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Cisco Certified Network Associate

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QUESTION 1:

Which of the following devices can an administrator use to segment their LAN?
(Choose all that apply)

- A. Hubs
- B. Repeaters
- C. Switches
- D. Bridges
- E. Routers
- F. Media Converters
- G. All of the above

Answer: C, D, E

Explanation:

Routers, switches, and bridges don't transmit broadcasts. They segment a large cumbersome network, into multiple efficient networks.

Incorrect Answers:

A. Hubs is incorrect because a hub doesn't segment a network, it only allows more hosts on one. Hubs operate at layer one, and is used primarily to physically add more stations to the LAN.

B. This also incorrect because the job of a repeater is to repeat a signal so it can exceed distance limitations. It also operates at layer one and provides no means for logical LAN segmentation.

F. This is incorrect because media converters work by converting data from a different media type to work with the media of a LAN. It also operates at layer one and provides no means for logical LAN segmentation.

QUESTION 2:

Routers perform which of the following functions? (Select three)

- A. Packet switching
- B. Collision prevention on a LAN segment.
- C. Packet filtering
- D. Broadcast domain enlargement
- E. Broadcast forwarding
- F. Internetwork communication

Answer: A, C, F

Explanation:

A. Routers work in Layer 3 of the OSI Model. A major function of the router is to route packets between networks.

C. Through the use of access lists, routers can permit and deny traffic using layer 3 and layer 4 packet information.

F. The primary purpose of a router is to route traffic between different networks, allowing for internetworking.

Incorrect Answers:

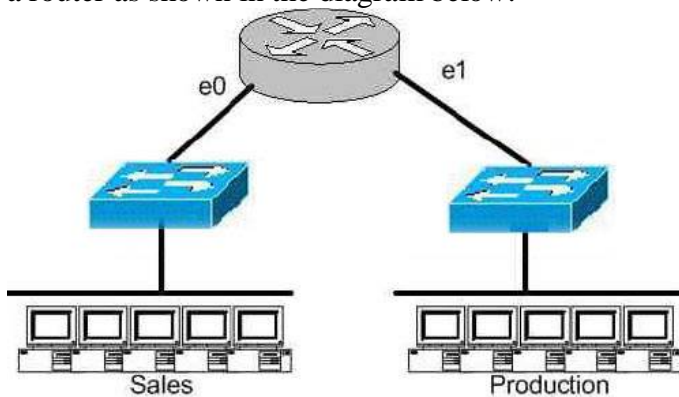
B. While routers can be used to segment LANs, which will reduce the amount of collision: it can not prevent all collisions from occurring. As long as there are 2 or more devices on a LAN segment, the possibility of a collision exists, whether a router is used or not.

D. The broadcast domain of a LAN is often segmented through the use of a router. This results in reducing the size of the broadcast domain.

E. Routers do not forward broadcast traffic.

QUESTION 3:

Within the Itexamworld office, The Sales and Production networks are separated by a router as shown in the diagram below:



Which of the following statements most accurately describes the characteristics of the above networks broadcast and collision domains? (Select the two best answer choices)

A. There are two broadcast domains in the network.

B. There are four broadcast domains in the network.

C. There are six broadcast domains in the network.

D. There are four collision domains in the network.

E. There are five collision domains in the network.

F. There are seven collision domains in the network.

Answer: A, F

Explanation:

In this network we have a hub being used in the Sales department, and a switch being used in the Production department. Based on this, we have two broadcast domains: one for each network being separated by a router. For the collision domains, we have 5

computers and one port for E1 so we have 6 collision domains total because we use a switch in the Production Department so 5 are created there, plus one collision domain for the entire Sales department because a hub is being used.

QUESTION 4:

The Itexamworld corporate LAN consists of one large flat network. You decide to segment this LAN into two separate networks with a router. What will be the affect of this change?

- A. The number of broadcast domains will be decreased.
- B. It will make the broadcasting of traffic between domains more efficient between segments.
- C. It will increase the number of collisions.
- D. It will prevent segment 1's broadcasts from getting to segment 2.
- E. It will connect segment 1's broadcasts to segment 2.

Answer: D

Explanation

A router does not forward broadcast traffic. It therefore breaks up a broadcast domain, reducing unnecessary network traffic. Broadcasts from one segment will not be seen on the other segment.

Incorrect Answers:

- A. This will actually increase the number of broadcast domains from one to two.
 - B. All link level traffic from segment one to segment two will now need to be routed between the two interfaces of the router. Although this will reduce the traffic on the LAN links, it does also provide a less efficient transport between the segments.
 - C. Since the network size is effectively cut into half, the number of collisions should decrease dramatically.
 - E. Broadcasts from one segment will be completely hidden from the other segment.
-

QUESTION 5:

Which of the following are benefits of segmenting a network with a router? (Select all that apply)

- A. Broadcasts are not forwarded across the router.
- B. All broadcasts are completely eliminated.
- C. Adding a router to the network decreases latency.
- D. Filtering can occur based on Layer 3 information.
- E. Routers are more efficient than switches and will process the data more quickly.
- F. None of the above.

Answer: A, D

Explanation

Routers do not forward broadcast messages and therefore breaks up a broadcast domain. In addition, routers can be used to filter network information with the use of access lists.

Incorrect Answers:

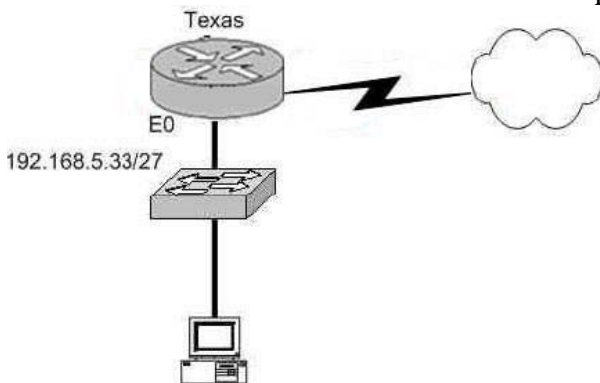
B. Broadcasts will still be present on the LAN segments. They will be reduced, because routers will block broadcasts from one network to the other.

C. Adding routers, or hops, to any network will actually increase the latency.

E. The switching process is faster than the routing process. Since routers must do a layer 3 destination based lookup in order to reach destinations, they will process data more slowly than switches.

QUESTION 6:

The Itexamworld Texas branch network is displayed in the following diagram:



Of the following choices, which IP address should be assigned to the PC host?

- A. 192.168.5.5
- B. 192.168.5.32
- C. 192.168.5.40
- D. 192.168.5.63
- E. 192.168.5.75

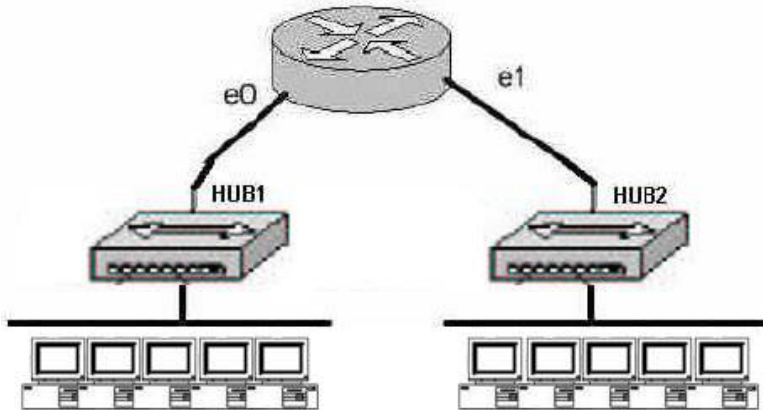
Answer: C.

Explanation:

The subnet mask used on this Ethernet segment is /27, which translates to 255.255.255.224. Valid hosts on the 192.168.5.33/27 subnet are 192.168.5.33-192.168.5.62, with 192.168.5.32 used as the network IP address and 192.168.5.63 used as the broadcast IP address. Therefore, only choice C falls within the usable IP range.

QUESTION 7:

The Itexamworld .com network is displayed in the diagram below:



Based on the diagram above, how many collision domains are present in the Itexamworld .com network?

- A. One
- B. Two
- C. Three
- D. Four
- E. Five
- F. Six
- G. Fourteen

Answer: B

Explanation:

Since hubs are being used for both Ethernet segments, there are a total of two collision domains. Routers do not forward broadcast and are used to segment LANs, so Itexamworld A consists of one collision domain while Itexamworld B consists of the second collision domain.

QUESTION 8:

Which two of the addresses below are available for host addresses on the subnet 192.168.15.19/28? (Select two answer choices)

- A. 192.168.15.17
- B. 192.168.15.14
- C. 192.168.15.29
- D. 192.168.15.16
- E. 192.168.15.31
- F. None of the above

Answer: A, C

Explanation:

The network uses a 28bit subnet (255.255.255.240). This means that 4 bits are used for the networks and 4 bits for the hosts. This allows for 14 networks and 14 hosts ($2^n - 2$). The last bit used to make 240 is the 4th bit (16) therefore the first network will be 192.168.15.16. The network will have 16 addresses (but remember that the first address is the network address and the last address is the broadcast address). In other words, the

networks will be in increments of 16 beginning at 192.168.15.16/28. The IP address we are given is 192.168.15.19. Therefore the other host addresses must also be on this network. Valid IP addresses for hosts on this network are: 192.168.15.17-192.168.15.30.

Incorrect Answers:

B. This is not a valid address for this particular 28 bit subnet mask. The first network address should be 192.168.15.16.

D. This is the network address.

E. This is the broadcast address for this particular subnet.

QUESTION 9:

The MAC address for your PC NIC is: C9-3F-32-B4-DC-19. What is the address of the OUI portion of this NIC card, expressed as a binary number?

- A. 11001100-00111111-00011000
- B. 11000110-11000000-00011111
- C. 11001110-00011111-01100000
- D. 11001001-00111111-00110010
- E. 11001100-01111000-00011000
- F. 11111000-01100111-00011001

Answer: D

Explanation:

The first half of the address identifies the manufacturer of the card. This code, which is assigned to each manufacturer by the IEEE, is called the organizationally unique identifier (OUI). In this example, the OUI is C9-3F-32. If we take this number and convert it to decimal form we have:

$$C9 = (12 \times 16) + 9 = 201$$

$$3F = (3 \times 16) + 15 = 63$$

$$32 = (3 \times 16) + 2 = 50$$

So, in decimal we have 201.63.50. If we then convert this to binary, we have:

$$201 = 11001001$$

$$63 = 00111111$$

$$50 = 00110010$$

So the correct answer is D: 11001001-00111111-00110010

QUESTION 10:

Given the choices below, which address represents a unicast address?

- A. 224.1.5.2
- B. FFFF. FFFF. FFFF.
- C. 192.168.24.59/30
- D. 255.255.255.255
- E. 172.31.128.255/18

Answer: E

Explanation:

172.31.128.255 is the only unicast address. It seems to be a broadcast address, because of 255 in the last octet, the broadcast address for this network is 172.31.131.255.

Incorrect Answers:

- A: 224.1.5.2 is a multicast address.
- B: This is a broadcast layer 2 (data link) address.
- C: Using a /30 for the subnet mask, this IP address becomes the broadcast address.
- D: This is a broadcast IP address.

QUESTION 11:

With regard to bridges and switches, which of the following statements are true?
(Choose three.)

- A. Switches are primarily software based while bridges are hardware based.
- B. Both bridges and switches forward Layer 2 broadcasts.
- C. Bridges are frequently faster than switches.
- D. Switches typically have a higher number of ports than bridges.
- E. Bridges define broadcast domain while switches define collision domains.
- F. Both bridges and switches make forwarding decisions based on Layer 2 addresses.

Answer: B, E, F

Explanation:

B, F: Both are layer 2 (data link) devices designed to forward layer 2 broadcasts and multicast addresses.

E: All hosts within a bridged network comprise a single broadcast domain, while switches can be used to segment LANs into separate collision domains. Switches are VLAN-capable while bridges are typically not capable of this.

QUESTION 12:

Which Layer 1 devices can be used to enlarge the area covered by a single LAN segment? (Select two)

- A. Switch

- B. Router
- C. NIC
- D. hub
- E. Repeater
- F. RJ-45 transceiver

Answer: D, E

Explanation:

Both hub, Repeater, Router and Switch repeat the packet. But only hub and Repeater do not segment the network. Repeaters and Hubs are contained in layer one of the OSI model (Physical layer) while a switch lies in layer two and a router is in layer 3.

QUESTION 13:

CDP is running between two Itexamworld devices. What information is supplied by CDP? (Select three)

- A. Device identifiers
- B. Capabilities list
- C. Platform
- D. Route identifier
- E. Neighbor traffic data

Answer: A, B, C

Explanation:

CDP is a Cisco proprietary protocol; to support forwarding CDP messages over an interface, that interface must support SNAP headers. Any LAN interface, HDLC, Frame Relay, and ATM all support CDP. The router or switch can discover Layer 3 addressing details of neighboring routers—without even configuring that Layer 3 protocol—because CDP is not dependent on any particular Layer 3 protocol.

CDP discovers several useful details from the neighboring device:

- **Device Identifier**—Typically the host name.
 - **Address list**—Network and data link addresses.
 - **Port Identifier**—Text that identifies the port, which is another name for an interface.
 - **Capabilities list**—Information on what the device does—for instance, a router or switch.
 - **Platform**—The model and OS level running in the device.
-

QUESTION 14:

If a host on a network has the address 172.16.45.14/30, what is the address of the subnet to which this host belongs?

- A. 172.16.45.0
- B. 172.16.45.4
- C. 172.16.45.8

- D. 172.16.45.12
- E. 172.16.45.18

Answer: D

Explanation:

The last octet in binary form is 00001110. Only 6 bits of this octet belong to the subnet mask. Hence, the subnetwork is 172.16.45.12.

QUESTION 15:

How do you express the binary number 10110011 in decimal form?

- A. 91
- B. 155
- C. 179
- D. 180
- E. 201
- F. 227

Answer: C

Explanation:

If you arrange the binary number 10110011, against the place value and multiply the values, and add them up, you get the correct answer.

1 0 1 1 0 0 1 1

128 64 32 16 8 4 2 1

$128 + 0 + 32 + 16 + 0 + 0 + 2 + 1 = 179$

QUESTION 16:

You have the binary number 10011101. Convert it to its decimal and hexadecimal equivalents. (Select two answer choices)

- A. 158
- B. 0x9D
- C. 156
- D. 157
- E. 0x19
- F. 0x9F

Answer: B, D

Explanation:

$10011101 = 128+0+0+16+8+4+0+1 = 157$

For hexadecimal, we break up the binary number 10011101 into the 2 parts:

$1001 = 9$ and $1101 = 13$, this is D in hexadecimal, so the number is 0x9D. We can further verify by taking the hex number 9D and converting it to decimal by taking 16 times 9, and then adding 13 for D ($0x9D = (16 \times 9) + 13 = 157$).

QUESTION 17:

The subnet mask on the serial interface of a router is expressed in binary as 11111000 for the last octet. How do you express the binary number 11111000 in decimal?

- A. 210
- B. 224
- C. 240
- D. 248
- E. 252

Answer: D

Explanation:

$128 + 64 + 32 + 16 + 8 = 248$. Since this is the last octet of the interface, the subnet mask would be expressed as a /29.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 559

Incorrect Answers:

- A. The number 210 would be 11010010 in binary.
- B. The number 224 would be 11100000 in binary.
- C. The number 240 would be 11110000 in binary
- E. The number 252 would be 11111100 in binary. This is known as a /30 and is used often in point-point links, since there are only 2 available addresses for use in this subnet.

QUESTION 18:

Which one of the binary number ranges shown below corresponds to the value of the first octet in Class B address range?

- A. 10000000-11101111
- B. 11000000-11101111
- C. 10000000-10111111
- D. 10000000-11111111
- E. 11000000-10111111

Answer: C

Explanation:

Class B addresses are in the range 128.0.0.0 through 191.255.255.255.

In binary, the first octet (128 through 191) equates to 10000000-10111111

Incorrect Answers:

- A. Binary 10000000 does equate to 128 but binary 11101111 equates to 239
- B. Binary 11000000 equates to 192 and binary 11101111 equates to 239
- D. Binary 10000000 does equate to 128 but binary 11011111 equates to 223
- E. Binary 11000000 equates to 192 but binary 10111111 does equate to 191

QUESTION 19:

How would the number 231 be expressed as a binary number?

- A. 11011011
- B. 11110011
- C. 11100111
- D. 11111001
- E. 11010011

Answer: C

Explanation

Decimal number 231 equates to 11100111 in binary (128+64+32+0+0+4+2+1)

Incorrect Answers:

- A: Binary 11011011 equates to 219 (128+64+0+16+8+0+2+1)
- B: Binary 11110011 equates to 243 (128+64+32+16+0+0+2+1)
- D: Binary 11101011 equates to 249 (128+64+32+16+8+0+0+1)
- E: Binary 11010011 equates to 211 (128+64+0+16+0+0+2+1)

QUESTION 20:

How would the number 172 be expressed in binary form?

- A. 10010010
- B. 10011001
- C. 10101100
- D. 10101110

Answer: C

Explanation:

10101100= 128 + 0 + 32 + 0 + 8 + 4 + 0 + 0 = 172

Incorrect Answers:

- A. Binary 10010010 = $128+0+0+16+0+0+2+0=146$
B. Binary 10011001 = $128+0+0+16+8+0+0+1=153$
D. Binary 10101110 = $128+0+32+0+8+4+2+0=174$
-