689-17.html

QUESTION 163
A user configured OSPF and advertised the Gigabit Ethernet interface in OSPF. By default, to which type of OSPF network does this interface belong?

A. point-to-multipoint
B. point-to-point
C. broadcast
D. nonbroadcast

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The Broadcast network type is the default for an OSPF enabled ethernet interface (while Point-to-Point is the default OSPF network type for Serial interface with HDLC and PPP encapsulation).

Reference: https://www.oreilly.com/library/view/cisco-ios-cookbook/0596527225/ch08s15.html

QUESTION 164
Which attribute does a router use to select the best path when two or more different routes to the same destination exist from two different routing protocols?

A. dual algorithm
B. metric
C. administrative distance
D. hop count

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Administrative distance is the feature used by routers to select the best path when there are two or more different routes to the same destination from different routing protocols. Administrative distance defines the

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reliability of a routing protocol.

QUESTION 165
Router A learns the same route from two different neighbors; one of the neighbor routers is an OSPF neighbor, and the other is an EIGRP neighbor.

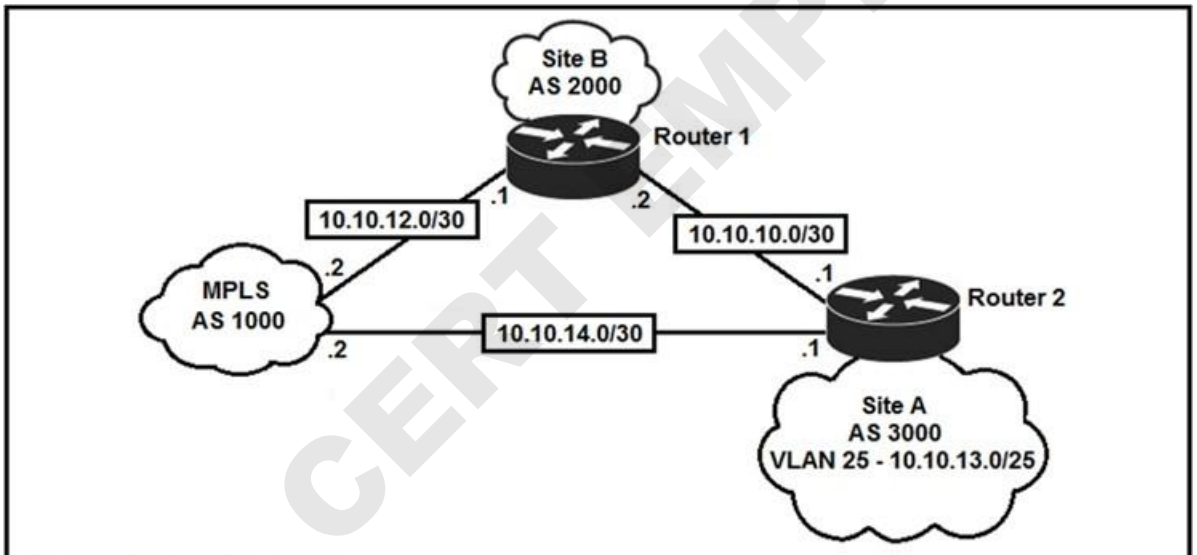
What is the administrative distance of the route that will be installed in the routing table?

A. 20
B. 90
C. 110
D. 115

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The Administrative distance (AD) of EIGRP is 90 while the AD of OSPF is 110 so EIGRP route will be chosen to install into the routing table.

QUESTION 166




```
Router1#show ip route
Gateway of last resort is 10.10.11.2 to network 0.0.0.0
     10.0.0.0/8 is variably subnetted, 8 subnets, 4 masks
C       10.10.10.0/28 is directly connected, GigabitEthernet0/0
C       10.10.11.0/30 is directly connected, FastEthernet2/0
O       10.10.13.0/25 [110/2] via 10.10.10.1, 00:00:17, GigabitEthernet0/0
O       10.10.13.128/28 [110/2] via 10.10.10.1, 00:33:38, GigabitEthernet0/0
O       10.10.13.144/28 [110/2] via 10.10.10.1, 00:33:38, GigabitEthernet0/0
O       10.10.13.160/29 [110/2] via 10.10.10.1, 00:33:38, GigabitEthernet0/0
O       10.10.13.208/29 [110/2] via 10.10.10.1, 00:33:39, GigabitEthernet0/0
O       10.10.13.252/30 [110/2] via 10.10.10.1, 00:33:39, GigabitEthernet0/0
S*   0.0.0.0/0 [1/0] via 10.10.11.2
```

Refer to the exhibit. An engineer is bringing up a new circuit to the MPLS provider on the Gi0/1 interface of Router 1. The new circuit uses eBGP and learns the route to VLAN25 from the BGP path.

What is the expected behavior for the traffic flow for route 10.10.13.0/25?

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A. Traffic to 10.10.13.0/25 is load balanced out of multiple interfaces.
B. Traffic to 10.10.13.0/25 is asymmetrical.
C. Route 10.10.13.0/25 is updated in the routing table as being learned from interface Gi0/1.
D. Route 10.10.13.0/25 learned via the Gi0/0 interface remains in the routing table.

Correct Answer: D
Section: IP Connectivity
Explanation

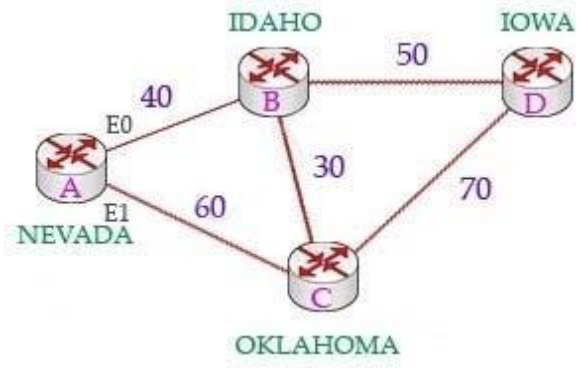
Explanation/Reference:
Explanation:
The AD of eBGP (20) is smaller than that of OSPF (110) so the route to 10.10.13.0/25 will be updated as being learned from the new BGP path.

QUESTION 167
Which two actions influence the EIGRP route selection process? (Choose two.)

A. The advertised distance is calculated by a downstream neighbor to inform the local router of the bandwidth on the link.
B. The router calculates the feasible distance of all paths to the destination route.
C. The router must use the advertised distance as the metric for any given route.
D. The router calculates the best backup path to the destination route and assigns it as the feasible successor.
E. The router calculates the reported distance by multiplying the delay on the exiting interface by 256.

Correct Answer: BD
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The reported distance (or advertised distance) is the cost from the neighbor to the destination. It is calculated from the router advertising the route to the network. For example in the topology below, suppose router A & B are exchanging their routing tables for the first time. Router B says “Hey, the best metric (cost) from me to IOWA is 50 and the metric from you to IOWA is 90” and advertises it to router A. Router A considers the first metric (50) as the Advertised distance. The second metric (90), which is from NEVADA to IOWA (through IDAHO), is called the Feasible distance.



The reported distance is calculated in the same way of calculating the metric. By default (K1 = 1, K2 = 0, K3 = 1, K4 = 0, K5 = 0), the metric is calculated as follows:

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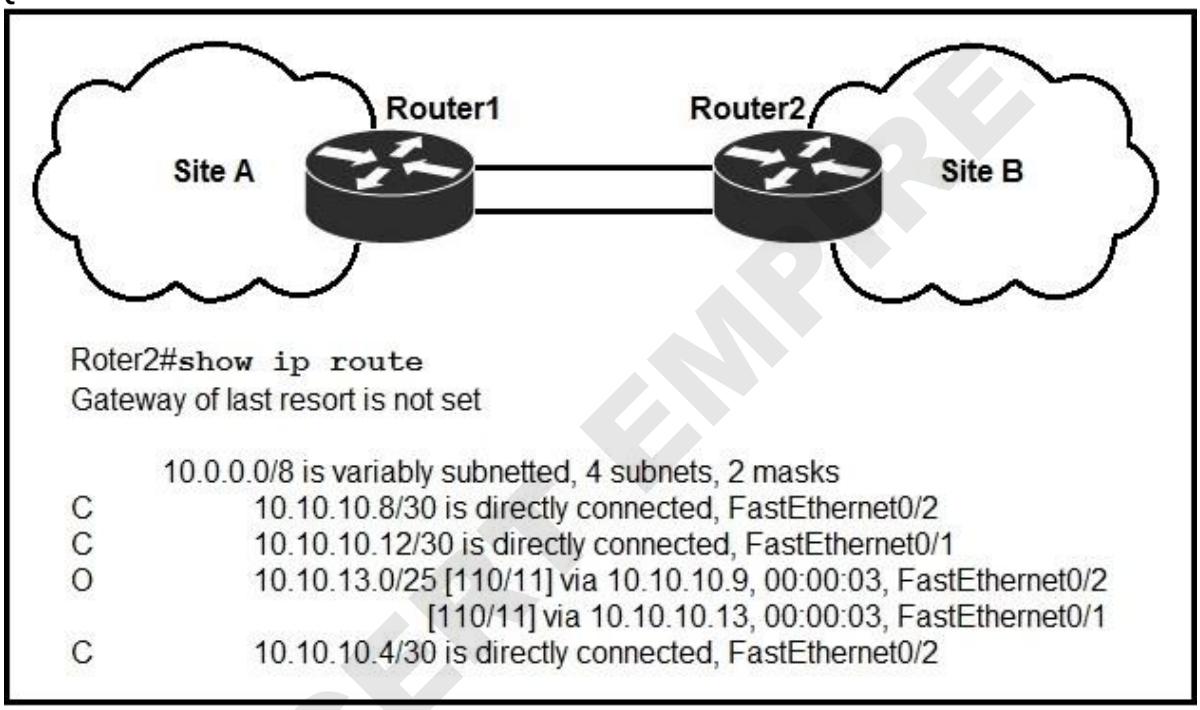
$$metric = \left[\frac{10{,}000{,}000}{\text{slowest bandwidth[in kbps]}} + \frac{\text{sum of delay[in µsec]}}{10}\right] * 256$$

Feasible successor is the backup route. To be a feasible successor, the route must have an Advertised distance (AD) less than the Feasible distance (FD) of the current successor route.

Feasible distance (FD): The sum of the AD plus the cost between the local router and the next-hop router. The router must calculate the FD of all paths to choose the best path to put into the routing table.

Note: Although the new CCNA exam does not have EIGRP topic but you should learn the basic knowledge of this routing protocol.

QUESTION 168



Refer to the exhibit. If OSPF is running on this network, how does Router2 handle traffic from Site B to 10.10.13.128/25 at Site A?

A. It sends packets out of interface Fa0/1 only.
B. It sends packets out of interface Fa0/2 only.
C. It load-balances traffic out of Fa0/1 and Fa0/2.
D. It cannot send packets to 10.10.13.128/25.

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Router2 does not have an entry for the subnet 10.10.13.128/25. It only has an entry for 10.10.13.0/25, which ranges from 10.10.13.0 to 10.10.13.127.

QUESTION 169

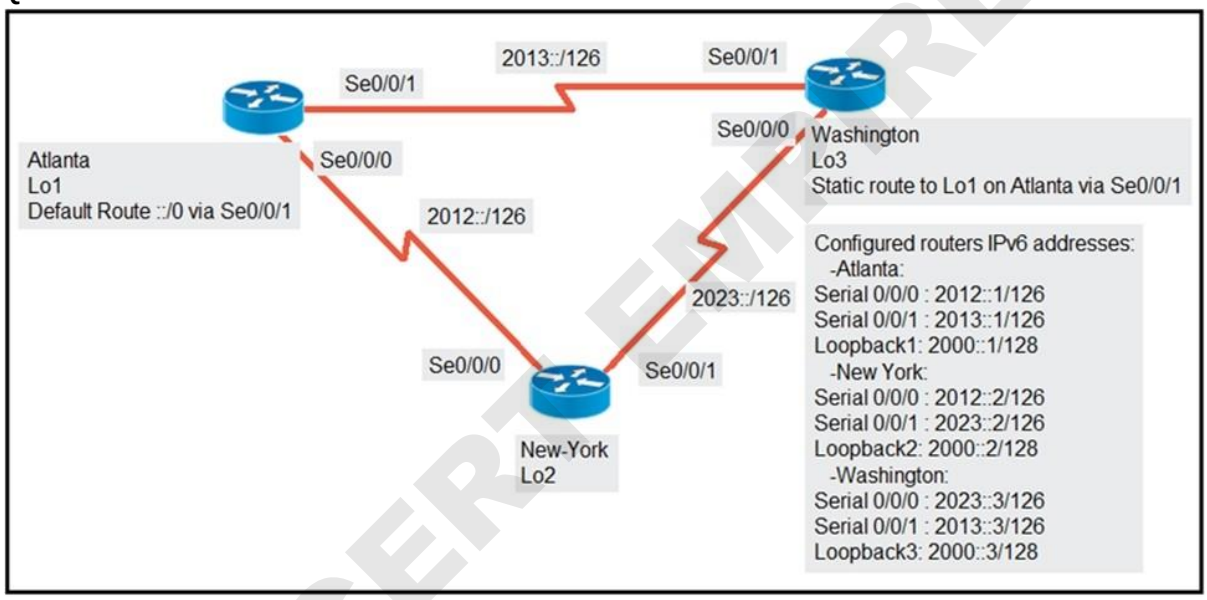
Which two outcomes are predictable behaviors for HSRP? (Choose two.)

A. The two routers negotiate one router as the active router and the other as the standby router.
B. The two routers share the same interface IP address, and default gateway traffic is load-balanced between them.
C. The two routers synchronize configurations to provide consistent packet forwarding.
D. Each router has a different IP address, both routers act as the default gateway on the LAN, and traffic is load-balanced between them.
E. The two routers share a virtual IP address that is used as the default gateway for devices on the LAN.

Correct Answer: AE
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 170



Refer to the exhibit. An engineer is configuring the New York router to reach the Lo1 interface of the Atlanta router using interface Se0/0/0 as the primary path. Which two commands must be configured on the New York router so that it reaches the Lo1 interface of the Atlanta router via Washington when the link between New York and Atlanta goes down? (Choose two.)

A. **Ipv6 route 2000::1/128 2012::1**
B. **Ipv6 route 2000::1/128 2012::1 5**
C. **Ipv6 route 2000::1/128 2012::2**
D. **Ipv6 route 2000::1/128 2023::2 5**
E. **Ipv6 route 2000::1/128 2023::3 5**

Correct Answer: AE
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:

Floating static routes are static routes that have an administrative distance greater than the administrative distance (AD) of another static route or dynamic routes. By default a static route has an AD of 1 then floating static route must have the AD greater than 1. Floating static route has a manually configured administrative distance greater than that of the primary route and therefore would not be in the routing table until the primary route fails.

QUESTION 171
How does HSRP provide first hop redundancy?

A. It load-balances Layer 2 traffic along the path by flooding traffic out all interfaces configured with the same VLAN.
B. It uses a shared virtual MAC and a virtual IP address to a group of routers that serve as the default gateway for hosts on a LAN.
C. It forwards multiple packets to the same destination over different routed links in the data path.
D. It load-balances traffic by assigning the same metric value to more than one route to the same destination in the IP routing table.

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:
Reference:
https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ipapp_fhrp/configuration/xe-16/fhp-xe-16-book/fhp-hsrp-mgo.html

QUESTION 172
Refer to the exhibit. What action establishes the OSPF neighbor relationship without forming an adjacency?

```
R1# sh ip ospf int gig0/0
Gig0/0 is up, line protocol is up
        Internet Address 10.201.24.8/28, Area 1, Attached via Network Statement
        Process ID 100, Router ID 192.168.1.1, Network Type BROADCAST, Cost: 1
        Topology-MTID    Cost    Disabled    Shutdown    Topology Name
                0          1        no          no          Base
        Transmit Delay is 1 sec, State DR, Priority 1
        Designated Router (ID) 192.168.1.1, Interface address 10.201.24.8
        No backup designated router on this network
        Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
            oob-resync timeout 40
            Hello due in 00:00:07

R2#sh ip ospf int gig0/0
gig0/0 is up, line protocol is up
        Internet Address 10.201.24.1/28, Area 1
        Process ID 100, Router ID 172.16.1.1, Network Type BROADCAST, Cost: 1
        Transmit Delay is 1 sec, State DR, Priority 1
        Designated Router (ID) 172.16.1.1, Interface address 10.201.24.1
        No backup designated router on this network
        Timer intervals configured, Hello 20, Dead 80, Wait 80, Retransmit 5
```

A. modify hello interval
B. modify process ID
C. modify priority

D. modify network type

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 173
Which command must you enter to guarantee that an HSRP router with higher priority becomes the HSRP primary router after it is reloaded?

A. standby 10 preempt
B. standby 10 version 1
C. standby 10 priority 150
D. standby 10 version 2

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The “preempt” command enables the HSRP router with the highest priority to immediately become the active router.

QUESTION 174
Which command should you enter to verify the priority of a router in an HSRP group?

A. show hsrp
B. show sessions
C. show interfaces
D. show standby

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The following is sample output from the show standby command:

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```
Router# show standby

Ethernet0/1 - Group 1
  State is Active
   2 state changes, last state change 00:30:59
  Virtual IP address is 10.1.0.20
   Secondary virtual IP address 10.1.0.21
  Active virtual MAC address is 0004.4d82.7981
   Local virtual MAC address is 0004.4d82.7981 (bia)
  Hello time 4 sec, hold time 12 sec
   Next hello sent in 1.412 secs
  Gratuitous ARP 14 sent, next in 7.412 secs
  Preemption enabled, min delay 50 sec, sync delay 40 sec
  Active router is local
  Standby router is 10.1.0.6, priority 75 (expires in 9.184 sec)
  Priority 95 (configured 120)
   Tracking 2 objects, 0 up
      Down Interface Ethernet0/2, pri 15
      Down Interface Ethernet0/3
Group name is "HSRP1" (cfgd)
Follow by groups:
    Et1/0.3 Grp 2 Active 10.0.0.254 0000.0c07.ac02 refresh 30 secs (nex
    Et1/0.4 Grp 2 Active 10.0.0.254 0000.0c07.ac02 refresh 30 secs (nex
  Group name is "HSRP1", advertisement interval is 34 sec
```

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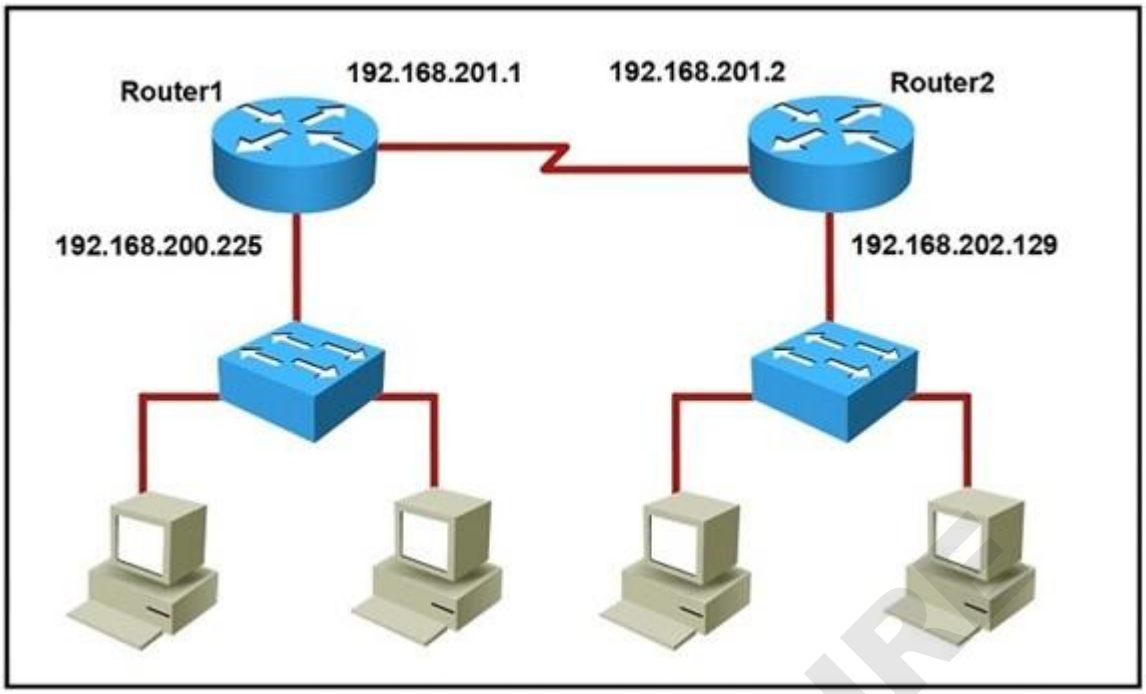
QUESTION 175

Refer to the exhibit. Which command would you use to configure a static route on Router1 to network 192.168.202.0/24 with a nondefault administrative distance?



A. router1(config)#ip route 192.168.202.0 255.255.255.0 192.168.201.2 1
B. router1(config)#ip route 192.168.202.0 255.255.255.0 192.168.201.2 5
C. router1(config)#ip route 1 192.168.201.1 255.255.255.0 192.168.201.2
D. router1(config)#ip route 5 192.168.202.0 255.255.255.0 192.168.201.2

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The default AD of static route is 1 so we need to configure another number for the static route.

QUESTION 176
Which of the following dynamic routing protocols are Distance Vector routing protocols?

A. IS-IS
B. EIGRP
C. OSPF
D. BGP
E. RIP

Correct Answer: BE
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 177
You have configured a router with an OSPF router ID, but its IP address still reflects the physical interface. Which action can you take to correct the problem in the least disruptive way?

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A. Reload the OSPF process
B. Specify a loopback address
C. Reboot the router
D. Save the router configuration

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Once an OSPF Router ID selection is done, it remains there even if you remove it or configure another OSPF Router ID. So the least disruptive way is to correct it using the command “clear ip ospf process”.

QUESTION 178
Which command should you enter to view the error log in an EIGRP for IPv6 environment?

A. show ipv6 eigrp neighbors
B. show ipv6 eigrp topology
C. show ipv6 eigrp traffic
D. show ipv6 eigrp events

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 179
Refer to the exhibit. Which two statements about the network environment of router R1 must be true? (Choose two.)

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```
R1#show ip route
Gateway of last resort is 10.85.33.14 to network 0.0.0.0
D*EX  0.0.0.0/0
          [170/257024] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/257024] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
    10.0.0.0/8 is variably subnetted, 6692 subnets, 20 masks
B         10.0.0.0/8 [20/0] via 10.48.144.14, 1w5d
D EX      10.0.1.0/24
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
D EX      10.0.2.0/23
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
D EX      10.0.4.0/22
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
D EX      10.0.8.0/21
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
D EX      10.0.16.0/20
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
D EX      10.0.32.0/19
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
B         10.1.96.0/23 [20/0] via 10.111.33.217, 2w3d
B         10.1.96.0/24 [20/0] via 10.111.33.217, 2w3d
B         10.1.97.0/24 [20/0] via 10.111.33.217, 4w5d
D EX      10.1.255.240/28
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
D EX      10.2.0.0/16
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
B         10.2.0.0/24 [20/0] via 10.111.33.217, 4w5d
B         10.2.96.0/23 [20/0] via 10.48.144.14, 4w5d
B         10.2.96.0/24 [20/0] via 10.48.144.14, 3w1d
B         10.2.97.0/24 [20/0] via 10.48.144.14, 4w5d
D EX      10.3.0.0/16
          [170/51968] via 10.85.33.14, 7w0d, TenGigabitEthernet0/2/0.100
          [170/51968] via 10.85.33.10, 7w0d, TenGigabitEthernet0/1/0.100
B         10.5.1.0/24 [20/0] via 10.111.33.217, 1w4d
B         10.5.5.0/24 [20/0] via 10.111.33.217, 4w3d
B         10.6.0.0/24 [20/0] via 10.111.33.217, 3w3d
```

A. The EIGRP administrative distance was manually changed from 90 to 170.
B. There are 20 different network masks within the 10.0.0.0/8 network.
C. Ten routes are equally load-balanced between Te0/1/0.100 and Te0/2/0.100.
D. The 10.0.0.0/8 network was learned via external EIGRP.
E. A static default route to 10.85.33.14 was defined.

Correct Answer: BC
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 180
Which two statements about exterior routing protocols are true? (Choose two.)

A. They determine the optimal within an autonomous system.
B. They determine the optimal path between autonomous systems.
C. BGP is the current standard exterior routing protocol.
D. Most modern networking supports both EGP and BGP for external routing.

E. Most modern network routers support both EGP and EIGRP for external routing.

Correct Answer: BC
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 181
You have two paths for the 10.10.10.0 network - one that has a feasible distance of 3072 and the other of 6144.

What do you need to do to load balance your EIGRP routes?

A. Change the maximum paths to 2
B. Change the configuration so they both have the same feasible distance
C. Change the variance for the path that has a feasible distance of 3072 to 2
D. Change the IP addresses so both paths have the same source IP address

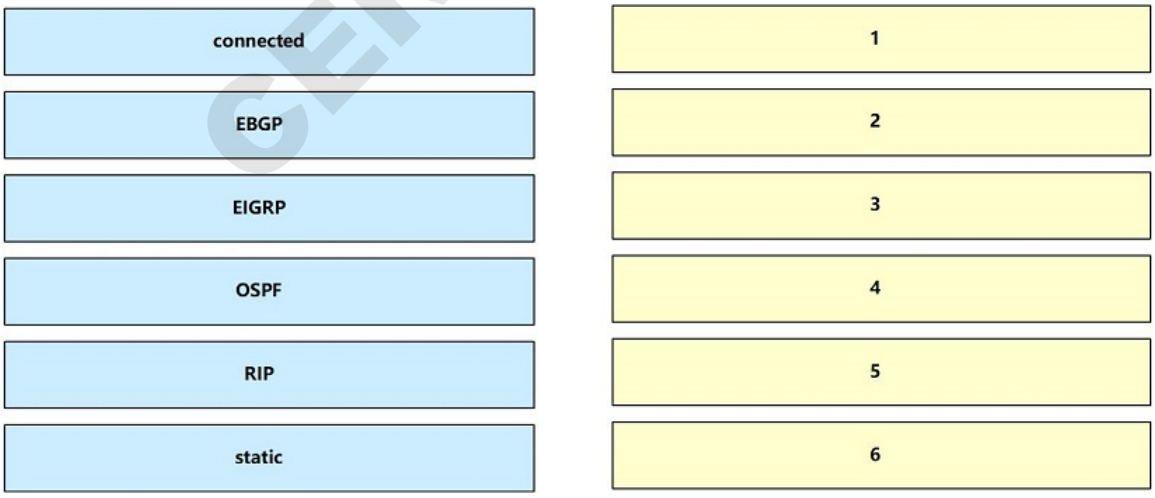
Correct Answer: BC
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 182
DRAG DROP

Drag each route source from the left to the numbers on the right. Beginning with the lowest and ending with the highest administrative distance.

Select and Place:



Correct Answer:

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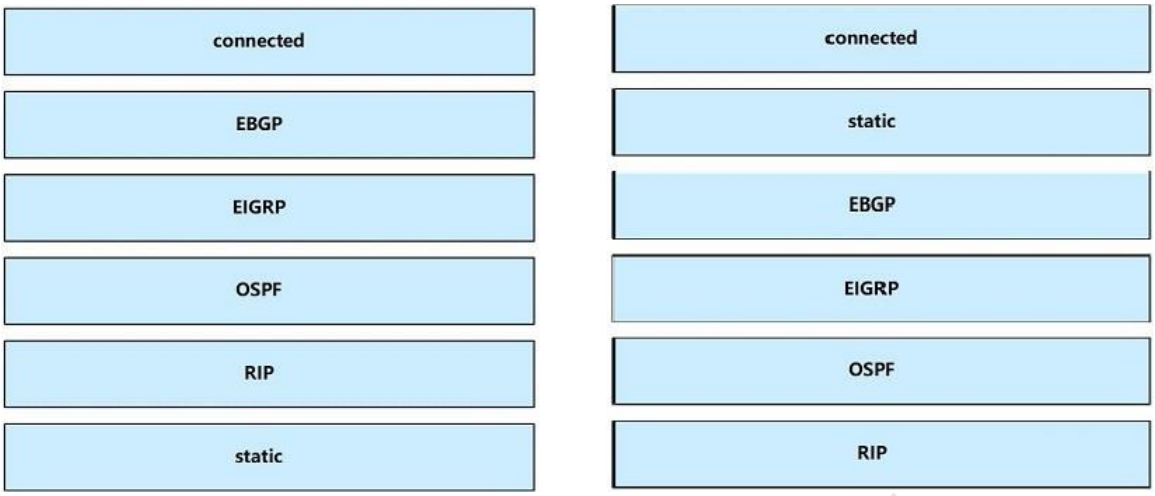

Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 183
Which two circumstances can prevent two routers from establishing an OSPF neighbor adjacency? (Choose two.)

A. mismatched autonomous system numbers
B. an ACL blocking traffic from multicast address 224.0.0.10
C. mismatched process IDs
D. mismatched hello timers and dead timers
E. use of the same router ID on both devices

Correct Answer: DE
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 184
Which three describe the reasons large OSPF networks use a hierarchical design? (Choose three.)

A. to speed up convergence
B. to reduce routing overhead
C. to lower costs by replacing routers with distribution layer switches
D. to decrease latency by increasing bandwidth
E. to confine network instability to single areas of the network
F. to reduce the complexity of router configuration

Correct Answer: ABE
Section: IP Connectivity
Explanation

CERT EMPIRE

Explanation/Reference:

QUESTION 185
Refer to the exhibit. If R1 receives a packet destined to 172.16.1.1, to which IP address does it send the packet?

```
R1@show ip route
Codes:  C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2
        i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        ia - IS-IS inter area, * - candidate default, U - per-user static route
        o - ODR, P - periodic downloaded static route

Gateway of last resort is 192.168.14.4 to network 0.0.0.0

C   192.168.12.0/24 is directly connected, FastEthernet0/0
C   192.168.13.0/24 is directly connected, FastEthernet0/1
C   192.168.14.0/24 is directly connected, FastEthernet1/0
    192.168.10.0/24 is variably subnetted, 3 subnets, 3 masks
O       192.168.10.0/24 [110/2] via 192.168.14.4, 00:02:01, FastEthernet1/0
O       192.168.10.32/27 [110/11] via 192.168.13.3, 00:00:52, FastEthernet0/1
O       192.168.0.0/16 [110/2] via 192.168.15.5, 00:05:01, FastEthernet1/1
D       192.168.10.1/32 [90/52778] via 192.168.12.2, 00:03:44, FastEthernet0/0
O*E2 0.0.0.0/0 [110/1] via 192.168.14.4, 00:00:10, FastEthernet1/0
```

A. 192.168.14.4
B. 192.168.12.2
C. 192.168.13.3
D. 192.168.15.5

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 186
Refer to the exhibit. On R1 which routing protocol is in use on the route to 192.168.10.1?

CERT ENTRE

```
R1#show ip route
Codes:  C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2
        i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        ia - IS-IS inter area, * - candidate default, U - per-user static route
        o - ODR, P - periodic downloaded static route

Gateway of last resort is 192.168.14.4 to network 0.0.0.0

C   192.168.12.0/24 is directly connected, FastEthernet0/0
C   192.168.13.0/24 is directly connected, FastEthernet0/1
C   192.168.14.0/24 is directly connected, FastEthernet1/0
    192.168.10.0/24 is variably subnetted, 3 subnets, 3 masks
O       192.168.10.0/24 [110/2] via 192.168.14.4, 00:02:01, FastEthernet1/0
O       192.168.10.32/27 [110/11] via 192.168.13.3, 00:00:52, FastEthernet0/1
O       192.168.0.0/16 [110/2] via 192.168.15.5, 00:05:01, FastEthernet1/1
D       192.168.10.1/32 [90/52778] via 192.168.12.2, 00:03:44, FastEthernet0/0
O*E2 0.0.0.0/0 [110/1] via 192.168.14.4, 00:00:10, FastEthernet1/0
```

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

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

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QUESTION 187
Refer to the exhibit. Which Command do you enter so that R1 advertises the loopback0 interface to the BGP Peers?

```
R1
interface Loopback0
    ip address 172.16.1.33 255.255.255.224

interface FastEthernet0/0
    ip address 192.168.12.1 255.255.255.0

router bgp 100
neighbor 192.168.12.2 remote-as 100
```

A. Network 172.16.1.32 mask 255.255.255.224
B. Network 172.16.1.0 0.0.0.255
C. Network 172.16.1.32 255.255.255.224
D. Network 172.16.1.33 mask 255.255.255.224
E. Network 172.16.1.32 mask 0.0.0.31
F. Network 172.16.1.32 0.0.0.31

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 188
Refer to exhibit. What Administrative distance has route to 192.168.10.1?

```
R1@show ip route
Codes:  C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2
        i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        ia - IS-IS inter area, * - candidate default, U - per-user static route
        o - ODR, P - periodic downloaded static route

Gateway of last resort is 192.168.14.4 to network 0.0.0.0

C   192.168.12.0/24 is directly connected, FastEthernet0/0
C   192.168.13.0/24 is directly connected, FastEthernet0/1
C   192.168.14.0/24 is directly connected, FastEthernet1/0
    192.168.10.0/24 is variably subnetted, 3 subnets, 3 masks
O       192.168.10.0/24 [110/2] via 192.168.14.4, 00:02:01, FastEthernet1/0
O       192.168.10.32/27 [110/11] via 192.168.13.3, 00:00:52, FastEthernet0/1
O       192.168.0.0/16 [110/2] via 192.168.15.5, 00:05:01, FastEthernet1/1
D       192.168.10.1/32 [90/52778] via 192.168.12.2, 00:03:44, FastEthernet0/0
O*E2 0.0.0.0/0 [110/1] via 192.168.14.4, 00:00:10, FastEthernet1/0
```

A. 1
B. 90
C. 110
D. 120

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 189
Which value is used to determine the active router in an HSRP default configuration?

A. Router loopback address

B. Router IP address
C. Router priority
D. Router tracking number

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Q. If there is no priority configured for a standby group, what determines which router is active?
A. The priority field is used to elect the active router and the standby router for the specific group. In the case of an equal priority, the router with the highest IP address for the respective group is elected as active. Furthermore, if there are more than two routers in the group, the second highest IP address determines the standby router and the other router/routers are in the listen state.

QUESTION 190
Refer to the exhibit. If RTR01 is configured as shown, which three addresses will be received by other routers that are running EIGRP on the network? (Choose three.)

```
RTR01 (config) #router eigrp 103
RTR01 (config-router) #network 10.4.3.0
RTR01 (config-router) #network 172.16.4.0
RTR01 (config-router) #network 192.168.2.0
RTR01 (config-router) #auto-summary
```

A. 192.168.2.0
B. 10.4.3.0
C. 10.0.0.0
D. 172.16.0.0
E. 172.16.4.0
F. 192.168.0.0

Correct Answer: ACD
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 191
Which configuration command can you apply to a HSRP router so that its local interface becomes active if all other routers in the group fail?

A. no additional config is required
B. standby 1 track ethernet
C. standby 1 preempt
D. standby 1 priority 250

Correct Answer: A

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Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Simply because that will be the default behavior routers would follow in the event all other routers in the HSRP group fail, then it would not keep attributes such as priority or preemption. What preemption does in summary is to make sure that the configured Priority on all routers within the same HSRP group is always respected. That is, if R1 is configured on the HSRP group with a priority of 150 but he stands as active since all other routers currently subscribed to that group have a priority 150, then will router will preempt the current active router and will take over hence becoming the new active router.
With preemption disabled, the new router does not preempt the current active router, unless routers in the group have to renegotiate their roles based on each router's priority at the time of negotiation.

QUESTION 192
Which two statements about eBGP neighbor relationships are true? (Choose two.)

A. The two devices must reside in different autonomous systems
B. Neighbors must be specifically declared in the configuration of each device
C. They can be created dynamically after the network statement is configured
D. The two devices must reside in the same autonomous system
E. The two devices must have matching timer settings

Correct Answer: AB
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 193
Refer to the exhibit. How will the router handle a packet destined for 192.0.2.156?

```
router#show ip route
      Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP, D - EIGRP
      EX - EIGRP external, O - OSPF, IA - OSPF inter area, N1 - OSPF NSSA external type 1,
      N2 - OSPF NSSA external type 2, E1 - OSPF external type 1, E2 - OSPF external type 2,
      E - EGP, i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default, U - per-user
      static route, o - ODR

Gateway of last resort is 192.168.4.1 to network 0.0.0.0

  10.0.0.0/24 is subnetted, 3 subnets
C          10.0.2.0 is directly connected, Ethernet1
D          10.0.3.0 [90/2195456] via 192.168.1.2, 00:03:01, Serial0
D          10.0.4.0 [90/2195456] via 192.168.3.1, 00:03:01, Serial1
C       192.168.1.0/24 is directly connected, Serial0
D       192.168.2.0/24 [90/2681856] via 192.168.1.2, 00:03:01, Serial0
                       [90/2681856] via 192.168.3.1, 00:03:01, Serial1
C       192.168.3.0/24 is directly connected, Serial1
C       192.168.4.0/24 is directly connected, Serial2
```

A. The router will forward the packet via either Serial0 or Serial1.

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B. The router will return the packet to its source.
C. The router will forward the packet via Serial2.
D. The router will drop the packet.

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 194
Which statements describe the routing protocol OSPF? (Choose three.)

A. It supports VLSM.
B. It is used to route between autonomous systems.
C. It confines network instability to one area of the network.
D. It increases routing overhead on the network.
E. It allows extensive control of routing updates.
F. It is simpler to configure than RIP v2.

Correct Answer: ACE
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The OSPF protocol is based on link-state technology, which is a departure from the Bellman-Ford vector based algorithms used in traditional Internet routing protocols such as RIP. OSPF has introduced new concepts such as authentication of routing updates, Variable Length Subnet Masks (VLSM), route summarization, and so forth.
OSPF uses flooding to exchange link-state updates between routers. Any change in routing information is flooded to all routers in the network. Areas are introduced to put a boundary on the explosion of link-state updates. Flooding and calculation of the Dijkstra algorithm on a router is limited to changes within an area.

QUESTION 195
Refer to the exhibit. After you apply the given configurations to R1 and R2 you notice that OSPFv3 fails to start.

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```
R1
ipv6 unicast-routing

interface FastEthernet0/0
     no ip address
ipv6 enable
     ipv6 address 3001:DBB:13::1/64
     ipv6 ospf 1 area 0
ipv6 router ospf 1
router-id 172.16.1.1

R2
ipv6 unicast-routing

interface FastEthernet0/0
     no ip address
     ipv6 enable
     ipv6 address 2001:DBB:12::12/64
     ipv6 ospf 1 area 3
ipv6 router ospf 1
router-id 172.16.3.3
```

A. The area numbers on R1 and R2 are mismatched
B. The IPv6 network addresses on R1 and R2 are mismatched
C. The autonomous system numbers on R1 and R2 are mismatched
D. The router ids on R1 and R2 are mismatched

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

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QUESTION 196
Which command is used to display the collection of OSPF link states?

A. show ip ospf link-state
B. show ip ospf lsa database
C. show ip ospf neighbors
D. show ip ospf database

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The "show ip ospf database" command displays the link states. Here is an example:
Here is the lsa database on R2.

R2#show ip ospf database
OSPF Router with ID (2.2.2.2) (Process ID 1)
Router Link States (Area 0)
Link ID ADV Router Age Seq# Checksum Link count2.2.2.2 2.2.2.2 793 0x80000003 0x004F85 210.4.4.4 10.4.4.4 776 0x80000004 0x005643 1111.111.111.111 111.111.111.111 755 0x80000005 0x0059CA 2133.133.133.133 133.133.133.133 775 0x80000005 0x00B5B1 2 Net Link States (Area 0)
Link ID ADV Router Age Seq# Checksum10.1.1.1 111.111.111.111 794 0x80000001 0x001E8B10.2.2.3 133.133.133.133 812 0x80000001 0x004BA910.4.4.1 111.111.111.111 755 0x80000001 0x007F1610.4.4.3 133.133.133.133 775 0x80000001 0x00C31F

QUESTION 197
Refer to the exhibit. A network associate has configured OSPF with the command:

```
City(config-router)# network 192.168.12.64 0.0.0.63 area 0
```

After completing the configuration, the associate discovers that not all the interfaces are participating in OSPF. Which three of the interfaces shown in the exhibit will participate in OSPF according to this configuration statement? (Choose three.)

City#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.12.48	Yes	manual	up	up
FastEthernet0/1	192.168.12.65	Yes	manual	up	up
Serial0/0	192.168.12.121	Yes	manual	up	up
Seriak0/1	unassigned	Yes	unset	up	up
Serial0/1.102	192.168.12.125	Yes	manual	up	up
Serial0/1.103	192.168.12.129	Yes	manual	up	up
Serial0/1.104	192.168.12.133	Yes	manual	up	up

City#

A. FastEthernet0 /0
B. FastEthernet0 /1
C. Serial0/0
D. Serial0/1.102
E. Serial0/1.103
F. Serial0/1.104

Correct Answer: BCD
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The "network 192.168.12.64 0.0.0.63 equals to network 192.168.12.64/26. This network has:
- Increment: 64 (/26= 1111 1111.1111 1111.1111 1111.1100 0000) + Network address: 192.168.12.64
- Broadcast address: 192.168.12.127

Therefore all interface in the range of this network will join OSPF.

QUESTION 198
Refer to the exhibit. C-router is to be used as a "router-on-a-stick" to route between the VLANs. All the interfaces have been properly configured and IP routing is operational. The hosts in the VLANs have been

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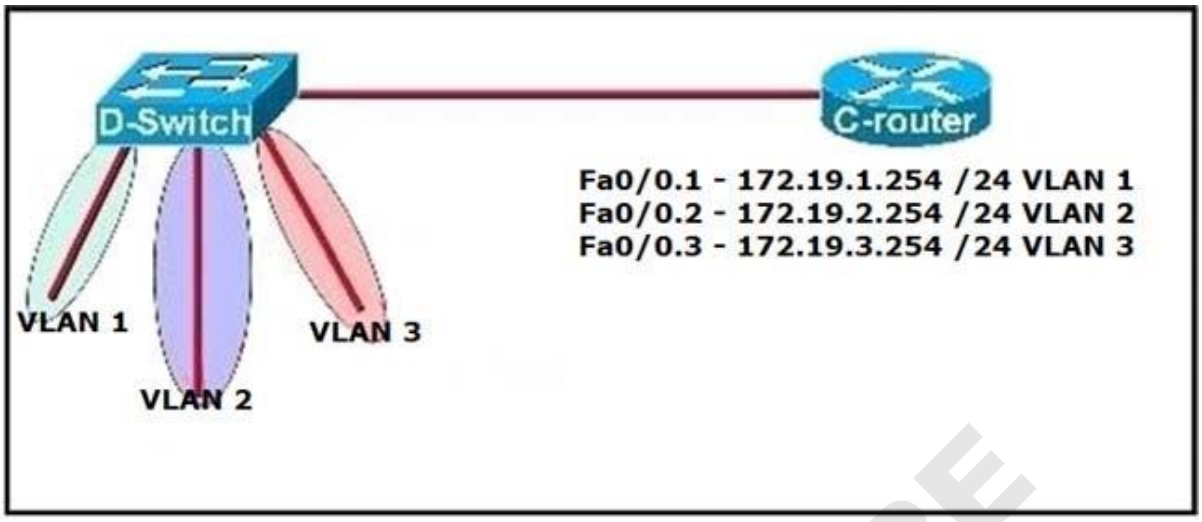
configured with the appropriate default gateway. What is true about this configuration?



A. These commands need to be added to the configuration:
C-router(config)# router eigrp 123
C-router(config-router)# network 172.19.0.0

B. These commands need to be added to the configuration:
C-router(config)# router ospf 1
C-router(config-router)# network 172.19.0.0 0.0.3.255 area 0

C. These commands need to be added to the configuration:
C-router(config)# router rip
C-router(config-router)# network 172.19.0.0

D. No further routing configuration is required.

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Since all the same router (C-router) is the default gateway for all three VLANs, all traffic destined to a different VLA will be sent to the C-router. The C-router will have knowledge of all three networks since they will appear as directly connected in the routing table. Since the C-router already knows how to get to all three networks, no routing protocols need to be configured.

QUESTION 199
Refer to the exhibit. Which address and mask combination represents a summary of the routes learned by EIGRP?

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```
Gateway of last resort is not set

     192.168.25.0/30 is subnetted, 4 subnets
D       192.168.25.20 [90/2681856] via 192.168.15.5, 00:00:10, Serial0/1
D       192.168.25.16 [90/1823638] via 192.168.15.5, 00:00:50, Serial0/1
D       192.168.25.24 [90/3837233] via 192.168.15.5, 00:05:23, Serial0/1
D       192.168.25.28 [90/8127323] via 192.168.15.5, 00:06:45, Serial0/1
C    192.168.15.4/30 is directly connected, Serial0/1
C    192.168.2.0/24 is directly connected, FastEthernet0/0
```

A. 192.168.25.0 255.255.255.240
B. 192.168.25.0 255.255.255.252
C. 192.168.25.16 255.255.255.240
D. 192.168.25.16 255.255.255.252
E. 192.168.25.28 255.255.255.240
F. 192.168.25.28 255.255.255.252

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The binary version of 20 is 10100.
The binary version of 16 is 10000.
The binary version of 24 is 11000.
The binary version of 28 is 11100.
The subnet mask is /28. The mask is 255.255.255.240.
Note:
From the output above, EIGRP learned 4 routes and we need to find out the summary of them:

- 192.168.25.16
- 192.168.25.20
- 192.168.25.24
- 192.168.25.28

-> The increment should be 28 ?16 = 12 but 12 is not an exponentiation of 2; so we must choose 16 (24).
Therefore the subnet mask is /28 (=1111 1111.1111 1111.1111 1111.11110000) = 255.255.255.240.
So the best answer should be 192.168.25.16 255.255.255.240.

QUESTION 200
Refer to the exhibit. Given the output for this command, if the router ID has not been manually set, what router ID will OSPF use for this router?

```
RouterD#   show ip interface brief
Interface          IP-Address     OK?   Method   Status    Protocol
FastEthernet0/0    192.168.5.3    Yes   manual     up        up
FastEthernet0/1    10.1.1.2       Yes   manual     up        up
Loopback0          172.16.5.1     Yes   NVRAM      up        up
Loopback1          10.154.154.1   Yes   NVRAM      up        up
```

A. 10.1.1.2

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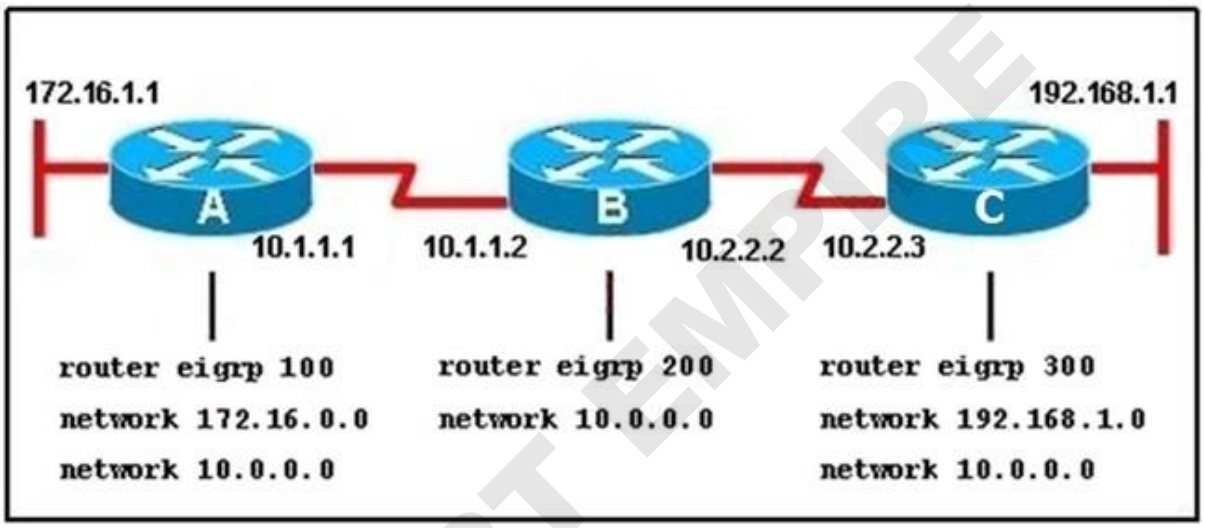
B. 10.154.154.1
C. 172.16.5.1
D. 192.168.5.3

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The highest IP address of all loopback interfaces will be chosen -> Loopback 0 will be chosen as the router ID.

QUESTION 201
Refer to the exhibit. When running EIGRP, what is required for RouterA to exchange routing updates with RouterC?



A. AS numbers must be changed to match on all the routers
B. Loopback interfaces must be configured so a DR is elected
C. The no auto-summary command is needed on Router A and Router C
D. Router B needs to have two network statements, one for each connected network

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
This question is to examine the understanding of the interaction between EIGRP routers. The following information must be matched so as to create neighborhood. EIGRP routers to establish, must match the following information:
1. AS Number;
2. K value.

QUESTION 202
A network administrator is troubleshooting the OSPF configuration of routers R1 and R2. The routers cannot establish an adjacency relationship on their common Ethernet link.

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R1: Ethernet0 is up, line protocol is up
Internet address 192.168.1.2/24, Area 0
Process ID 1, Router ID 192.168.31.33, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.31.33, Interface address 192.168.1.2
No backup designated router on this network
Timer intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5

R2: Ethernet0 is up, line protocol is up
Internet address 192.168.1.2/24, Area 0
Process ID 2, Router ID 192.168.31.11, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.31.11, Interface address 192.168.1.1
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

The graphic shows the output of the show ip ospf interface e0 command for routers R1 and R2. Based on the information in the graphic, what is the cause of this problem?

A. The OSPF area is not configured properly.
B. The priority on R1 should be set higher.
C. The cost on R1 should be set higher.
D. The hello and dead timers are not configured properly.
E. A backup designated router needs to be added to the network.
F. The OSPF process ID numbers must match.

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
In OSPF, the hello and dead intervals must match and here we can see the hello interval is set to 5 on R1 and 10 on R2. The dead interval is also set to 20 on R1 but it is 40 on R2.

QUESTION 203
Refer to the exhibit. Which two statements are true about the loopback address that is configured on RouterB? (Choose two.)

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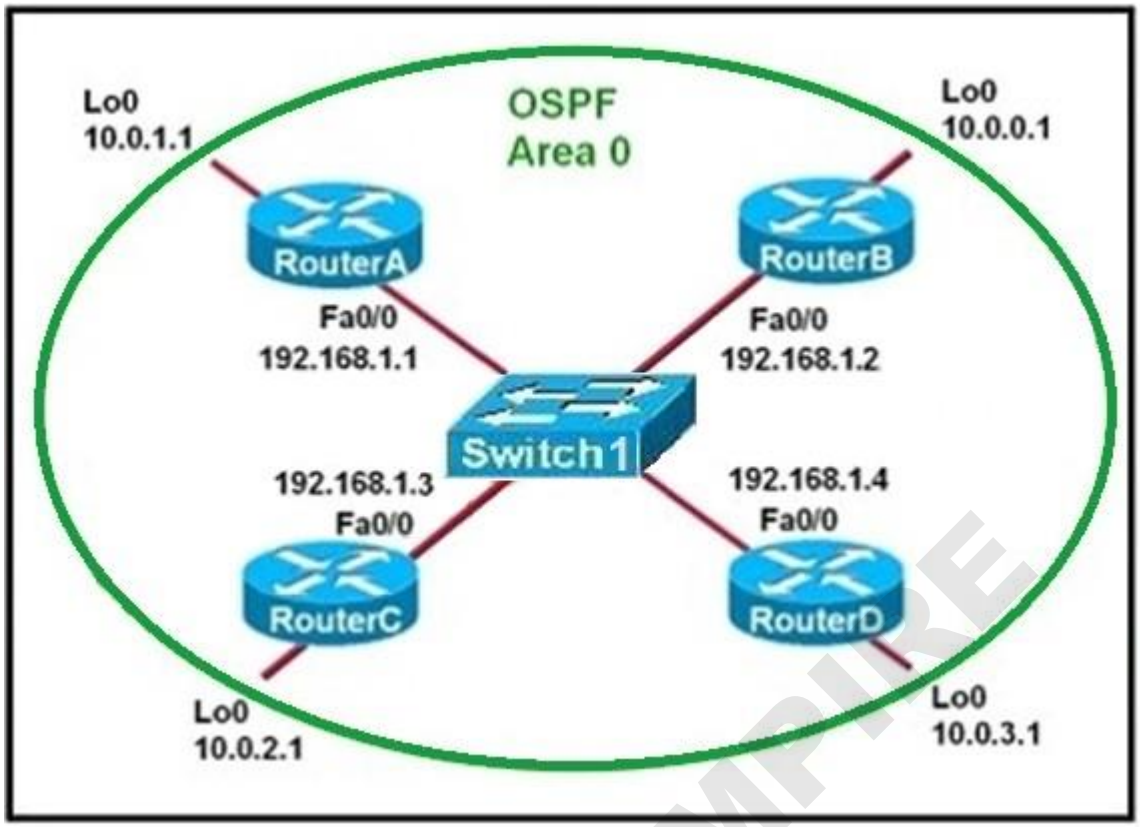

A. It ensures that data will be forwarded by RouterB.
B. It provides stability for the OSPF process on RouterB.
C. It specifies that the router ID for RouterB should be 10.0.0.1.
D. It decreases the metric for routes that are advertised from RouterB.
E. It indicates that RouterB should be elected the DR for the LAN.

Correct Answer: BC
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 204
If all OSPF routers in a single area are configured with the same priority value, what value does a router use for the OSPF router ID in the absence of a loopback interface?

A. the IP address of the first Fast Ethernet interface
B. the IP address of the console management interface
C. the highest IP address among its active interfaces
D. the lowest IP address among its active interfaces
E. the priority value until a loopback interface is configured

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

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QUESTION 205
The OSPF Hello protocol performs which of the following tasks? (Choose two.)

A. It provides dynamic neighbor discovery.
B. It detects unreachable neighbors in 90 second intervals.
C. It maintains neighbor relationships.
D. It negotiates correctness parameters between neighboring interfaces.
E. It uses timers to elect the router with the fastest links as the designated router.
F. It broadcasts hello packets throughout the internetwork to discover all routers that are running OSPF.

Correct Answer: AC
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 206
What are two requirements for an HSRP group? (Choose two.)

A. exactly one active router
B. one or more standby routers
C. one or more backup virtual routers
D. exactly one standby active router
E. exactly one backup virtual router

Correct Answer: AB
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Exactly one active router: Only one Active Router per HSRP group will be elected based on highest priority. In case of equal priority, Highest IP address will be elected as Active Router.
One or more standby routers: There can be one or more Standby Routers.

QUESTION 207
Which two pieces of information can you learn by viewing the routing table? (Choose two.)

A. whether an ACL was applied inbound or outbound to an interface
B. the EIGRP or BGP autonomous system
C. whether the administrative distance was manually or dynamically configured
D. which neighbor adjacencies are established
E. the length of time that a route has been known

Correct Answer: CE
Section: IP Connectivity
Explanation

Explanation/Reference:

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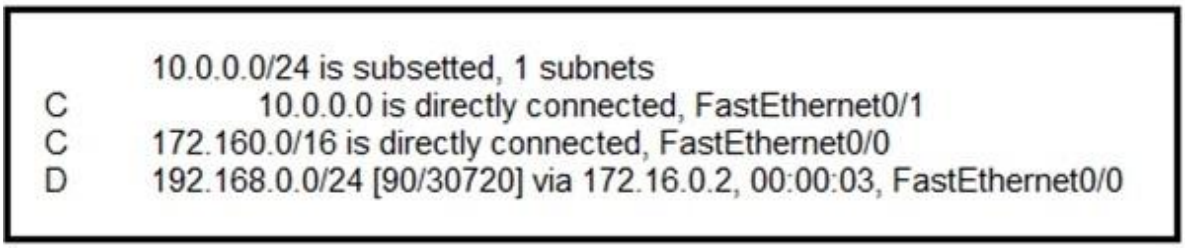
QUESTION 208



Refer to the exhibit. Which route type does the routing protocol Code D represent in the output?

A. statically assigned route
B. route learned through EIGRP
C. /24 route of a locally configured IP
D. internal BGP route

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 209
An engineer must configure an OSPF neighbor relationship between router R1 and R3. The authentication configuration has been configured and the connecting interfaces are in the same 192.168.1.0/30 subnet. What are the next two steps to complete the configuration? (Choose two.)

A. configure the interfaces as OSPF active on both sides
B. configure both interfaces with the same area ID
C. configure the hello and dead timers to match on both sides
D. configure the same process ID for the router OSPF process
E. configure the same router ID on both routing processes

Correct Answer: AB
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 210

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```
R1# show ip route | begin gateway
Gateway of last resort is 209.165.200.246 to network 0.0.0.0
S* 0.0.0.0/0 [1/0] via 209.165.200.246, Serial0/1/0
      is directly connected, Serial0/1/0
      172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
S     172.16.3.0/24 [1/0] via 209.165.200.250, Serial0/0/0
O     172.16.3.0/28 [110/1] via 209.165.200.254, 00:00:28, Serial0/0/1
      209.165.200.0/24 is variably subnetted, 6 subnets, 2 masks
C     209.165.200.244/30 is directly connected, Serial0/1/0
L     209.165.200.245/32 is directly connected, Serial0/1/0
C     209.165.200.248/30 is directly connected, Serial0/0/0
L     209.165.200.249/32 is directly connected, Serial0/0/0
C     209.165.200.252/30 is directly connected, Serial0/0/1
L     209.165.200.253/32 is directly connected, Serial0/0/1
```

Refer to the exhibit. A packet is being sent across router R1 to host 172.16.0.14. What is the destination route for the packet?

A. 209.165.200.250 via Serial0/0/0
B. 209.165.200.254 via Serial0/0/0
C. 209.165.200.254 via Serial0/0/1
D. 209.165.200.246 via Serial0/1/0

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 211

```
R1# show ip route | begin gateway
Gateway of last resort is 209.165.200.246 to network 0.0.0.0
S* 0.0.0.0/0 [1/0] via 209.165.200.246, Serial0/1/0
      is directly connected, Serial0/1/0
      172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
S     172.16.3.0/24 [1/0] via 207.165.200.250, Serial0/0/0
O     172.16.3.0/28 [110/84437] via 207.165.200.254, 00:00:28, Serial0/0/1
      207.165.200.0/24 is variably subnetted, 6 subnets, 2 masks
C     207.165.200.244/30 is directly connected, Serial0/1/0
L     207.165.200.245/32 is directly connected, Serial0/1/0
C     207.165.200.248/30 is directly connected, Serial0/0/0
L     207.165.200.249/32 is directly connected, Serial0/0/0
C     207.165.200.252/30 is directly connected, Serial0/0/1
L     207.165.200.253/32 is directly connected, Serial0/0/1
```

Refer to the exhibit. A packet is being sent across router R1 to host 172.16.3.14. To which destination does the router send the packet?

A. 207.165.200.246 via Serial0/1/0
B. 207.165.200.254 via Serial0/0/0
C. 207.165.200.250 via Serial0/0/0
D. 207.165.200.254 via Serial0/0/1

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 212

```
R1#config t
R1(config)# interface gi1/1
R1(config-if)# ip address 192.168.0.1 255.255.255.0

R1(config)# router bgp 65000
R1(config-router)# neighbor 192.168.0.2 remote-as 65001
R1(config-router)# network 10.1.1.0 mask 255.255.255.0

R1(config)# router ospf 1
R1(config)# router-id 1.1.1.1
R1(config)# network 192.168.0.1 0.0.0.0 area 0
R1(config)# network 10.1.1.0 0.0.0.255 area 0

R1(config)# router eigrp 1
R1(config)# eigrp router-id 1.1.1.1
R1(config)# network 10.1.1.0 0.0.0.255
R1(config)# network 192.168.0.1 0.0.0.0

R2#config t
R2(config)# interface gi1/1
R2(config-if)# ip address 192.168.0.2 255.255.255.0

R2#config t
R2(config)# router bgp 65001
R2(config-router)# neighbor 192.168.0.1 remote-as 65000

R2(config)# router ospf 1
R2(config)# router-id 2.2.2.2
R2(config)# network 192.168.1.2 0.0.0.0 area 0

R2(config)# router eigrp 1
R2(config)# eigrp router-id 1.1.1.1
R2(config)# network 192.168.0.1 0.0.0.0

R2(config)# ip route 10.1.1.0 255.255.255.0 192.168.0.1
```

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Refer to the exhibit. Router R2 is configured with multiple routes to reach network 10.1.1.0/24 from router R1. Which path is chosen by router R2 to reach the destination network 10.1.1.0/24?

A. static

B. EIGRP
C. eBGP
D. OSPF

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 213

```
R1# show ip route
Codes:    C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
          D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
          N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
          E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
          i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
          U - per-user static route, o - ODR
Gateway of last resort is not set
C         1.0.0.0/8 is directly connected, Loopback0
          10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
O              10.0.1.3/32 [110/100] via 10.0.1.3, 00:39:08, Serial0
C              10.0.1.0/24 is directly connected, Serial0
O              10.0.1.5/32 [110/5] via 10.0.1.50, 00:39:08, Serial0
O              10.0.1.4/32 [110/10] via 10.0.1.4, 00:39:08, Serial0
```

Refer to the exhibit. What is the next hop address for traffic that is destined to host 10.0.1.5?

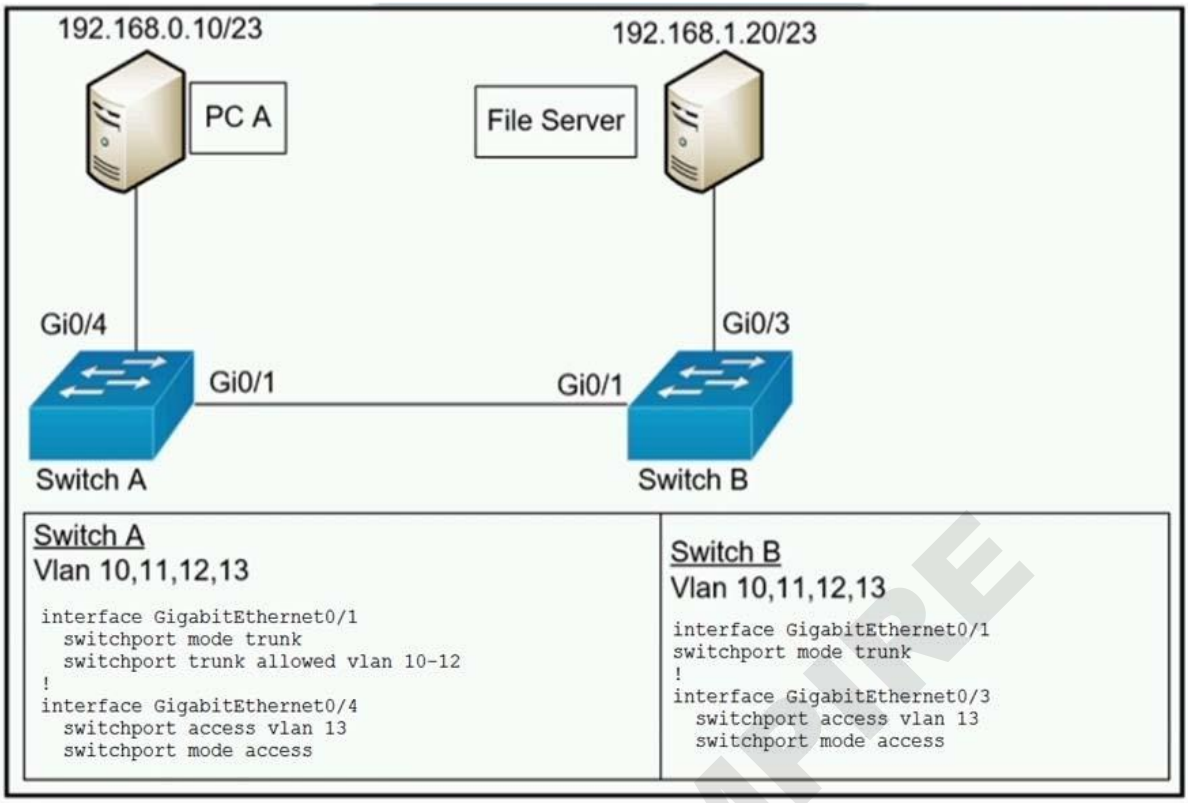
A. Loopback 0
B. 10.0.1.4
C. 10.0.1.3
D. 10.0.1.50

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 214

CERT EMPIRE



Refer to the exhibit. A network administrator assumes a task to complete the connectivity between PC A and the File Server. Switch A and Switch B have been partially configured with VLANs 10, 11, 12, and 13. What is the next step in the configuration?

A. Add PC A to VLAN 10 and the File Server to VLAN 11 for VLAN segmentation
B. Add VLAN 13 to the trunk links on Switch A and Switch B for VLAN propagation
C. Add a router on a stick between Switch A and Switch B allowing for Inter-VLAN routing
D. Add PC A to the same subnet as the File Server allowing for intra-VLAN communication

Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 215
DRAG DROP

A network engineer is configuring an OSPFv2 neighbor adjacency. Drag and drop the parameters from the left onto their required categories on the right. Not all parameters are used.

Select and Place:

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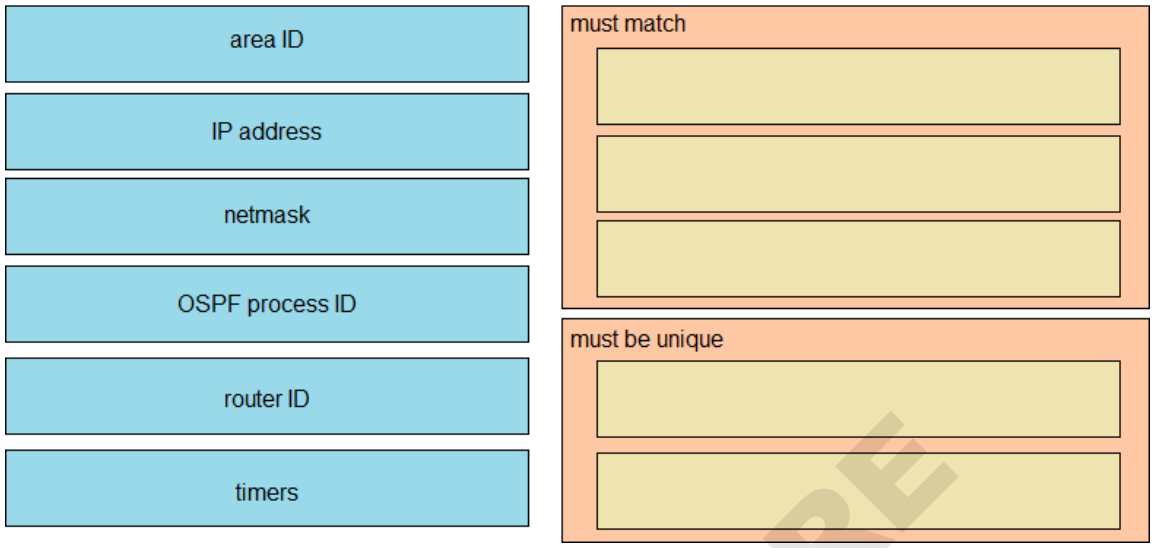
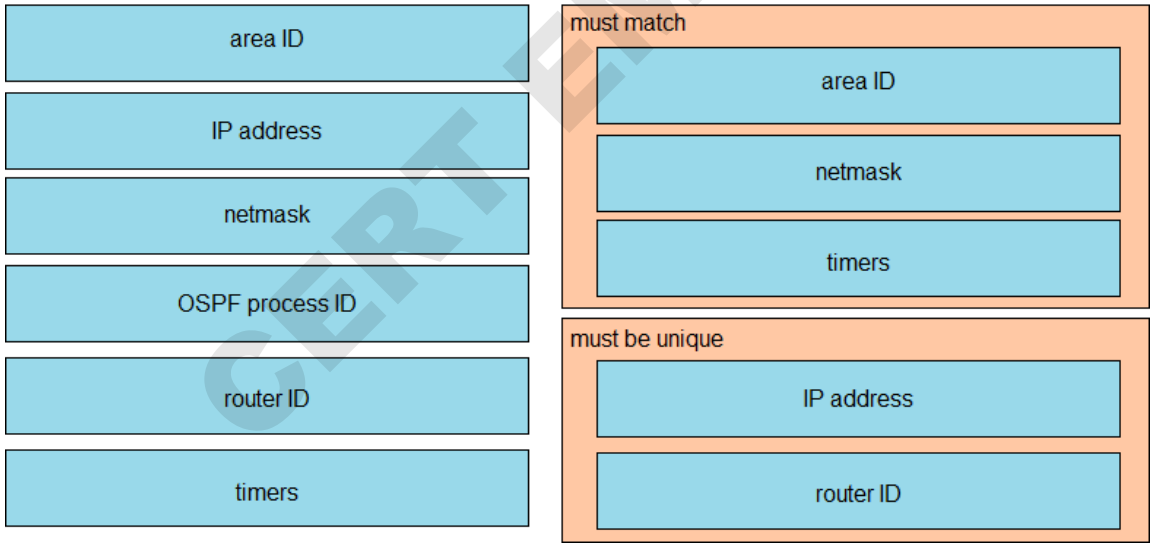
Answer Area



Correct Answer:

Answer Area



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Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 216
R1 has learned route 192.168.12.0/24 via IS-IS, OSPF, RIP, and Internal EIGRP. Under normal operating conditions, which routing protocol is installed in the routing table?

A. IS-IS

B. Internal EIGRP
C. RIP
D. OSPF

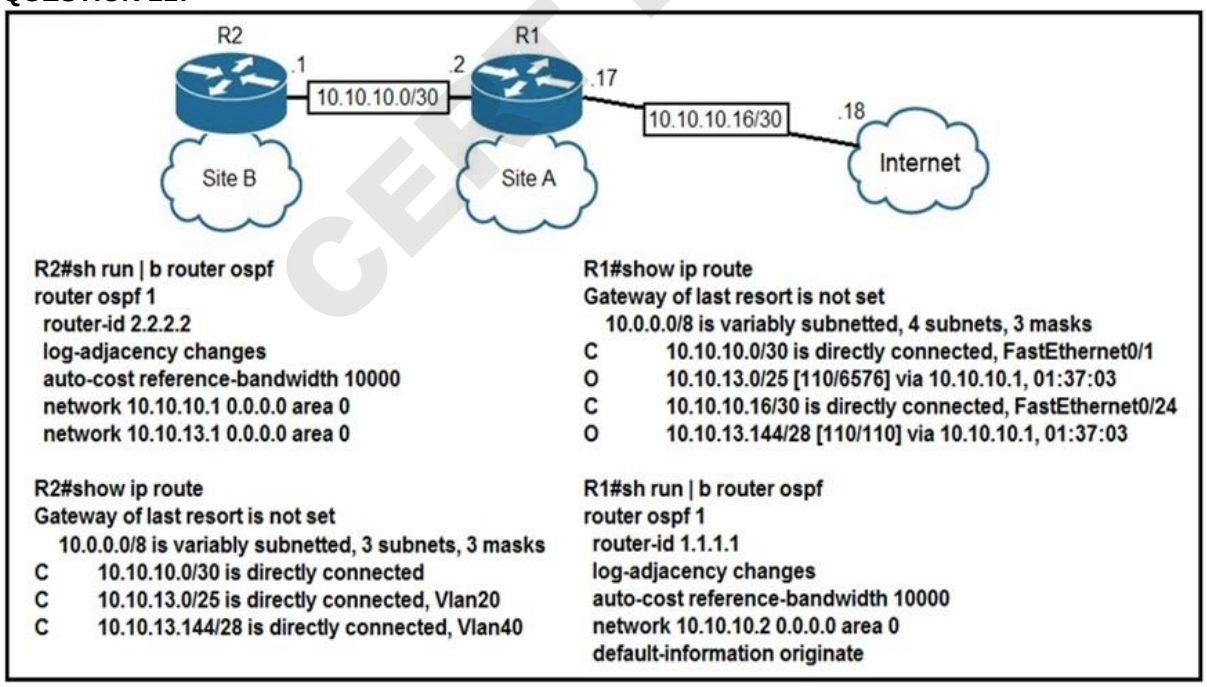
Correct Answer: B
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
With the same route (prefix), the router will choose the routing protocol with lowest Administrative Distance (AD) to install into the routing table. The AD of Internal EIGRP (90) is lowest so it would be chosen. The table below lists the ADs of popular routing protocols.

Route Source	Administrative Distance
Directly Connected	0
Static	1
EIGRP	90
EIGRP Summary route	5
OSPF	110
RIP	120

Note: The AD of IS-IS is 115. The "EIGRP" in the table above is "Internal EIGRP". The AD of "External EIGRP" is 170. An EIGRP external route is a route that was redistributed into EIGRP.

QUESTION 217



Refer to the exhibit. The **default-information originate** command is configured under the R1 OSPF configuration. After testing, workstations on VLAN 20 at Site B cannot reach a DNS server on the Internet.

Which action corrects the configuration issue?

CERT EMPIRE

A. Add the **default-information originate** command on R2.
B. Add the **always** keyword to the **default-information originate** command on R1.
C. Configure the **ip route 0.0.0.0 0.0.0.0 10.10.10.18** command on R1.
D. Configure the **ip route 0.0.0.0 0.0.0.0 10.10.10.2** command on R2.

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 218

```
R1# show ip route | begin gateway
Gateway of last resort is 209.165.200.246 to network 0.0.0.0
S* 0.0.0.0/0 [1/0] via 209.165.200.246, Serial0/1/0
     is directly connected, Serial0/1/0
     172.16.0.0/16 is variably subnetted, 3 subnets, 3 masks
S    172.16.0.0/24 [1/0] via 207.165.200.250, Serial0/0/0
O    172.16.0.128/25 [110/38443] via 207.165.200.254, 00:00:23, Serial0/0/1
D    172.16.0.192/29 [90/3184439] via 207.165.200.254, 00:00:25, Serial0/0/1
     209.165.200.0/24 is variably subnetted, 4 subnets, 2 masks
C    209.165.200.248/30 is directly connected, Serial0/0/0
L    209.165.200.249/32 is directly connected, Serial0/0/0
C    209.165.200.252/30 is directly connected, Serial0/0/1
L    209.165.200.253/32 is directly connected, Serial0/0/1
```

Refer to the exhibit. With which metric was the route to host 172.16.0.202 learned?

A. 0
B. 110
C. 38443
D. 3184439

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Both the line “O 172.16.0.128/25” and “S 172.16.0.0/24” cover the host 172.16.0.202 but with the “longest (prefix) match” rule the router will choose the first route.

QUESTION 219
A user configured OSPF in a single area between two routers. A serial interface connecting R1 and R2 is running encapsulation PPP. By default, which OSPF network type is seen on this interface when the user types show ip ospf interface on R1 or R2?

A. nonbroadcast
B. point-to-point
C. point-to-multipoint
D. broadcast

Correct Answer: B

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Section: IP Connectivity
Explanation

Explanation/Reference:

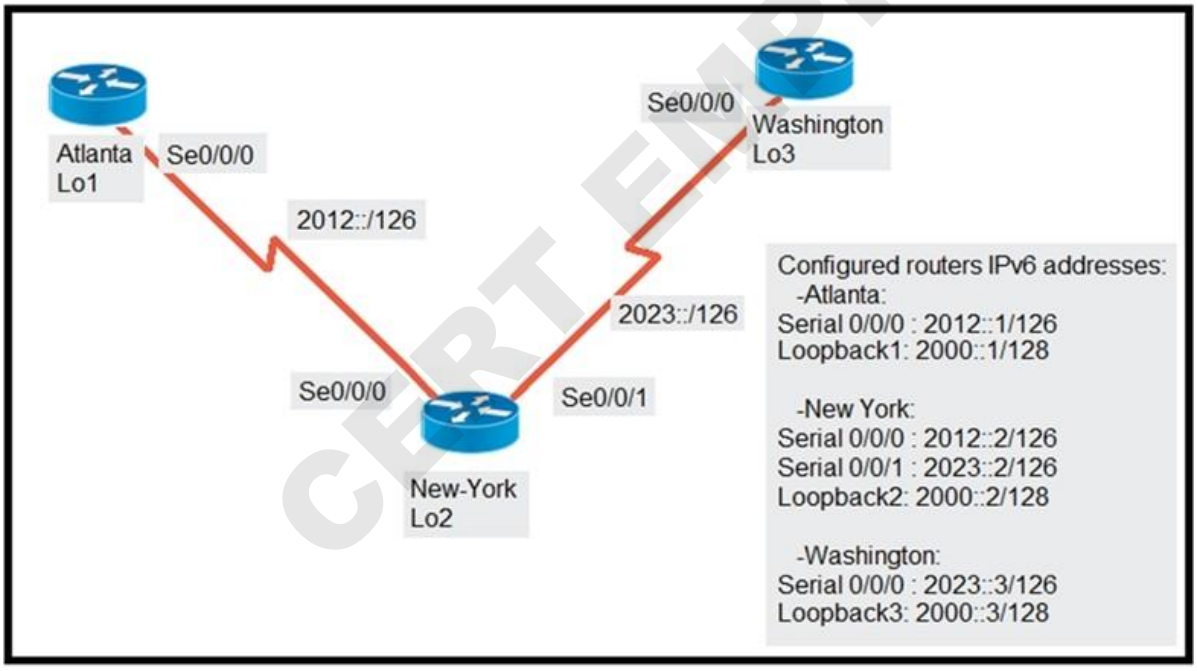
QUESTION 220
Which MAC address is recognized as a VRRP virtual address?

A. 0000.5E00.010a
B. 0005.3709.8968
C. 0000.0C07.AC99
D. 0007.C070.AB01

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 221



Refer to the exhibit. The New York router is configured with static routes pointing to the Atlanta and Washington sites.

Which two tasks must be performed so that the Se0/0/0 interfaces on the Atlanta and Washington routers can reach one another? (Choose two.)

A. Configure the **ipv6 route 2023::/126 2012::1** command on the Atlanta router.
B. Configure the **ipv6 route 2012::/126 2023::2** command on the Washington router.
C. Configure the **ipv6 route 2012::/126 2023::1** command on the Washington router.
D. Configure the **ipv6 route 2023::/126 2012::2** command on the Atlanta router.
E. Configure the **ipv6 route 2012::/126 s0/0/0** command on the Atlanta router.

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Correct Answer: BD
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 222
A router running EIGRP has learned the same route from two different paths. Which parameter does the router use to select the best path?

A. as-path
B. administrative distance
C. metric
D. cost

Correct Answer: C
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
If a router learns two different paths for the same network from the same routing protocol, it has to decide which route is better and will be placed in the routing table. **Metric** is the measure used to decide which route is better (lower number is better). Each routing protocol uses its own metric.
For example, RIP uses hop counts as a metric, while OSPF uses cost.

Reference: https://study-ccna.com/administrative-distance-metric/

QUESTION 223
An engineer configured an OSPF neighbor as a designated router. Which state verifies the designated router is in the proper mode?

A. Init
B. 2-way
C. Exchange
D. Full

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:

QUESTION 224

CERT EMPIRE

```
R1# show ip route

D    192.168.16.0/26 [90/2679326] via 192.168.1.1
R    192.168.16.0/24 [120/3] via 192.168.1.2
O    192.168.16.0/21 [110/2] via 192.168.1.3
i L1 192.168.16.0/27 [115/30] via 192.168.1.4
```

Refer to the exhibit. Which route does R1 select for traffic that is destined to 192.168.16.2?

A. 192.168.16.0/21
B. 192.168.16.0/24
C. 192.168.26.0/26
D. 192.168.16.0/27

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
The destination IP addresses match all four entries in the routing table but the 192.168.16.0/27 has the longest prefix so it will be chosen. This is called the “longest prefix match” rule.

QUESTION 225

```
Gateway of last resort is 10.12.0.1 to network 0.0.0.0

O*E2 0.0.0.0/0 [110/1] via 10.12.0.1, 00:00:01, GigabitEthernet0/0
     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.0.0.0/24 is directly connected, GigabitEthernet0/0
L    10.0.0.2/32 is directly connected, GigabitEthernet0/0
C    10.13.0.0/24 is directly connected, GigabitEthernet0/1
L    10.13.0.2/32 is directly connected, GigabitEthernet0/1
```

Refer to the exhibit. If configuring a static default route on the router with the **ip route 0.0.0.0 0.0.0.0 10.13.0.1 120** command, how does the router respond?

A. It starts sending traffic without a specific matching entry in the routing table to GigabitEthernet0/1.
B. It immediately replaces the existing OSPF route in the routing table with the newly configured static route.
C. It starts load-balancing traffic between the two default routes.
D. It ignores the new static route until the existing OSPF default route is removed.

Correct Answer: D
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
Our new static default route has the Administrative Distance (AD) of 120, which is bigger than the AD of OSPF External route (O*E2) so it will not be pushed into the routing table until the current OSPF External route is removed.

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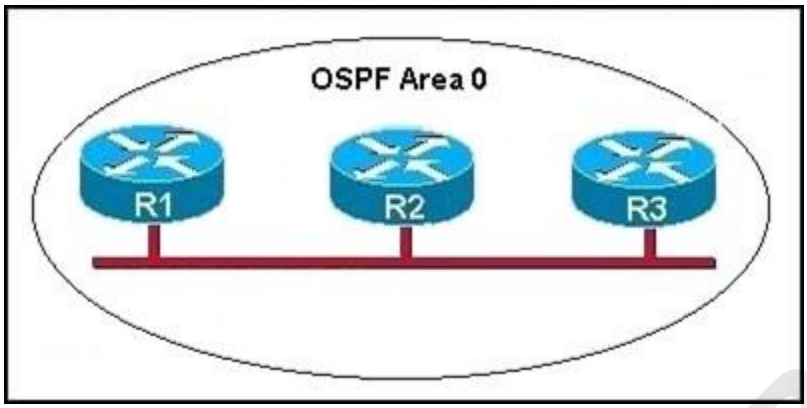
For your information, if you don't type the AD of 120 (using the command "ip route 0.0.0.0 0.0.0.0 10.13.0.1") then the new static default route would replace the OSPF default route as the default AD of static route is 1. You will see such line in the routing table:

S* 0.0.0.0/0 [1/0] via 10.13.0.1

QUESTION 226
Refer to the graphic. R1 is unable to establish an OSPF neighbor relationship with R3. What are possible reasons for this problem? (Choose two.)



A. All of the routers need to be configured for backbone Area 1.
B. R1 and R2 are the DR and BDR, so OSPF will not establish neighbor adjacency with R3.
C. A static route has been configured from R1 to R3 and prevents the neighbor adjacency from being established.
D. The hello and dead interval timers are not set to the same values on R1 and R3.
E. EIGRP is also configured on these routers with a lower administrative distance.
F. R1 and R3 are configured in different areas.

Correct Answer: DF
Section: IP Connectivity
Explanation

Explanation/Reference:
Explanation:
This question is to examine the conditions for OSPF to create neighborhood. So as to make the two routers become neighbors, each router must be matched with the following items:
1. The area ID and its types
2. Hello and failure time interval timer
3. OSPF Password (Optional)

QUESTION 227

CERT EMPIRE

```
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route

Gateway of last resort is 209.165.202.131 to network 0.0.0.0

S*    0.0.0.0/0 [1/0] via 209.165.202.131
      209.165.200.0/27 is subnetted, 1 subnets
S        209.165.200.224 [254/0] via 209.165.202.129
      209.165.201.0/27 is subnetted, 1 subnets
S        209.165.201.0 [1/0] via 209.165.202.130
```

Refer to the exhibit. Which command configures a floating static route to provide a backup to the primary link?

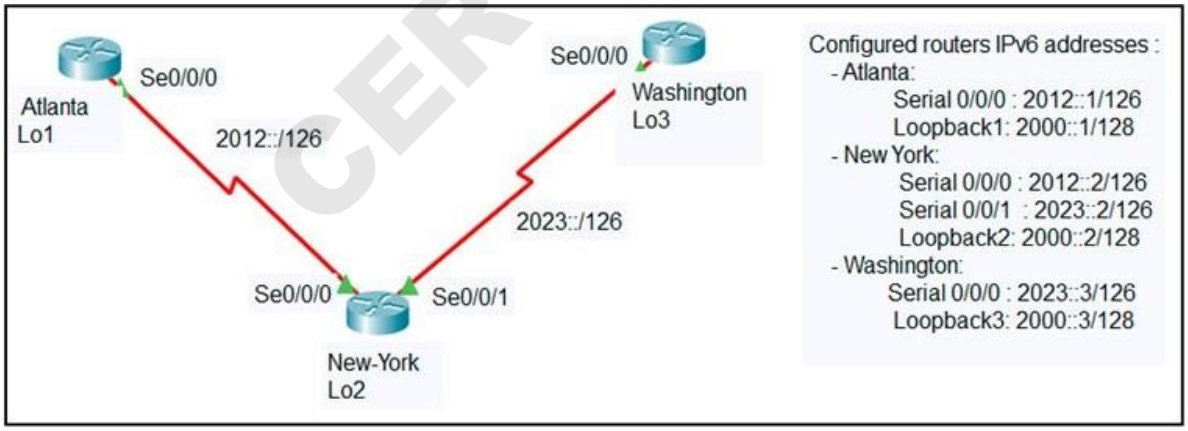
A. **ip route 209.165.200.224 255.255.255.224 209.165.202.129 254**
B. **ip route 209.165.201.0 255.255.255.224 209.165.202.130**
C. **ip route 0.0.0.0 0.0.0.0 209.165.200.224**
D. **ip route 0.0.0.0 0.0.0.0 209.165.202.131**

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 228



Refer to the exhibit. An engineer configured the New York router with static routes that point to the Atlanta and Washington sites. Which command must be configured on the Atlanta and Washington routers so that both sites are able to reach the loopback2 interface on the New York router?

A. ipv6 route::/0 Serial 0/0/0
B. ipv6 route::/0 Serial 0/0/1
C. ipv6 route:0/0 Serial 0/0/0
D. **ip route 0.0.0.0 0.0.0.0 Serial 0/0/0**

Correct Answer: A
Section: IP Connectivity
Explanation

Explanation/Reference:
Reference: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/iproute_pi/configuration/xe-3s/iri-xe-3s-book/ip6-route-static-xe.html#GUID-85796C3A-3143-4DF7-B9D0-8EC87D0DB08B

QUESTION 229
Which two statements about NTP operations are true? (Choose two.)

A. NTP uses UDP over IP.
B. Cisco routers can act as both NTP authoritative servers and NTP clients.
C. Cisco routers can act only as NTP servers.
D. Cisco routers can act only as NTP clients.
E. NTP uses TCP over IP.

Correct Answer: AB
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 230
Which feature or protocol is required for an IP SLA to measure UDP jitter?

A. LLDP
B. EEM
C. CDP
D. NTP

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 231
Refer to the exhibit. Which feature is enabled by this configuration?

```
R1(config)#ip nat pool cisco 10.1.1.0 10.1.1.50 255.255.255.0
```

A. static NAT translation
B. a DHCP pool
C. a dynamic NAT address pool
D. PAT

Correct Answer: C
Section: IP Services

CERT EMPIRE

Explanation

Explanation/Reference:

QUESTION 232
Which NAT term is defined as a group of addresses available for NAT use?

A. NAT pool
B. dynamic NAT
C. static NAT
D. one-way NAT

Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 233
Which command can you enter to allow Telnet to be supported in addition to SSH?

A. transport input telnet ssh
B. transport input telnet
C. no transport input telnet
D. privilege level 15

Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 234
Refer to the exhibit. After you apply the given configuration to a router, the DHCP clients behind the device cannot communicate with hosts outside of their subnet. Which action is most likely to correct the problem?

```
ip dhcp pool test
    network 192.168.10.0 /27
    domain-name cisco.com
    dns-server 172.16.1.1 172.16.2.1
    netbios-name-server 172.16.1.10 172.16.2.10
```

A. Configure the dns server on the same subnet as the clients
B. Activate the dhcp pool
C. Correct the subnet mask
D. Configure the default gateway

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Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 235
Refer to the exhibit. Which rule does the DHCP server use when there is an IP address conflict?

```
Router#  show ip dhcp conflict
IP address      Detection method    Detection time
172.16.1.32     Ping                Feb 16 1998 12:28 PM
172.16.1.64     Gratuitous ARP      Feb 23 1198 08:12 AM
```

A. The address is removed from the pool until the conflict is resolved.
B. The address remains in the pool until the conflict is resolved.
C. Only the IP detected by Gratuitous ARP is removed from the pool.
D. Only the IP detected by Ping is removed from the pool.
E. The IP will be shown, even after the conflict is resolved.

Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
An address conflict occurs when two hosts use the same IP address. During address assignment, DHCP checks for conflicts using ping and gratuitous ARP. If a conflict is detected, the address is removed from the pool. The address will not be assigned until the administrator resolves the conflict.

QUESTION 236
Which command can you enter to determine the addresses that have been assigned on a DHCP Server?

A. Show ip DHCP database.
B. Show ip DHCP pool.
C. Show ip DHCP binding.
D. Show ip DHCP server statistic.

Correct Answer: C
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 237
What is the authoritative source for an address lookup?

A. a recursive DNS search
B. the operating system cache
C. the ISP local cache
D. the browser cache

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Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 238
Which command is used to verify the DHCP relay agent address that has been set up on your Cisco IOS router?

A. show ip interface brief
B. show ip dhcp bindings
C. show ip route
D. show ip interface
E. show interface
F. show ip dhcp pool

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 239
Which type of information resides on a DHCP server?

A. a list of the available IP addresses in a pool
B. a list of public IP addresses and their corresponding names
C. usernames and passwords for the end users in a domain
D. a list of statically assigned MAC addresses

Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 240
What are two roles of Domain Name Services (DNS)? (Choose two.)

A. builds a flat structure of DNS names for more efficient IP operations
B. encrypts network Traffic as it travels across a WAN by default
C. improves security by protecting IP addresses under Fully Qualified Domain Names (FQDNs)
D. enables applications to identify resources by name instead of IP address
E. allows a single host name to be shared across more than one IP address

Correct Answer: DE
Section: IP Services
Explanation

CERT EMPIRE

Explanation/Reference:

QUESTION 241
Which Cisco IOS command will indicate that interface GigabitEthernet 0/0 is configured via DHCP?

A. show ip interface GigabitEthernet 0/0 dhcp
B. show interface GigabitEthernet 0/0
C. show ip interface dhcp
D. show ip interface GigabitEthernet 0/0
E. show ip interface GigabitEthernet 0/0 brief

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 242
What will happen if you configure the logging trap debug command on a router?

A. It causes the router to send messages with lower severity levels to the syslog server
B. It causes the router to send all messages with the severity levels Warning, Error, Critical, and Emergency to the syslog server
C. It causes the router to send all messages to the syslog server
D. It causes the router to stop sending all messages to the syslog server

Correct Answer: C
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 243
A network administrator enters the following command on a router: logging trap 3. What are three message types that will be sent to the Syslog server? (Choose three.)

A. informational
B. emergency
C. warning
D. critical
E. debug
F. error

Correct Answer: BDF
Section: IP Services
Explanation

Explanation/Reference:

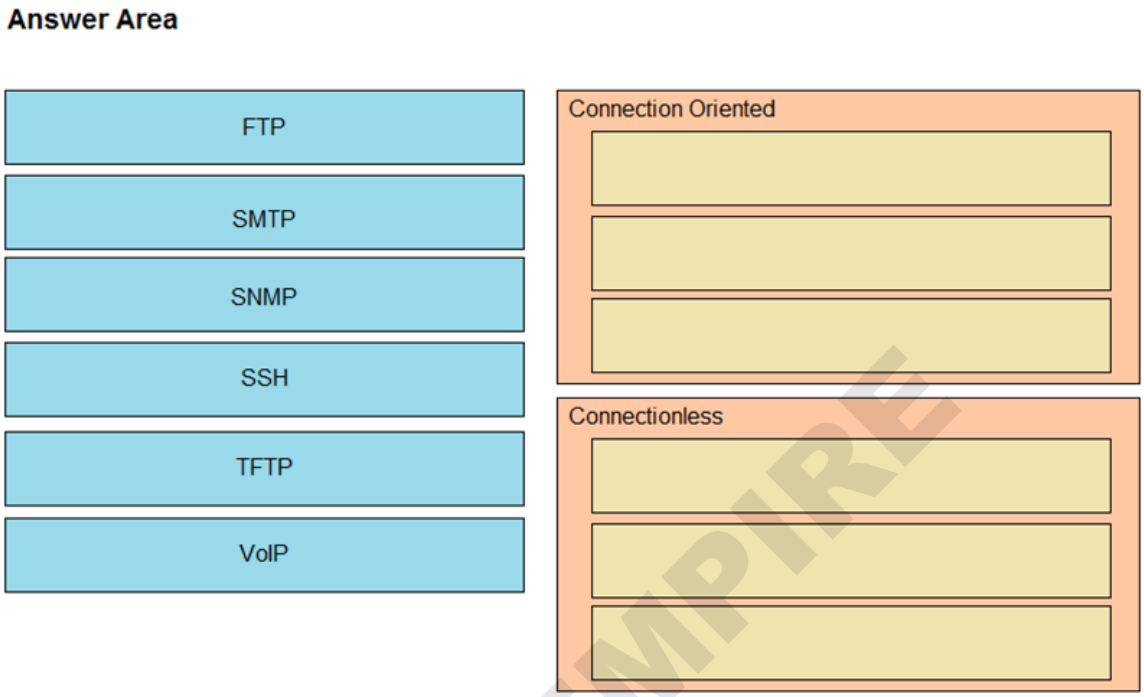
QUESTION 244

CERT EMPIRE

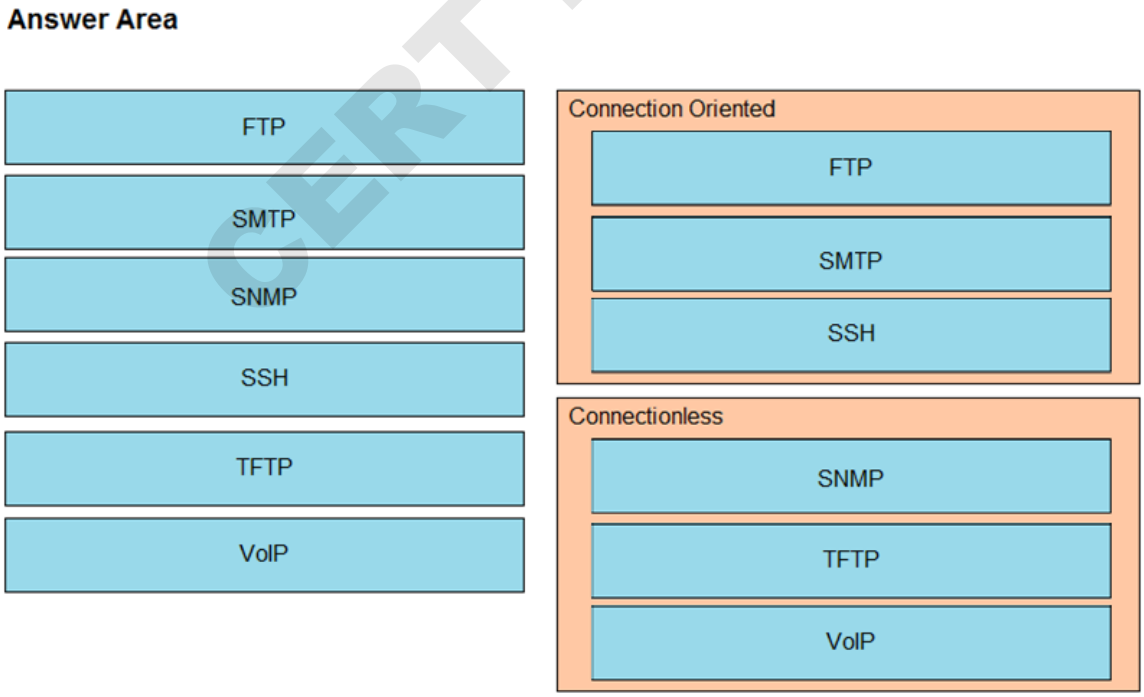
DRAG DROP

Drag and drop the network protocols from the left onto the correct transport services on the right.

Select and Place:



Correct Answer:



CERT EMPIRE

Section: IP Services
Explanation

Explanation/Reference:

QUESTION 245
A network engineer must back up 20 network router configurations globally within a customer environment. Which protocol allows the engineer to perform this function using the Cisco IOS MIB?

A. ARP
B. SNMP
C. SMTP
D. CDP

Correct Answer: B
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
SNMP is an application-layer protocol that provides a message format for communication between SNMP managers and agents. SNMP provides a standardized framework and a common language used for the monitoring and management of devices in a network.
The SNMP framework has three parts:
- An SNMP manager
- An SNMP agent
- A Management Information Base (MIB)

The Management Information Base (MIB) is a virtual information storage area for network management information, which consists of collections of managed objects.

With SNMP, the network administrator can send commands to multiple routers to do the backup.

QUESTION 246
Which command enables a router to become a DHCP client?

A. ip address dhcp
B. ip dhcp client
C. ip helper-address
D. ip dhcp pool

Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
If we want to get an IP address from the DHCP server on a Cisco device, we can use the command “ip address dhcp”.

Note: The command “ip helper-address” enables a router to become a DHCP Relay Agent.

QUESTION 247
Which function does an SNMP agent perform?

A. It sends information about MIB variables in response to requests from the NMS
B. It manages routing between Layer 3 devices in a network

CERT EMPIRE

C. It coordinates user authentication between a network device and a TACACS+ or RADIUS server
D. It requests information from remote network nodes about catastrophic system events

Correct Answer: A
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 248
What are two roles of the Dynamic Host Configuration Protocol (DHCP)? (Choose two.)

A. The DHCP server assigns IP addresses without requiring the client to renew them.
B. The DHCP server leases client IP addresses dynamically.
C. C. The DHCP client is able to request up to four DNS server addresses.
D. The DHCP server offers the ability to exclude specific IP addresses from a pool of IP addresses.
E. The DHCP client maintains a pool of IP addresses it is able to assign.

Correct Answer: BD
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 249
Which command must be entered when a device is configured as an NTP server?

A. ntp peer
B. ntp master
C. ntp authenticate
D. ntp server

Correct Answer: B
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 250
What event has occurred if a router sends a notice level message to a syslog server?

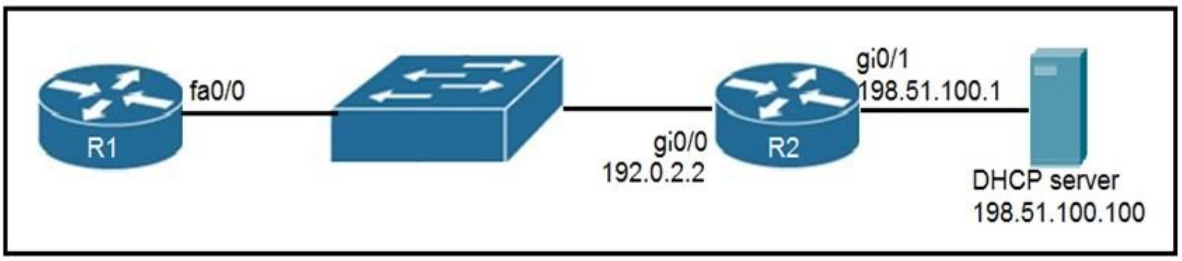
A. A certificate has expired
B. An interface line has changed status
C. A TCP connection has been torn down
D. An ICMP connection has been built

Correct Answer: B
Section: IP Services
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 251



Refer to the exhibit. An engineer deploys a topology in which R1 obtains its IP configuration from DHCP. If the switch and DHCP server configurations are complete and correct, which two sets of commands must be configured on R1 and R2 to complete the task? (Choose two.)

A. R1(config)# interface fa0/0
R1(config-if)# ip helper-address 198.51.100.100
B. R2(config)# interface gi0/0
R2(config-if)# ip helper-address 198.51.100.100
C. R1(config)# interface fa0/0
R1(config-if)# ip address dhcp
R1(config-if)# no shutdown
D. R2(config)# interface gi0/0
R2(config-if)# ip address dhcp
E. R1(config)# interface fa0/0
R1(config-if)# ip helper-address 192.0.2.2

Correct Answer: BC
Section: IP Services
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 252
Which two actions are performed by the Weighted Random Early Detection mechanism? (Choose two.)

A. It supports protocol discovery.
B. It guarantees the delivery of high-priority packets.
C. It can identify different flows with a high level of granularity.
D. It can mitigate congestion by preventing the queue from filling up.
E. It drops lower-priority packets before it drops higher-priority packets.

Correct Answer: DE
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
Weighted Random Early Detection (WRED) is just a congestion avoidance mechanism. WRED drops packets selectively based on IP precedence. Edge routers assign IP precedences to packets as they enter the network. When a packet arrives, the following events occur:

1. The average queue size is calculated.

2. If the average is less than the minimum queue threshold, the arriving packet is queued.
3. If the average is between the minimum queue threshold for that type of traffic and the maximum threshold for the interface, the packet is either dropped or queued, depending on the packet drop probability for that type of traffic.
4. If the average queue size is greater than the maximum threshold, the packet is dropped.

WRED reduces the chances of tail drop (when the queue is full, the packet is dropped) by selectively dropping packets when the output interface begins to show signs of congestion (thus it can mitigate congestion by preventing the queue from filling up). By dropping some packets early rather than waiting until the queue is full, WRED avoids dropping large numbers of packets at once and minimizes the chances of global synchronization. Thus, WRED allows the transmission line to be used fully at all times.

WRED generally drops packets selectively based on IP precedence. Packets with a higher IP precedence are less likely to be dropped than packets with a lower precedence. Thus, the higher the priority of a packet, the higher the probability that the packet will be delivered.

Reference: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/qos_conavd/configuration/15-mt/qos-conavd-15-mt-book/qos-conavd-cfg-wred.html

QUESTION 253

```
R2#show ip nat translations
Pro  Inside global      Inside local     Outside local      Outside global
tcp  172.23.104.3:43268 10.4.4.4:43268   172.23.103.10:23   172.23.103.10:23
tcp  172.23.104.4:45507 10.4.4.5:45507   172.23.103.10:80   172.23.103.10:80
```

Refer to the exhibit. An engineer configured NAT translations and has verified that the configuration is correct. Which IP address is the source IP after the NAT has taken place?

A. 10.4.4.4
B. 10.4.4.5
C. 172.23.103.10
D. 172.23.104.4

Correct Answer: C
Section: IP Services
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 254
If a notice-level message is sent to a syslog server, which event has occurred?

A. A network device has restarted.
B. A debug operation is running.
C. A routing instance has flapped.
D. An ARP inspection has failed.

Correct Answer: C
Section: IP Services
Explanation

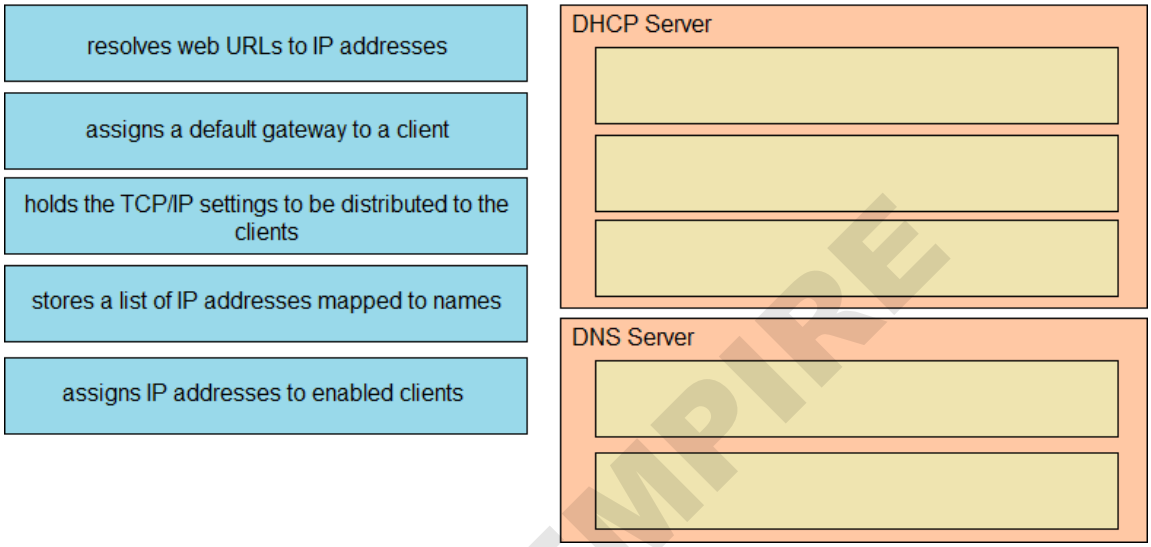
Explanation/Reference:
Explanation:
Usually no action is required when a route flaps so it generates the notification syslog level message (level 5).

QUESTION 255
DRAG DROP

Drag and drop the functions from the left onto the correct network components on the right.

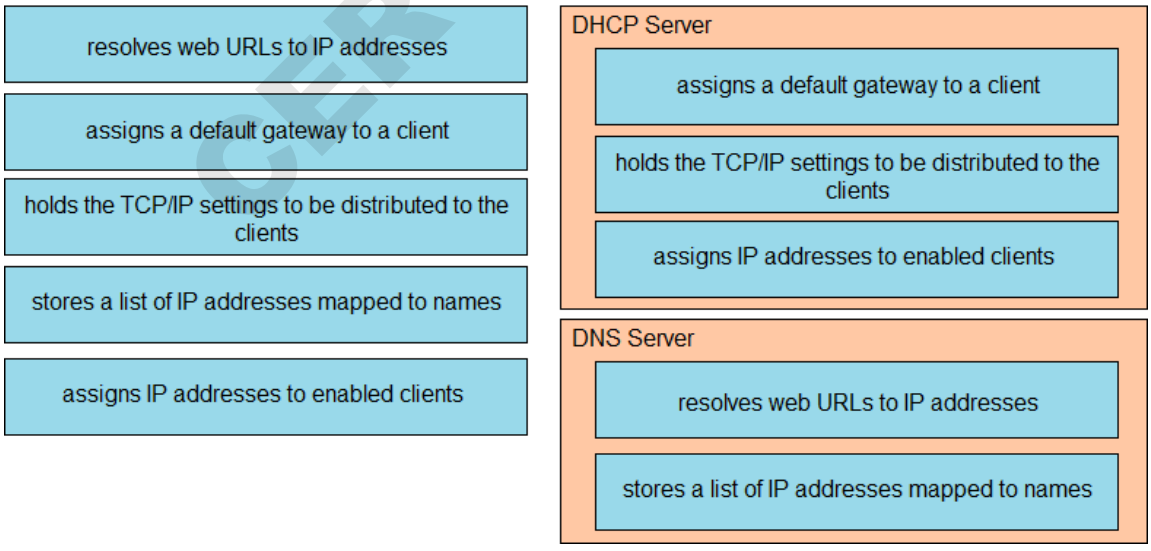
Select and Place:

Answer Area



Correct Answer:

Answer Area



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Section: IP Services
Explanation

Explanation/Reference:

QUESTION 256
Which two tasks must be performed to configure NTP to a trusted server in client mode on a single network device? (Choose two.)

A. Enable NTP authentication.
B. Verify the time zone.
C. Specify the IP address of the NTP server.
D. Set the NTP server private key.
E. Disable NTP broadcasts.

Correct Answer: AC
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
To configure authentication, perform this task in privileged mode:
Step 1: Configure an authentication key pair for NTP and specify whether the key will be trusted or untrusted.
Step 2: Set the IP address of the NTP server and the public key.
Step 3: Enable NTP client mode.
Step 4: Enable NTP authentication.
Step 5: Verify the NTP configuration.

Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4000/8-2glx/configuration/guide/ntp.html

QUESTION 257
What is the primary purpose of a First Hop Redundancy Protocol?

A. It allows directly connected neighbors to share configuration information
B. It reduces routing failures by allowing Layer 3 load balancing between OSPF neighbors that have the same link metric
C. It allows a router to use bridge priorities to create multiple loop-free paths to a single destination
D. It reduces routing failures by allowing more than one router to represent itself as the default gateway of a network

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 258
An engineer is configuring NAT to translate the source subnet of 10.10.0.0/24 to any one of three addresses: 192.168.3.1, 192.168.3.2, or 192.168.3.3. Which configuration should be used?

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A.
```
enable
configure terminal
ip nat pool mypool 192.168.3.1 192.168.3.3 prefix-length 30
access-list 1 permit 10.10.0.0 0.0.0.255
ip nat outside destination list 1 pool mypool
interface g1/1
ip nat inside
interface g1/2
ip nat outside
```

B.
```
enable
configure terminal
ip nat pool mypool 192.168.3.1 192.168.3.3 prefix-length 30
access-list 1 permit 10.10.0.0 0.0.0.254
ip nat inside source list 1 pool mypool
interface g1/1
ip nat inside
interface g1/2
ip nat outside
```

C.
```
enable
configure terminal
ip nat pool mypool 192.168.3.1 192.168.3.3 prefix-length 30
route-map permit 10.10.0.0 255.255.255.0
ip nat outside destination list 1 pool mypool
interface g1/1
ip nat inside
interface g1/2
ip nat outside
```

D.
```
enable
configure terminal
ip nat pool mypool 192.168.3.1 192.168.3.3 prefix-length 30
access-list 1 permit 10.10.0.0 0.0.0.255
ip nat inside source list 1 pool mypool
interface g1/1
ip nat inside
interface g1/2
ip nat outside
```

CERT EMPIRE

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 259
When the active router in an HSRP group fails, what router assumes the role and forwards packets?

A. forwarding

B. listening
C. standby
D. backup

Correct Answer: C
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 260
What protocol allows an engineer to back up 20 network router configurations globally while using the **copy** function?

A. TCP
B. SMTP
C. FTP
D. SNMP

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 261
Which type of address is the public IP address of a NAT device?

A. outside global
B. outside local
C. inside global
D. inside local
E. outside public
F. inside public

Correct Answer: C
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
NAT use four types of addresses:

- Inside local address - The IP address assigned to a host on the inside network. The address is usually not an IP address assigned by the Internet Network Information Center (InterNIC) or service provider. This address is likely to be an RFC 1918 private address.
- Inside global address - A legitimate IP address assigned by the InterNIC or service provider that represents one or more inside local IP addresses to the outside world.
- Outside local address - The IP address of an outside host as it is known to the hosts on the inside network.
- Outside global address - The IP address assigned to a host on the outside network. The owner of the host assigns this address.

QUESTION 262

CERT EMPIRE

Which two pieces of information can you determine from the output of the show ntp status command? (Choose two.)

A. whether the NTP peer is statically configured
B. the IP address of the peer to which the clock is synchronized
C. the configured NTP servers
D. whether the clock is synchronized
E. the NTP version number of the peer

Correct Answer: BD
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
Below is the output of the "show ntp status" command. From this output we learn that R1 has a stratum of 10 and it is getting clock from 10.1.2.1.

```
R1#show ntp status
Clock is synchronized, stratum 10, reference is 10.1.2.1
nominal freq is 250.0000 Hz, actual freq is 249.9987 Hz, precision is 2**18
reference time is D5E492E9.98ACB4CF (13:00:25.596 CST Wed Sep 18 2013)
clock offset is 15.4356 msec, root delay is 52.17 msec
root dispersion is 67.61 msec, peer dispersion is 28.12 msec
```

QUESTION 263
Which keyword in a NAT configuration enables the use of one outside IP address for multiple inside hosts?

A. source
B. static
C. pool
D. overload

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
By adding the keyword "overload" at the end of a NAT statement, NAT becomes PAT (Port Address Translation). This is also a kind of dynamic NAT that maps multiple private IP addresses to a single public IP address (many-to-one) by using different ports. Static NAT and Dynamic NAT both require a one-to-one mapping from the inside local to the inside global address. By using PAT, you can have thousands of users connect to the Internet using only one real global IP address. PAT is the technology that helps us not run out of public IP address on the Internet. This is the most popular type of NAT.

An example of using "overload" keyword is shown below:

R1(config)# ip nat inside source list 1 interface ethernet1 overload

QUESTION 264
Which feature or protocol determines whether the QOS on the network is sufficient to support IP services?

A. LLDP

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B. CDP
C. IP SLA
D. EEM

Correct Answer: C
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
IP SLA allows an IT professional to collect information about network performance in real time. Therefore it helps determine whether the QoS on the network is sufficient for IP services or not.

Cisco IOS Embedded Event Manager (EEM) is a powerful and flexible subsystem that provides real-time network event detection and onboard automation. It gives you the ability to adapt the behavior of your network devices to align with your business needs.

QUESTION 265
In QoS, which prioritization method is appropriate for interactive voice and video?

A. traffic policing
B. round-robin scheduling
C. low-latency queuing
D. expedited forwarding

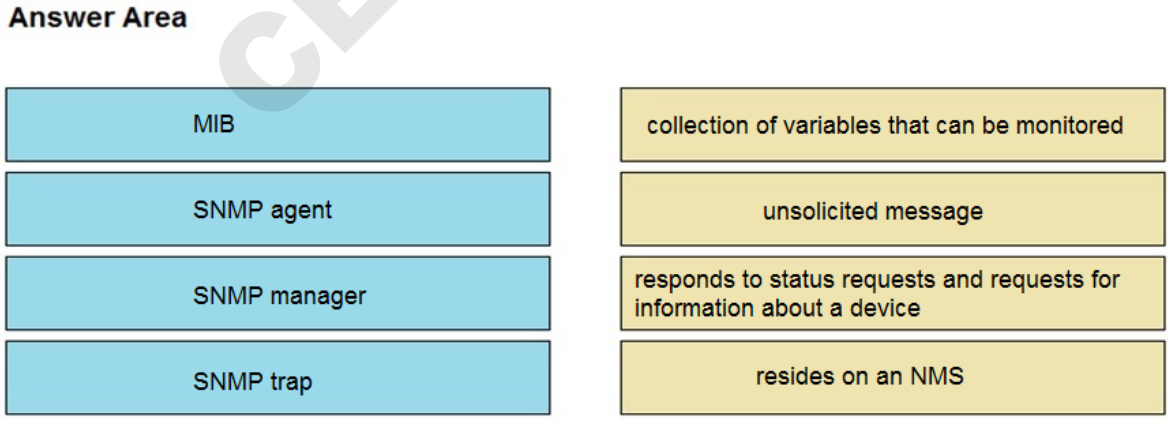
Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

CERT EMPIRE

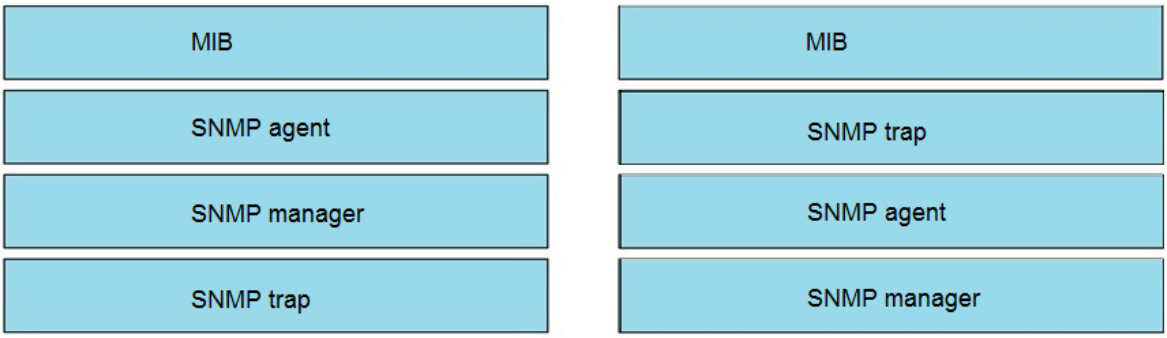
QUESTION 266
Drag and drop the SNMP components from the left onto the descriptions on the right.

Select and Place:



Correct Answer:

Answer Area



Section: IP Services
Explanation

Explanation/Reference:

QUESTION 267
What is the purpose of traffic shaping?

A. to be a marking mechanism that identifies different flows
B. to provide fair queuing for buffered flows
C. to mitigate delays over slow links
D. to limit the bandwidth that a flow can use

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:
Explanation:
The primary reasons you would use traffic shaping are to control access to available bandwidth, to ensure that traffic conforms to the policies established for it, and to regulate the flow of traffic in order to avoid congestion that can occur when the sent traffic exceeds the access speed of its remote, target interface.
Reference: Cisco IOS 12.0 Quality of Service, page 94

QUESTION 268
What is a function of TFTP in network operations?

A. transfers IOS images from a server to a router for firmware upgrades
B. transfers a backup configuration file from a server to a switch using a username and password
C. transfers a configuration files from a server to a router on a congested link
D. transfers files between file systems on a router

Correct Answer: D
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 269

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What is a DHCP client?

A. a workstation that requests a domain name associated with its IP address
B. a host that is configured to request an IP address automatically
C. a server that dynamically assigns IP addresses to hosts.
D. a router that statically assigns IP addresses to hosts.

Correct Answer: B
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 270
Where does the configuration reside when a helper address is configured lo support DHCP?

A. on the router closest to the server
B. on the router closest to the client
C. on every router along the path
D. on the switch trunk interface

Correct Answer: B
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 271
What facilitates a Telnet connection between devices by entering the device name?

A. SNMP
B. DNS lookup
C. syslog
D. NTP

Correct Answer: B
Section: IP Services
Explanation

Explanation/Reference:

QUESTION 272
When a WPA2-PSK WLAN is configured in the Wireless LAN Controller, what is the minimum number of characters that is required in ASCII format?

A. 6
B. 8
C. 12
D. 18

Correct Answer: B
Section: Security Fundamentals

CERT EMPIRE

Explanation

Explanation/Reference:

QUESTION 273
What mechanism carries multicast traffic between remote sites and supports encryption?

A. ISATAP
B. IPsec over ISATAP
C. GRE
D. GRE over IPsec

Correct Answer: D
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 274
An organization secures its network with multi-factor authentication using an authenticator app on employee smartphones. How is the application secured in the case of a user's smartphone being lost or stolen?

A. The application requires the user to enter a PIN before it provides the second factor
B. The application requires an administrator password to reactivate after a configured interval
C. The application verifies that the user is in a specific location before it provides the second factor
D. The application challenges a user by requiring an administrator password to reactivate when the smartphone is rebooted

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 275
Which device performs stateful inspection of traffic?

A. switch
B. firewall
C. access point
D. wireless controller

Correct Answer: B
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 276
A network administrator enabled port security on a switch interface connected to a printer. What is the next configuration action in order to allow the port to learn the MAC address of the printer and insert it into the table automatically?

CERT EMPIRE

A. enable dynamic MAC address learning
B. implement static MAC addressing
C. enable sticky MAC addressing
D. implement auto MAC address learning

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 277

```
Switch(config)#hostname R1
R1(config)#interface FastEthernet0/1
R1(config-if)#no switchport
R1(config-if)#ip address 10.100.20.42 255.255.255.0
R1(config-if)#line vty 0 4
R1(config-line)#login
```

Refer to the exhibit. An engineer booted a new switch and applied this configuration via the console port. Which additional configuration must be applied to allow administrators to authenticate directly to enable privilege mode via Telnet using a local username and password?

A.
```
R1(config)#username admin
R1(config-if)#line vty 0 4
R1(config-line)#password p@ss1234
R1(config-line)#transport input telnet
```

B.
```
R1(config)#username admin privilege 15 secret p@ss1234
R1(config-if)#line vty 0 4
R1(config-line)#login local
```

C.
```
R1(config)#username admin secret p@ss1234
R1(config-if)#line vty 0 4
R1(config-line)#login local
R1(config)#enable secret p@ss1234
```

D.
```
R1(config)#username admin
R1(config-if)#line vty 0 4
R1(config-line)#password p@ss1234
```

Correct Answer: B
Section: Security Fundamentals
Explanation

Explanation/Reference:

CERT EMPIRE

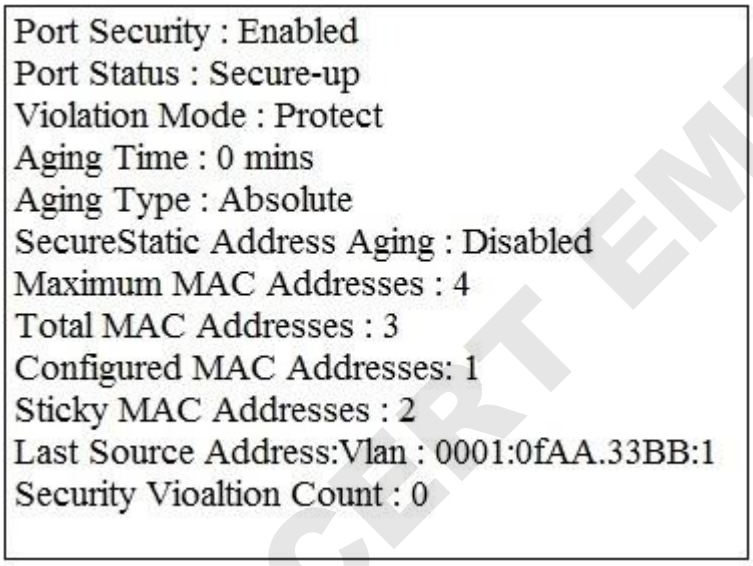
QUESTION 278
Which effete does the aaa new-model configuration command have?

A. It enables AAA services on the device.
B. It configures the device to connect to a RADIUS server for AAA.
C. It associates a RADIUS server to the group.
D. It configures a local user on the device.

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 279
Refer to the exhibit. Which two events occur on the interface, if packets from an unknown Source address arrive after the interface learns the maximum number of secure MAC address? (Choose two.)



A. The security violation counter dose not increment
B. The port LED turns off
C. The interface is error-disabled
D. A syslog message is generated
E. The interface drops traffic from unknown MAC address

Correct Answer: AE
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 280
Which technology must be implemented to configure network device monitoring with the highest security?

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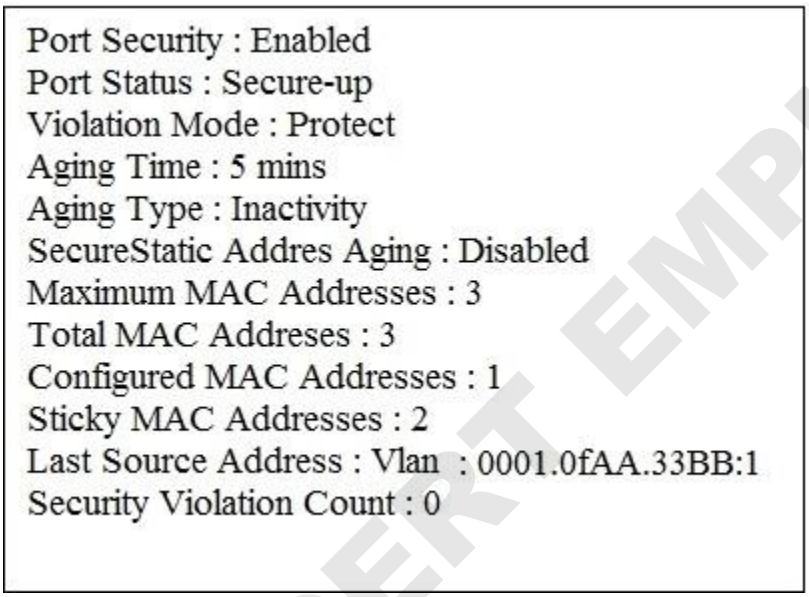
A. IP SLA
B. syslog
C. NetFlow
D. SNMPv3

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 281
Refer to the exhibit. Which two statements about the interface that generated the output are true? (Choose two.)



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A. learned MAC addresses are deleted after five minutes of inactivity
B. the interface is error-disabled if packets arrive from a new unknown source address
C. it has dynamically learned two secure MAC addresses
D. it has dynamically learned three secure MAC addresses
E. the security violation counter increments if packets arrive from a new unknown source address

Correct Answer: AC
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 282
Refer to the exhibit. Which statement about the interface that generated the output is true?

```
Port Security                  : Enabled
Port Status                    : Secure-up
Violation Mode                 : Shutdown
Aging Time                     : 0 mins
Aging Type                     : Absolute
SecureStatic Address Aging     : Disabled
Maximum MAC Addresses          : 5
Total MAC Addresses            : 1
Configured MAC Addresses       : 1
Sticky MAC Addresses           : 0
Last Source Address : Vlan     : 0001.0fAA.33BB:1
Security Violation Count       : 0
```

A. A syslog message is generated when a violation occurs.
B. One secure MAC address is manually configured on the interface.
C. One secure MAC address is dynamically learned on the interface.
D. Five secure MAC addresses are dynamically learned on the interface.

Correct Answer: B
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 283

```
ip arp inspection vlan 2
interface fastethernet 0/1
        switchport mode access
        switchport access vlan 2
```

Refer to the exhibit. What is the effect of this configuration?

A. The switch port remains administratively down until the interface is connected to another switch.
B. Dynamic ARP Inspection is disabled because the ARP ACL is missing.
C. The switch port interface trust state becomes untrusted.
D. The switch port remains down until it is configured to trust or untrust incoming packets.

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:

CERT EMPIRE

Dynamic ARP inspection (DAI) is a security feature that validates ARP packets in a network. It intercepts, logs, and discards ARP packets with invalid IP-to-MAC address bindings. This capability protects the network from certain man-in-the-middle attacks. After enabling DAI, all ports become untrusted ports.

QUESTION 284
What is the primary difference between AAA authentication and authorization?

A. Authentication identifies and verifies a user who is attempting to access a system, and authorization controls the tasks the user can perform.
B. Authentication controls the system processes a user can access, and authorization logs the activities the user initiates.
C. Authentication verifies a username and password, and authorization handles the communication between the authentication agent and the user database.
D. Authentication identifies a user who is attempting to access a system, and authorization validates the user's password.

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
AAA stands for Authentication, Authorization and Accounting.

- Authentication: Specify who you are (usually via login username & password)
- Authorization: Specify what actions you can do, what resource you can access
- Accounting: Monitor what you do, how long you do it (can be used for billing and auditing)

An example of AAA is shown below:

- Authentication: "I am a normal user. My username/password is user_tom/learnforever"
- Authorization: "user_tom can access LearnCCNA server via HTTP and FTP"
- Accounting: "user_tom accessed LearnCCNA server for 2 hours". This user only uses "show" commands.

QUESTION 285
When configuring a WLAN with WPA2 PSK in the Cisco Wireless LAN Controller GUI, which two formats are available to select? (Choose two.)

A. decimal
B. ASCII
C. hexadecimal
D. binary
E. base64

Correct Answer: BC
Section: Security Fundamentals
Explanation

Explanation/Reference:
Reference: https://www.cisco.com/c/en/us/td/docs/wireless/controller/9800/config-guide/b_wl_16_10_cg/multi-preshared-key.pdf

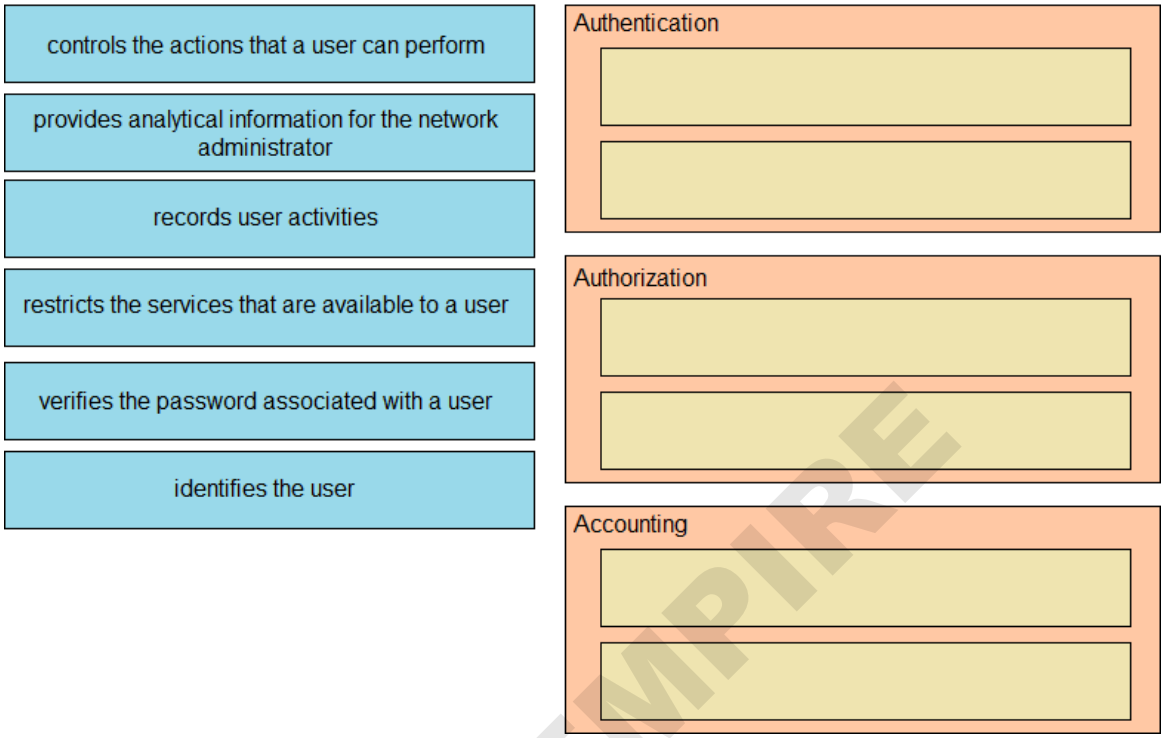
QUESTION 286
DRAG DROP

Drag and drop the AAA functions from the left onto the correct AAA services on the right.

CERT EMPIRE

Select and Place:

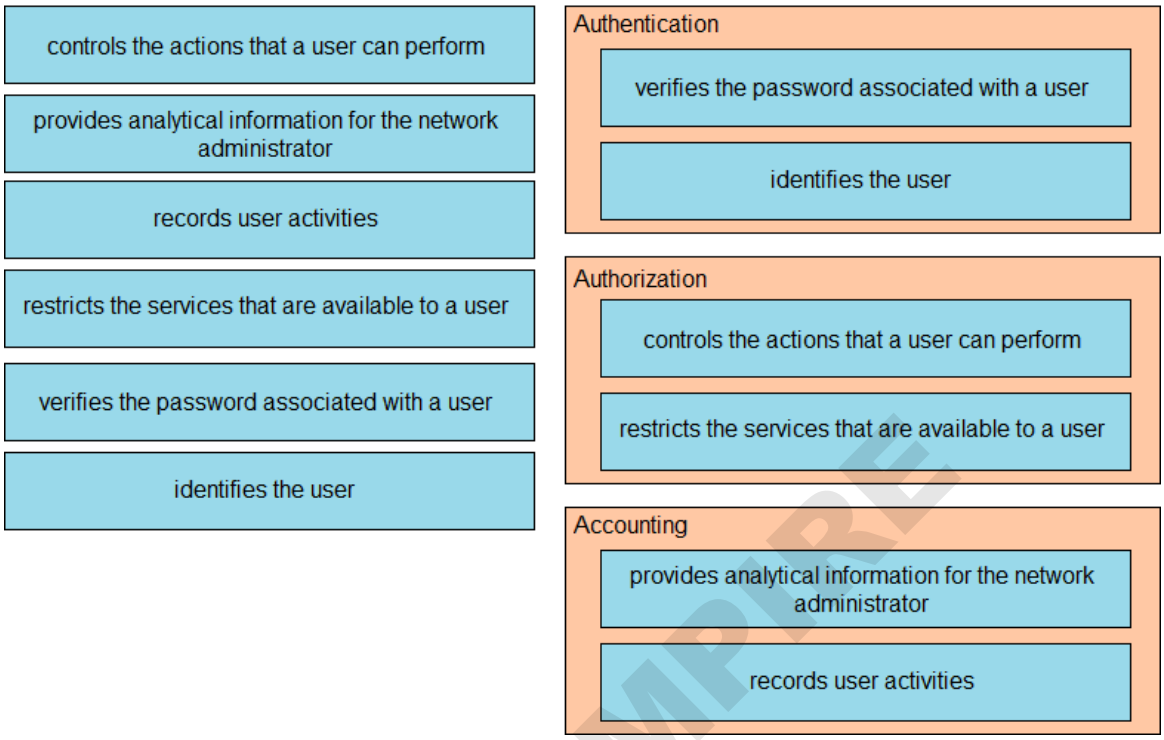
Answer Area



Correct Answer:

CERT EMPIRE

Answer Area



Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 287
An engineer is asked to protect unused ports that are configured in the default VLAN on a switch. Which two steps will fulfill the request? (Choose two.)

A. Configure the ports as trunk ports.
B. Enable the Cisco Discovery Protocol.
C. Configure the port type as access and place in VLAN 99.
D. Administratively shut down the ports.
E. Configure the ports in an EtherChannel.

Correct Answer: CD
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 288
An email user has been lured into clicking a link in an email sent by their company's security organization. The webpage that opens reports that it was safe, but the link may have contained malicious code.

Which type of security program is in place?

CERT EMPIRE

A. user awareness
B. brute force attack
C. physical access control
D. social engineering attack

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
This is a training program which simulates an attack, not a real attack (as it says “The webpage that opens reports that it was safe”) so we believed it should be called a “user awareness” program. Therefore the best answer here should be “user awareness”. This is the definition of “User awareness” from CCNA 200-301 Offical Cert Guide Book:

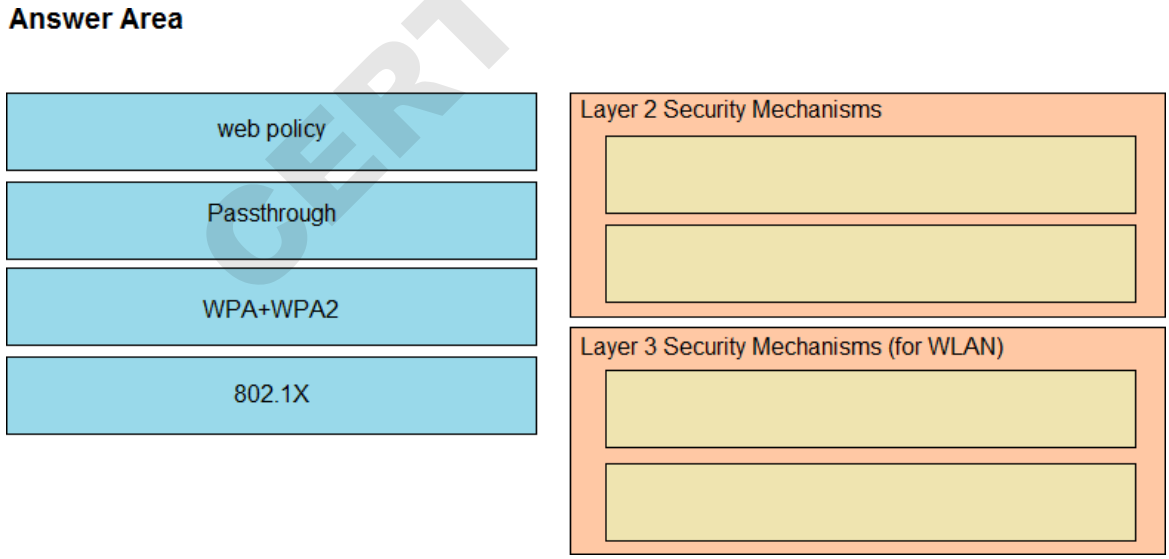
“User awareness: All users should be made aware of the need for data confidentiality to protect corporate information, as well as their own credentials and personal information. They should also be made aware of potential threats, schemes to mislead, and proper procedures to report security incidents. “

Note: Physical access control means infrastructure locations, such as network closets and data centers, should remain securely locked.

QUESTION 289
DRAG DROP

Drag and drop the Cisco Wireless LAN Controller security settings from the left onto the correct security mechanism categories on the right.

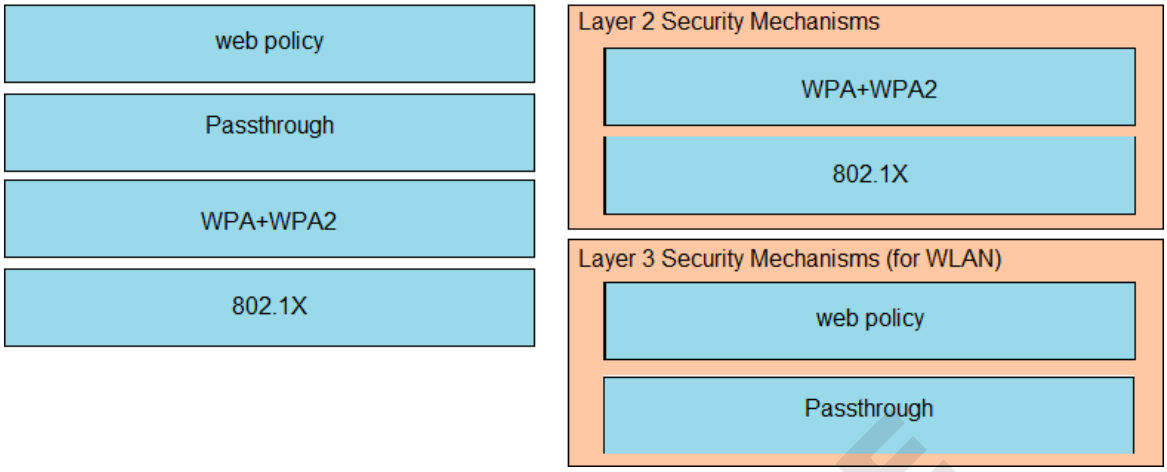
Select and Place:



Correct Answer:

CERT EMPIRE

Answer Area



Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:

Layer 2 Security Mechanism includes WPA+WPA2, 802.1X, Static WEP, CKIP while Layer 3 Security Mechanisms (for WLAN) includes IPSec, VPN Pass-Through, Web Passthrough …

Reference: https://www.cisco.com/c/en/us/support/docs/wireless/4400-series-wireless-lan-controllers/106082-wlc-compatibility-matrix.html

QUESTION 290
Which feature on the Cisco Wireless LAN Controller when enabled restricts management access from specific networks?

A. TACACS
B. CPU ACL
C. Flex ACL
D. RADIUS

Correct Answer: B
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
Whenever you want to control which devices can talk to the main CPU, a CPU ACL is used.

Note: CPU ACLs only filter traffic towards the CPU, and not any traffic exiting or generated by the CPU.

Reference: https://www.cisco.com/c/en/us/support/docs/wireless/4400-series-wireless-lan-controllers/109669-secure-wlc.html

QUESTION 291
Which set of actions satisfy the requirement for multifactor authentication?

CERT EMPIRE

A. The user enters a user name and password, and then re-enters the credentials on a second screen.
B. The user swipes a key fob, then clicks through an email link.
C. The user enters a user name and password, and then clicks a notification in an authentication app on a mobile device.
D. The user enters a PIN into an RSA token, and then enters the displayed RSA key on a login screen.

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
This is an example of how two-factor authentication (2FA) works:
1. The user logs in to the website or service with their username and password.
2. The password is validated by an authentication server and, if correct, the user becomes eligible for the second factor.
3. The authentication server sends a unique code to the user's second-factor method (such as a smartphone app).
4. The user confirms their identity by providing the additional authentication for their second-factor method.

QUESTION 292
Which configuration is needed to generate an RSA key for SSH on a router?

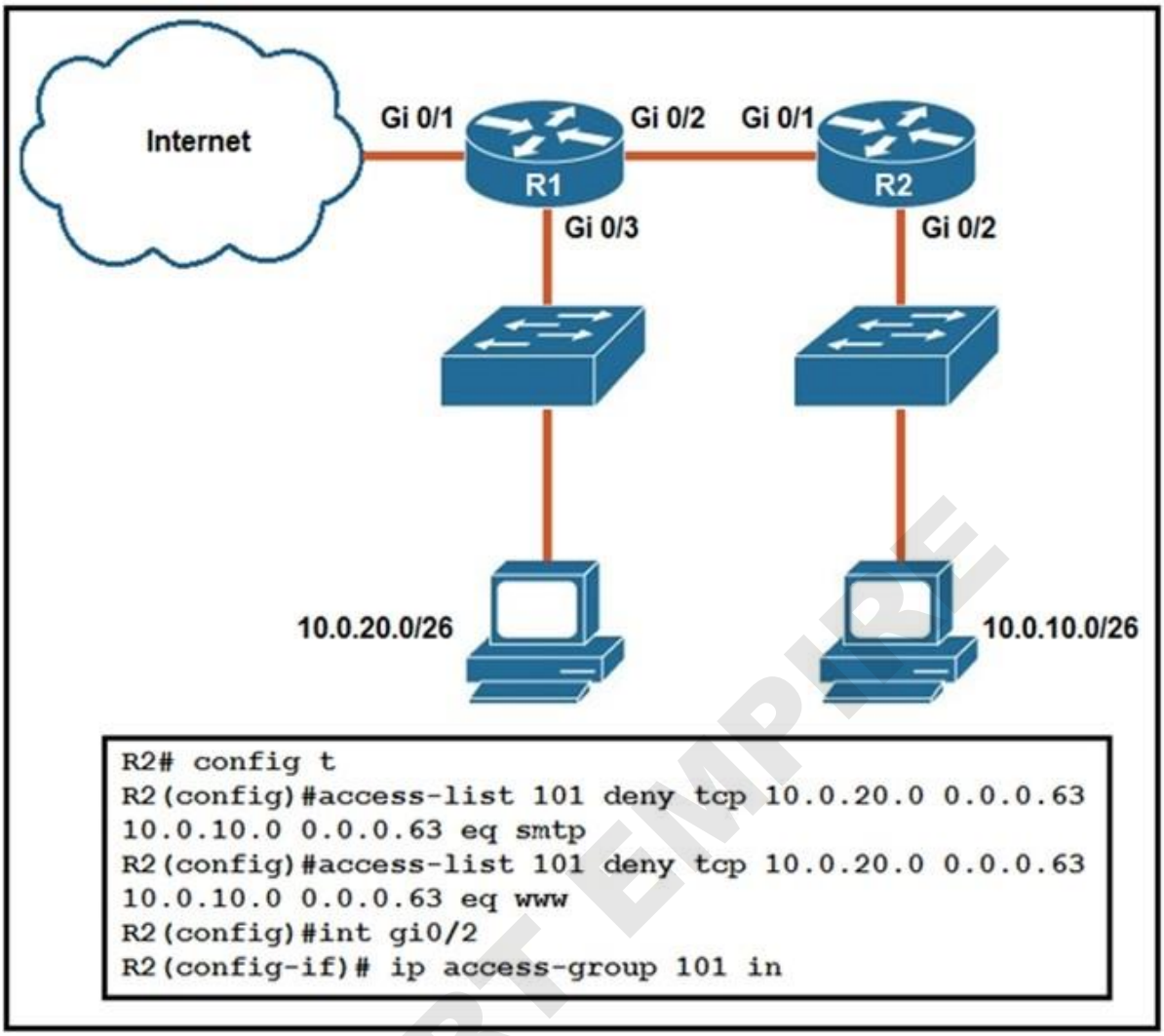
A. Configure VTY access.
B. Configure the version of SSH.
C. Assign a DNS domain name.
D. Create a user with a password.

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 293

CERT EMPIRE



Refer to the exhibit. An extended ACL has been configured and applied to router R2. The configuration failed to work as intended.

Which two changes stop outbound traffic on TCP ports 25 and 80 to 10.0.20.0/26 from the 10.0.10.0/26 subnet while still allowing all other traffic? (Choose two.)

A. Add a “permit ip any any” statement at the end of ACL 101 for allowed traffic.
B. Add a “permit ip any any” statement to the beginning of ACL 101 for allowed traffic.
C. The ACL must be moved to the Gi0/1 interface outbound on R2.
D. The source and destination IPs must be swapped in ACL 101.
E. The ACL must be configured the Gi0/2 interface inbound on R1.

Correct Answer: AD
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 294
An engineer must configure a WLAN using the strongest encryption type for WPA2-PSK. Which cipher fulfills

CERT EMPIRE

the configuration requirement?

A. WEP
B. AES
C. RC4
D. TKIP

Correct Answer: B
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
Many routers provide WPA2-PSK (TKIP), WPA2-PSK (AES), and WPA2-PSK (TKIP/AES) as options. TKIP is actually an older encryption protocol introduced with WPA to replace the very-insecure WEP encryption at the time. TKIP is actually quite similar to WEP encryption. TKIP is no longer considered secure, and is now deprecated. In other words, you shouldn't be using it.

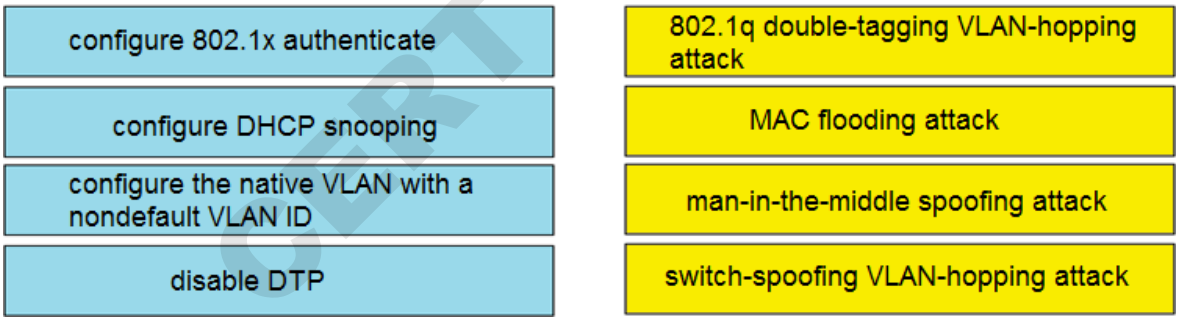
AES is a more secure encryption protocol introduced with WPA2 and it is currently the strongest encryption type for WPA2-PSK/.

QUESTION 295
DRAG DROP

Drag and drop the attack-mitigation techniques from the left onto the types of attack that they mitigate on the right.

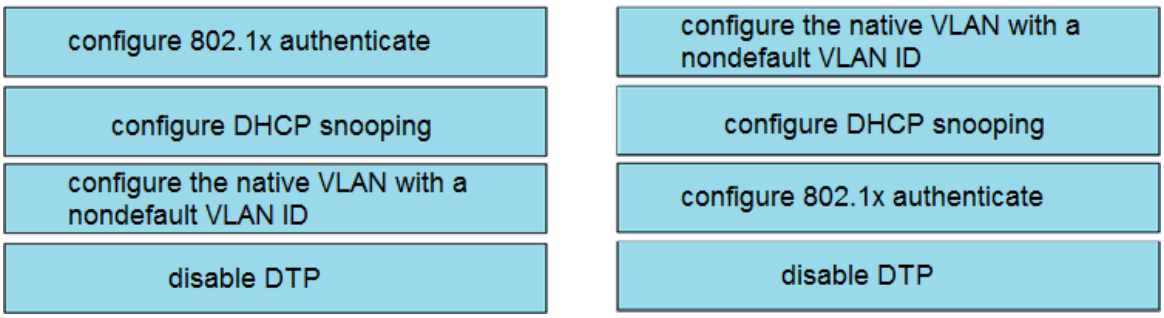
Select and Place:

Answer Area



Correct Answer:

Answer Area

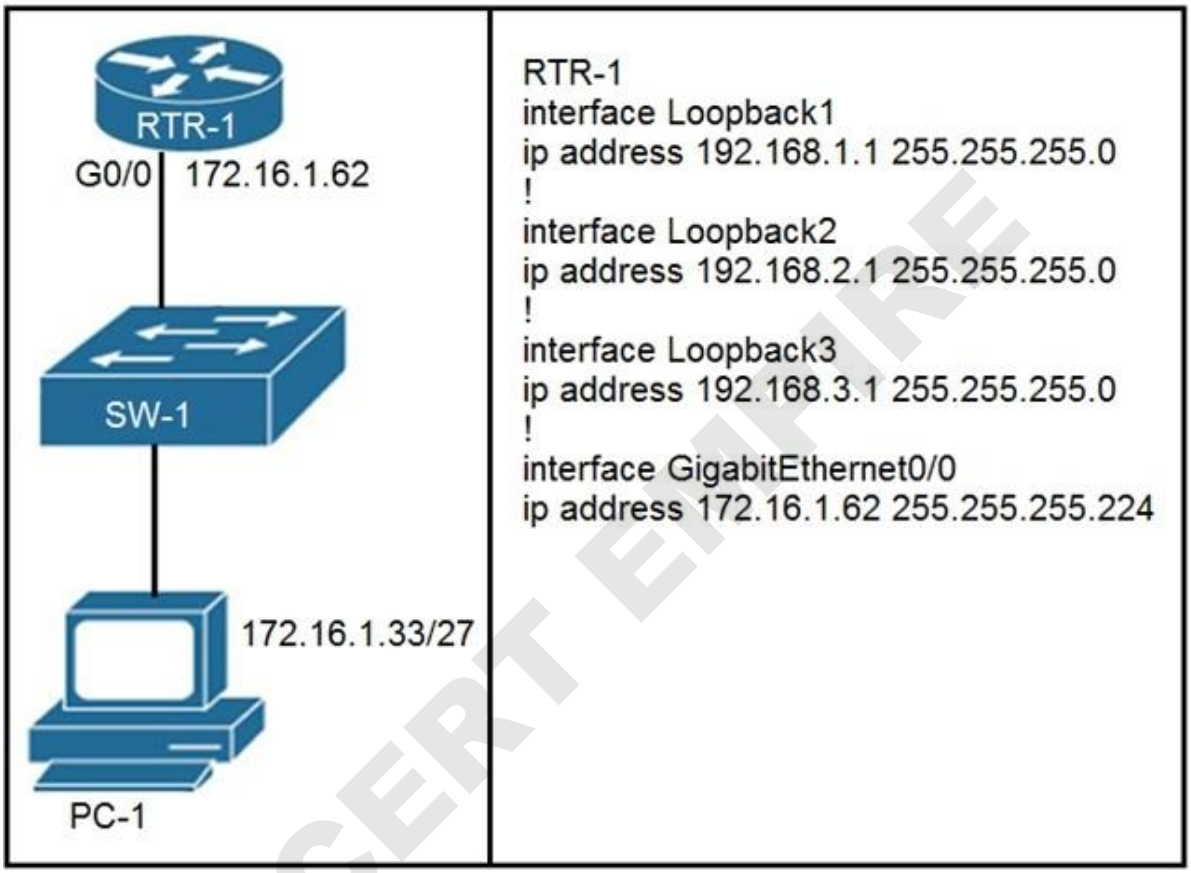


CERT EMPIRE

Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 296
Refer to the exhibit. What configuration for RTR-1 denies SSH access from PC-1 to any RTR-1 interface and allows all other traffic?



CERT EMPIRE

A. **access-list 100 deny tcp host 172.16.1.33 any eq 22**
access-list 100 permit ip any any

interface GigabitEthernet0/0
ip access-group 100 in

B. **access-list 100 deny tcp host 172.16.1.33 any eq 22**
access-list 100 permit ip any any

line vty 0 15
access-class 100 in

C.
```
access-list 100 deny tcp host 172.16.1.33 any eq 23
access-list 100 permit ip any any

interface GigabitEthernet0/0
ip access-group 100 in
```

D.
```
access-list 100 deny tcp host 172.16.1.33 any eq 23
access-list 100 permit ip any any

line vty 0 15
access-class 100 in
```

Correct Answer: B
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 297
While examining excessive traffic on the network, it is noted that all incoming packets on an interface appear to be allowed even though an IPv4 ACL is applied to the interface. Which two misconfigurations cause this behavior? (Choose two.)

A. The ACL is empty
B. A matching **permit** statement is too broadly defined
C. The packets fail to match any **permit** statement
D. A matching **deny** statement is too high in the access list
E. A matching **permit** statement is too high in the access list

Correct Answer: BE
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 298
The **service password-encryption** command is entered on a router. What is the effect of this configuration?

A. restricts unauthorized users from viewing clear-text passwords in the running configuration
B. prevents network administrators from configuring clear-text passwords
C. protects the VLAN database from unauthorized PC connections on the switch
D. encrypts the password exchange when a VPN tunnel is established

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:

CERT EMPIRE

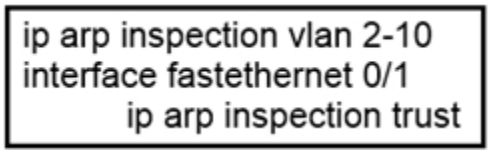
QUESTION 299
Which WPA3 enhancement protects against hackers viewing traffic on the Wi-Fi network?

A. SAE encryption
B. TKIP encryption
C. scrambled encryption key
D. AES encryption

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 300
Refer to the exhibit. If the network environment is operating normally, which type of device must be connected to interface FastEthernet 0/1?



A. DHCP client
B. access point
C. router
D. PC

Correct Answer: D
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 301
Refer to the exhibit. An administrator configures four switches for local authentication using passwords that are stored as a cryptographic hash. The four switches must also support SSH access for administrators to manage the network infrastructure. Which switch is configured correctly to meet these requirements?

CERT EMPIRE

```
SW1(config-line) #line vty 0 15
SW1(config-line) #no login local
SW1(config-line) #password cisco

SW2(config) #username admin1 password abcd1234
SW2(config) #username admin2 password abcd1234
SW2(config-line) #line vty 0 15
SW2(config-line) #login local

SW3(config) #username admin1 secret abcd1234
SW3(config) #username admin2 secret abcd1234
SW3(config-line) #line vty 0 15
SW3(config-line) #login local

SW4(config) #username admin1 secret abcd1234
SW4(config) #username admin2 secret abcd1234
SW4(config-line) #line console 0
SW4(config-line) #login local
```

A. SW1
B. SW2
C. SW3
D. SW4

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 302

```
ip arp inspection vlan 5-10
interface fastethernet 0/1
   switchport mode access
   switchport access vlan 5
```

Refer to the exhibit. What is the effect of this configuration?

A. The switch discards all ingress ARP traffic with invalid MAC-to-IP address bindings.
B. All ARP packets are dropped by the switch.
C. Egress traffic is passed only if the destination is a DHCP server.
D. All ingress and egress traffic is dropped because the interface is untrusted.

Correct Answer: A
Section: Security Fundamentals

Explanation

Explanation/Reference:
Explanation:
Dynamic ARP inspection is an ingress security feature; it does not perform any egress checking.

QUESTION 303
When a site-to-site VPN is used, which protocol is responsible for the transport of user data?

A. IPsec
B. IKEv1
C. MD5
D. IKEv2

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
A site-to-site VPN allows offices in multiple fixed locations to establish secure connections with each other over a public network such as the Internet. A site-to-site VPN means that two sites create a VPN tunnel by encrypting and sending data between two devices. One set of rules for creating a site-to-site VPN is defined by IPsec.

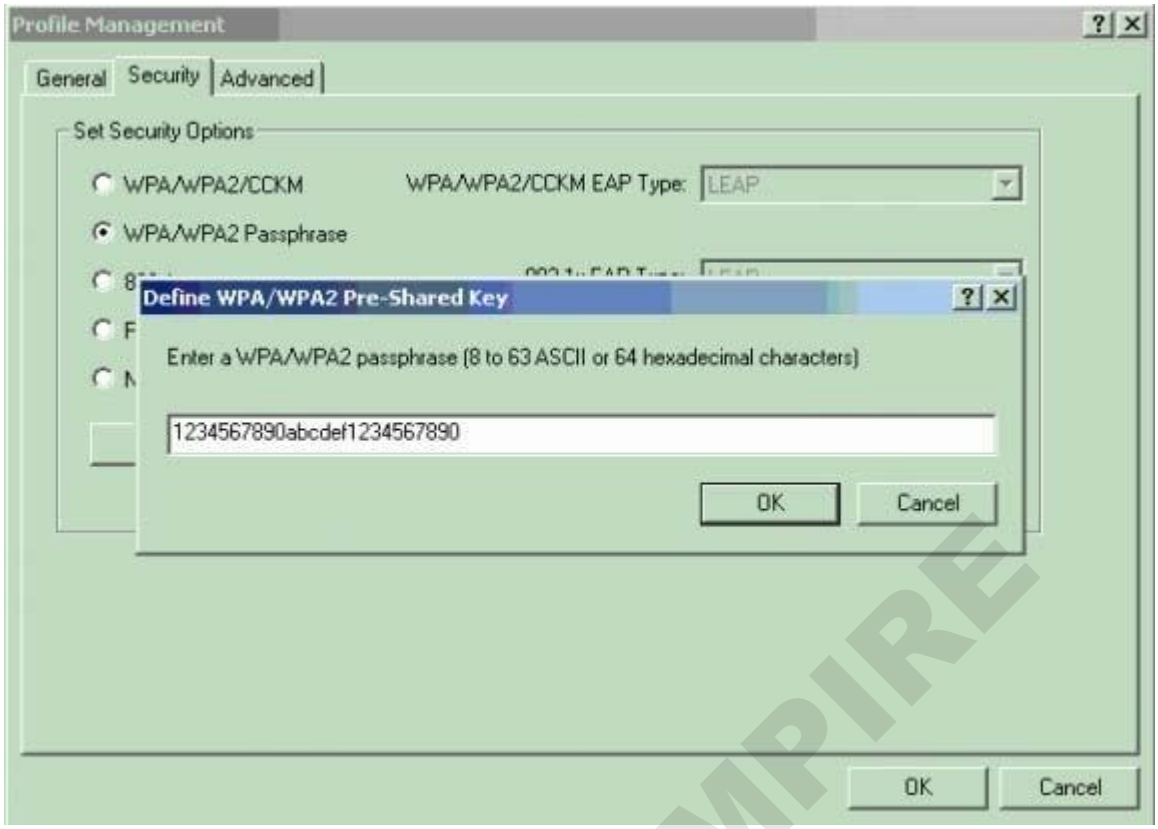
QUESTION 304
Which type of wireless encryption is used for WPA2 in preshared key mode?

A. AES-128
B. TKIP with RC4
C. AES-256
D. RC4

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
We can see in this picture we have to type 64 hexadecimal characters (256 bit) for the WPA2 passphrase so we can deduce the encryption is AES-256, not AES-128.

CERT EMPIRE



Reference: https://www.cisco.com/c/en/us/support/docs/wireless-mobility/wireless-lan-wlan/67134-wpa2-config.html

QUESTION 305
DRAG DROP

Drag and drop the threat-mitigation techniques from the left onto the types of threat or attack they mitigate on the right.

Select and Place:

Answer Area

Configure BPDU guard.	802.1q double tagging
Configure dynamic ARP inspection.	ARP spoofing
Configure root guard.	unwanted superior BPDUs
Configure VACL.	unwanted BPDUs on PortFast-enabled interfaces

Correct Answer:

CERT EMPIRE

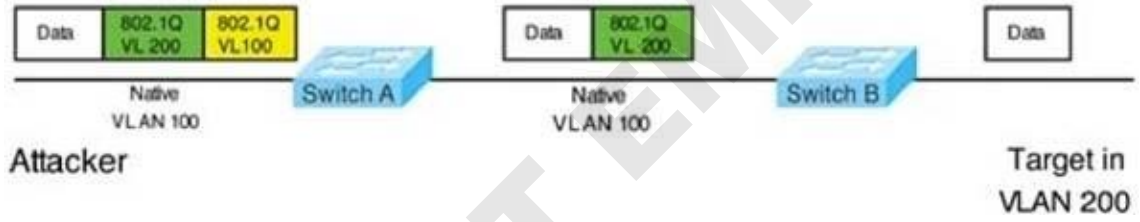
Answer Area

Configure BPDU guard.	Configure VACL.
Configure dynamic ARP inspection.	Configure dynamic ARP inspection.
Configure root guard.	Configure root guard.
Configure VACL.	Configure BPDU guard.

Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:

Double-Tagging attack:



In this attack, the attacking computer generates frames with two 802.1Q tags. The first tag matches the native VLAN of the trunk port (VLAN 10 in this case), and the second matches the VLAN of a host it wants to attack (VLAN 20).

When the packet from the attacker reaches Switch A, Switch A only sees the first VLAN 10 and it matches with its native VLAN 10 so this VLAN tag is removed. Switch A forwards the frame out all links with the same native VLAN 10. Switch B receives the frame with an tag of VLAN 20 so it removes this tag and forwards out to the Victim computer.

Note: This attack only works if the trunk (between two switches) has the same native VLAN as the attacker.

To mitigate this type of attack, you can use VLAN access control lists (VACLs, which applies to all traffic within a VLAN. We can use VACL to drop attacker traffic to specific victims/servers) or implement Private VLANs.

ARP attack (like ARP poisoning/spoofing) is a type of attack in which a malicious actor sends falsified ARP messages over a local area network as ARP allows a gratuitous reply from a host even if an ARP request was not received. This results in the linking of an attacker's MAC address with the IP address of a legitimate computer or server on the network. This is an attack based on ARP which is at Layer 2. Dynamic ARP inspection (DAI) is a security feature that validates ARP packets in a network which can be used to mitigate this type of attack.

QUESTION 306
Which command prevents passwords from being stored in the configuration as plain text on a router or switch?

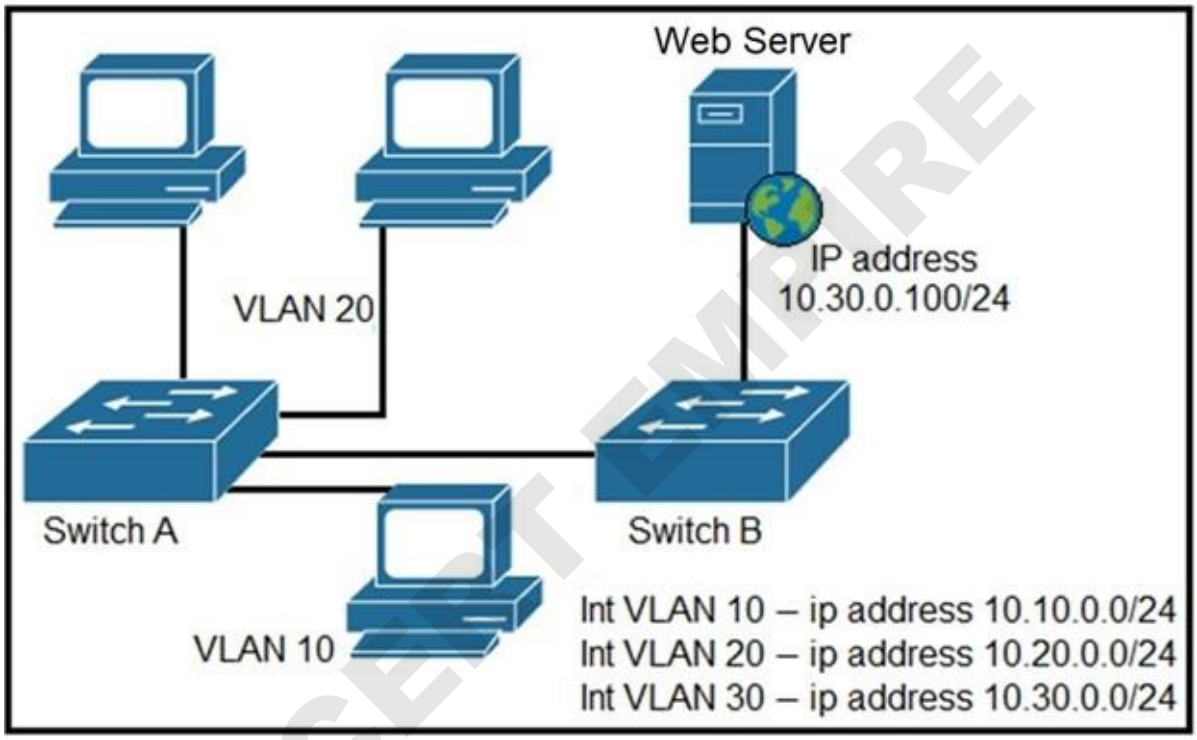
CERT EMPIRE

A. enable secret
B. enable password
C. service password-encryption
D. username cisco password encrypt

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 307



Refer to the exhibit. A network engineer must block access for all computers on VLAN 20 to the web server via HTTP. All other computers must be able to access the web server. Which configuration when applied to switch A accomplishes the task?

A.
```
config t
ip access-list extended wwwblock
permit ip any any
deny tcp any host 10.30.0.100 eq 80
int vlan 20
ip access-group wwwblock in
```

B.
```
config t
ip access-list extended wwwblock
permit ip any any
deny tcp any host 10.30.0.100 eq 80
int vlan 30
ip access-group wwwblock in
```

C.
```
config t
ip access-list extended wwwblock
deny tcp any host 10.30.0.100 eq 80
int vlan 10
ip access-group wwwblock in
```

D.
```
config t
ip access-list extended wwwblock
deny tcp any host 10.30.0.100 eq 80
permit ip any any
int vlan 20
ip access-group wwwblock in
```

Correct Answer: D
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 308
In which two ways does a password manager reduce the chance of a hacker stealing a user's password? (Choose two.)

A. It encourages users to create stronger passwords
B. It uses an internal firewall to protect the password repository from unauthorized access
C. It stores the password repository on the local workstation with built-in antivirus and anti-malware functionality
D. It automatically provides a second authentication factor that is unknown to the original user
E. It protects against keystroke logging on a compromised device or web site

Correct Answer: AE
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 309
Which goal is achieved by the implementation of private IPv4 addressing on a network?

A. provides an added level of protection against Internet exposure
B. provides a reduction in size of the forwarding table on network routers
C. allows communication across the Internet to other private networks
D. allows servers and workstations to communicate across public network boundaries

CERT EMPIRE

Correct Answer: A
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 310
Which type of attack is mitigated by dynamic ARP inspection?

A. DDoS
B. malware
C. man-in-the-middle
D. worm

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 311
What is a function of a remote access VPN?

A. establishes a secure tunnel between two branch sites
B. uses cryptographic tunneling to protect the privacy of data for multiple users simultaneously
C. uses exclusively when a user is connected to a company's internal network
D. allows the users to access company internal network resources through a secure tunnel

Correct Answer: D
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 312
What are two recommendations for protecting network ports from being exploited when located in an office space outside of an IT closet? (Choose two.)

A. enable the PortFast feature on ports
B. configure static ARP entries
C. configure ports to a fixed speed
D. implement port-based authentication
E. shut down unused ports

Correct Answer: DE
Section: Security Fundamentals
Explanation

Explanation/Reference:

CERT EMPIRE

QUESTION 313

```
interface GigabitEthernet0/1
ip address 192.168.1.2 255.255.255.0
ip access-group 2699 in
!
access-list 2699 deny icmp any 10.10.1.0 0.0.0.255 echo
access-list 2699 deny ip any 10.20.1.0 0.0.0.255
access-list 2699 permit ip any 10.10.1.0 0.0.0.255
access-list 2699 permit tcp any 10.20.1.0 0.0.0.127 eq 22
```

Refer to the exhibit. A network administrator must permit SSH access to remotely manage routers in a network. The operations team resides on the 10.20.1.0/25 network. Which command will accomplish this task?

A. **access-list 2699 permit udp 10.20.1.0 0.0.0.255**
B. no access-list 2699 deny tcp any 10.20.1.0 0.0.0.127 eq 22
C. access-list 2699 permit tcp any 10.20.1.0 0.0.0.255 eq 22
D. no access-list 2699 deny ip any 10.20.1.0 0.0.0.255

Correct Answer: D
Section: Security Fundamentals
Explanation

Explanation/Reference:
Explanation:
Already a statement is there in last to allow SSH Traffic for network 10.20.1.0 0.0.0.127, but Second statement says deny ip any 10.20.1.0 0.0.0.255, so how it will work once it is denied. So the right answer is remove the --- no access-list 2699 deny ip any 10.20.1.0 0.0.0.255.

QUESTION 314
A port security violation has occurred on a switch port due to the maximum MAC address count being exceeded. Which command must be configured to increment the security-violation count and forward an SNMP trap?

A. switchport port-security violation access
B. switchport port-security violation protect
C. switchport port-security violation restrict
D. switchport port-security violation shutdown

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:
Reference: https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst4500/12-2/25ew/configuration/guide/conf/port_sec.html

QUESTION 315
What is a practice that protects a network from VLAN hopping attacks?

A. Enable dynamic ARP inspection
B. Configure an ACL to prevent traffic from changing VLANs

CERT EMPIRE

C. Change native VLAN to an unused VLAN ID
D. Implement port security on internet-facing VLANs

Correct Answer: C
Section: Security Fundamentals
Explanation

Explanation/Reference:

QUESTION 316
What are two southbound APIs? (Choose two.)

A. Thrift
B. DSC
C. CORBA
D. NETCONF
E. OpenFlow

Correct Answer: DE
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
OpenFlow is a well-known southbound API. OpenFlow defines the way the SDN Controller should interact with the forwarding plane to make adjustments to the network, so it can better adapt to changing business requirements.

The Network Configuration Protocol (NetConf) uses Extensible Markup Language (XML) to install, manipulate and delete configuration to network devices.

Other southbound APIs are:
- onePK: a Cisco proprietary SBI to inspect or modify the network element configuration without hardware upgrades.
- OpFlex: an open-standard, distributed control system. It send “summary policy” to network elements.

QUESTION 317
What makes Cisco DNA Center different from traditional network management applications and their management of networks?

A. Its modular design allows someone to implement different versions to meet the specific needs of an organization.
B. It only supports auto-discovery of network elements in a greenfield deployment.
C. It does not support high availability of management functions when operating in cluster mode.
D. It abstracts policy from the actual device configuration.

Correct Answer: D
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 318
Which API is used in controller-based architectures to interact with edge devices?

CERT EMPIRE

A. southbound
B. overlay
C. northbound
D. underlay

Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 319
An organization has decided to start using cloud-provided services. Which cloud service allows the organization to install its own operating system on a virtual machine?

A. platform-as-a-service
B. network-as-a-service
C. software-as-a-service
D. infrastructure-as-a-service

Correct Answer: D
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
Below are the 3 cloud supporting services cloud providers provide to customer:

- SaaS (Software as a Service): SaaS uses the web to deliver applications that are managed by a third-party vendor and whose interface is accessed on the clients' side. Most SaaS applications can be run directly from a web browser without any downloads or installations required, although some require plugins.
- PaaS (Platform as a Service): are used for applications, and other development, while providing cloud components to software. What developers gain with PaaS is a framework they can build upon to develop or customize applications. PaaS makes the development, testing, and deployment of applications quick, simple, and cost-effective. With this technology, enterprise operations, or a third-party provider, can manage OSes, virtualization, servers, storage, networking, and the PaaS software itself. Developers, however, manage the applications.
- IaaS (Infrastructure as a Service): self-service models for accessing, monitoring, and managing remote datacenter infrastructures, such as compute (virtualized or bare metal), storage, networking, and networking services (e.g. firewalls). Instead of having to purchase hardware outright, users can purchase IaaS based on consumption, similar to electricity or other utility billing.

In general, IaaS provides hardware so that an organization can install their own operating system.

QUESTION 320
How do traditional campus device management and Cisco DNA Center device management differ in regards to deployment?

A. Traditional campus device management allows a network to scale more quickly than with Cisco DNA Center device management.
B. Cisco DNA Center device management can deploy a network more quickly than traditional campus device management.
C. Cisco DNA Center device management can be implemented at a lower cost than most traditional campus device management options.

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D. Traditional campus device management schemes can typically deploy patches and updates more quickly than Cisco DNA Center device management.

Correct Answer: B
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 321
Which purpose does a northbound API serve in a controller-based networking architecture?

A. facilitates communication between the controller and the applications
B. reports device errors to a controller
C. generates statistics for network hardware and traffic
D. communicates between the controller and the physical network hardware

Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 322
What benefit does controller-based networking provide versus traditional networking?

A. allows configuration and monitoring of the network from one centralized point
B. provides an added layer of security to protect from DDoS attacks
C. combines control and data plane functionality on a single device to minimize latency
D. moves from a two-tier to a three-tier network architecture to provide maximum redundancy

Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 323
What is an advantage of Cisco DNA Center versus traditional campus device management?

A. It is designed primarily to provide network assurance.
B. It supports numerous extensibility options, including cross-domain adapters and third-party SDKs.
C. It supports high availability for management functions when operating in cluster mode.
D. It enables easy autodiscovery of network elements in a brownfield deployment.

Correct Answer: B
Section: Automation and Programmability
Explanation

Explanation/Reference:

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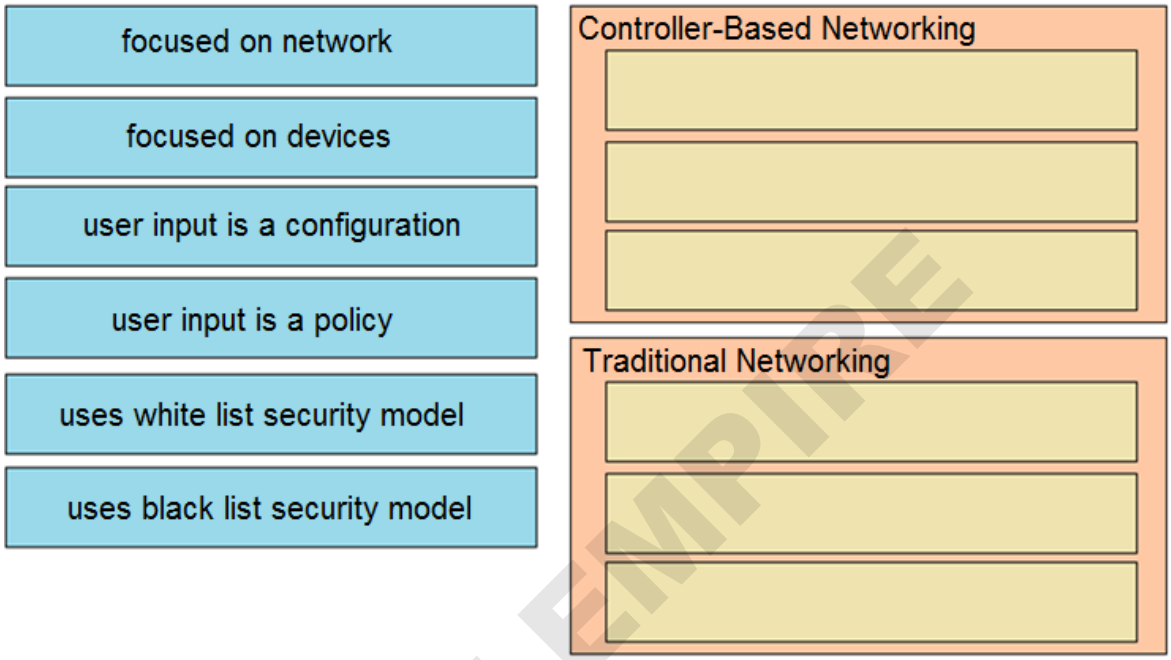
QUESTION 324
DRAG DROP

Drag and drop the characteristics of networking from the left onto the correct networking types on the right.

Select and Place:

Answer Area



Correct Answer:

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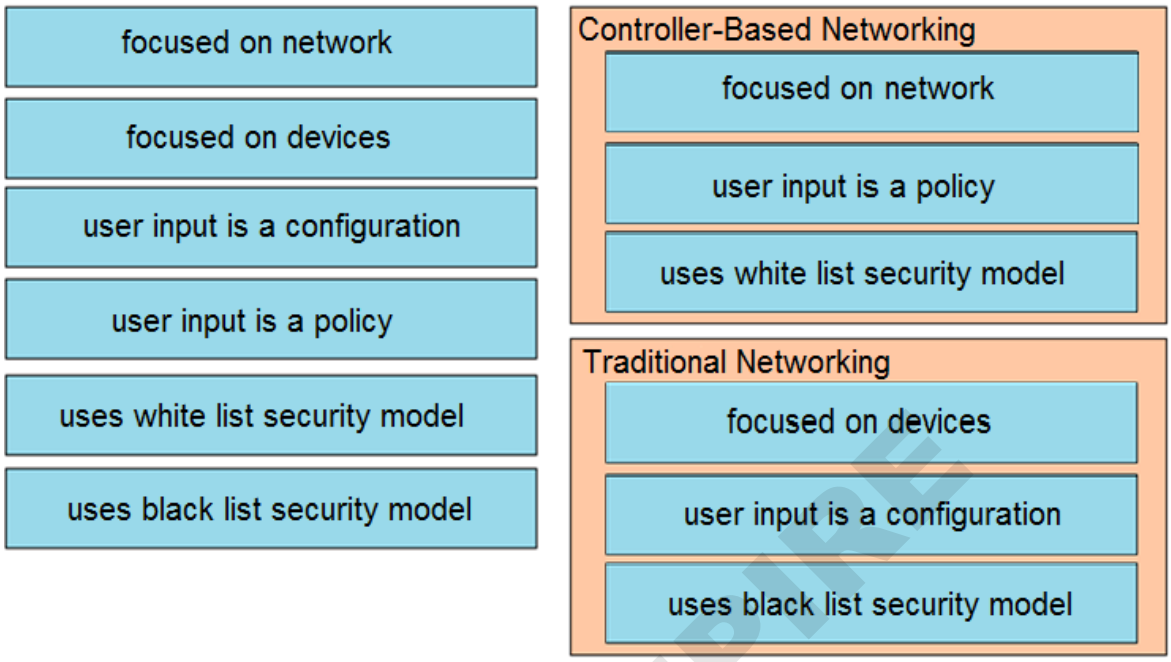
Answer Area



Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 325
What are two fundamentals of virtualization? (Choose two.)

A. It allows logical network devices to move traffic between virtual machines and the rest of the physical network.
B. It allows multiple operating systems and applications to run independently on one physical server.
C. It allows a physical router to directly connect NICs from each virtual machine into the network.
D. It requires that some servers, virtual machines, and network gear reside on the Internet.
E. The environment must be configured with one hypervisor that serves solely as a network manager to monitor SNMP traffic.

Correct Answer: AB
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 326
How does Cisco DNA Center gather data from the network?

A. Devices use the call-home protocol to periodically send data to the controller
B. Devices establish an IPsec tunnel to exchange data with the controller
C. The Cisco CLI Analyzer tool gathers data from each licensed network device and streams it to the

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controller

D. Network devices use different services like SNMP, syslog, and streaming telemetry to send data to the controller

Correct Answer: D
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 327
Which statement correctly compares traditional networks and controller-based networks?

A. Only controller-based networks decouple the control plane and the data plane.
B. Traditional and controller-based networks abstract policies from device configurations.
C. Only traditional networks natively support centralized management.
D. Only traditional networks offer a centralized control plane.

Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
Most traditional devices use a distributed architecture, in which each control plane is resided in a networking device. Therefore they need to communicate with each other via messages to work correctly.
In contrast to distributed architecture, centralized (or controller-based) architectures centralizes the control of networking devices into one device, called SDN controller.

QUESTION 328
What are two benefits of network automation? (Choose two.)

A. reduced hardware footprint
B. reduced operational costs
C. faster changes with more reliable results
D. fewer network failures
E. increased network security

Correct Answer: BC
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 329
Which two encoding methods are supported by REST APIs? (Choose two.)

A. SGML
B. YAML
C. XML
D. JSON
E. EBCDIC

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Correct Answer: CD
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
The Application Policy Infrastructure Controller (APIC) REST API is a programmatic interface that uses REST architecture. The API accepts and returns HTTP (not enabled by default) or HTTPS messages that contain JavaScript Object Notation (JSON) or Extensible Markup Language (XML) documents.

Reference: https://www.cisco.com/c/en/us/td/docs/switches/datacenter/aci/apic/sw/2-x/rest_cfg/2_1_x/b_Cisco_APIC_REST_API_Configuration_Guide/b_Cisco_APIC_REST_API_Configuration_Guide_chapter_01.html

QUESTION 330
What are two characteristics of a controller-based network? (Choose two.)

A. It uses Telnet to report system issues.
B. The administrator can make configuration updates from the CLI.
C. It uses northbound and southbound APIs to communicate between architectural layers.
D. It decentralizes the control plane, which allows each device to make its own forwarding decisions.
E. It moves the control plane to a central point.

Correct Answer: CE
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 331
Which output displays a JSON data representation?

A.
```
{
  "response": {
  "taskId": {};
  "url": "string"
  };
  "version": "string"
}
```

B.
```
{
  "response"- {
  "taskId"- {},
  "url"- "string"
  },
  "version"- "string"
}
```

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C.
```
{
  "response": {
  "taskId": {},
  "url": "string"
  },
  "version": "string"
}
```
D.
```
{
  "response", {
  "taskId", {};
  "url", "string"
  };
  "version", "string"
}
```

Correct Answer: C
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
JSON data is written as name/value pairs.
A name/value pair consists of a field name (in double quotes), followed by a colon, followed by a value:
"name":"Mark"

JSON can use arrays. Array values must be of type string, number, object, array, boolean or null. For example:
{
"name":"John",
"age":30,
"cars":["Ford", "BMW", "Fiat"]
}

JSON can have empty object like "taskId":{}

QUESTION 332
DRAG DROP

Drag and drop the descriptions from the left onto the configuration-management technologies on the right.

Select and Place:

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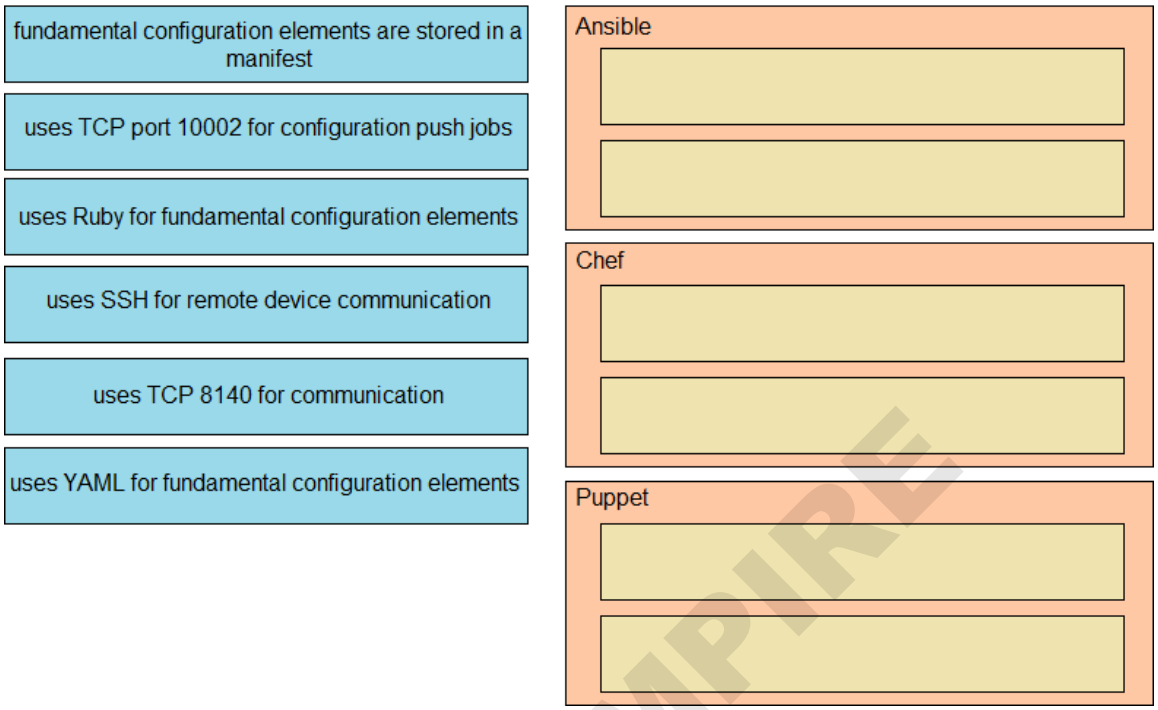
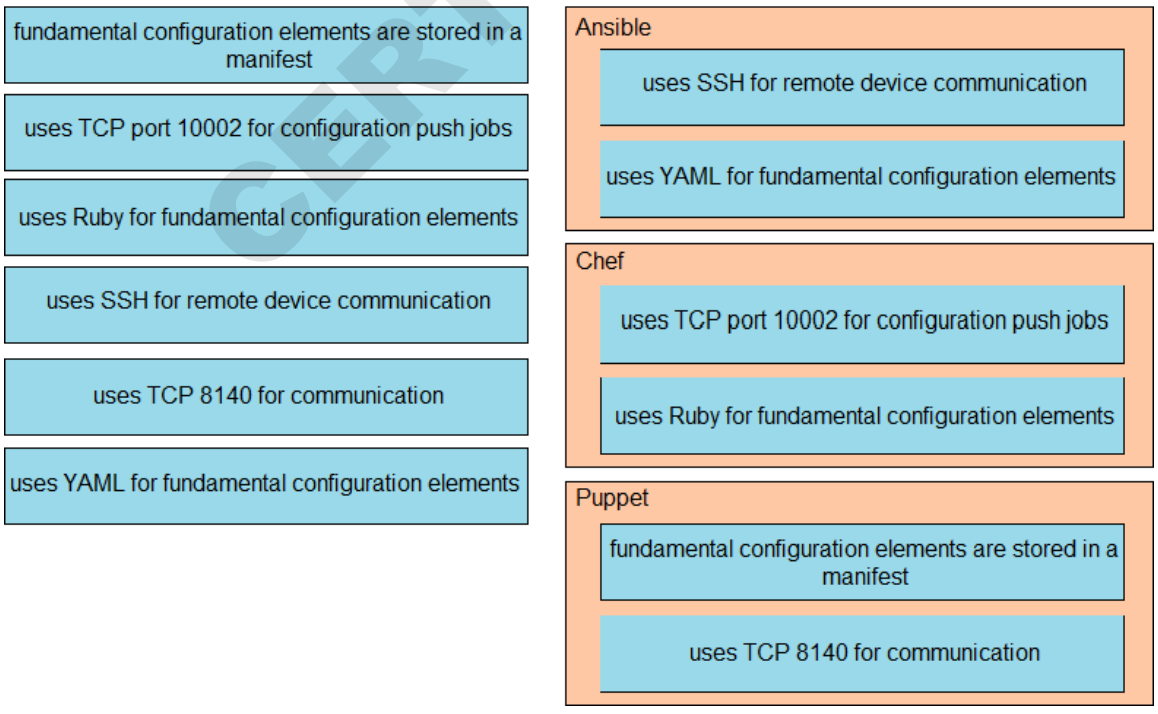
Answer Area



Correct Answer:

Answer Area



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Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
The focus of Ansible is to be streamlined and fast, and to require no node agent installation. Thus, Ansible performs all functions over SSH. Ansible is built on Python, in contrast to the Ruby foundation of Puppet and Chef.

TCP port 10002 is the command port. It may be configured in the Chef Push Jobs configuration file . This port allows Chef Push Jobs clients to communicate with the Chef Push Jobs server.

Puppet is an open-source configuration management solution, which is built with Ruby and offers custom Domain Specific Language (DSL) and Embedded Ruby (ERB) templates to create custom Puppet language files, offering a declarative-paradigm programming approach.

A Puppet piece of code is called a manifest, and is a file with .pp extension.

QUESTION 333
Which two capabilities of Cisco DNA Center make it more extensible? (Choose two.)

A. REST APIs that allow for external applications to interact natively with Cisco DNA Center
B. adapters that support all families of Cisco IOS software
C. SDKs that support interaction with third-party network equipment
D. modular design that is upgradable as needed
E. customized versions for small, medium, and large enterprises

Correct Answer: AC
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
Cisco DNA Center offers 360-degree extensibility through four distinct types of platform capabilities:

- Intent-based APIs leverage the controller and enable business and IT applications to deliver intent to the network and to reap network analytics and insights for IT and business innovation.
- Process adapters, built on integration APIs, allow integration with other IT and network systems to streamline IT operations and processes.
- Domain adapters, built on integration APIs, allow integration with other infrastructure domains such as data center, WAN, and security to deliver a consistent intent-based infrastructure across the entire IT environment.
- SDKs allow management to be extended to third-party vendor's network devices to offer support for diverse environments.

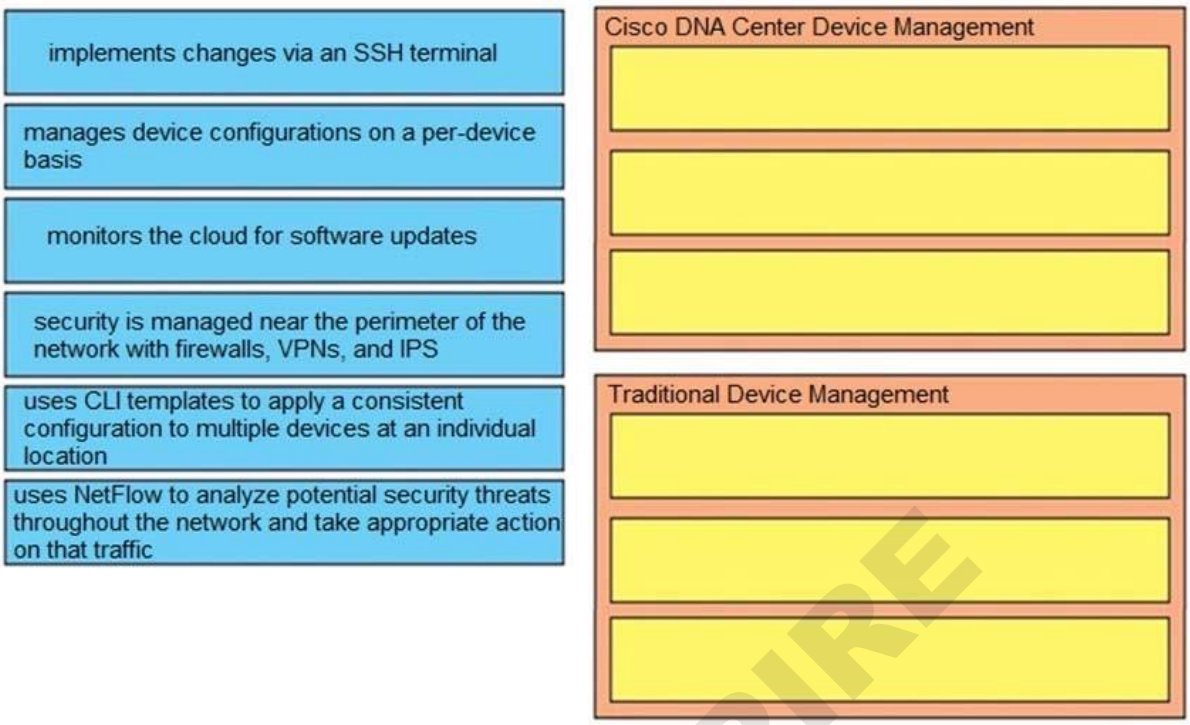
Reference: https://www.cisco.com/c/en/us/products/collateral/cloud-systems-management/dna-center/nb-06-dna-cent-platf-aag-cte-en.html

QUESTION 334
DRAG DROP

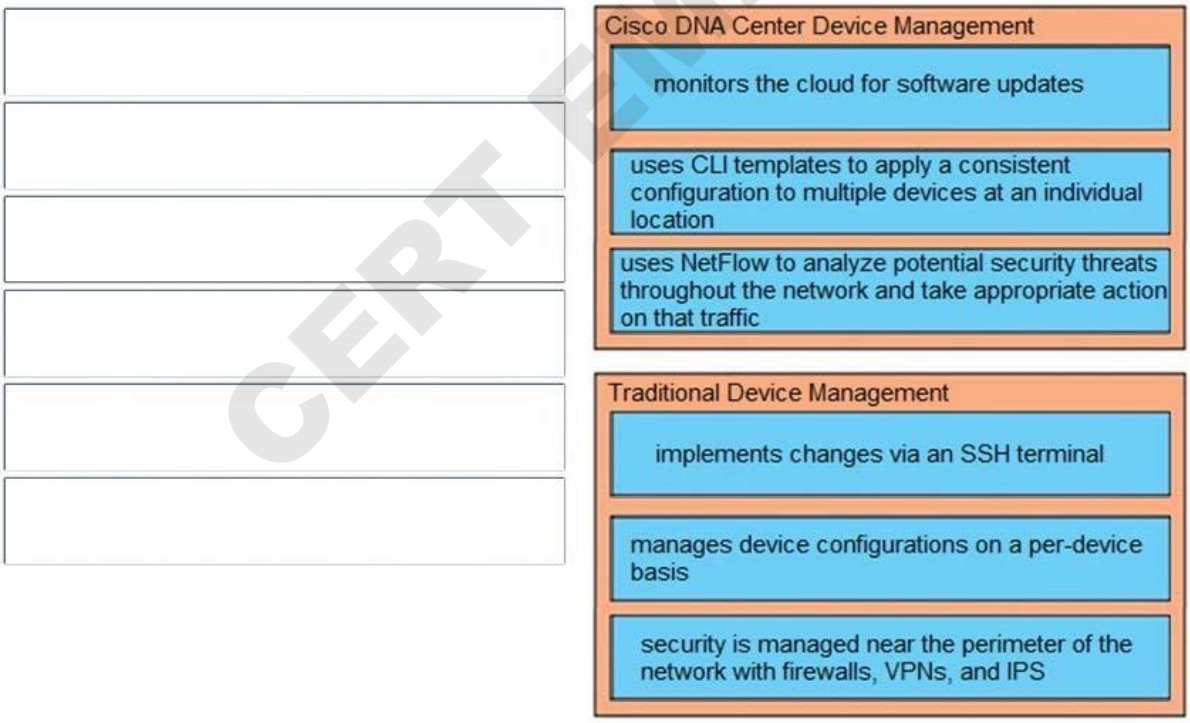
Drag the descriptions of device management from the left onto the types of device management on the right.

Select and Place:

CERT EMPIRE



Correct Answer:



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Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 335

What software-defined architecture plane assists network devices with making packet-forwarding decisions by providing Layer 2 reachability and Layer 3 routing information?

A. management plane
B. control plane
C. data plane
D. policy plane

Correct Answer: B
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 336
What are two benefits of controller-based networking compared to traditional networking? (Choose two.)

A. controller-based increases network bandwidth usage, while traditional lightens the load on the network
B. controller-based reduces network configuration complexity, while traditional increases the potential for errors
C. controller-based allows for fewer network failures, while traditional increases failure rates
D. controller-based provides centralization of key IT functions, while traditional requires distributed management functions
E. controller-based inflates software costs, while traditional decreases individual licensing costs

Correct Answer: BD
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 337
Which type of API allows SDN controllers to dynamically make changes to the network?

A. northbound API
B. REST API
C. SOAP API
D. southbound API

Correct Answer: D
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 338
DRAG DROP

Drag and drop the AAA terms from the left onto the descriptions on the right.

Select and Place:

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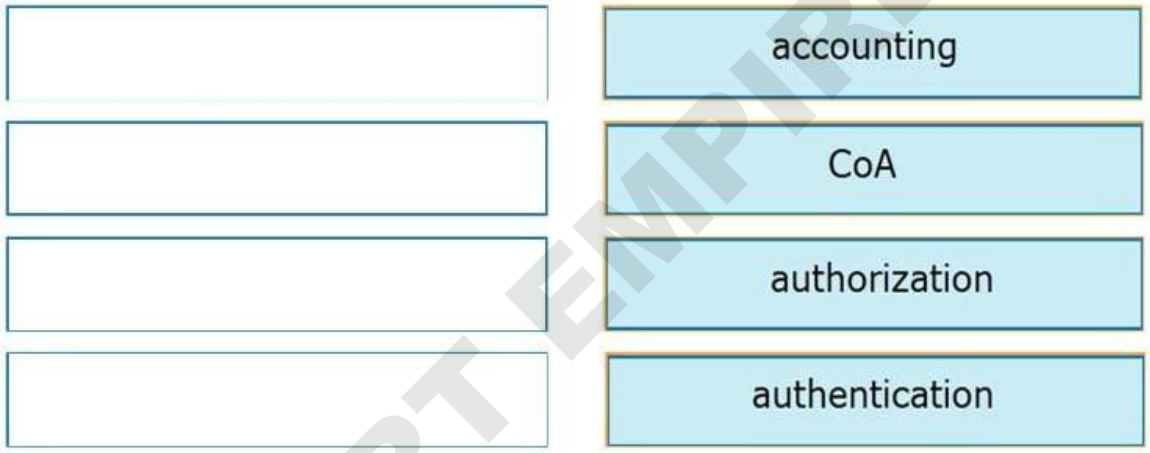
Correct Answer:



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Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 339
Which option about JSON is true

A. uses predefined tags or angle brackets () to delimit markup text
B. used to describe structured data that includes arrays
C. used for storing information
D. similar to HTML, it is more verbose than XML

Correct Answer: B
Section: Automation and Programmability
Explanation

Explanation/Reference:
Explanation:
JSON data is written as name/value pairs.

A name/value pair consists of a field name (in double quotes), followed by a colon, followed by a value:
“name”:”Mark”

JSON can use arrays. Array values must be of type string, number, object, array, boolean or null..
For example:
{
“name”:”John”,
“age”:30,
“cars”:[“Ford”, “BMW”, “Fiat”]
}

QUESTION 340
Which option best describes an API?

A. a contract that describes how various components communicate and exchange data with each other
B. an architectural style (versus a protocol) for designing applications
C. a stateless client-server model
D. request a certain type of data by specifying the URL path that models the data

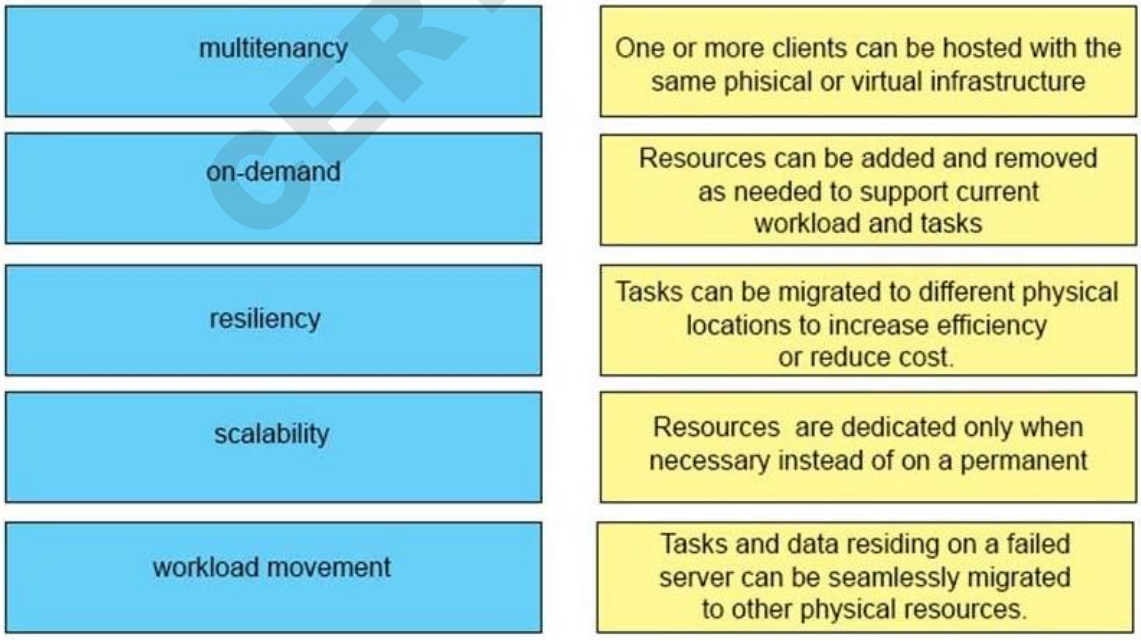
Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 341
DRAG DROP

Drag and drop the characteristics of a cloud environment from the left onto the correct examples on the right.

Select and Place:



Correct Answer:

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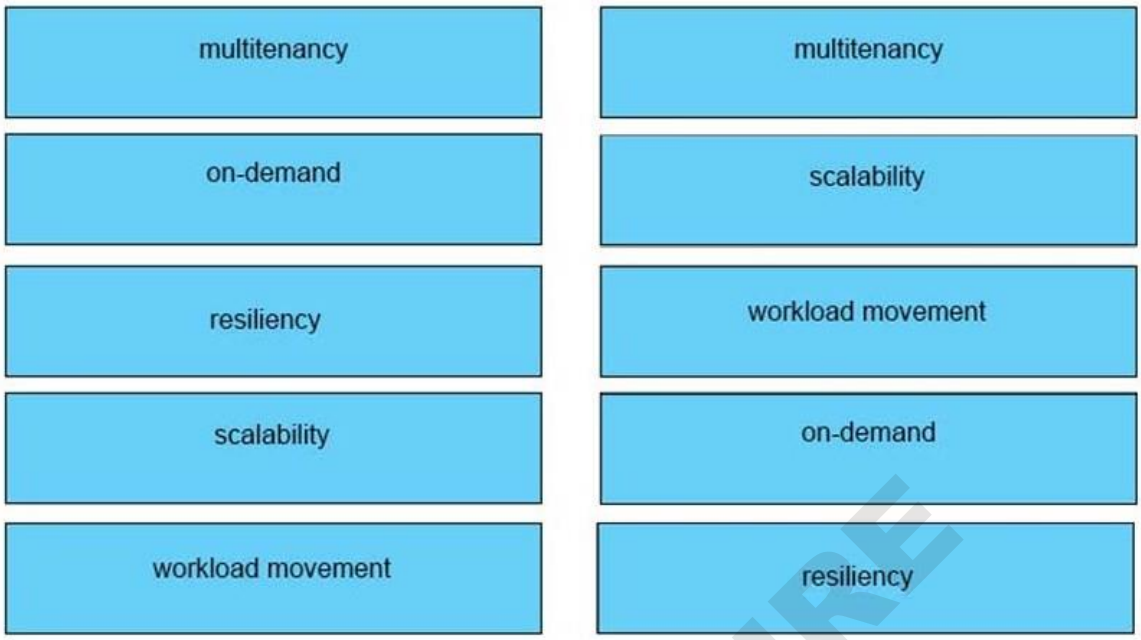

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Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 342
Which of the following is the JSON encoding of a dictionary or hash?

A. {“key”: “value”}
B. [“key”, “value”]
C. {“key”, “value”}
D. (“key”: “value”)

Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 343
What role does a hypervisor provide for each virtual machine in server virtualization?

A. infrastructure-as-a-service
B. Software-as-a-service
C. control and distribution of physical resources
D. services as a hardware controller

Correct Answer: C
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 344
What is the function of a server?

A. It transmits packets between hosts in the same broadcast domain.
B. It provides shared applications to end users.
C. It routes traffic between Layer 3 devices.
D. It Creates security zones between trusted and untrusted networks.

Correct Answer: B
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 345
Which CRUD operation modifies an existing table or view?

A. read
B. update
C. replace
D. create

Correct Answer: B
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 346
In software defined architectures, which plane is distributed and responsible for traffic forwarding?

A. management plane
B. policy plane
C. data plane
D. control plane

Correct Answer: C
Section: Automation and Programmability
Explanation

Explanation/Reference:

QUESTION 347
Refer to the exhibit. Which type of configuration is represented in the output?

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```
cisco_ospf_vrf {"R1 default":
      ensure => 'present',
      auto_cost => '100',
}
```

A. Ansible
B. JSON
C. Chef
D. Puppet

Correct Answer: D
Section: Automation and Programmability
Explanation

Explanation/Reference:
Reference: https://forge.puppet.com/modules/puppetlabs/ciscopuppet/1.0.0

QUESTION 348
Which configuration management mechanism uses TCP port 22 by default when communicating with managed nodes?

A. Ansible
B. Python
C. Puppet
D. Chef

Correct Answer: A
Section: Automation and Programmability
Explanation

Explanation/Reference:

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