

## Part 1

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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.

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### 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 collisions; 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.

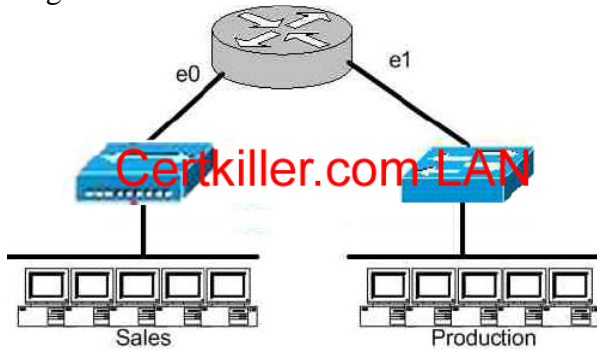
D. The broadcast domain of a LAN is often segmented through the use of a router. This results in reducing the size of the broadcast domain.

E. Routers do not forward broadcast traffic.

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**QUESTION 3**

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 Certkiller 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.

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**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:

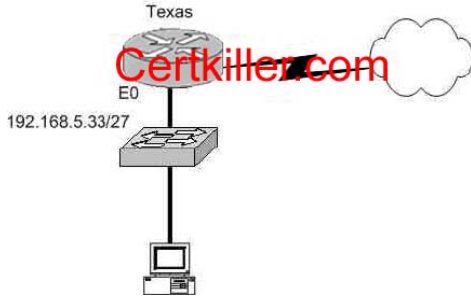
- B. Broadcasts will still be present on the LAN segments. They will be reduced, because routers will block broadcasts from one network to the other.

- 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.

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**QUESTION 6**

The Certkiller 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.

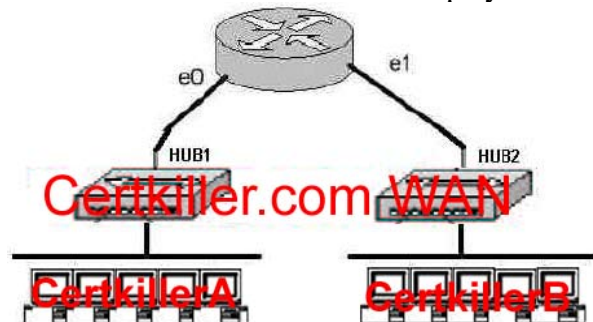
Explanation:

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.

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**QUESTION 7**

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



Based on the diagram above, how many collision domains are present in the Certkiller .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 Certkiller A consists of one collision domain while Certkiller B consists of the second collision domain.

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**QUESTION 8**

Network topology exhibit



In the exhibit a part of the Certkiller .com is displayed. Notice the Certkiller 1 Switch and the Certkiller 2 hub.

Which of the devices shown can transmit simultaneously without causing collisions?

- A. All hosts
- B. Only hosts attached to the switch
- C. All hosts attached to the hub and one host attached to the switch
- D. All hosts attached to the switch and one host attached to the hub

Answer: B

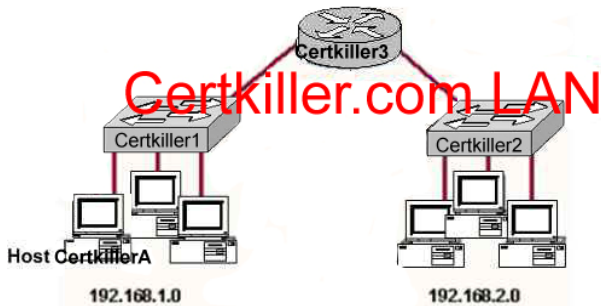
Explanation:

As we know switch is the device which avoids collisions. When two computers communicate through a switch they make their own collision domain. So, there is no chance of collisions. Whenever a hub is included, it supports on half duplex communication and works on the phenomena of CSMA/CD so, there is always a chance of collision.

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**QUESTION 9**

Network topology exhibit



Study the network topology exhibit carefully, in particular the two switches Certkiller 1, Certkiller 2, and the router Certkiller 3.

Which statements are true in this scenario? Select two.

- A. All the devices in both networks will receive a broadcast to 255.255.255.255 sent by host Certkiller A.
- B. Only the devices in network 192.168.1.0 will receive a broadcast to 255.255.255.255 sent by host Certkiller A.
- C. All the devices on both networks are members of the same collision domain.
- D. The hosts on the 192.168.1.0 network form one collision domain, and the hosts on the 192.168.2.0 network form a second collision domain.
- E. Each host is in a separate collision domain.

Answer: B, E

Explanation:

B is in fact correct, however D is not. If the diagram used hubs and not switches then yes, there would only be two collision domains, but the diagram has switches. The author may have intended to state broadcast domains which would have been correct as well.

Answer E is correct, since the network is comprised of switches.

### QUESTION 10

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.

Not A: 224.1.5.2 is a multicast 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 D F

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**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.

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**QUESTION 13**

What information is supplied by CDP? Select three.

- A. Device identifiers
- B. Capabilities list
- C. Platform
- D. Route identifier
- E. Neighbour 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.

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**QUESTION 14**

If a host on a network has the address 172.16.45.14/30, what is the address of the subnetwork 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

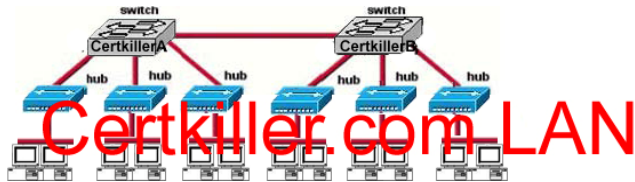
**Explanation:**

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.

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**QUESTION 15**

Exhibit



How many broadcast domains are shown in the graphic assuming only the default VLAN is configured on the switches?

- A. one
- B. two
- C. six
- D. twelve

Answer: A

**Explanation:**

There is only one broadcast domain because switches and hubs do not switch the broadcast domains. Only layer 3 devices can segment the broadcast domains.



**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 ( $0x9D = (16 \times 9) + 13 = 157$ ).

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**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.

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**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
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**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 =  $128+0+32+0+8+4+2+0=174$

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**QUESTION 21**

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

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**QUESTION 22**

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

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

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**QUESTION 23**

Convert the hex and decimal numbers on the left into binary, and match them to their corresponding slot on the right. (Not all of the hexadecimal and decimal numbers will be used)

F1	10101010
1F	11000000
192 (decimal)	11110001
96 (decimal)	10011111
9F	
F9	
85 (decimal)	
170 (decimal)	

Answer:

10101010	170 (decimal)
11000000	192 (decimal)
11110001	F1
10011111	9F

Explanation:

170 (Decimal) = 10101010

192 (Decimal) = 11000000

F1 (241 = Decimal) = 11110001

9F (159 = Decimal) = 10011111

The following chart displays all of the possible IP address numbers, expressed in decimal, hexadecimal, and binary:

DEC	HEX	BIN	DEC	HEX	BIN	DEC	HEX	BIN
0	00	00000000	43	2B	00101011	86	56	01010110
1	01	00000001	44	2C	00101100	87	57	01010111
2	02	00000010	45	2D	00101101	88	58	01011000
3	03	00000011	46	2E	00101110	89	59	01011001
4	04	00000100	47	2F	00101111	90	5A	01011010
5	05	00000101	48	30	00110000	91	5B	01011011
6	06	00000110	49	31	00110001	92	5C	01011100
7	07	00000111	50	32	00110010	93	5D	01011101
8	08	00001000	51	33	00110011	94	5E	01011110
9	09	00001001	52	34	00110100	95	5F	01011111
10	0A	00001010	53	35	00110101	96	60	01100000
11	0B	00001011	54	36	00110110	97	61	01100001
12	0C	00001100	55	37	00110111	98	62	01100010
13	0D	00001101	56	38	00111000	99	63	01100011
14	0E	00001110	57	39	00111001	100	64	01100100
15	0F	00001111	58	3A	00111010	101	65	01100101
16	10	00010000	59	3B	00111011	102	66	01100110
17	11	00010001	60	3C	00111100	103	67	01100111
18	12	00010010	61	3D	00111101	104	68	01101000
19	13	00010011	62	3E	00111110	105	69	01101001
20	14	00010100	63	3F	00111111	106	6A	01101010
21	15	00010101	64	40	01000000	107	6B	01101011
22	16	00010110	65	41	01000001	108	6C	01101100
23	17	00010111	66	42	01000010	109	6D	01101101
24	18	00011000	67	43	01000011	110	6E	01101110
25	19	00011001	68	44	01000100	111	6F	01101111
26	1A	00011010	69	45	01000101	112	70	01110000
27	1B	00011011	70	46	01000110	113	71	01110001
28	1C	00011100	71	47	01000111	114	72	01110010
29	1D	00011101	72	48	01001000	115	73	01110011
30	1E	00011110	73	49	01001001	116	74	01110100
31	1F	00011111	74	4A	01001010	117	75	01110101
32	20	00100000	75	4B	01001011	118	76	01110110
33	21	00100001	76	4C	01001100	119	77	01110111
34	22	00100010	77	4D	01001101	120	78	01111000
35	23	00100011	78	4E	01001110	121	79	01111001
36	24	00100100	79	4F	01001111	122	7A	01111010
37	25	00100101	80	50	01010000	123	7B	01111011
38	26	00100110	81	51	01010001	124	7C	01111100
39	27	00100111	82	52	01010010	125	7D	01111101
40	28	00101000	83	53	01010011	126	7E	01111110
41	29	00101001	84	54	01010100	127	7F	01111111
42	2A	00101010	85	55	01010101			

DEC	HEX	BIN	DEC	HEX	BIN	DEC	HEX	BIN
128	80	10000000	171	AB	10101011	214	D6	11010110
129	81	10000001	172	AC	10101100	215	D7	11010111
130	82	10000010	173	AD	10101101	216	D8	11011000
131	83	10000011	174	AE	10101110	217	D9	11011001
132	84	10000100	175	AF	10101111	218	DA	11011010
133	85	10000101	176	B0	10110000	219	DB	11011011
134	86	10000110	177	B1	10110001	220	DC	11011100
135	87	10000111	178	B2	10110010	221	DD	11011101
136	88	10001000	179	B3	10110011	222	DE	11011110
137	89	10001001	180	B4	10110100	223	DF	11011111
138	8A	10001010	181	B5	10110101	224	E0	11100000
139	8B	10001011	182	B6	10110110	225	E1	11100001
140	8C	10001100	183	B7	10110111	226	E2	11100010
141	8D	10001101	184	B8	10111000	227	E3	11100011
142	8E	10001110	185	B9	10111001	228	E4	11100100
143	8F	10001111	186	BA	10111010	229	E5	11100101
144	90	10010000	187	BB	10111011	230	E6	11100110
145	91	10010001	188	BC	10111100	231	E7	11100111
146	92	10010010	189	BD	10111101	232	E8	11101000
147	93	10010011	190	BE	10111110	233	E9	11101001
148	94	10010100	191	BF	10111111	234	EA	11101010
149	95	10010101	192	C0	11000000	235	EB	11101011
150	96	10010110	193	C1	11000001	236	EC	11101100
151	97	10010111	194	C2	11000010	237	ED	11101101
152	98	10011000	195	C3	11000011	238	EE	11101110
153	99	10011001	196	C4	11000100	239	EF	11101111
154	9A	10011010	197	C5	11000101	240	F0	11110000
155	9B	10011011	198	C6	11000110	241	F1	11110001
156	9C	10011100	199	C7	11000111	242	F2	11110010
157	9D	10011101	200	C8	11001000	243	F3	11110011
158	9E	10011110	201	C9	11001001	244	F4	11110100
159	9F	10011111	202	CA	11001010	245	F5	11110101
160	A0	10100000	203	CB	11001011	246	F6	11110110
161	A1	10100001	204	CC	11001100	247	F7	11110111
162	A2	10100010	205	CD	11001101	248	F8	11111000
163	A3	10100011	206	CE	11001110	249	F9	11111001
164	A4	10100100	207	CF	11001111	250	FA	11111010
165	A5	10100101	208	D0	11010000	251	FB	11111011
166	A6	10100110	209	D1	11010001	252	FC	11111100
167	A7	10100111	210	D2	11010010	253	FD	11111101
168	A8	10101000	211	D3	11010011	254	FE	11111110
169	A9	10101001	212	D4	11010100	255	FF	11111111
170	AA	10101010	213	D5	11010101			

**QUESTION 24**

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.

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**QUESTION 25**

You have a Class C network, and you need ten subnets. You wish to have as many addresses available for hosts as possible. Which one of the following subnet masks should you use?

- A. 255.255.255.192
- B. 255.255.255.224
- C. 255.255.255.240
- D. 255.255.255.248
- E. None of the above

Answer: C

Explanation:

Using the  $2^n - 2$  formula, we will need to use 4 bits for subnetting, as this will provide for  $2^4 - 2 = 14$  subnets. The subnet mask for 4 bits is then 255.255.255.240.

Incorrect Answers:

- A. This will give us only 2 bits for the network mask, which will provide only 2 networks.
  - B. This will give us 3 bits for the network mask, which will provide for only 6 networks.
  - D. This will use 5 bits for the network mask, providing 30 networks. However, it will provide for only for 6 host addresses in each network, so C is a better choice.
- 

**QUESTION 26**

Which of the following is an example of a valid unicast host IP address?

- A. 172.31.128.255./18
- B. 255.255.255.255
- C. 192.168.24.59/30
- D. FFFF.FFFF.FFFF
- E. 224.1.5.2
- F. All of the above

Answer: A

Explanation

The address 172.32.128.255 /18 is 10101100.00100000.10|000000.11111111 in binary, so this is indeed a valid host address.

Incorrect Answers:

- B. This is the all 1's broadcast address.
  - C. Although at first glance this answer would appear to be a valid IP address, the /30 means the network mask is 255.255.255.252, and the 192.168.24.59 address is the broadcast address for the 192.168.24.56/30 network.
  - D. This is the all 1's broadcast MAC address
  - E. This is a multicast IP address.
- 

**QUESTION 27**

How many subnetworks and hosts are available per subnet if you apply a /28 mask to the 210.10.2.0 class C network?

- A. 30 networks and 6 hosts.
- B. 6 networks and 30 hosts.
- C. 8 networks and 32 hosts.
- D. 32 networks and 18 hosts.
- E. 14 networks and 14 hosts.
- F. None of the above

Answer: E

Explanation:

A 28 bit subnet mask (11111111.11111111.11111111.11110000) applied to a class C network uses a 4 bits for networks, and leaves 4 bits for hosts. Using the  $2^n - 2$  formula, we have  $2^4 - 2$  (or  $2 \times 2 \times 2 - 2$ ) which gives us 14 for both the number of networks, and the number of hosts.

Incorrect Answers:

- A. This would be the result of a /29 (255.255.255.248) network.
- B. This would be the result of a /27 (255.255.255.224) network.
- C. This is not possible, as we must subtract two from the subnets and hosts for the network and broadcast addresses.
- D. This is not a possible combination of networks and hosts.

---

**QUESTION 28**

The Certkiller network was assigned the Class C network 199.166.131.0 from the ISP. If the administrator at Certkiller were to subnet this class C network using the 255.255.255.224 subnet mask, how many hosts will they be able to support on each subnet?

- A. 14
- B. 16
- C. 30
- D. 32
- E. 62
- F. 64

Answer: C

Explanation:

The subnet mask 255.255.255.224 is a 27 bit mask (11111111.11111111.11111111.11100000). It uses 3 bits from the last octet for the network ID, leaving 5 bits for host addresses. We can calculate the number of hosts supported by this subnet by using the  $2^n - 2$  formula where n represents the number of host bits. In this case it will be 5.  $2^5 - 2$  gives us 30.

Incorrect Answers:

- A. Subnet mask 255.255.255.240 will give us 14 host addresses.
- B. Subnet mask 255.255.255.240 will give us a total of 16 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.
- D. Subnet mask 255.255.255.224 will give us a total of 32 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.
- E. Subnet mask 255.255.255.192 will give us 62 host addresses.
- F. Subnet mask 255.255.255.192 will give us a total of 64 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.

---

**QUESTION 29**

What is the subnet for the host IP address 172.16.210.0/22?



- A. 172.16.42.0
- B. 172.16.107.0
- C. 172.16.208.0
- D. 172.16.252.0
- E. 172.16.254.0
- F. None of the above

Answer: C

Explanation:

This question is much easier than it appears when you convert it to binary and do the Boolean operation as shown below:

IP address 172.16.210.0 = 10101100.00010000.11010010.00000000

/22 mask = 11111111.11111111.11111100.00000000

AND result = 11111111.11111111.11010000.00000000

AND in decimal= 172 . 16 . 208 . 0

---

**QUESTION 30**

What is the subnet for the host IP address 201.100.5.68/28?

- A. 201.100.5.0
- B. 201.100.5.32
- C. 201.100.5.64
- D. 201.100.5.65
- E. 201.100.5.31
- F. 201.100.5.1

Answer: C

Explanation:

This question is much easier than it appears when you convert it to binary and do the Boolean operation as shown below:

IP address 201.100.5.68 = 11001001.01100100.00000101.01000100

/28 mask = 11111111.11111111.11111111.11000000

AND result = 11001001.01100100.00000101.01000000

AND in decimal= 200 . 100 . 5 . 64

---

**QUESTION 31**

3 addresses are shown in binary form below:

- A. 01100100.00001010.11101011.00100111
- B. 10101100.00010010.10011110.00001111
- C. 11000000.10100111.10110010.01000101

Regarding these three binary addresses in the above exhibit; which statements below are correct? (Select three)

- A. Address C is a public Class C address.
- B. Address C is a private Class C address.
- C. Address B is a public Class B address.
- D. Address A is a public Class A address.
- E. Address B is a private Class B address.
- F. Address A is a private Class A address.

Answer: A, D, E

Explanation:

- A. Address C converts to 192.167.178.69 in decimal, which is a public class C address.
- D. Address A converts to 100.10.235.39, which is a public class A IP address.
- E. Address B converts to 172.18.158.15, which is a private (RFC 1918) IP address.

---

**QUESTION 32**

What is the IP address range for the first octet in a class B address, in binary form?

- A. 00000111-10001111
- B. 00000011-10011111
- C. 10000000-10111111
- D. 11000000-11011111
- E. 11100000-11101111
- F. None of the above

Answer: C

Explanation:

The class B address range is 128.0.0.0-191.255.255.255. When looking at the first octet alone, the range is 128-191. The binary number for 128 is 10000000 and the binary number for 191 is 10111111, so the value range is 10000000-10111111.

---

**QUESTION 33**

Which one of the binary bit patterns below denotes a Class B address?

- A. 0xxxxxxx
- B. 10xxxxxx
- C. 110xxxxx
- D. 1110xxxx
- E. 11110xxx

Answer: B

Explanation:

Class B addresses start with a binary of 10. The valid class B range is 128.0.0.0-191.255.255.255.

Incorrect Answers:

- A. Class A addresses start with 0, as they are addresses that are less than 128.
- C. Class C addresses start with 110, for a value of 192.0.0.0-223.255.255.255
- D. Class D addresses start with 1110. They are reserved for multicast use
- E. Class E addresses start with 11110. They are currently reserved for experimental use.

---

**QUESTION 34**

The Certkiller network consists of 5 different departments as shown below:



You are a systems administrator at Certkiller and you've just acquired a new Class C IP network. Which of one of the subnet masks below is capable of providing one useful subnet for each of the above departments (support, financial, sales & development) while still allowing enough usable host addresses to meet the needs of each department?

- A. 255.255.255.128
- B. 255.255.255.192
- C. 255.255.255.224
- D. 255.255.255.240
- E. 255.255.255.248
- F. 255.255.255.252

Answer: C

Explanation:

The network currently consists of 5 subnets. We need to subnet the Class C network into at least 5 subnets. This requires that we use 3 bits for the network address. Using the formula  $2^n - 2$  we get 6. This also leaves us with 5 bits for hosts, which gives us 30 hosts.

Incorrect Answers:

- A. Only 1 bit is required to give us 128 but 1 bit gives us 0 subnets.
  - B. 2 bits are required to give us 192 but 2 bits gives us only 2 subnets. This is too few.
  - D. 4 bits are required to give us 240. This gives us 14 subnets. However we are left with 4 bits for hosts leaving us with 14 host addresses. Two of the networks require more than 14 hosts so this will not do.
  - E. 5 bits are required to give us 248. This gives us 30 subnets. However we are left with 3 bits for hosts leaving us with 6 host addresses. All the networks require more than 6 hosts so this will not do.
  - F. 6 bits are required to give us 252. This gives us 62 subnets. However we are left with 2 bits for hosts leaving us with 2 host addresses. This is too few.
-

**QUESTION 35**

Your network uses the 172.12.0.0 class B address. You need to support 459 hosts per subnet, while accommodating the maximum number of subnets. Which mask would you use?

- A. 255.255.0.0.
- B. 255.255.128.0.
- C. 255.255.224.0.
- D. 255.255.254.0.

Answer: D

Explanation:

To obtain 459 hosts the number of host bits will be 9. This can support a maximum of 510 hosts. To keep 9 bits for hosts means the last bit in the 3rd octet will be 0. This gives 255.255.254.0 as the subnet mask.

---

**QUESTION 36**

Using a subnet mask of 255.255.255.224, which of the IP addresses below can you assign to the hosts on this subnet? (Select all that apply)

- A. 16.23.118.63
- B. 87.45.16.159
- C. 92.11.178.93
- D. 134.178.18.56
- E. 192.168.16.87
- F. 217.168.166.192

Answer: C, D, E

Explanation:

Since the subnet mask is 255.255.255.224, the number of network hosts that is available is 30. Every network boundary will be a multiple of 32. This means that every subnet will be a multiple (0, 32, 64, 96, 128, 160, 192, 224) and the broadcast address for each of these subnets will be one less this number (31, 63, 95, 127, 159, 191, 223). Therefore, any IP address that does not end in one of these numbers will be a valid host IP address.

- C. Valid Host in subnetwork 2 (92.11.178.64 to 92.11.178.95)
- D. Valid Host in subnetwork 1 (134.178.18.32 to 134.178.18.63)
- E. Valid Host in subnetwork 2 (192.168.16.64 to 192.168.16.95)

Incorrect Answers:

- A. This will be the broadcast address for the 16.23.118.32/27 network.
  - B. This will be the broadcast address for the 87.45.16.128/27 network
  - F. This will be the network address for the 217.168.166.192/27 network.
-

**QUESTION 37**

Your ISP has assigned you the following IP address and subnet mask:

IP address: 199.141.27.0

Subnet mask: 255.255.255.240

Which of the following addresses can be allocated to hosts on the resulting subnet?

(Select all that apply)

- A. 199.141.27.2
- B. 199.141.27.175
- C. 199.141.27.13
- D. 199.141.27.11
- E. 199.141.27.208
- F. 199.141.27.112

Answer: A, C, D

Explanation:

IP address = 11001000.10001101.00011011.00000000 = 199.141.27.0

Subnet mask = 11111111.11111111.11111111.11110000 = 255.255.255.240

Subnet # = 11001000.10001101.00011011.00000000 = 199.141.27.0

Broadcast = 11001000.10001101.00011011.00001111 = 199.141.27.15

The valid IP address range = 199.141.27.1 - 199.141.27.14

---

**QUESTION 38**

The IP network 210.106.14.0 is subnetted using a /24 mask. How many usable networks and host addresses can be obtained from this?

- A. 1 network with 254 hosts
- B. 4 networks with 128 hosts
- C. 2 networks with 24 hosts
- D. 6 networks with 64 hosts
- E. 8 networks with 36 hosts

Answer: A

Explanation:

A subnet with 24 bits on would be 255.255.255.0. Since this is a class C network, this subnet can have only 1 network and 254 usable hosts.

---

**QUESTION 39**

Given that you have a class B IP address network range, which of the subnet masks below will allow for 100 subnets with 500 usable host addresses per subnet?

- A. 255.255.0.0
- B. 255.255.224.0
- C. 255.255.254.0

- D. 255.255.255.0
- E. 255.255.255.224

Answer: C

Explanation:

Using the  $2^n - 2$  formula for host addresses,  $2^9 - 2 = 510$  host address, so a 9-bit subnet mask will provide the required number of host addresses. If these 9 bits are used for the hosts in a class B network, then the remaining 7 bits are used for the number of networks.

Again using the  $2^n - 2$  formula, we have  $2^7 - 2 = 126$  networks that are available.

Incorrect Answers:

- A. This will provide for only 1 network with  $2^{16} - 2 = 65534$  hosts
- B. This will provide for 6 networks with 8190 host addresses.
- D. This will provide 254 networks and 254 hosts.
- E. This will provide 2046 different networks, but each network will have only 30 hosts.

---

**QUESTION 40**

You have a class C network, and you need to design it for 5 usable subnets with each subnet handling a minimum of 18 hosts each. Which of the following network masks should you use?

- A. 225.225.224.0.
- B. 225.225.240.0.
- C. 225.225.255.0.
- D. 255.255.255.224
- E. 225.225.255.240

Answer: D

Explanation:

The default subnet mask for class C network is 255.255.255.0. If one has to create 5 subnets, then 3 bits are required. With 3 bits we can create 6 subnets. The remaining 5 bits are used for Hosts. One can create 30 hosts using 5 bits in host field. This matches with the requirement.

Incorrect Answers:

- A, B. This is an illegal subnet mask for a class C network, as the third octet can not be divided when using a class C network.
- C. This is the default subnet mask for a class C network. It provides for one network, with 254 usable host IP addresses.
- E. This subnet mask will provide for 14 separate networks with 14 hosts each. This does not meet the requirement of a minimum of 18 hosts.

---

**QUESTION 41**

The 213.115.77.0 network was subnetted using a /28 subnet mask. How many usable subnets and host addresses per subnet were created as a result of this?

- A. 2 networks with 62 hosts
- B. 6 networks with 30 hosts
- C. 16 networks and 16 hosts
- D. 62 networks and 2 hosts
- E. 14 networks and 14 hosts
- F. None of the above

Answer: E

Explanation:

A class C subnet with a 28 bit mask requires 4 bits for the network address, leaving 4 bits for host addresses. Using the  $2^n - 2$  formula ( $2^4 - 2$  in this case) we have 14 host addresses and 14 network addresses.

Incorrect Answers:

- A. This would be the result of a /26 network mask
- B. This would be the result of a /27 network mask
- C. Remember we need to always subtract two for the network and broadcast addresses, so this answer is incorrect.
- D. This would be the result of a /30 network mask.

---

**QUESTION 42**

The 201.145.32.0 network is subnetted using a /26 mask. How many networks and IP hosts per network exists using this subnet mask?

- A. 4 networks with 64 hosts
- B. 64 networks and 4 hosts
- C. 2 networks and 62 hosts
- D. 62 networks and 2 hosts
- E. 6 network and 30 hosts

Answer: C

Explanation:

A class C network with a 26 bit mask requires 2 bits for the network address, leaving 6 bits for host addresses. Using the  $2^n - 2$  formula ( $2^2 - 2$  for the network and  $2^6 - 2$  for hosts) we have 2 network addresses and 62 host addresses.

Incorrect Answers:

- A, B. This is not a possible combination. No network mask will provide for 64 usable hosts, because we must always subtract 2 for the network and broadcast address.
- D. This would be the result of a /30 mask.
- E. This would be the result of a /27 network mask.

---

**QUESTION 43**

You have a class B network with a 255.255.255.0 mask. Which of the statements

below are true of this network? (Select all valid answers)

- A. There are 254 usable subnets.
- B. There are 256 usable hosts per subnet.
- C. There are 50 usable subnets.
- D. There are 254 usable hosts per subnet.
- E. There are 24 usable hosts per subnet.
- F. There is one usable network.

Answer: A, D

Explanation

The default subnet mask for Class B is 255.255.0.0. Thus an extra 8 bits have been used for the network portion, leaving 8 for hosts. The  $2^n - 2$  formula (28 - 2 in this case for both the network and IP hosts) gives us 254 networks and 254 hosts per network.

Incorrect Answers:

- B. We must remember to always subtract 2 (one for the network, and one for the broadcast) so the result is 254, not 256.
- C, E. No possible network mask would give us this exact number of subnets or hosts.
- F. This would be true if this were a class C network, not a class B.

---

**QUESTION 44**

How many usable IP addresses can you get from a conventional Class C address?

- A. 128
- B. 192
- C. 254
- D. 256
- E. 510

Answer: C

Explanation:

Class C addresses range from 192.0.0.0 through 223.225.225.225 and default subnet mask of 255.255.255.0. In Class C addresses, the first 24 bits are used as for the network ID while only the last 8 bits is used for the host ID. Using the  $2^n - 2$  formula, we can calculate that Class C addresses can support a maximum of 254 (28-2) hosts.

Incorrect Answers:

- D. Note that the question asked for the number of usable addresses, and not the total number of all addresses. We must subtract 2 for the network and broadcast addresses to calculate the number of usable addresses in any subnet.

---

**QUESTION 45**

Your ISP assigned you a full class B address space. From this, you need at least 300 sub-networks that can support at least 50 hosts each. Which of the subnet masks below are capable of satisfying your needs? (Select two).



- A. 255.255.255.0
- B. 255.255.255.128
- C. 255.255.252.0
- D. 255.255.255.224
- E. 255.255.255.192
- F. 255.255.248.0

Answer: B, E

Explanation:

Requirement in the question is that the company needs 300 subnets and 50 hosts per subnet.

Number of Bits in the Host or Subnet Field	Maximum number of Hosts or Subnets ( $2^n - 2$ )
1	0
2	2
3	6
4	14
5	30
6	62
7	126
8	254
9	510
10	1022
11	2046
12	4094
13	8190
14	16,382

With 9 bits used for the subnet portion, we get 510 subnets and using the remaining 7 bits for the hosts gives us 126 hosts per subnet. The subnet mask will be 255.255.255.128

With 10 bits used for the subnet portion, we get 1022 subnets and then using the remaining 6 bits for hosts provides 62 hosts per subnet. The subnet mask will be 255.255.255.192 in this case which will also fulfill the requirement.

---

**QUESTION 46**

Your work PC has the IP address 172.16.209.10 /22. What is the subnet of this address?

- A. 172.16.42.0
- B. 172.16.107.0
- C. 172.16.208.0
- D. 172.16.252.0
- E. 172.16.254.0

Answer: C

Explanation:

172.16.209.10/22 translates to 10101100.00010000.11010001.00001010 in binary form. The network portion is 22 bits, so after the logical AND comparison the network address translates to 10101100.00010000.11010000.00001010. Converting the network portion to decimal results in the address 172.16.208.0/22

---

**QUESTION 47**

You've been assigned the CIDR (classless inter domain routing) block of 115.64.4.0/22 from your ISP. Which of the IP addresses below can you use for a host? (Select all valid answers)

- A. 115.64.8.32
- B. 115.64.7.64
- C. 115.64.6.255
- D. 115.64.3.255
- E. 115.64.5.128
- F. 115.64.12.128

Answer: B, C, E

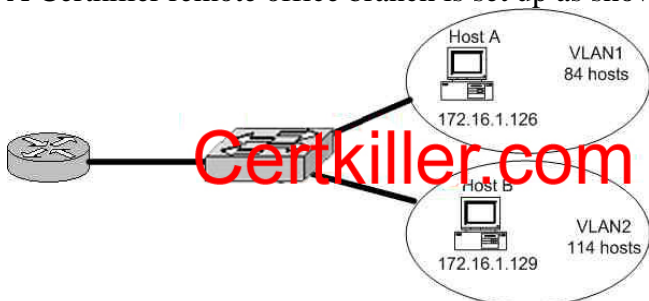
Explanation:

115.64.4.0 = 01110011.01000000.00000100.00000000  
Subnet mask = 11111111.11111111.11111100.00000000 = 255.255.252.0  
Subnet number = 01110011.01000000.00000100.00000000 = 115.64.4.0  
Broadcast = 01110011.01000000.00000111.11111111 = 115.64.7.255  
Valid address range = 115.64.4.1 - 115.64.7.254

---

**QUESTION 48**

A Certkiller remote office branch is set up as shown in the diagram below:



All of the hosts in the above exhibit are connected with each other via the single Catalyst switch. Which of the following statements correctly describe the addressing scheme of this network? (Select three)

- A. The subnet mask in use is 255.255.255.192.
- B. The subnet mask in use is 255.255.255.128.

- C. The IP address 172.16.1.25 can be assigned to hosts in VLAN1.
- D. The IP address 172.16.1.205 can be assigned to hosts in VLAN1
- E. The LAN interface of the router is configured with one IP address.
- F. The LAN interface of the router is configured with multiple IP addresses.

Answer: B, C, F

Explanation:

Based on the diagram above, the subnet mask used for each VLAN is 255.255.255.128. This means that hosts in VLAN 1 will be addressed 172.16.1.1-172.16.1.126, with 172.16.1.127 being used as the broadcast address. Hosts in VLAN 2 will be addressed 172.16.1.129-172.16.1.254. Because there is only one LAN interface on the router, sub interfaces will be used, so the router's LAN interface will be configured with 2 IP addresses, one for VLAN 1 and 1 for VLAN 2.

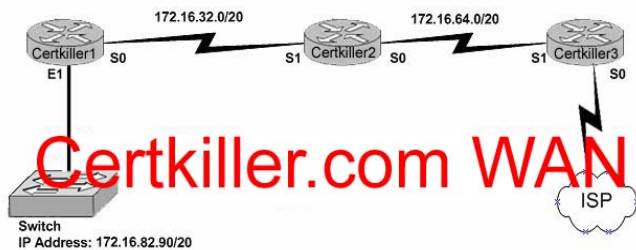
Incorrect Answers:

- A. This subnet mask will only provide 62 host IP addresses, and the diagram shows that as many as 114 host IP addresses are needed.
- D. This IP address can be used in VLAN 2, not VLAN 1.
- E. Since there are 2 subnets in this network, each separate network will require a distinct default gateway IP address, so 2 IP addresses will be required on the LAN interface of the router.

---

**QUESTION 49**

The Certkiller network is shown in the following diagram:



In the above network diagram, what are the broadcast addresses of the subnets?  
(Select three)

- A. 172.16.82.255
- B. 172.16.95.255
- C. 172.16.64.255
- D. 172.16.32.255
- E. 172.16.47.255
- F. 172.16.79.255

Answer: B, E, F

Explanation:

The subnets in the network are subnetted Class B addresses. A /20 subnet mask means

that the subnet addresses increment by a factor of 16. For example: 172.16.16.0, 172.16.32.0, 172.16.48.0, 172.16.64.0 etc. The broadcast address is the last IP address before the next subnet address.

B. The switch IP address (172.16.82.90) is in the 172.16.80.0 subnet. 172.16.95.255 is the broadcast address for the 172.16.80.0 subnet.

E. This is the broadcast address for the 172.16.32.0 subnet.

F. This is the broadcast address for the 172.16.64.0 subnet.

---

**QUESTION 50**

Which one of the following varieties of NAT utilizes different ports to map multiple IP addresses to a single globally registered IP address?

- A. Static NAT
- B. Port loading
- C. NAT Overloading
- D. Dynamic NAT

Answer: C

Explanation:

Port address translation, or NAT overloading, uses transport layer port information to dynamically create NAT entries. This is also known as one to many network address translation.

Incorrect Answers:

A. Static NAT is known as one to one NAT, and is used to map a single IP address to a single registered IP address. It is often used for servers that need to be accessed via the Internet.

B, D. This is the incorrect term, and is not used.

---

**QUESTION 51**

On the topic of VLSM, which one of the following statements best describes the concept of the route aggregation?

- A. Deleting unusable addresses through the creation of many subnets.
- B. Combining routes to multiple networks into one supernet.
- C. Reclaiming unused space by means of changing the subnet size.
- D. Calculating the available host addresses in the AS.

Answer: B

Explanation:

In the networking world route aggregate means combining routes to multiple networks into one. This is also known as route summarization or supernetting. It is normally used to reduce the number of route entries in the routing table by advertising numerous routes into one larger route.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 236.

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**QUESTION 52**

You have a single Class C IP address and a point-to-point serial link that you want to implement VLSM on. Which subnet mask is the most efficient?

- A. 255.255.255.0
- B. 255.255.255.240
- C. 255.255.255.248
- D. 255.255.255.252
- E. 255.255.255.254

Answer: D

Explanation:

For a single point to point link, only 2 IP addresses are required, one for the serial interface of the router at each end. Therefore, the 255.255.255.252 subnet mask is often used for these types of links, as no IP addresses are wasted.

---

**QUESTION 53**

You have a network that supports VLSM and you need to reduce IP address waste in your point to point WAN links. Which of the masks below would you use?

- A. /38
- B. /30
- C. /27
- D. /23
- E. /18
- F. /32

Answer: B

Explanation:

For a single point to point link, only 2 IP addresses are required, one for the serial interface of the router at each end. Therefore, the 255.255.255.252 subnet mask is often used for these types of links because no IP addresses are wasted. The subnet mask 255.255.255.252 is a /30, so answer B is correct.

Incorrect Answers:

- A. The largest mask that can be used is the single IP host mask, which is /32. It is not possible to use a /38 mask, unless of course IPv6 is being used.
  - C, D, E. These masks will provide for a larger number of host addresses, and since only 2 IP addresses are needed for a point to point link, these extra addresses are wasted.
  - F: No available host addresses with a /32 mask
-

**QUESTION 54**

How would you express the binary number: 10101010 in its decimal and hexadecimal forms?

- A. Decimal=160, hexadecimal=00
- B. Decimal=170, hexadecimal=AA
- C. Decimal=180, hexadecimal=BB
- D. Decimal=190, hexadecimal=CC

Answer: B

Explanation:

For the binary equivalent of 10101010 to Decimal, the answer is  $128+32+8+2=170$ .

For the hexadecimal number, we need to break up the binary number into two bytes of 1010 and 1010. Each one in binary is then 10 and 10, which is A and A in hexadecimal.

---

**QUESTION 55**

Which of the following IP hosts would be valid for PC users, assuming that a /27 network mask was used for all of the networks? (Choose all that apply.)

- A. 15.234.118.63
- B. 83.121.178.93
- C. 134.178.18.56
- D. 192.168.19.37
- E. 201.45.116.159
- F. 217.63.12.192

Answer: B, C, D

Explanation:

With a 255.255.255.224 network mask, the network boundaries will be a multiple of 32, so any network will have a multiple of 32 (32, 64, 96, 128, 160, 192, 224) in the last octet. If we subtract 1 from each of these numbers (so we have 31, 63, 95, etc), we know that any IP address ending in any of these numbers will be a broadcast address.

Valid Address Current host range

83.121.178.93 83.121.178.65 to 82.121.178.94

134.178.18.56 134.178.18.33 to 134.178.18.62

192.168.19.37 192.168.19.33 to 192.168.19.62

Incorrect Answers:

A. This is the broadcast address for the 15.234.118.32/27 network.

E. This is the broadcast address for the 201.45.116.128/27 network.

F. This is the network address for the 217.63.12.192/27 network.

---

**QUESTION 56**

You are the network administrator at Certkiller . Certkiller has been provided with

the network address 165.100.27.0/24. The Certkiller CEO wants to know how many subnetworks this address provides, and how many hosts can be supported on each subnet.

What would your reply be? (Choose all that apply)

- A. One network with 254 hosts.
- B. 254 networks with 254 hosts per network.
- C. 65,534 networks with 255 hosts per network.
- D. 30 networks with 64 hosts per network.
- E. 254 networks with 65,534 per network.

Answer: A

When we have address 165.100.27.0/24 the number of networks is 1 with 254 hosts because this address is already subnetted and valid hosts range are 165.100.27.1-165.100.27.254.

The right answer is A.

If the address is 165.100.0.0/24 then right answer is B.

---

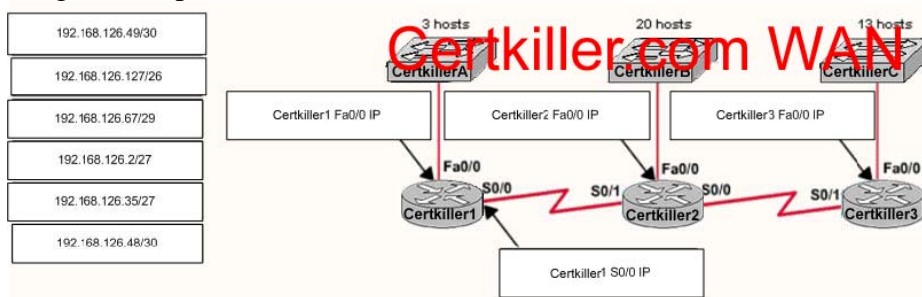
**QUESTION 57**

Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.126.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

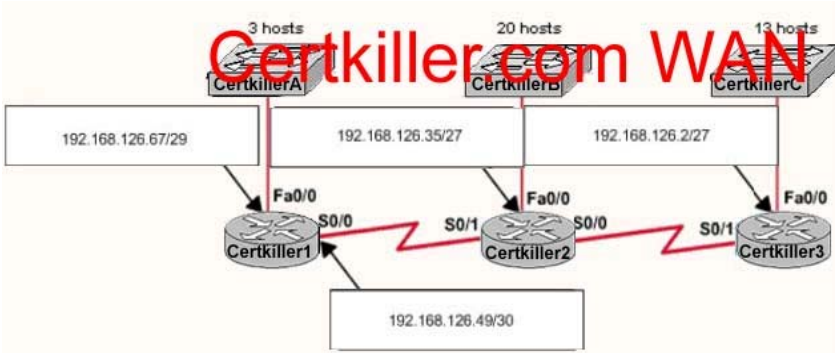
The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration. Not all of the host addresses on the left will be used.

Drag and drop



Answer:



Explanations:

Answers

Certkiller 1 Fa0/0 192.168.126.67/29

Certkiller 1 S0/0 192.168.126.49/30

Certkiller 2 Fa0/0 and Certkiller 3 Fa0/0 both can have either of the following  
192.168.126.35/27 or 192.168.126.2/27

### QUESTION 58

The Certkiller network has been divided into 5 separate departments as displayed below:



Using a Class C IP network, which subnet mask will provide one usable subnet per department while allowing enough usable host addresses for each department specified in the graphic?

- A. 255.255.255.0
- B. 255.255.255.192
- C. 255.255.255.224
- D. 255.255.255.240
- E. 255.255.255.248
- F. 255.255.255.252

Answer: C

Explanation:

Choice C will provide for 8 separate subnets with 30 usable hosts per subnet. Since we only require 5 different subnets with at most 16 users, this will suffice.

Incorrect Answers:

- A. This will only provide 1 network with 254 hosts. This question requires 5 different networks.
- B. This will only provide 4 networks, with 62 hosts per network.
- D. This will provide for 14 networks, but with only 14 hosts per network so there will not be enough hosts for the Production and Engineering LANs.



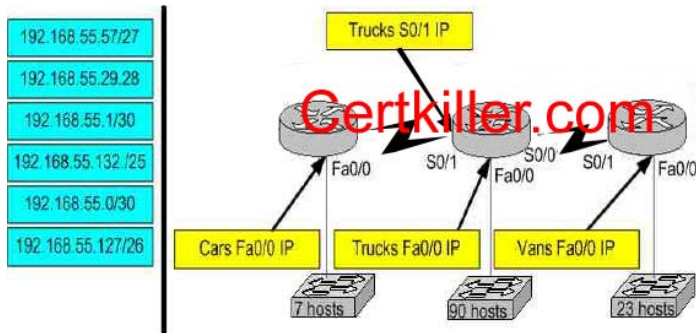
E. This will provide for 62 different networks, but each with only 2 usable hosts per network.

### QUESTION 59

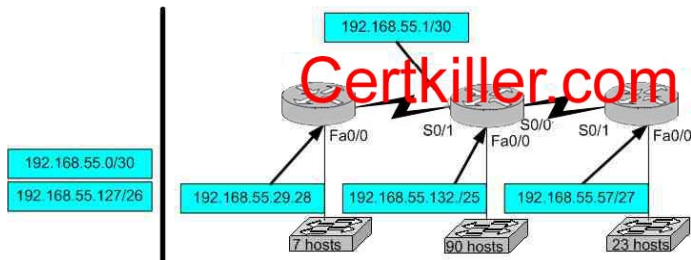
Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.55.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Not all of the host addresses on the left will be used.



Answer:



### QUESTION 60

You are the network administrator at Certkiller . Certkiller has been assigned the class C IP address 189.66.1.0 by its Internet Service Provider. If you divide the network range by using the 255.255.255.224 subnet mask, how many hosts can be supported on each network?

- A. 14
- B. 16
- C. 30
- D. 32
- E. 62
- F. 64

Answer: C

Explanation:

The subnet mask 255.255.255.224 is a 27 bit mask (11111111.11111111.11111111.11100000). It uses 3 bits from the host Id for the network ID, leaving 5 bits for host addresses. We can calculate the number of hosts supported by this subnet by using the  $2^n - 2$  formula where n represents the number of host bits. In this case it will be 5.  $2^5 - 2$  gives us 30.

Incorrect Answers:

- A. Subnet mask 255.255.255.240 will give us 14 host addresses.
- B. Subnet mask 255.255.255.240 will give us a total of 16 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.
- D. Subnet mask 255.255.255.224 will give us a total of 32 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.
- E. Subnet mask 255.255.255.192 will give us 62 host addresses.
- F. Subnet mask 255.255.255.192 will give us a total of 64 addresses. However, we must still subtract two addresses (the network address and the broadcast address) to determine the maximum number of hosts the subnet will support.

---

**QUESTION 61**

Which of the following are true regarding a network with a subnet mask of 255.255.248.0. Choose three

- A. It corresponds to a Class A address with 13 bits borrowed.
- B. It corresponds to a Class B address with 4 bits borrowed.
- C. The network address of the last subnet will have 248 in the 3rd octet.
- D. The first 21 bits make the host portion of the address.
- E. This subnet mask allows for 16 total subnets to be created.
- F. The subnetwork numbers will be in multiples of 8.

Answer: A, C, F

---

**QUESTION 62**

Which of the following IP addresses is a private IP address? Select all that apply.

- A. 12.0.0.1
- B. 168.172.19.39
- C. 172.20.14.36
- D. 172.33.194.30
- E. 192.168.42.34

Answer: C, E

Explanation:

RFC 1918 Private Address Space:

Range of IP Addresses	Class of Networks	Number of Network
10.0.0.0 to 10.255.255.255	A	1
172.16.0.0 to 172.31.255.255	B	16
192.168.0.0 to 192.168.255.255	C	256

---

**QUESTION 63**

What is the subnetwork address for a host with the IP address 201.100.5.68/28?

- A. 201.100.5.0
- B. 201.100.5.32
- C. 201.100.5.64
- D. 201.100.5.65
- E. 201.100.5.31
- F. 201.100.5.1

Answer: C

This is a C ip with a subnet mask of 255.255.255.240

the host 201.100.5.68/28 belong to the second subnet which is 201.100.5.64

this is determined by doing the following

subnets?  $2^4 - 2 = 14$

hosts?  $2^4 - 2 = 14$

valid subnet range?  $256 - 240 = 16$

$16 + 16 = 32, 16 + 32 = 48, 16 + 48 = 64, 64 + 16 = 80$  and so as you can see the ip

201.100.5.68 belongs to the second subnet which is .64

---

**QUESTION 64**

Which of the following IP addresses fall into the CIDR block of 115.54.4.0/22? Select three

- A. 115.54.8.32
- B. 115.54.7.64
- C. 115.54.6.255
- D. 115.54.3.32
- E. 115.54.5.128
- F. 115.54.12.128

Answer: B, C, E

Explanation :-

Given CIDR block of 115.54.4.0 /22:

subnet mask : 255.255.252.0

the IP addr range would be 115.54.4.1 to 115.54.7.254.

Therefore, 115.54.5.128 (E), 115.54.6.255 (C) and 115.54.7.64 (B) are correct.

---

**QUESTION 65**

If an Ethernet port on router was assigned an IP address of 172.16.112.1/20, what is the maximum number of hosts allowed on this subnet?

- A. 1024
- B. 2046
- C. 4094
- D. 4096
- E. 8190

Answer: C

Explanation :-

Given IP addr of 172.16.112.1 / 20,

subnet mask : 255.255.240.0

max. num of hosts =  $((2^{12}) - 2) = 4096 - 2 = 4094$

---

**QUESTION 66**

You work as network consultant. Your customer, Certkiller Inc, has a class C network license. Certkiller wants you to subnet the network to provide a separate subnet for each of its 5 departments. Each subnet must support at least 24 hosts.

Which subnet mask should you use?

Which network mask should you use?

- A. 255.255.255.192
- B. 255.255.255.224
- C. 255.255.255.240
- D. 255.255.255.248
- E. 255.255.255.252
- F. 255.255.255.254

Answer: B

Explanation:

The default subnet mask for class C network is 255.255.255.0. If one has to create 5 subnets, then 3 bits are required. With 3 bits we can create 6 subnets. Remaining 5 bits are used for Hosts. One can create 30 hosts using 5 bits in host field. This matches with requirement.

---

**QUESTION 67**

Your Certkiller trainee Bob asks you what 11111001 binary is in decimal. What should you tell him?

- A. 6
- B. 193
- C. 225
- D. 241
- E. 249

Answer: E

Explanation:

$$128 + 64 + 32 + 16 + 8 + 1 = 249$$

---

**QUESTION 68**

What is the maximum number of IP addresses that can be assigned to hosts on a local subnet that use the 255.255.255.224 subnet mask?

- A. 14
- B. 15
- C. 16
- D. 30
- E. 31
- F. 32

Answer: D

Explanation:

The subnet mask 255.255.255.224 means that there are 27 network bits. The remaining 5 bits are the host bits. The maximum possible combinations with 5 bits are  $2^5 = 32$ . As all zero's and all one's hosts are not allowed so, maximum number of valid hosts with the mask 255.255.255.224 are  $2^5 - 2 = 32 - 2 = 30$  Hosts

---

**QUESTION 69**

Which of the following IP addresses for the network 27.35.16.32/28 can be assigned to hosts? Choose three

- A. 27.35.16.32
- B. 27.35.16.33
- C. 27.35.16.48
- D. 27.35.16.47
- E. 27.35.16.45
- F. 27.35.16.44

Answer: B, E, F

Explanation:

Explanation:

	25	26	27	/28				
.	128	64	32	16	8	4	2	1
/28	0	0	0	0	1	1	1	1
network 32	0	0	1	0	0	0	0	0
next network	0	0	1	1	0	0	0	0

(which equals 48)

Range of host values are:

RANGE	0	0	1	0	0	0	0	1
TO RANGE	0	0	1	0	1	1	1	0

network is 32

the next network is  $32 + 16 = 48$

the range is  $32 + 1$  to  $48 - 2$ .

this results in a range 33 to 46.

and b, e, f

Incorrect answers:

32 cannot be used it is the network; 47 cannot be used it is the broadcast.

A. IS A NETWORK

C. IS A NETWORK

D. IS A BROADCAST

**QUESTION 70**

Certkiller has three locations and has plans to redesign the network accordingly. The networking team received 192.168.236.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

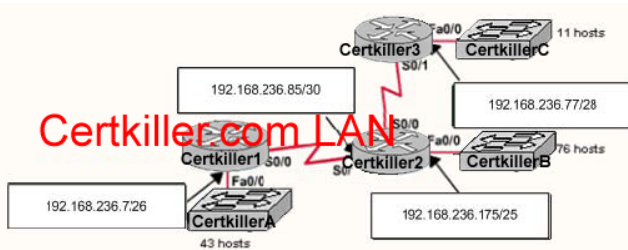
The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time conserve unused addresses for future growth.

Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration. Not all of the host addresses on the left will be used.

Drag and Drop

192.168.236.85/30
192.168.236.127/27
192.168.236.7/26
192.168.236.84/30
192.168.236.175/25
192.168.236.77/28

Answer:



**QUESTION 71**

When designing OSPF networks; what is the purpose of using a hierarchical design? (Select all choices that apply)

- A. To reduce the complexity of router configuration
- B. To speed up convergence
- C. To confine network instability to single areas of the network
- D. To reduce routing overhead
- E. To lower costs by replacing routers
- F. To decrease latency

Answer: B, C, D

Explanation:

An OSPF network designed in a hierarchical fashion with different areas is used because a small change in the topology of a single area won't force every router to run the SPF algorithm. Changes in one area are limited to that area only, not to every router within the entire network. Confining the topology changes to one area reduces the overhead and speeds the convergence of the network.

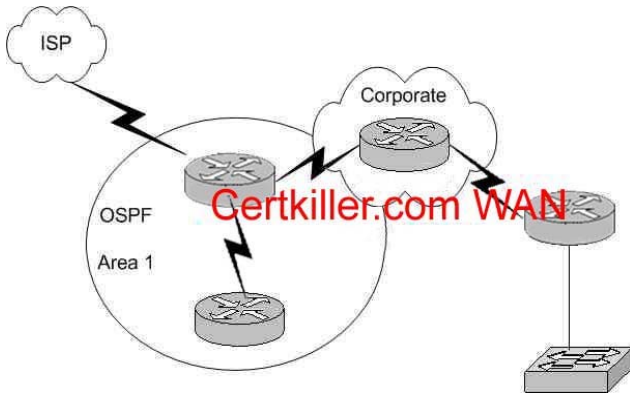
Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 194

Incorrect Answers:

- A. This choice is incorrect because a hierarchical design actually adds complexity to the router configuration.
- E. This is incorrect because a hierarchical design will not eliminate the need for routers. In fact, segmenting the network into multiple areas may actually require the use of additional routers.
- F. The use of a hierarchical design will in no way reduce the latency involved. If additional routers are implemented in order to segment the network into additional areas, then the latency involved may actually increase.

**QUESTION 72**

The Certkiller network is shown in the diagram below:



In this diagram, OSPF is used as the routing protocol between the corporate office and the offices on the left side of the diagram. An ISDN link provides connectivity from the central corporate router to the remote sales office on the right side of the diagram. Which type of route should the corporate office use to reach the router on the right side of the diagram if the overhead on the ISDN link is to be kept to a minimum?

- A. A RIP route
- B. An OSPF route
- C. A static route
- D. A default route
- E. A dynamic route
- F. None of the above

Answer: C

Explanation:

A static route uses the least amount of overhead because no routing protocol information will be exchanged over the ISDN link. As long as the ISDN link is up, the static route will always remain in the routing table of the corporate router.

Incorrect Answers:

- A. This will not only provide additional overhead on the ISDN link as the RIP information is passed from one side to the other, but it will add additional overhead and complexity to the corporate router because now two routing protocols will need to be running. With this choice, RIP and OSPF will need to be configured on the corporate router.
  - B. This will add the overhead of LSP information being passed between the two routers over the ISDN link.
  - D. Although a default route can be a type of static route, in this case a default route will be a poor choice because then traffic destined to the Internet will go to remote office on the right side, instead of towards the ISP on the left.
  - E. All dynamic routing protocols will add some level of overhead. Static routes will not increase the traffic level at all over the ISDN link.
-



**QUESTION 73**

You are a network administrator and you need to implement a routing protocol on your network that provides:

- Scalability
- VLSM support
- Minimal overhead
- Support for connecting networks using routers of multiple vendors

Which of the following routing protocol would best serve your needs?

- A. VTP
- B. RIP version 1
- C. EIGRP
- D. OSPF
- E. IGRP
- F. CDP

Answer: D

Explanation:

Since one of the requirements is that the routing protocol must support other vendors, our only choices are RIP and OSPF. Since RIP version 1 does not support VLSM, OSPF is the only choice.

Incorrect Answers:

- A. VTP is the VLAN Trunking Protocol. This is not a routing protocol.
- B. RIP version one does not support VLSM. Note that RIPv2 does support VLSM, and would be a valid choice.
- C, E. EIGRP and IGRP are Cisco proprietary routing protocols, and are not supported by other vendors.
- F. CDP is the Cisco Discovery Protocol, which is used to exchange information between Cisco devices. It can only be used between Cisco routers and switches, and it is not a routing protocol.

---

**QUESTION 74**

You need to configure a single router into load balancing traffic across 4 unequal cost paths. Which routing protocols can satisfy this requirement? (Select two)

- A. RIP v1
- B. RIP v2
- C. IGRP
- D. EIGRP
- E. OSPF
- F. IS-IS

Answer: C, D

Explanation:

In general, load balancing is the capability of a router to distribute traffic over all its network ports that are the same distance from the destination address. Load balancing increases the utilization of network segments, thus increasing effective network bandwidth. There are two types of load balancing: equal cost path and unequal cost path. Every routing protocol supports equal cost path load balancing. In addition to that, IGRP and EIGRP also support unequal cost path load balancing, which is known as variance. The variance command instructs the router to include routes with a metric less than n times the minimum metric route for that destination, where n is the number specified by the variance command. The variable n can take a value between 1 and 128, with the default being 1, which means equal cost load balancing (variance<n> for example. Traffic is also distributed proportionally among unequal cost links, with respect to the metric.

---

**QUESTION 75**

You need to choose a routing protocol for a new Certkiller network. This network will be running IP, IPX, and Appletalk, and you wish to utilize only one routing protocol. Which one would be the best choice?

- A. OSPF
- B. EIGRP
- C. RIP v2
- D. IGRP
- E. RIP v1

Answer: B

Explanation:

Only EIGRP provides routing protocol support for IP, IPX, and Appletalk networks.

---

**QUESTION 76**

Which of the routing protocols shown below support both VLSM and route summarization? (Select three)

- A. IGRP
- B. EIGRP
- C. RIP v1
- D. RIP v2
- E. OSPF
- F. VTP
- G. CDP

Answer: B, D, E

Explanation:

EIGRP and OSPF support Variable Length Subnet Masks (VLSM) and provide for both

automatic and manual route summarization configurations. RIPv2 is an enhanced version of RIP, and overcame some of the limitations of RIP by introducing support for VLSM.

Incorrect Answers:

A, C. IGRP and RIP are relatively old and simplistic routing protocols that were developed before the concepts of VLSM and route summarization.

F. VTP is the VLAN Trunking Protocol, used in switched LAN environments to carry VLAN information. It is not a routing protocol.

G. CDP is the Cisco Discovery Protocol, used between neighboring Cisco devices to automatically discover information. It is not a routing protocol.

---

**QUESTION 77**

Which of the following routing protocols support the use of VLSM (Variable Length Subnet Masking)? (Select three)

- A. RIPv1
- B. EIGRP
- C. OSPF
- D. IGRP
- E. RIPv2

Answer: B, C, E

Explanation:

Static routing, OSPF, IS-IS, EIGRP, BGP, and RIP version 2 all support VLSM.

Incorrect Answers:

A, D. RIPv1 and IGRP do not support VLSM.

Reference: Sybex CCNA Study Guide edition 4, Page 123

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**QUESTION 78**

Which of the following routing protocols do NOT support VLSM (variable length subnet masking)? (Choose all that apply).

- A. RIPv1
- B. IGRP
- C. EIGRP
- D. OSPF
- E. IS-IS
- F. RIPv2

Answer: A, B

Explanation:

RIP version 1 and IGRP are classful IP routing protocols. They do not support variable length subnet masks.

Incorrect Answers:

C, D, E, F. Static routing, OSPF, IS-IS, EIGRP, BGP, and RIP version 2 all support VLSM.

---

**QUESTION 79**

You need to implement the use of a routing protocol that meets the following requirements:

2. Converges quickly
3. Supports VLSM, CIDR, IP, and IPX.
4. Uses minimal bandwidth for routing updates.

Which one of the following routing protocols would be the best choice?

- A. RIPv1
- B. RIPv2
- C. IGRP
- D. OSPF
- E. EIGRP

Answer: E

Explanation:

EIGRP would be the best choice as it provides support for VLSM and CIDR, has faster convergence times than other protocols, is scalable, and supports IP, IPX, and Appletalk. EIGRP is a Cisco proprietary routing protocol, so it will not work with other vendors. However, the requirements of the question made no mention of the use of non-Cisco routers, so it will not be an issue in this case.

Incorrect Answers:

- A, C. Both of these routing protocols do not support VLSM.
- B. While RIPv2 supports VLSM, it provides no support for IPX. The IPX RIP protocol is similar in function to RIP version 1. Both versions of RIP are also consume more bandwidth than EIGRP.
- D. OSPF does not support IPX.

---

**QUESTION 80**

See the WAN diagram below:



Certkiller has four offices, each with its own network, as shown in the graphic. Three of the networks have approximately 50 hosts each, and one network has 10 hosts.

The multi-vendor routers are connected by serial links that use separate subnetwork numbers. The Certkiller network has leased one Class C address to be used for all networks and serial links, and they do not wish to replace any of their existing routers.

Which routing protocol would be most appropriate for this scenario?

- A. TCP/IP
- B. RIP version 1
- C. RIP version 2
- D. IGRP
- E. EIGRP
- F. All of the above are acceptable

Answer: C

Explanation:

The question describes 2 important requirements. The first is the fact that a routing protocol that supports VLSM is needed, as specified by the fact that one class C address range is to be used for all networks. The second important requirement is that routers from multiple vendors are being used, so the routing protocol chosen must be nonproprietary. RIP version 2 is a standards based routing protocol that supports variable length subnet masking (VLSM).

Incorrect Answers:

- A. This is not a routing protocol.
- B. RIP version 1 does not support VLSM
- D, E. Although these both support VLSM, IGRP and EIGRP are Cisco proprietary routing protocols which are not supported by other router vendors.

---

**QUESTION 81**

RIP version 2 is being used as the routing protocol within the Certkiller network. What does RIP version 2 use to prevent routing loops? (Choose two)

- A. CIDR
- B. Split horizon
- C. Authentication
- D. Classless masking
- E. Hold-down timers
- F. Multicast routing updates
- G. Path Vectoring

Answer: B, E

Explanation:

Distance Vector routing protocols employ the split horizon mechanism to reduce the possibility of routing loops. Split horizon blocks information about routes from being

advertised by a router out of any interface from which that information originated. RIP versions 1 and 2 also use the concept of hold timers. When a destination has become unreachable (or the metric has increased enough to cause poisoning), the destination goes into "holddown". During this state, no new path will be accepted for the same destination for this amount of time. The hold time indicates how long this state should last.

Incorrect Answers:

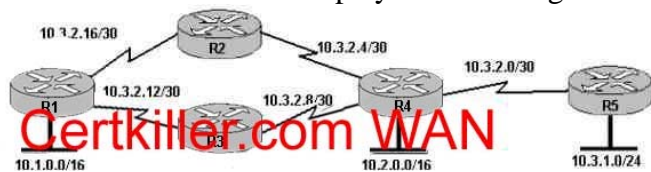
A, C, D, F. Although these are all features and functions of RIP version 2, they are not mechanisms used to prevent routing loops.

G. Path Vectoring is a concept used by BGP routers. RIP version 1 and 2 are considered to be distance vector routing protocols.

---

**QUESTION 82**

The Certkiller WAN is displayed in the diagram below:



Based on the information shown above, which routing protocols can be used within the Certkiller network show in the diagram? (Choose three).

- A. RIP v1
- B. RIP v2
- C. IGRP
- D. OSPF
- E. BGP
- F. EIGRP

Answer: B, D, F

Explanation: the exhibit showed routers with Variable Length Subnet Mask (VLSM), and asked which 3 protocols can be used. 3 protocols that support VLSM are RIP v2, OSPF and EIGRP.

Incorrect Answers:

A, C. Both of these routing protocols do not support VLSM information.

E. BGP is used for external routing between different autonomous systems, and is not generally used within a single AS.

---

**QUESTION 83**

The Certkiller Network consists of the following 5 IP networks:

NETWORK 1: 192.168.10.0/26

NETWORK 2: 192.168.10.64/27

NETWORK 3: 192.168.10.96/27

NETWORK 4: 192.168.10.128/30

NETWORK 5: 192.168.10.132/30

Which of the following routing protocols will support this IP addressing scheme?

(Choose all that apply).

- A. RIP version 1
- B. RIP version 2
- C. IGRP
- D. EIGRP
- E. OSPF
- F. BGP

Answer: B, D, E

Explanation:

Because this network is using IP subnets with variable length subnet masks, only routing protocols that support VLSM will fit this particular case. The routing protocols that support VLSM are RIP v2, EIGRP and OSPF.

Incorrect Answers:

A, C. RIP version 1 and IGRP do not support VLSM information within the routing updates.

F. BGP is used for inter-AS routing, such as the Internet. It is not normally used as an Interior routing protocol.

---

**QUESTION 84**

Which one of the following commands would you enter to terminate a VTY line session?

- A. close
- B. disable
- C. disconnect
- D. suspend
- E. exit
- F. None of the above

Answer: E

Explanation:

A VTY line is a telnet session. To end a telnet session from a remote device, enter the exit or logout command.

Incorrect Answers:

A, B, C, D. These are all invalid commands.

---

**QUESTION 85**

You are implementing a new frame relay network to provide connectivity between you offices. To do this, you set up the frame relay network using point-to-point subinterfaces.

Which of the following does NOT need to be configured?

- A. The Frame Relay encapsulation on the physical interface.

- B. The local DLCI on each subinterface.
- C. An IP address on the physical interface.
- D. The subinterface type as point-to-point.

Answer: C

When using point to point subinterfaces in a frame relay network, the subinterfaces will each have their own IP addresses and will each be contained within their own IP subnet. The physical interface does not require an IP address.

Incorrect Answers:

- A. The physical interface will need to be configured with a layer two encapsulation type, so in this case it must be frame relay.
- B. The subinterfaces will have the local DLCI assigned to each one, using the "framerelay interface-dlci" command for each of the subinterfaces.
- D. Each subinterface should be configured as a point to point network type.

---

**QUESTION 86**



After the router interfaces shown in the diagram have been configured, it is discovered that hosts in the Branch LAN cannot access the Internet. Further testing reveals additional connectivity issues. What will fix this problem?

- A. Change the address of the Branch router LAN interface.
- B. Change the address of the Branch router WAN interface.
- C. Change the subnet mask of the HQ router LAN interface.
- D. Change the address of the HQ router LAN interface.
- E. Change the address of the HQ router interface to the Internet.
- F. Change the subnet mask of the HQ router interface to the Internet.

Answer: B

Explanation:

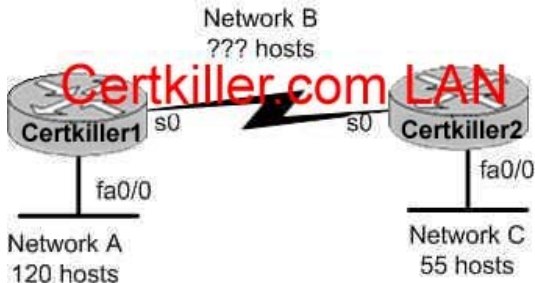
The serial line connection between the Branch office and the HQ office should have interfaces that belong in the same subnet. Based on the diagram above, the WAN interface of the Branch router is configured with an IP address that is in a different IP network than the serial interface of the HQ router. As it is set up currently, no traffic will pass from the Branch router to the HQ until these two interfaces are in the same subnet.

---

**QUESTION 87**

A portion of the Certkiller network is shown in the diagram below:





Consider the 192.1.1.0/24 network in this exhibit. This network uses RIP v2. Which combination of subnetwork assignments will satisfy the requirements for networks A, B, and C of this design? (Select three)

- A. Network A = 192.1.1.128/25
- B. Network A = 192.1.1.0/25
- C. Network B = 192.1.1.252/30
- D. Network B = 192.1.1.4/30
- E. Network C = 192.1.1.64/26
- F. Network C = 192.1.1.224/27

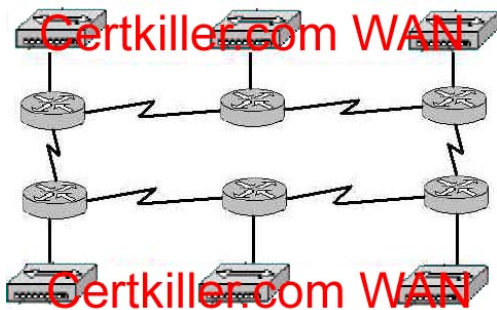
Answer: A, D, E

To properly answer this question, it is best to start from the end, which is network C. Since network C requires at least 55 host addresses, a /26 network must be used. A network mask of /26 will provide for 62 usable IP addresses while a /27 network will only provide for 30 so we must choose E. With choice E taken, hosts within the range of 192.1.1.65-192.1.1.126 will be used.

For network A, both choices A and B are using the correct subnet mask, but we are only limited to choice A since many of the hosts in choice B are already being used in network C. Finally, for network B we are left with choice D since hosts in choice C are already being used by network A.

### QUESTION 88

The Certkiller network topology is displayed in the following diagram:



Assume that RIP v1 is the only routing protocol in use. What is the Maximum number of usable IP address that can be supported on each LAN if the Certkiller network is using one Class C address block?

- A. 14
- B. 16

- C. 30
- D. 32
- E. 62
- F. 64

Answer: A

Explanation:

RIP version 1 does not support VLSM information, so all networks must have the same subnet mask. In the network above, there are a total of 12 networks (6 LANs and 6 different point to point WAN connections). Therefore, if each of the 12 networks use the 255.255.255.240 subnet mask, there will be a total of 16 networks with 14 usable hosts on each LAN.

Incorrect Answers:

- B. There are only 14 usable IP addresses in the 255.255.255.240 subnet mask, not 16, since we must subtract 2 for the network and broadcast IP addresses.
- C, E. These options will not provide enough separate networks. A total of 12 are required due to the use of a protocol that does not support VLSM.
- D, F. These options omit the fact that we must subtract 2 addresses from the usable range for the network and broadcast IP addresses for each subnet.

---

**QUESTION 89**

You are a technician at Certkiller . Your newly appointed Certkiller trainee wants to know what the CDP is.

What would your reply be? (Choose all that apply.)

- A. It is globally enabled by default on Cisco routers.
- B. It is globally enabled by default on all routers.
- C. It is a proprietary protocol.
- D. It is a non-proprietary protocol.
- E. It can be used to gather hardware and protocol information about neighbor devices.

Answer: A, C, E

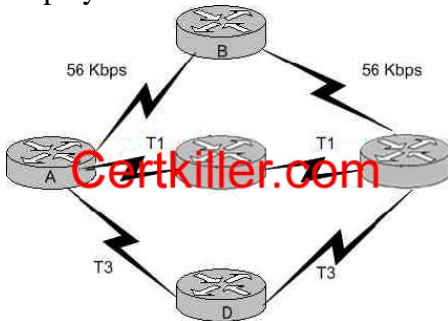
Explanation:

Cisco Discovery Protocol (CDP) is a Cisco proprietary protocol designed to help administrators collect information about local and remote devices. You can use the CDP to gather hardware and protocol information about neighbor devices, which can be useful for troubleshooting and documenting the network.

The CDP discovers basic information about neighboring routers and switches, without needing to know the passwords for the neighboring devices. CDP supports any LAN, HDLC, Frame Relay, and ATM interface- in fact, it supports any interface that supports the use of SNAP headers. The router or switch can discover Layer 2 and layer 3 addressing details of neighboring router without even configuring that Layer 3 protocol - this is because CDP is not dependant on any particular Layer 3 protocol.

**QUESTION 90**

Five different routers are connected via varying point to point circuit types as displayed below:



Which of the following statements are true regarding how router A will chose a path to router E? (Choose three)

- A. If RIP is the routing protocol, router A will determine all paths have an equal cost.
- B. If RIP is the routing protocol, router A will install only the ADE path in its routing table.
- C. If IGRP is the routing protocol, router A will determine that path ACE has the lowest cost.
- D. If IGRP is the routing protocol, router A will determine that path ADE has the lowest cost.
- E. If RIP and IGRP are both configured on router A, the router will use the route information learned by IGRP.
- F. If RIP and IGRP are both configured on router A, the router will use the route information learned by RIP.

Answer: A, D, E

Explanation:

RIP simply uses hop counts as the metric for path determination, so RIP will see all routes as equal in this case. IGRP uses bandwidth and delay, by default, so it will prefer the paths over the T3 links. By default, IGRP routes are always preferred over RIP routes because IGRP has a lower Administrative Distance (AD) than RIP. The AD of IGRP is 100 while the AD of RIP is 120.

**QUESTION 91**

You work as a network engineer at Certkiller .com. You are required to allow establishment of a Telnet session with a router Certkiller C.

Which set command must be configured?

- A. Certkiller C(config)# line console 0  
Certkiller C(config-line)# enable password Certkiller
- B. Certkiller C(config)# line console 0  
Certkiller C(config-line)# enable secret Certkiller  
Certkiller C(config-line)# login

- C. Certkiller C(config)# line console 0  
 Certkiller C(config-line)# password Certkiller  
 Certkiller C(config-line)# login
- D. Certkiller C(config)# line vty 0  
 Certkiller C(config-line)# enable password Certkiller
- E. Certkiller C(config)# line vty 0  
 Certkiller C(config-line)# enable secret Certkiller  
 Certkiller C(config-line)# login
- F. Certkiller C(config)# line vty 0  
 Certkiller C(config-line)# password Certkiller  
 Certkiller C(config-line)# login

Answer: F

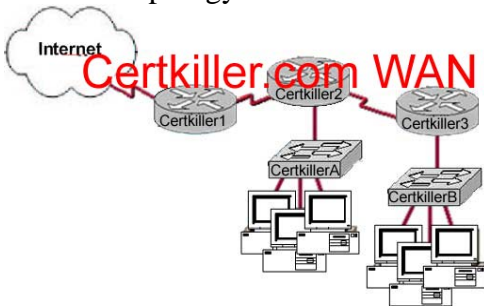
Explanation:

CLI Password Configuration:

Access From	Password Type	Configuration
Console	Console password	Line console 0 Login Password faith
Auxiliary	Auxiliary password	Line aux 0 Login Password hope
Telnet	Vty password	Line vty 0 4 Login Password love

## QUESTION 92

Network topology exhibit



As a network technician at Certkiller .com you would like to implement NAT in the network shown in the exhibit. You would like to allow inside hosts to use a private addressing scheme. Where should NAT be configured?

- A. Certkiller 1 router
- B. Certkiller 2 router
- C. Certkiller 3 router

- D. All routers
- E. All routers and switches

Answer: A

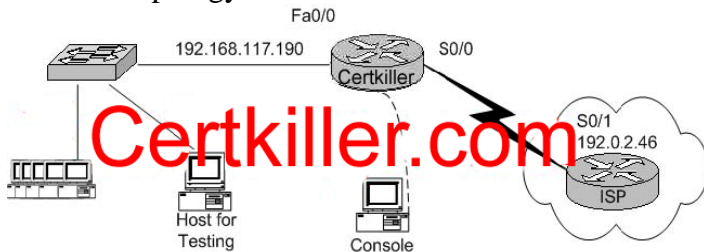
Explanation:

NAT should always be configured on the border device. It can be a border router or a Firewall.

---

**QUESTION 93**

Network topology exhibit



You work as a network administrator at Certkiller .com. You are configuring a router to provide Internet access. The ISP has provided Certkiller .com with six public IP addresses of 198.18.131.65, 198.18. 131.66, 198.18. 131.67, 198.18. 131.68, 198.18. 131.69, and, 198.18. 131.70. Certkiller .com has 62 hosts that need access to the Internet simultaneously. The hosts in the Certkiller .com LAN have been assigned private space addresses in the range of 192.168.117.129 - 192.168.117.190.

The following have already been configured on the router:

The basic router configuration

The appropriate interfaces have been configured for NAT inside an NAT outside.

**\*\* MISSING\*\***

Simulation.

Answer:

Network has 63 hosts all requiring access to internet simultaneously. Only 6 public IP's have been assigned, therefore PAT needs to be configured.

Interfaces have been configured for NAT Inside and NAT outside, so all that remains to be done is:

```
router(config)#ip nat inside source list 1 interface Serial0 overload
router(config)#access-list 1 permit 192.168.117.129 0.0.0.61
```

---

**QUESTION 94**

When are packets processed in an inbound access list?

- A. Before they are routed to an outbound interface.
- B. After they are routed for outbound traffic.
- C. After they are routed to an outbound interface while queuing.
- D. Before and after they are routed to an outbound interface.
- E. Depends on the configuration of the interface

F. None of the above

Answer: A

Explanation:

When a packet is received on an interface with an inbound access list configured, the packets are matched against the access list to determine if they should be permitted or denied. After this check, the packets are processed by the routing function. The access list check is always done first.

Incorrect Answers:

B, C. The packets are always processed by the inbound access list prior to being routed.

D. All packets are always checked against a specific access list only once. While packets traversing through a router may be checked against different access lists for each interface and in each direction (inbound and outbound), each access list is always only consulted once.

---

**QUESTION 95**

Which of the following are benefits provided with access control lists (ACLs)?

(Select all that apply)

A. ACLs monitor the number of bytes and packets.

B. Virus detection.

C. ACLs identify interesting traffic for DDR.

D. ACLs provide IP route filtering.

E. ACLs provide high network availability.

F. ACLs classify and organize network traffic.

Answer: C, D

Explanation:

IP access control lists allow a router to discard some packets based on criteria defined by the network engineer. The goal of these filters is to prevent unwanted traffic in the network - whether to prevent hackers from penetrating the network or just to prevent employees from using systems they should not be using.

IP access lists can also be used to filter routing updates, to match packets for prioritization, to match packets for VPN tunneling, and to match packets for implementing quality of service features. It is also used to specify the interesting traffic, which is used to trigger ISDN and Dial on Demand Routing (DDR) calls.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 427

Incorrect Answers:

A, F. ACLs do not provide for management and traffic analysis functions such as the monitoring and organization of network packets.

B. While ACLs can be used to filter out some unwanted traffic; they can not be used to

routinely provide for virus detection and removal.  
 E. ACLs alone do not provide for any additional level of network availability.

**QUESTION 96**

On the exhibit below, match the access list conditions on the left side with the corresponding design goal on the right side. (Not all the conditions will be used)

Select all from here, access List Condition	Place here	Design Goals
deny icmp any 192.168.47.5 0.0.0.0	place here	Allow all web access to server 192.168.47.4
permit ip 192.168.45.32 0.0.0.31 192.168.47.32 0.0.0.15	place here	Block all IP access to subnet 192.168.47.32/28
deny icmp any 192.168.47.5 0.0.0.31	place here	Block all ping messages to server 192.168.47.5/27
permit tcp any 192.168.47.4 0.0.0.0 eq 80	place here	Allow access from subnet 192.168.45.32/27 to subnet 192.168.47.32/28
permit tcp 192.168.47.4 0.0.0.0 any eq	place here	
deny ip any 192.168.47.32 0.0.0.15		

Answer:

Select all from here, access List Condition	Place here	Design Goals
deny icmp any 192.168.47.5 0.0.0.0	permit tcp any 192.168.47.4 0.0.0.0 eq 80	Allow all web access to server 192.168.47.4
	deny ip any 192.168.47.32 0.0.0.15	Block all IP access to subnet 192.168.47.32/28
	deny icmp any 192.168.47.5 0.0.0.31	Block all ping messages to server 192.168.47.5/27
	permit ip 192.168.45.32 0.0.0.31 192.168.47.32 0.0.0.15	Allow access from subnet 192.168.45.32/27 to subnet 192.168.47.32/28
permit tcp 192.168.47.4 0.0.0.0 any eq		

Explanation:

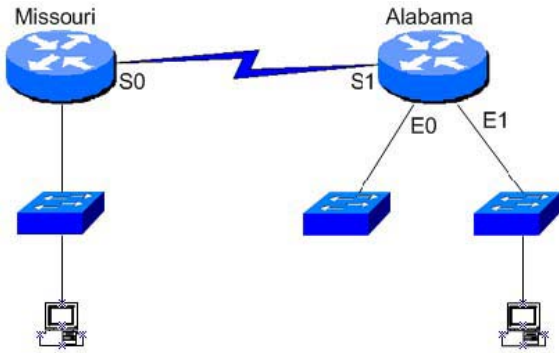
1. permit tcp any 192.168.47.4 0.0.0.0 eq 80 Allow all Web access to server 192.168.47.4
2. deny ip any 192.168.47.32 0.0.0.15 Block all IP access to subnet 192.168.47.32/28
3. deny icmp any 192.168.47.5 0.0.0.0 Block all ping messages only to server 192.168.47.5/27

Note: Should be deny icmp any 192.168.47.5 0.0.0.0 to block all ping messages ONLY to server ... with 0.0.0.0 wildcard

4. permit ip 192.168.45.32 0.0.0.31 192.168.47.32 0.0.0.15 Allow access from subnet 192.168.45.32/27 to subnet 192.168.47.32/28

**QUESTION 97**

The Certkiller network consists of the Missouri and Alabama routers as shown below:



You are a network administrator of a large corporation situated in the United States.

The network interfaces are:

Missouri: e0 - 192.168.35.17/28; s0- 192.168.35.33/28;

Alabama: e0- 192.168.35.49/28 e1 - 192.168.35.65/28, s1 -192.168.35.34/28.

The address of the accounting server is:

Accounting Server: 192.168.35.66/28.

With your mouse; drag the access list conditions on the left with their corresponding objectives on the right. (Please note: Not all of the options on the left are going to be used.)

deny ip 192.168.35.35 0.0.0.0 host 192.168.35.66	Block only the users attached to the e0 interface of the Missouri router from access to the accounting server.
deny ip 192.168.35.16 0.0.0.15 host 192.168.35.66	Block a user from the Alabama e0 network from access to the accounting server.
permit ip any any	Prevent all users from outside the enterprise network from accessing the accounting server.
permit ip 192.168.35.0 0.0.0.255 host 192.168.35.66	

Answer:

Block only the users attached to the e0 interface of the Missouri router from access to the accounting server.	deny ip 192.168.35.16 0.0.0.15 host 192.168.35.66
Block a user from the Alabama e0 network from access to the accounting server.	deny ip 192.168.35.35 0.0.0.0 host 192.168.35.66
Prevent all users from outside the enterprise network from accessing the accounting server.	permit ip 192.168.35.0 0.0.0.255 host 192.168.35.66

**QUESTION 98**

Choose the correct access list statements form the left and drag them to their corresponding IP address on the right. (Not all the access list statements are used.)

access-list 2 deny 172.26.48.0 0.0.15.255	172.26.92.10	Place here
access-list 3 deny 172.26.64.0 0.0.31.255	172.26.198.94	Place here
access-list 4 deny 172.26.128.0 0.0.31.255	172.26.50.173	Place here
access-list 5 deny 172.26.192.0 0.0.31.254	172.26.144.17	Place here
access-list 6 deny 172.26.192.1 0.0.31.254		



Answer:

172.26.92.10	access-list 3 deny 172.26.64.0 0.0.31.255
172.26.198.94	access-list 6 deny 172.26.192.1 0.0.31.254
172.26.50.173	access-list 2 deny 172.26.48.0 0.0.15.255
172.26.144.17	access-list 4 deny 172.26.128.0 0.0.31.255
access-list 5 deny 172.26.192.0 0.0.31.254	

Explanation:

172.26.192.0 = 172.26.11000000.00000000

0.0.31.254 = 0.0.00011111.11111110

172.26.198.94 = 172.26.11000110.01011110

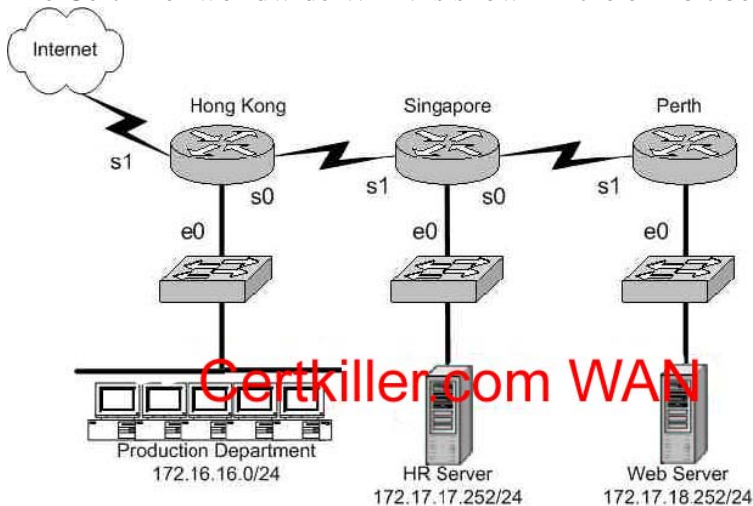
Since only 0 should be matched, the last bit HAS to be 0

In case of access-list 6 deny 172.26.192.1 0.0.31.254

the last bit is 1 and then the matched address would not go through

### QUESTION 99

The Certkiller worldwide WAN is shown in the exhibit below:



On the Hong Kong router an access list is needed that will accomplish the following:

1. Allow a Telnet connection to the HR Server through the Internet
2. Allow internet HTTP traffic to access the webserver
3. Block any other traffic from the internet to everything else

Which of the following access list statements are capable of accomplishing these three goals? (Select all that apply)

- A. access-list 101 permit tcp any 172.17.18.252 0.0.0.0 eq 80
- B. access-list 1 permit tcp any 172.17.17.252 0.0.0.0 eq 23
- C. access-list 101 permit tcp 172.17.17.252 0.0.0.0 any eq 23
- D. access-list 101 deny tcp any 172.17.17.252 0.0.0.0 eq 23
- E. access-list 101 deny tcp any 172.17.18.252 0.0.0.0 eq 80

F. access-list 101 permit tcp any 172.17.17.252 0.0.0.0 eq 23

Answer: A, F

Explanation:

Because of the implicit deny rule at the end of every access list, only two choices need to be made, as the final requirement is automatic.

A. This is correct as we need to allow the access list to allow port 80 connections (port 80 = HTTP) from anywhere, to the web server's IP address.

F. This will fulfill the first requirement, as it allows port 23 (Telnet) traffic from anywhere.

Incorrect Answers:

B. The answer asks you to create an access list, a single one. The answer choices require you to choose two answers. For two statements to be on the same list, you need them to have the same number. So answer choice B can be ruled out by process of elimination. In addition to this, access list 1 is an illegal number, since we need an extended access list to use source and destination information, and extended access lists are in the 100-199 range.

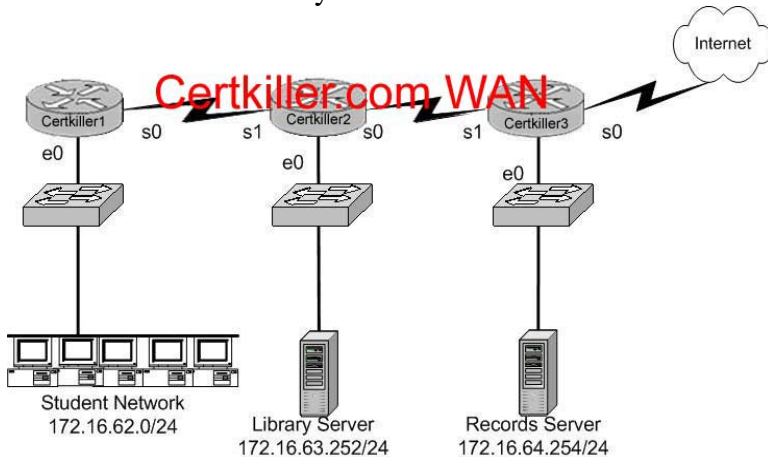
C. This is incorrect as it allows telnet traffic from the HR server to the Internet, but we need it to be the other way around.

D, E. Because of the implicit deny any rule, we need to only be concerned with the access rules that permit traffic.

---

**QUESTION 100**

The Certkiller University network is shown below:



In the above network, an access list was created in order to prevent students and outsiders on the internet from changing student files in the Records Server, while still allowing other departments in the enterprise access. The access control list was applied to the e0 interface of the Certkiller 3 router going outbound. Which two of the following conditions below were contained in the access control list? (Select two answer choices)

A. permit 172.16.64.254 0.0.0.0 172.16.0.0 0.0.255.255

640-801

- B. permit 172.16.0.0 0.0.255.255 172.16.64.254 0.0.0.0
- C. deny 172.16.64.254 0.0.0.0 172.16.62.0 0.0.0.255
- D. deny 172.16.62.0 0.0.0.255 172.16.64.254 0.0.0.0
- E. deny 172.16.64.254 0.0.0.0 any
- F. permit any any

Answer: B, D

Explanation:

Answer choice B and D together will specifically deny the students and the internet from accessing the Records Server, while still allowing access to the Library Server. It is important to note that the rules in any access list are consulted in order. Because of this, the actual access list used in this case would need to have choice D first, and then choice B. If this was not done, then traffic coming from the students would be first allowed, before the rule denying them was consulted. The rule to prevent traffic from the Internet to the records server is handled by the implicit deny any rule.