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Exam Code: 100-101

Exam Name: CCNA Interconnecting Cisco Networking Devices 1 (ICND1)

CERTKEY

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Exam A

QUESTION 1
Which two statements describe the operation of the CSMA/CD access method? (Choose two)

A. In a CSMA/CD collision domain, multiple stations can successfully transmit data simultaneously.
B. In a CSMA/CD collision domain, stations must wait until the media is not in use before transmitting.
C. The use of hubs to enlarge the size of collision domains is one way to improve the operation of the CSMA/CD access method.
D. After a collision, the station that detected the collision has first priority to resend the lost data.
E. After a collision, all stations run a random backoff algorithm. When the backoff delay period has expired, all stations have equal priority to transmit data.
F. After a collision, all stations involved run an identical backoff algorithm and then synchronize with each other prior to transmitting data.

Correct Answer: BE
Section: (none)
Explanation

Explanation/Reference:
Explanation

CSMA/CD stands for Carrier Sense Multiple Access with Collision Detection. In an Ethernet LAN, before transmitting, a computer first listens to the network media. If the media is idle, the computer sends its data. If the media is not idle (another station is talking), the computer must wait for some time.

When a station transmits, the signal is referred to as a carrier. Carrier Sense means that before a station can send data onto an Ethernet wire, it have to listen to see if another "carrier" (of another station) is present. If another station is talking, this station will wait until there is no carrier present.

Multiple Access means that stations can access the network at any time. It is opposed to Token-Ring network where a station must have the "token" so that it can send data.

Although Carrier Sense help two stations not send data at the same time but sometimes two stations still send data at the same time! This is because two stations listen for network traffic, hear none, and transmit simultaneously -> a collision occurs and both stations must retransmit at some later time. Collision Detection is the ability of the media to detect collisions to know that they must retransmit.

Basically, the CSMA/CD algorithm can be summarized as follows:

+ A device that wants to send a frame must wait until the LAN is silent (no one is "talking") + If a collision still occurs, the devices that caused the collision wait a random amount of time and then try to send data again.

Note: A switch separates each station into its own collision domain. It means that station can send data without worrying its data is collided with the data of other stations. It is as opposed to a hub which can cause collision between stations connected to it.

QUESTION 2
On a live network, which commands will verify the operational status of router interfaces? (Choose two)

A. Router#show interfaces
B. Router#show ip protocols
C. Router#debug interface
D. Router#show ip interface brief
E. Router#show start

Correct Answer: AD
Section: (none)
Explanation

Explanation/Reference:
Explanation

Only two commands "show interfaces" and "show ip interface brief" reveal the status of router interfaces (up/up, for example).

The outputs of two commands are shown below:

```
Router1#show interfaces serial 0/0

Serial0/0 is up, line protocol is up

  Hardware is PowerQUICC Serial

  Internet address is 10.0.0.1/8

  MTU 1500 bytes, BW 512 Kbit, DLY 20000 usec,

    reliability 255/255, txload 1/255, rxload 1/255

  Encapsulation HDLC, loopback not set

  Keepalive set (10 sec)

  Last input 00:00:05, output 00:00:05, output hang never

  Last clearing of "show interface" counters never

  Input queue: 0/75/0/0 (size/max/drops/flushes);Total output drops: 0
```

City# show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protcocol
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
Serial0/1	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#

QUESTION 3
What must occur before a workstation can exchange HTTP packets with a web server?

A. A UDP connection must be established between the workstation and its default gateway.
B. A UDP connection must be established between the workstation and the web server.
C. A TCP connection must be established between the workstation and its default gateway.
D. A TCP connection must be established between the workstation and the web server.
E. An ICMP connection must be established between the workstation and its default gateway.
F. An ICMP connection must be established between the workstation and the web sewer.

Correct Answer: D
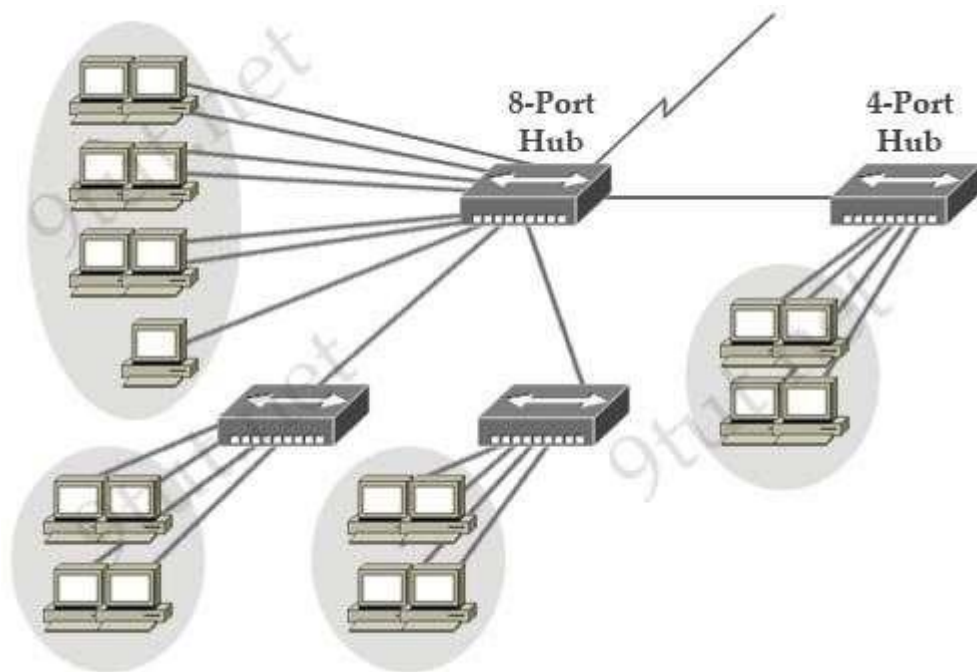**Section: (none)**
Explanation

Explanation/Reference:
Explanation

HTTP is based on TCP connection so a TCP connection must be established first between the workstation and the web server.

QUESTION 4
Refer to the exhibit. If the hubs in the graphic were replaced by switches, what would be virtually eliminated?

A. broadcast domains
B. repeater domains
C. Ethernet collisions
D. signal amplification
E. Ethernet broadcasts

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation
Hubs do not separate collision domains so if hub is used in the topology above, we will have only 1 collision domain. Switches do separate collision domains so if hubs are replaced by switches, we would have 22 collision domains (19 collision domains for hosts and 3 collision domains among three switches. Please notice that the WAN (serial) connection is not counted as a collision (or broadcast) domain.

QUESTION 5
If a host experiences intermittent issues that relate to congestion within a network while remaining connected, what could cause congestion on this

LAN?

A. half-duplex operation
B. broadcast storms
C. network segmentation
D. multicasting

Correct Answer: B
**Section: (none)**
Explanation

Explanation/Reference:
Explanation

A broadcast storm can cause congestion within a network. For more information about broadcast storm please read my STP tutorial.

QUESTION 6
Refer to the exhibit. The network administrator is testing connectivity from the branch router to the newly installed application server. What is the most likely reason for the first ping having a success rate of only 60 percent?
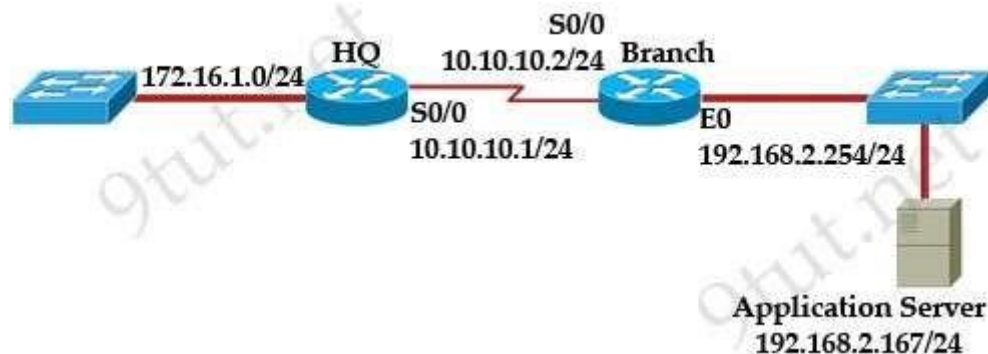
Branch# ping 192.168.2.167
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.167, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 1/2/4 ms

Branch# ping 192.168.2.167
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.167, timeout is 2 seconds:

!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms Branch#

A. The network is likely to be congested, with the result that packets are being intermittently dropped.
B. The branch router had to resolve the application server MAC address.
C. There is a short delay while NAT translates the server IP address.
D. A routing table lookup delayed forwarding on the first two ping packets.
E. The branch router LAN interface should be upgraded to FastEthernet.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

Before a host can send ICMP (ping) packets to another device, it needs to learn the MAC address of the destination device so it first sends out an ARP Request. In fact, the first ping packet is dropped because the router cannot create a complete packet without learning the destination MAC address.

QUESTION 7
An administrator is in the process of changing the configuration of a router. What command will allow the administrator to check the changes that have been made prior to saving the new configuration?

A. Router# show startup-config
B. Router# show current-config
C. Router# show running-config
D. Router# show memory
E. Router# show flash
F. Router# show processes

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

The "show running-config" command displays active configuration in memory.

QUESTION 8

What does a host on an Ethernet network do when it is creating a frame and it does not have the destination address?

A. drops the frame
B. sends out a Layer 3 broadcast message
C. sends a message to the router requesting the address
D. sends out an ARP request with the destination IP address

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:

QUESTION 9
Which IOS command is used to initiate a login into a VTY port on a remote router?

A. router# login
B. router# telnet
C. router# trace
D. router# ping
E. router(config)# line vty 0 5
F. router(config-line)# login

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

QUESTION 10
Which three statements are true about the operation of a full-duplex Ethernet network? (Choose three)

A. There are no collisions in full-duplex mode.
B. A dedicated switch port is required for each full-duplex node.
C. Ethernet hub ports are preconfigured for full-duplex mode.
D. In a full-duplex environment, the host network card must check for the availability of the network media before transmitting.
E. The host network card and the switch port must be capable of operating in full-duplex mode.

Correct Answer: ABE
Section: (none)
Explanation

Explanation/Reference:
Explanation

Full-duplex communication allows both sending and receiving of data simultaneously. Switches provide full-duplex communication capability. Half-duplex communication only allows data transmission in only one direction at a time (either sending or receiving).

QUESTION 11
Which two options will help to solve the problem of a network that is suffering a broadcast storm? (Choose two)

A. a bridge
B. a router
C. a hub
D. a Layer 3 switch
E. an access point

Correct Answer: BD
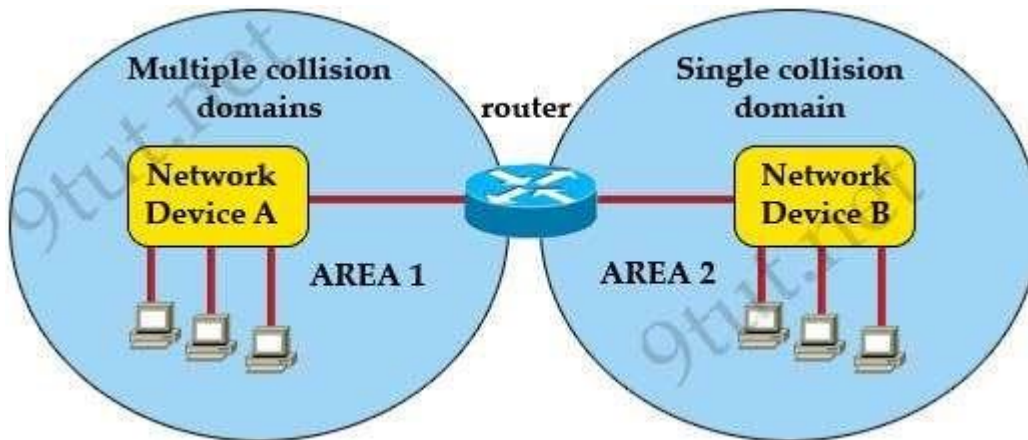**Section: (none)**
Explanation

Explanation/Reference:
Explanation

Only a router or a Layer 3 switch can mitigate a broadcast storm because they separate broadcast domains -> B and D are correct.

QUESTION 12
Refer to the exhibit. A network has been planned as shown. Which three statements accurately describe the areas and devices in the network plan? (Choose three)

A. Network Device A is a switch.
B. Network Device B is a switch.
C. Network Device A is a hub.
D. Network Device B is a hub.
E. Area 1 contains a Layer 2 device.
F. Area 2 contains a Layer 2 device.

Correct Answer: ADE
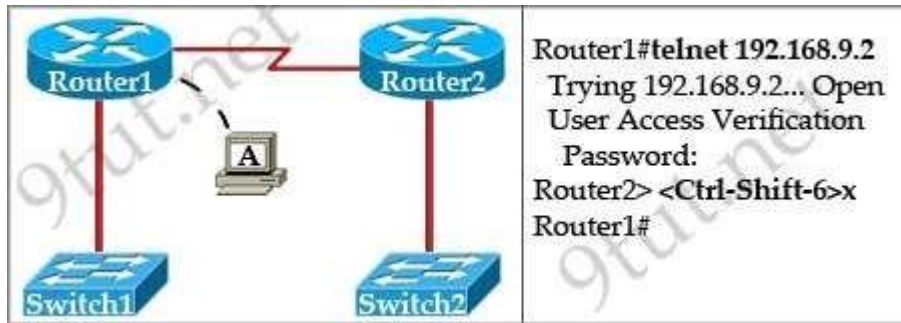**Section: (none)**
Explanation

Explanation/Reference:
Explanation

AREA 1 has "multiple collision domains" so Network Device A must be a device operating in Layer 2 or above (a router or switch) -> A & E are correct.

AREA 2 only has "single collision domain" so Network Device B must be a device operating in Layer 1 (a hub or repeater) -> D is correct.

QUESTION 13
Refer to the exhibit. If the resume command is entered after the sequence that is shown in the exhibit, which router prompt will be displayed?

Router1#telnet 192.168.9.2
Trying 192.168.9.2... Open
User Access Verification
Password:
Router2> <Ctrl-Shift-6>x
Router1#

A. Router1>
B. Router1#
C. Router2>
D. Router2#

Correct Answer: C
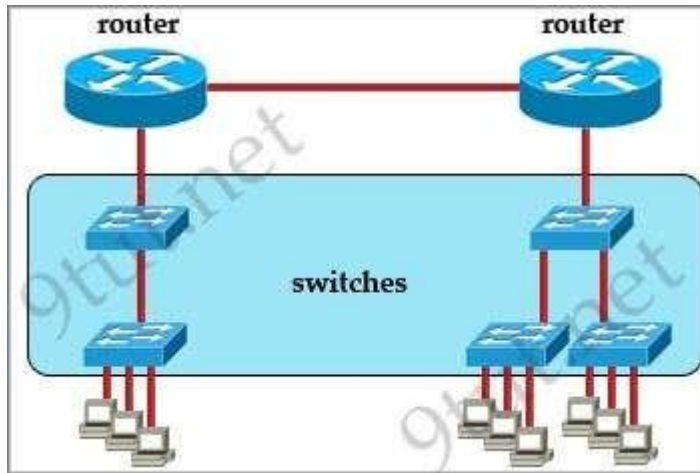**Section: (none)**
Explanation

Explanation/Reference:
Explanation

The "Ctrl-Shift-6 and "x" is used to suspend the telnet session. In this case, the telnet session from Router1 to Router2 will be suspended.

If we enter the keyword "resume", Router1 will try to resume the telnet session to Router2 (you will see the line [Resuming connection 1 to 192.168.9.2 ...]) and we will get back the Router2> prompt.

QUESTION 14
Refer to the exhibit. All devices attached to the network are shown. How many collision domains are present in this network?
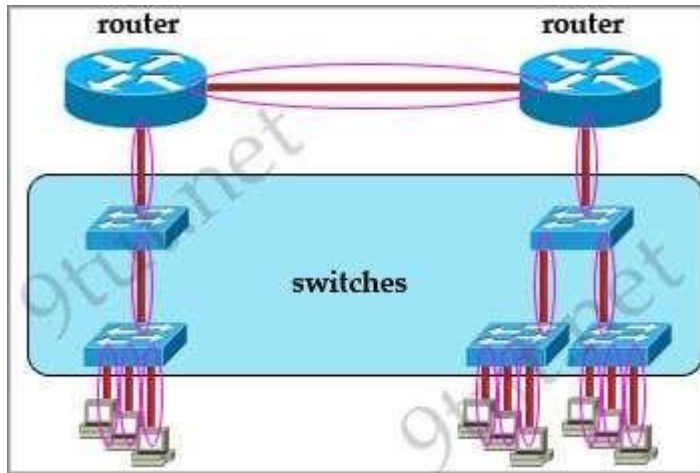
A. 2
B. 3
C. 6
D. 9
E. 15

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

In the topology above only routers and switches are used so for each link we have one collision domains. In the picture below each pink ellipse represents for one collision domain.

QUESTION 15
Which OSI layer header contains the address of a destination host that is on another network?

A. application
B. session
C. transport
D. network
E. data link
F. physical

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:

QUESTION 16
At which layer of the OSI model does the protocol that provides the information that is displayed by the show cdp neighborscommand operate?

A. application
B. transport
C. network
D. physical

E. data link

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

CDP runs at Layer 2 (Data Link) of the OSI model -> E is correct.

QUESTION 17
What are two common TCP applications? (Choose two)

A. TFTP
B. SMTP
C. SNMP
D. FTP
E. DNS

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation

SMTP stands for Simple Mail Transfer Protocol. It's a set of communication guidelines that allow software to transmit email over the Internet while File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over TCP-based network.

Note: Simple Network Management Protocol (SNMP) uses UDP as the transport protocol for passing data between managers and agents. SNMP uses UDP to help reduce the impact on your network's performance. Although SNMP can be configured to run on TCP but we should only do it in special situations. SNMP uses the UDP port 161 for sending and receiving requests, and port 162 for receiving traps from managed devices.

DNS work on both the TCP and UDP protocols. DNS uses TCP for zone exchanges between servers and UDP when a client is trying to resolve a hostname to an IP address. Therefore in most cases we say "DNS uses UDP".

QUESTION 18
Which two characteristics describe the access layer of the hierarchical network design model? (Choose two)

A. layer 3 support

B. port security

C. redundant components

D. VLANs

E. PoE

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation

The primary function of an access-layer is to provide network access to the end user.

The hardware and software attributes of the access layer that support high availability include security services for additional security against unauthorized access to the network through the use of tools such as 802.1x, port security, DHCP snooping, Dynamic ARP Inspection, and IP Source Guard.

QUESTION 19
Which layer of the TCP/IP stack combines the OSI model physical and data link layers?

A. Internet layer

B. transport layer

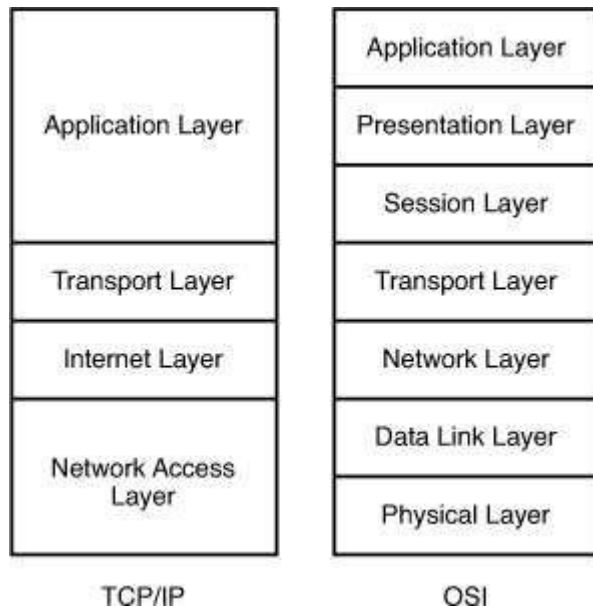C. application layer

D. network access layer

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation

The picture below compares the two TCP/IP and OSI models:

	Application Layer
	Presentation Layer
Application Layer	Session Layer
Transport Layer	Transport Layer
Internet Layer	Network Layer
Network Access Layer	Data Link Layer
	Physical Layer

TCP/IP   OSI

QUESTION 20
Which layer of the OSI model controls the reliability of communications between network devices using flow control, sequencing and acknowledgments?

A. Physical
B. Data-link
C. Transport
D. Network

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

Transmission Control Protocol (TCP) has all the features mentioned above and TCP resides in Transport Layer (Layer 4) of the OSI model.

Flow control: A methodology used to ensure that receiving units are not overwhelmed with data from sending devices when buffers at a receiving unit are full, a message is transmitted to the sending unit to temporarily halt trans-missions until all the data in the receiving buffer has been processed and the buffer is again ready for action.

Sequencing: is used to number segments before sending so they can be put back together again in the correct order at the receiving side.

Acknowledgment: When the receiver gets the data, it sends a response telling the sender that the data have been safely arrived.

QUESTION 21
Which network device functions only at Layer 1 of the OSI model?

A. bridge

B. hub

C. NIC

D. router

E. switch

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

In CCNA, the popular devices operate in Layer 1 are hub and repeater.

QUESTION 22
Which protocol uses a connection-oriented service to deliver files between end systems?

A. TFTP
B. DNS
C. FTP
D. SNMP
E. RIP

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

File Transfer Protocol (FTP) is a standard network protocol used to transfer files from one host to another host over TCP-based network, such as the Internet.

QUESTION 23
On a Cisco switch, which protocol determines if an attached VoIP phone is from Cisco or from another vendor?

A. RTP
B. TCP
C. CDP
D. UDP

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

Cisco Discovery Protocol (CDP) is a proprietary protocol of Cisco so if you can see the VoIP phone via the "show cdp neighbors" command on a Cisco switch then that phone is from Cisco.

QUESTION 24

Which transport layer protocol provides best-effort delivery service with no acknowledgment receipt required?

A. HTTP
B. IP
C. TCP
D. Telnet
E. UDP

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

User Datagram Protocol (UDP) provides a connectionless datagram service that offers best-effort delivery, which means that UDP does not guarantee delivery or verify sequencing for any datagrams. UDP is typically used by programs that transmit small amounts of data at one time or have real-time requirements (voice, for example).

QUESTION 25
Which statements accurately describe CDP? (Choose three)

A. CDP is an IEEE standard protocol.
B. CDP is a Cisco proprietary protocol.
C. CDP is a datalink layer protocol.
D. CDP is a network layer protocol.
E. CDP can discover directly connected neighboring Cisco devices.
F. CDP can discover Cisco devices that are not directly connected.

Correct Answer: BCE
Section: (none)
Explanation

Explanation/Reference:
Explanation

CDP is a device discovery protocol that runs over Layer 2. We can view the CDP information with the show cdp neighbors command (thus the provided information is at layer 2), notice this command only shows information about directly connected devices. The output of the show cdp neighbors command is shown below:

```
R-CENTER# show cdp neighbors
```

Device ID	Local Interface	Holdtme	Capability	Platform	Port ID
Birmingham	Fas 0/0	151	R S	2514	E1
Relmap	Fas 0/1	150	R S	2621	Fa0/0
Boaz	Ser 0/0	137	R S	2501	S0
Atlanta	Ser 0/1	126	R S	2620	S0/1

There are 3 columns you must pay attention to:

* Local interface: type & ID of the local interface on which CDP information of the neighbor were received.
* Device platform: the neighboring device model.
* Port ID: the connected interface of the neighbor.

QUESTION 26
A workstation has just resolved a browser URL to the IP address of a server. What protocol will the workstation now use to determine the destination MAC address to be placed into frames directed toward the server?

A. HTTP
B. DNS
C. DHCP
D. RARP
E. ARP

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

After resolving a browser URL to an IP address (via DNS server), the workstation must learn the MAC address of the server so that it can create a complete packet (a complete packet requires destination MAC and IP address, source MAC and IP address). Therefore the workstation must use ARP to find out the MAC address from the IP address.

QUESTION 27
How does TCP differ from UDP? (Choose two)

A. TCP provides best effort delivery.

B. TCP provides synchronized communication.

C. TCP segments are essentially datagrams.

D. TCP provides sequence numbering of packets.

E. TCP uses broadcast delivery.

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation
Before two computers can communicate over TCP, they must synchronize their initial sequence numbers (ISN) -> B is correct.

TCP uses a sequence number to identify each byte of data. The sequence number identifies the order of the bytes sent from each computer so that the data can be reconstructed in order, regardless of any fragmentation, disordering, or packet loss that may occur during transmission -> D is correct.

QUESTION 28
Refer to the exhibit. The two routers have had their startup configurations cleared and have been restarted. At a minimum, what must the administrator do to enable CDP to exchange information between R1 and R2?

A. Configure the router with the cdp enable command.

B. Enter no shutdown commands on the R1 and R2 fa0/1 interfaces.

C. Configure IP addressing and no shutdown commands on both the R1 and R2 fa0/1 interfaces.

D. Configure IP addressing and no shutdown commands on either of the R1 or R2 fa0/1 interfaces.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

By default CDP is enabled on Cisco routers -> A is not correct.

CDP runs at Layer 2 in the OSI model and it does not need an IP address to run -> C & D are not correct.

QUESTION 29

Which statements are true regarding ICMP packets? (Choose two)

A. They acknowledge receipt of TCP segments.
B. They guarantee datagram delivery
C. TRACERT uses ICMP packets.
D. They are encapsulated within IP datagrams.
E. They are encapsulated within UDP datagrams

Correct Answer: CD
Section: (none)
Explanation
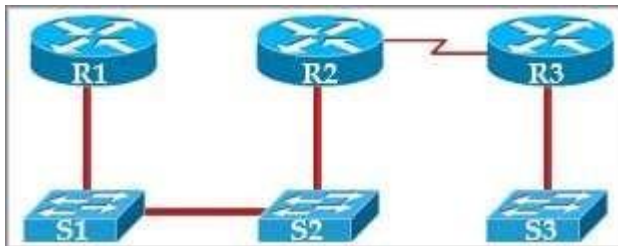
Explanation/Reference:
Explanation

Tracert (or traceroute) is used to trace the path between the sender and the destination host. Traceroute works by sending packets with gradually increasing Time-to-Live (TTL) value, starting with TTL value = 1. The first router receives the packet, decrements the TTL value and drops the packet because it then has TTL value zero. The router sends an ICMP Time Exceeded message back to the source. The next set of packets are given a TTL value of 2, so the first router forwards the packets, but the second router drops them and replies with ICMP Time Exceeded. Proceeding in this way, traceroute uses the returned ICMP Time Exceeded messages to build a list of routers that packets traverse, until the destination is reached and returns an ICMP Echo Reply message -> C is correct. ICMP is encapsulated in an IP packet. In particular, the ICMP message is encapsulated in the IP payload part of an IP datagram -> D is correct.

Note: The TRACERT command on Windows Operating System uses ICMP while MAC OS X and Linux TRACEROUTE use UDP.

QUESTION 30
Refer to the exhibit. If CDP is enabled on all devices and interfaces, which devices will appear in the output of a show cdp neighbors command issued from R2?

A. R2 and R3
B. R1 and R3
C. R3 and S2

D. R1, S1, S2, and R3

E. R1, S1, S2, R3, and S3

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

CDP runs at Layer 2 so it can recognize a switch (if that switch also runs CDP).

QUESTION 31
Which two of these functions do routers perform on packets? (Choose two)

A. examine the Layer 2 headers of inbound packets and use that information to determine the next hops for the packets

B. update the Layer 2 headers of outbound packets with the MAC addresses of the next hops

C. examine the Layer 3 headers of inbound packets and use that information to determine the next hops for the packets

D. examine the Layer 3 headers of inbound packets and use that information to determine the complete paths along which the packets will be routed to their ultimate destinations

E. update the Layer 3 headers of outbound packets so that the packets are properly directed to valid next hops

F. update the Layer 3 headers of outbound packets so that the packets are properly directed to their ultimate destinations

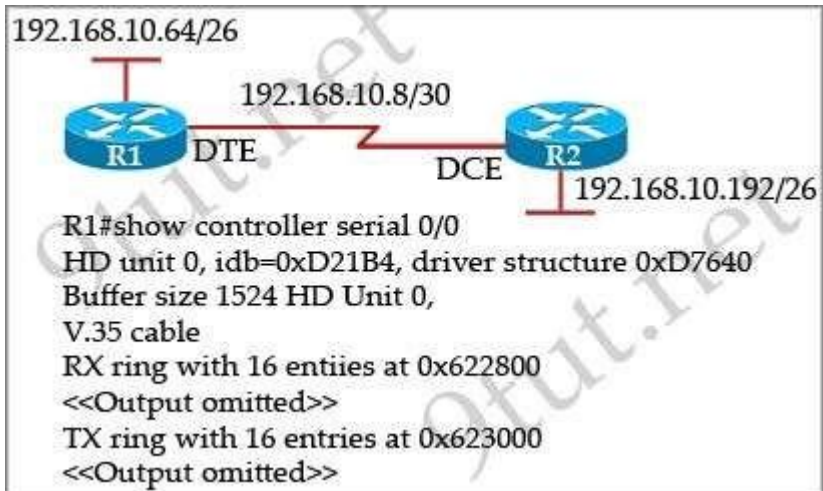**Correct Answer:** BC
Section: (none)
Explanation

Explanation/Reference:
Explanation
When packets travel through many routers, the source and destination IP addresses do not change but the source and destination MAC do change.

QUESTION 32
Refer to the exhibit. An administrator cannot connect from R1 to R2. To troubleshoot this problem, the administrator has entered the command shown in the exhibit. Based on the output shown, what could be the problem?

192.168.10.64/26

192.168.10.8/30

R1 DTE   DCE R2
192.168.10.192/26

R1#show controller serial 0/0
HD unit 0, idb=0xD21B4, driver structure 0xD7640
Buffer size 1524 HD Unit 0,
V.35 cable
RX ring with 16 entiies at 0x622800
<<Output omitted>>
TX ring with 16 entries at 0x623000
<<Output omitted>>

A. The serial interface is configured for half duplex.
B. The serial interface does not have a cable attached.
C. The serial interface has the wrong type of cable attached.
D. The serial interface is configured for the wrong frame size.
E. The serial interface has a full buffer.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

The output above is unclear. Normally when we use this command we can see the type of serial connection on this interface, for example "V.35 DCE cable. Below is an example of the same command as above:

RouterA#show controllers serial 0
HD unit 0, idb = 0xECA4C, driver structure at 0xF1EC8
buffer size 1524 HD unit 0, V.35 DTE cable
cpb = 0×62, eda = 0x403C, cda = 0×4050
RX ring with 16 entries at 0×624000
00 bd_ptr=0×4000 pak=0x0F5704 ds=0x62FFB8 status=80 pak_size=22

Or

RouterB#show controllers serial 0
buffer size 1524 HD unit 0, V.35 DCE cable, clockrate 64000 cpb = 0×62, eda = 0x408C, cda = 0x40A0
RX ring with 16 entries at 0×624000
00 bd_ptr=0×4000 pak=0x0F2F04 ds=0×627908 status=80 pak_size=22

but in this case we only get "V.35 cable". So in fact we are not sure about the answer C. But the output above also does not have any information to confirm other answers are correct or not.

Just for your information, the V.35 male and V.35 female cable are shown below:

V.35 Male

QUESTION 33
What two things does a router do when it forwards a packet? (Choose two)

A. switches the packet to the appropriate outgoing interfaces
B. computes the destination host address
C. determines the next hop on the path
D. updates the destination IP address
E. forwards ARP requests

Correct Answer: AC
Section: (none)
Explanation

Explanation/Reference:

QUESTION 34
Refer to the exhibit. A network device needs to be installed in the place of the icon labeled Network Device to accommodate a leased line attachment to the Internet. Which network device and interface configuration meets the minimum requirements for this installation?
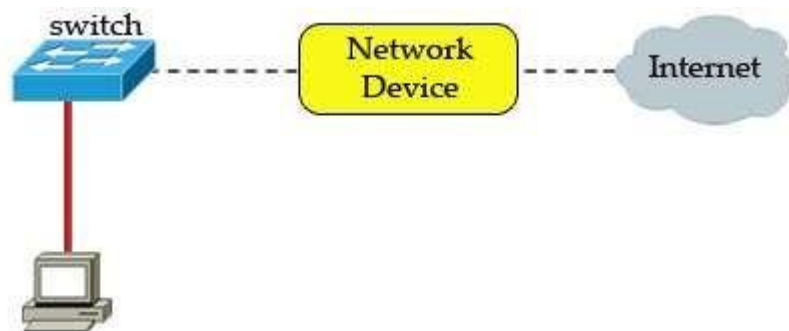
A. a router with two Ethernet interfaces
B. a switch with two Ethernet interfaces
C. a router with one Ethernet and one serial interface
D. a switch with one Ethernet and one serial interface
E. a router with one Ethernet and one modem interface

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

QUESTION 35
Which two commands will display the current IP address and basic Layer 1 and 2 status of an interface? (Choose two)

A. Router#show version
B. Router#show ip interface
C. router#show protocols
D. router#show controllers
E. Router#show running-config

Correct Answer: BC
Section: (none)
Explanation

Explanation/Reference:
Explanation

The outputs of "show protocols" and "show ip interface" are shown below:

Global values:
Internet Protocol routing is enabled
Serial0/0 is up, line protocol is down
Internet address is 10.1.1.1/30
Serial0/1 is up, line protocol is down
Internet address is 209.65.200.225/30
Serial0/2 is up, line protocol is down
Serial0/3 is up, line protocol is down
NVI0 is up, line protocol is up
Interface is unnumbered. Using address of NVI0 (0.0.0.0) Loopback0 is up, line protocol is up
Internet address is 10.1.10.1/32
Loopback1 is up, line protocol is up
Internet address is 10.1.2.1/27
Loopback6 is up, line protocol is up

Serial0/0 is up, line protocol is down
Internet address is 10.1.1.1/30
Broadcast address is 255.255.255.255
Address determined by non-volatile memory
MTU is 1500 bytes
Helper address is not set
Directed broadcast forwarding is disabled
Multicast reserved groups joined: 224.0.0.5
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Local Proxy ARP is disabled
Security level is default
Split horizon is disabled
ICMP redirects are always sent
ICMP unreachables are always sent
ICMP mask replies are never sent
IP fast switching is enabled
IP fast switching on the same interface is enabled
IP Flow switching is disabled
IP CEF switching is disabled
IP Feature Fast switching turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast
Router Discovery is disabled

IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Policy routing is disabled
Network address translation is enabled, interface in domain inside BGP Policy Mapping is disabled
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled

QUESTION 36
A switch has 48 ports and 4 VLANs. How many collision and broadcast domains exist on the switch?

A. 4, 48
B. 48, 4
C. 48, 1
D. 1, 48
E. 4, 1

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

Each port on a switch is a collision domain while each VLAN is a broadcast domain because broadcast is only forwarded within that VLAN so we have 48 collision domains and 4 broadcast domains on this switch (if all ports are used).

QUESTION 37
A switch receives a frame on one of its ports. There is no entry in the MAC address table for the destination MAC address. What will the switch do with the frame?

A. drop the frame
B. forward it out of all ports except the one that received it
C. forward it out of all ports
D. store it until it learns the correct port

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

QUESTION 38
Which address type does a switch use to make selective forwarding decisions?

A. source IP address
B. destination IP address
C. source and destination IP address
D. source MAC address
E. destination MAC address

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

When a switch receives a frame, it first checks for the destination MAC address and tries to find a matching entry in its MAC address table. If found, the switch then forwards that frame on the corresponding port associated with that MAC address. If no entry is found, the switch will flood that frame out of all (active) ports except the port that sent it.

QUESTION 39
Which two characteristics apply to Layer 2 switches? (Choose two)

A. increases the number of collision domains
B. decreases the number of collision domains
C. implements VLAN
   D decreases the number of broadcast domains
D. uses the IP address to make decisions for forwarding data packets

Correct Answer: AC
Section: (none)
Explanation

Explanation/Reference:

QUESTION 40

What is the purpose of assigning an IP address to a switch?

A. provides local hosts with a default gateway address
B. allows remote management of the switch
C. allows the switch to respond to ARP requests between two hosts
D. ensures that hosts on the same LAN can communicate with each other

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

QUESTION 41
How does a switch differ from a hub?

A. A switch does not induce any latency into the frame transfer time.
B. A switch tracks MAC addresses of directly-connected devices.
C. A switch operates at a lower, more efficient layer of the OSI model.
D. A switch decreases the number of broadcast domains.
E. A switch decreases the number of collision domains.

Correct Answer: B
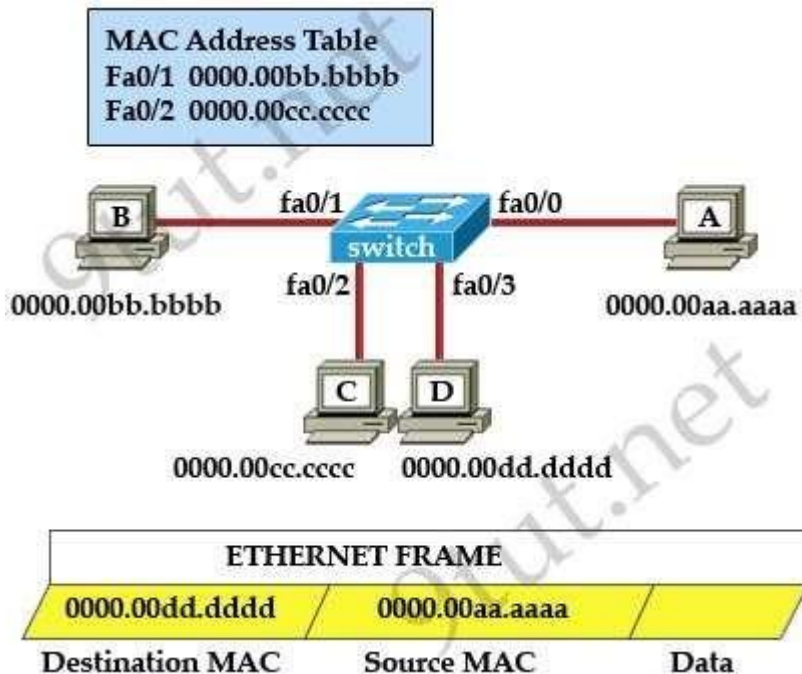**Section: (none)**
Explanation

Explanation/Reference:
Explanation

A hub is not as "intelligent" as a switch because a hub does not try to remember anything passing to it. It just floods out all the ports (except the one that sent it) when it receives a frame.

QUESTION 42
Refer to the exhibit. The ports that are shown are the only active ports on the switch. The MAC address table is shown in its entirety. The Ethernet frame that is shown arrives at the switch. What two operations will the switch perform when it receives this frame? (Choose two)

MAC Address Table
Fa0/1 0000.00bb.bbbb
Fa0/2 0000.00cc.cccc

ETHERNET FRAME

0000.00dd.dddd	0000.00aa.aaaa	Data
Destination MAC	Source MAC	Data

A. The MAC address of 0000.00aa.aaaa will be added to the MAC address table.
B. The MAC address of 0000.00dd.dddd will be added to the MAC address table.
C. The frame will be forwarded out port fa0/3 only.
D. The frame will be forwarded out fa0/1, fa0/2, and fa0/3.
E. The frame will be forwarded out all the active ports.

Correct Answer: AD
Section: (none)
Explanation

Explanation/Reference:
Explanation

When a switch receives a frame, it first checks for the destination MAC address and tries to find a matching entry in its MAC address table. If found, the switch then forwards that frame on the corresponding port associated with that MAC address. If no entry is found, the switch will flood that frame out of all active ports except the port that sent it. In this case, the destination MAC address 0000.00dd.dddd has not been in the MAC address table so the switch will flood the frame out all of its ports except fa0/0 (the port that it received the frame) -> D is correct.

Also, the switch learns that the MAC address 0000.00aa.aaaa is received on fa0/0 -> the switch adds 0000.00aa.aaaa and its corresponding port fa0/0 to the MAC address table -> A is correct.

QUESTION 43
Refer to the exhibit. The MAC address table is shown in its entirety. The Ethernet frame that is shown arrives at the switch. What two operations will the switch perform when it receives this frame? (Choose two)
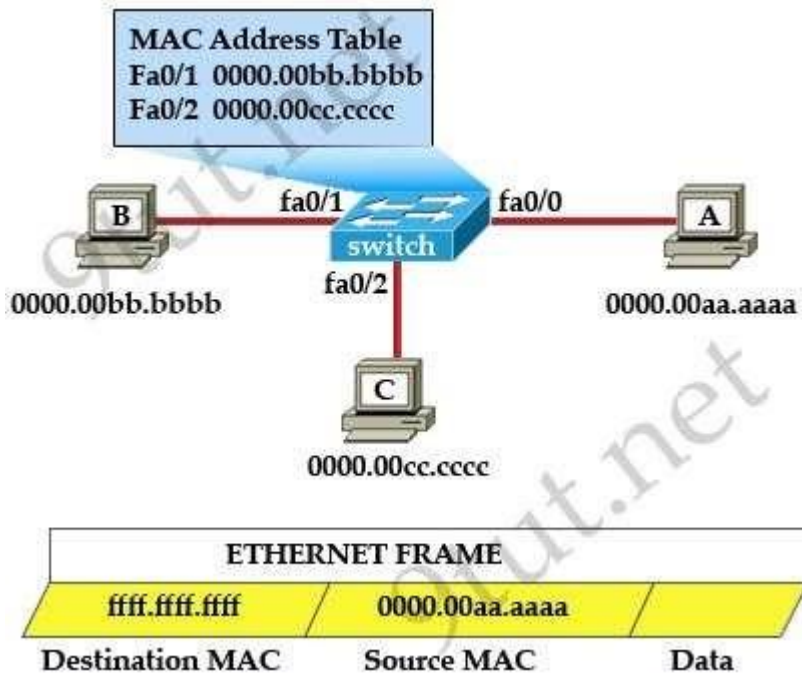
A. The switch will not forward a frame with this destination MAC address.
B. The MAC address of 0000.00aa.aaaa will be added to the MAC Address Table.
C. The MAC address of ffff.ffff.ffff will be added to the MAC address table.
D. The frame will be forwarded out all active switch ports except for port fa0/0.
E. The frame will be forwarded out fa0/0 and fa0/1 only.
F. The frame will be forwarded out all the ports on the switch.

Correct Answer: BD
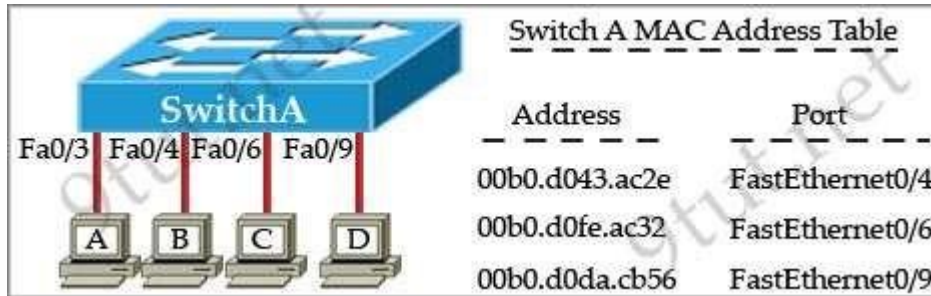**Section: (none)**
Explanation

Explanation/Reference:
Explanation

The destination MAC address is ffff.ffff.ffff so this is a broadcast frame so the switch will forward the frame out all active switch ports except for port fa0/0.

QUESTION 44
Refer to the exhibit. The exhibit is showing the topology and the MAC address table. Host A sends a data frame to host D. What will the switch do when it receives the frame from host A?

A. The switch will add the source address and port to the MAC address table and forward the frame to host D.
B. The switch will discard the frame and send an error message back to host A.
C. The switch will flood the frame out of all ports except for port Fa0/3.
D. The switch will add the destination address of the frame to the MAC address table and forward the frame to host D.

**Correct Answer:** A
Section: (none)
Explanation

Explanation/Reference:
Explanation

In this case the destination MAC address has been learned so the switch just forwards the frame to the corresponding port. It also learn that the source MAC address of host A has not been existed in the MAC address table so it will add it (and port fa0/3) to its MAC address table.

QUESTION 45
Refer to the topology and switching table shown in the graphic. Host B sends a frame to Host C. What will the switch do with the frame?
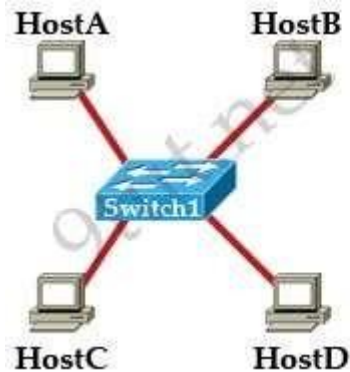
Switch1 switch table

Host	MAC Address	Port
A	00-0A-8A-47-E6-12	0/5
D	01-00-CD-22-03-14	0/9
B	01-00-CD-22-03-14	0/2

A. drop the frame
B. send the frame out all ports except port 0/2
C. return the frame to Host B
D. send an ARP request for Host C
E. send an ICMP Host Unreachable message to Host B
F. record the destination MAC address in the switching table and send the frame directly to Host C

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

QUESTION 46
Refer to the exhibit. SwitchA receives the frame with the addressing shown in the exhibit. According to the command output also shown in the exhibit, how will SwitchA handle this frame?

```
SwitchA# show mac-address-table
< non-essential output omitted >
Destination Address        Address Type   VLAN   Destination Port
-----------------------    -------------- -----  -----------------------
00b0.d056.fe4d             Dynamic          1    FastEthernet0/3
00b0.d043.ac2e             Dynamic          1    FastEthernet0/4
00b0.d0fe.ac32             Dynamic          1    FastEthernet0/5
00b0.d0da.cb56             Dynamic          1    FastEthernet0/6

Frame received by SwitchA:

Source MAC       Destination MAC   Source IP       Destination IP
00b0.d056.fe4d   00b0.d0da.cb56    192.168.40.5    192.168.40.6
```

A. It will drop the frame.
B. It will forward the frame out port Fa0/6 only.
C. It will forward the frame out port Fa0/3 only.
D. It will flood the frame out all ports.
E. It will flood the frame out all ports except Fa0/3.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

QUESTION 47
Which of the following describe the process identifier that is used to run OSPF on a router? (Choose two)

A. It is locally significant.
B. It is globally significant.
C. It is needed to identify a unique instance of an OSPF database.
   D It is an optional parameter required only if multiple OSPF processes are running on the router.
D. All routers in the same OSPF area must have the same process ID if they are to exchange routing information.

Correct Answer: AC
Section: (none)
Explanation

Explanation/Reference:

QUESTION 48
Open Shortest Path First (OSPF) is a routing protocol developed for Internet Protocol (IP) networks by the Interior Gateway Protocol (IGP) working group of the Internet Engineering Task Force (IETF). What is the default administrative distance of the OSPF routing protocol?

A. 90
B. 100
C. 110
D. 20
E. 130
F. 170

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

QUESTION 49
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 RIPv2.

Correct Answer: ACE
Section: (none)
Explanation

Explanation/Reference:

Explanation

Answer A and C are obviously correct. For answer E, it allows extensive control of routing updates via Link-State Advertisement (LSA). Administrators can filter these LSAs to meet their requirements easily.

QUESTION 50
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: (none)
Explanation

Explanation/Reference:
Explanation

A is not correct because the backbone area of OSPF is always Area 0. B is not correct because R1 or R3 must be the DR or BDR -> it has to establish neighbor adjacency with the other.
C is not correct because OSPF neighbor relationship is not established based on static routing. It uses multicast address 224.0.0.5 to establish OSPF neighbor relationship. E is not correct because configure EIGRP on these routers (with a lower administrative distance) will force these routers to run EIGRP, not OSPF.

D and F are correct because these entries must match on neighboring routers:

- Hello and dead intervals
  Area ID (Area 0 in this case)
  Authentication password
  Stub area flag

QUESTION 51
Which address are OSPF hello packets addressed to on point-to-point networks?

A. 224.0.0.5
B. 172.16.0.1
C. 192.168.0.5
D. 223.0.0.1
E. 254.255.255.255

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:

QUESTION 52
RouterD# show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.160.5.3	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

Given the output for this command, if the router ID has not been manually set, what router ID will OSPF use for this router?

A. 10.1.1.2
B. 10.154.154.1
C. 172.16.5.1
D. 192.168.5.3

Correct Answer: C
Section: (none)
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 53
ROUTER# show ip route

192.168.12.0/24 is variably subnetted, 9 subnets, 3 masks C 192.168.12.64 /28 is directly connected, Loopback1
C 192.168.12.32 /28 is directly connected, Ethernet0
C 192.168.12.48 /28 is directly connected, Loopback0
O 192.168.12.236 /30 [110/128] via 192.168.12.233, 00:35:36, Serial0 C 192.168.12.232 /30 is directly connected, Serial0
O 192.168.12.245 /30 [110/782] via 192.168.12.233, 00:35:36, Serial0 O 192.168.12.240 /30 [110/128] via 192.168.12.233, 00:35:36, Serial0 O
192.168.12.253 /30 [110/782] via 192.168.12.233, 00:35:37, Serial0 O 192.168.12.249/30 [110/782] via 192.168.12.233, 00:35:37, Serial0 O
192.168.12.240/30 [110/128] via 192.168.12.233, 00:35:36, Serial0

To what does the 128 refer to in the router output above?

A. OSPF cost
B. OSPF priority
C. OSPF hop count 5
D. OSPF ID number
E. OSPF administrative distance

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation

OSPF uses a metric referred to as cost. The cost of the entire path is the sum of the costs of the outgoing interfaces along the path. Cisco uses a simple formula to calculate OSPF cost:

OSPF cost = 108 / Bandwidth (bit)

Therefore, a 100 Mbps FastEthernet interface will have the cost of 108 / 100,000,000 (bps) = 1

Note: Cost for interfaces with bandwidth equal or larger than 10^8 bps is normalized to 1 so a 1Gbps interface will also have OSPF cost of 1.

For "O 192.168.12.240 /30 [110/128] via 192.168.12.233, 00:35:36, Serial0 line, the first number in the brackets is the administrative distance of the information source; the second number is the metric for the route -> In this case the second number is the OSPF cost.

QUESTION 54
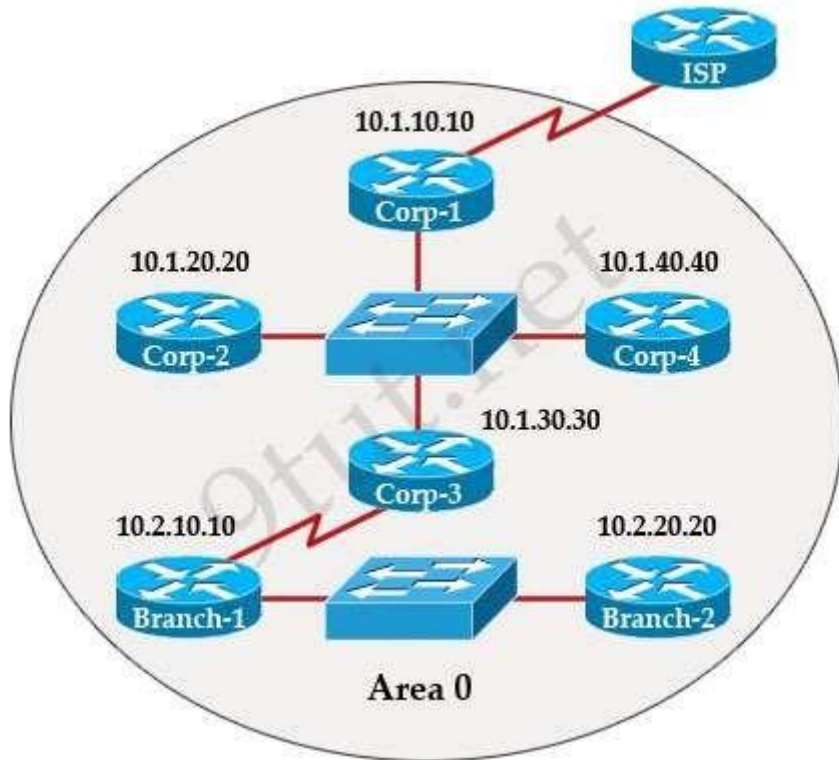
The internetwork infrastructure of company XYZ consists of a single OSPF area as shown in the graphic. There is concern that a lack of router resources is impeding internetwork performance.

As part of examining the router resources the OSPF DRs need to be known.

All the router OSPF priorities are at the default and the router IDs are shown with each router.

Which routers are likely to have been elected as DR? (Choose two)

A. Corp-1

B. Corp-2

C. Corp-3

D. Corp4

E. Branch-1

F. Branch-2

Correct Answer: DF
Section: (none)
Explanation

Explanation/Reference:
Explanation

There are 2 segments on the topology above which are separated by Corp-3 router. Each segment will have a DR so we have 2 DRs.

To select which router will become DR they will compare their router-IDs. The router with highest (best) router-ID will become DR. The router-ID is chosen in the order below:

+ The highest IP address assigned to a loopback (logical) interface. + If a loopback interface is not defined, the highest IP address of all active router's physical interfaces will be chosen.

In this question, the IP addresses of loopback interfaces are not mentioned so we will consider IP addresses of all active router's physical interfaces. Router Corp-4 (10.1.40.40) & Branch-2 (10.2.20.20) have highest "active" IP addresses so they will become DRs.

QUESTION 55
What information does a router running a link-state protocol use to build and maintain its topological database? (Choose two)

A. hello packets

B. SAP messages sent by other routers

C. LSAs from other routers

D. beacons received on point-to-point links

E. routing tables received from other link-state routers

F. TTL packets from designated routers

Correct Answer: AC
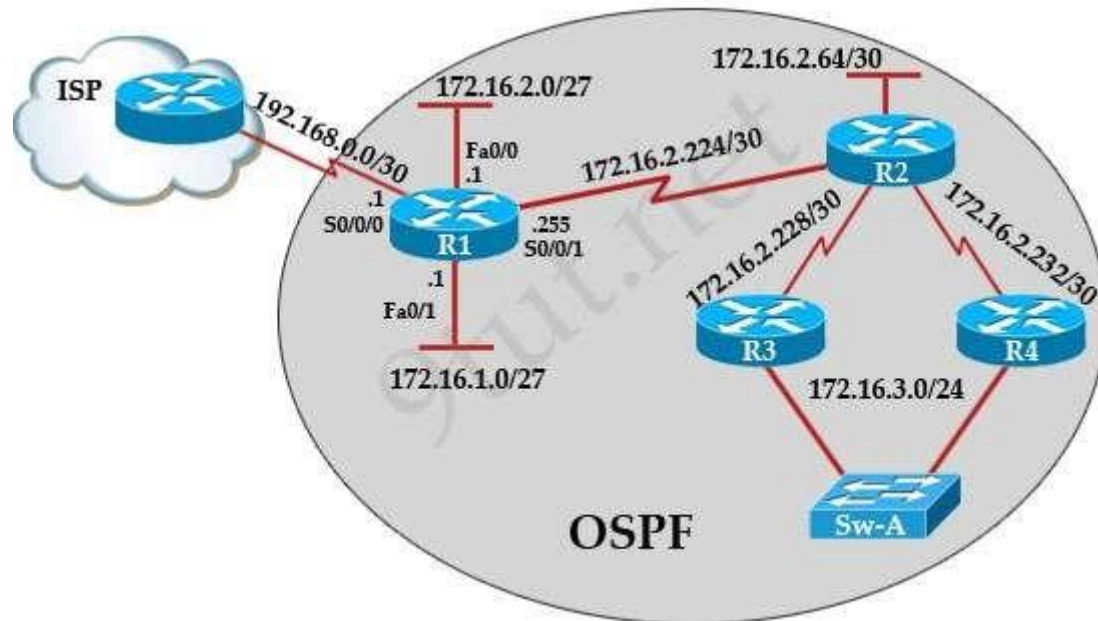**Section: (none)**
Explanation

Explanation/Reference:

QUESTION 56
This item contains several questions that you must answer. You can view these questions by clicking on the corresponding button to the left. Changing questions can be accomplished by clicking the numbers to the left of each question. In order to complete the questions, you will need to refer to the topology.
To gain access to the topology, click on the topology button at the bottom of the screen. When you have finished viewing the topology, you can return to your questions by clicking on the Questions button to the left.

Each of the windows can be minimized by clicking on the [-]. You can also reposition a window by dragging it by the title bar.

A.
B.
C.
D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:

QUESTION 57
R1 is configured with the default configuration of OSPF.

From the following list of IP addresses configured on R1, which address will the OSPF process select as the router ID?

A. 192.168.0.1
B. 172.16.1.1
C. 172.16.2.1
D. 172.16.2.225

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation

The Router ID (RID) is an IP address used to identify the router and is chosen using the following sequence:

+ The highest IP address assigned to a loopback (logical) interface. + If a loopback interface is not defined, the highest IP address of all active router's physical interfaces will be chosen.
+ The router ID can be manually assigned

In this case, because a loopback interface is not configured so the highest active IP address 192.168.0.1 is chosen as the router ID.

QUESTION 58
After the network has converged, what type of messaging, if any, occurs between R3 and R4?

A. No messages are exchanged.
B. Hellos are sent every 10 seconds.
C. The full database from each router is sent every 30 seconds.
D. The routing table from each router is sent every 60 seconds.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

HELLO messages are used to maintain adjacent neighbors so even when the network is converged, hellos are still exchanged. On broadcast and point-to-point links, the default is 10 seconds, on NBMA the default is 30 seconds.

Although OSPF is a link-state protocol but the full database from each router is sent every 30 minutes (not seconds) -> C and D are not correct.

QUESTION 59
To allow or prevent load balancing to network 172.16.3.0/24, which of the following commands could be used in R2? (Choose two)

A. R2(config-if)#clock rate
B. R2(config-if)#bandwidth
C. R2(config-if)#ip ospf cost
D. R2(config-if)#ip ospf priority
E. R2(config-router)#distance ospf

Correct Answer: BC
Section: (none)
Explanation

Explanation/Reference:

QUESTION 60
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: (none)
Explanation

Explanation/Reference:

QUESTION 61
OSPF is configured using default classful addressing. With all routers and interfaces operational, how many networks will be in the routing table of R1

that are indicated to be learned by OSPF?

A. 2
B. 3
C. 4
D. 5
E. 6
F. 7

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

Although OSPF is configured using default classful addressing but OSPF is a link-state routing protocol so it will always send the subnet mask of each network in their advertised routes. Therefore R1 will learn the the complete subnets. Four networks list below will be in the routing table of R1:
+ 172.16.2.64/30
+ 172.16.2.228/30
+ 172.16.2.232/30
+ 172.16.3.0/24

Note: Other networks will be learned as "Directly connected" networks (marked with letter "C")

QUESTION 62
An administrator has connected devices to a switch and, for security reasons, wants the dynamically learned MAC addresses from the address table added to the running configuration. What must be done to accomplish this?

A. Enable port security and use the keyword sticky.
B. Set the switchport mode to trunk and save the running configuration.
C. Use the switchport protected command to have the MAC addresses added to the configuration.
D. Use the no switchport port-security command to allow MAC addresses to be added to the configuration.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation

This is the full command mentioned in answer A:

switchport port-security mac-address sticky [MAC]

If we don't specify the MAC address (like in this question) then the switch will dynamically learn the attached MAC Address and place it into your running-configuration.

QUESTION 63
The following commands are entered on the router:

Burbank(config)# enable secret fortress
Burbank(config)# line con 0
Burbank(config-line)# login
Burbank(config-line)# password n0way1n
Burbank(config-line)# exit
Burbank(config)# service password-encryption

What is the purpose of the last command entered?

A. to require the user to enter an encrypted password during the login process
B. to prevent the vty, console, and enable passwords from being displayed in plain text in the configuration files
C. to encrypt the enable secret password
D. to provide login encryption services between hosts attached to the router

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

The "service password-encryption" command encrypts passwords used by "enable password" global configuration command, as well as the password line configuration command (VTY, console) that are saved in the router configuration file.

Note: The secret password (configured by the command "enable secret fortress") is always encrypted even if the "service password-encryption" command is not used.

Also, the "service password-encryption" command encrypts both current and future passwords.

QUESTION 64
Why would a network administrator configure port security on a switch?

A. to prevent unauthorized Telnet access to a switch port
B. to prevent unauthorized hosts from accessing the LAN
C. to limit the number of Layer 2 broadcasts on a particular switch port
D. block unauthorized access to the switch management interfaces

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:

QUESTION 65
A company has placed a networked PC in a lobby so guests can have access to the corporate directory. A security concern is that someone will disconnect the directory PC and re-connect their laptop computer and have access to the corporate network. For the port servicing the lobby, which three configuration steps should be performed on the switch to prevent this? (Choose three)

A. Enable port security.
B. Create the port as a trunk port.
C. Create the port as an access port.
   D Create the port as a protected port.
D. Set the port security aging time to 0.
E. Statically assign the MAC address to the address table.
F. Configure the switch to discover new MAC addresses after a set time of inactivity.

Correct Answer: ACF
Section: (none)
Explanation

Explanation/Reference:
Explanation
By configuring the port connected with the directory PC as access port the network administrator will mitigate a lot of security issues because access port does not have as much privilege as a trunk port - > C is correct.

The port security feature can also help mitigate security issue because it can learn the MAC address of the directory PC. When another laptop is plugged into the port, the switch will automatically block or shut down that port (if suitable configuration is used) -> A is correct. But nowadays a hacker can fake the MAC address of the directory PC.

By statically assigning the MAC address to the address table, only that MAC address can access to the network -> F is correct.

QUESTION 66

What is the effect of using the service password-encryption command?

A. Only the enable password will be encrypted.
B. Only the enable secret password will be encrypted.
C. Only passwords configured after the command has been entered will be encrypted.
D. It will encrypt the secret password and remove the enable secret password from the configuration.
E. It will encrypt all current and future passwords.

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

The "service password-encryption" command encrypts passwords used by "enable password" global configuration command, as well as the password line configuration command (VTY, console) that are saved in the router configuration file.

The "service password-encryption" command encrypts both current and future passwords.

QUESTION 67
How can you ensure that only the MAC address of a server is allowed by switch port Fa0/1?

A. Configure port Fa0/1 to accept connections only from the static IP address of the server.
B. Configure the server MAC address as a static entry of port security.
C. Use a proprietary connector type on Fa0/1 that is incomputable with other host connectors.
D. Bind the IP address of the server to its MAC address on the switch to prevent other hosts from spoofing the server IP address.

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

The command to configure port security on a switch is (in interface configuration mode):

switchport port-security mac-address sticky [MAC]

In this case we will type the server MAC address. That MAC address will be stored in the address table, and added to the switch running configuration.
Note: If we don't specify the MAC address then the switch will dynamically learn the attached MAC Address and place it into your running-configuration

QUESTION 68
Refer to the exhibit. The network administrator made the entries that are shown and then saved the configuration. From a console connection, what password or password sequence is required for the administrator to access privileged mode on Router1?

Router# configure terminal
Router(config)# hostname Router1
Router1(config)# enable secret sanfran
Router1(config)# enable password cisco
Router1(config)# line vty 0 4
Router1(config-line)# password sanjose
Route r1(config-line)#

A. cisco
B. sanfran
C. sanjose
D. either cisco or sanfran
E. either cisco or sanjose
F. sanjose and sanfran

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

In the configuration above we have three passwords:

+ The "enable secret" password: sanfran
+ The "enable password" password: cisco
+ The VTY line password: sanjose

The two first "enable secret" and "enable password" are used to set password for entering privilege mode (an example of privilege mode: Router#). Both of them will be stored in the running configuration. But the password in "enable secret" command is always encrypted using MD5 hash while the password in "enable password" is in plain text.

Note: If you want to encrypt "enable password" you can use the command "service password- encryption" but it will be encrypted with a very basic form of encryption called vigenere cipher, which is very weak.

When you configure both an enable and a secret password, the secret password will be used -> B is correct.

QUESTION 69
What is the subnet address for the IP address 172.19.20.23/28?

A. 172.19.20.0
B. 172.19.20.15
C. 172.19.20.16
D. 172.19.20.20
E. 172.19.20.32

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

From the /28 we can find all information we need:

Increment: 16 (/28 = 11111111.11111111.11111111.11110000) Network address: 172.19.20.16 (because 16 < 23)
Broadcast address: 172.16.20.31 (because 31 = 16 + 16 1)

In fact we don't need to find out the broadcast address because the question only asks about subnet address (network address).

QUESTION 70
What is the network address for the host with IP address 192.168.23.61/28?

A. 192.168.23.0
B. 192.168.23.32
C. 192.168.23.48
D. 192.168.23.56
E. 192.168.23.60

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

From the /28 we can find all information we need:

Increment: 16 (/28 = 11111111.11111111.11111111.11110000) Network address: 192.168.23.48 (because 48 = 16 * 3 and 48 < 61)

QUESTION 71
Given an IP address of 192.168.1.42 255.255.255.248, what is the subnet address?

A. 192.168.1.8/29
B. 192.168.1.32/27
C. 192.168.1.40/29
D. 192.168.1.16/28
E. 192.168.1.48/29

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation
From the subnet mask of 255.255.255.248 we learn:

Increment: 8 (248 = 11111111.11111111.11111111.11111000) Network address: 192.168.1.40 (because 40 = 8 * 5 and 40 < 42)

QUESTION 72
Which IP addresses are valid for hosts belonging to the 10.1.160.0/20 subnet? (Choose three)

A. 10.1.168.0
B. 10.1.176.1
C. 10.1.174.255
D. 10.1.160.255
E. 10.1.160.0
F. 10.1.175.255

Correct Answer: ACD
Section: (none)
Explanation

Explanation/Reference:
Explanation

From the /20 we can find all information we need:

Increment: 16 (/20 = 11111111.11111111.11110000.00000000). This is applied for the 3rd octet. Network address: 10.1.160.0 (because 160 = 16 * 10 and 160 = 160 -> the IP address above is also the network address.
Broadcast address: 10.1.175.255 (because 175 = 160 + 16 1)

Therefore only 10.1.168.0, 10.1.174.255 and 10.1.160.255 are in this range. Please notice 10.1.174.255 is not a broadcast address and can be assigned to host.

QUESTION 73
Which one of the following IP addresses is the last valid host in the subnet using mask 255.255.255.224?

A. 192.168.2.63
B. 192.168.2.62
C. 192.168.2.61
D. 192.168.2.60
E. 192.168.2.32

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

Increment: 32 (224 = 11111111.11111111.11111111.11100000) Network address: x.x.x.(0;32;64;96;128;160;192;224)
Broadcast address: x.x.x.(31;63;95;127;159;191;223)
-> Last valid host (reduced broadcast addresses by 1): x.x.x.(30;62;94;126;158;190;222) -> Only B is correct.

QUESTION 74
An administrator is working with the 192.168.4.0 network, which has been subnetted with a /26 mask. Which two addresses can be assigned to hosts within the same subnet? (Choose two)

A. 192.168.4.61
B. 192.168.4.63
C. 192.168.4.67
D. 192.168.4.125
E. 192.168.4.128
F. 192.168.4.132

Correct Answer: CD
Section: (none)
Explanation

Explanation/Reference:
Explanation

Increment: 64 (/26 = 11111111.11111111.11111111.11000000) The IP 192.168.4.0 belongs to class C. The default subnet mask of class C is /24 and it has been subnetted with a /26 mask so we have 2(26-24) = 22 = 4 sub-networks:

1st subnet: 192.168.4.0 (to 192.168.4.63)
2nd subnet: 192.168.4.64 (to 192.168.4.127)
3rd subnet: 192.168.4.128 (to 192.168.4.191)
4th subnet: 192.168.4.192 (to 192.168.4.225)

In all the answers above, only answer C and D are in the same subnet.

Therefore only IPs in this range can be assigned to hosts.

QUESTION 75
An administrator must assign static IP addresses to the servers in a network. For network 192.168.20.24/29, the router is assigned the first usable host address while the sales server is given the last usable host address. Which of the following should be entered into the IP properties box for the sales server?

A. IP address: 192.168.20.14
   Subnet Mask: 255.255.255.248
   Default Gateway. 192.168.20.9
B. IP address: 192.168.20.254
   Subnet Mask: 255.255.255.0
   Default Gateway: 192.168.20.1
C. IP address: 192.168.20.30
   Subnet Mask: 255.255.255.248
   Default Gateway: 192.168.20.25
D. IP address: 192.168.20.30
   Subnet Mask: 255.255.255.240
   Default Gateway: 192.168.20.17
E. IP address: 192.168.20.30
   Subnet Mask: 255.255.255.240
   Default Gateway. 192.168.20.25

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

Explanation

With network 192.168.20.24/29 we have:

Increment: 8 (/29 = 255.255.255.248 = 11111000 for the last octet) Network address: 192.168.20.24 (because 24 = 8 * 3)
Broadcast address: 192.168.20.31 (because 31 = 24 + 8 1)

Therefore the first usable IP address is 192.168.20.25 (assigned to the router) and the last usable IP address is 192.168.20.30 (assigned to the sales server). The IP address of the router is also the default gateway of the sales server.

QUESTION 76
Given a Class C IP address subnetted with a /30 subnet mask, how many valid host IP addresses are available on each of the subnets?

A. 1
B. 2
C. 4
D. 8
E. 252
F. 254

Correct Answer: B
**Section: (none)**
Explanation

Explanation/Reference:
Explanation

The number of valid host IP addresses depends on the number of bits 0 left in the subnet mask. With a /30 subnet mask, only two bits 0 left (/30 = 11111111.11111111.11111111.11111100) so the number of valid host IP addresses is 22 2 = 2. Also please notice that the /30 subnet mask is a popular subnet mask used in the connection between two routers because we only need two IP addresses. The /30 subnet mask help save IP addresses for other connections. An example of the use of /30 subnet mask is shown below:

192.168.1.9/30
192.168.1.10/30
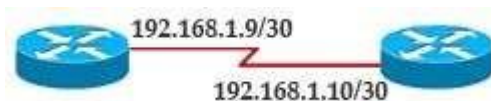
QUESTION 77
Which two statements describe the IP address 10.16.3.65/23? (Choose two)

A. The subnet address is 10.16.3.0 255.255.254.0.
B. The lowest host address in the subnet is 10.16.2.1 255.255.254.0.

C. The last valid host address in the subnet is 10.16.2.254 255.255.254.0
D. The broadcast address of the subnet is 10.16.3.255 255.255.254.0.
E. The network is not subnetted.

Correct Answer: BD
Section: (none)
Explanation

Explanation/Reference:
Explanation

Increment: 2 (/23 = 11111111.11111111.11111110.00000000 = 255.255.254.0) Network address: 10.16.2.0 (because 2 = 2 * 1 and 2 < 3) Broadcast address: 10.16.3.255 (because 2 + 2 1 = 3 for the 3rd octet)

-> The lowest (first assignable) host address is 10.16.2.1 and the broadcast address of the subnet is 10.16.3.255 255.255.254.0

QUESTION 78
What is the subnet address of 172.16.159.159/22?

A. 172.16.0.0
B. 172.16.128.0
C. 172.16.156.0
D. 172.16.159.0
E. 172.16.159.128
F. 172.16.192.0

Correct Answer: C
Section: (none)
Explanation

**Explanation/Reference:**
Explanation

Increment: 4 (/22 = 11111111.11111111.11111100.00000000) Network address: 172.16.156.0 (156 is multiple of 4 and 156 < 159)

QUESTION 79
Refer to the exhibit. The junior network support staff provided the diagram as a recommended configuration for the first phase of a four-phase network expansion project. The entire network expansion will have over 1000 users on 14 network segments and has been allocated this IP address space:

192.168.1.1 through 192.168.5.255
192.168.100.1 through 198.168.100.255

What are three problems with this design? (Choose three)
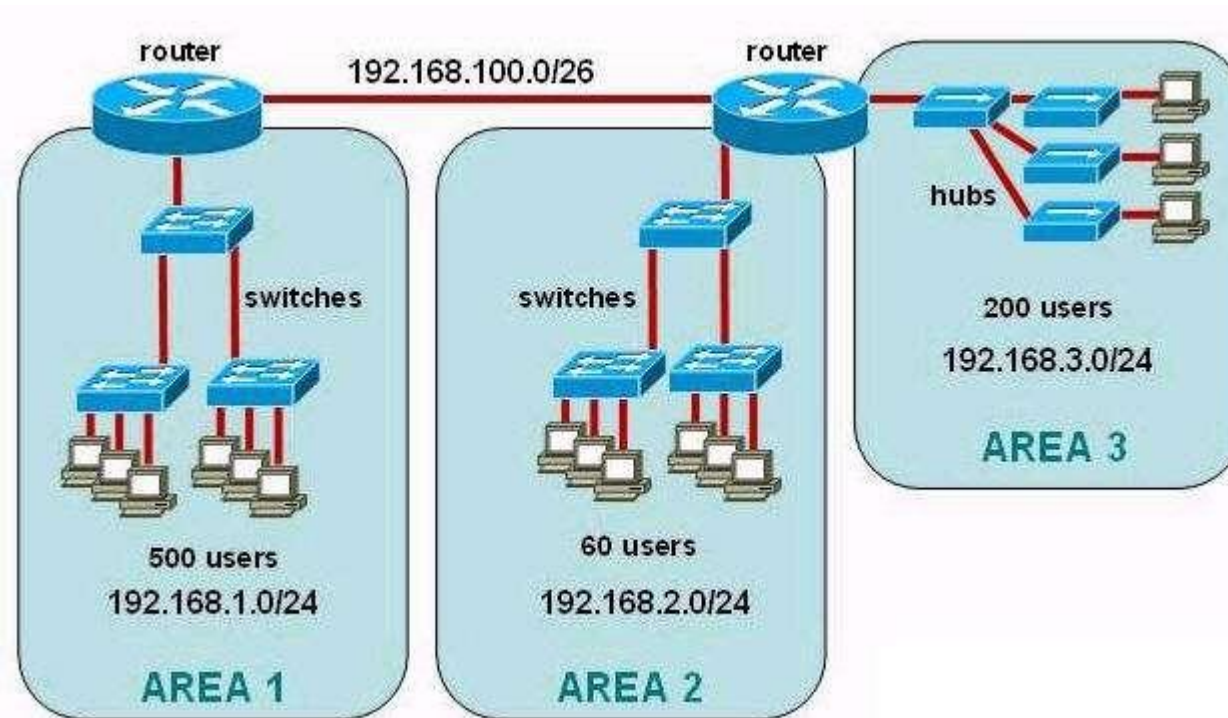
A The AREA 1 IP address space is inadequate for the number of users. B The AREA 3 IP address space is inadequate for the number of users. C -
AREA 2 could use a mask of /25 to conserve IP address space. D The network address space that is provided requires a single network-wide mask. E
 The router-to-router connection is wasting address space. F The broadcast domain in AREA 1 is too large for IP to function.

A.
B.
C.
D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:

Explanation

AREA 1 has 500 users but it uses class C which only supports 254 users (from 192.168.1.1 to 192.168.1.254)-> A is correct.

AREA 3 also uses class C and as mentioned above it supports 254 users so it is enough for 200 users - > B is incorrect.

In AREA 2 there are only 60 users < 64 = 26 so we can use a subnet mask which has 6 bits 0 -> /26. Of course we can use larger subnets (like /25) for future expansion -> C is correct.

A large network should never use a single network-wide mask. It should be some different subnet masks to make the network flexible and easy to be summarized -> D is incorrect.

For router-to-router connection we should use a subnet mask of /30 which supports 2 hosts per subnet. This subnet mask is ideal for router-to-router connection -> E is correct.

There is no limit for IP to function if we know how to organize our network -> F is incorrect.

QUESTION 80
Refer to the exhibit. The enterprise has decided to use the network address 172.16.0.0. The network administrator needs to design a classful addressing scheme to accommodate the three subnets, with 30, 40, and 50 hosts, as shown. What subnet mask would accommodate this network?

Net bits Subnet mask total-addresses per subnet

/20 255.255.240.0 4096

/21 255.255.248.0 2048

/22 255.255.252.0 1024

/23 255.255.254.0 512

/24 255.255.255.0 256

/25 255.255.255.128 128

/26 255.255.255.192 64

/27 255.255.255.224 32

/28 255.255.255.240 16

/29 255.255.255.248 8

/30 255.255.255.252 4

A. 255.255.255.192
B. 255.255.255.224
C. 255.255.255.240
D. 255.255.255.248

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation

The maximum number of hosts in this question is 50 hosts so we have to use /26 subnet mask or above.

QUESTION 81
The network manager has requested a 300-workstation expansion of the network. The workstations are to be installed in a single broadcast domain, but each workstation must have its own collision domain. The expansion is to be as cost-effective as possible while still meeting the requirements. Which three items will adequately fulfill the request? (Choose three)

A. one IP subnet with a mask of 255.255.254.0
B. two IP subnets with a mask of 255.255.255.0
C. seven 48-port hubs
D. seven 48-port switches
E. one router interface
F. seven router interfaces

Correct Answer: ADE
Section: (none)
Explanation

Explanation/Reference:
Explanation

To support 300 workstations in a single broadcast domain, we need to use a subnet mask which supports 512 hosts = 29 -> /23 or 255.255.254.0 in decimal form -> A is correct.

If we use 48-port switches we need 300/48 = 6.25 -> seven 48-port switches are enough because we also need trunking between them -> D is correct.

We only need one router interface and it is connected with one of seven switches -> E is correct.

QUESTION 82
Which router command will configure an interface with the IP address 10.10.80.1/19?

A. router(config-if)# ip address 10.10.80.1/19
B. router(config-if)# ip address 10.10.80.1 255.255.0.0
C. router(config-if)# ip address 10.10.80.1 255.255.255.0
D. router(config-if)# ip address 10.10.80.1 255.255.224.0
E. router(config-if)# ip address 10.10.80.1 255.255.240.0
F. router(config-if)# ip address 10.10.80.1 255.255.255.240

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation

/19 = 255.255.224.0. The fast way to find out this subnet mask is to remember /16 = 255.255.0.0 and we need 3 more bits 1 for 3rd octet: 1110 0000 which is 224.

QUESTION 83
What is the best practice when assigning IP addresses in a small office of six hosts?

A. Use a DHCP server that is located at the headquarters.
B. Use a DHCP server that is located at the branch office.
C. Assign the addresses by using the local CDP protocol.
D. Assign the addresses statically on each node.

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:

QUESTION 84
The ip helper-address command does what?

A. assigns an IP address to a host
B. resolves an IP address from a DNS server

C. relays a DHCP request across networks

D. resolves an IP address overlapping issue

Correct Answer: C
Section: (none)
Explanation
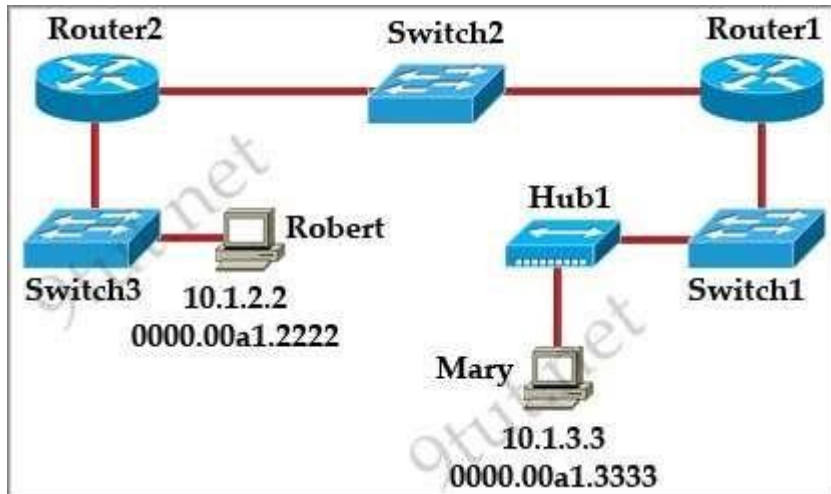
Explanation/Reference:
Explanation

By default, Cisco routers do not forward broadcast address. So what will happen if your PC does not in the same LAN with DHCP Server? Your PC (also a DHCP Client) will broadcast a packet but it is dropped by the router -> Your PC cannot get the IP from DHCP Server. So the "ip helper-address" command enables the DHCP broadcast to be forwarded to the DHCP server. For example, the IP address of your DHCP Server is 10.10.10.254 then we can type in the interface connecting with the DHCP Client (fa0/0 in this case) this command: "ip helper-address 10.10.10.254.
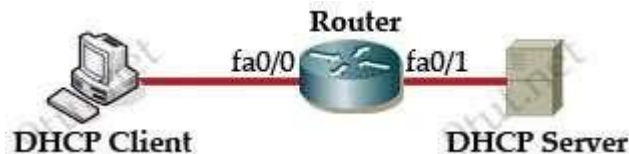
Note: When a client boots up for the first time, it transmits a DHCPDISCOVER message on its local physical subnet. Because the client has no way of knowing the subnet to which it belongs, the DHCPDISCOVER is an all-subnets broadcast (destination IP address of 255.255.255.255, which is a layer 3 broadcast address). The client does not have a configured IP address, so the source IP address of 0.0.0.0 is used.

QUESTION 85
Refer to the exhibit. As packets travel from Mary to Robert, which three devices will use the destination MAC address of the packet to determine a forwarding path? (Choose three)

A. Hub1
B. Switch1
C. Router1
D. Switch2
E. Router2
F. Switch3

Correct Answer: BDF
Section: (none)
**Explanation**

Explanation/Reference:
Explanation

Routers do not look to the destination MAC address to forward packet. It will find the next destination MAC address itself to replace the old destination MAC address of the received packet.

Hubs do not care about MAC addresses, it just flood the frames out of all its port except the port that sent it.

Therefore only three switches in the exhibit above use destination MAC address to determine the next hops.

QUESTION 86
Refer to the exhibit. HostX is transferring a file to the FTP server. Point A represents the frame as it goes toward the Toronto router. What will the Layer 2 destination address be at this point?
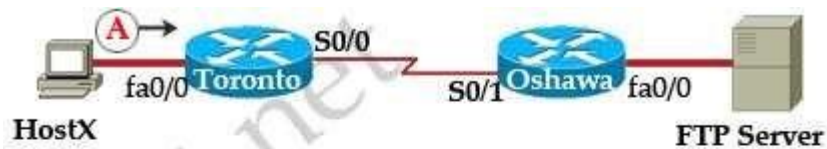
	IP Address	MAC Address
HostA	192.168.1.5	abcd.1123.0045
fa0/0 (Toronto)	192.168.1.1	abcd.2246.0035
	192.168.7.1	aabb.7777.3333
FTP Server	192.168.7.17	aabb.5555.2222

A. abcd. 1123.0045
B. 192.168.7.17
C. aabb.5555.2222
D. 192.168.1.1
E. abcd.2246.0035

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

The destination MAC address at point A must be the MAC address of the interface fa0/0 of Toronto router -> E is correct.

QUESTION 87
The command ip route 192.168.100.160 255.255.255.224 192.168.10.2 was issued on a router. No routing protocols or other static routes are configured on the router. Which statement is true about this command?

A. The interface with IP address 192.168.10.2 is on this router.
B. The command sets a gateway of last resort for the router.
C. Packets that are destined for host 192.168.100.160 will be sent to 192.168.10.2.
D. The command creates a static route for all IP traffic with the source address 192.168.100.160.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:
Explanation

The simple syntax of static route:

ip route destination-network-address subnet-mask {next-hop-IP-address | exit-interface} + destination-network-address: destination network address of the remote network + subnet mask: subnet mask of the destination network
+ next-hop-IP-address: the IP address of the receiving interface on the next-hop router + exit-interface: the local interface of this router where the packets will go out

Therefore the purpose of this command is to send any packets with destination IP address in the range of 192.168.100.160/27 subnet to 192.168.10.2. In fact, answer C is a bit weird when saying "host 192.168.100.160 because 192.168.100.160 is the network address in this case and it cannot be assigned to a host. But answer C is the most suitable answer for this question.

QUESTION 88
What does administrative distance refer to?

A. the cost of a link between two neighboring routers
B. the advertised cost to reach a network
C. the cost to reach a network that is administratively set
D. a measure of the trustworthiness of a routing information source
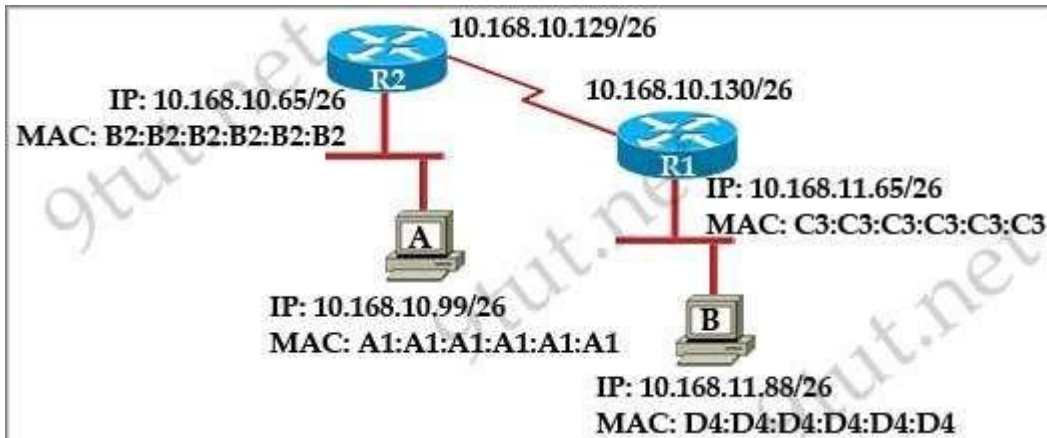
Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:

QUESTION 89
Refer to the exhibit. If host A sends an IP packet to host B, what will the source physical address be in the frame when it reaches host B?

A. 10.168.10.99
B. 10.168.11.88
C. A1:A1:A1:A1:A1:A1
D. B2:B2:B2:B2:B2:B2
E. C3:C3:C3:C3:C3:C3
F. D4:D4:D4:D4:D4:D4

Correct Answer: E
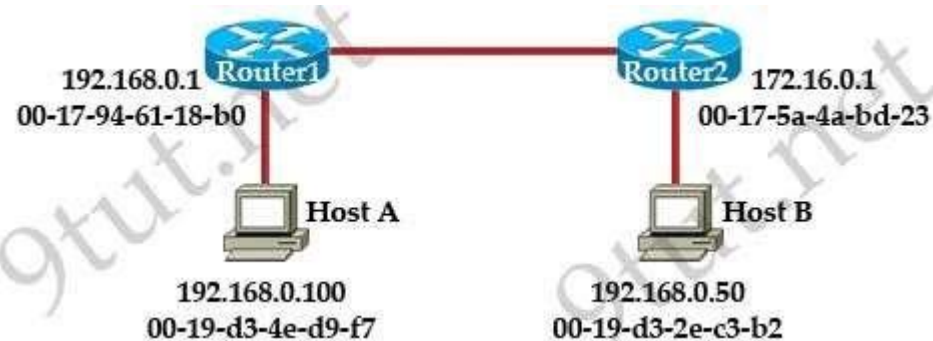**Section: (none)**
Explanation

Explanation/Reference:
Explanation

After receiving a packet, the router will keep the source and destination IP addresses while change the source MAC address (to the MAC address of its outgoing interface) and the destination MAC address (to the MAC address of the next-hop interface). Therefore when the packet reaches host B, the source MAC address must be the MAC address of the outgoing interface of R1.

QUESTION 90
Refer to the exhibit. Host A is sending a packet to Host B for the first time. What destination MAC address will Host A use in the ARP request?

A. 192.168.0.1
B. 172.16.0.50
C. 00-17-94-61-18-b0
D. 00-19-d3-2d-c3-b2
E. ff-ff-ff-ff-ff-ff
F. 255.255.255.255

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
Explanation

Host A knows the IP address of Host B but it does not know the MAC address of host B, so it have to create an ARP Request (which is a broadcast frame) to ask for the MAC address of host B. When Router1 receives this ARP Request, it answers with its own MAC address.

QUESTION 91
Refer to the exhibit. Host A can communicate with Host B but not with Host C or D. How can the network administrator solve this problem?

192.168.1.2/24
Switch1

Host A
192.168.2.15/24

Host B
192.168.2.16/24

Host C
192.168.3.15/24

Host D
192.168.3.16/24

VLAN 2

VLAN 3
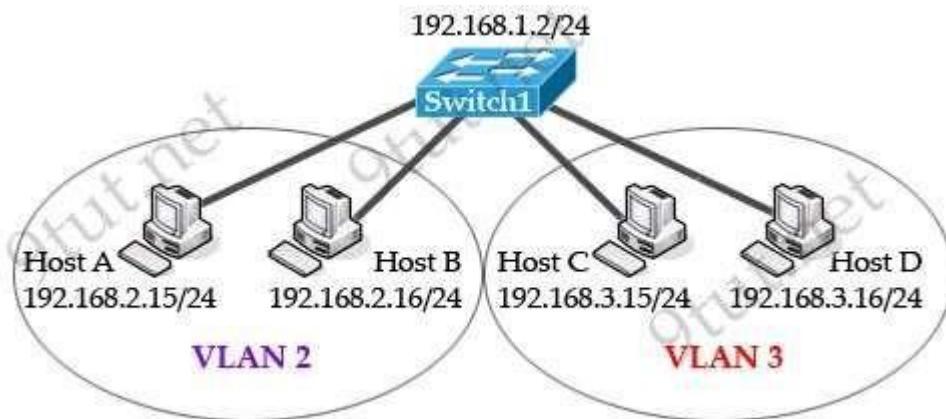
A. Configure Hosts C and D with IP addresses in the 192.168.2.0 network.
B. Install a router and configure a route to route between VLANs 2 and 3.
C. Install a second switch and put Hosts C and D on that switch while Hosts A and B remain on the original switch.
D. Enable the VLAN trunking protocol on the switch.

Correct Answer: B
Section: (none)
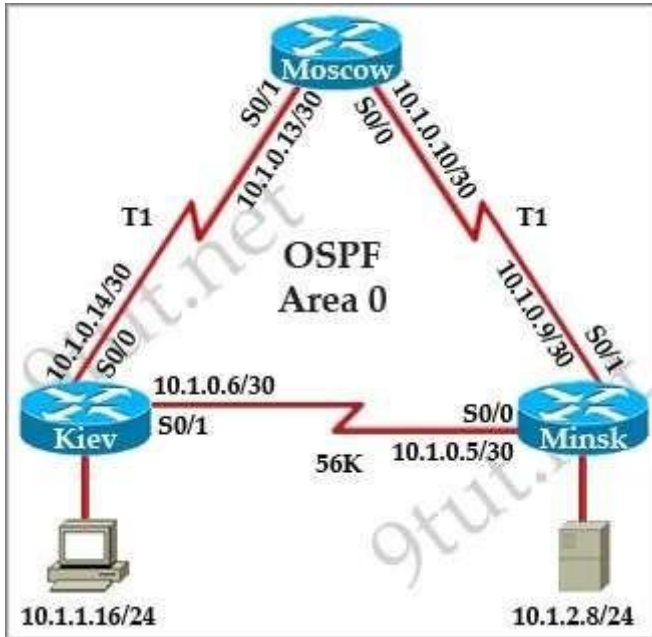**Explanation**

Explanation/Reference:

QUESTION 92
Refer to the exhibit. The host in Kiev sends a request for an HTML document to the server in Minsk. What will be the source IP address of the packet as it leaves the Kiev router?

A. 10.1.0.1
B. 10.1.0.5
C. 10.1.0.6
D. 10.1.0.14
E. 10.1.1.16
F. 10.1.2.8

Correct Answer: E
Section: (none)
Explanation

Explanation/Reference:
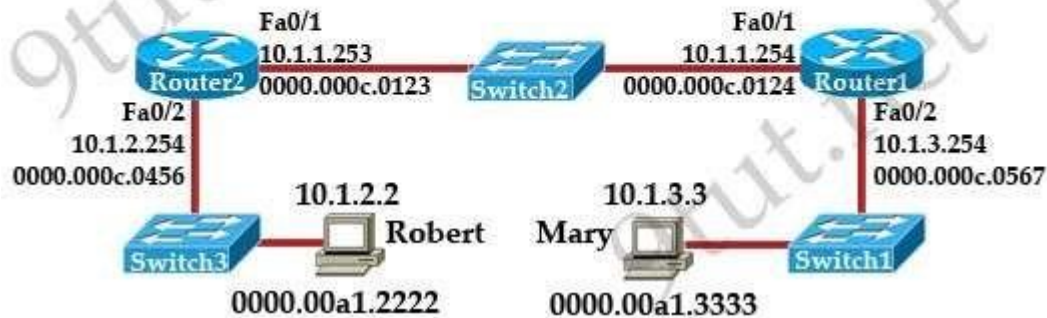Explanation

Along the routing path, the source and destination IP address will not change so the source IP will always be 10.1.1.16.

QUESTION 93
Refer to the exhibit. Mary is sending an instant message to Robert. The message will be broken into a series of packets that will traverse all network devices. What addresses will populate these packets as they are forwarded from Router1 to Router2?

Destination MAC Source MAC Destination IP   Source IP

ETHERNET FRAME

Fa0/1
10.1.1.253   Fa0/1
Router2 0000.000c.0123   Switch2   10.1.1.254
                          0000.000c.0124 Router1
Fa0/2   Fa0/2
10.1.2.254   10.1.3.254
0000.000c.0456   0000.000c.0567

                10.1.2.2   10.1.3.3
                    Robert   Mary
Switch3   Switch1

        0000.00a1.2222   0000.00a1.3333

Destination MAC	Source MAC	Destination IP	Source IP
0000.000c.0123	0000.000c.0124	10.1.2.2	10.1.3.3

A.

Destination MAC	Source MAC	Destination IP	Source IP
0000.000c.0123	0000.000c.0124	10.1.1.253	10.1.1.254

B.

Destination MAC	Source MAC	Destination IP	Source IP
0000.00a1.2222	0000.00a1.3333	10.1.1.253	10.1.1.254

C.

Destination MAC	Source MAC	Destination IP	Source IP
0000.000c.0456	0000.000c.0567	10.1.2.2	10.1.3.3

D.

Correct Answer: A
**Section: (none)**
Explanation

Explanation/Reference:
Explanation

After receiving a packet, the router will keep the source and destination IP addresses (10.1.3.3 and 10.1.2.2, respectively) while change the source MAC address (to the MAC address of its outgoing interface) and the destination MAC address (to the MAC address of the next-hop interface). Therefore when the packet leaves Router1, the source MAC address must be the MAC address of the outgoing interface of Router1 (0000.000c.0124) and the destination MAC address must be the MAC of fa0/1 of R2 (0000.000c.0123).

QUESTION 94
Refer to the exhibit. Which two statements are correct? (Choose two)
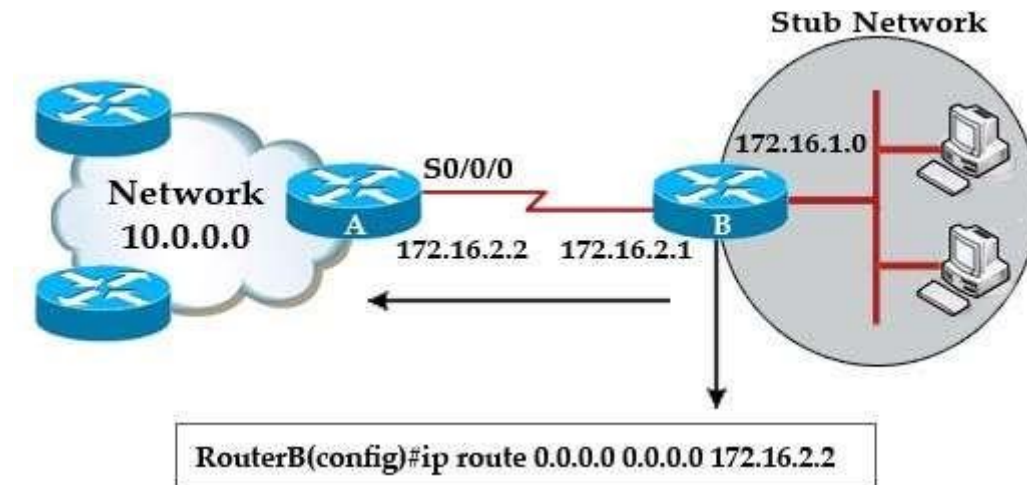
A. This is a default route.
B. Adding the subnet mask is optional for the ip route command.
C. This will allow any host on the 172.16.1.0 network to reach all known destinations beyond RouterA.
D. This command is incorrect, it needs to specify the interface, such as s0/0/0 rather than an IP address.
E. The same command needs to be entered on RouterA so that hosts on the 172.16.1.0 network can reach network 10.0.0.0.

Correct Answer: AC
Section: (none)
**Explanation**

Explanation/Reference:
Explanation

A static route with 0.0.0.0 0.0.0.0 will become a default route. The default route means: "send all traffic to this IP address". So the default route "ip route

0.0.0.0 0.0.0.0 172.16.2.2 will send all traffic to 172.16.2.2.

QUESTION 95
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?
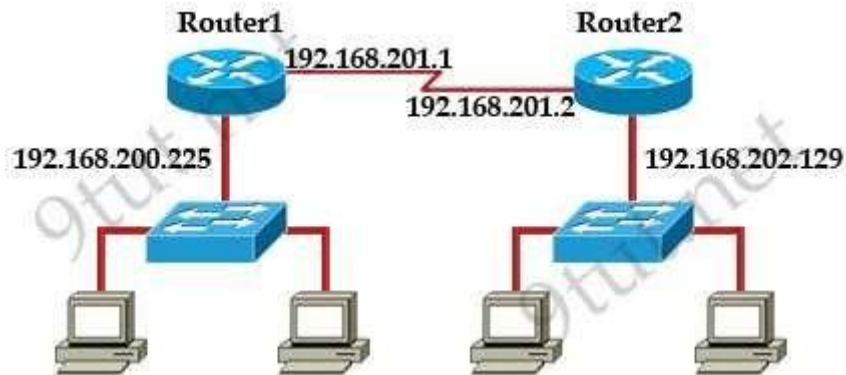
A. router1(config)#ip route 1 192.168.201.1 255.255.255.0 192.168.201.2
B. router1(config)#ip route 192.168.202.0 255.255.255.0 192.168.201.2 1
C. router1(config)#ip route 5 192.168.202.0 255.255.255.0 192.168.201.2
D. router1(config)#ip route 192.168.202.0 255.255.255.0 192.168.201.2 5

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation

The Administrative Distance (AD) parameter must be put at the end of the "ip route" command. The default AD is 1.

QUESTION 96
Refer to the exhibit. The output is from a router in a large enterprise. From the output, determine the role of the router.

```
RouterA# 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 0.0.0.0 to network 0.0.0.0

      172.16.0.0/24 is subnetted, 1 subnets
C          172.16.1.0 is directly connected, Ethernet0/1
      10.0.0.0/30 is subnetted, 1 subnets
C          10.255.255.200 is directly connected, Serial0/0
S*    0.0.0.0/0 is directly connected, Serial0/0
RouterA#
```

A. A Core router.
B. The HQ Internet gateway router.
C. The WAN router at the central site.
D. Remote stub router at a remote site.

Correct Answer: D
Section: (none)
Explanation

**Explanation/Reference:**
Explanation

This router only have directly connected networks (symbolized by letter "C") and one default route out of Serial0/0. Maybe this is a stub router with only one connection to the Headquarter or to the Internet.

QUESTION 97
Refer to the exhibit. What is the simplest way to configure routing between the regional office network 10.89.0.0/20 and the corporate network?
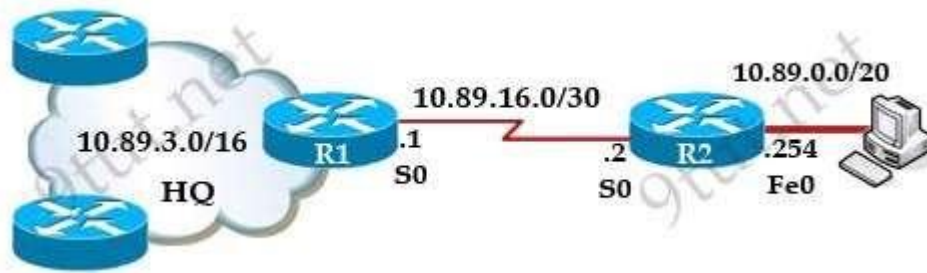
A. router1(config)#ip route 10.89.0.0 255.255.240.0 10.89.16.2
B. router2(config)#ip route 10.89.3.0 255.255.0.0 10.89.16.2
C. router1(config)#ip route 10.89.0.0 255.255.240.0 10.89.16.1
D. router2(config)#ip route 0.0.0.0 0.0.0.0 10.89.16.1

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation

In this topology, R2 is a stub router with only one connection to the HQ network so the best way to configure routing is to set a static route (default route) to R1.

QUESTION 98
Refer to the exhibit. What must be configured to establish a successful connection from Host A to switch SW-A through router RT-A?
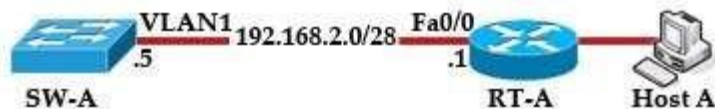
A. VLAN 1 on RT-A
B. IP routing on SW-A
C. default gateway on SW-A
D. crossover cable connecting SW-A and RT-A

Correct Answer: C
Section: (none)

Explanation

Explanation/Reference:
Explanation

Host A is in a different subnet of SW-A so SW-A does not know how to send data to host A so it needs to be assigned with a default gateway. The command to assign a default gateway to a switch is "ip default-gateway ". Please notice this command only has effect when "ip routing" is disabled on SW-A.

QUESTION 99
Refer to the exhibit. Which default gateway address should be assigned to HostA?
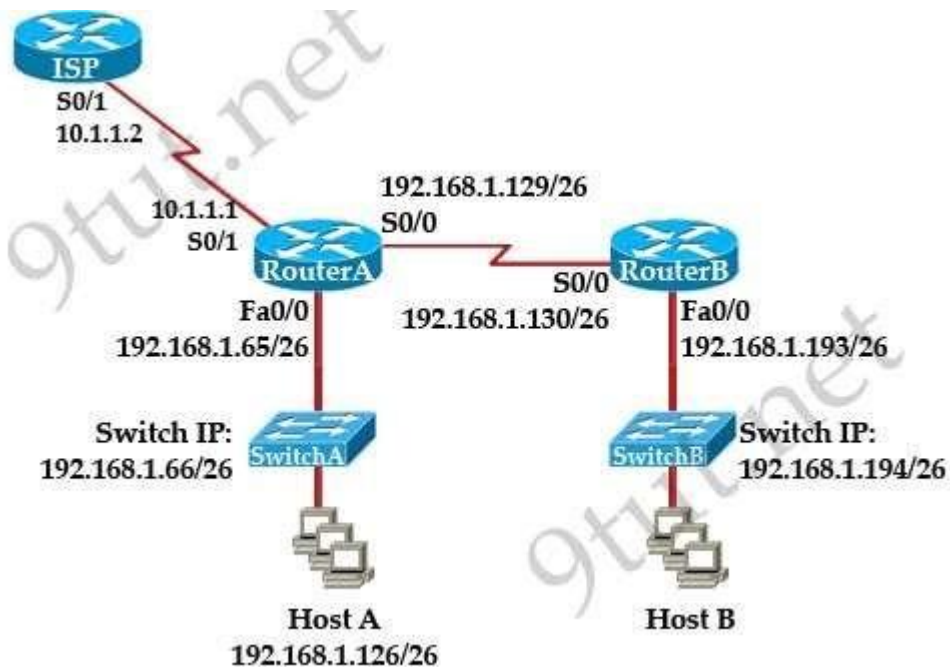
A. 192.168.1.1
B. 192.168.1.65
C. 192.168.1.66
D. 192.168.1.129
E. 10.1.1.1
F. 10.1.1.2

Correct Answer: B
Section: (none)
Explanation

Explanation/Reference:
Explanation

The default gateway of Host A should be the connected interface of the router, except host A is connected with a Layer 3 switch. In this case, Switch A is a pure Layer 2 switch and Switch A IP address is just for management purpose.

QUESTION 100
What happens when computers on a private network attempt to connect to the Internet through a Cisco router running PAT?

A. The router uses the same IP address but a different TCP source port number for each connection.
B. An IP address is assigned based on the priority of the computer requesting the connection.
C. The router selects an address from a pool of one-to-one address mappings held in the lookup table.
D. The router assigns a unique IP address from a pool of legally registered addresses for the duration of the connection.

Correct Answer: A
Section: (none)
Explanation

Explanation/Reference:
Explanation
Port Address Translation (PAT) can support thousands of users connect to the Internet using only one real global IP address. With PAT, each computer will be assigned a separate port number so that the router can identify which computer should receive the return traffic.

QUESTION 101
In the configuration of NAT, what does the keyword overload signify?

A. When bandwidth is insufficient, some hosts will not be allowed to access network translation.
B. The pool of IP addresses has been exhausted.
C. Multiple internal hosts will use one IP address to access external network resources.
D. If the number of available IP addresses is exceeded, excess traffic will use the specified address pool.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

Explanation

The keyword "overload" specifies we are using NAT Overload (PAT) in which multiple internal hosts will use only one IP address to access external network resources.

QUESTION 102
When configuring NAT, the Internet interface is considered to be what?

A. local

B. inside

C. global

D. outside

Correct Answer: D
Section: (none)
Explanation

Explanation/Reference:
Explanation

On the interface connecting to the Internet of the router we have to use the command "ip nat outside" for NAT to work. It identifies that interface as the outside interface.

QUESTION 103
Refer to the exhibit. A TFTP server has recently been installed in the Atlanta office. The network administrator is located in the NY office and has made a console connection to the NY router. After establishing the connection they are unable to backup the configuration file and IOS of the NY router to the TFTP server. What is the cause of this problem?
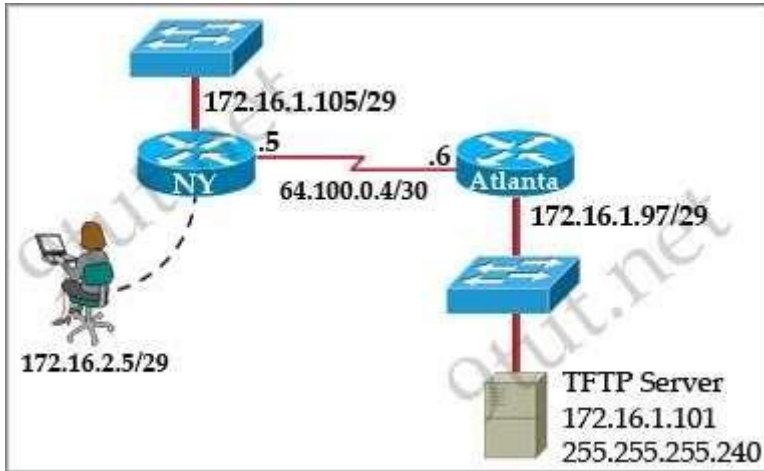
A. The NY router has an incorrect subnet mask.
B. The TFTP server has an incorrect IP address.
C. The TFTP server has an incorrect subnet mask.
D. The network administrator computer has an incorrect IP address.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

QUESTION 104
Refer to the exhibit. A network administrator has configured a Catalyst 2950 switch for remote management by pasting into the console the configuration commands that are shown in the exhibit. However, a Telnet session cannot be successfully established from a remote host. What should be done to fix this problem?

interface vlan 1
ip address 192.168.17.253 255.255.255.240
no shutdown
exit
ip default-gateway 192.168.17.1
line vty 0 15
password cisco
login
exit

A. Change the first line to interface fastethernet 0/1.
B. Change the first line to interface vlan 0/1.
C. Change the fifth line to ip default-gateway 192.168.17.241.
D. Change the fifth line to ip route 0.0.0.0 0.0.0.0 192.168.17.1.
E. Change the sixth line to line con 0.

Correct Answer: C
Section: (none)
Explanation

Explanation/Reference:

QUESTION 105
Various protocols are listed on the left On the right are applications for the use of those protocols. Drag the protocol on the left to an associated function for that protocol on the right (Not all options are used)

ICMP	A PC sends packets to the default gateway IP address the first time since the PC turned on.
DHCP	The network administrator is checking basic IP connectivity from a workstation to a server.
RARP	The TCP/IP protocol stack must find an IP address for packets destined for a URL.
UDP	A network device will automatically assign IP addresses to workstations.
DNS	
ARP	

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
+ ARP: A PC sends packets to the default gateway IP address the first time since the PC turned on. + ICMP: The network administrator is checking basic IP connectivity from a workstation to a server. + DNS: The TCP/IP protocol stack must find an IP address for packets destined for a URL. + DHCP: A network device will automatically assign IP addresses to workstations.

QUESTION 106
Move the protocol or service on the left to a situation on the right where it would be used. (Not all options are used)

OSPF	A PC with address 10.1.5.10 must access devices on the Internet.
ARP	Only routers and servers require static IP addresses. Easy IP administration is required.
NAT	A PC only knows a server as a MediaServer. IP needs to send data to that server.
DNS	A protocol is needed to replace current static routes with automatic route updates.
SQL	
DHCP	

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
+ NAT: A PC with address 10.1.5.10 must access devices on the Internet. + DHCP: Only routers and servers require static IP addresses. Easy IP administration is required. + DNS: A PC only knows a server as MediaServer. IP needs to send data to that server. + OSPF: A protocol is needed to replace current static routes with automatic route updates.

QUESTION 107
Drag the definition on the left to the correct term on the right. Not all definitions on the left will be used.

a protocol that converts human-readable names into machine-readable addresses	SNMP
used to assign IP addresses automatically and set parameters such as subnet mask and default gateway	FTP
a protocol for using HTTP or HTTPS to exchange XML-based messages over computer networks	TFTP
a connectionless service that uses UDP to transfer files between systems	DNS
a protocol used to monitor and manage network devices	DHCP
a reliable, connection-oriented service that uses TCP to transfer files between systems	

A.
B.
C.
D.

Correct Answer:

Section: (none)
Explanation

Explanation/Reference:
+ SNMP: a protocol used to monitor and manage network devices + FTP: a reliable, connection-oriented service that uses TCP to transfer files between systems + TFTP: a connectionless service that uses UDP to transfer files between systems + DNS: a protocol that converts human-readable names into machine-readable addresses + DHCP: used to assign IP addresses automatically and set parameters such as subnet mask and default gateway

QUESTION 108
Drag the appropriate command on the left to the configuration task it accomplishes (not all options are used)

login password cantCome1n	encrypt all clear text passwords
enable password uwi11NeverNo	protect access to the user mode prompt
service password-encryption	set privileged mode encrypted password
line console 0 password friendS0nly	set password to allow Telnet connections
enable secret noWay1n4u	set privileged mode clear text password
line vty 0 4 password 2hard2Guess	

A.

B.
C.
D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
service password-encryption encrypt all clear text passwords

line console 0 protect access to the user mode prompt
password friendS0nly
enable secret noWay1n4u set privileged mode encrypted password

line vty 0 4 set password to allow Telnet connections
password 2hard2Guess

enable password uwi11NeverNo set privileged mode clear text password

QUESTION 109
On the left are various network protocols. On the right are the layers of the TCP/IP model. Assuming a reliable connection is required, move the protocols on the left to the TCP/IP layers on the right to show the proper encapsulation for an email message sent by a host on a LAN. (Not all options are used)

UDP	application layer
SNMP	transport layer
IP	internet layer
ARP	network access layer
Ethernet	
TCP	
SMTP	

A.

B.

C.

D.
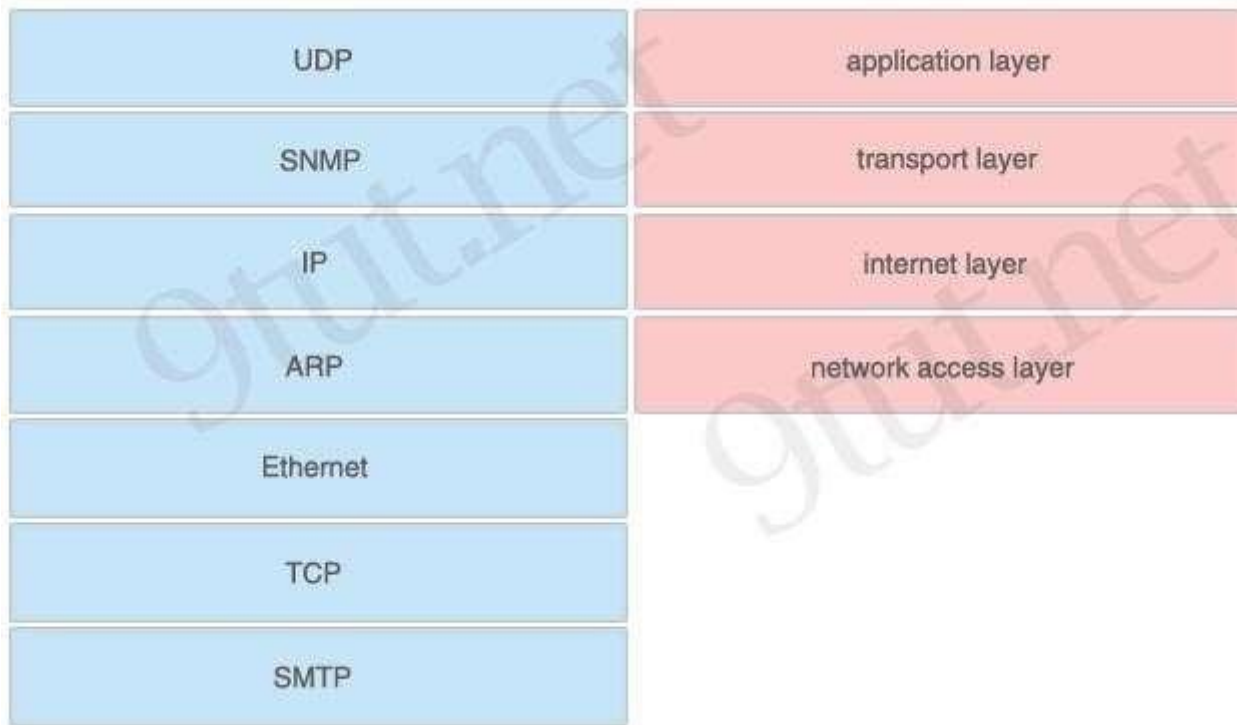
Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
+ application layer: SMTP
+ transport layer: TCP
+ internet layer: IP
+ network access layer: Ethernet

QUESTION 110

Not sure about the requirement of this question but it is something like this:
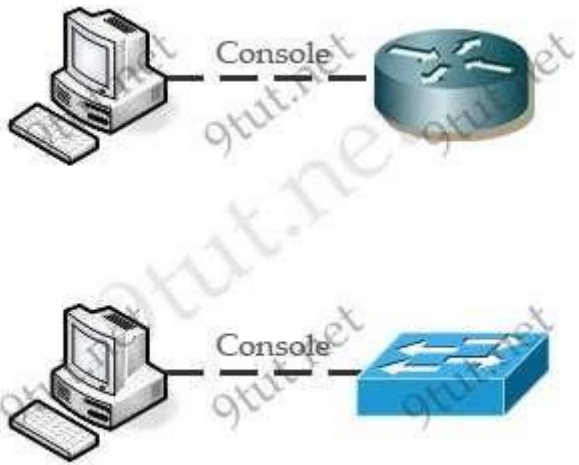
Before this switch and router can be put to use in the network, what security risks can be found...

We are still not sure about the configurations in this sim but we got some information to share with you (updated on December-07-2011. Thanks Joe Mendola, xallax and many candidates who share the information!):

Maybe this is the configurations on Router and Switch (but notice that they are surely missing something):

ROUTER A CONFIGURATION

```
!
no service password-encryption
!
enable password cisco
!
username ciscouser privilege 15 password 0 cisco
!
banner motd ^CWelcome! If you encountered any problem, please consult the administrator^C !
line vty 0 4
password 4t&34rkf
login local
transport input telnet ssh
!
```

SWITCH A CONFIGURATION

!
no service password-encryption
!
line console 0
line vty o 4
no login
transport input telnet ssh (????)
line vty 5 15 (????)
login (????)
transport input telnet ssh (????)
banner motd ^CWelcome! If you encountered any problem, please consult the administrator^C

Note: This is just what we gather and guess. In the exam the configurations may be different so make sure you understand about "enable secret", "enable password", "login", "login local", "transport input", "line vty", "service password-encryption", "bannder motd", "privilege" before taking this exam!

This sim has 4 questions:

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:

QUESTION 111
Identify security threats on RouterA (select 3)

A. unencrypted password set
B. unsecured message on banner
C. remote access can only be made through telnet or SSH
D. user gets level 15 automatically by default

Correct Answer: ACD
Section: (none)

Explanation

Explanation/Reference:
Guideline to answer this question:

Because the "service password-encryption" is not set on RouterA so the password to access privileged mode (via the command "enable password cisco") is unencrypted. Also, the password for VTY is unencrypted (notice that the password "4t&34rkf" is in fact unencrypted) -> A is correct.

Although the banner says "Welcome ..." but it does not leak any security information so it is still safe - > B is not correct.

From the command "transport input telnet ssh" we learn that remote access can be mad through telnet or SSH. This is also the default setting of Cisco router -> C is correct.

In the "line vty 0 4 configuration, the type of login is specified as "login local". It means that the router will not use the password configured under "line vty 0 4 (in this case "4t&34rkf") but it will use the user & password configured in "username ciscouser privilege 15 password cisco" command. The command "username ciscouser privilege 15 password cisco" will grant the privilege of 15 for "ciscouser" user -> D is correct.

QUESTION 112
Which two of the following are true regarding the configuration of RouterA (choose two)

A. at least 5 simultaneous remote connect are possible
B. only telnet protocol connections to Router A are supported
C. remotely connection to RouterA using telnet will succeed
D. console line connection will never time out due to inactivity
E. since DHCP is not used on Fa0/1 there is not a need to use the NAT protocol

Correct Answer: AC
Section: (none)
Explanation

Explanation/Reference:
Guideline to answer this question:

A is correct as we can telnet from line 0 to line 4 (line vty o 4).

We can use both telnet and SSH to connect to this router (transport input telnet ssh) -> B is not correct.

C is correct as we can telnet to it.

D is not correct because by default, the timeout is set to 10 minutes on both the console and the vty ports.

E is not correct as NAT can be used even DHCP is not used.

QUESTION 113
Select the options which are security issues which need to be modified before RouterA is used (not sure how many answers we can choose)

A. unencrypted weak password is configured to protect privilege mode
B. inappropriate wording in banner message
C. the virtual terminal lines have weak password configured
D. virtual terminal lines have a password, but it will not be used
E. configuration supports in-secure web server access

Correct Answer: AD
Section: (none)
Explanation

Explanation/Reference:
Guideline to answer this question:

Privilege mode on RouterA is protected with unencrypted password (via "enable password" command) -> A is correct.

B is not correct as mentioned above.

The password of VTY lines is "4t&34rkf". Although it is unencrypted but it is not a weak password because it has number & special characters inside -> C is not correct.

Although a password of "4t&34rkf" is configured but with the command "login local", router will use the username of "ciscouser" & password of "cisco" (configured in "username ciscouser privilege 15 password 0 cisco" command) -> D is correct.

By checking the configuration of routerA with the "show run" command. To support web server access it must have the command "ip http server" but it does not -> E is not correct.

QUESTION 114
Select three options which are security issues with the current configuration of Switch A. (Choose three)

A. privilege mode is protected with an unencrypted password
B. inappropriate wording in banner message
C. virtual terminal lines are protected only by a password requirement
D. both the username and password are weak
E. telnet connections can be used to remotely manage the switch
F. Cisco user will be granted privilege level 15 by default

Correct Answer:

Section: (none)
Explanation

Explanation/Reference:
Answer: not sure

Guideline to answer this question:

We haven't had enough information about switch configuration so we can't be sure about the correct answers but the below is a guideline:

Answer B is surely not correct as the wording in banner does not leak any security information.

If under "line vty 0 4 you see the "login" command but it does not have a password then maybe answer C is correct. In this case if we try to telnet/ssh to the switch then we will receive a message "Password required, but none set" then we are kicked out ^^.

If you see popular username and password then maybe answer D is correct.

If the command "transport input ..." specifies "telnet" as a method then answer E is correct.

For answer F, if you see something like this:

line vty 0 4
privilege level 15

or these lines:

username ciscouser privilege 15 password cisco

and

login local (in "line vty 0 4)

then answer F is correct.

Hope you will contribute your experience about this sim after taking the ICND1 exam. We will post here when we get new information about this sim as soon as possible.

QUESTION 115
OSPF Neighbor Sim

We don't have enough information about this sim to make a complete solution but here is some information from the candidates about this sim so far:

Topology:
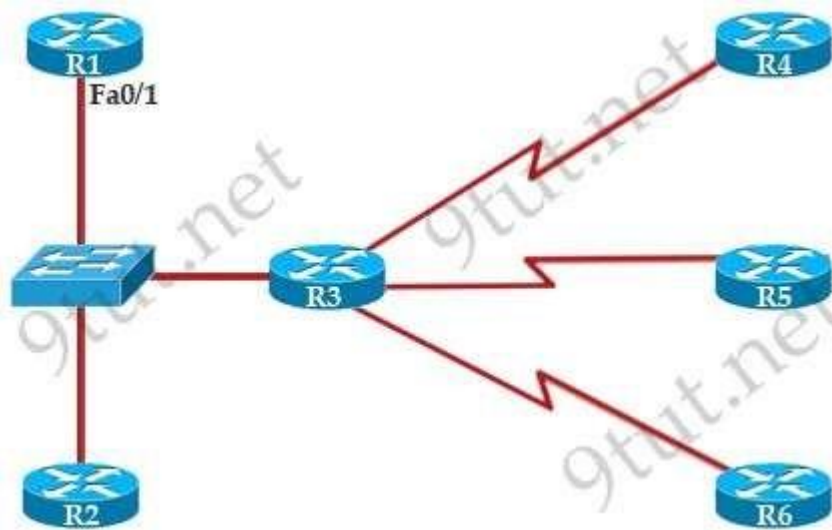
"I was talking about the ICND1 (100-101) exam. The 6 routers are configured with OSPF, however they are not forming adjacencies. You do not have to configure any of them. All you have to do is use the show ip ospf interface command on the routers in question and compare them to see what errors are there. In mine I had one question that was the OSPF area for the two routers were different, another was the router ID were the same for two of the routers, and I had 2 with different Hello and Dead intervals. Understand that OSPF requires areas to match, routers to have different router IDs and hello and dead timers must match, then you will find it easy to find the errors."
--- -----
"The 6 router OSPF sim in which you have to do a show run and compare areas or show ip ospf interface and compare hello and dead timers to troubleshoot adjacency issues. One of the problems between two of the routers is that PPP is configured and the passwords do not match."
--- -----
"There is a question lab (but no conf) of 6 router with 1 switch...the question is only for router about Ospf...4 question: i remember 3 answer, 1 is ppp chap authentication on serial' 2 is wrong conf area on interface and 3 is 1 router have hello or dead packet but the neighbor router no...i not member more but is easy with show run."
--- -----
"OSPF lab with 6 routers / 1 switch which need to know "-show ip ospf interfaces" command and do some sh run to find incorrect OSPF parameter between 2 routers preventing adjacencies work." -- -----
"I have the OSPF lab with 6 routers, the questions were router to router config questions. Why they aren't forming adjacency etc. do show ip OSPF commands to get info. Wrong dead timers/wrong OSPF areas etc are the reasons. Just do your show commands and you'll be fine. I also had the security applet with one router and one switch. So run to get info about VTY passwords etc. Then I had the config lab with the routers and switches."
--- -----
"Had the OSPF sim, no biggie though, just use your show ip ospf interface command and compare the router interfaces it's asking for."
--- -----
"u have to enter the "show ip ospf interface" ""show ip ospf database" command and compare every router for "area" "process id" and "hello and dead timer". --- -----

there is new simulations, i found this questions
1) Between R1 and R2 connected over Ethernet. Why aren't they forming OSPF adjacency? Answer:
One of the interfaces is shutdown.
2) Between R3 and R4 connected over Serial. Why aren't they forming OSPF adjacency? Answer: One router has PPP Encapsulation and the other is using HDLC.
3) Between R3 and R5 connected over Serial. Why aren't they forming OSPF adjacency? Answer: On R5 OSFP is not configured to route between them.
4) Between R3 and R6 connected over Serial. Why aren't they forming OSPF adjacency? Answer: The Hello interval are mismatched.

--- -----
Thanks all the candidates for your information! We will continue update this site when we get new information about this sim.

A.

B.

C.

D.

Correct Answer:
Section: (none)
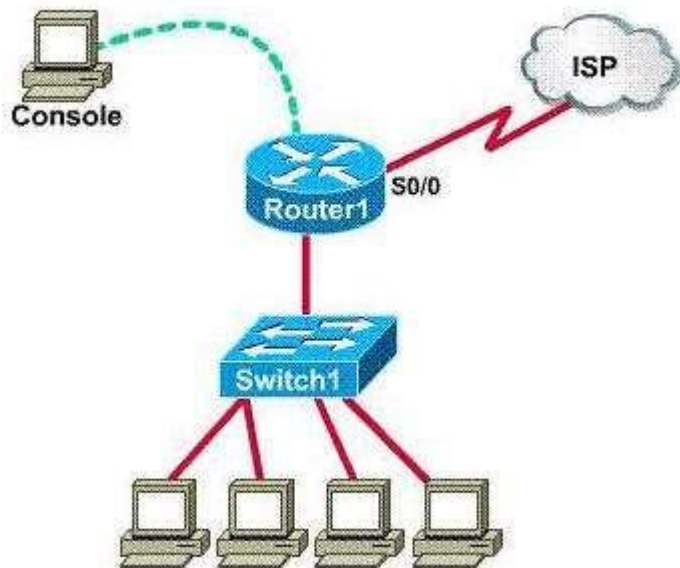**Explanation**

Explanation/Reference:

QUESTION 116
Show Configuration Sim

This task requires the use of various show commands from the CLI of Router1 to answer 5 multiple- choice questions. This does not require any configuration.

```
Router1 con0 is now available




Press RETURN to get started.
```

NOTE: The show running-configuration and the show startup-configuration commands have been disabled in this simulation.
To access the multiple-choice questions, click on the numbered boxes on the right of the top panel. There are 5 multiple-choice questions with this task.
Be sure to answer all 5 questions before leaving this item.

A.
B.
C.
D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:

QUESTION 117
.1

What is the subnet broadcast address of the LAN connected to Router1? A 192.168.136.15
B -192.168.136.31
C -192.168.136.63
D 192.168.136.127
E 255.255.255.255

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
Explanation:

The "show running-configuration" and "show startup-configuration" have been disabled as stated above so we should use the show ip interface command to get information about the LAN network connected to Router1.

```
Router1#show ip interface
FastEthernet0/0 is up, line protocol is up (connected)
   Internet address is 192.168.136.1/28
   Broadcast address is 255.255.255.255
   Address determined by setup command
   MTU is 1500 bytes
   Helper address is not set
   Directed broadcast forwarding is disabled
   Outgoing access list is not set
   Inbound  access list is not set

   .........................................................
<output omitted>
```

From the output we learn that the ip address of the FastEthernet interface of Router1 is 192.168.136.1 and the subnet mask is /28. Therefore:

Increment: 16 (/28=1111 1111.1111 1111.1111 1111.1111 0000) Network address: 192.168.136.0
Broadcast address: 192.168.136.15 (15 = 0 + 16 1)

-> The broadcast address of this subnetwork is 192.168.136.15

QUESTION 118
.2

What is the bandwidth on the WAN interface of Router1? A 16 Kbit/sec
B 32 Kbit/sec
C 64 Kbit/sec
D 128 Kbit/sec
E 512 Kbit/sec
F 1544 Kbit/sec

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
Explanation:

To find out the bandwidth on the WAN (serial) interface of Router1 we need to use the show interfaces serial 0/0 command:

```
Router1#show interfaces serial 0/0

Serial0/0 is administratively down, line protocol is down

  Hardware is PowerQUICC Serial

  Internet address is 10.11.12.13/30

  MTU 1500 bytes, BW 512 Kbit, DLY 20000 usec,

    reliability 255/255, txload 1/255, rxload 1/255

  Encapsulation HDLC, loopback not set

  Keepalive set (10 sec)

  Last input 00:00:05, output 00:00:05, output hang never

  Last clearing of "show interface" counters never

  Input queue: 0/75/0/0 (size/max/drops/flushes);Total output drops: 0
```

Therefore the bandwidth on the WAN is 512 Kbit/sec.

QUESTION 119
.3

What interfaces on Router1 have not had any configurations applied? (Choose two)

A Ethernet 0
B FastEthenet 0/0
C FastEthernet 0/1
D Serial 0
E Serial 0/0
F Serial 0/1

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
Explanation:

Use the show ip interface brief to identify what interfaces Router 1 have. Notice that Router1 does not have Ethernet 0 and Serial 0 interfaces.
FastEthernet 0/0 and Serial 0/0 were configured with their IP addresses therefore only FastEthernet 0/1 and Serial0/1 have not had any configurations applied.

QUESTION 120
.4:

Including the address on the Router1 FastEthernet interface, how many hosts can have IP addresses on the LAN to which Router1 is connected?
A 6
B 14
C 62
D 128

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
Explanation:

The mask address of interface Fa0/0 of Router1 is /28 (as shown in

QUESTION 121
), which has four 0 bits
(1111 1111.1111 1111.1111 1111.1111 0000). Therefore there are 24 2 = 14 assignable IP addresses for hosts on the LAN.

A.
B.
C.
D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:

QUESTION 122
.5:

The hosts in the LAN are not able to connect to the Internet. Which commands will correct this issue? A Router1(conf)# interface fa0/0
Router1(conf-if)# no shutdown
B Routed (conf)# interface fa0/1
Router1(conf-if)# no shutdown
C Router1(conf)# interface s0/0
Router1(conf-if)# no shutdown
D Router1(conf)# interface s0/1
Router1(conf-if)# no shutdown
E Router1(conf)# interface s0/0
Router1(conf-if)# ip address 10.11.12.13 255.255.255.252 F Router1(conf)# interface s0/1
Routerl (conf-if)# ip address 10.11.12.13 255.255.255.252

A.

B.

C.

D.

Correct Answer:
Section: (none)
Explanation

Explanation/Reference:
Explanation:

We should check the statuses of all the interfaces on Router1 with the show ip interface brief command:

```
Router#show ip interface brief

Interface        IP-Address       OK?   Method Status                      Protocol
FastEthernet0/0  192.168.136.1    YES   manual up                          up


FastEthernet0/1  unassigned       YES   manual administratively down       down


Serial0/0        10.11.12.13      YES   manual administratively down       down


Serial0/1        unassigned       YES   manual administratively down       down


Serial1/0        unassigned       YES   manual administratively down       down


Serial1/1        unassigned       YES   manual administratively down       down
```

From the output, we learn that the status of Serial0/0 interface which connects to ISP router is currently "administratively down". This status indicates this interface is shutting down so we need to turn it on.