Cisco 640-801

Cisco® Certified Network Associate (CCNA®)

Q&A with explanations

Version 109.0

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Table of Contents

Total number of questions: 1013

Topic 1: PLANNING & DESIGN (165 questions)

Section 1: Design a simple LAN using Cisco Technology (23 questions)

QUESTION NO: 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:
Switches and bridges forward broadcast but routers do not forward broadcasts by default
(they can via the "ip helper-address" command).
Switches, bridges and routers can segment an Ethernet collision domain via the use of
VLAN's
Incorrect Answers:
A. Hubs is incorrect because a hub doesn't segment a network, it only allows more hosts
on one. Hubs operate at layer one, and is used primarily to physically add more stations to
the LAN.
B. This also incorrect because the job of a repeater is to repeat a signal so it can exceed
distance limitations. It also operates at layer one and provides no means for logical LAN
segmentation.
F. This is incorrect because media converters work by converting data from a different
media type to work with the media of a LAN. It also operates at layer one and provides no
means for logical LAN segmentation.

QUESTION NO: 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.

QUESTION NO: 3
Within the TestKing office, The Sales and Production networks are separated by a router as shown in the diagram below:
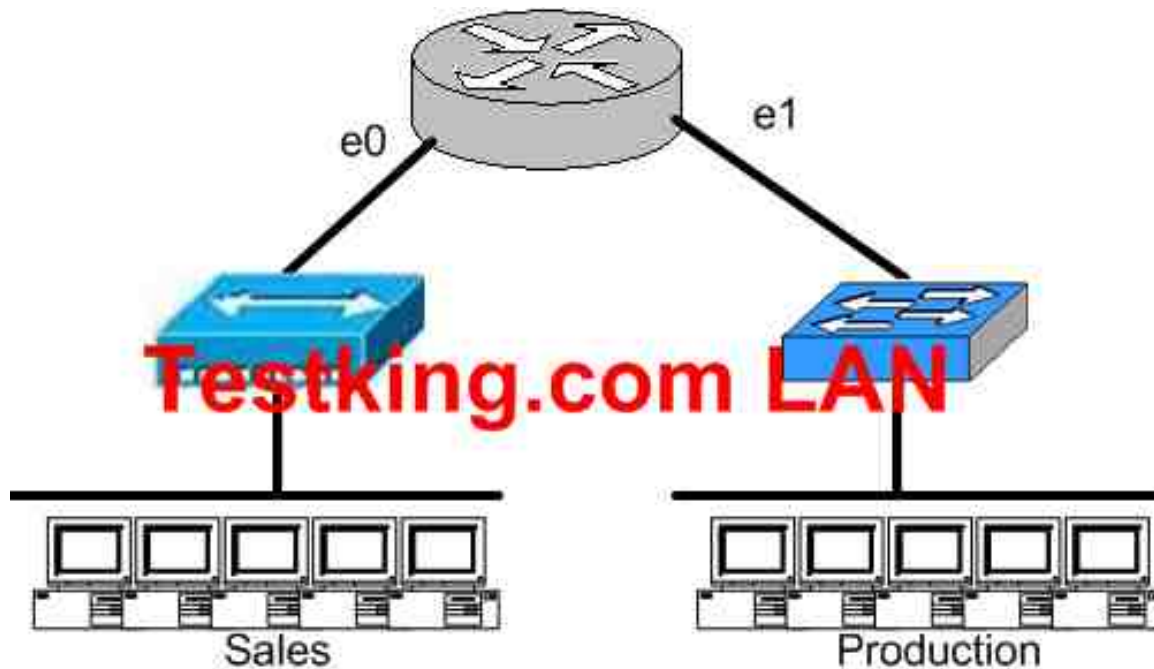
Which of the following statements most accurately describes the characteristics of the above networks broadcast and collision domains? (Select the two best answer choices)

A. There are two broadcast domains in the network.
B. There are four broadcast domains in the network.
C. There are six broadcast domains in the network.
D. There are four collision domains in the network.
E. There are five collision domains in the network.
F. There are seven collision domains in the network.

Answer: A, F
Explanation:
In this network we have a hub being used in the Sales department, and a switch being used in the Production department. Based on this, we have two broadcast domains: one for each network being separated by a router. For the collision domains, we have 5 computers and one port for E1 so we have 6 collision domains total because we use a switch in the Production Department so 5 are created there, plus one collision domain for the entire Sales department because a hub is being used.

QUESTION NO: 4
The TestKing corporate LAN consists of one large flat network. You decide to segment this LAN into two separate networks with a router. What will be the affect of this change?

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

Answer: D
Explanation
A router does not forward broadcast traffic. It therefore breaks up a broadcast domain, reducing unnecessary network traffic. Broadcasts from one segment will not be seen on the other segment.
Incorrect Answers:
A. This will actually increase the number of broadcast domains from one to two.
B. All link level traffic from segment one to segment two will now need to be routed between the two interfaces of the router. Although this will reduce the traffic on the LAN links, it does also provide a less efficient transport between the segments.
C. Since the network size is effectively cut into half, the number of collisions should decrease dramatically.
E. Broadcasts from one segment will be completely hidden from the other segment.

QUESTION NO: 5
Which of the following are benefits of segmenting a network with a router? (Select all that apply)

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

Answer: A, D
Explanation
Routers do not forward broadcast messages and therefore breaks up a broadcast domain.
In addition, routers can be used to filter network information with the use of access lists.
Incorrect Answers:
B. Broadcasts will still be present on the LAN segments. They will be reduced, because routers will block broadcasts from one network to the other.
C. Adding routers, or hops, to any network will actually increase the latency.
E. The switching process is faster than the routing process. Since routers must do a layer 3 destination based lookup in order to reach destinations, they will process data more slowly than switches.

QUESTION NO: 6
The TestKing Texas branch network is displayed in the following diagram:
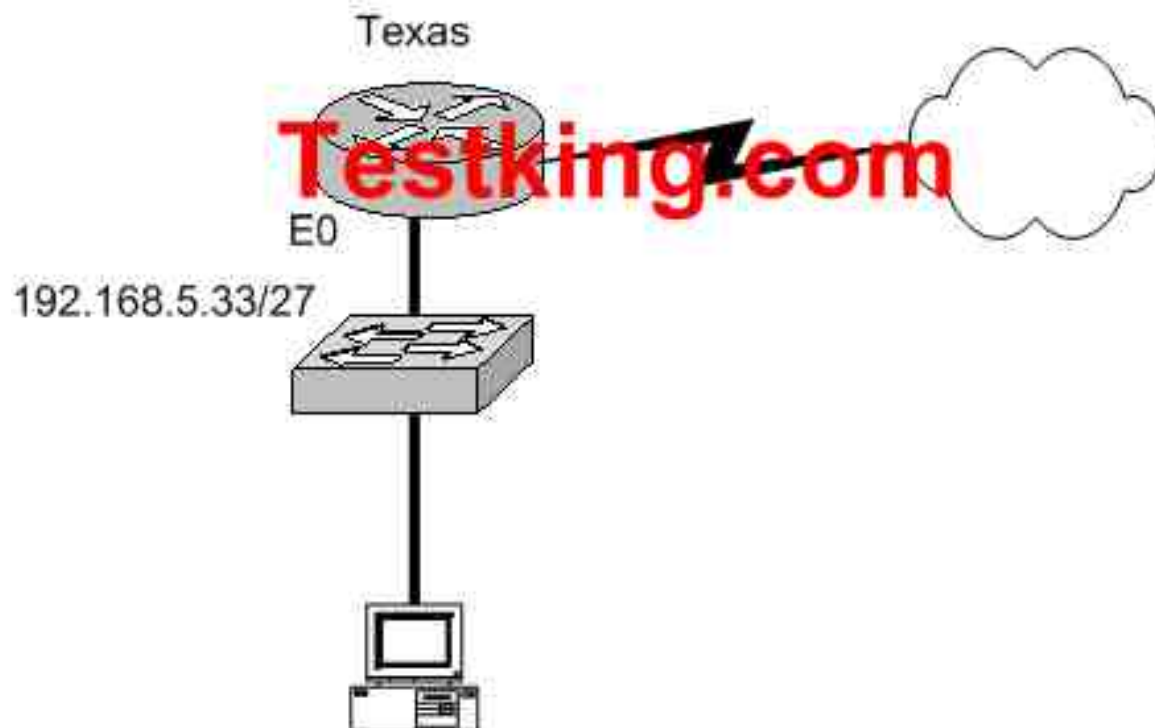
Of the following choices, which IP address should be assigned to the PC host?

A. 192.168.5.5

B. 192.168.5.32
C. 192.168.5.40
D. 192.168.5.63
E. 192.168.5.75

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

QUESTION NO: 7
The Testking.com network is displayed in the diagram below:
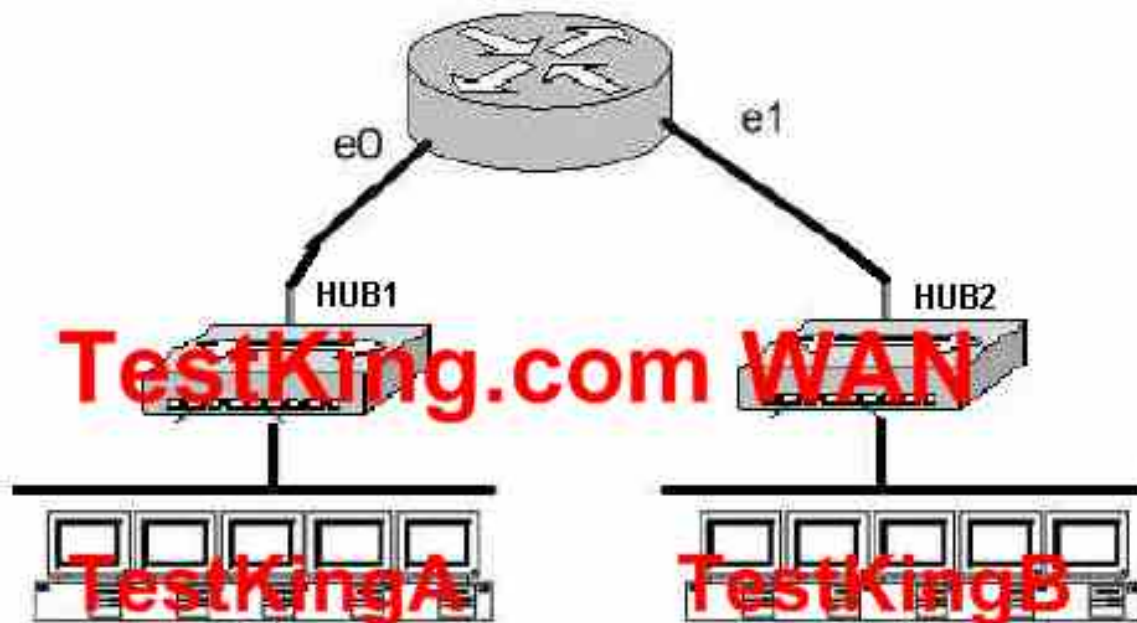
**Based on the diagram above, how many collision domains are present in the
TestKing.com network?**

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 TestKingA consists of one collision domain while TestKingB consists of the second collision domain.

QUESTION NO: 8
The TestKing network is displayed in the following diagram:

Based on the diagram shown above, 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:

Unlike hubs, a switch is the device which is used to avoid 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 via CSMA/CD technology, so there is always a chance of collision. In fact, some collisions are a normal occurrence in CSMA/CD.

QUESTION NO: 9
The TestKing network is displayed in the diagram below:
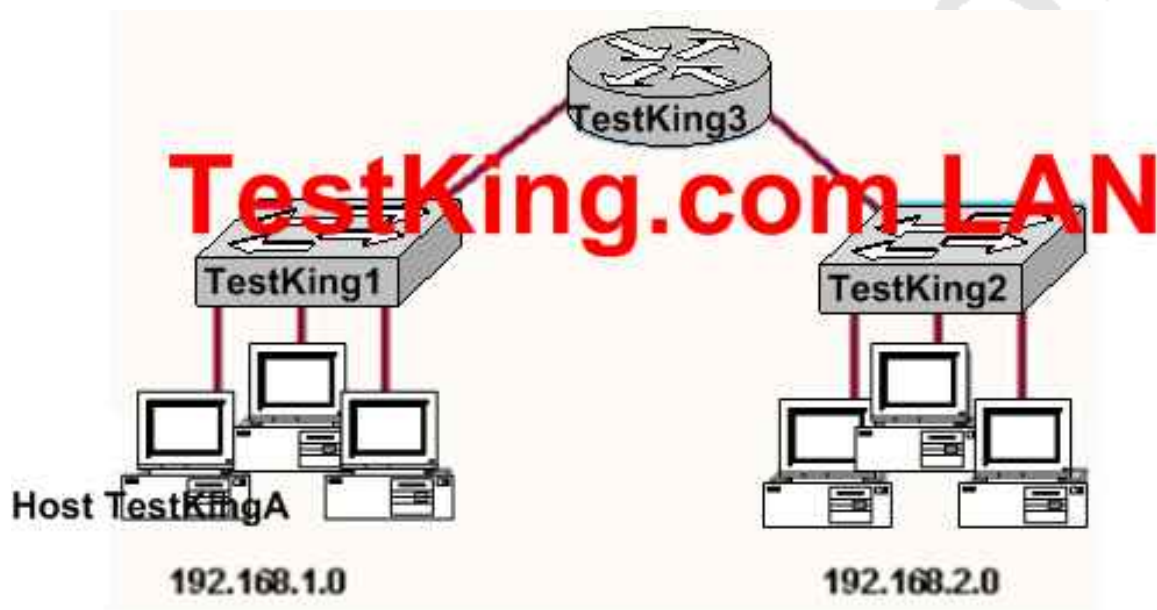
Referring to the devices shown above, which statements are true in this scenario? (Select two)

A. All the devices in both networks will receive a broadcast to 255.255.255.255 sent by host TestKingA.
B. Only the devices in network 192.168.1.0 will receive a broadcast to 255.255.255.255 sent by host TestKingA.
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:
Since the devices shown in the diagram are switches, B is in fact correct. D is not correct.
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 also correct, since the network is comprised of switches each host will be in
a separate collision domain.

QUESTION NO: 10
Given the choices below, which address represents a unicast address?

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

Answer: E
Explanation:
172.31.128.255 is the only unicast address. It seems to be a broadcast address, because of
255 in the last octet. However, the broadcast address for this network is actually
172.31.131.255.
Incorrect Answers:
A: 224.1.5.2 is a multicast address.
B: This is a broadcast layer 2 (data link) address.
C: Using a /30 for the subnet mask, this IP address becomes the broadcast address.
D. This is a broadcast IP address.

QUESTION NO: 11
With regards 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
Explanation:
B, F: Both are layer 2 (data link) devices designed to forward layer 2 broadcasts and multicast addresses.
D: Switches do have more ports than bridges. Bridges normally use two ports to bridge LANs together while switches typically come in 24 or 48 ports.

QUESTION NO: 12
Which Layer 1 devices can be used to extend the area covered by a single LAN segment? (Select two)

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

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

QUESTION NO: 13
CDP is running between two TestKing devices. What information is supplied by CDP? (Select three)

A. Device Identifiers
B. Capabilities list
C. Platform
D. Route identifier

E. Neighbor traffic data

Answer: A, B, C
Explanation:

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

CDP discovers several useful details from the neighboring device:

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

QUESTION NO: 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.

QUESTION NO: 15
Two TestKing devices are connected as shown below:
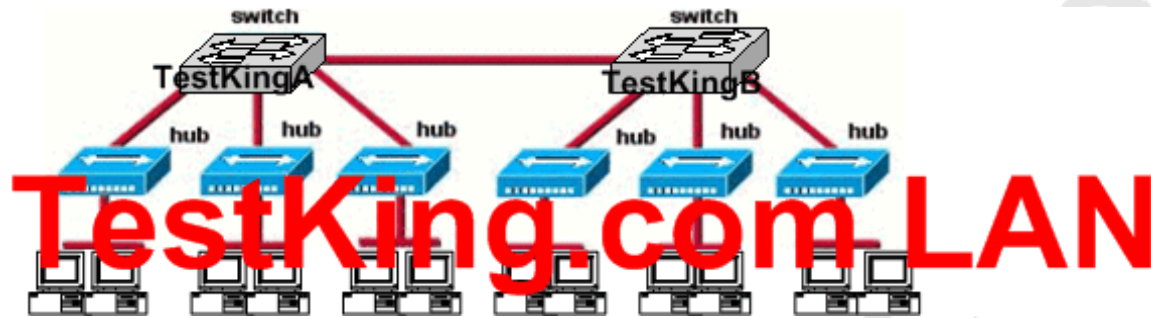
How many broadcast domains are shown in the graphic assuming only the default VLAN is configured on the switches?

A. One
B. Two
C. Six
D. Twelve

Answer: A
Explanation:
There is only one broadcast domain because switches and hubs do not segment the broadcast domains when only a single VLAN is configured. Only layer 3 devices can segment the broadcast domains, or VLAN-capable switches where multiple VLANs are configured. By default, all ports in a switch belong to VLAN 1 so in this case the entire network will consist of one large broadcast domain.

QUESTION NO: 16
Exhibit:

Study the Exhibit carefully. What switch functionality will prevent Layer 2 broadcasts from moving between the networks shown?

A. VLA.N
B. STP
C. ISL
D. VTP

Answer: A
Explanation:
Broadcasts occur in every protocol, but how often they occur depends upon three things:
1. The type of protocol
2. The application(s) running on the internetwork
3. How these services are used
Since switches have become more cost-effective lately, many companies are replacing their flat hub networks with a pure switched network and VLAN environment. All devices in a VLAN are members of the same broadcast domain and receive all broadcasts. The broadcasts, by default, are filtered from all ports on a switch that are not members of the same VLAN. This is great because it offers all the benefits you gain with a switched design without the serious anguish you would experience if all your users were in the same broadcast domain!

QUESTION NO: 17

The TestKing network is shown in the following exhibit:
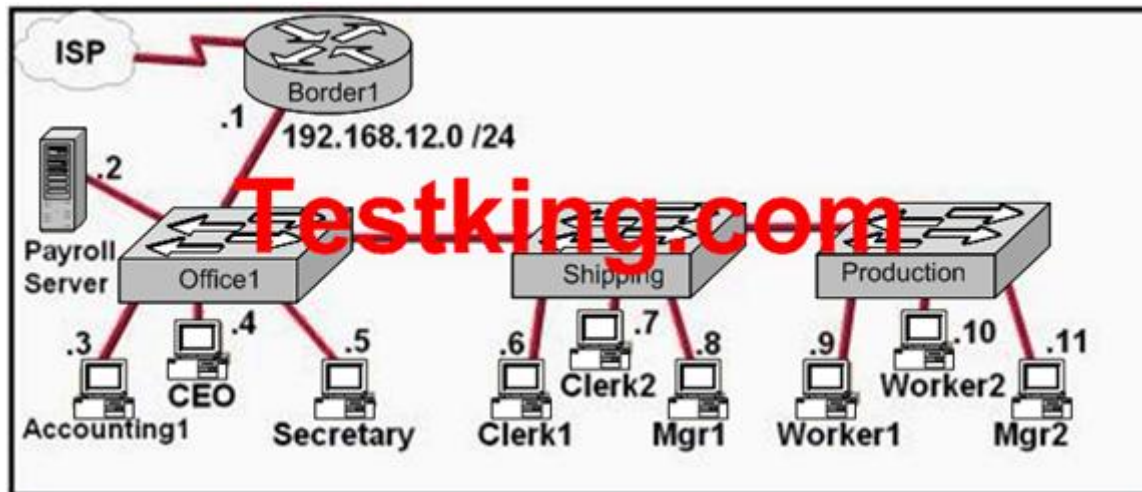
TestKing is concerned about unauthorized access to the Payroll Server. The Accounting1, CEO, Mgr1, and Mgr2 workstations should be the only computers with access to the Payroll Server. What two technologies should be implemented to help prevent unauthorized access to the server? (Choose two.)

A. Access lists
B. Encrypted router passwords
C. STP
D. VLANs
E. VTP
F. Wireless LANs

Answer: A, D
Explanation:

Layer 2 switched networks are typically designed as flat networks from a broadcast perspective. Every broadcast packet that is transmitted is seen by every device on the network, regardless of whether the device needs to receive that data or not. By default, routers allow broadcasts only within the originating network, but switches forward broadcasts to all segments. The reason it's called a flat network is because it's one broadcast domain, not because its design is physically flat. VLAN helps to control the broadcast for entire LAN, as well as VLAN helps to implement for Secure LAN design. Access List is another most import security tool in Cisco router, using access list we can allow or deny certain services to certain host or network.

QUESTION NO: 18
Exhibit:
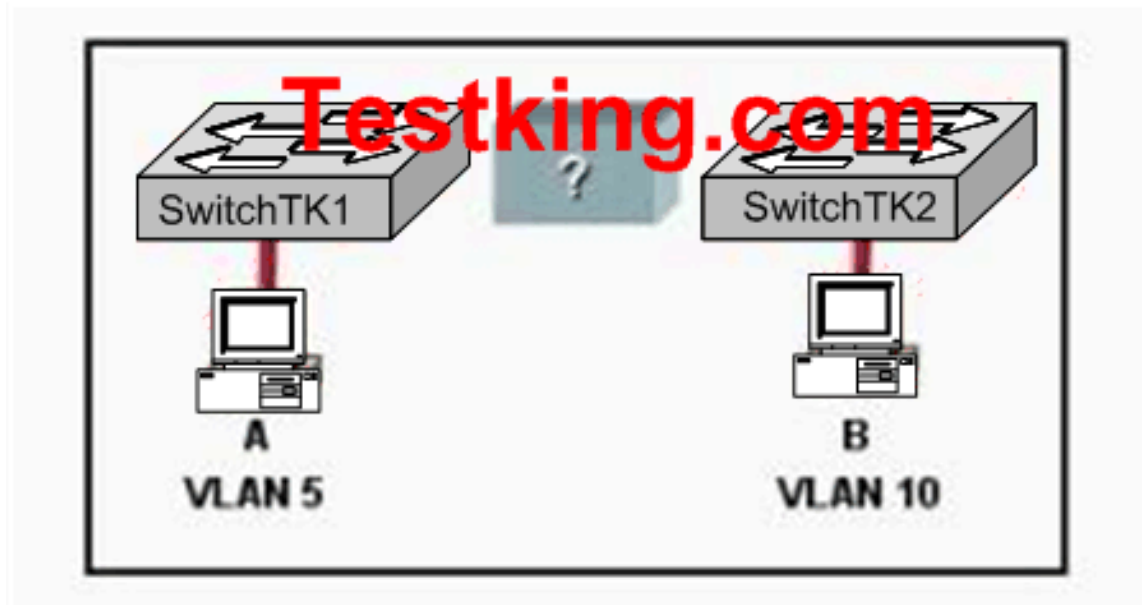
Refer to the exhibit shown above. What is required to allow communication between host A and host B?

A. A CSU/DSU connected to the switches with crossover cables
B. A router connected to the switches with straight-through cables
C. A router connected to the switches with crossover cables
D. A straight-through cable only
E. A crossover cable only

Answer: B
Explanation:
There are two different VLANs in the figure so we will require a router to make
inter-VLAN communication. In addition, the switch should connect with the router using
the straight-through cable to router for the trunk. Straight-through cable is used to connect
two different devices like, switch to router, host to switch. Since we need to insert a
router for communication between the two switches, straight through cables will be used
between the switches and the router.

QUESTION NO: 19
The TestKing network is shown in the following exhibit:
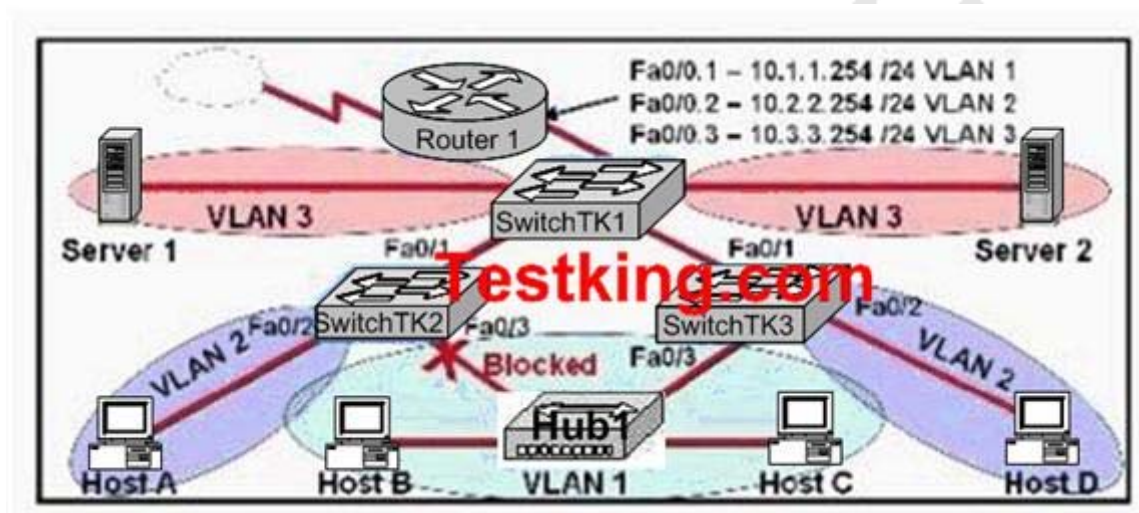
Based on this diagram, which of the following is true?

A. Switch TK2 is the root bridge.
B. Spanning Tree is not running.
C. Host D and Server 1 are in the same network.
D. No collisions can occur in traffic between Host B and Host C.
E. If Fa0/0 is down on Router 1, Host A cannot access Server 1.
F. If Fa0/1 is down on Switch 3, Host C cannot access Server 2.

Answer: E
Explanation:
A VLAN is a group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same LAN segment.

The above diagram is configured with inter-VLAN communication so the router has a great role to make communication between different VLAN. When router's port configured with trunk goes down all host can't communicate with other host in different VLAN.

QUESTION NO: 20
Refer to the exhibit shown below. What is needed to allow host A to ping host B?

A. a backbone switch connecting the switches with either fiber optic or straight-through cables
B. a crossover cable connecting the switches
C. a router connected to the switches with straight-through cables
D. a straight-through cable connecting the switches
E. a CSU/DSU connected to the switches with straight-through cables

Answer: C
Explanation:
Routers are Layers 3 devices used for inter-network communication. In this scenario there are two different networks, so both switches need to connect to a router using straight-through cables.

QUESTION NO: 21
The corporate LAN shown in the TestKing network uses IP network 172.28.4.0/22 for all departments. All workstations use 172.28.4.1 as a default gateway address. Network administrators have recently become concerned that excessive broadcasts are slowing network performance. Which change is most likely to reduce broadcast traffic on the corporate LAN?

Exhibit:
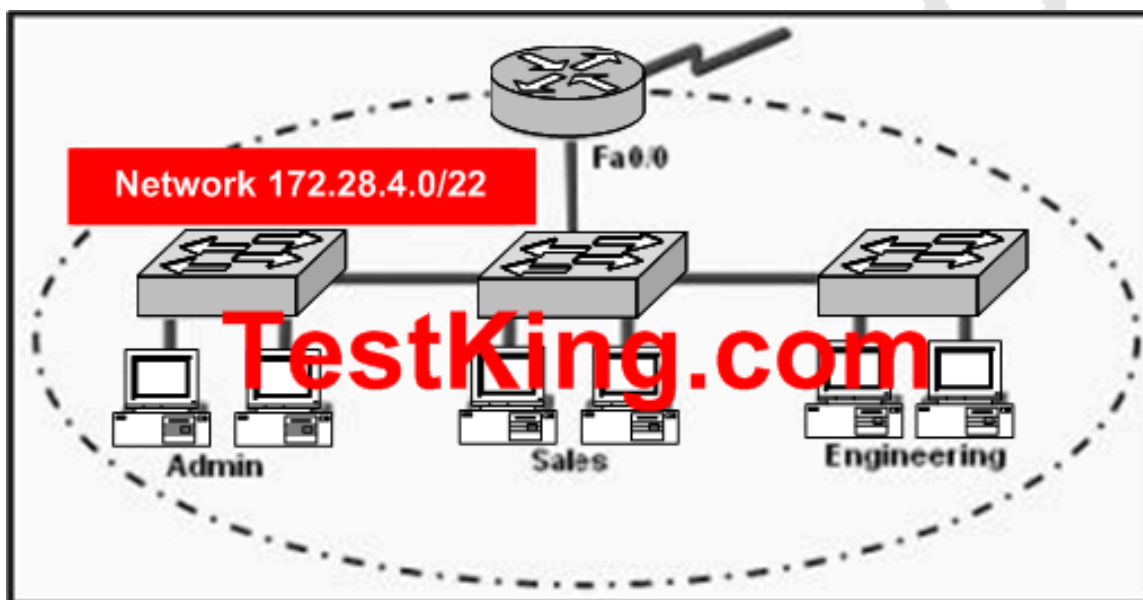
A. Configure an access control list on the router to prevent broadcast forwarding.
B. Configure each NIC and switch port to operate at full duplex.
C. Change the router-to-switch connection from Fast Ethernet to Gigabit Ethernet.
D. Implement VLANs after creating IP subnets for each department.
E. Increase the number of switches in the network closet of each department.

Answer: D
Explanation:

Switches using VLANs create the same division of the network into separate broadcast domains but do not have the latency problems of a router. Switches are also a more cost-effective solution.

There are several benefits to using VLANs, including:

1. Increased performance
2. Improved manageability
3. Network tuning and simplification of software configurations
4. Physical topology independence
5. Increased security options

Increased performance

Switched networks by nature will increase performance over shared media devices in use today, primarily by reducing the size of collision domains. Grouping users into logical networks will also increase performance by limiting broadcast traffic to users performing similar functions or within individual workgroups. Additionally, less traffic will need to be routed, and the latency added by routers will be reduced.

QUESTION NO: 22 DRAG DROP

Select from these

| crossover |
| null modem |
| straight-through |
| rollover |
| 9-25 pin serial |

Place here

| Switch access port to router |
| Switch to switch |
| PC COM port to switch |

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Answer:
Explanation:

Place here

straight-through

crossover

rollover
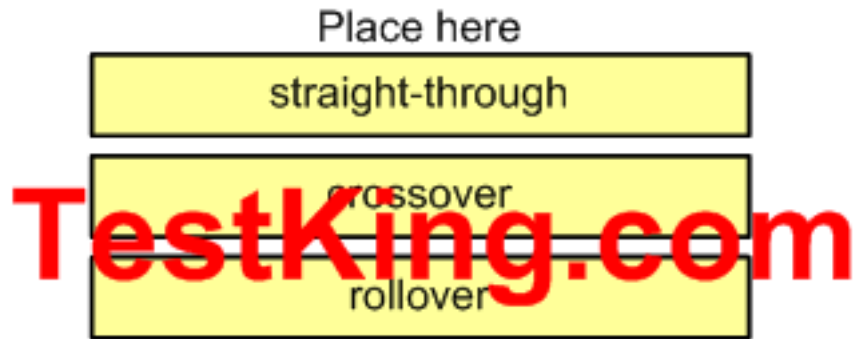
QUESTION NO: 23
Two buildings on the San Jose campus of the TestKing network must be connected to use Ethernet with a bandwidth of at least 100 Mbps. The company is concerned about possible problems from voltage differences between the two buildings. Which media type should be used for the connection?

Exhibit:

55 meters

San Jose 1   San Jose 2
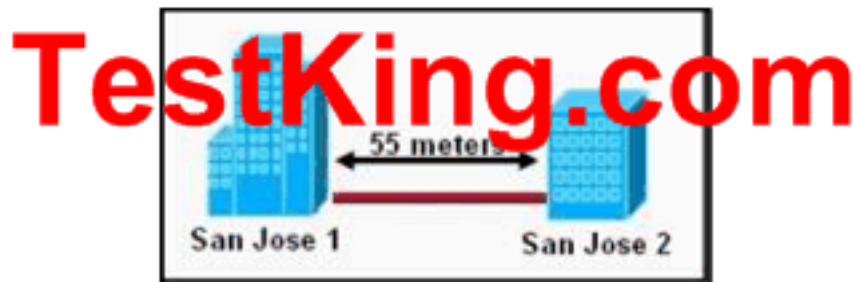
A. STP cable
B. Coaxial cable
C. Fiber optic cable
D. UTP cable
E. None of the above

Answer: C
Explanation:

Since fiber optic cable does not carry electrical charges, all electrical cable problems disappear. When fiber optic cable (outdoor quality) is used to link buildings, grounding problems, ground loops, and voltage spikes are eliminated and fiber-optic cable is all so immune to electronic eavesdropping. The other options (STP, Coax, and UTP) are all copper based and prone to electrical interferences.

Section 2: Design an IP addressing scheme to meet design requirements (68 questions)

QUESTION NO: 1
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 = (16x9)+13 = 157).

QUESTION NO: 2
The subnet mask on the serial interface of a router is expressed in binary as 11111000 for the last octet. How do you express the binary number 11111000 in decimal?

A. 210

B. 224
C. 240
D. 248
E. 252

Answer: D
Explanation:
128 + 64+32+16+8 = 248. Since this is the last octet of the interface, the subnet mask would be expressed as a /29.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 559
Incorrect Answers:
A. The number 210 would be 11010010 in binary.
B. The number 224 would be 11100000 in binary.
C. The number 240 would be 11110000 in binary
E. The number 252 would be 11111100 in binary. This is known as a /30 and is used often in point-point links, since there are only 2 available addresses for use in this subnet.

QUESTION NO: 3
Which one of the binary number ranges shown below corresponds to the value of the first octet in Class B address range?

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

Answer: C
Explanation:
Class B addresses are in the range 128.0.0.0 through 191.255.255.255.
In binary, the first octet (128 through 191) equates to 10000000-10111111
Incorrect Answers:
A. Binary 10000000 does equate to 128 but binary 11101111 equates to 239
B. Binary 11000000 equates to 192 and binary 11101111 equates to 239
D. Binary 10000000 does equate to 128 but binary 11011111 equates to 223
E. Binary 11000000 equates to 192 but binary 10111111 does equate to 191

QUESTION NO: 4
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 NO: 5
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

QUESTION NO: 6
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 = (12x16) + 9 = 201
3F = (3x16) + 15 = 63
32 = (3x16) + 2 = 50

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

201 = 11001001
63 = 00111111
50 = 00110010

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

QUESTION NO: 7
How do you express the binary number 10110011 in decimal form?

A. 91
B. 155
C. 179
D. 180
E. 201

F. 227

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

1 0 1 1 0 0 1 1
128 64 32 16 8 4 2 1
128 + 0 + 32 +16 + 0 + 0 +2 +1 = 179

QUESTION NO: 8 DRAG DROP
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)

Answer:
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 NO: 9
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 (2n-2).
The last bit used to make 240 is the 4th bit (16) therefore the first network will be
192.168.15.16. The network will have 16 addresses (but remember that the first address is
the network address and the last address is the broadcast address). In other words, the
networks will be in increments of 16 beginning at 192.168.15.16/28. The IP address we
are given is 192.168.15.19. Therefore the other host addresses must also be on this
network. Valid IP addresses for hosts on this network are: 192.168.15.17-192.168.15.30.
Incorrect Answers:
B. This is not a valid address for this particular 28 bit subnet mask. The first network
address should be 192.168.15.16.
D. This is the network address.
E. This is the broadcast address for this particular subnet.

QUESTION NO: 10
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 2n-2 formula, we will need to use 4 bits for subnetting, as this will provide for 24-2 = 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 NO: 11
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 10101100.00011111.10000000.11111111 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 NO: 12

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. 16 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 2n-2 formula, we have 24-2 (or 2x2x2x2-2) which gives us 14 for the number of hosts, and the number of networks is 24 = 16.

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 NO: 13
The TestKing network was assigned the Class C network 199.166.131.0 from the ISP. If the administrator at TestKing were to subnet this class C network using the 255.255.255.224 subnet mask, how may 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 2n-2 formula where n represents the number of host bits. In this case it will be 5. 25-2 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 NO: 14
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 then 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 NO: 15
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 then 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 NO: 16
Exhibit:

```
A. 01100100.00001010.11101011.00100111
B. 10101100.00010010.10011110.00001111
C. 11000000.10100111.10110010.01000101
```

3 addresses are shown in binary form in the exhibit.

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 NO: 17

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 rang is 10000000-10111111.

QUESTION NO: 18

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 NO: 19

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

You are a systems administrator at TestKing 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 2n-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.
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 NO: 20
Your network uses the172.12.0.0 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 NO: 21
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 NO: 22
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 NO: 23
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 NO: 24
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 2n-2 formula for host addresses, 29-2 = 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 2n-2 formula, we have 2n-2 = 126 networks that are available.

Incorrect Answers:

A. This will provide for only 1 network with 216-2 = 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 NO: 25
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 NO: 26

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: F
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 2n-2 formula (24-2 in this case) we have 14 host addresses and 16 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 NO: 27
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 62 hosts
B. 64 networks and 4 hosts
C. 4 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 2n-2 formula (22 for the network and 26-2for hosts) we have 4 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 NO: 28
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 2n - 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 NO: 29
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 Caddresses range from 192.0.0.0 through 223.225.225.225 and default subnet maskof 255.255.255.0. In Class C addresses, the first 24 bits are used as for the network IDwhile only the last 8 bits is used for the host ID. Using the 2n-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 NO: 30
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 ($2n-2$)
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 NO: 31
A TestKing 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 to10101100.00010000.110100001.00001010. Converting the network portion to decimal results in the address 172.16.208.0/22

QUESTION NO: 32
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 NO: 33
A TestKing remote office branch is set up as shown in the diagram below:
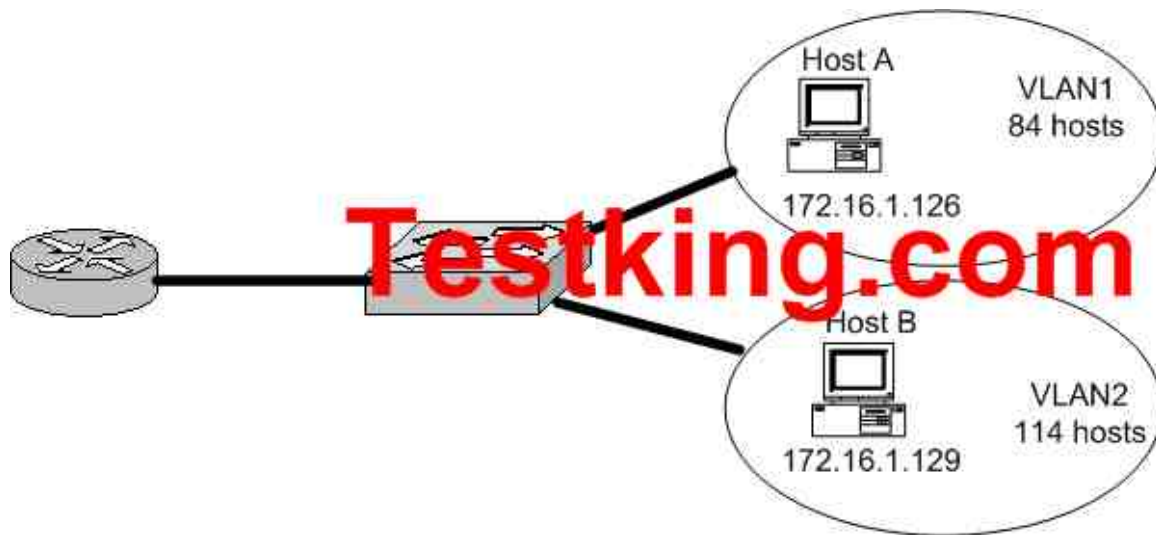
All of the hosts in the above exhibit are connected with each other via the single Catalyst switch. Which of the following statements correctly describe the addressing scheme of this network? (Select three)

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 NO: 34
The TestKing network is shown in the following diagram:
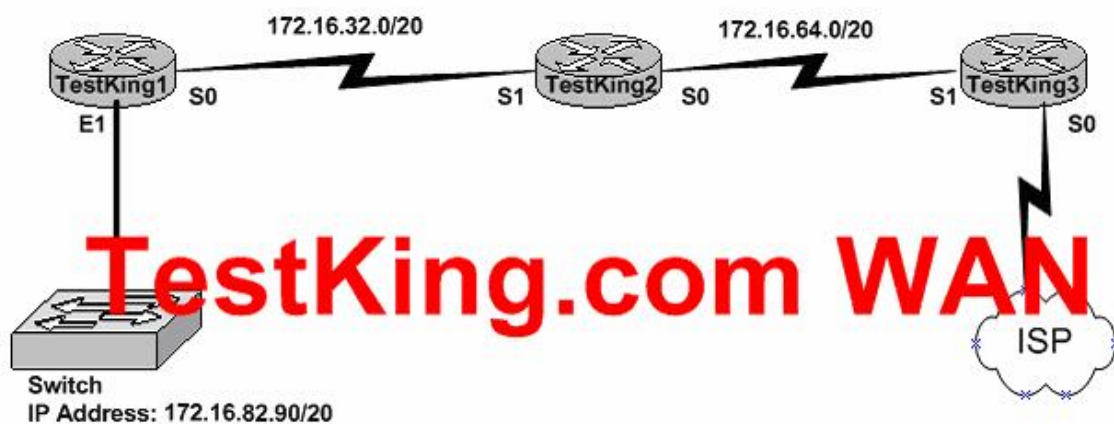
In the above network diagram, what are the broadcast addresses of the subnets? (Select three)

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 NO: 35
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
E. None of the above

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 NO: 36
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.

QUESTION NO: 37
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 NO: 38
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 NO: 39
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 NO: 40
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 NO: 41
You are the network administrator at TestKing. TestKing has been provided with the network address 165.100.27.0/24. The TestKing 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, making the right answer A. If the address was 165.100.0.0/24 then right answer is B.

QUESTION NO: 42 DRAG DROP
TestKing 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 converse 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 (This information is missing**). Not all of the host addresses on the left will be used.**
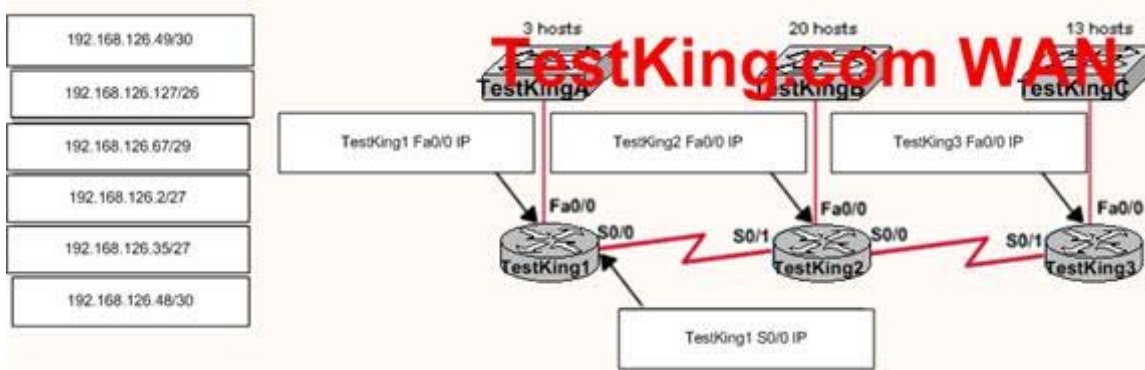
 Answer:
Explanation:

TestKing1 Fa0/0 192.168.126.67/29
TestKing1 S0/0 192.168.126.49/30
TestKing 2 Fa0/0 and TestKing 3 Fa0/0 both can have either of the following

192.168.126.35/27 or 192.168.126.2/27

QUESTION NO: 43
The TestKing 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 NO: 44 DRAG DROP
TestKing 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.
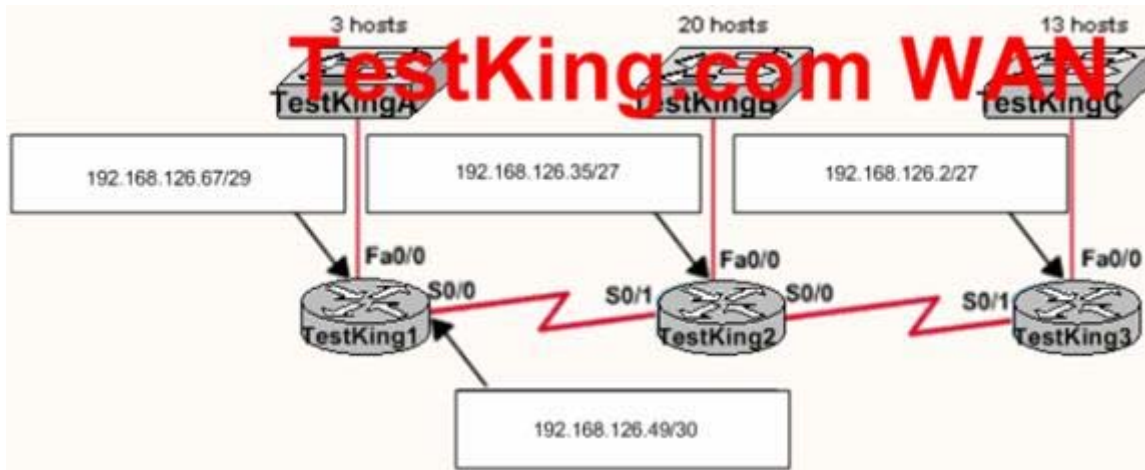
The administrator plans to configure ip subnet-zero and use RIP v2 as the routing protocol. As a member of the networking team, you must address the network and at the same time converse unused addresses for future growth.

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.

192.168.55.57/27

192.168.55.29.28

192.168.55.1/30

192.168.55.132./25

192.168.55.0/30

192.168.55.127/26

Trucks S0/1 IP

Testking.com

Fa0/0   S0/1   S0/0   S0/1   Fa0/0
             Fa0/0

Cars Fa0/0 IP   Trucks Fa0/0 IP   Vans Fa0/0 IP

7 hosts   90 hosts   23 hosts

Answer:
Explanation:

192.168.55.1/30

Testking.com

Fa0/0   S0/1   S0/0   S0/1   Fa0/0
                 Fa0/0

192.168.55.0/30

192.168.55.127/26

192.168.55.29.28   192.168.55.132./25   192.168.55.57/27

7 hosts   90 hosts   23 hosts
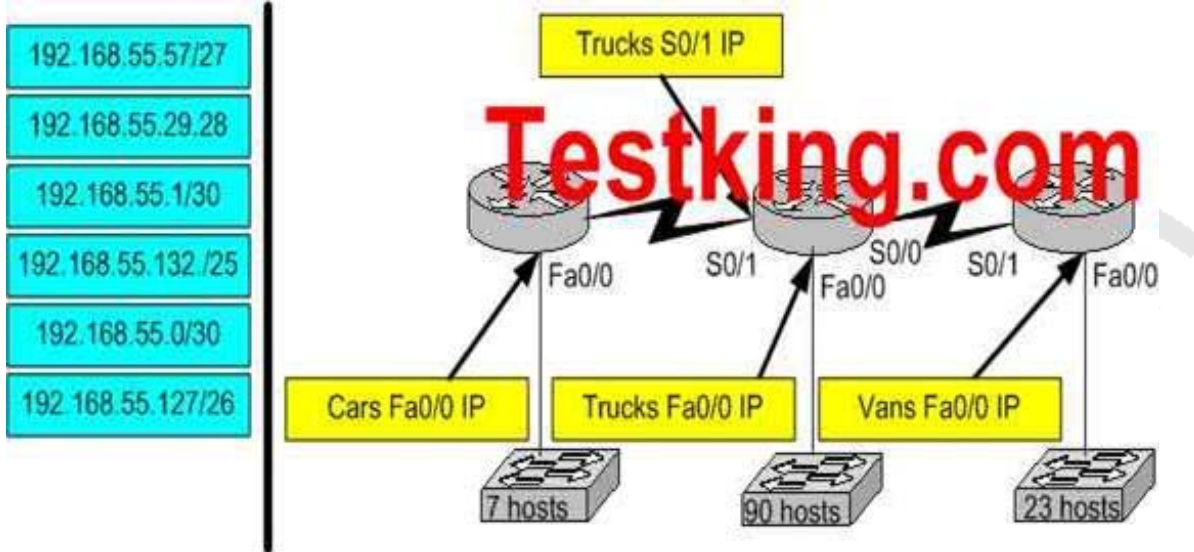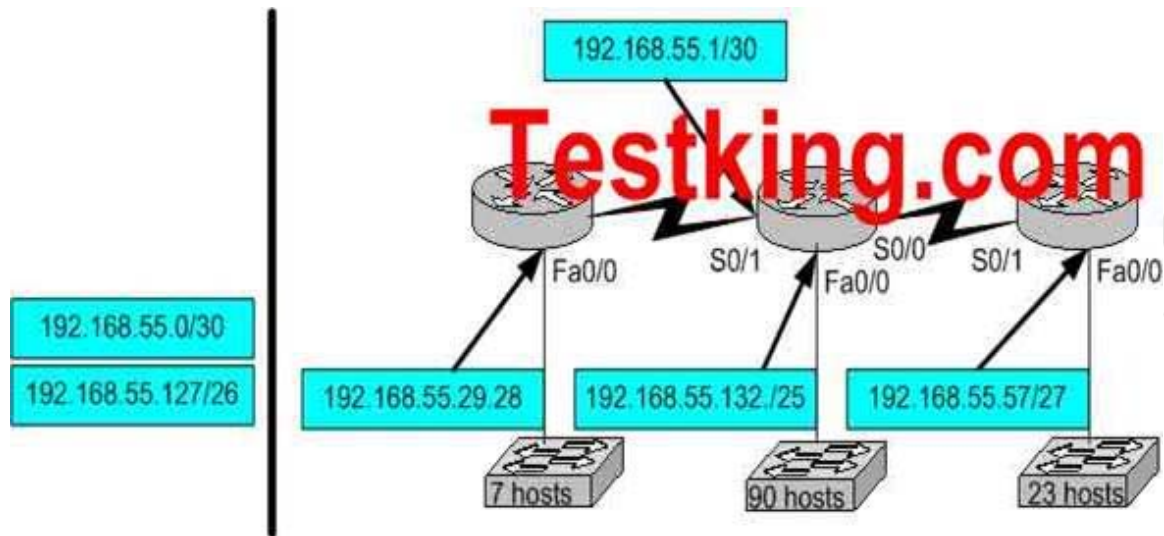
QUESTION NO: 45
**You are the network administrator at TestKing. TestKing has been assigned the
class C IP address 189.66.1.0 by its Internet Service Provider. If you divide the
network range by using the 255.255.255.224 subnet mask, how many hosts can be
supported on each network?**

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 2n-2 formula where n represents the number of host bits. In this case it will be 5. 25-2 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 NO: 46
Which of the following statements are true regarding a network using 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
Explanation:
This subnet mask includes the first 5 bits within the third octet, so for a class A address 13 bits will be used for the mask (8 bits in the second octet plus 5 in the third).
Since the first 5 bits are used in this octet, that means that remaining 3 bits in this octet will be available for hosts, so each network will be a factor of 8, making the last available subnet with a .248 in the third octet.

QUESTION NO: 47
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 10.255.255.255.255	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 NO: 48
What is the network 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
Explanation:
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 NO: 49
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 the CIDR block of 115.54.4.0 /22 the subnet mask is 255.255.252.0.
This gives us theIP address range of 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 NO: 50
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 address of 172.16.112.1 / 20,

subnet mask: 255.255.240.0
max. num of hosts =((2^12) -2) = 4096-2 = 4094

QUESTION NO: 51

You work as network consultant. Your customer, TestKing Inc, has a class C network license. TestKing 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 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 NO: 52

Your TestKing 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:
The binary number 11111001 translates to 128 + 64+32+16+8+1 = 249

QUESTION NO: 53
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 25 = 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 25 -2 =32-2 = 30 Hosts

QUESTION NO: 54
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:
 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.

Incorrect Answers:
32 cannot be used it is the network; 47 cannot be used it is the broadcast.
A, C: These choices are both network addresses.
D. This is a broadcast address.

QUESTION NO: 55DRAG DROP
**TestKing 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 converse 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 (** This information is missing**). Not all of the host
addresses on the left will be used.**

The following address blocks are available to be placed:

- 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:
Explanation:

Network diagram with placements:
- 192.168.236.85/30 — TestKing1 S0/0 to TestKing2 link
- 192.168.236.77/28 — TestKingC (11 hosts)
- 192.168.236.7/26 — TestKingA (43 hosts)
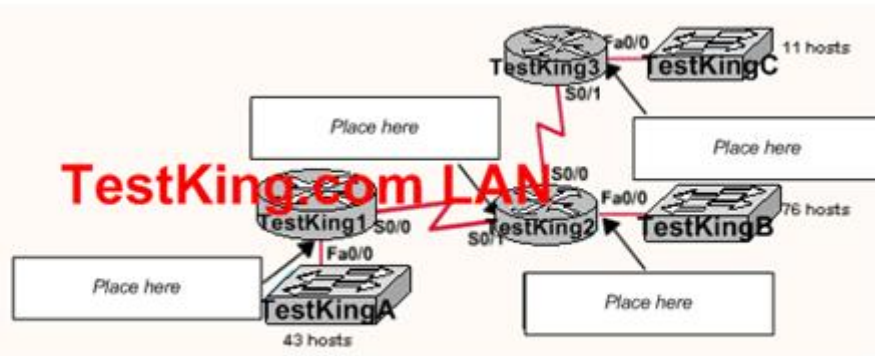- 192.168.236.175/25 — TestKingB (76 hosts)
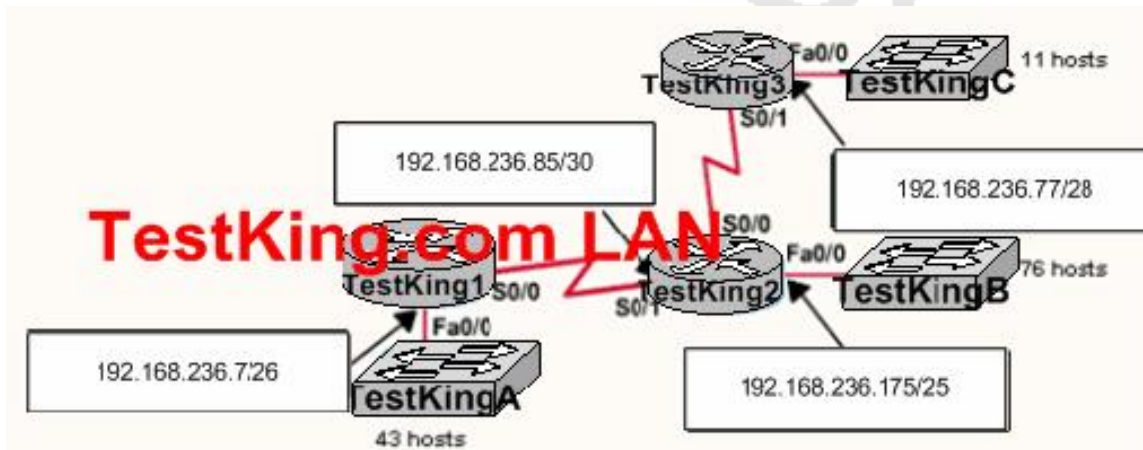
QUESTION NO: 56 DRAG DROP
TestKing has three locations and has plans to redesign the network accordingly. The networking team received 192.168.132.0 to use as the addressing for entire network from the administrator. After subnetting the address, the team is ready to assign the address.

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 converse 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 (** This information is missing**). Not all of the host addresses on the left will be used.
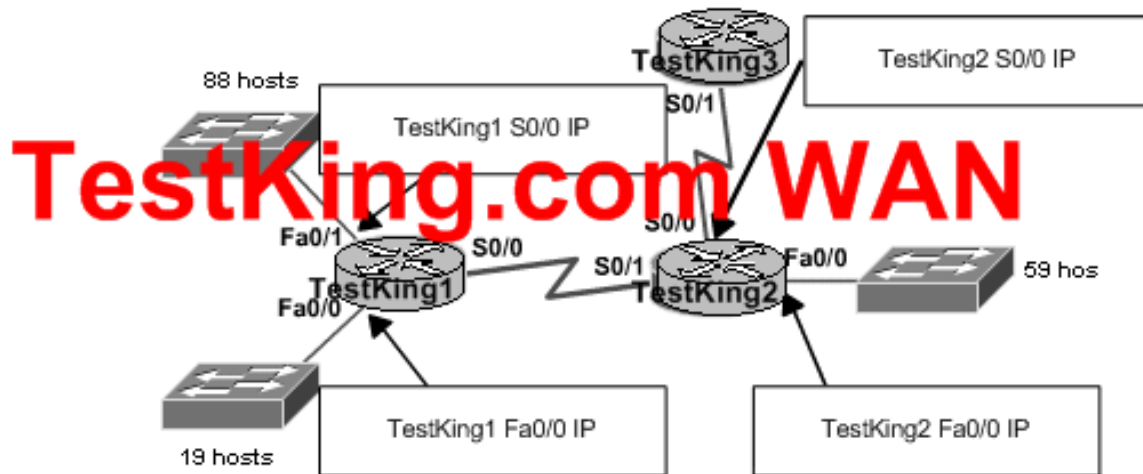
Select from these:

192.168.132.131/27	192.168.132.226/26
192.168.132.161/30	192.168.132.199/28
192.168.132.160/30	192.168.132.39/25

 Answer:
Explanation:

88 hosts
192.168.132.39/25
TestKing3
192.168.132.161/30
S0/1

TestKing.com WAN

Fa0/1
S0/0
S0/0
S0/1
Fa0/0
59 hos
Fa0/0
TestKing1
TestKing2
Fa0/0

19 hosts
192.168.132.131/27
192.168.132.226/26

Select from these:

192.168.132.199/28

TestKing.com

192.168.132.160/30

QUESTION NO: 57
In network that support VLSM, which network mask should be used for
point-to-point WAN links in order to reduce waste of IP addresses?

A. /24
B. /30
C. /27
D. /26
E. /32

Answer: B
Explanation:

A 30-bit mask is used to create subnets with two valid host addresses. This is the exact number needed for a point-to-point connection.

QUESTION NO: 58
The network 172.25.0.0 has been divided into eight equal subnets. Which of the following IP addresses can be assigned to hosts in the third subnet if the ip subnet-zero command is configured on the router? (Choose three)

A. 172.25.78.243
B. 172.25.98.16
C. 172.25.72.0
D. 172.25.94.255
E. 172.25.96.17
F. 172.25.100.16

Answer: A, C, D
Explanation:
If we divide the address 172.25.0.0 in 8 subnets, the resulting subnets will be
1. 172.25.0.0
2. 172.25.32.0
3. **172.25.64.0 This is the third subnet**
4. 172.25.96.0
5. 172.25.128.0
6. 172.25.160.0
7. 172.25.192.0
8. 172.25.224.0

Addresses that fall in the 3rd subnet will be from 172.25.64.0 ---- 172.25.95.255
Choices A, C and D lie in this network range.

QUESTION NO: 59 DRAG DROP
TestKing has three locations and has plans to redesign the network accordingly. The networking team received 192.168.199.0 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 converse 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 (** This information is missing**). Not all of the host addresses on the left will be used.
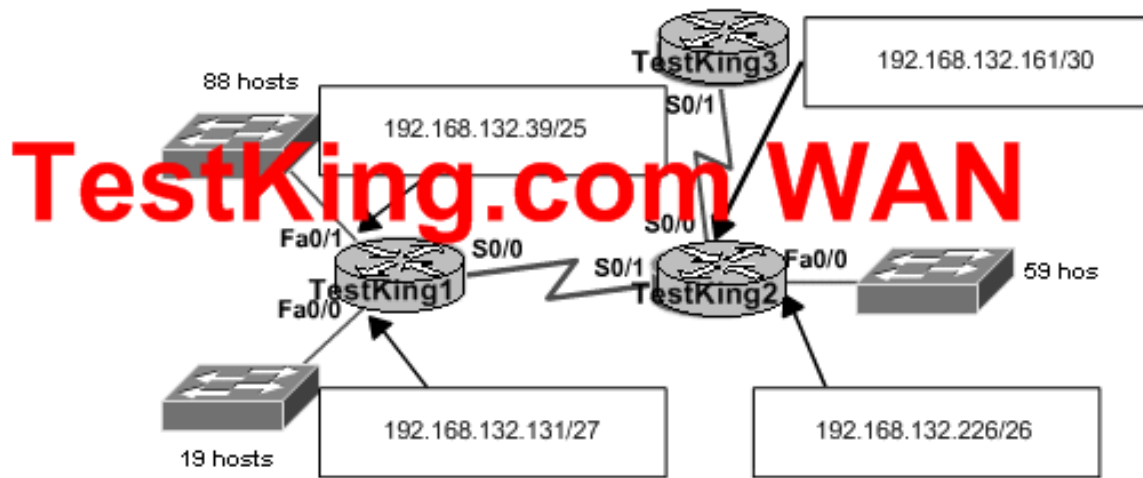
3 hosts

TestKing3

TestKing2 S0/0 IP

TestKing1 S0/0 IP

S0/1

S0/0

S0/0

TestKing.com WAN

Fa0/1

S0/0

S0/1

Fa0/0

110 hosts

TestKing1

TestKing2

Fa0/0

TestKing1 Fa0/0 IP

TestKing2 Fa0/0 IP

43 hosts
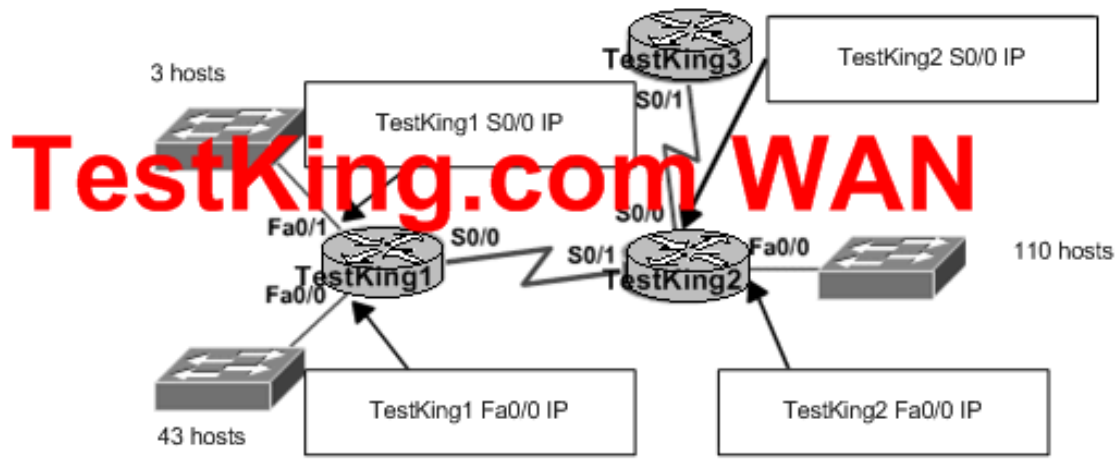
Select from these:

192.168.99.135/25	192.168.99.108/26
192.168.99.63/27	192.168.99.11/29
192.168.99.0/30	192.168.99.1/30

 Answer:
Explanation:

3 hosts

192.168.99.11/29

TestKing3

192.168.99.1/30

S0/1

Fa0/1

S0/0

S0/0

Fa0/0

TestKing1

S0/0

S0/1

TestKing2

110 hosts

Fa0/0

192.168.99.108/26

192.168.99.135/25

43 hosts

Select from these:

192.168.99.63/27

192.168.99.0/30

QUESTION NO: 60 DRAG DROP
TestKing has three locations and has plans to redesign the network accordingly. The networking team received 192.168.197.0 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 converse 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 (** This information is missing**). Not all of the host addresses on the left will be used.
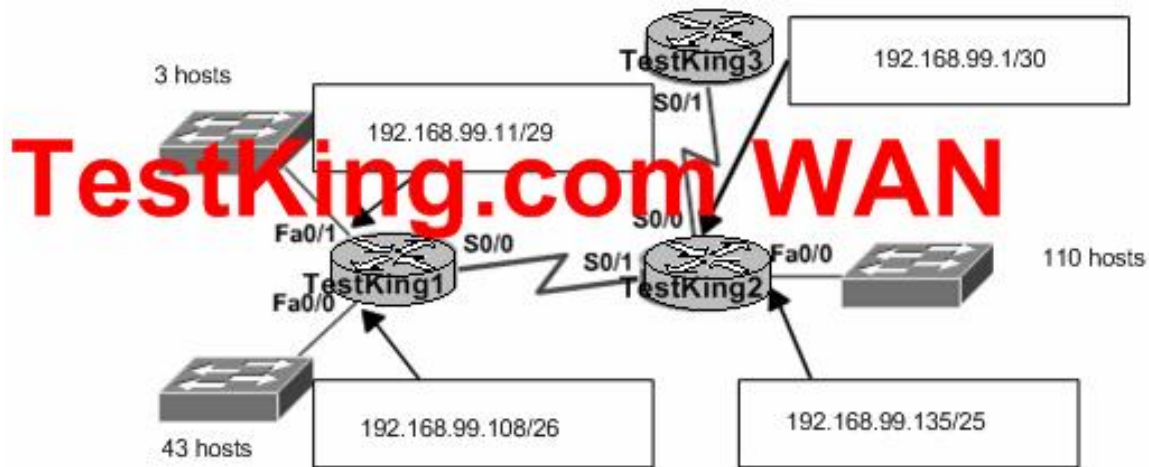
192.168.197.127/25

192.168.197.229/30

192.168.197.235/29

192.168.197.194/27

192.168.197.132/26

192.168.197.228/30

47 hosts — TestKingA

5 hosts — TestKingB

26 hosts — TestKingC

TestKing.com WAN

TestKing1 Fa0/0 IP

TestKing2 Fa0/0 IP

TestKing3 Fa0/0 IP

Fa0/0 — S0/0 — TestKing1

S0/0 — S0/1 — Fa0/0 — TestKing2

S0/1 — Fa0/0 — TestKing3

TestKing1 S0/0 IP

Answer:
Explanation:

192.168.197.127/25

192.168.197.229/30

192.168.197.235/29

192.168.197.194/27

192.168.197.132/26

192.168.197.228/30

47 hosts — TestKingA

5 hosts — TestKingB

26 hosts — TestKingC

TestKing.com WAN

192.168.197.132/26

192.168.197.235/29

192.168.197.194/27

Fa0/0 — S0/0 — TestKing1

S0/0 — S0/1 — Fa0/0 — TestKing2

S0/1 — Fa0/0 — TestKing3
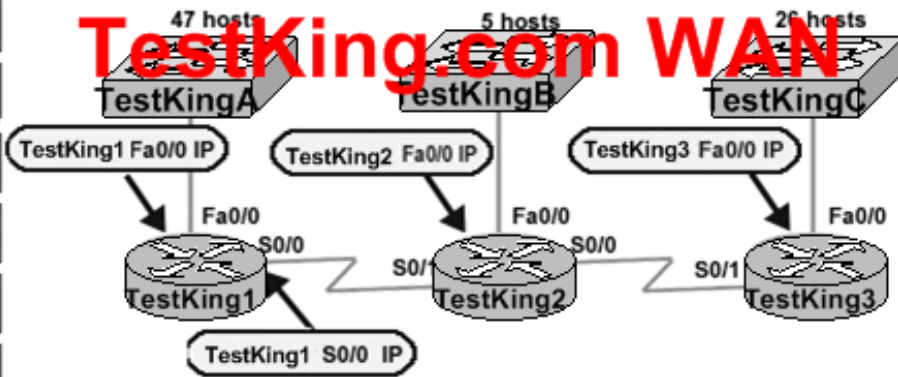
192.168.197.229/30

QUESTION NO: 61 DRAG DROP
**TestKing has three locations and has plans to redesign the network accordingly. The
networking team received 192.168.15.0 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 converse unused addresses for future growth.
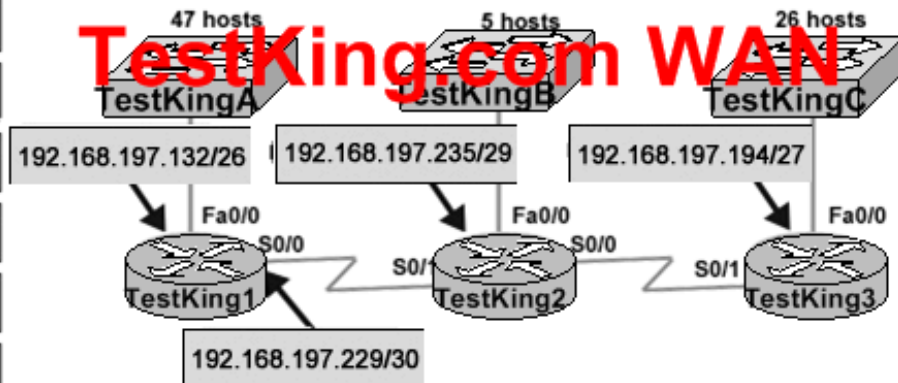
Being mindful of these goals, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Move the mouse over a router to view its configuration (** This information is missing**). Not all of the host addresses on the left will be used.
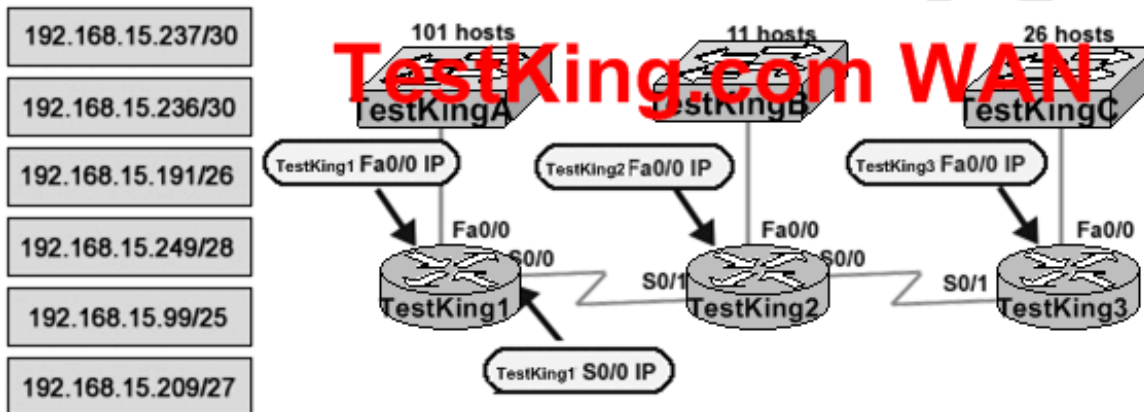
Answer:
Explanation:

QUESTION NO: 62
Refer to the exhibit. All of the routers in the TestKing network are configured with the "ip subnet-zero" command. Which network addresses should be used for Link A and Network A? (Choose two)

Exhibit:
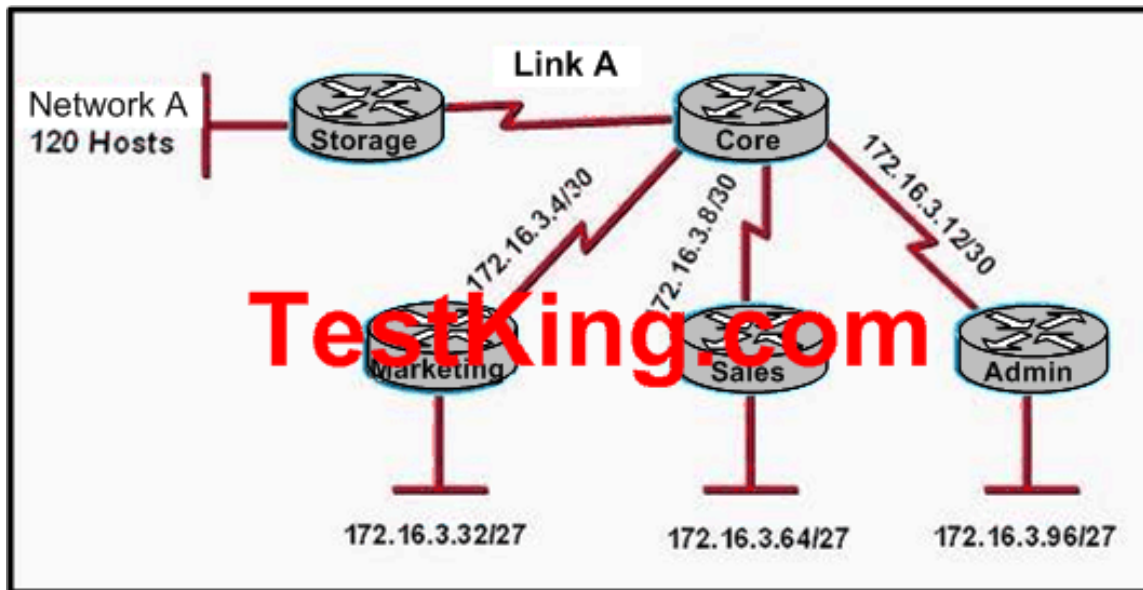
A. Link A - 172.16.3.0/30
B. Link A - 172.16.3.40/30
C. Network A - 172.16.3.128/25
D. Link A - 172.16.3.112/30
E. Network A - 172.16.3.48/26
F. Network A - 172.16.3.192/26

Answer: A, C
Explanation:
If a network address is subnetted, the first subnet obtained after subnetting the network address is called subnet zero.
Consider a Class B address, 172.16.0.0. By default the Class B address 172.16.0.0 has 16 bits reserved for representing the host portion, thus allowing 65534 (216-2) valid host addresses. If network 172.16.0.0/16 is subnetted by borrowing three bits from the host portion, eight (23) subnets are obtained. The table below is an example showing the subnets obtained by subnetting the address 172.16.0.0, the resulting subnet mask, the corresponding broadcast addresses, and the range of valid host addresses.

Subnet Address	Subnet Mask	Broadcast Address	Valid Host Range
172.16.0.0	255.255.224.0	172.16.31.255	172.16.0.1 to 172.16.31.254
172.16.32.0	255.255.224.0	172.16.63.255	172.16.32.1 to 172.16.63.254
172.16.64.0	255.255.224.0	172.16.95.255	172.16.64.1 to 172.16.95.254
172.16.96.0	255.255.224.0	172.16.127.255	172.16.96.1 to 172.16.127.254
172.16.128.0	255.255.224.0	172.16.159.255	172.16.128.1 to 172.16.159.254
172.16.160.0	255.255.224.0	172.16.191.255	172.16.160.1 to 172.16.191.254
172.16.192.0	255.255.224.0	172.16.223.255	172.16.192.1 to 172.16.223.254
172.16.224.0	255.255.224.0	172.16.255.255	172.16.224.1 to 172.16.255.254

the example above, the first subnet (subnet 172.16.0.0/19) is called subnet zero.

The class of the network subnetted and the number of subnets obtained after subnetting have no role in determining subnet zero. It is the first subnet obtained when subnetting the network address. Also, when you write the binary equivalent of the subnet zero address, all the subnet bits (bits 17, 18, and 19 in this case) are zeros. Subnet zero is also known as the all-zeros subnet.

In this example, link A will use the zero subnet of 172.16.30./30, while network A will need a /25 to support the 120 hosts. Answer C will support up to 128 (126 usable) hosts while options E and F will only support 62 usable IP addresses.

QUESTION NO: 63
A new subnet with 60 hosts has been added to the TestKing network shown below. Which subnet address should this network use to provide enough usable addresses while wasting the fewest addresses?

Exhibit:

192.168.1.0/27   192.168.1.32/28   192.168.1.48/28   60 hosts
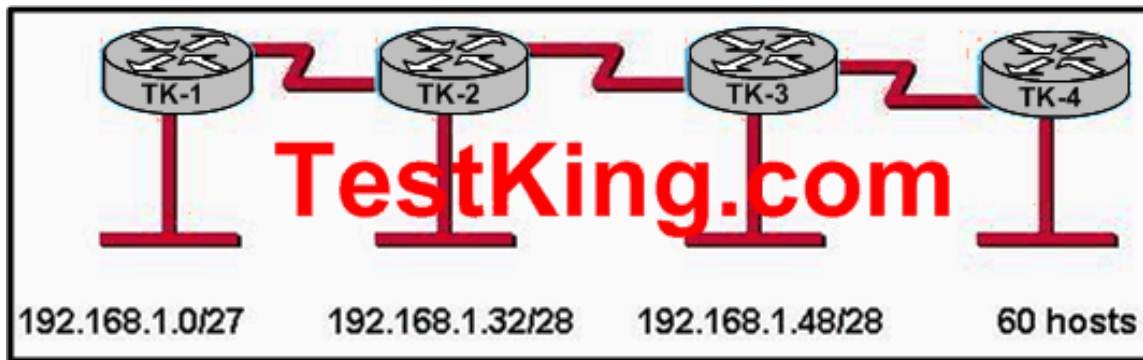
A. 192.168.1.56/27
B. 192.168.1.64/26
C. 192.168.1.56/26
D. 192.168.1.64/27

Answer: B
Explanation:
A subnet mask of 255.255.255.192 (/26) will be needed to support 60 hosts. Option B
will allow for this number of hosts, and the next available IP subnet in the 192.168.1.0
subnet that is not already used in the network is 192.168.1.64.
Incorrect Answers:
A, D: A /27 subnet mask will only support up to 30 hosts.
C: This network will conflict with the 192.168.1.48/28 network that is already in use, as
the range of IP addresses used in this network is 192.168.1.48-192.168.1.63.

QUESTION NO: 64
**In the TestKing network shown below, which subnet address could a network
administrator use for Network A on the left?**

Exhibit:
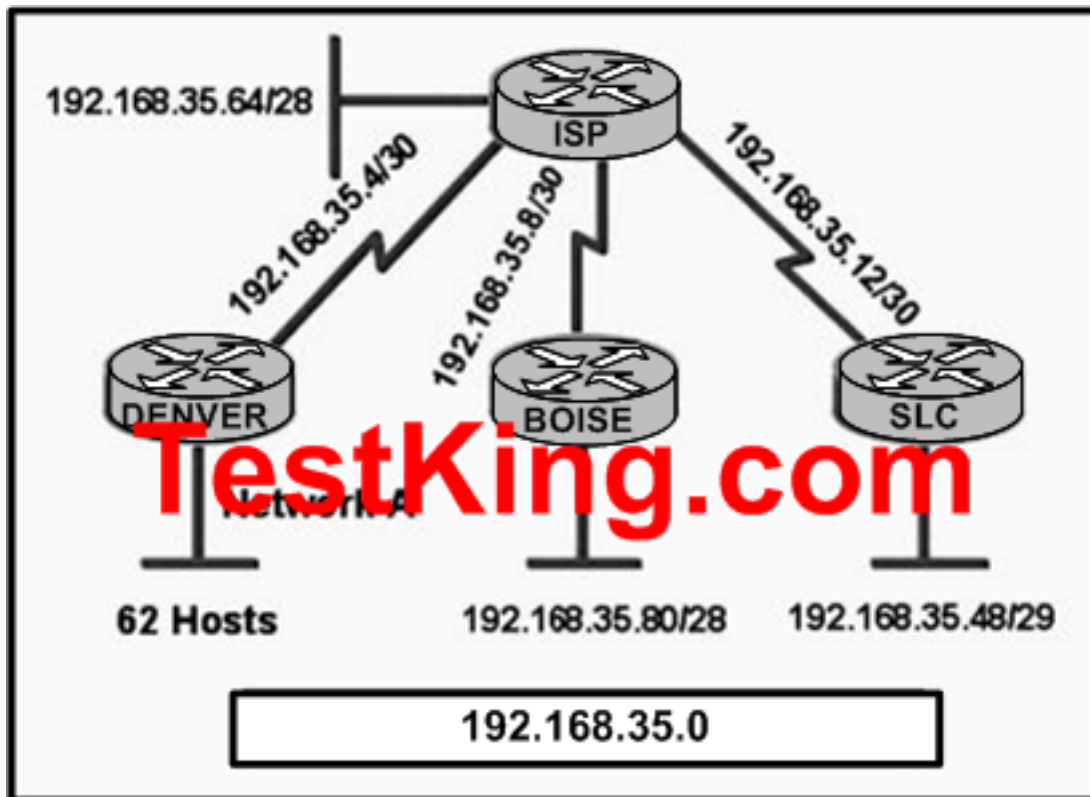
A. 192.168.35.64/26
B. 192.168.35.32/27
C. 192.168.35.128/26
D. 192.168.35.192/27
E. 192.168.35.96/27

Answer: C
Explanation:
In order to support 62 hosts, a /26 will be needed, leaving only options A and C. The IP network in option A will conflict with the 192.168.35.64/28 that is already in use, leaving only choice C as the correct answer.
Incorrect Answers:
A: This will conflict with a network that is already in use, causing there to be duplicate IP addresses assigned in the network.
B, D, E: A /27 will only support 30 hosts.

QUESTION NO: 65
The TestKing network administrator has designed the IP scheme as shown in the diagram below. What effect will this addressing scheme have on the network?

Exhibit:
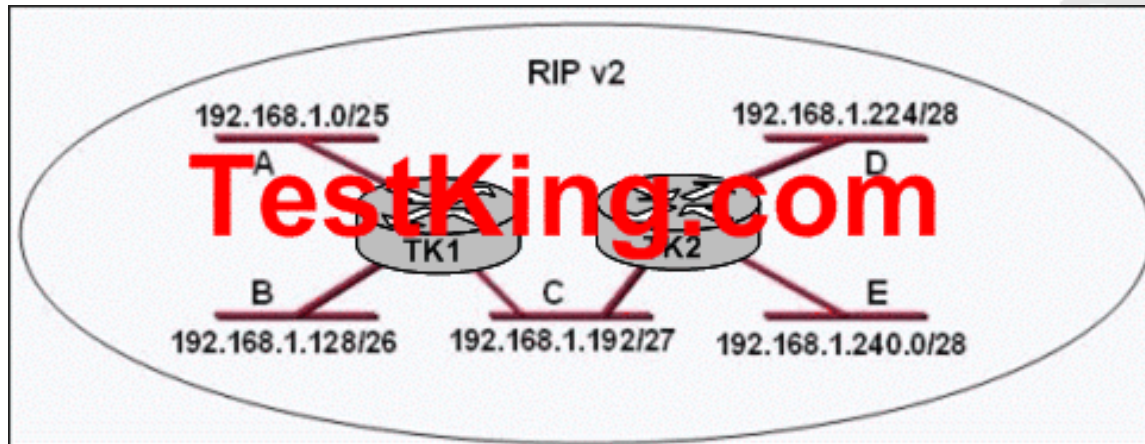
A. IP traffic between subnet A and B will be prevented.
B. Routing information will not be exchanged.
C. The addressing scheme will allow all IP traffic between the LANs.
D. IP traffic between all the LANs will be prevented.

Answer: C
Explanation:
This scheme will allow for communication between all networks, and uses all IP addresses in the 192.168.1.0/24 IP network with no overlap. Note that RIPv2 is being used instead of RIPv1. RIPv2 carries subnet mask information allowing for VLSM networks like the one shown here.

QUESTION NO: 66
The network with the IP address 172.31.0.0/19 is to be configured on the TestKing router with the partial configuration shown in the graphic. Which of the following statements describes the number of available subnets and hosts that will result from this configuration?

Exhibit:

```
Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R1
!
ip subnet-zero
!
!
ip classless
ip route 0.0.0.0 0.0.0.0 Serial0/0
no ip http server
!
<output omitted>
```

A. There are 7 usable subnets, with 2046 usable host addresses.
B. There are 8 usable subnets, with 30 usable host addresses.
C. There are 7 usable subnets, with 30 usable host addresses.
D. There are 8 usable subnets, with 2046 usable host addresses.
E. There are 7 usable subnets, with 8190 usable host addresses.
F. There are 8 usable subnets, with 8190 usable host addresses.

Answer: F
Explanation:
The 172.31.0.0/19 will have 3 bits in the network portion, and 13 bits in the host portion.
This will allow for $2^3 = 8$ networks and $2^{13} = 8192$ hosts available for each network
(8190 usable). Since the IP subnet-zero command is used the first network is available,
making choice F correct.

QUESTION NO: 67

A new subnet with 12 hosts in the TestKing network has been added. Which subnet address should this network use to provide enough useable addresses while wasting the fewest addresses?

Exhibit:
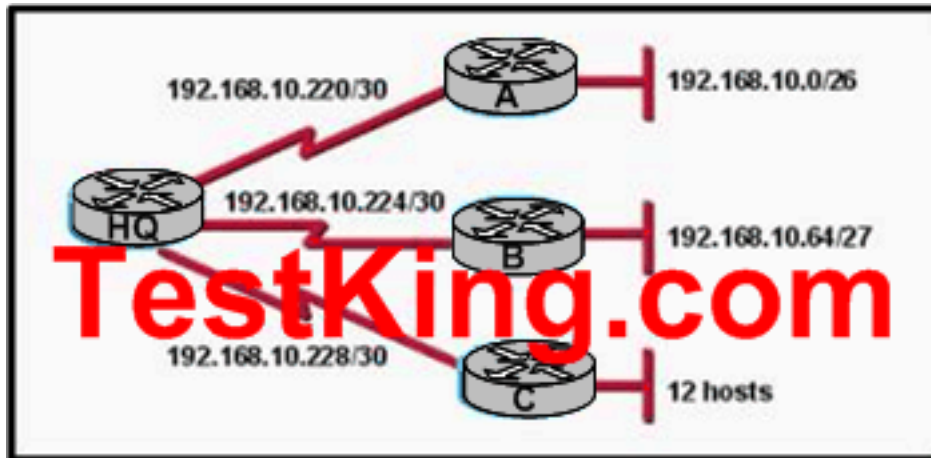
A. 192.168.10.80/29
B. 192.168.10.96/28
C. 192.168.10.80/28
D. 192.168.10.96/29

Answer: B
Explanation:
A /29 subnet mask will only support 6 IP hosts. A subnet mask of 255.255.255.240 (/28) will support up to 14 hosts, leaving only options B and C as viable. Option C will overlap with the existing 192.168.10.64/27 network, which will cause duplicate IP addresses to be assigned in the network.

QUESTION NO: 68
A company has the following addressing scheme requirements:

-uses a Class B IP address
-currently has 60 subnets
-has a maximum of 1000 computers on any network segment
-needs to leave the fewest unused addresses in each subnet
-uses RIP v1

Which subnet mask is appropriate to use in this network?

A. 255.255.252.0
B. 255.255.248.0
C. 255.255.255.0
D. 255.255.255.128
E. 255.255.255.248
F. 255.255.240.0

Answer: A
Explanation:
A subnet mask of 255.255.255.252 (/22) will result in 6 bits for the network portion and 10 bits for the host portion. This will allow for $2^6 = 64$ IP subnets (62 usable), with each one supporting $2^{10} = 1024$ hosts (1022 usable IP addresses). This meets the requirements of 60 subnets with 1000 maximum hosts per subnet.

Section 3: Select an appropriate routing protocol based on user requirements (18 questions)

QUESTION NO: 1
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 NO: 2

The TestKing network is shown in the diagram below:
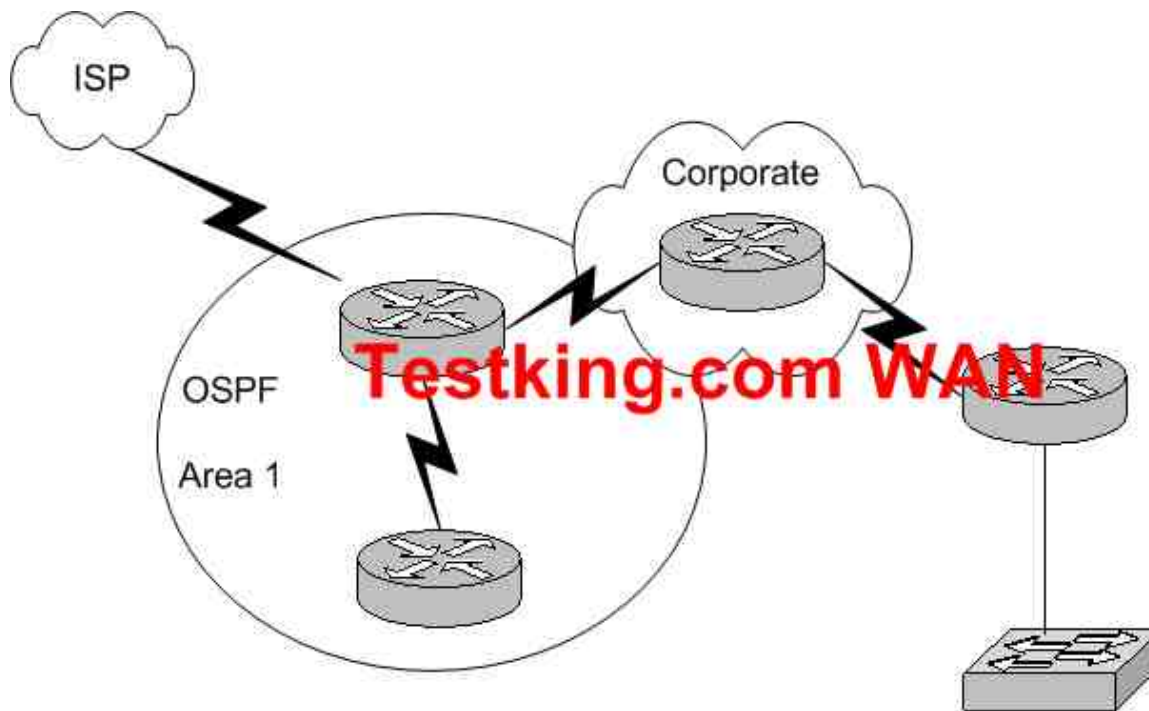
In this diagram, OSPF is used as the routing protocol between the corporate office and the offices on the left side of the diagram. An ISDN link provides connectivity from the central corporate router to the remote sales office on the right side of the diagram. Which type of route should the corporate 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 NO: 3
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 NO: 4
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 NO: 5
You need to choose a routing protocol for a new TestKing 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 NO: 6
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 NO: 7
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

QUESTION NO: 8
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 NO: 9
You need to implement the use of a routing protocol that meets the following requirements:

1. **Converges quickly**
2. **Supports VLSM, CIDR, IP, and IPX.**
3. **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 also consume more bandwidth than EIGRP.
D. OSPF does not support IPX.

QUESTION NO: 10
See the TestKing WAN diagram below:
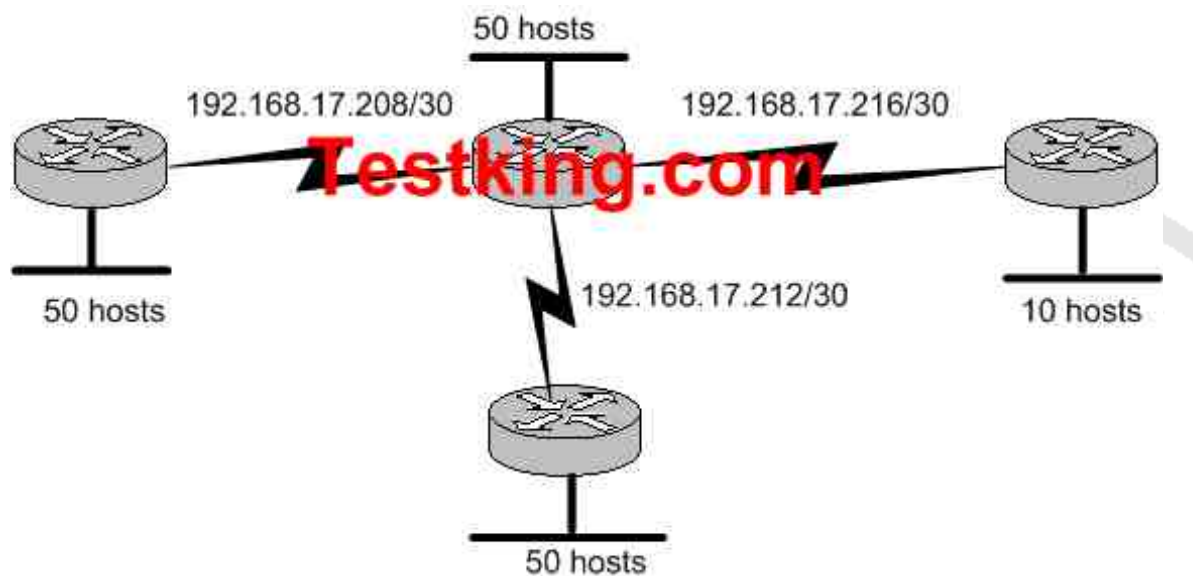
TestKing has four offices, each with its own network, as shown in the graphic. Three of the networks have approximately 50 hosts each, and one network has 10 hosts. The multi-vendor routers are connected by serial links that use separate subnetwork numbers. The TestKing network has leased one Class C 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 non-proprietary. RIP version 2 is a standards based routing protocol that supports variable length subnet masking (VLSM). Note that OSPF would also be a viable choice, but it was not one of the answer choices.

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 NO: 11
RIP version 2 is being used as the routing protocol within the TestKing 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 NO: 12
The TestKing WAN is displayed in the diagram below:
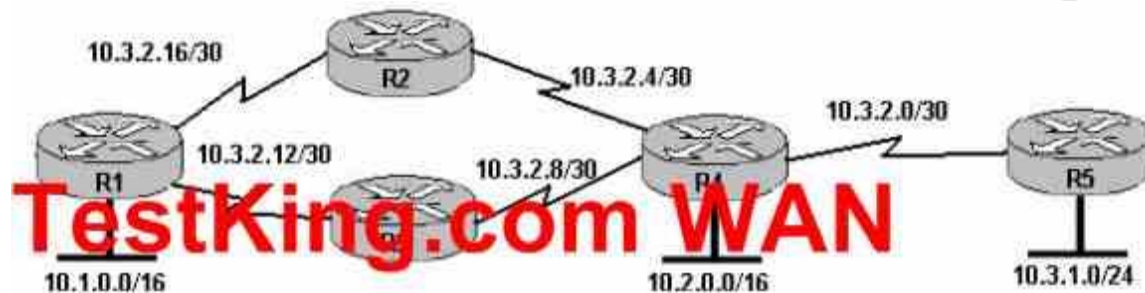
Based on the information shown above, which routing protocols can be used within the TestKing network show in the diagram? (Choose three).

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

Answer: B, D, F
Explanation: the exhibit showed routers withVariable 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 NO: 13
The TestKing 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 NO: 14
The TestKing network is displayed in the diagram shown below:

The TestKing network consists of a small office with twenty-five employees that has one connection to the Internet through the TK1 router. What routing configurations are recommended on the TK1 and ISP routers?

A. BGP on both the routers.
B. RIP on both the routers.
C. Default routes on both routers.
D. BGP on the ISP router and a static route on TK1.
E. A default route on TK1 and a static route on the ISP router.

Answer: E
Explanation:
Since private network use RFC 1918 IP address ranges internally, and because of security reasons, it is generally not possible to use an interior routing protocol with the ISP. This eliminates choice B. When connecting to an ISP, usually only BGP or static routes are supported. In this case, since there is only one connection to the Internet, BGP is not needed so choices A and D can be eliminated. A static default route would be needed on router TK1 to route to the Internet. In turn, the ISP only needs a specific static route to reach the LAN of the TestKing network.
Incorrect Answers:
A, D: BGP is not needed on networks that contain only a single link to the Internet.
B. Interior routing protocols are generally not supported with an ISP.
C. A default route on the ISP router would send all of their customers Internet traffic to the TestKing network, and not the Internet.

QUESTION NO: 15
What is the purpose of the OSPF router ID in a DR/BDR election?

A. It is used with the OSPF priority values to determine which OSPF router will become the DR or BDR in a point-to-point network
B. It is used with the OSPF priority values to determine which interface will be used to form a neighbor relationship with another OSPF router
C. It is used with the OSPF priority values to determine which router will become the DR or BDR in a multi access network
D. It is used to determine which interfaces will send Hello packets to neighboring OSPF routers

Answer: C
Explanation:
The router ID is the highest IP address or the highest IP address among loopback addresses (if one is configured) on the Cisco router or can be configured manually by "router-id x.x.x.x". Once the router ID is chosen, it will not be changed unless the OSPF process is reset(clear ip ospf process xx) or the router is reloaded. The IP address of router ID doesn't need to be reachable, but it is used to determine which will router will become the DR or BDR in a multi-access network.

QUESTION NO: 16
The TestKing network is shown in the following exhibit:
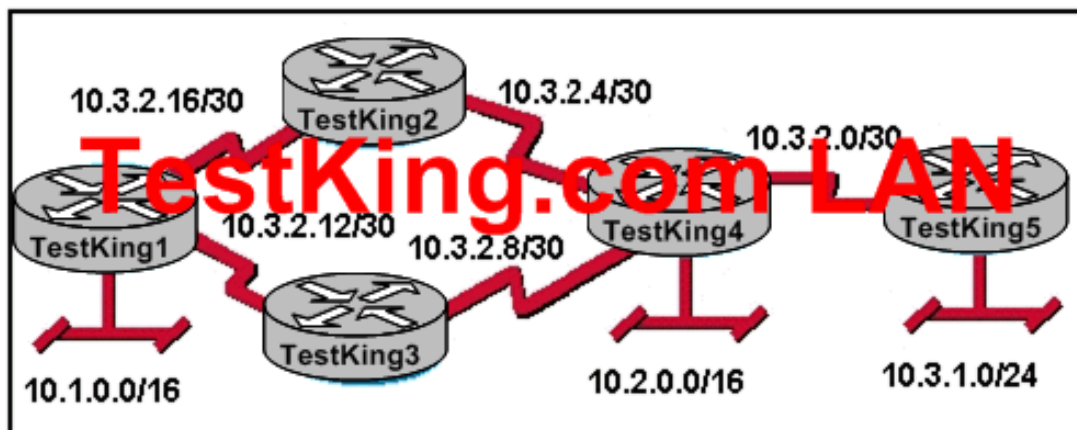
Which routing protocols can be used within the enterprise network shown in the diagram? (Choose three.)

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

Answer: B, D, F
Explanation:
In this network there are IP subnets which use variable length subnet masks. RIP V2, OSPF and EIGRP are the interior routing protocols that support VLSM.

QUESTION NO: 17
What is the advantage of using a multipoint interface instead of point-to-point subinterfaces when configuring a Frame Relay hub in a hub-and-spoke topology?

A. It avoids split-horizon issues with distance vector routing protocols.
B. IP addresses can be conserved if VLSM is not being used for subnetting.
C. A multipoint interface offers greater security compared to point-to-point subinterface configurations.
D. The multiple IP network addresses required for a multipoint interface provide greater addressing flexibility over point-to-point configurations.

Answer: B
Explanation:
Frame Relay supports two types of interfaces: point-to-point and multipoint. The one you choose determines whether you need to use the configuration commands that ensure IP address to data-link connection identifier (DLCI) mappings. After configuring the PVC itself, you must tell the router which PVC to use in order to reach a specific destination. Let's look at these options:
1.

Point-to-point subinterface - With point-to-point subinterfaces, each pair of routers has its own subnet. If you put the PVC on a point-to-point subinterface, the router assumes that there is only one point-to-point PVC configured on the subinterface. Therefore, any IP packets with a destination IP address in the same subnet are forwarded on this VC. This is the simplest way to configure the mapping and is therefore the recommended method. Use the frame-relay interface-dlci command to assign a DLCI to a specified Frame Relay subinterface.

2. Multipoint networks - Multipoint networks have three or more routers in the same subnet. If you put the PVC in a point-to-multipoint subinterface or in the main interface (which is multipoint by default), you need to either configure a static mapping or enable inverse Address Resolution Protocol (ARP) for dynamic mapping.

QUESTION NO: 18
TestKing.com is merging with several local businesses that use routers from multiple vendors. Which routing protocol would work best to connect TestKing.com with the enterprise networks it has acquired by providing scalability and VLSM support while minimizing network overhead?

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

Answer: C
Explanation:
RIP (both version 1 and version 2) is standards based, providing inter-operability support between vendors. RIPv2 is an enhancement to the first version and contains the following enhancements:

1. Support for variable length subnet masks (VLSM) (Because of this, RIP doesn't assume that all networks are classful.)
2. Multicast routing updates
3. Authentication with an encrypted password for routing updates

Incorrect Answers:
A, B: IGRP and EIGRP are Cisco proprietary routing protocols that are not supported by other vendors.
C: OSPF is a CPU-intensive protocol, and very large OSPF networks can experience routing and update traffic problems that seriously impact network performance. In addition, routers in large OSPF networks require large amounts of memory.

E: RIPv1 does not support VLSM.

Section 4: Design a simple internetwork using Cisco technology (19 questions)

QUESTION NO: 1
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 NO: 2
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
Explanation:
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 "frame-relay interface-dlci" command for each of the subinterfaces.
D. Each subinterface should be configured as a point to point network type.

QUESTION NO: 3

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 HG 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 HG router. As it is set up currently, no traffic will pass from the Branch router to the HG until these two interfaces are in the same subnet.

QUESTION NO: 4
A portion of he TestKing network is shown in the diagram below:
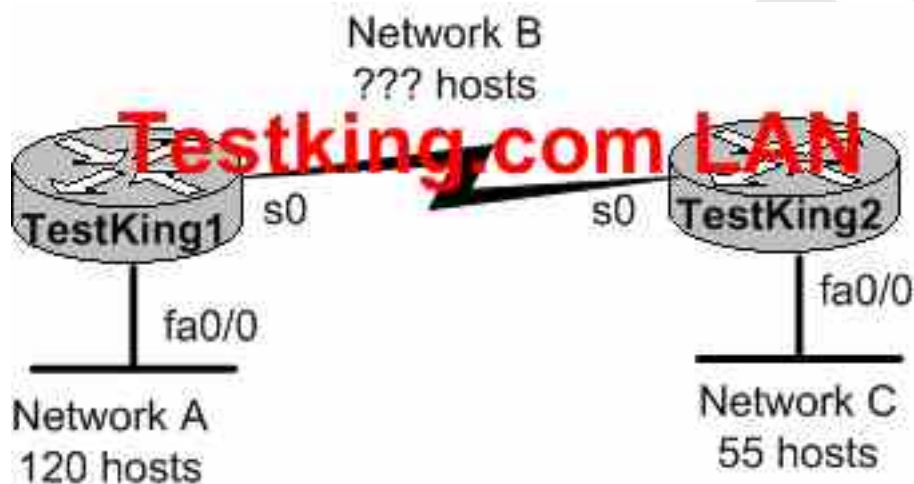
Consider the 192.1.1.0/24 network in this exhibit. This network uses RIP v2. Which combination of subnetwork assignments will satisfy the requirements for networks A, B, and C of this design? (Select three)

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
Explanation:
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 NO: 5
The TestKing network topology is displayed in the following diagram:
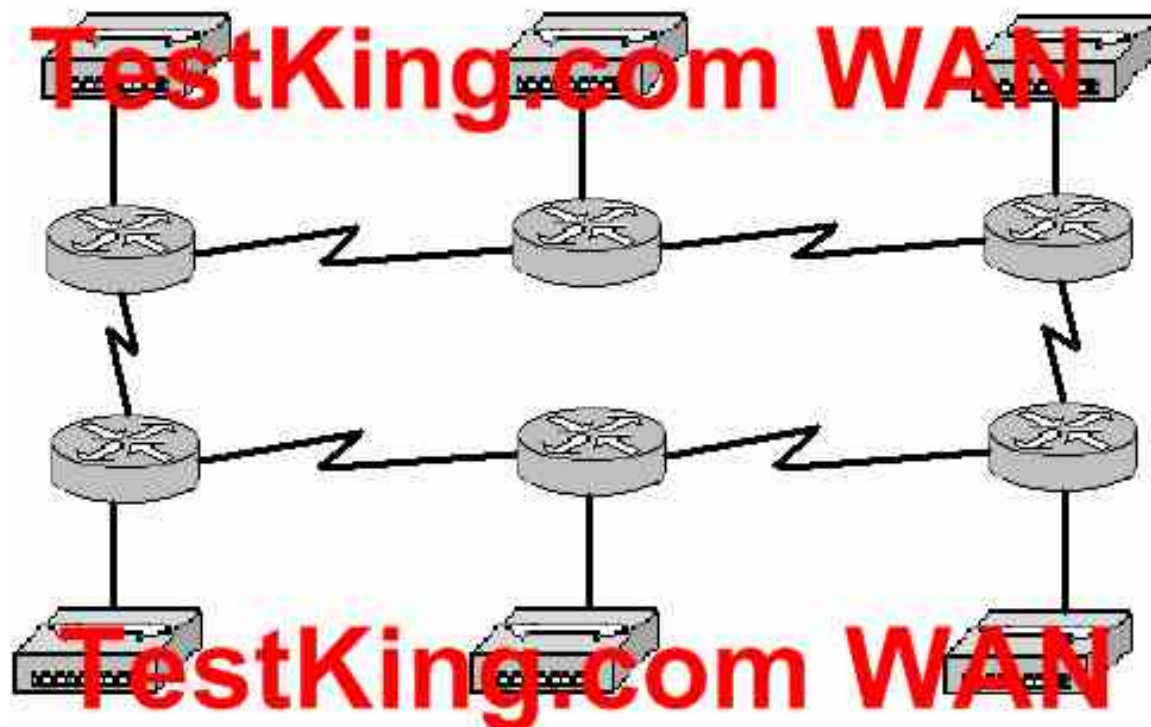
Assume that RIP v1 is the only routing protocol in use. What is the Maximum number of usable IP address that can be supported on each LAN if the TestKing network is using one Class C address block?

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 NO: 6
You are a technician at TestKing. Your newly appointed TestKing 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 NO: 7
Five different routers are connected via varying point to point circuit types as
displayed below:
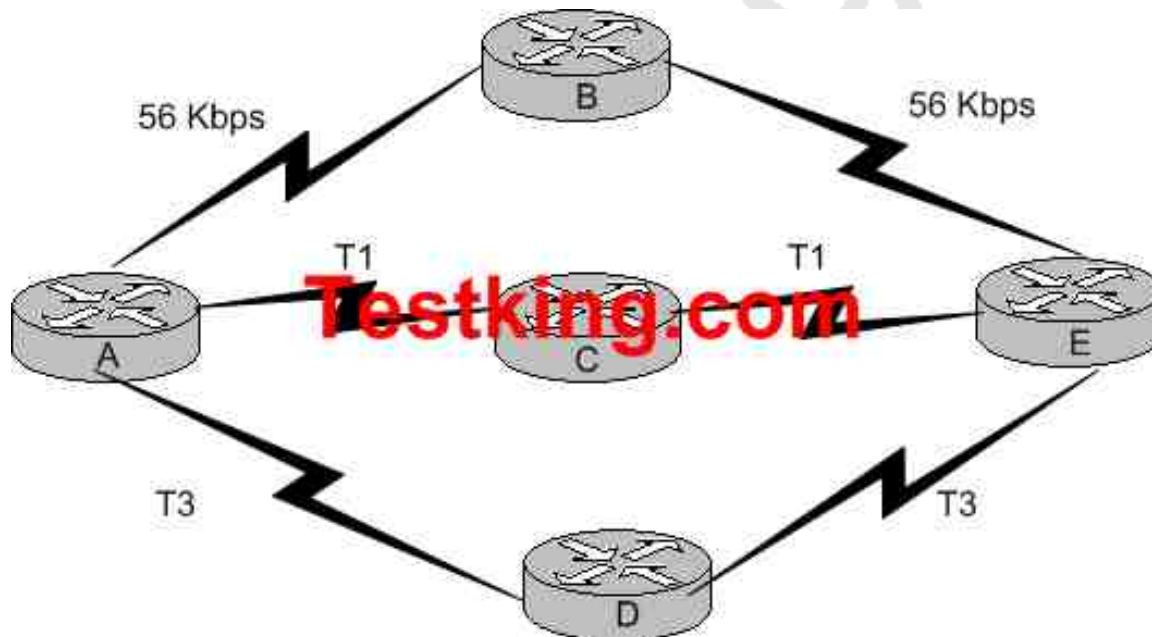
Which of the following statements are true regarding how router A will chose a path to router E? (Choose three)

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 NO: 8
You work as a network engineer at TestKing.com. You are required to allow establishment of a Telnet session with a router TestKingC.
Which set command must be configured?

A. TestKingC(config)# line console 0
TestKingC(config-line)# enable password testking

B. TestKingC(config)# line console 0
TestKingC(config-line)# enable secret testking
TestKingC(config-line)# login

C. TestKingC(config)# line console 0
TestKingC(config-line)# password testking

TestKingC(config-line)# login

D. TestKingC(config)# line vty 0
TestKingC(config-line)# enable password testking

E. TestKingC(config)# line vty 0
TestKingC(config-line)# enable secret testking
TestKingC(config-line)# login

F. TestKingC(config)# line vty 0
TestKingC(config-line)# password testking
TestKingC(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 NO: 9
The TestKing WAN is depicted below:
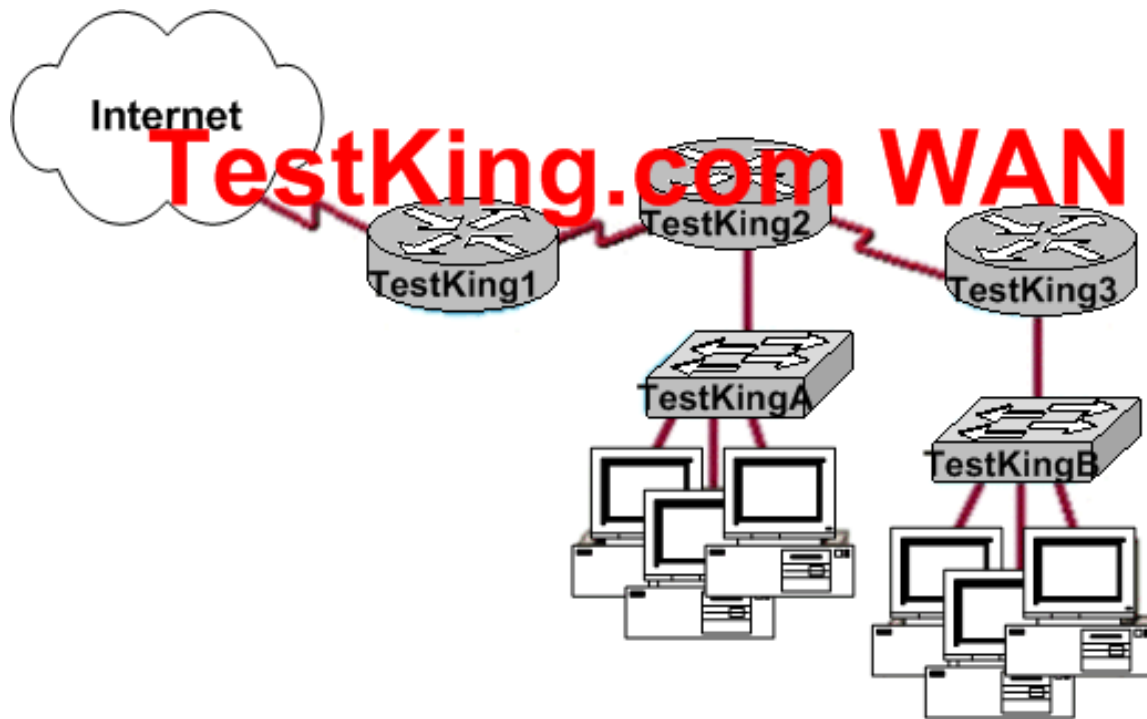
As a network technician at TestKing.com you would like to implement NAT in the network shown in the exhibit. You would like to allow inside hosts to use a private addressing scheme. Where should NAT be configured?

A. TestKing1 router
B. TestKing2 router
C. TestKing3 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 either a border router or a PIX firewall connecting to the Internet.

QUESTION NO: 10
Which command will configure a default route on a router?

A. router(config)# ip route 0.0.0.0 10.1.1.0 10.1.1.1
B. router(config)# ip default-route 10.1.1.0
C. router(config)# ip default-gateway 10.1.1.0
D. router(config)# ip route 0.0.0.0 0.0.0.0 10.1.1.1

Answer: D
Explanation:
The command "IP route 0.0.0.0 0.0.0.0 <ip-address of the interface>" command is used to configure a default route on a router. In this case, a default route with a next hop IP address of 10.1.1.1 was configured.
Incorrect Answers:
A. This will be an invalid route, since the "10.1.1.0" value will specify the network mask, which in this case is invalid.
B, C. These commands are invalid. The command "ip default-network" could be used, but not "ip default-route" or "ip default-gateway". IP default-gateway is used on switches, not routers.

QUESTION NO: 11
In which situation would the use of a static route be appropriate?

A. To configure a route to the first Layer 3 device on the network segment.
B. To configure a route from an ISP router into a corporate network.
C. To configure a route when the administrative distance of the current routing protocol is too low.
D. To reach a network is more than 15 hops away.
E. To provide access to the Internet for enterprise hosts.

Answer: B
Explanation:
Static routes are special routes that the network administrator manually enters into the router configuration. Stub networks are the ideal candidate for static routes.
There is no need to run a routing protocol over the WAN links between an ISP Router and a corporate network when only a single Internet link exists.

QUESTION NO: 12
The TestKing WAN connection is shown below:

Based on this diagram, which two devices can be used to complete the connection between the WAN router at the customer site and the service provider? (Choose two.)

A. CSU/DSU
B. modem
C. WAN switch
D. ATM switch
E. Frame Relay switch
F. ISDN TA

Answer: A, B
Explanation:
DTE is an abbreviation for Data Terminal Equipment, and refers to an end instrument that converts user information into signals for transmission, or reconverts the received signals into user information. A DTE device communicates with the Data Circuit-terminating Equipment (DCE), such as a modem or CSU/DSU.

A DTE is the functional unit of a data station that serves as a data source or a data sink and provides for the data communication control function to be performed in accordance with link protocol.

The data terminal equipment (DTE) may be a single piece of equipment or an interconnected subsystem of multiple pieces of equipment that perform all the required functions necessary to permit users to communicate. A user interacts with the DTE (e.g. through a Human-Machine Interface), or the DTE may be the user.

Usually, the DTE device is the terminal (or a computer emulating a terminal), and the DCE is a modem.

A CSU/DSU (Channel Service Unit/Data Service Unit) is a hardware device about the size of an external modem that converts a digital data frame from the communications technology used on a local area network (LAN) into a frame appropriate to a wide-area network (WAN) and vice versa. The DSU provides an interface to the data terminal equipment (DTE) using a standard (EIA/CCITT) interface. It also provides testing capabilities.

QUESTION NO: 13

Which sequence of actions will allow telnet traffic from a user's PC to a router using TCP/IP?

A. Connect the PC's COM port to the router's console port using a straight-through cable.

B. Connect the PC's COM port to the router's console port using a crossover cable.

C. Connect the PC's COM port to the router's Ethernet port using a straight-through cable.

D. Connect the PC's Ethernet port to the router's Ethernet port using a crossover cable.

E. Connect the PC's Ethernet port to the router's Ethernet port using a rollover cable.

F. Connect the PC's Ethernet port to the router's Ethernet port using a straight-through cable.

Answer: D

Explanation:

A crossover cable is used to directly connect a switch to a switch, a hub to a hub, a host to a host, or a host's Ethernet port to a router's Ethernet interface. If your Router's interface is configured with IP addressing and telnet service is enabled you can log through the telnet program into your router.

Incorrect Answers:

A, B, C: The COM port is used for direct terminal connections to a router, via the use of terminal emulation programs such as hyperterminal.

E: A rollover cable is used to connect via a console connection.

F: A straight through cable would be used if there was a LAN switch or a hub in place, but when connecting to the router directly from a PC a cross over cable should be used.

QUESTION NO: 14

You are given a PC, a router, and a cable. Select the correct combination that will allow you to log into the router locally using a terminal emulation program such as HyperTerminal.

A. Connect the PC's COM port to the router's console port using a straight-through cable.

B. Connect the PC's COM port to the router's console port using a rollover cable.

C. Connect the PC's COM port to the router's Ethernet port using a straight-through cable.

D. Connect the PC's Ethernet port to the router's Ethernet port using a rollover cable.

E. Connect the PC's Ethernet port to the router's Ethernet port using a straight- through cable.

Answer: B

Explanation:

To connect the Router in Console port to configure using HyperTerminal, you required the Rollover Cable, which connects the PC's COM port to the router's Console port.

Incorrect Answers:

A, C, E: Straight Cables are used for: Host to switch, Switch to Router.

D: Rollover cables are used for Console/COM connections, not for IP traffic over the Ethernet ports.

QUESTION NO: 15

The Testking network is shown below:
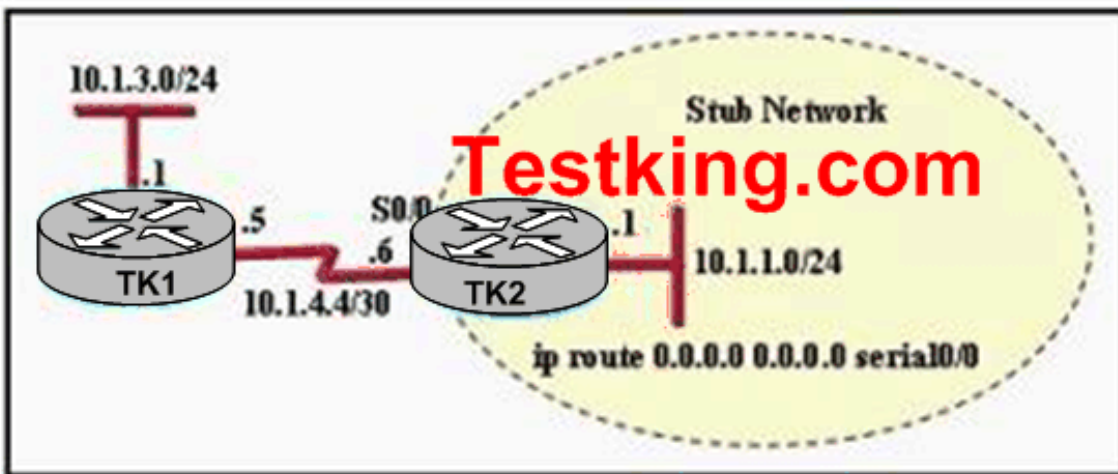
In this network, subnet 10.1.3.0/24 is unknown to router TK2. Which router command will prevent router TK2 from dropping a packet destined for the 10.1.3.0/24 network if a default route is configured?

A. ip classless
B. ip default-network
C. network 10.1.1.0
D. network 10.1.1.0.0.0.0.255 area 0

Answer: A
Explanation:
All Cisco routers are classful routers, meaning that they expect a default subnet mask on each interface of the router. When a router receives a packet for a destination subnet that's not in the routing table, it will drop packets by default. If you are using the default routing, you should use the ip classless command because it is possible that no remote subnet will be in routing table. In more recent versions of IOS "ip classless" is enabled by default.

QUESTION NO: 16
The TestKing network is replacing all of their hubs with new switches. How does a switch differ from a hub?

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

Answer: D
Explanation:
Some of the features and functions of a switch include:
l A switch is essentially a fast, multi-port bridge, which can contain dozens of ports.
l Rather than creating two collision domains, each port creates its own collision domain.
l In a network of twenty nodes, twenty collision domains exist if each node is plugged into its own switch port.
l If an uplink port is included, one switch creates twenty-one single-node collision domains.
l A switch dynamically builds and maintains a Content-Addressable Memory (CAM) table, holding all of the necessary MAC information for each port.

For a detailed description of how switches operate, and their key differences to hubs, see the reference link below.
Reference: http://www.cisco.com/warp/public/473/lan-switch-cisco.shtml

QUESTION NO: 17
A network associate needs to configure a router by connecting a remote computer to the router through the router auxiliary port. Which two statements describe the hardware required to make the connection to the router? (Choose two.)

A. The auxiliary port must be connected to a modem.
B. The auxiliary port must be connected to an Ethernet LAN.
C. The technician needs an RJ-45 to DB25 adapter.
D. The technician needs an Ethernet transceiver.

Answer: A, C
Explanation:
Connecting to the Auxiliary Port
When a modem is connected to the auxiliary port, a remote user can dial in to the router and configure it. Use the light blue console cable and the DB-9-to-DB-25 connector adapter that came in the router accessory kit.
To connect a modem to the router, follow these steps:
Step 1
Connect the RJ-45 end of the adapter cable to the black AUX port on the router. (See Figure2 below)
Figure2 Connecting a Modem to the Router
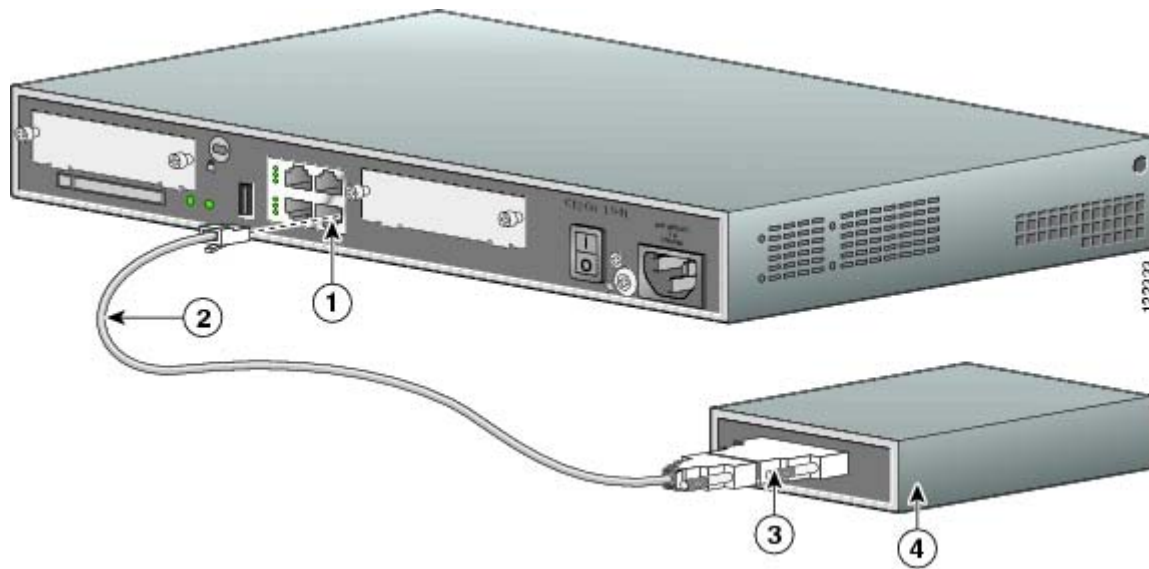
1	Aux port (RJ-45)	3	DB-9-to-DB-25 modem adapter
2	Light blue console cable	4	Modem

Step 2

Connect the DB-9 end of the console cable to the DB-9 end of the modem adapter.

Step 3

Connect the DB-25 end of the modem adapter to the modem.

Reference:

http://www.exio.com/en/US/products/ps5853/products_installation_guide_chapter09186a00802c36a5.html

QUESTION NO: 18

It has become necessary to configure an existing serial interface to accept a second Frame Relay virtual circuit. Which of the following procedures are required to accomplish this task? (Choose three.)

A. Encapsulate the physical interface with multipoint PPP.
B. Configure static Frame Relay map entries for each subinterface network.
C. Disable split horizon to prevent routing loops between the subinterface networks.
D. Remove the IP address from the physical interface.
E. Create the virtual interfaces with the interface command.
F. Configure each subinterface with its own IP address.

Answer: D, E, F
Explanation:
Normally, when only one logical virtual circuit (PVC) is assigned to a router it is placed on the physical serial interface. To accept a second PVC, subinterfaces must be created, with each PVC using its own logical interface as shown in the example below:

```
interface serial 0
encapsulation frame-relay
interface serial 0.1 point-to-point
ip address 10.0.1.1 255.255.255.0
frame-relay interface-dlci 142
interface serial 0.2 multipoint
ip address 10.0.2.1 255.255.255.0
frame-relay map 10.0.2.2 118
```

In this example, two virtual circuits are used (one pt-pt and one point-multipoint), each with its own IP address. Note that the physical serial 0 interface was not assigned an IP address.

QUESTION NO: 19
In the network shown below, an associate has the task of planning a Frame Relay implementation to replace the existing WAN infrastructure. The addresses for the North, East, and South branch offices have been assigned as shown in the diagram. Which type of topology should be implemented?

Exhibit:

A. Extended star
B. Ring
C. Hub and spoke
D. Bus
E. Full mesh

Answer: C
Explanation:
In a Fully meshed environment, every router has a PVC defined to every other router and in a Non-fully meshed environment (or Hub and Spoke) PVCs are only defined between routers that need to communicate. In this example, a /30 IP subnet mask is used at each remote location. This mask allows for only two hosts on the network, which will used for the local router's frame relay interface, and the hub router's interface. In this example, all site to site (spoke) traffic will need to traverse through the main (hub) location.

Section 5: Develop an access list to meet user specifications (20 questions)

QUESTION NO: 1
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 NO: 2
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 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 NO: 3 DRAG DROP

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 only 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		
deny ip any 192.168.47.32 0.0.0.15		

Answer:
Explanation:

Select all from here, access List Condition

deny icmp any 192.168.47.5 0.0.0.31

permit tcp 192.168.47.4 0.0.0.0 any eq

Place here

permit tcp any 192.168.47.4 0.0.0.0 eq 80

deny ip any 192.168.47.32 0.0.0.15

deny icmp any 192.168.47.5 0.0.0.0

permit ip 192.168.45.32 0.0.0.31 192.168.47.32 0.0.0.16

Design Goals

Allow all web access to server 192.168.47.4

Block all IP access to subnet 192.168.47.32/28

Block all ping messages only to server 192.168.47.5/27

Allow access from subnet 192.168.45.32/27 to subnet 192.168.47.32/28

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 NO: 4 DRAG DROP
**The Testking network consists of the Missouri and Alabama routers as shown
below:**
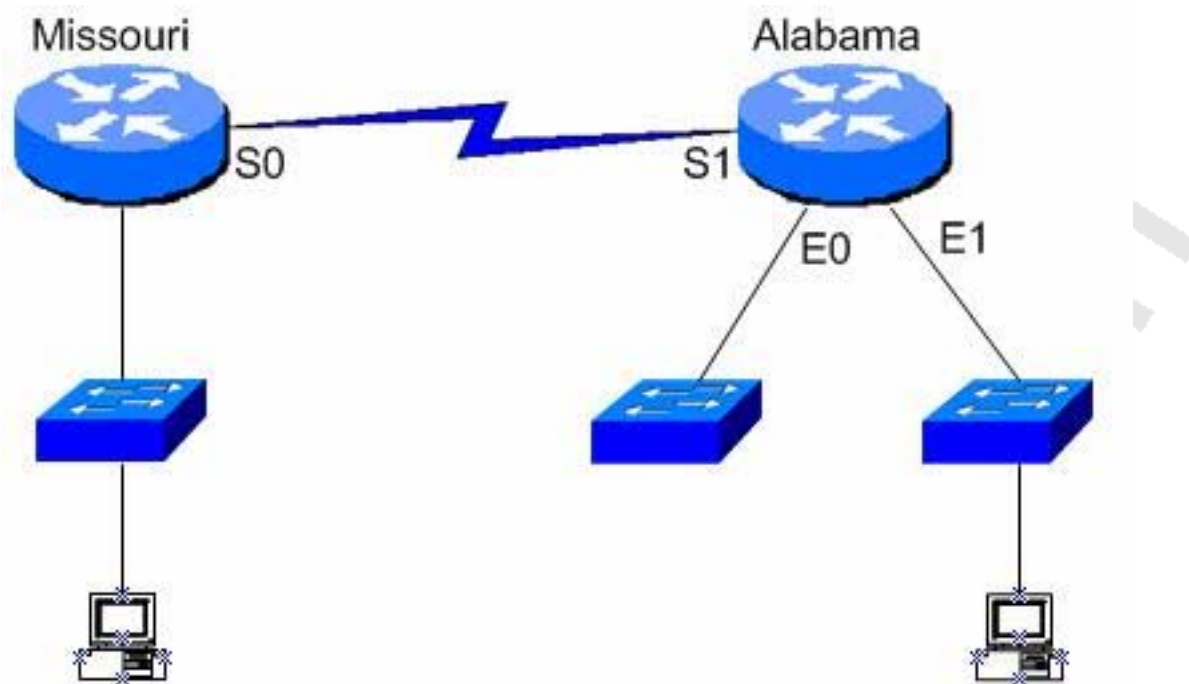
You are a network administrator of a large corporation situated in the United States.

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

Deny ip 192.168.35.49 0.0.0.0 host 192.168.35.66

permit ip any any   **Testking.com**

permit ip 192.168.35.0 0.0.0.255 host 192.168.35.66

Block only the users attached to the e0 interface of the Missouri router from access to the accounting server.

Block a user from the Alabama e0 network from access to the accounting server.

Prevent all users from outside the enterprise network from accessing the accounting server.

Answer:
Explanation:

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 192.168.35.49 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

permit ip any any   **Testking.com**

QUESTION NO: 5 DRAG DROP
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:
Explanation:

172.26.92.10	access-list 3 deny 172.26.64.0 0.0.31.255
172.26.198.94	access-list 5 deny 172.26.192.0 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

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 NO: 6

The Testking worldwide WAN is shown in the exhibit below:
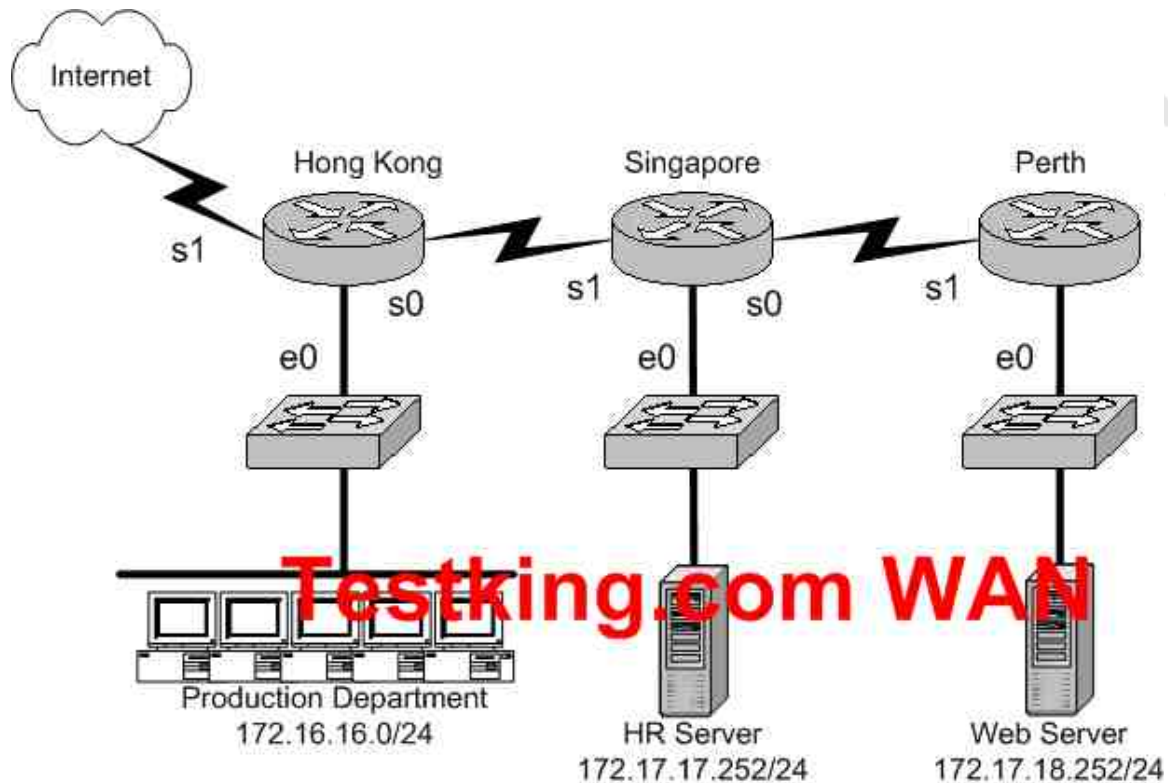
On the Hong Kong router an access list is needed that will accomplish the following:

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 NO: 7
The Testking University network is shown below:
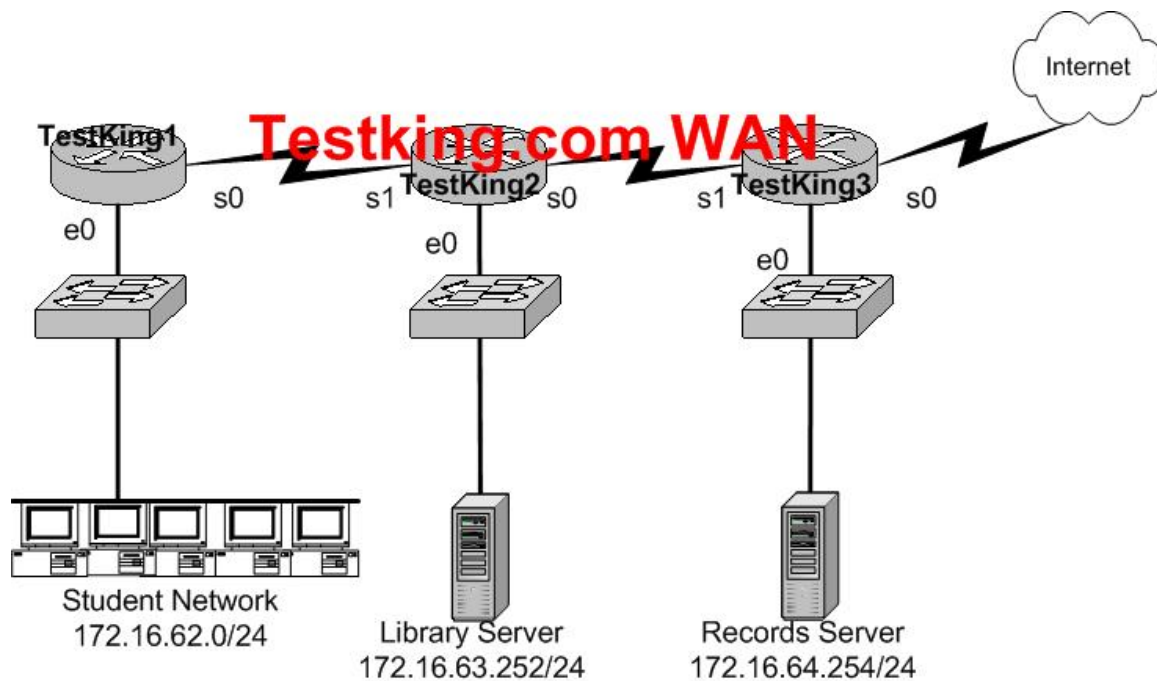
In the above network, an access list was created in order to prevent students and outsiders on the internet from changing student files in the Records Server, while still allowing other departments in the enterprise access. The access control list was applied to the e0 interface of the TestKing 3 router 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
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.

QUESTION NO: 8
Which one of the access control list statements below will deny all telnet connections to subnet 10.10.1.0/24?

A. access-list 15 deny telnet any 10.10.1.0 0.0.0.255 eq 23
B. access-list 115 deny udp any 10.10.1.0 eq telnet
C. access-list 15 deny tcp 10.10.1.0 255.255.255.0 eq telnet
D. access-list 115 deny tcp any 10.10.1.0 0.0.0.255 eq 23
E. access-list 15 deny udp any 10.10.1.0 255.255.255.0 eq 23

Answer: D
Explanation:
Telnet uses port TCP port 23. Since we are using source and destination IP address information, an extended access list is required. Extended access lists are access lists in the 100-199 range.
Incorrect Answers:
A, C, E. These access lists are numbered 15. Standard access lists are numbered 1-99, and in this case an extended access lists is required.
B. This access list specifies UDP port 23, and TCP port 23 is the port used by telnet.

QUESTION NO: 9

Which of the following answer choices are correct characteristics of named access list? (Select all that apply)

A. You can delete individual statements in a named access list
B. Named access lists require a numbered range from 1000 to 1099.
C. Named access lists must be specified as standard or extended.
D. You can use the ip access-list command to create named access lists.
E. You cannot delete individual statements in a named access list.
F. You can use the ip name-group command to apply named access lists.

Answer: A, C, D
Explanation:
Named access lists have two advantages over numbered access lists: the first one being that a name is easier to remember and the second being the fact that you can delete individual statements in a named access list. That makes A correct.
When you create a named access list you use the ip access-list command, and you have to specify whether it's standard or extended (since there are no numbers). So C and D are both correct. An example from the textbook is the command, "ip access-list extended Barney"
Incorrect Answers:
B. Named access lists don't require a number range from 1000 to 1099 so B is incorrect.
E. Answer choice E is not true.
F. This is incorrect because the command ip name-group is absolutely unnecessary.
Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Pages 443-445

QUESTION NO: 10
The Testking WAN is displayed below:

Westfield — e0, s0
Eastfield — s1, s0, e0
Northfield — s1, e0

Graphics Department
192.168.16.0/24

HR Server
192.168.17.252/24

Web Server
192.168.18.252/24
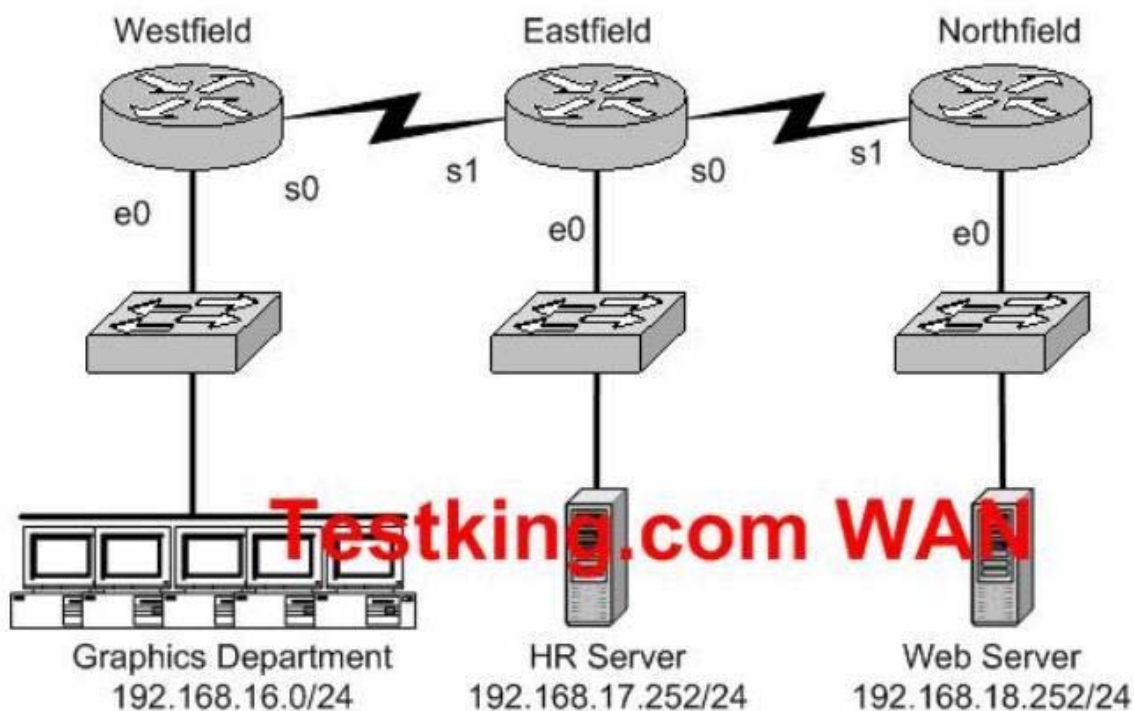
An access list needs to be implemented that will block users from the Graphics Department from telnetting to the HR server; and this list is to be implemented on the Ethernet 0 interface of the Westfield router for the inbound direction. All other office communications should be allowed. Which of the following answer choices would accomplish this?

A. deny tcp 192.168.16.0 0.0.0.255 192.168.17.252 0.0.0.0 eq 23
permit ip any any
B. permit ip any any
deny tcp 192.168.16.0 0.0.0.255 192.172.252 0.0.0.0 eq 23
C. permit ip any any

deny tcp 192.168.17.252 0.0.0.0 192.168.0 0.0.0.255 eq 23
D. deny tcp 192.168.18.262 0.0.0.0 192.168.16.0 0.0.0.255 eq 23
permit ip any any

Answer: A
Explanation:
The syntax for an access list is the source address first then the destination address. In this case the source address is 192.168.16.0/24 and the destination address 192.168.17.252. The "permit ip any any" statement is required because of the implicit deny all at the end of every access list. Generally speaking, all access lists require at least one permit statement, otherwise all traffic will be denied through the interface.

QUESTION NO: 11
The Testking WAN is shown below:
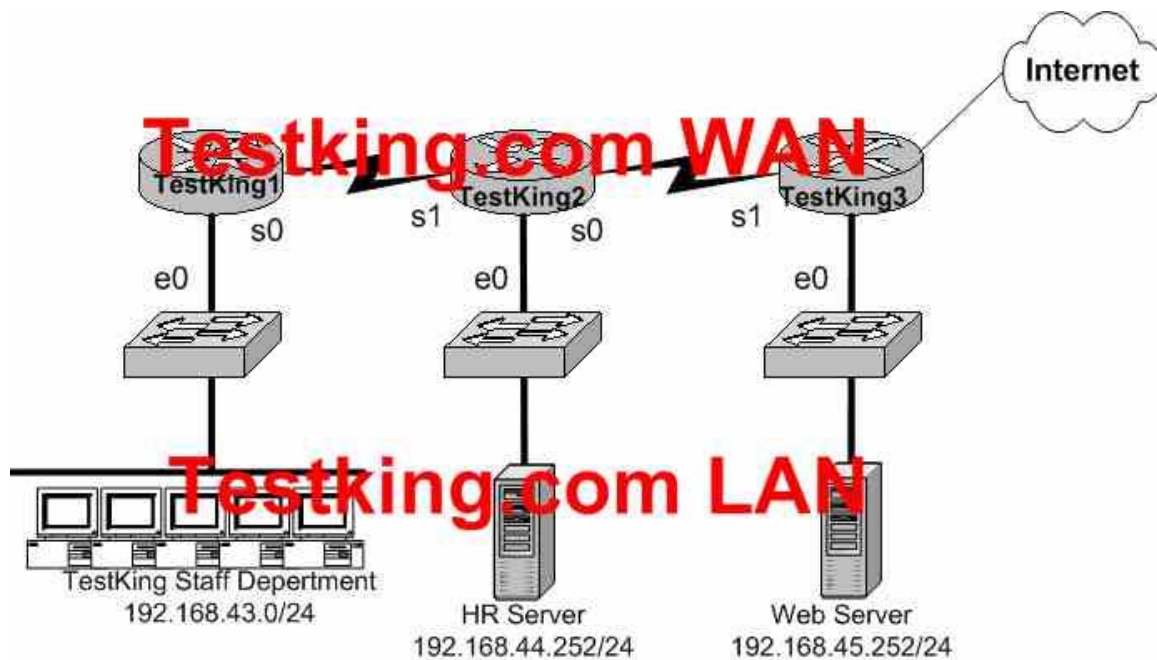
Your goal is to allow FTP access to the HR server, while blocking out all other traffic. Which of the access list configurations below will fulfill your goal? (Select two answer choices)

A. Access-list 101 Permit tcp any 192.168.44.252 0.0.0.0 eq 21
B. Access-list 101 Permit tcp any 192.168.44.252 0.0.0.0 eq 20
C. Access-list 101 Permit tcp 192.168.44.252 0.0.0.0 any eq 20
D. Access-list 101 Permit tcp 192.168.44.252 0.0.0.0 any eq 21
E. Access-list 101 Deny tcp any 192.168.44.255 0.0.0.0 gt 21
F. Access-list 101 Permit tcp 192.168.44.255 0.0.0.0 any gt 21

Answer: A, B

Explanation:
FTP uses two ports: TCP port 20 and TCP port 21. you want to allow all hosts (ANY) to access the HR server (192.168.44.252 0.0.0.0) through ftp (eq 20 & eq 21) and the implicit deny any rule will block everything else.

QUESTION NO: 12
The Testking Network is displayed in the flowing diagram:
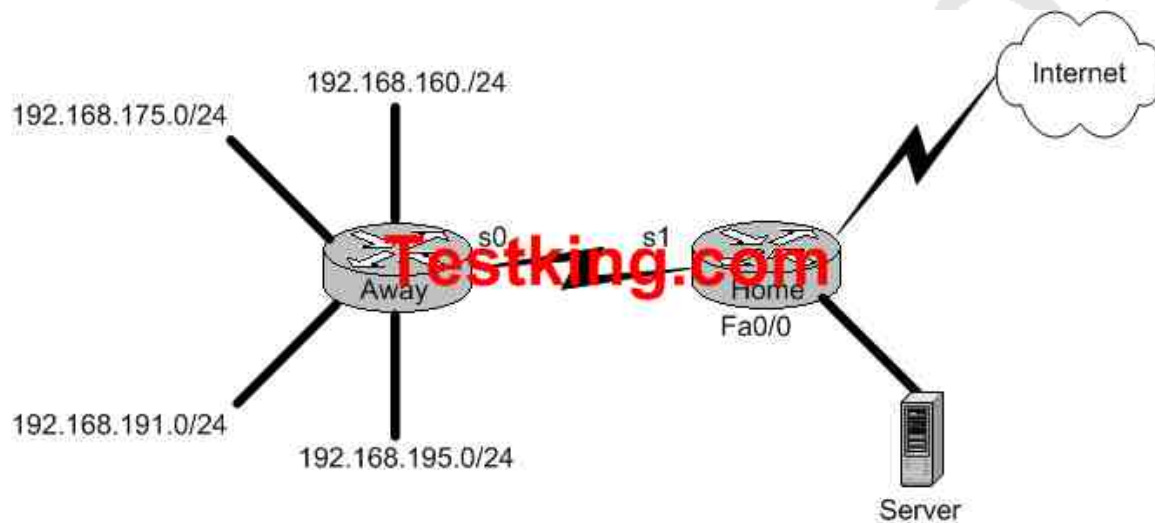
You need to place an access list on the Fa0 interface of the Home router; that will deny access to all hosts that lie within the range 192.168.160.0-192.168.191.0. Hosts in the 192.168.195.0 network should be granted full access. Which one of the following answer choices fulfills your needs?

A. access-list 1 deny 192.168.163.0 0.0.0.255
B. access-list 1 deny 192.168.128.0 0.0.127.255
C. access-list 1 deny 192.168.160.0 0.0.255.255
D. access-list 1 deny 192.168.160.0 0.0.31.255

Answer: D
Explanation:
This question is really more of an inverse subnet masking questions than a security question. Your goal is to block access to the host range 192.168.160.0- 192.168.191.0 while allowing everything else (including hosts from 192.168.195.0) full access. Answer choice D is correct because the address and mask are numbered correctly.

QUESTION NO: 13
Which of the following access list statements would deny traffic from a specific host?

A. Router(config)# access-list 1 deny 172.31.212.74 any
B. Router(config)# access-list 1 deny 10.6.111.48 host
C. Router(config)# access-list 1 deny 172.16.4.13 0.0.0.0
D. Router(config)# access-list 1 deny 192.168.14.132 255.255.255.0
E. Router(config)# access-list 1 deny 192.168.166.127 255.255.255.255

Answer: C
Explanation:
Only choice C is the correct syntax for a specific host. The access list is denying all traffic from the host with IP address 172.16.4.13. It is important to note that in an access list, the subnet mask is the inverse. Normally, a host subnet mask is 255.255.255.255, but in an access list it is 0.0.0.0.
Incorrect Answers:
A. The syntax is incorrect here, as there is no subnet mask at all specified.
B. This would be an acceptable choice, if the "host" keyword were placed in front of the IP address, not after.
D. The subnet mask here includes the entire class C network here, not an individual host.
E. In an access list, the subnet mask is an inverse mask. The mask specified here would be equivalent to all 0's in a subnet mask, meaning that the don't care bits apply to the entire address.

QUESTION NO: 14
Which IP address and wildcard mask would you use in your ACL to block all the hosts in the subnet 192.168.16.43/28?

A. 192.168.16.32 0.0.0.16
B. 192.168.16.43 0.0.0.212
C. 192.168.16.0 0.0.0.15
D. 192.168.16.32 0.0.0.15
E. 192.168.16.0 0.0.0.31
F. 192.168.16.16 0.0.0.31

Answer: D
Explanation:
Since there are 28 bits in the subnet mask, we can find the inverse mask by reversing the
1's and 0's.

/28 = 11111111.11111111.11111111.11110000
/28 Inverse = 00000000.00000000.00000000.00001111 = 192.168.16.32/15

The address 192.168.16.32 and the wildcard mask 0.0.0.15 is the correct answer as
shown. This will match all addresses in the 192.168.16.32-192.168.16.47 range.

QUESTION NO: 15
Two TestKing routers are connected together as shown below:
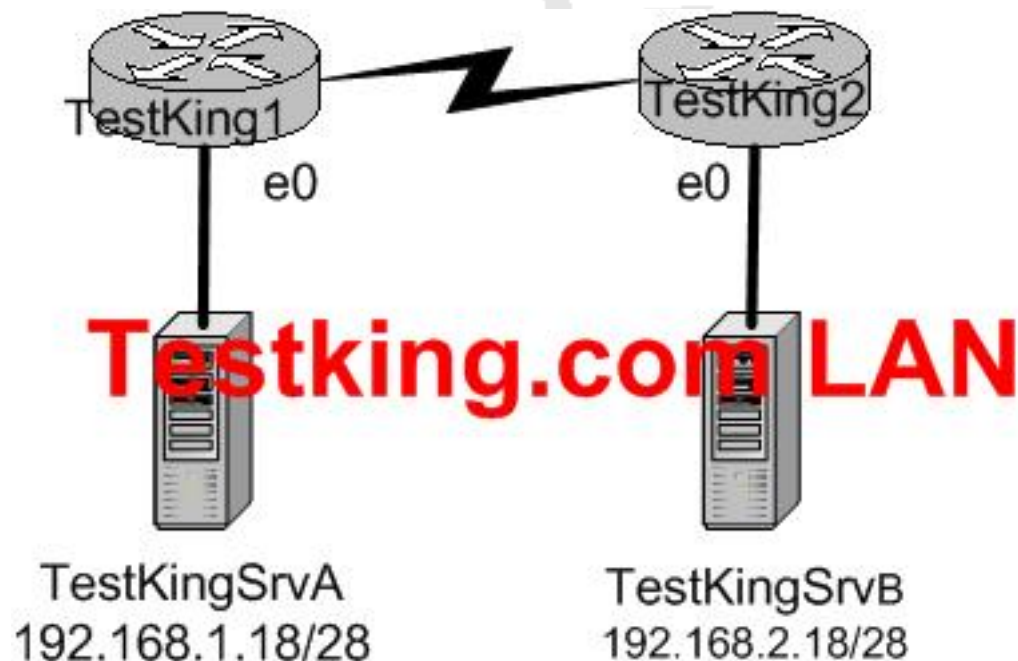
In order to control access on the Testking network, the following access list is created:

```
access-list 101 permit tcp 192.168.1.16 0.0.0.15 192.168.2 16
0.0.0.15 eq 23
```

What would happen if you applied the following ACL to any one of the TestKing routers in the above exhibit? On what interface and what direction should you apply it? Once applied, what will this access list accomplish? (Select all valid answer choices)

A. Telnet traffic from 192.168.1.16 0.0.0.15 to 168.2.16 0.0.0.15 is allowed.
B. SMTP traffic from 192.168.1.16 0.0.0.15 to 168.2.16 0.0.0.15 is allowed.
C. The ACL is configured to allow traffic from one specific host to another.
D. The ACL should be applied inbound to the e0 interface of Router TestKing1.
E. The ACL should be applied outbound to the e0 interface of Router TestKing1.

Answer: A, D
Explanation:
This is a two part question. The first part is the type of traffic that will match this specific access list entry. Since telnet uses TCP port 23, choice B is correct.
Next, to determine which interface and which direction to apply the access list, we see that the source of the traffic is the 192.168.1.16/28 network, while the destination is the 192.168.2.16/28 network. Therefore, only choice D makes sense.
Incorrect Answers:
B. SMTP uses TCP port 25.
C. There is a /15 network mask for both the source and destination in this access list, which translates to a /28 network.
E. This would not be useful if applied to the outbound, as no traffic would match then. Note that if this answer had stated that the access list be placed on the outbound serial (WAN) interface, then this would have been an acceptable choice.

QUESTION NO: 16
A standard IP access list is applied to an Ethernet interface of a router. What does this standard access list filter on?

A. The source and destination addresses

B. The destination port number
C. The destination address
D. The source address
E. All of the above

Answer: D
Explanation:
The standard IP access-list will only filter on the source address contained in the packet. Extended access lists can filter on the source and destination address and port information.

QUESTION NO: 17
The TestKing network is subnetted using 29 bits for the subnet mask. Which wild card mask should be used to configure an extended access list to permit or deny access to an entire subnetwork?

A. 255.255.255.224
B. 255.255.255.248
C. 0.0.0.224
D. 0.0.0.8
E. 0.0.0.7
F. 0.0.0.3

Answer: E
Explanation:
Class C wild card masks start with 0.0.0.x. The subnet used in this example is 29 bits, or subnet mask 255.255.255.248. Therefore, we are left with 7 hosts in the final octet (255-248) so the answer is 0.0.0.7.

QUESTION NO: 18
Part of the TestKing network is shown below:

192.168.23.64/26   FA0/0   FA0/1   192.168.23.128/26

The TestKing network administrator wants to prevent computers on the 192.168.23.64/26 subnet from accessing the 192.168.23.128/26 subnet via FTP. All other hosts should be allowed to access. What commands should be entered on the router to accomplish this task?

A. **Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.0.63 192.168.23.128 0.0.0.63 eq ftp**
Router(config)#access-list 101 permit ip any any
Router(config)#interface fa0/0
Router(config-if)#ip access-group 101 in

B. **Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.255 192.168.23.128 0.0.0.255 eq ftp**
Router(config)#access-list 101 permit ip any any
Router(config)#interface fa0/0
Router(config-if)#ip access-group 101 in

C. **Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.0.63 192.168.23.128 0.0.0.63 eq ftp**
Router(config)#access-list 101 permit ip any any
Router(config)#interface fa0/0
Router(config-if)#access-list 101 out

D. **Router(config)#access-list 101 deny tcp 192.168.23.64 0.0.0.255 192.168.23.128 0.0.0.255 eq ftp**
Router(config)#access-list 101 permit ip any any
Router(config)#interface fa0/1
Router(config-if)#ip access-group 101 in

E. Router(config)#access-list 101 deny tcp 192.168.23.128 0.0.0.63 192.168.23.64 0.0.0.63 eq ftp
Router(config)#access-list 101 permit ip any any
Router(config)#interface fa0/1
Router(config-if)#ip access-group 101 in

F. Router(config)#access-list 101 deny tcp 192.168.23.128 0.0.0.255 192.168.23.128 0.0.0.255 eq ftp
Router(config)#access-list 101 permit ip any any
Router(config)#interface fa0/1
Router(config-if)#ip access-group 101 out

Answer: A
Explanation:
Only choice A specifies the correct wildcard mask and direction. If we apply the access list to interface FA0/0, we need to specify incoming FTP traffic from the 192.168.23.64/26 network to the 192.168.23.128/26 network.
Incorrect Answers:
B, D, F. The wildcard mask for a /26 network is 0.0.0.63, not 0.0.0.255.
C. This access list statement is correct, but when it is applied to the FA0/0 interface it needs to be in the incoming direction.
E. This access list needs to be applied to interface FA0/0, not FA0/1. Alternatively, it could have been applied to interface FA0/1, but in the outbound direction, not the inbound direction.

QUESTION NO: 19
The TestKing network is shown below:
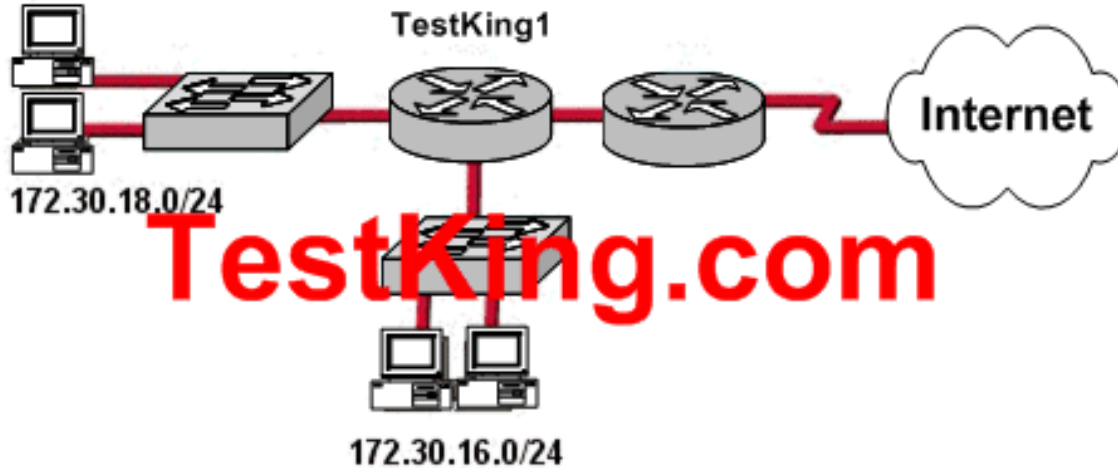
The network administrator would like to permit only hosts on the 172.30.16.0/24 network to access the Internet. Which wild card mask and address combination will only match addresses on this network?

A. 172.30.0.0 0.0.0.0
B. 172.30.16.0 0.0.0.255
C. 172.30.0.0 0.0.15.255
D. 172.30.16.0 0.0.31.255
E. 172.30.16.0 0.0.255.255

Answer: B
Explanation:
According to question, only the hosts from 172.30.16.30/24 network allow to access the Internet, for that we should use the wildcard masking. 172.168.16.0 0.0.0.255 where 0 means exact and 255 means 1-255 range.
For any particular host: 192.168.0.1 0.0.0.0
For Range: 192.168.0.1 0.0.0.3 means 1-4 total 4 hosts.

QUESTION NO: 20
What are two reasons that a network administrator would use access lists? (Choose two.)

A. To filter traffic as it passes through a router
B. To filter traffic that originates from the router

C. To replace passwords as a line of defense against security incursions
D. To control vty access into a router
E. To control broadcast traffic through a router

Answer: A, D
Explanation:
Access lists are used to process data received by a router can be divided into two broad categories:
1. traffic that passes through the router via the forwarding path (choice A)
2. traffic destined for the router via the receive path for route processor handling, such as ssh/telnet vty access (Choice D)
In normal operations, the vast majority of traffic simply flows through a router en route to its ultimate destination.
Incorrect Answers:
B: Traffic originated by the router will bypass the access list.
C: Access lists can be used to permit or deny access, but it can not be used to replace the need for passwords for authorizing users into the system.
E: Routers do not forward broadcast traffic by default, and this is true regardless if access lists are configured or are not.

Section 6: Choose WAN services to meet customer requirements (17 questions)

QUESTION NO: 1
The Testking Corporation consists of the head office in New York with its regional offices in: Chicago, Detroit, Philadelphia, Toronto, and Atlanta. These offices need to be connected in a WAN, and Testking wishes to do this via a hub and spoke arrangement that will utilize packet-switched technology.

Which one of the WAN technologies below would be the best choice for Testking?

A. ISDN
B. Wireless
C. Frame Relay
D. T1 leased line
E. ATM

F. VPN

Answer: C
Explanation:
To provide efficient IP multicast support in Frame Relay networks, the underlying Frame Relay network architecture should be designed in a "hub and spoke" topology (hierarchical topology). The hub and spoke topology is also named a "star" topology, because the central hub acts as the center of a star and the connections to the remote sites act as light radiating from the star. In the hub and spoke topology, each remote router may also act as a hub and each connection to another remote site may act as a spoke (in a hierarchical fashion). In a multiple hub topology, the load associated with sending broadcast and multicast data can be distributed across multiple central hub sites rather than concentrated at a single central site. Thus, even though data may require extra hops to get to a particular location, data delivery is more efficient in a hub and spoke network than in other network topologies. This design also provides a scalable, hierarchical network that greatly reduces the resource requirements of the central router, allowing the Frame Relay network to utilize the advantages of IP multicast applications.
Incorrect Answers:
A, B, D: These networks are typically not Hub and spoke, and do not operate via packet switching.
E. ATM is a somewhat viable choice, as they work in a similar fashion to frame relay. However, ATM would be considering a cell switching technology, not a packet switching technology.
F. VPN's work through the use of encryption, tunnels, or MPLS.

QUESTION NO: 2
You are a systems administrator of an HR company in Dallas. You want to connect your company's head office with a branch office in Detroit. To do this, you want to use two data link layer encapsulations: one exclusively for data and the other exclusively for signaling. Which one of the following WAN services would best suit your needs?

A. ISDN
B. ATM
C. FDDI
D. ATX
E. Frame Relay

Answer: A
Explanation:
ISDN Q.931 messages are used for signaling via the ISDN D channel.
ISDN B channels are used to transport data.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN
1-58720-083-X) Page 327

QUESTION NO: 3
**A brand new network application is required for the Acme Company, and they are
considering the use of a connectionless service. What are the characteristics of a
connectionless service? (Select two answer choices)**

A. It uses a Reliable transport mechanism.
B. It uses a Non-reliable transport mechanism
C. It is less bandwidth-intensive than connection oriented services
D. it uses handshaking

Answer: B, C
Explanation:
The Transport layer is a good example of how both a connectionless and connection
oriented service works.
UDP is a connectionless service that is considered unreliable, but it uses less bandwidth
then a connection oriented service.
TCP is a connection oriented service and is considered reliable because it uses
handshaking to create the service and acknowledgments.
Incorrect Answers:
A, D: These are the characteristics of a connection oriented service, such as TCP.

QUESTION NO: 4
**You are a network administrator of a small company that's experiencing explosive
growth. Within the next quarter the company is going to open up seven more
regional offices with the potential of more in the future. These regional offices send
and receive mission critical traffic, and will need to be connected to the head office
around the clock. However, your head office doesn't have any additional free ports
available on the router. Which of the following technologies would be the best choice
for this new WAN?**

A. Frame Relay
B. Broadband cable
C. ISDN-BRI
D. ADSL
E. Dedicated PPP/HDLC links
F. ISDN

Answer: A
Explanation:
Frame Relay is a dedicated service that would be acceptable for a mission critical WAN application, and multiple locations can connect to a single router port. The use of frame relay PVCs can connect all the locations together, while using only one physical port.
Incorrect Answers:
B, D. While DSL and Cable Modem are acceptable for home use, they have not yet achieved the availability and reliability associated with dedicated WAN technologies such as ATM, Frame Relay, and Point to Point links.
C, F. ISDN is usage based, and would it would be cost prohibitive to keep the ISDN links up at all times.
E. Dedicated leased lines would require a separate router port for each link.

QUESTION NO: 5
The Testking WAN is displayed in the diagram below:

Which dynamic routing protocol should be recommended for the Testking network shown in the graphic above? (Choose three)

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

Answer: A, C, E
Explanation:
In this network, the 192.168.23.0/24 network is subnetted into two other networks. Because this class C network is being subnetted, a routing protocol that supports variable length subnet mask information is required. OSPF, EIGRP, and RIP version 2 all support VLSM information to be shared across the network.
Incorrect Answers:
B, D. RIP version 1 and IGRP do not support VLSM, which will be required in order for this network to have the two LANs both be reachable.

QUESTION NO: 6
The TestKing network is implementing dialup services for their remote employees. TestKing uses several different Layer 3 protocols on the network. Authentication of the users connecting to the network is required for security. Additionally, some employees will be dialing long distance and will need callback support.
Which protocol is the best choice for these remote access services?

A. 802.1
B. Frame relay
C. HDLC
D. PPP
E. SLIP
F. PAP

Answer: D
Explanation:

PPP is the Point to Point Protocol, and is used in the majority of dial-up connections. PPP includes support for numerous features, including caller ID check, PPP callback, and security support. For security, either CHAP or PAP can be used, although CHAP is normally used as it is more secure. PPP is a layer 2 protocol that can support any layer 3 protocols.

QUESTION NO: 7
The TestKing network is displayed in the following diagram:
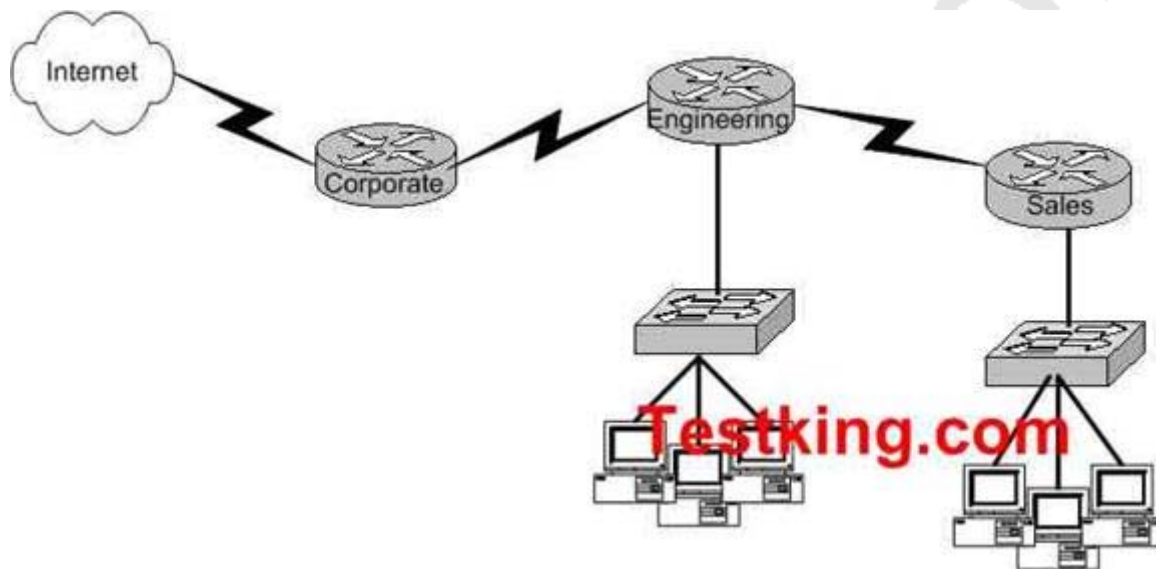
A network administrator would like to implement NAT in the network shown in the graphic to allow inside hosts to use a private addressing scheme. Where should NAT be configured?

A. Corporate router
B. Engineering router
C. Sales router
D. All routes
E. All routes and switches

Answer: A
Explanation:
Network Address Translation (NAT) can be used to hide the private IP addressing scheme of the entire network from the Internet. To do this, NAT needs to only be configured on the router that resides between the Internet and the rest of the private internal network. In this case, it needs to only be implemented on the Corporate router.

QUESTION NO: 8
TestKing has 25 computers and decides to connect the network to the Internet. TestKing would like for all of the computers to have access to the Internet at the same time, but TestKing only has four usable publicly routable IP addresses. What should be configured on the router so that all computers can connect to the Internet simultaneously?

A. Static NAT
B. Global NAT
C. Dynamic NAT
D. Static NAT with ACLs
E. Dynamic NAT with overload

Answer: E
Explanation:
NAT overload, also called many to one NAT or Port Address Translation (PAT) allows for many IP hosts to share a single IP address when connecting to the outside. In this case, the use of dynamic NAT with overloading will allow for the 25 hosts to use an IP address from the NAT pool, which will contain the 4 public IP addresses.

QUESTION NO: 9
A Cisco router has been configured with the following command:

IP nat pool nat-test 192.168.6.10 192.168.6.20 netmask 255.255.255.0

This is an example of what type of NAT?

A. Static NAT
B. Dynamic NAT
C. Dynamic NAT with overload

D. Port Address Translation
E. None of the above

Answer: B
Explanation:
The configuration statement in this example is used to define a pool of IP addresses to be used for dynamic NAT translations.
Incorrect Answers:
A. Static NAT is used for 1 to 1 translation entries, using the "static" configuration keyword. In this example a range of addresses are being defined for the use in a pool.
C, D. With NAT overload, also known as Port Address Translation (PAT), the keyword "overload" is added at the end of the configuration statement.

QUESTION NO: 10
You are a technician at TestKing. Your newly appointed TestKing trainee is setting up a new frame relay connection to a remote branch and wants to know what the valid options for frame relay LMI types are.

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

A. EIA/TIA
B. Q.932
C. Q.933 A
D. IEEE
E. IETF
F. Cisco
G. ANSI

Answer: C, F, G
Explanation:
The following describe the various frame relay LMI options:

 Name Document IOS LMI-Type
* Cisco Proprietary cisco
* ANSI T1.617 Annex D ansi
* ITU Q.933. Annex A q.933a

Reference:

QUESTION NO: 11
TestKing has five regional offices that are located in different cities. The IT staff is evaluating WAN technologies to interconnect the regional offices to corporate headquarters. Each of the regional offices should be connected to the corporate headquarters in a hub and spoke arrangement using a packet-switched technology. Which of the following WAN technologies will fulfill these requirements?

A. Frame Relay
B. ISDN
C. T1 leased lines
D. Wireless

Answer: A
Explanation:
There are three packet switching technologies which can be used:
1. Frame Relay
2. X.25
3. ATM

So, only choice A is right.

QUESTION NO: 12
Which of the following describe private IP addresses? (Choose two)

A. Addresses chosen by a company to communicate with the Internet.
B. Addresses that cannot be routed through the public Internet.
C. Addresses that can be routed through the public Internet.
D. A scheme to conserve public addresses.
E. Addresses licensed to enterprise or ISPs by an Internet registry organization.

Answer: B, D
Explanation:

Private IP address space has been allocated via RFC 1918. This means the addresses are available for any use by anyone and therefore the same private IP addresses can be reused. However they are defined as not routable on the public Internet. They are used extensively in private networks due to the shortage of publicly registered IP address space and therefore network address translation is required to connect those networks to the Internet.

QUESTION NO: 13
Which PPP subprotocol negotiates authentication options?

A. NCP
B. ISDN
C. SLIP
D. LCP
E. DLCI

Answer: D
Explanation:
LCP: A method of establishing, configuring, maintaining, and terminating the point-to-point connection.
Link-establishment phase LCP packets are sent by each PPP device to configure and test the link. These packets contain a field called the Configuration Option that allows each device to see the size of the data, compression, and authentication. If no Configuration Option field is present, then the default configurations are used.

QUESTION NO: 14
A network administrator is designing a Cisco network for a large company. The network must be able to use minimal bandwidth for routing updates, converge quickly, and support VLSM, CIDR, IP and IPX. Which routing protocol will best fit the requirements of this network?

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

Answer: E
Explanation:
Enhanced Interior Gateway Routing Protocol (EIGRP) is a Cisco-proprietary routing protocol based on IGRP. Unlike IGRP, which is a classful routing protocol, EIGRP supports CIDR, allowing network designers to maximize address space by using CIDR and VLSM. Compared to IGRP, EIGRP boasts faster convergence times, improved scalability, and superior handling of routing loops as well as EIGRP supports IP, IPX protocols also.

QUESTION NO: 15
A network administrator has been asked to set up a fully-meshed Frame Relay network to connect six remote research sites. How many PVCs are required in this network?

A. 15
B. 6
C. 41
D. 36
E. 18

Answer: A
Explanation:
The formula for calculating the number of links to achieve a full mesh is N(N-1)/2, where N is the number of locations. In this case there are 6 locations, so we will need 6(5)/2 = 15 links for the full mesh.

QUESTION NO: 16
A medical imaging company must redesign its network to use LAN and WAN topologies that provide the highest degree of redundancy. Which topologies should the company choose for the most redundancy? (Choose two)

A. Partial mesh
B. Extended star
C. Dual ring
D. Mesh
E. Hub and spoke

F. Star

Answer: C, D
Explanation:
There are four basic topologies used to interconnect devices: bus, ring, star, and mesh.
For maximum redundancy, a full mesh or a dual ring design should be used as shown
below:

Mesh topology

Fault tolerance of a dual-ring architecture
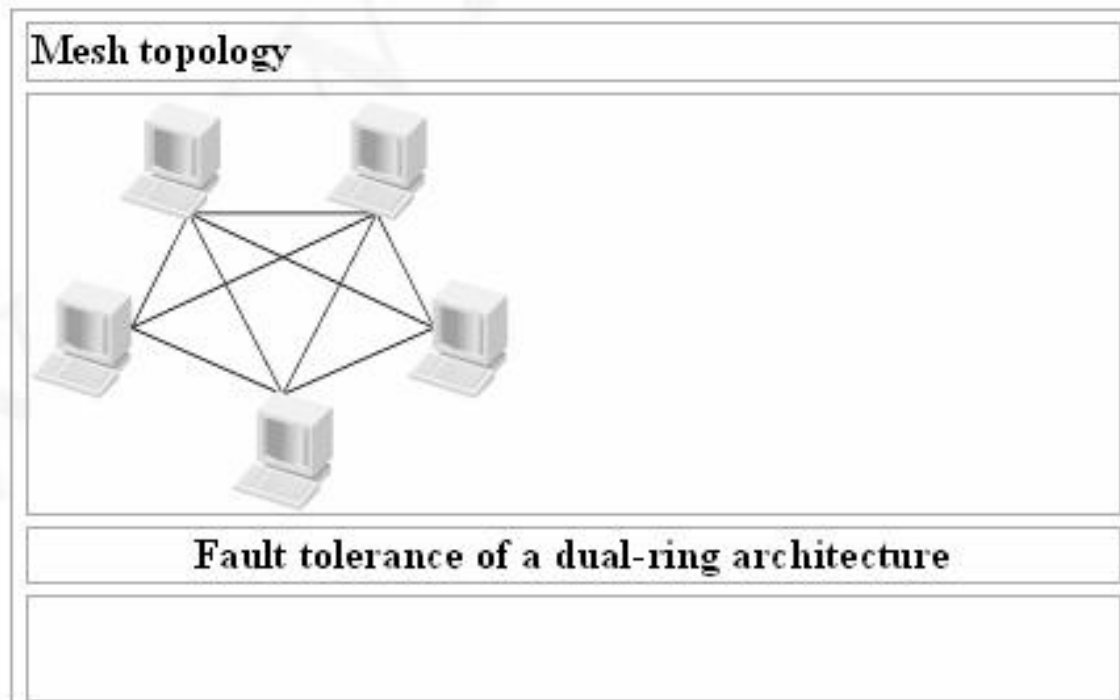
Due to the high cost of fully meshed designs and the fact that they do not scale well, they
are not commonly used except for very small networks.

QUESTION NO: 17
A mid-sized company with five branch offices across Canada wants to create a
WAN that will provide the most cost effective fully meshed environment with at
least 512 kbps throughput. What WAN service would meet this need?

A. ATM
B. ISDN BRI

C. Frame Relay
D. PPP
E. leased lines

Answer: C
Explanation:
Since frame relay uses the concept of virtual circuits, PVC's can be created as a low cost way to provide a fully meshed environment.
Incorrect Answers:
A: Although ATM could also be used to connect to each location via the use of PVC's similar to frame relay, ATM costs are higher than frame relay and this question asked for the most cost effective method.
B: ISDN BRI only supports bandwidth speeds of up to 128K.
D, E: PPP or leased lines would be cost prohibitive, and requires a dedicated T1 interface for each location. PPP/leased lines do not use virtual circuits so a dedicated connection would need to be made between all sites.

Topic 2: IMPLEMENTATION & OPERATION (302 questions)
Section 1: Configure routing protocols given user requirements (44 questions)

QUESTION NO: 1
Which one of the following parameters is the very first thing that needs to be configured as part of the IGRP routing process?

A. The wild card mask
B. The IP address
C. The IP address mask
D. The metric weights
E. The Autonomous System number

Answer: E
Explanation:

You configure IGRP just like RIP, except that the router igrp command has an additional parameter - the autonomous system (AS) number. The term autonomous system refers to a network that is within the control of a single company or organization. The term AS number refers to a number assigned to a single company or organization when it registers its connection to the Internet. However, for IGRP, you do not need a registered AS number. All that is needed for IGRP to work is for all the routers to use the same AS number.
Example configuration:

Router EIGRP 1
 Network 10.0.0.0

In this example, 1 is the AS number chose for EIGRP process 1.

QUESTION NO: 2
Which of the following answer choices is an additional parameter which must be supplied before the IGRP routing process can initialize?

A. Connected subnet numbers
B. Register administrative subnet masks
C. IP address mask
D. Autonomous system number
E. Metric weights

Answer: D
Explanation:
You configure IGRP just like RIP, except that the router igrp command has an additional parameter - the autonomous system (AS) number. The term autonomous system refers to a network that is within the control of a single company or organization. The term AS number refers to a number assigned to a single company or organization when it registers its connection to the Internet. However, for IGRP, you do not need a registered AS number. All that is needed for IGRP to work is for all the routers to use the same AS number.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 165

QUESTION NO: 3
What parameters must you specify when you enable EIGRP routing?

A. The broadcast address, and AS number
B. The network number and AS number
C. EIGRP routing, network number and passive interface
D. EIGRP routing, network number, and AS

Answer: D
Explanation:
To enable EIGRP on your router, you must specify EIGRP routing, the network number, and the AS system number.

Example:
Router EIGRP 33
 Network 10.0.0.0

In the case above the AS process number is 33.

QUESTION NO: 4
Which of the following technologies can be used in distance vector routing protocols to prevent routing loops? (Select all valid answer choices)

A. Spanning Tree Protocol
B. Shortest path first tree
C. Link-state advertisements (LSA)
D. Hold-down timers
E. Split horizon
F. VRRP

Answer: D, E
Explanation:
Distance vector routing protocols use the rule of split horizons and hold down timers to prevent routing loops after a topology change.
* **Splithorizon -** the routing protocol advertises routes out an interface only if they were not learned from updates entering that interface.
* Hold-down timer - After finding out that a router to a subnet has failed, a router waits a certain period of time before believing any other routing information about that subnet.
Incorrect Answers:

A. STP is used in bridged LANs to prevent bridging loops. It is a means for preventing loops at layer two, not layer 3.

B, C. These are two of the mechanisms of Link State Protocols, not distance vector protocols.

F. VRRP is the Virtual Router Redundancy Protocol, which is a standards based method similar to Cisco's proprietary HSRP. Neither of these two methods deal with distance vector routing protocols.

Reference:

CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 154

QUESTION NO: 5

What is the reason for configuring a passive interface on a router? (Select only one answer)

A. Allows interfaces to share common IP addresses.

B. Allows an interface to remain up without the aid of keepalives.

C. Allows a router to send routing and not receive updates via that interface.

D. Allows a routing protocol to forward updates that is missing its IP address.

E. Allows a router to receive routing updates on an interface but not send updates via that interface.

Answer: E

Explanation:

The passive-interface command is used to control the advertisement of routing information. The command enables the suppression of routing updates over some interfaces while allowing updates to be exchanged normally over other interfaces. For any interface specified as passive, no routing information will be sent. Routing information received on that interface will be accepted and processed by the router. This is often useful for DDR links such as ISDN.

QUESTION NO: 6

The Testking WAN is displayed in the diagram below:
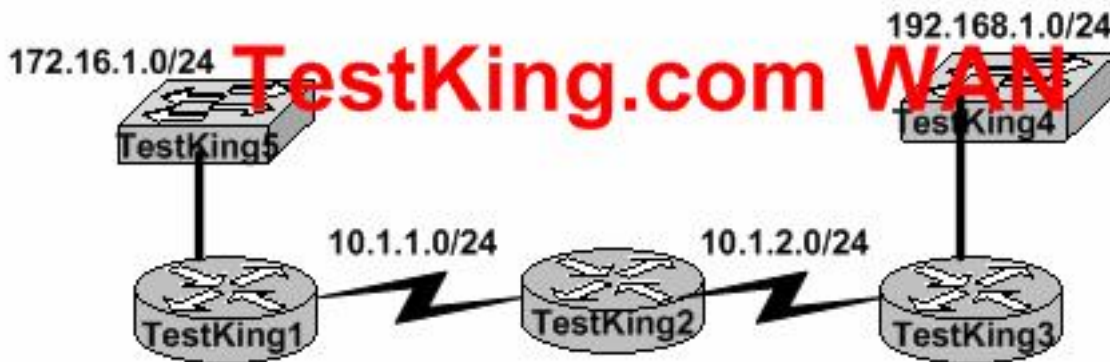
You have just added the router TestKing1 to your network and wish it to have full connectivity with routers TestKing2 and Testking3. Which of the following configurations would suit TestKing1 most appropriately?

A. TestKing1(config)# router rip
TestKing1(config-router)# network 10.0.0.0
TestKing1(config-router)# network 172.16.0.0
TestKing1(config-router)# network 192.168.1.0
B. TestKing1(config)# router rip
TestKing1(config-router)# network 10.0.0.0
TestKing1(config-router)# network 192.168.1.0
C. TestKing1(config)# router rip
TestKing1(config-router)# network 10.0.0.0
TestKing1(config-router)# network 172.16.0.0
D. TestKing1(config)# router rip
TestKing1(config-router)# network 10.0.0.0

Answer: C
Explanation:
When configuring RIP you configure only the directly connected networks that are to be advertised via the RIP routing process are to be configured.
Incorrect Answers:
A. This choice implies that when configuring rip on a router every possible network in the entire system should be configured. This is not the case.
B. Testking 1 requires the 172.16.0.0 network to be configured, not the 192.168.1.0 network.
D. If the 172.16.0.0 network is omitted, then the other routers in the network will not be able to reach the LAN users of Testking 1 via RIP.
Reference:

QUESTION NO: 7
A new point to point circuit is installed, connecting Testking 1 to Testking 2 as shown below:

Users at Testking 1 wish to utilize the existing Internet connection at Testking 2. To do this, a gateway of last resort needs to be set. What is the command to do this?

A. TestKing1(config)# ip route 172.16.4.2 0.0.0.0 0.0.0.0
B. TestKing1(config)# ip route 0.0.0.0 0.0.0.0 S1
C. TestKing1(config)# ip route 172.16.4.1 0.0.0.0 0.0.0.0
D. TestKing1(config)# ip route S0 0.0.0.0 0.0.0.0
E. TestKing1(config)# ip route 0.0.0.0 0.0.0.0 172.16.4.2

Answer: E
Explanation:
Setting the default gateway is done by issuing either the "ip route 0.0.0.0 0.0.0.0 serial 0" or the "ip route 0.0.0.0 0.0.0.0 172.16.4.2" command. The following excerpt provides some additional information:

The ip default-network command and the ip route 0.0.0.0 0.0.0.0 commands accomplish the goal of having the router use a known route as the default for packets that are not matched in the routing table. The ip route 0.0.0.0 0.0.0.0 command uses the fact that network 0.0.0.0 is used by Cisco IOS software to represent the default network.

Incorrect Answers:

A, C. The IP address of the next hop needs to go after the route, not before.

B. This would have been acceptable if the interface specified was S0, not S1.

C. The interface used to forward packets for the route should be placed after the route, not before.

QUESTION NO: 8
You are configuring the serial interface of your Cisco router; which of the following are valid encapsulation types you can use? (Select all that apply)

A. Token Ring
B. Ethernet
C. HDLC
D. PPP
E. Frame Relay
F. CHAP

Answer: C, D, E
Explanation:
HDLC, Frame Relay, and PPP are the most common encapsulation types set for serial interfaces in a Cisco router. HDLC is often used in point to point circuits with Cisco routers on each end. HDLC is Cisco proprietary and offers an alternative to PPP.
Incorrect Answers:
A, B. Token Ring and Ethernet aren't encapsulation types used on serial interfaces; they are types of LAN networks.
F. CHAP is the Challenge Authentication Protocol. It is used for authentication on PPP links.

QUESTION NO: 9

Which of the following OSPF commands, when used together, will put the network 192.168.10.0/24 into OSPF area 0? (Select all valid responses)

A. Router(config-router)# network 192.168.10.0 0.0.0.255 0
B. Router(config-router)# network 192.168.10.0 0.0.0.255 area 0
C. Router(config-router)# network 192.168.10.0 255.255.255.0 area 0
D. Router(config)# router ospf 0
E. Router(config)# router ospf 1

Answer: B, E
Explanation:
B. The network command specifies the IP address (192.168.10.0) followed by the wildcard mask (not the subnet mask), and the area that is to be associated with the OSPF address range (in this case, area 0). The wildcard mask indicates in binary how much of the IP address much be matched with 0s indicating that the bits must match and 1 indicating that they may vary. Thus 0.0.0.255 or 00000000.00000000.00000000.11111111 indicates that any bit in the last octet can vary while all bits in the first 3 octets must match the network address (in other words, 192.168.10.xx)
E. The router ospf command enables OSPF routing and enters router configuration mode. This command takes a <process-id> argument which identifies the OSPF process.
Incorrect Answers:
A. This command is correct, except for the fact that the keyword "area" is missing and needs to be inserted.
C. For OSPF, the inverse mask must be used, not the regular subnet mask.
D. OSPF can not use process ID 0, and the goal of this question is to put a specific network in area 0, not the entire routing process.

QUESTION NO: 10
Which of the following routing protocols are less likely prone routing loops and network reachability problems when used in discontiguous networks? (Select all valid responses)

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

Answer: C, E, F

Explanation: Only OSPF, RIP version 2, and EIGRP carry VLSM information. In a discontiguous network, subnet masks of different lengths can be used, but this information will need to be propagated via the routing protocol if all networks are to be reached.

Incorrect Answers:

A, D. With RIP version one and IGRP, discontiguous networks can be problematic, as VLSM is not supported.

B. 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 NO: 11

Which one of the following statements best explains the split horizon rule?

A. Only routers can split boundaries (horizons) between networks in separate AS numbers.

B. Each AS must keep routing tables converged to prevent dead routes from being advertised across boundaries.

C. Once a route is received on an interface, advertise that route as unreachable back out the same interface.

D. Information about a route should never be sent back in the direction from which the original update came.

Answer: D

Explanation:

The split horizon rule states:

* Never advertise a route out of the interface through which you learned it.

For instance, in Figure 4a below, if Router One is connected to Routers Two and Three through a single multipoint interface (such as Frame Relay), and Router One learned about Network A from Router Two, it will not advertise the route to Network A back out the same interface to Router Three. Router one assumes that Router Three would learn about Network A directly from Router Two.
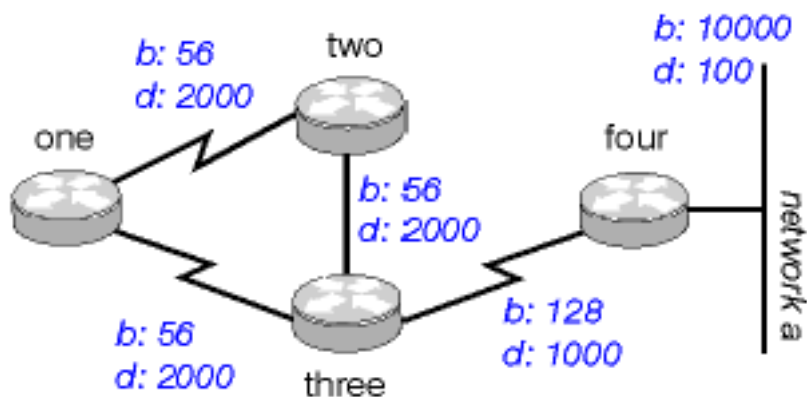
Figure 4a

Incorrect Answers:

A: There is no such requirement

B: Distance vector protocols updates routing table at regular intervals instead of Topology changes

C: This is the definition of the poison reverse rule, not the split horizon rule.

Reference: Wendell Odom. CISCO CCNA Certification Guide (2000 Press) Page 369.

QUESTION NO: 12
In EIGRP, what kind of route information is stored in the RAM of the router and maintained by way of hello packets and update packets? (Select two answer choices)

A. Neighbor Table
B. SRF Table
C. RTP Table
D. Topology Table
E. Query Table
F. Dual Table

Answer: A, D
Explanation:
In EIGRP the only two tables of significance are the neighbor table and the topology table.
Incorrect Answers:

B, C, E, F. These are not tables used by EIGRP.
Reference: Sybex CCNA Study Guide edition 4, Page 271

QUESTION NO: 13
What is the maximum number of hops OSPF allows before it deems a network unreachable?

A. 15
B. 16
C. 99
D. 255
E. Unlimited

Answer: E
Explanation:
OSPF is a link state protocol. Link state protocols do not use hops to mark networks as unreachable. Instead OSPF implements a steady state operation to its adjacent neighbors by sending and receiving small Hello packets periodically. When an OSPF router does not receive a Hello packet for a specified time period, it assumes that the neighbor is down. The router then runs the SPF algorithm to calculate new routes. Hops counts are not used.

QUESTION NO: 14
On the topic of the OSPF hello protocol; which of the statements below are true? (Select two answer choices)

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

Answer: A, C
Explanation:
OSPF contains a protocol (the Hello protocol) that is used to establish and maintain relationships between neighboring nodes. These relationships are called adjacencies. Adjacencies are the basis for the exchange of routing data in OSPF.

It is through the use of this protocol, and packet type, that an OSPF node discovers the other OSPF nodes in its area. Its name is intentionally significant; the Hello protocol establishes communications between potential neighboring routers. The Hello protocol uses a special subpacket structure that is appended to the standard 24-octet OSPF header. Together, these structures form a hello packet.

All routers in an OSPF network must adhere to certain conventions that must be uniform throughout the network. These conventions include the following:

1. The network mask
2. The interval at which hello packets will be broadcast (the hello interval)
3. The amount of time that must elapse before a non responding router will be declared dead (that is, the router dead interval) by the other routers in the network
4. All routers in an OSPF network must agree to use the same value for each of these parameters; otherwise, the network might not operate properly. These parameters are exchanged using hello packets. Together, they comprise the basis for neighborly communications. **They ensure that neighbor relationships (known as adjacencies) are not formed between routers in different subnets and that all members of the network agree on how frequently to stay in contact with each other.**

The hello packet also includes a listing of other routers (using their unique router IDs) that the source router has recently been in contact with. This field, the Neighbor field, facilitates the neighbor discovery process. The hello packet also contains several other fields such as Designated Router and Backup Designated Router. These fields are useful in maintaining adjacencies and support the operation of the OSPF network in both periods of stability and convergence.

QUESTION NO: 15
A routing table contains static, RIP, and IGRP routes destined to the same network with each route set to its default administrative distance. Which route will be the preferred route?

A. The RIP route
B. The static route
C. The IGRP route
D. All three will load balance.

Answer: B
Explanation:
To decide which route to use, IOS uses a concept called Administrative Distance. The administrative distance is a number that denotes how believable an entire routing protocol is on a single router. The lower the number, the better, or more believable the routing protocol.
 Route Type Administrative Distance
* Static 1
* IGRP 100
* RIP 120

Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 177

QUESTION NO: 16
You are an administrator and you've just configured OSPF on a router with both physical and logical interfaces. Which of the following factors determine the router ID?

A. The lowest IP address of any interface.
B. The highest IP address of any interface.
C. The highest IP address of any logical interface.
D. The middle IP address of any logical interface.
E. The lowest IP address of any physical interface.
F. The highest IP address of any physical interface.
G. The lowest IP address of any logical interface.

Answer: C
Explanation:
When the OSPF process starts, the Cisco IOS uses the highest local active IP address as its OSPF router ID. If there is no active interface, the OSPF process will not start. If the active interface goes down, the OSPF process has no router ID and therefore ceases to function until the interface comes up again.

To ensure OSPF stability there should be an active interface for the OSPF process at all times. A loopback interface, which is a logical interface, can be configured for this purpose. When a loopback interface is configured, OSPF uses this address as the router ID, regardless of the value. On a router that has more than one loopback interface, OSPF takes the highest loopback IP address as its router ID.

To create and assign an IP address to a loopback interface use the following commands:

Router(config)#interface loopback number (no can be range from 0 -255)
Router(config-if)#ip address ip-address subnet-mask

example:
Router(config)#interface loopback 0
Router(config-if)#ip address 192.168.31.33 255.255.255.255
Router(config-if)#exit

It is considered good practice to use loopback interfaces for all routers running OSPF. This loopback interface should be configured with an address using a 32-bit subnet mask of 255.255.255.255. A 32-bit subnet mask is called a host mask because the subnet mask specifies a network of one host. When OSPF is requested to advertise a loopback network, OSPF always advertises the loopback as a host route with a 32-bit mask.

Summary
lookback address(logical address) is use when active interfaces (physical addresses) is down in order to make OSPF stable or reliable

Source: Cisco Network Academy Semester 3 version 3
Topic: Single Area OSPF Configuration
Sub Topic: Configuring OSPF loopback address and router priority

QUESTION NO: 17
Under which circumstance, i.e. network type, would an OSPF router establish a neighbor adjacency, even though the DR/BDR election process was not performed?

A. Point-to-point
B. Broadcast multicast
C. Nonbroadcast multicast
D. Backbone area 0
E. Virtual Link

Answer: A

Explanation: If there's a point to point connection, there's no need for a designated router or a backup designated router election. By definition, only two routers exist on a point to point connection.

Incorrect Answers:

B, C. In these network types, the potential for more than two routers on the segment exist, so the Designated Router and Backup Designated Routers are elected.

D. This is not a network type. Area 0 is the backbone of any OSPF network.

E. Virtual Links are used in OSPF to link an area to area 0. Every area must be directly connected to area 0 at some point, and virtual links are used for areas that do not meet this requirement.

QUESTION NO: 18

On the assumption that every OSPF router in a particular area is configured with the same priority value; which secondary value would be used as a router ID when there is no loopback interface set?

A. The IP address of the first Fast Ethernet interface.

B. The IP address of the console management interface.

C. The highest IP address among its active interfaces.

D. The lowest IP address among its active interfaces.

E. There will be no router ID until a loopback interface is configured.

Answer: C

Explanation: Ordinarily the loopback interface would be selected as the router ID. In the event that no loopback interface is configured, the router ID will be the first active interface that comes up on the router. If that particular interface has more then one IP address, then the highest address will be selected as the Router ID.

Incorrect Answers:

B. Putting an IP address on the management console is a concept that is configured on a Catalyst switch, not a router.

QUESTION NO: 19

The statements below compare and contrast link state and distance vector routing protocols. Which of these are true? (Choose two)

A. Distance vector protocols send the entire routing table to directly connected neighbors.

B. Distance vector protocols are responsible for sending updates to all networks listed in the routing table.

C. Link state protocols are responsible for sending the entire routing table to the whole network.

D. Link state protocols send updates regarding their own links status to all other routers on the network.

Answer: A D

Explanation:

Distance Vector Protocols:

Distance Vector Protocols advertise routing information by sending messages, called routing updates, out the interfaces on a router. These updates contain a series of entries, with each entry representing a subnet and a metric.

Link-State Protocols:

Send partial updates when link status changes and floods full routing table updates every 30 minutes. The flooding, however, does not happen all at once, so the overhead is minimal.

Incorrect Answers:

B. Distance Vector protocols only send information to adjacent neighbors.

C. Only partial routing updates and sent to neighbors on a regular basis. The entire table is not sent to all neighbors. This would obviously create far too much overhead traffic.

Reference:

CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5) Page 413 + 419

QUESTION NO: 20

What are the characteristic of link state routing protocols? (Choose all that apply.)

A. The exchange of advertisement is triggered by a change in the network.

B. All routers exchange routing tables with each other in a multipoint network.

C. Packets are routed based upon the shortest path to the destination.

D. Paths are chosen depending on the cost efficiency factor.

E. Every router in an OSPF area is capable of representing the entire network topology.

F. Only the designated router in an OSPF area can represent the entire network topology.

Answer: A C E

Explanation:

Open Shortest Path First

* Each router discovers its neighbors on each interface. The list of neighbors is kept in a neighbor table.
* Each router uses a reliable protocol to exchange topology information with its neighbors.
* Each router places the learned topology information into its topology database.
* Each router runs the SPF algorithm against its own topology database.
* Each router runs the SPF algorithm against its own topology database to calculate the best routes to each subnet in the database.
* Each router places the best roué to each subnet into the IP routing table.

The following list points out some of the key features of OSPF:
* Converges very quickly - from the point of recognizing a failure, it often can converge in less than 10 seconds.
* Supports VLSM.
* Uses short Hello messages on a short regular interval, with the absence of hello messages indicating that a neighbor is no longer reachable.
* Sends partial updates when link status changes, and floods full updates every 30 minutes. The flooding, however, does not happened all at once, so the overhead s minimal.
* Uses cost for the metric.
Reference: CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5) Page 417

QUESTION NO: 21
On the topic of OSPF routing; which of the following are the traits of an OSPF area? (Select all that apply)

A. Each OSPF area requires a loopback interface to be configured.
B. Areas may be assigned any number from 0 to 65535.
C. Area 0 is called the backbone area.
D. Hierarchical OSPF networks do not require multiple areas.
E. Multiple OSPF areas must connect to area 0.
F. Single area OSPF networks must be configured in area 1.

Answer: C, E
Explanation:
OPSF uses areas in a hierarchical fashion, and the backbone area is always area 0. All other areas have at least one connection to area 0.
Incorrect Answers:

A. Loopback interfaces are often used in OSPF networks, so that the router ID can be configured. However, this is not a requirement.

B. The area-id can be an integer between 0 and 4294967295.

F. Single area OSPF networks do not have to be configured with the backbone area 0. Although area 1 can indeed be used, it is not required that area 1 is used. Single area OSPF networks can be any integer from 0-4294967295.

QUESTION NO: 22
If the bandwidth of an OSPF interface is configured with the "bandwidth 64" command, what would be the calculated cost of the link?

A. 1
B. 64
C. 1562
D. 64000
E. 1500

Answer: C
Explanation: The question states that OSPF interface has been configured with the bandwidth 64command. Cisco IOS always interprets the values for the bandwidth command as being in kbps, so the bandwidth is configured as 64 kbps. The metric for any OSPF defaults to 100,000,000/bandwidth. So, in this example:

100,000,000 / 64000 = 1562.5

QUESTION NO: 23
Which two are NOT characteristics of the OSPF routing protocol? (Select all that apply)

A. It confines network instability to a single area of network.
B. It increases the routing overhead of the network
C. It supports VLSM
D. It routes between Autonomous Systems.
E. It allows extensive control of routing updates

Answer: B, D

Explanation:

Through the use of areas, routing information and instability's are reduced to specific areas. This will reduce the routing overhead on a network, not increase it. OSPF is not used to provide routing information between different systems. BGP is predominately used for this purpose.

Incorrect Answers:

A, C, E. These are all true statements that describe the features and functionality of OSPF.

QUESTION NO: 24

Which of the following are true statements regarding the characteristics of OSPF areas? Select all that apply.

A. All OSPF networks require the use of multiple areas

B. Multiple OSPF areas must connect to area 0

C. Single area OSPF networks must be configured in area 1

D. Areas can be assigned any number from 0 to 63535

E. Area 0 is called the backbone area

F. Each OSPF area need to be configured with a loopback interface

Answer: B, E

Explanation:

OSPF divides its routing domain into areas. Area 0, the backbone, is required. This divides interior routing into two levels. If traffic must travel between two areas, the packets are first routed to the backbone. This may cause non-optimal routes, since interarea routing is not done until the packet reaches the backbone. Once there, it is routed to the destination area, which is then responsible for final delivery. This layering permits addresses to be consolidated by area, reducing the size of the link state databases. All areas must be connected to area 0, either directly or through the use of virtual links.

Incorrect Answers:

A. OSPF network can only consist of a single area.

C. Single area networks can use any area number. If more than one area is configured in the network, then at least one of the areas must be area 0.

D. The area-id can be an integer between 0 and 4294967295.

F. While loopback interfaces are commonly used in OSPF networks, it is not a requirement.

QUESTION NO: 25
On what kinds of networks does OSPF elect a backup designated router?

A. Point-to-point
B. Point to multipoint
C. Broadcast
D. Non-broadcast multi-access

Answer: C, D
Explanation:
The DR and BDR election process is performed on broadcast and non-broadcast
multi-access networks.
Incorrect Answers:
A, B: There is no DR or BDR on point to point and point to multipoint links. On a point
to point link, only two routers exist so there is no need for a DR or BDR.

QUESTION NO: 26
**Three TestKing routers are configured for OSPF area 0 as shown in the diagram
below:**
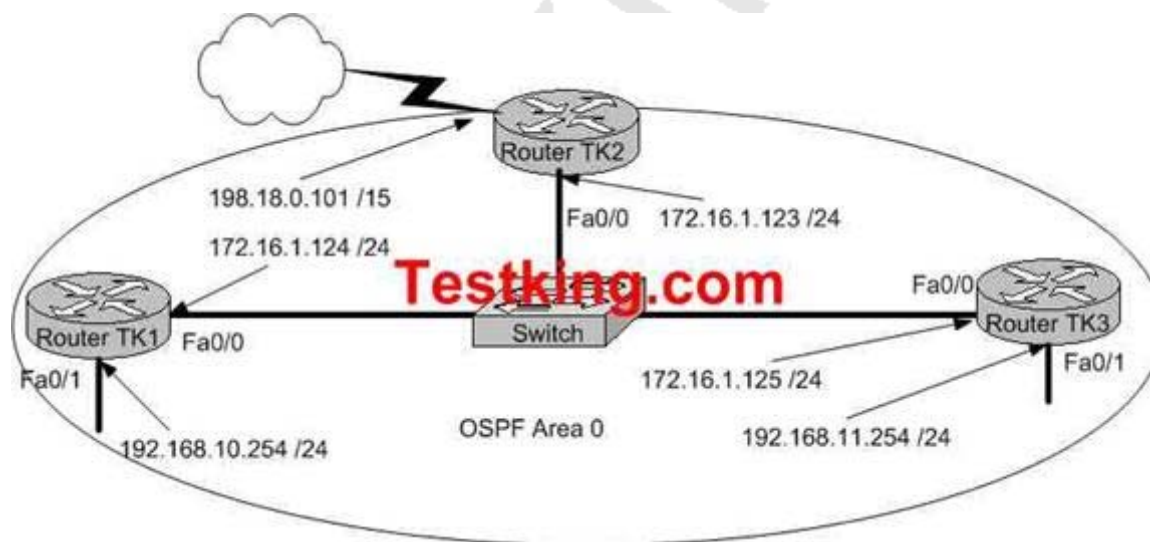
You wish to ensure that router TK2 will be preferred as the designated router (DR) for the 172.16.1.0 /24 LAN segment.
What configuration tasks could be used to establish this preference? (Choose all that apply)

A. Configure the priority value of the Fa0/0 interface of RouterTK2 to a higher value than any other interface on the Ethernet network.
B. Change the router id for Router TK2 by assigning the IP address 172.16.1.130/24 to the Fa0/0 interface of RouterTK2.
C. Configure a loopback interface on RouterTK2 with an IP address higher than any IP address on the other routers.
D. Change the priority value of the Fa0/0 interface of RouterTK2 to zero.
E. Change the priority values of the Fa0/0 interfaces of RouterTK1 and RouterTK3 to zero.
F. No further configuration is necessary.
G. All of the above will make TK2 the DR

Answer: A, C, E
Explanation:
In order to ensure that a router will become the OSPF DR for any given segment, there are a number of options. One way is to manually configure the interface priority as described in option A above using the "ip ospf priority" interface configuration command. The second method is described in option C. OSPF routers will always use the loopback interface IP address as the router ID, when configured, and the router with the highest IP address will be chosen as the DR when the priorities are the same. The final method is to change the priority of the other routers in the segment to zero. When the OSPF priority is set to 0, the router is ineligible to become the DR or the BDR. Important Note: The OSPF DR/BDR election process is not pre-emptive, so any changes to the network regarding the DR/BDR election process will only occur when the routers are restarted.
Incorrect Answers:
B. This method will not work as the router ID is taken by using the highest IP address of all interfaces in the router, or from the loopback interface if it is configured. Although choosing this option will give router TK2 the highest IP address on the LAN segment, the router ID will be taken from the highest IP address in the router, which as shown will be 192.168.0.101.
D. This will make TK2 ineligible to become either the DR or the BDR.

QUESTION NO: 27

The TestKing router has been configured for EIGRP. Information relating to the configuration is displayed in the output shown below:

Routing Protocol is "eigrp 478"
--- output omitted ---
Redistributing: eigrp 478
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
172.26.168.128/26
172.26.169.0/26
Routing Information Sources:
Gateway   Distance   Last Update
172.26.168.129   90   01:01:59
Distance: internal 90 external 170

The EIGRP configuration in the TestKing router used a single network statement. From the output shown in the graphic, which network statement was used to advertise these networks in EIGRP?

A. network 172.26.168.128 0.0.0.127
B. network 172.26.168.128 area 478
C. network 172.26.0.0
D. network 172.26.168.0 area 478

Answer: C
Explanation:
The correct configuration statements used in the above were:

Router eigrp 478
 Network 172.26.0.0

Incorrect Answers:
A. A wildcard mask is not required at the end of the network statement in order to configure EIGRP. It is only required for an OSPF configuration.
B, D: In EIGRP, the concept of an area does not exist. This is only used by OSPF.

QUESTION NO: 28
Which commands are required to properly configure a router to run OSPF and to add network 192.168.16.0/24 to OSPF area 0? (Select two)

A. TestKingRouter(config)# router ospf 0
B. TestKingRouter(config)# router ospf 1
C. TestKingRouter(config)# router ospf area 0
D. TestKingRouter(config)# network 192.168.16.0 0.0.0.255 0
E. TestKingRouter(config)# network 192.168.16.0 0.0.0.255 area 0
F. TestKingRouter(config)# network 192.168.16.0 255.255.255.0 area 0

Answer: B, E
Explanation:
The valid OSPF process ID can be a value from 1-65535 (0 is not valid).
The following is the correct syntax:

TK1(router)# router ospf 1
TK1 (router)# network 192.168.16.0 0.0.0.255

This will configure OSPF with process ID 1, and adds the 192.168.16/24 network to be advertised as belonging to area 0.

QUESTION NO: 29
TestKing routers are connected as shown in the diagram below:

Routers TestKingB and TestKingC are configured for RIPv2 and have complete connectivity. Router TestKingA is added to the network. What is the most appropriate TestKingA configuration for full connectivity?

A. TestKingA(config)# router rip
TestKingA(config)# network 10.0.0.0
TestKingA(config)# network 172.16.0.0
TestKingA(config)# network 192.168.1.0

B. TestKingA(config)# router rip
TestKingA(config)# network 10.0.0.0

C. TestKingA(config)# router rip
TestKingA(config)# network 10.0.0.0
TestKingA(config)# network 172.16.0.0

D. TestKingA(config)# router rip
TestKingA(config)# network 10.0.0.0
TestKingA(config)# network 192.168.1.0

Answer: C
Explanation:
When configuring RIP you configure only the directly connected networks that are to be advertised via the RIP routing process are to be configured.
Incorrect Answers:
A. This choice implies that when configuring rip on a router every possible network in the entire system should be configured. This is not the case.
B. Testking 1 requires the 172.16.0.0 network to be configured, not the 192.168.1.0 network.
D. If the 172.16.0.0 network is omitted, then the other routers in the network will not be able to reach the LAN users of TestkingA via RIP.

QUESTION NO: 30
The following configuration command was issued on router TK1:

ip route 172.16.3.0 255.255.255.0 192.168.2.1

Which of the following statements are true regarding this command? (Select two)

A. The command is used to establish a static route.
B. The default administrative distance is used.
C. The command is used to configure the default route.
D. The subnet mask for the source address is 255.255.255.0
E. The command is used to establish a stub network

Answer: A, B
Explanation:
The IP route command is used to establish a static route. The default administrative distance is used because the other distance is not set at the end of the command. Unless otherwise specified by placing a cost at the end of this command, the default administrative distance will be 1.

QUESTION NO: 31
The TestKing network is shown in the following exhibit:

```
TestKing3# show ip route
Gateway of last resort is not set
    192.168.10.0/24 is variably subnetted, 6 subnets, 2 masks
D      192.168.10.64/26 [90/2195456] via 192.168.10.9, 00:03:31, Serial0/0
D      192.168.10.0/30 [90/2681856] via 192.168.10.9, 00:03:31, Serial0/0
C      192.168.10.4/30 is directly connected, Serial 0/1
C      192.168.10.8/30 is directly connected, Serial 0/0
C      192.168.10.192/26 is directly connected, FastEthernet0/0
D      192.168.10.128/26 [90/2195456] via 192.168.10.5, 00:03:31, Serial 0/1
```

TestKing uses EIGRP as the routing protocol. Based on the info shown above, what path will packets take from a host on the 192.168.10.192/26 network to a host on the LAN attached to routerTESTKING1?

A. The path of the packets will be TESTKING3 to TESTKING2 to TESTKING1
B. The path of the packets will be TESTKING3 to TESTKING1 to TESTKING2
C. The path of the packets will be both TESTKING3 to TESTKING2 to TESTKING1 AND TESTKING3 to TESTKING1
D. The path of the packets will be TESTKING3 to TESTKING1

Answer: D

Explanation:
Based on the routing table of TestKing3, the best path to the TestKing1 LAN is shown on the first routing entry (192.168.10.64). TestKing 3 will use the Serial 0/0 interface to route traffic to this destination, with the next hop IP address of 192.168.10.9, which is the network used between TestKing3 and TestKing1, making choice D correct. Note that there is only one routing entry for this destination. If traffic were load balancing over both paths, then both would be displayed in the routing table.

QUESTION NO: 32
The TestKing network is shown below:
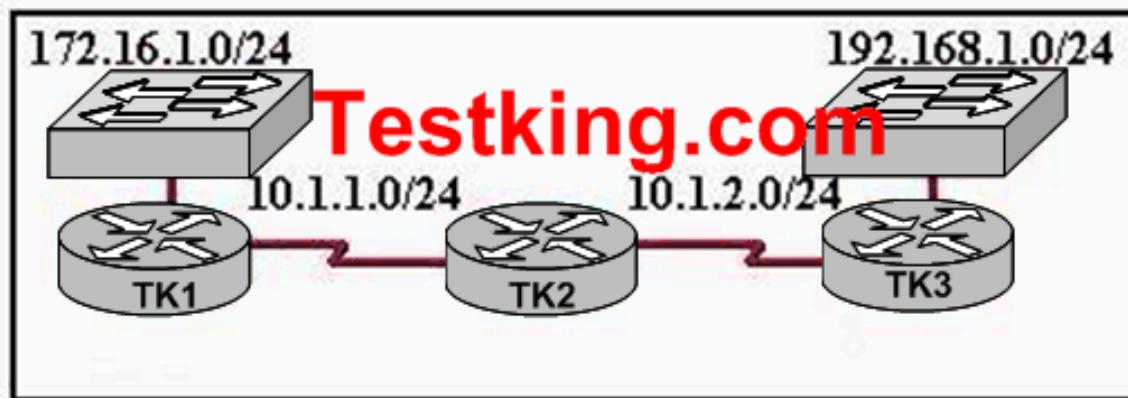
TK2 and TK3 are configured for RIPv1 and have complete connectivity. TK1 is added to the network. What is the most appropriate TK1 configuration for full connectivity?

A. TK1(config)# router rip
     TK1(config-router)# network 10.0.0.0
     TK1(config-router)# network 172.16.0.0
     TK1(config-router)# network 192.168.1.0
B. TK1(config)# router rip
     TK1(config-router)# network 10.0.0.0
C. TK1(config)# router rip
     TK1(config-router)# network 10.0.0.0
     TK1(config-router)# network 172.16.0.0
D. TK1(config)# router rip
     TK1(config-router)# network 10.0.0.0

TK1(config-router)# network 192.168.1.0

Answer: C
Explanation:
Steps to Configure RIP include:
1. Enable the RIP
(Config)#router rip
2. publish the connected networks to the RIP routing process:
(config-router)# network 10.0.0.0
(config-router)# network 172.16.0.0
Which publishes the 10 and 172.16 networks on RIP.
It is only necessary to add the directly connected links to the routing process, not all
networks used within the entire network domain.

QUESTION NO: 33
The TestKing network is shown below:
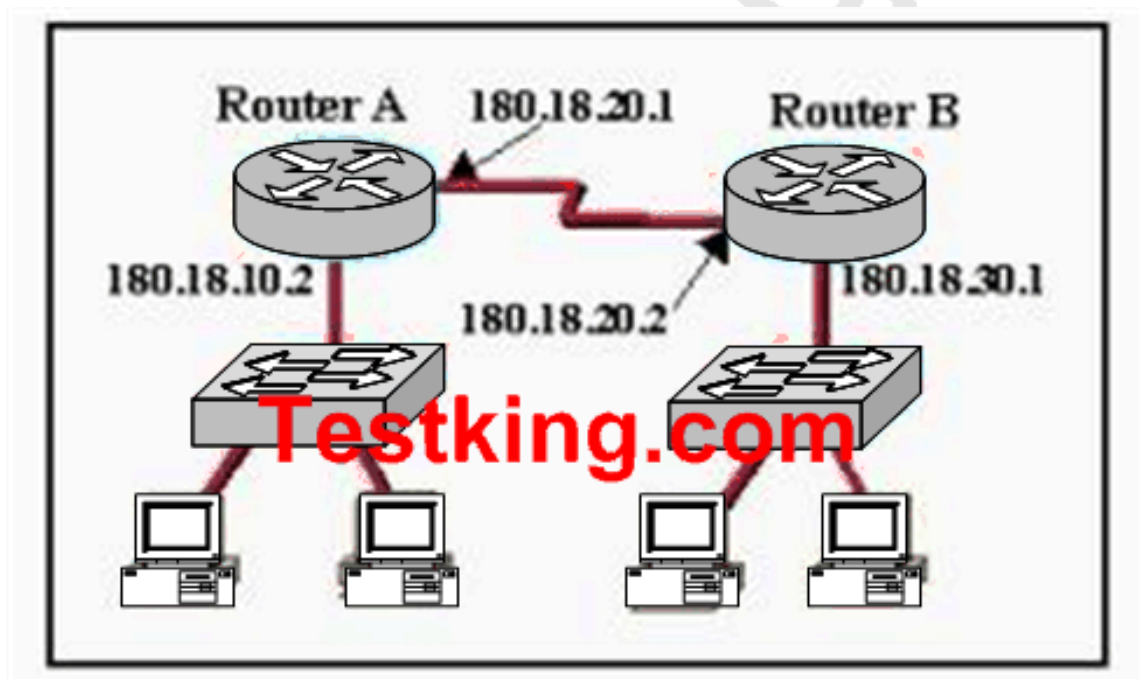
**Based on this information, which of the following will configure a static route on
Router A to network 180.18.30.0/24 with an administrative distance of 90?**

A. Router(config)# ip route 90 180.18.20.1 255.255.255.0 182.18.20.2
B. Router(config)# ip route 180.18.20.1 255.255.255.0 182.18.30.0 90
C. Router(config)# ip route 180.18.30.1 255.255.255.0 182.18.20.1 90
D. Router(config)# ip route 90 180.18.30.0 255.255.255.0 182.18.20.2
E. Router(config)# ip route 180.18.30.0 255.255.255.0 182.18.20.2 90

Answer: E
Explanation:
Static route entries consist of the destination IP network address, the IP address of the
next hop router, and the metric (hop count) for the route. A static route that points to the
next hop IP address has an Administrative distance of 1. If the static route points to an
outgoing interface, the static route has the Administrative distance of 0.
One common reason to change the administrative distance of a route is when you use
Static Routes to backup and existing IGP route. This is normally used to bring up a
backup link when the primary fails. In this example, choice E specifies that to reach the
180.18.30.0/24 network, forward this traffic to the router with the next hop IP address of
182.18.20.2 (Router B) using an administrative distance of 90.

QUESTION NO: 34
A router learns about a remote network from EIGRP, OSPF, and a static route.
Assuming all routing protocols are using their default administrative distance,
which route will the router use to forward data to the remote network?

A. The router will use the static route.
B. The router will use the OSPF route.
C. The route will use the EIGRP route.
D. The router will load balance and use all three routes.

Answer: A
Explanation:
When a router learns about the same network via multiple sources, the router will choose
the source with the lowest administrative distance (AD). By default, the AD for these
routing protocols are:

Connected Interface has 0 AD
Static Route : 1
EIGRP : 90

OSPF : 110

So, the static route will be chosen since it has the lowest AD.

QUESTION NO: 35
A TestKing router learns two routes to a remote network, one route via OSPF and one route via RIPv2. The network administrator wants the router to install the route learned via RIPv2 into its routing table. What should the network administrator configure to ensure that the router will use the route learned via RIPv2?

A. Nothing. The router will automatically use routes learned via RIP over routes learned via OSPF.
B. The network administrator should configure the routers along the OSPF path with lower priority numbers.
C. The network administrator should configure the router interface on the OSPF path to be a passive interface.
D. The network administrator should configure an administrative distance for RIP that is lower than the administrative distance of OSPF.
E. If two paths exist to a remote network, the only way to force the router to prefer one path over the other is to configure the preferred path as a static route.

Answer: D
Explanation:
When multiple routing protocols are configured for the same networks, the router will use the path with the lowest Administrative Distance (AD). By default, OSPF has and AD of 110 and RIP has an AD of 120. In order to ensure that the router prefers the route learned via RIP over OSPF, the AD of the RIP route must be reduced to a value less than 120.

QUESTION NO: 36
Two TestKing routers are connected as shown in the diagram below:
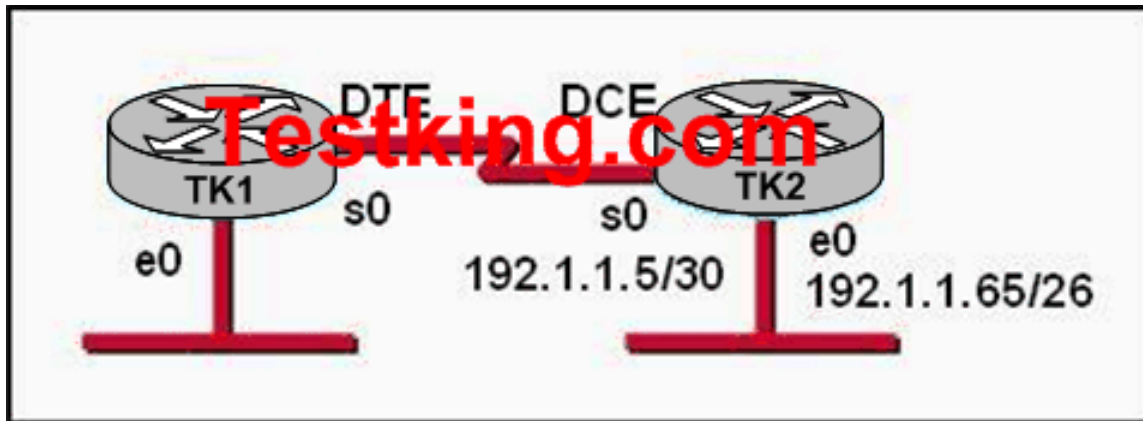
Which series of commands will configure router TK1 for LAN-to-LAN communication with router TK2? The enterprise network address is 192.1.1.0/24 and the routing protocol in use is RIP. (Choose three)

A. TK1(config)# interface ethernet 0
TK1(config-if)# ip address 192.1.1.129 255.255.255.192
TK1(config-if)# no shutdown
B. TK1(config)# interface ethernet 0
TK1(config-if)# ip address 192.1.1.97 255.255.255.192
TK1(config-if)# no shutdown
C. TK1(config)# interface serial 0
TK1(config-if)# ip address 192.1.1.4 255.255.255.252
TK1(config-if)# clock rate 56000
D. TK1(config)# interface serial 0
TK1(config-if)# ip address 192.1.1.6 255.255.255.252
TK1(config-if)# no shutdown
E. TK1(config)# router rip
TK1(config-router)# network 192.1.1.4
TK1(config-router)# network 192.1.1.128
F. TK1(config)# router rip
TK1(config-router)# version 2
TK1(config-router)# network 192.1.1.0

Answer: A, D, F
Explanation:

To establish connectivity on router TK1 the first step is to configure the interfaces with the correct IP address and enable them with the "no shutdown" command as shown in answer choices A and D. The final step is to enable the RIP routing process. Since this network uses VLSM, RIP version 2 will be required to establish connectivity. RIP version 1 is the default RIP version, but it does not support VLSM.

Incorrect Answers:
B: The IP address in use here will conflict with the LAN network configured on TK2.
C: the 192.168.1.4/30 address is a network address, not a host address.
E: In this example we are required to use RIP version 2, not 1. In addition, the IP networks shown are not required. Since RIP assumes classful routing, we only need the single 192.168.1.0 network to be added to the routing process.

QUESTION NO: 37
What command will disable CDP on a router interface?

A. TestKing1(config-if)# no cdp enable
B. TestKing1(config-if)# no cdp
C. TestKing1(config-if)# no cdp run
D. TestKing1(config-if)# no cdp active

Answer: A
Explanation:

CDP is a proprietary protocol designed by Cisco to help administrators collect information about both locally attached and remote devices. By using CDP, you can gather hardware and protocol information about neighbor devices which is useful info for troubleshooting and documenting the network.

To disable the CDP on particular interface use the "no cdp enable" command. To disable CDP on the entire router use the "no cdp run" in global configuration mode.

QUESTION NO: 38

The network administrator of the Oregon router adds the following command to the router configuration: ip route 192.168.12.0 255.255.255.0 172.16.12.1. What are the results of adding this command? (Choose two.)

Exhibit:

A. Traffic for network 192.168.12.0 is forwarded to 172.16.12.1.
B. This route is automatically propagated throughout the entire network.
C. Traffic for all networks is forwarded to 172.16.12.1.
D. Traffic for network 172.16.12.0 is forwarded to the 192.168.12.0 network.
E. The command invokes a dynamic routing protocol for 192.168.12.0.
F. The command establishes a static route.

Answer: A, F
Explanation:
In order to configure a static route the router has to be in global configuration mode.
ip route network prefix mask {address | interface} [distance]

network - the destination network
mask - is the subnet mask for that network
address - IP address of the next hop router
interface - or the interface the traffic is to leave by
distance - (optional) the administrative distance of the route

There are other parameters but these have been removed as they are not relevant to the CCNA exam.
Example:

ip route 10.0.0.0 255.0.0.0 131.108.3.4 110

10.0.0.0 is the destination network. 255.0.0.0 is the subnet mask for that network and 131.108.3.4 is the next hop for the router to use. The 110 is the administrative distance which we will look at later on.

QUESTION NO: 39
A network associate has configured the internetwork that is shown in the exhibit, but has failed to configure routing properly. Which configuration will allow the hosts on the Branch LAN to access resources on the HQ LAN with the least impact on router processing and WAN bandwidth?

Exhibit:

A. HQ(config)# router rip
 HQ(config-router)# network 192.168.2.0
 HQ(config-router)# network 172.16.0.0
 Branch(config)# router rip
 Branch (config-router)# network 192.168.1.0
 Branch (config-router)# network 192.168.2.0
B. HQ(config)# router eigrp 56
 HQ(config-router)# network 192.168.2.4
 HQ(config-router)# network 172.16.25.0
 Branch(config)# router eigrp 56
 Branch (config-router)# network 192.168.1.0
 Branch (config-router)# network 192.168.2.4
C. HQ(config)# ip route 192.168.1.0 255.255.255.0 192.168.2.5
 Branch(config)# ip route 172.16.25.0 255.255.255.0 192.168.2.6
D. HQ(config)# router ospf 1
 HQ(config-router)# network 192.168.2.4 0.0.0.3 area 0

HQ(config-router)# network 172.16.25.0 0.0.0.255 area 0
Branch(config)# router ospf 1
Branch (config-router)# network 192.168.1.0 0.0.0.255 area 0
Branch (config-router)# network 192.168.2.4 0.0.0.3 area 0

Answer: C
Explanation:
As far as the CCNA exam goes, there are three types of routing: static, dynamic, and default.
* Static routes - are fixed routes that are manually entered by the administrator into the router's configuration.
* Dynamic routing - is the process by which a network adapts automatically to the changes in topology or traffic as those changes occur.
* Default routes - are very much like static route. The administrator enters the default route, and it becomes the default path the router uses to forward packets for which it knows no other route to use. Without a default route, packets with unknown destinations are dripped.
A static route is configured on the router with a command like this:
ip route [destination_network] [mask] [next_hop_address or exit interface] [administrative-distance] [permanent]
Example: RouterA(config)#ip route 192.168.1.0 255.255.255.0 192.168.1.1 3
Using the previous command example the key elements of the static router configuration command are:
* ip route: This is the command used to designate a static route.
* destination address: in this example, 209.220.93.243 is the IP address of the destination network.
* subnet mask: 192.169.1.0 is a Class C IP address and is using the default subnet mask for Class C addresses, 255.255.255.0
* next hop: Following the subnet mask is the address of the next hop router, 192.168.1.1
* administrative distance: This is a number between 0 and 255 that indicates how well the route can be trusted. The higher the number, the lower the trust.
* permanent: if the interface is shut down or the router cannot communicate to the next hop router, the route is automatically discarded from the routing table. Choosing the permanent option keeps the entry in the routing table no matter what happens.
Static routing has the following benefits:
* No overhead on the router CPU
* No bandwidth usage between routers
* Security (because the administrator only allows routing to certain networks)

QUESTION NO: 40
In the TestKing network shown below, what is the most efficient summarization that TK1 can use to advertise its networks to TK2?
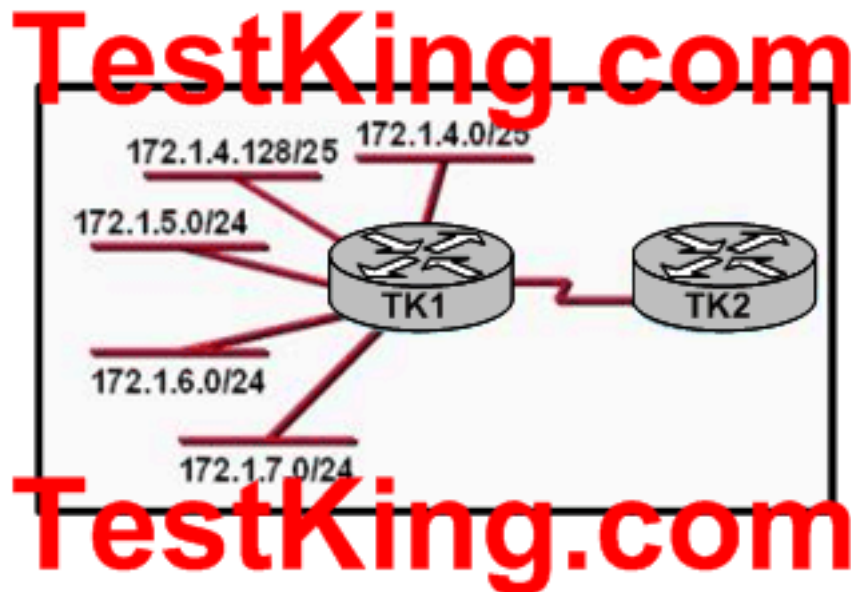
A. 172.1.4.0/24172.1.5.0/24172.1.6.0/24172.1.7.0/24
B. 172.1.0.0/22
C. 172.1.4.0/25172.1.4.128/25172.1.5.0/24172.1.6.0/24172.1.7.0/24
D. 172.1.0.0/21
E. 172.1.4.0/22

Answer: E
Explanation:
Route Summarization Overview:
In large internetworks, hundreds, or even thousands, of network addresses can exist. It is often problematic for routers to maintain this volume of routes in their routing tables. Route summarization (also called route aggregation or supernetting) can reduce the number of routes that a router must maintain, because it is a method of representing a series of network numbers in a single summary address.
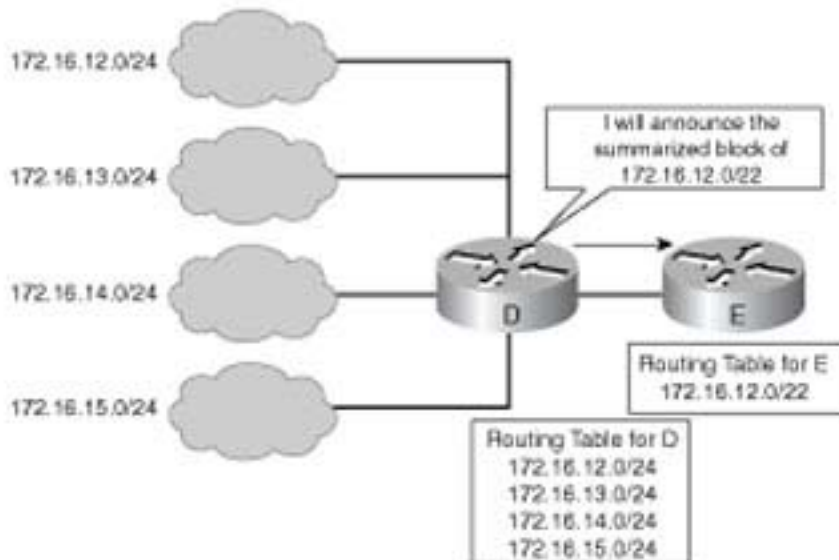
For example, in the figure above, router D can either send four routing update entries or summarize the four addresses into a single network number. If router D summarizes the information into asingle network number entry, the following things happen:

1. Bandwidth is saved on the link between routers D and E.
2. Router E needs to maintain only one route and therefore saves memory.
3. Router E also saves CPU resources, because it evaluates packets against fewer entries in its routing table.

A summary route is announced by the summarizing router as long as at least one specific route in its routing table matches the summary route.

QUESTION NO: 41
A network associate has configured OSPF with the following command:
City(config-router)# network 192.168.12.64 0.0.0.63 area 0.
After completing the configuration, the associate discovers that not all the interfaces
are participating in OSPF. Which three of the interfaces shown below will
participate in OSPF according to this configuration statement? (Choose three)

```
City#show ip interface brief

Interface          IP-Address      OK?  Method  Status  Protocol
FastEthernet0/0    192.168.12.48   YES  manual  up      up
FastEthernet0/1    192.168.12.65   YES  manual  up      up
Serial0/0          192.168.12.121  YES  manual  up      up
Serial0/1          unassigned      YES  unset   up      up
Serial0/1.102      192.168.12.125  YES  manual  up      up
Serial0/1.103      192.168.12.129  YES  manual  up      up
Serial0/1.104      192.168.12.3    YES  manual  up      up
City#
```

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

Answer: A, D, E
Explanation:
OSPF uses the concept of wildcard masks much like access list filters. OSPF network
matches are done using the network number and wildcard bits. The network number is
the network portion of the IP address, with the host bits all set to zero. The wildcard bits
determine which portion of the address the access list will act on. Only bits set to zero are
acted upon (bits set to one are ignored.) This is the exact opposite of a netmask.
Remember that this number is in bits, and you will always have all zeros to the left of the
first one, and all ones to the right of the last zero. The table below shows some examples
of netmasks and wildcard bits.

Type of network	Netmask	Wildcard Bits
Class A	255.0.0.0	0.255.255.255
Class B	255.255.0.0	0.0.255.255
Class C	255.255.255.0	0.0.0.255
Class C 2-bit subnet	255.255.255.192	0.0.0.63
Class B 4-bit subnet	255.255.240.0	0.0.31.255

In this example, the 192.168.12.64 0.0.0.63 will comprise of all interfaces with an IP address in the 192.168.12.64-127 range.

QUESTION NO: 42
Refer to the exhibit. The Lakeside Company has the internetwork in the exhibit. The administrator would like to reduce the size of the routing table on the Central router. Which partial routing table entry in the Central router represents a route summary that represents the LANs in Phoenix but no additional subnets?

Exhibit:

Upstream Provider

FA0/1
10.3.0.0/24
CENTRAL
S0/0
S0/1
S1/1 S1/0
10.2.0.0/24
10.4.3.0/24

S0/0
NEW YORK
FA0/1

S0/0
LA
FA0/1

S0/0
PHOENIX
FA0/3
FA0/0 FA0/1 FA0/2
10.4.2.0/24

10.6.1.0/24
10.5.1.0/24
10.4.0.0/24 10.4.1.0/24
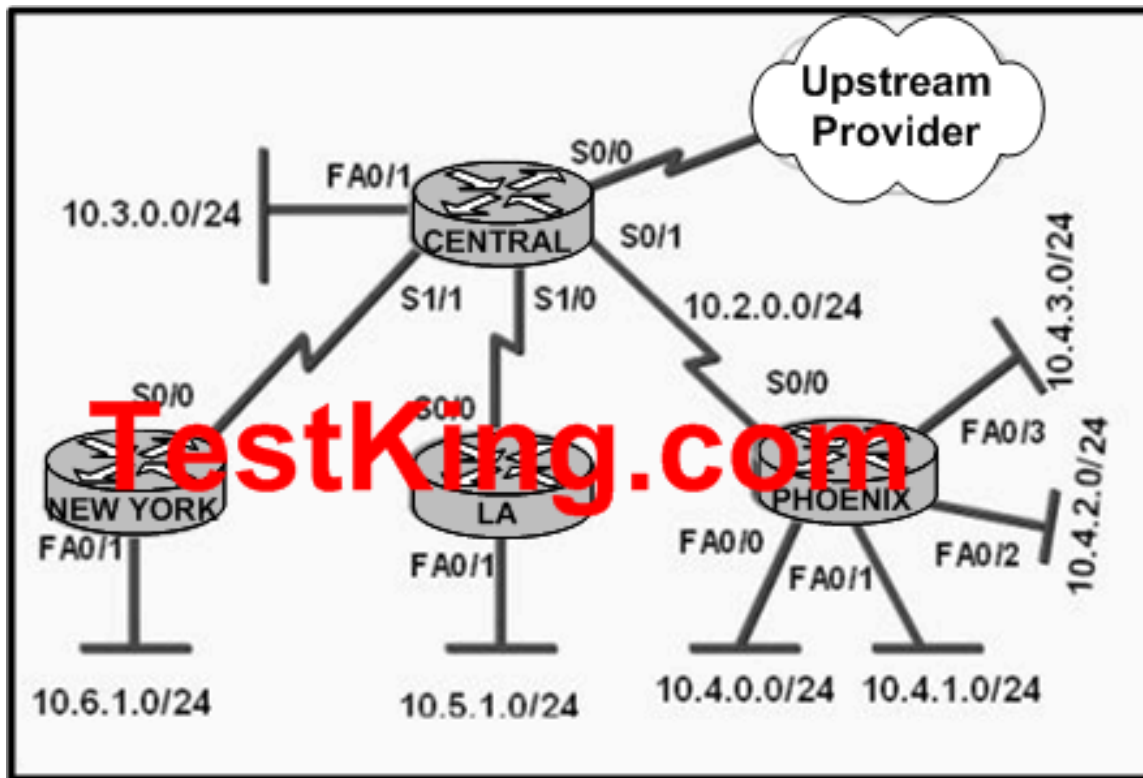
A. 10.0.0.0/28 is subnetted, 1 subnets
D 10.2.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
B. 10.0.0.0/30 is subnetted, 1 subnets
D 10.4.4.4 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
C. 10.0.0.0/30 is subnetted, 1 subnets
D 10.2.2.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
D. 10.0.0.0/28 is subnetted, 1 subnets
D 10.4.4.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
E. 10.0.0.0/22 is subnetted, 1 subnets
D 10.4.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1
F. 10.0.0.0/22 is subnetted, 1 subnets
D 10.0.0.0 [90/20514560] via 10.2.0.2, 6w0d, Serial0/1

Answer: E
Explanation:
The 10.4.0.0, 10.4.1.0, 10.4.2.0, and 10.4.3.0 can be correctly summarized by the single
10.4.0.0/22 network route as shown by option E.

QUESTION NO: 43
The network associate is configuring OSPF on the Core router shown below. All the connections to the branches should be participating in OSPF. The link to the ISP should NOT participate in OSPF and should only be advertised as the default route. What set of commands will properly configure the Core router?
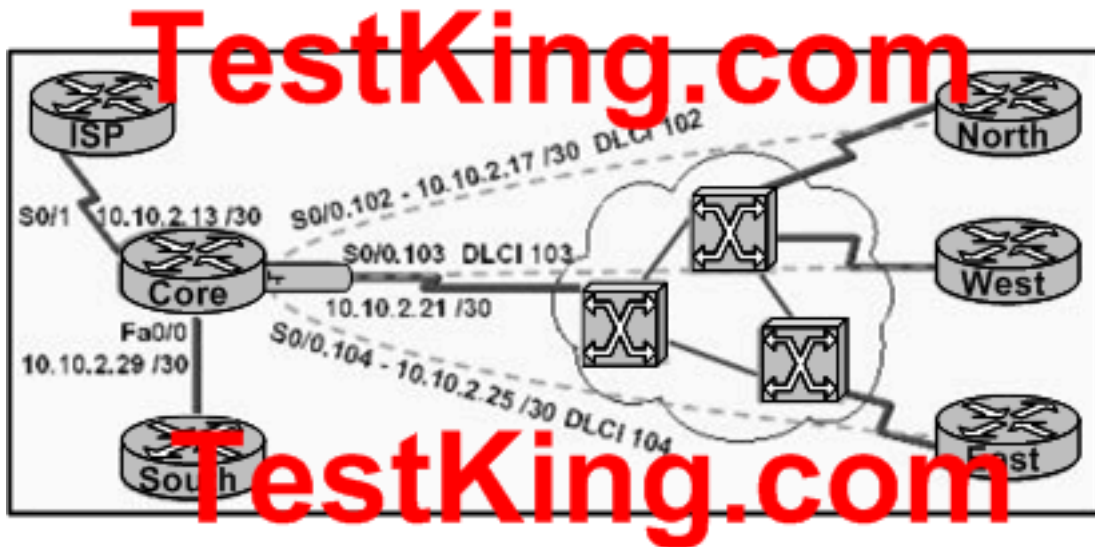
A. Core(config-router)# default-information originate
Core(config-router)# network 10.0.0.00.255.255.255 area 0
Core(config-router)# exit
Core(config)# ip route 0.0.0.00.0.0.010.10.2.14
B. Core(config-router)# default-information originate
Core(config-router)# network 10.10.2.32 0.0.0.31 area 0
Core(config-router)# exit
Core(config)# ip route 0.0.0.00.0.0.0 10.10.2.14
C. Core(config-router)# default-information originate
Core(config-router)# network 10.10.2.13 0.0.0.242 area 0
Core(config-router)# exit
Core(config)# ip route 0.0.0.00.0.0.010.10.2.14
D. Core(config-router)# default-information originate
Core(config-router)# network 10.10.2.16 0.0.0.15 area 0
Core(config-router)# exit
Core(config)# ip route 0.0.0.00.0.0.010.10.2.14

Answer: D
Explanation:
There are two ways to inject a default route into a normal area.
1. If the ASBR already has the default route in its routing table, you can advertise the
    existing 0.0.0.0/0 into the OSPF domain with the default-information originate router
    configuration command.
2. If the ASBR doesn't have a default route, you can add the keyword always to the
    default-information originate command (default-information originate always).
This command will advertise a default route into the OSPF domain, regardless of whether
it has a route to 0.0.0.0. Another benefit of adding always keyword is that it can add
stability to the internetwork. For example, if the ASBR is learning a default route from
another routing domain such as RIP and this route is flapping, then without the always
keyword, each time the route flaps, the ASBR will send a new Type 5 LSA into the OSPF
domain causing some instability inside the OSPF domain. With the always keyword, the
ASBR will advertise the default inside the OSPF domain always, and thus the flapping of
the default route from the RIP domain will not cause any instability inside the OSPF
domain.
In the example shown here, only choice D is correct as the wildcard mask correctly
specifies the 10.10.2.16 0.0.0.15 networks, which include all IP addresses in the
10.10.2.16-10.10.2.31 range.
Reference: http://www.cisco.com/warp/public/104/21.html

QUESTION NO: 44
**The Ethernet 0 interface of a TestKing router was configured with address 10.64.0.1
255.224.0.0 while the Ethernet 1 interface was configured with address 10.96.0.1/11.
Which commands could be used to configure RIP version 1 on this router to
advertise both networks to neighboring routers? (Choose two.)**

A. Router(config)# router rip
 Router(config-router)# network 10.0.0.0 255.224.0.0
B. Router(config)# router rip
 Router(config-router)# network 10.0.0.0
C. Router(config)# router rip
 Router(config-router)# network 10.64.0.0
 Router(config-router)# network 10.96.0.0
D. Router(config)# router rip
 Router(config-router)# network 10.64.0.1 255.224.0.0
 Router(config-router)# network 10.96.0.1 255.224.0.0

Answer: B, C
Explanation:
Both options B and C correctly include both of the networks in the routing process, making them correct. With RIP, the subnet mask is not specified as the networks involved are assumed to be classful.
Incorrect Answers:
A, D: Both of these options incorrectly show a subnet mask used in the network commands under the routing process. This is not an option with RIP.

Section 2: Configure IP addresses, subnet masks, and gateway addresses on routers and hosts (40 questions)

QUESTION NO: 1
You are a systems administrator and you are about to assign static IP addresses to various servers on your network. For the network 192.168.20.24/29 the router is assigned to the first usable host address, while the last usable host address goes to your Sales server. Which one of the following commands would you enter into the IP properties box of the sales server?

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

Answer: C
Explanation

A subnet mask uses 29 bits. This means that it uses 5 bits in the 4th octet. This equates to 255.255.255.248. This network has 3 bits for hosts. Using the 2n-2 formula (23-2) in this case), we are left with 6 (2*2*2 - 2 = 6) host addresses. 192.168.20.24 is the network address. Therefore the next address (192.168.20.25) would be the first host address. This address must be assigned to the router, which serves as the gateway for the network. The last available host address would be 192.168.20.30 (192.168.20.24+6). This address is assigned to the server. The broadcast address is 192.168.20.31.

QUESTION NO: 2
You've been assigned a single Class C address. From this, you need 8 subnets, and your subnet mask is 255.255.255.224. Which one of the following configuration commands would you have to use before you begin?

A. Router(config)# ip classless
B. Router(config)# ip subnet-zero
C. Router(config)# ip version 6
D. Router(config)# no ip classful
E. Router(config)# ip unnumbered
F. Router(config)# ip all-nets

Answer: B
Explanation:To get 8 subnets from a class C address, and a mask of 255.255.255.224 use the reserved subnet space. To do this, you need the command 'ip subnet-zero.' This will allow the router to use the very first subnet, which is normally reserved and unused as the network address.Prior to Cisco IOS® Software Release 12.0, Cisco routers, by default, did not allow an IP address belonging to subnet zero to be configured on an interface. However, if a network engineer working with a Cisco IOS software release older than 12.0 finds it safe to use subnet zero, the ip subnet-zero command in the global configuration mode can be used to overcome this restriction. As of Cisco IOS Software Release 12.0, Cisco routers now have ip subnet-zero enabled by default, but if the network engineer feels that it is unsafe to use subnet zero, the no ip subnet-zero command can be used to restrict the use of subnet zero addresses.
In versions prior to Cisco IOS Software Release 8.3, the service subnet-zero command was used.

It should be noted that even though it was discouraged, the entire address space including subnet zero and the all-ones subnet have always been usable. The use of the all-ones subnet was explicitly allowed and the use of subnet zero is explicitly allowed since Cisco IOS Software Release 12.0. Even prior to Cisco IOS Software Release 12.0, subnet zero could be used by entering the ip subnet-zero global configuration command.

On the issue of using subnet zero and the all-ones subnet, RFC 1878 states, "This practice (of excluding all-zeros and all-ones subnets) is obsolete. Modern software will be able to utilize all definable networks." Today, the use of subnet zero and the all-ones subnet is generally accepted and most vendors support their use. However, on certain networks, particularly the ones using legacy software, the use of subnet zero and the all-ones subnet can lead to problems.

QUESTION NO: 3
Three TestKing routers are connected as shown below:

Taking the information shown above, which command line below would correctly configure serial port0 on the TestKing2 router with the LAST usable host addresses on the 192.216.32.32 subnet?

A. TestKing2(config-if)# ip address 192.216.32.63 255.255.255.248
B. TestKing2(config-if)# ip address 192.216.32.38 255.255.255.240
C. TestKing2(config-if)# ip address 192.216.32.39 255.255.255.248
D. TestKing2(config-if)# ip address 192.216.32.63 255.255.255.248 no shut
E. TestKing2(config-if)# ip address 192.216.32.39 255.255.255.248 no shut
F. TestKing2(config-if)# ip address 192.216.32.38 255.255.255.248

Answer: F
Explanation:
F is the correct answer, as the last usable IP address on this subnet is 192.216.32.38. The subnet mask for a /29 is 255.255.255.248

Mask/29 11111111.11111111.11111111.11111000 255.255.255.248
Subnet 11000000.11011000.00100000.00100000 192.216.32.32
Broadcast 11000000.11011000.00100000.00100111 192.216.32.39
Address range = 192.216.32.33 - 192.216.32.38

QUESTION NO: 4
The Testking Network is displayed as follows:
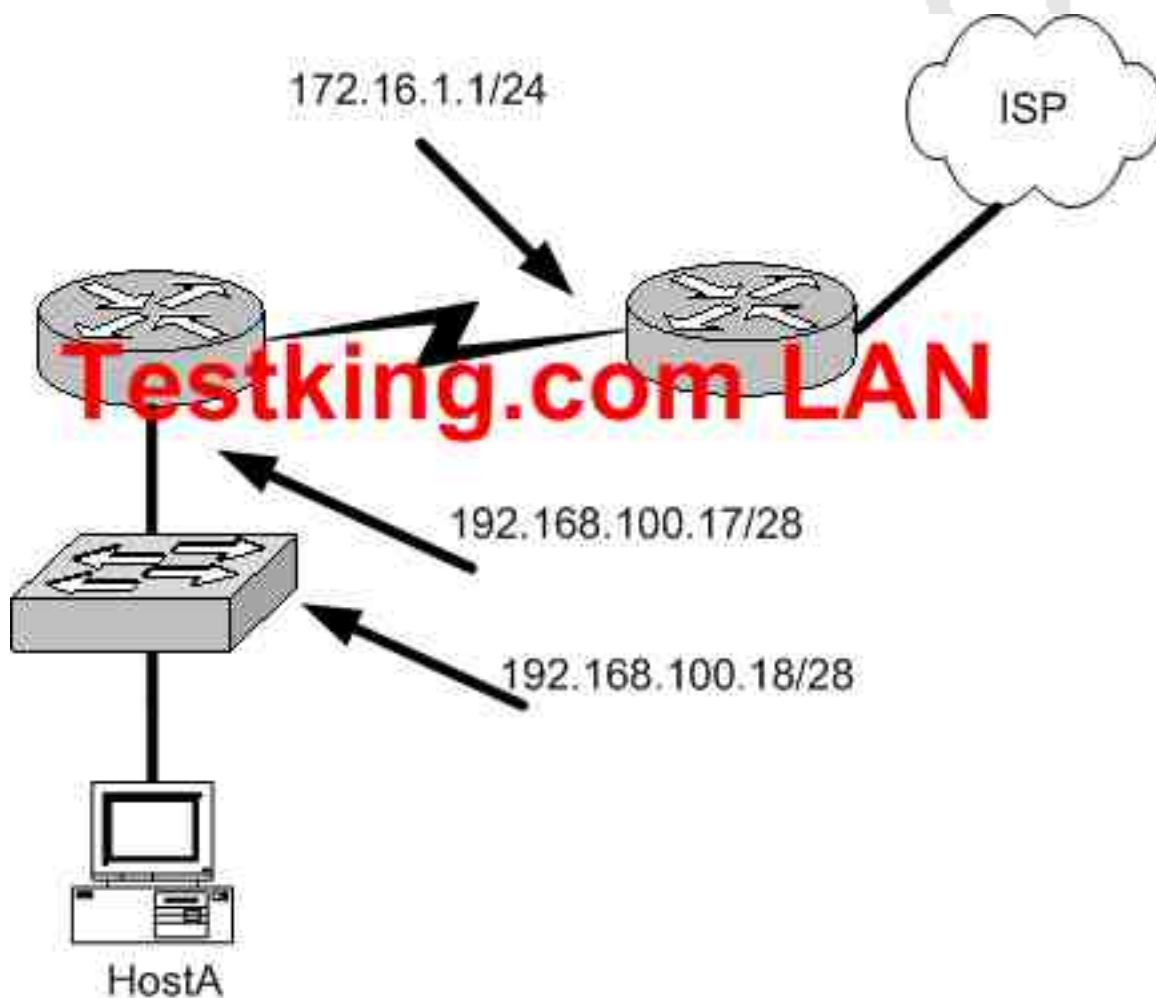
What is a valid possible IP address configuration for Host A?

A. IP 192.168.100.31 255.255.255.240 default-gateway 192.168.100.18
B. IP 192.168.100.30 255.255.255.240 default-gateway 172.16.1.1

C. IP 192.168.100.20 255.255.255.240 default-gateway 192.168.100.17
D. IP 192.168.100.21 255.255.255.248 default-gateway 192.168.100.17
E. IP 192.168.100.19 255.255.255.248 default-gateway 172.16.1.1

Answer: C
Explanation:
The network mask for a /28 is 255.255.255.240. The default gateway is always the IP
address of the router on the local subnet, and the valid IP range for this network is
192.168.100.17 - 192.168.100.30. Choice C is the only one that meets all of these.
Incorrect Answers:
A. The IP address 192.168.100.31 is the broadcast address. It cannot be used for the host.
B. The default gateway should be the fist exit point for the network that the host is on. In
this case it should be the router interface address 192.168.100.17.
D. The network uses a 28 bit subnet mask (11111111.11111111.11111111.11110000).
This equates to 255.255.255.240, not 255.255.255.248.
E. The network uses a 28 bit subnet mask (11111111.11111111.11111111.11110000).
This equates to 255.255.255.240, not 255.255.255.248. Also, the default gateway should
be the fist exit point for the network that the host is on. In this case it should be the router
interface address 192.168.100.17.

QUESTION NO: 5
A simple TestKing network is shown below:
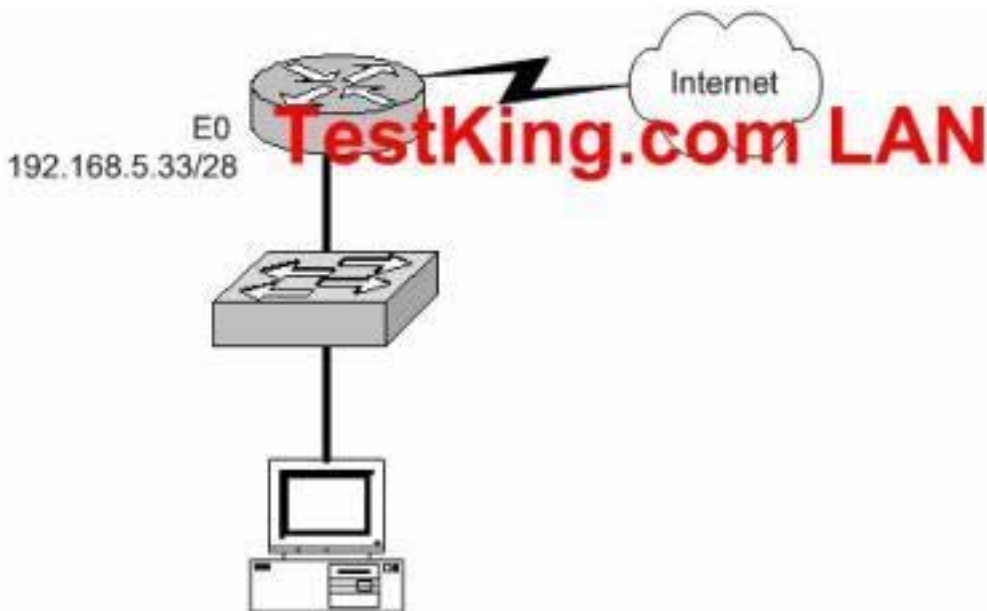
Based on the information above, which of the following would be a valid IP address of the PC?

A. 192.168.5.55
B. 192.168.5.47
C. 192.168.5.40
D. 192.168.5.32
E. 192.168.5.14

Answer: 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 (2n-2). The last bit used to make 240 is the 4th bit (16) therefore the first network will be 192.168.5.16. 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 192.168.5.16/28. The router interface E0 has the IP address 192.168.5.33. Therefore it is on the 2nd network (192.169.5.32/28). The host must also be on this network. Valid IP addresses for hosts on this network are: 192.168.5.33-192.168.5.46.
Incorrect Answers:
A. 192.168.5.55 is on network 192.168.5.48. It is not on the same network as the router interface.

B. This is the broadcast address.

D. This is the network address.

E. This is not a valid address for a 28 bit subnet mask. The first network address should be 192.168.5.16.

QUESTION NO: 6

In any NAT (network address translation) configuration, what is the Inside Global IP address?

A. The summarized address for all internal subnetted addresses.

B. A private IP address assigned to a host on the inside network.

C. A registered address that represents an inside host to an outside network.

D. A unique IP address used on an internal network

E. Non of the above

Answer: C

Explanation:

With NAT, Cisco defines 4 different types of addresses as follows:

∗ **Inside local address** - The IP address assigned to a host on the inside network. This is the address configured as a parameter of the computer's OS or received via dynamic address allocation protocols such as DHCP. The address is likely not a legitimate IP address assigned by the Network Information Center (NIC) or service provider.

∗ **Inside global address** - A legitimate IP address assigned by the NIC or service provider that represents one or more inside local IP addresses to the outside world.

∗ **Outside local address** - The IP address of an outside host as it appears to the inside network. Not necessarily a legitimate address, it is allocated from an address space routable on the inside.

∗ **Outside global address** - The IP address assigned to a host on the outside network by the host's owner. The address is allocated from a globally routable address or network space.

The above definitions still leave a lot to be interpreted. For this example, this document redefines these terms by first defining "local address" and "global address." Keep in mind that the terms "inside" and "outside" are NAT definitions. Interfaces on a NAT router are defined as "inside" or "outside" with the NAT configuration commands, ip nat inside and ip nat outside. Networks to which these interfaces connect can then be thought of as "inside" networks or "outside" networks, respectively.

∗ **Local address** A local address is any address that appears on the "inside" portion of the network.

∗ **Global address** A global address is any address that appears on the "outside" portion of the network.

QUESTION NO: 7

The following configuration command was entered into a router:

ip route 172.16.3.0 255.255.255.0 192.168.2.4

Which of the following statements are true regarding this configuration change? (Select two)

A. The default administrative distance is used.
B. The command is used to establish a static route.
C. The command is used to configure the router interfaces.
D. The command is used to establish a stub network.
E. The subnet mask for the source address is 255.255.255.0

Answer: A, B
Explanation:
This command specifies a static route, and tells the router that it should forward all traffic destined for the 172.16.3.0/24 subnet to the next hop router located at 192.168.2.4. The default Administrative Distance for a static route is one, and since there is no AD value specified at the end of this configuration change, the default is used.
Incorrect Answers:
C. This command is done in global configuration mode, not in interface mode.
D. Stub networks are used in OSPF topologies. The example in this question is simply applying a single static route.
E. There is not source network or subnet specified in a static route. All traffic destined to the target of 172.16.3.0/24 is to be forwarded, regardless of the source.

QUESTION NO: 8
Which of the commands below can you use to configure a default route? (Select two answer choices)

A. TK1(config)# ip route 0.0.0.0 0.0.0.0 E0
B. TK1(config)# ip route 0.0.0.0 255.255.255.255 S0
C. TK1(config-interface)# ip route 255.255.255.255 0.0.0.0 192.168.1.21
D. TK1(config)# ip route 0.0.0.0 0.0.0.0 192.168.1.21
E. TK1(config)# ip route 0.0.0.0 192.168.1.21 255.255.255.255
F. TK1# ip default-network 0.0.0.0 192.168.1.21 255.255.255.255

Answer: A, D
Explanation:

There are two ways to specify a default static route. One is to specify the interface to use for forwarding packets, like the example in A. The other way is to specify the IP address of the next hop router, such as the example in D. The ip route 0.0.0.0 0.0.0.0 command uses the fact that network 0.0.0.0 is used by Cisco IOS software to represent the default network.

Reference: CCNA ICND Exam Certification Guide By Wendell Odem Pg.524

Incorrect Answers:

B. All zero's must used for the subnet mask of a default route, not all 1's.

C. The default route is made in global configuration mode.

D, E. A subnet mask is not needed after the next hop router is specified.

QUESTION NO: 9

Which of the following commands would you use, to configure a default route to any destination NOT found in the routing table?

A. Router(config)# ip default-route 0.0.0.0 255.255.255.255 s0

B. Router(config)# ip route 0.0.0.0 255.255.255.255 s0

C. Router(config)# ip default-route 0.0.0.0 0.0.0.0 s0

D. Router(config)# ip route 0.0.0.0 0.0.0.0 s0

E. Router(config)# ip route any any e0

Answer: D

Explanation:

Choice D is the correct syntax for configuring a gateway of last resort. Note that an alternative way is to specify the IP address of the next hop router, for example, "ip route 0.0.0.0 0.0.0.0 10.1.1.1."

QUESTION NO: 10 DRAG DROP

You are on the TestKing network design team and have the task of networking three TestKing locations together. Your team will be using the address range 192.168.55.0. RIP v2 will be used as the routing protocol, and "ip subnet-zero" will be configured. Your goal is to fulfill the address needs of the network while conserving unused addresses for potential future growth.

With these goals in mind, drag the host addresses on the left side to the correct router interface on the right side. Not all the addresses are going to be used, and one of the routers is already partially configured.
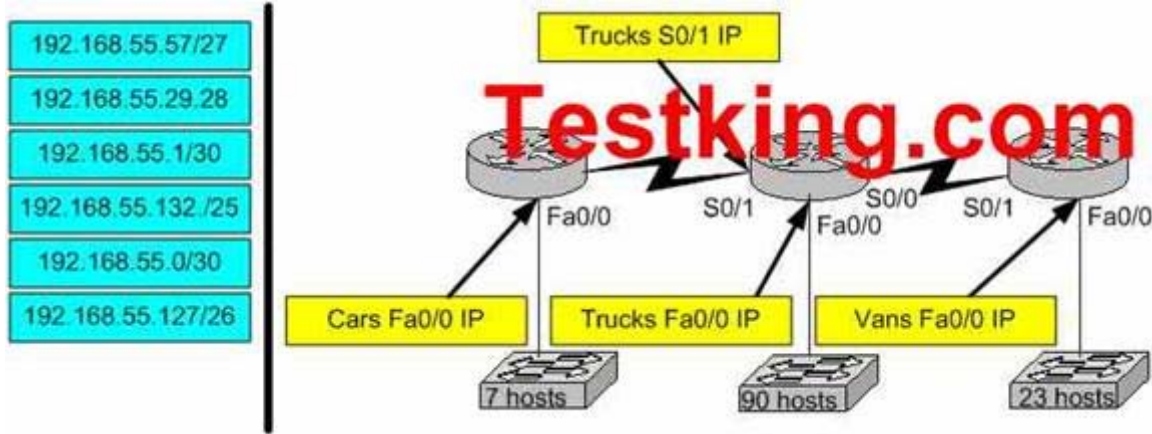
Answer:
Explanation:
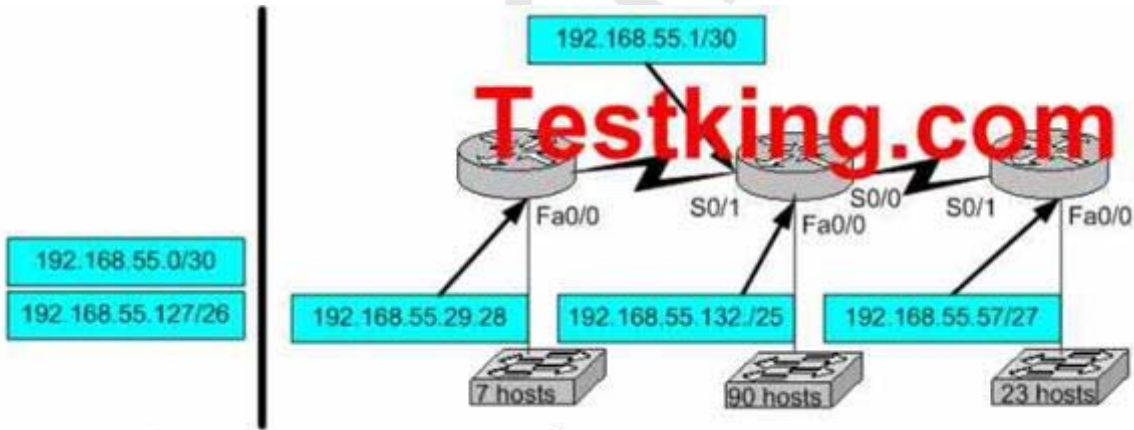
QUESTION NO: 11
The TestKing network is shown in the following exhibit:

What command would you use to configure the correct IP address and subnet mask on TestKing2's serial interface?

A. TESTKING2(config-if)# ip address 172.16.17.1 255.255.255.0
B. TESTKING2(config-if)# ip address 172.16.18.2 255 255. 252.0
C. TESTKING2(config-if)# ip address 172.16.17.2 255.255.255.252
D. TESTKING2(config-if)# ip address 172.16.16.0 255.255.255.0

Answer: B
Explanation:
The address 172.16.17.0/22 is in the 172.16.16.0/22 network. This means that the IP addresses in all four answers are valid. However, the /22 subnet mask equals 255.255.252.0 in decimal. Therefore, answer B is correct.
Incorrect Answers:
A, C, D. The subnet mask used in the diagram shows a /22, which equates to 255.255.252.0. The subnet masks in choices A, C, and D are incorrect.

QUESTION NO: 12
You have been asked to configure a default route. Which of the IOS commands mentioned below will accomplish this task? (Select two answer choices)

A. LTD(config)# ip route 0.0.0.0 0.0.0.0 192.168.15.36
B. LTD(config)# ip route 0.0.0.0 192.168.15.36 255.255.255.255
C. LTD# ip default-network 0.0.0.0 192.168.15.36 255.255.255.255
D. LTD(config)# ip route 0.0.0.0 0.0.0.0 E0
E. LTD(config)# ip route 0.0.0.0 255.255.255.255 S0
F. LTD(config-router)# ip route 255.255.255.255 0.0.0.0 192.168.15.36

Answer: A, D
Explanation:
The default route is the IP address of the next hop when no other routes are known. To
configure the default route you type in 'ip route' and then two address sets of 0 followed
by the address (as is the case in A) or the interface (as is the case in D).

QUESTION NO: 13
The TestKing network is displayed below:

In this network, you must configure router TK1 to provide connectivity to router
TK2. The entire network must utilize the 192.1.1.0/24 network. If RIP is being used
as the routing protocol, which 3 sets of commands will need to be completed on
TK1? (Choose 3).

A. TK1(config)# interface ethernet 0
TK1(config-if)# ip address 192.1.1.129 255.255.255.192
TK1(config-if)# no shutdown
B. TK1(config)# interface ethernet 0
TK1(config-if)# ip address 192.1.1.97 255.255.255.192
TK1(config-if)# no shutdown
C. TK1(config)# interface serial 0
TK1(config-if)# ip address 192.1.1.4 255.255.255.252
TK1(config-if)# clock rate 56000
D. TK1(config)# interface serial 0
TK1(config-if)# ip address 192.1.1.6 255.255.255.252
TK1(config-if)# no shutdown
E. TK1(config)# router rip
TK1(config-router)# network 192.1.1.4
TK1(config-router)# network 192.1.1.128

F. TK1(config)# router rip
TK1(config-router)# version 2
TK1(config-router)# network 192.1.1.0

Answer: A, D, F
Explanation:
Subnetting a Class C Address
We start by using the first subnet mask available with a Class C address, which borrows 2 bits for subnetting.
For this example, I'll be using 255.255.255.192. To review the binary translation of 192:
192 = 11000000
Here, the 1s represent the subnet bits, and the 0s represent the host bits available in each subnet. 192 provides 2 bits for subnetting and 6 bits for defining the hosts in each subnet. What are the subnets? Since the subnet bits can't be both off or on at the same time, the only two valid subnets are these:
01000000 = 64 (all host bits off) revealing host addresses from .65------.127
10000000 = 128 (all host bits off) revealing host addresses from .129------.190
The valid hosts would be defined as the numbers between the subnets, minus the all-host-bits-off and all-host-bits-on numbers.
In Choice A, a valid host is configured on E0 interface of the router 192.1.1.129/26 so it is correct. Choice D is correct because each WAN link uses the /30 or 255.255.255.252 mask revealing 2 valid host addresses. Serial 0 is configured with the address 192.1.1.6/30, which comes from the subnet 192.1.1.4/30. Valid hosts in this subnet are 192.1.1.5/30 and 192.1.1.6/30
Choice F is correct because we RIP version 2 will be required in this case as VLSM information needs to be carried throughout the network, and VLSM is not supported on RIP version 1.

QUESTION NO: 14 SIMULATION
The TestKing Corporation (an online training facility) has three production facilities which have their own routers: QA, Study Guide, and Examinator. QA and Study Guide already have network connectivity between them. Configure Examinator's router's IP to the e0 and s1 interfaces so e0 resolves the first usable subnet and S1 receives the second usable subnet. (From the network 192.168.81.0/27) Both interfaces should get the first available IP of the subnet.

Configure the Examinator router's IP addresses on the E0 and S1 interfaces so that the E0 resolves the first usable subnet while S1 receives the second usable subnet from the network 192.168.81.0/27. Both interfaces should receive the first available IP of the subnet. The zero subnet should not be used. The routers have been configured with the following specifications:

1. **The routers are named QA, StudyGuide, and Examinator**
2. **RIP is the routing protocol**
3. **Clocking is provided on the serial 0 interfaces.**
4. **The secret password on the Examinator router is "testking"**
5. **The IP addresses are listed in the chart below.**
6. **The zero subnet shouldn't be used**

Name: QA
E0 : 192.168.83.1
S0 : 192.168.85.1

Name: StudyGuide
E0 : 192.168.88.1
S0 : 192.168.81.89
S1 : 192.168.85.2

Name: Examinator
E0 : to be determined
S1 : to be determined
Secret Password: testking
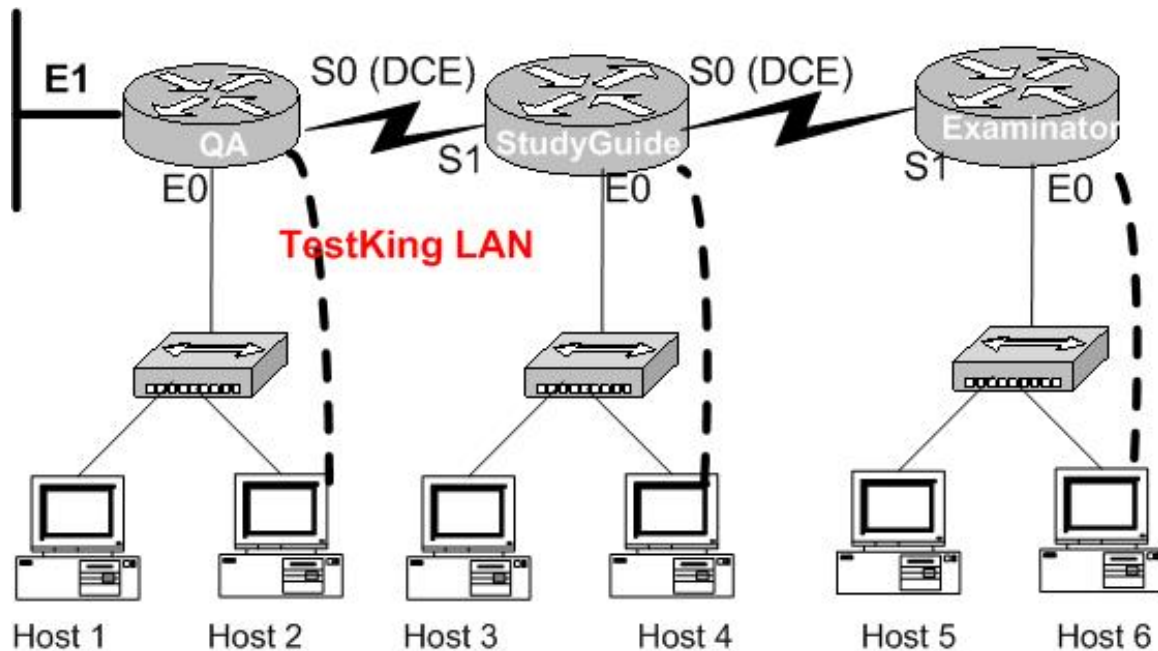
Task: To configure the router click on the host icon that is connected to the router by a serial cable.

Answer:
Explanation:
Examinator#config t
Enter configuration commands, one per line. End with END.
Examinator(config)#int e 0
Examinator(config-if)#ip add 192.168.81.33 255.255.255.224
Examinator(config-if)#no shut
Examinator(config-if)#exit
Examinator(config)#int s 1
Examinator(config-if)#ip add 192.168.81.65 255.255.255.224
Examinator(config-if)#no shut
Examinator(config-if)#CTRL+Z
Examinator#copy ru st

..

..

[OK]
Examinator#

QUESTION NO: 15
You work as a technician at TestKing. You are configuring a Cisco router. You want to configure the IP address on an interface.

Which command should you use?

A. router(config-if)#ip address 142.8.2.1 subnet mask 255.255.252.0
B. router(config-if)#142.8.2.1 0.0.3.255
C. router(config-if)#ip address 142.8.2.1 255.255.252.0
D. router(config-if)#142.8.2.1 subnet mask 255.255.252.0
E. router(config-if)#ip address 142.8.2.1 0.0.3.255
F. router(config-if)#ip address 142.8.2.1 subnet mask /22

Answer: C
Explanation:
ip address address subnet-mask - Interface configuration mode command that sets the IP address for interfaces. Only choice C uses the correct syntax.

QUESTION NO: 16
The TestKing connection between the BMW and ATL routers are displayed below:

Based on the information above, which of the following commands can be used to configure the address on the ATL serial 0/0 interface?

A. ATL(config-if)# ip address 172.16.17.1 255.255.255.0
B. ATL(config-if)# ip address 172.16.18.255 255.255.252.0
C. ATL(config-if)# ip address 172.16.17.2 255.255.255.252
D. ATL(config-if)# ip address 172.16.16.0 255.255.255.0
E. None of the above

Answer: B
Explanation:
CIDR Notation /22 implies that the subnet mask be 255.255.252.0. The IP address
172.16.18.255 falls within the same network range as the 172.16.17.0/22 network.

QUESTION NO: 17
A portion of the TestKing network is displayed below


```
TK1(config)# interface FastEthernet 0/0.2
TK1(config-subif)# encapsulation dot1q 1
TK1(config-subif)# ip address 192.1.1.129 255.255.255.240
TK1(config)# interface FastEthernet 0/0.3
TK1(config-subif)# encapsulation dot1q 2
TK1(config-subif)# ip address 192.1.1.65 255.255.255.192
```

Host A in the graphic is connected to a switch port assigned to VLAN 1.
Which two settings on host A are required to allow connectivity with Host B on
VLAN 2? (Choose two)

A. IP address: 192.1.1.66 255.255.255.240
B. IP address: 192.1.1.130 255.255.255.192
C. IP address: 192.1.1.142 255.255.255.240
D. Default gateway: 192.1.1.129

E. Default gateway: 192.1.1.65
F. Default gateway: 192.1.1.1

Answer: C, D
Explanation:
Sub-interface Fast Ethernet 0/0.2 was created for VLAN 1 through the use of the
"encapsulation dot1q 1" command. Therefore, since host A resides in VLAN 1 it must be
configured with an IP address in the 192.1.1.128/28 subnet and it must be configured
with the IP address of the default gateway, which is the IP address assigned to the
corresponding sub-interface of the router.
Incorrect Answers:
A. This IP address is not in the same subnet as the Fast Ethernet 0/0.2 sub-interface.
B. The subnet mask is incorrect in this choice.
E, F. The default gateway needs to be set as the IP address for the sub-interface created in
the router for VLAN 1.

QUESTION NO: 18
**An 802.1Q trunk is configured between a TestKing switch and router TK1 as shown
below:**

**Which of the following are valid configuration values for the host shown in the
graphic? (Choose three)**

A. host A IP address: 192.1.1.65

B. host A subnet mask: 255.255.255.224
C. host B IP address: 192.1.1.125
D. host B default gateway: 192.1.1.65
E. host C IP address: 192.1.1.166
F. host C subnet mask: 255.255.255.224

Answer: C, D, F
Explanation:
Host B resides on port 3, which is configured for VLAN 1. As shown in the
configuration, the default gateway for VLAN is the IP address associated with the Fast
Ethernet 0/1.1 sub-interface. Valid IP hosts for the VLAN 1 subnet is
192.1.1.65-192.1.1.126.
Incorrect Answers:
A. The 192.1.1.65 IP address is already assigned to the router.
B. Host A is in VLAN 1, so the subnet mask should be 255.255.255.192
E. Host C belongs to VLAN 10, and this IP address is not in the 192.1.1.128/27 subnet.

QUESTION NO: 19
**Which of the following addresses can be assigned to a host when using a subnet
mask of 255.255.254.0? (Select three)**

A. 113.10.4.0
B. 186.54.3.0
C. 175.33.3.255
D. 26.35.2.255
E. 152.135.7.0
F. 17.35.36.0

Answer: B, D, E
Explanation:
These are all valid host IP addresses within the /23 subnet.
Incorrect Answers:
A. This is the network address for the 113.10.4.0/23 subnet.
C. This is the broadcast address for the 175.33.2.0/23 subnet.
F. This is the network address for the 17.35.36.0/23 subnet.

QUESTION NO: 20
The TestKing network topology is depicted below:
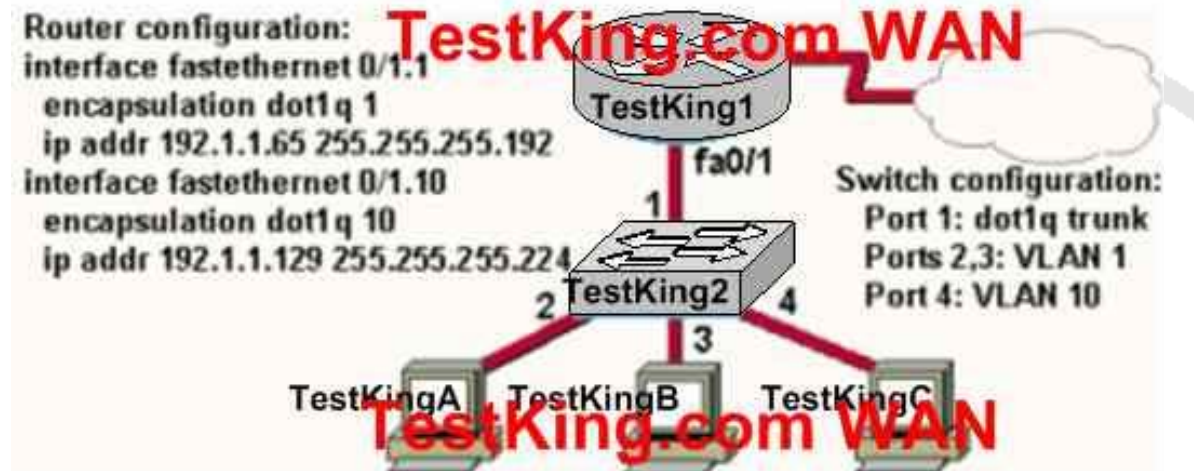
Based on the diagram above, which of the following are valid configuration values for the hosts? Select three

A. Host TestKingA IP address: 192.1.1.85
B. Host TestKingA subnet mask: 255.255.255.224
C. Host TestKingB IP address: 192.1.1.125
D. Host TestKingB default gateway: 192.1.1.85
E. Host TestKingC IP address: 192.1.1.166
F. Host TestKingC subnet mask: 255.255.255.224

Answer: A, C, F
Explanation:
The answers A and C are right, because the ip address
192.1.1.85 and 192.1.1.125 are in the same subnet
192.1.1.64 as the ip address of the subinterface
0/1.1.
Incorrect Answers:
E. This answer is wrong because the network address of the IP address 192.1.1.166 is
192.1.1.160.

QUESTION NO: 21
Which command will assign the last usable IP address from the 192.168.32.128/28 subnetwork to a router interface?

A. TestKingA(config-if)# ip address 192.168.32.142 255.255.255.240
B. TestKingA(config-if)# ip address 192.168.32.143 255.255.255.240
C. TestKingA(config-if)# ip address 192.168.32.158 255.255.255.240
D. TestKingA(config-if)# ip address 192.168.32.145 255.255.255.240
E. TestKingA(config-if)# ip address 192.168.32.144 255.255.255.240
F. TestKingA(config-if)# ip address 192.168.32.158 255.255.255.240

Answer: A
Explanation:
The last usable IP address would be $128 + (16-2) = 142$. Because only last 4 bits of the last octet are used for host addressing.

QUESTION NO: 22
The TestKing LAN is shown below:

TestKing1   TestKing2   TestKing3

192.1.1.20   192.1.1.22   ?

255.255.255.240   255.255.255.240

A TestKing.com network administrator is adding host TestKing3 to the network shown in the exhibit. Which IP address can be assigned this host on this network?

A. 192.1.1.14
B. 192.1.1.18
C. 192.1.1.20
D. 192.1.1.30
E. 192.1.1.31
F. 192.1.1.36

Answer: B, D
Explanation:
Subnet Mask of 255.255.255.240 means 4-bits of subnetting. When we do 4-bits of subnetting, we have a total of 16 subnets having 16 hosts each. Subnets will be

192.1.1.0 ----- 191.1.1.15 (0-15)
192.1.1.16 ---- 191.1.1.31 (16-31)
192.1.1.32 ---- 191.1.1.47 (32-47)
192.1.1.240---- 192.1.1.255 (240-255)

Only choices B and D are possible as 192.1.1.20 is already used by host TestKing1

QUESTION NO: 23 DRAG DROP
As a TestKing.com network administrator you are required to construct the command sequence to configure an IP address on an Ethernet interface. (Not all options will be used.)

enter privileged EXEC mode	place here
enter global configuration mode	place here
enter interface configuration mode	place here
configure the interface IP address	place here
enable the interface	place here

Select from these

TestKing3# configure terminal	TestKing3(config)#interface fa0/0
TestKing3(config-if)#ip address 192.168.3.3/24	TestKing3(config-if)#no shutdown
TestKing3(config-if)#ip address 10.8.26.0 255.255.248.0	TestKing3(config-if)#enable interface
TestKing3(config)#ip address 172.16.10.1 255.255.255.0	TestKing3#enable
TestKing3#interface fa0/0	TestKing3>enable

Answer:
Explanation:

As a TestKing.com network administrator you are required to construct the command sequence to configure an IP address on an Ethernet interface. (Not all options will be used)

enter privileged EXEC mode	TestKing3>enable
enter global configuration mode	TestKing3# configure terminal
enter interface configuration mode	TestKing3(config)#interface fa0/0
configure the interface IP address	TestKing3(config-if)#ip address 10.8.26.0 255.255.248.0
enable the interface	TestKing3(config-if)# no shutdown

Select from these

TestKing3(config-if)#ip address 192.163.3.3/24	TestKing3(config-if)#no shutdown
TestKing3(config)#ip address 172.16.10.1 255.255.255.0	TestKing3#enable
TestKing3#interface fa0/0	

QUESTION NO: 24
You need to set the default gateway of one of your TestKing switches. Which command will set the default gateway to 192.168.12.1 on a Cisco switch?

A. Switch(config)# ip default-network 192.168.12.1
B. Switch(config)#ip route-default 192.168.12.1
C. Switch(config)# ip default-gateway 192.168.12.1
D. Switch(config)# ip route 192.168.12.1 0.0.0.0

Answer: C
Explanation:
IP default-gateway address is a global command that sets the default gateway so that the management interface can be reached from a remote network. This is the correct command used on Cisco switches.
Reference: Cisco CCNA ICND p.14

QUESTION NO: 25 DRAG DROP
You work as a network engineer at TestKing.com. TestKing.com is redesigning the network that connects its three locations. You are give the 192.168.9.1 addressing to be used for the entire network. After the subnetting the address, you are ready to assign the addresses. You place to configure ip subnet-zero and use RIP v2 as the routing protocol. Now you must address the network and at the same time conserve unused addresses for future growth. You are required to place the host addresses to the correct interface. On of the routers is partially configured. You can view the configuration by placing the mouse over the router. Not all host addresses will be used.

TestKing2 S0/1 IP

TestKing.com LAN

TestKing1 S0/0   S0/1 TestKing2 S0/0   S0/1 TestKing3

Fa0/0   Fa0/0   Fa0/0

TestKing1 Fa0/0 IP   TestKing2 Fa0/0 IP   TestKing3 Fa0/0 IP

TestKing.com LAN

TestKingA   TestKingB   TestKingC
5 hosts   7 hosts   34 hosts

Select from these

192.168.91.196/30
192.168.91.197/30
192.168.91.204/29
192.168.91.213/28
192.168.91.152/26
192.168.91.255/27

Answer:
Explanation:

Reason for not selecting the other choices in DRAG DROP

192.168.91.196/30 = Network ID cannot be assigned to an interface

192.168.91.255/27 = Not a valid IP address as SNM = 255.255.255.224 (last octet >224)

QUESTION NO: 26
**A network administrator needs to configure a serial link between the main office
and a remote location. The router at the remote office is a non-Cisco router.
How should the network administrator configure the serial interface of the main
office router to make the connection?**

A. Main(config)# interface serial 0/0
 Main(config-if)# ip address 172.16.1.1 255.255.255.255
 Main(config-f)# no shut

B. Main(config)# interface serial 0/0
 Main(config-if)# ip address 172.16.1.1 255.255.255.255
 Main(config-f)# encapsulation ppp
 Main(config-if)# no shut

C. Main(config)# interface serial 0/0

Main(config-if)# ip address 172.16.1.1 255.255.255.255
Main(config-f)# encapsulation frame-relay
Main(config-if)# authentication chap
Main(config-if)# no shut

D. Main(config)# interface serial 0/0
Main(config-if)# ip address 172.16.1.1 255.255.255.255
Main(config-f)# encapsulation ietf

Answer: B
Explanation:
The default encapsulation on a serial interface is the Cisco proprietary HDLC. When connecting to routers from another vendor, we will need to use the standards based PPP, which is correctly defined in choice B.

Incorrect Answers:
A: This is not a correct answer because no encapsulation is defined, so the default HDLC will be used, which is a Cisco proprietary protocol.
C: CHAP authentication is only used by PPP, not HDLC.
D: IETF itself is not an encapsulation option on an interface; it is used in frame relay networks, where the encapsulation can be frame relay IETF, but not simply IETF alone.

QUESTION NO: 27
The administrator of the TestKing network needs to ensure that a web server in their network is accessible from the Internet. Since the network uses private addressing, this requires an IP-to-registered-address mapping. The following command is entered on the router:

TestKing1(config)# ip nat inside source static 192.168.2.1 198.18.1.254

After unsuccessful results from a ping to the Internet, the administrator issues the show ip nat translations command and the output is blank. What could be the problem with the NAT configuration for this mapping?

A. The keyword overload is missing from the command.
B. The administrator needs to define a NAT pool first.
C. An access list must be defined to create static NAT translations.
D. The interfaces need to be configured for NAT.

Answer: D
Explanation:
After configuring the static NAT administrator should configure the NAT on interface in order to define which interfaces are on the outside and which are on the inside:
Example:
interface s0
 ip nat outside àBecause s0 interface is connected to ISP
interface e0
ip nat inside à Because e0 interface is connected to Local LAN.
Incorrect Answers:
A, B, C: These are all tasks that need to be configured when performing many to one NAT, also known as Port Address Translation (PAT). In this example, we are specifying a static 1-1 NAT entry.

QUESTION NO: 28
Exhibit:


```
interface Serial1
  ip address 200.2.2.18 255.255.255.252
  ip nat outside
!
interface FastEthernet0
  ip address 10.10.0.1 255.255.255.0
  ip nat inside
  speed auto
!
ip nat pool test 199.99.9.40 199.99.9.62 netmask 255.255.255.224
ip nat inside source list 1 pool test

ip route 0.0.0.0 0.0.0.0 200.2.2.17
!
access-list 1 permit 10.10.0.0 0.0.0.255
```

S1: 200.2.2.18/30
Fa0: 10.10.0.1/24

10.10.0.0

Refer to the topology and router configuration shown in the graphic above. A host on the LAN is accessing an FTP server across the Internet. Which of the following addresses could appear as a source address for the packets forwarded by the router to the destination server?

A. 10.10.0.1
B. 10.10.0.2
C. 199.99.9.3
D. 199.99.9.57
E. 200.2.2.17
F. 200.2.2.18

Answer: D
Explanation:
Using NAT we can translate the Source or Destination Address. In our example all source address from the 10.10.00 0.0.0.255 network will be translated to an IP address form the 199.99.9.40-62 pool.

QUESTION NO: 29
Exhibit:

192.168.1.0

192.168.2.0

E0   S0

E1

Router#show run
interface ethernet 0
    ip address 192.168.1.1 255.255.255.0
!
interface ethernet 1
    ip address 192.168.2.1 255.255.255.0
!
interface serial 0
    ip address 192.168.3.1 255.255.255.0
!
ip nat inside source list 1 interface serial 0 overload
!
access-list 1 permit 192.168.1.0 0.0.0.255
access-list 1 permit 192.168.2.0 0.0.0.255

The network administrator has configured NAT as shown in the exhibit. Clients still cannot access the Internet. What should the network administrator do to resolve this problem?

A. Configure an IP NAT address pool.
B. Properly configure the ACL.
C. Apply the ip nat command to the S0 interface.
D. Configure the ip nat inside and ip nat outside commands on the interfaces.

Answer: D
Explanation:

The "ip nat inside" and "ip nat outside" commands must be used from interface configuration mode to tell the router which interface is performing which role in the NAT process. The following commands show how to configure our example router:

Border(config)#interface ethernet0Border(config-if)#ip nat insideBorder(config-if)#exitBorder(config)#interface serial0Border(config-if)#ip nat outsideBorder(config-if)#exitBorder(config)#

QUESTION NO: 30
What is the purpose of the command shown below?

ip route 0.0.0.0 0.0.0.0 serial0/0

A. It configures a router to send all packets out interface serial 0/0.
B. It configures a router to block routing updates from being sent out interface serial 0/0.
C. It configures a router as a firewall, blocking all unauthorized packets from exiting serial 0/0.
D. It configures a router to send all packets for unknown destination networks out interface serial 0/0.
E. It configures a router to drop all packets for which the destination network is unknown.

Answer: D
Explanation:
A default static route serves as a gateway of last resort. If there are no matches for a destination in the routing table, the default route will be used. Default routes use all zeroes for both the destination and mask, and again a next-hop IP address or local exit interface can be used.
TK1(config)#ip route 0.0.0.0 0.0.0.0 200.1.1.2 (next-hop IP address)
OR
TK1(config)#ip route 0.0.0.0 0.0.0.0 serial0 (local exit interface)

QUESTION NO: 31
A TestKing network is shown in the exhibit below:
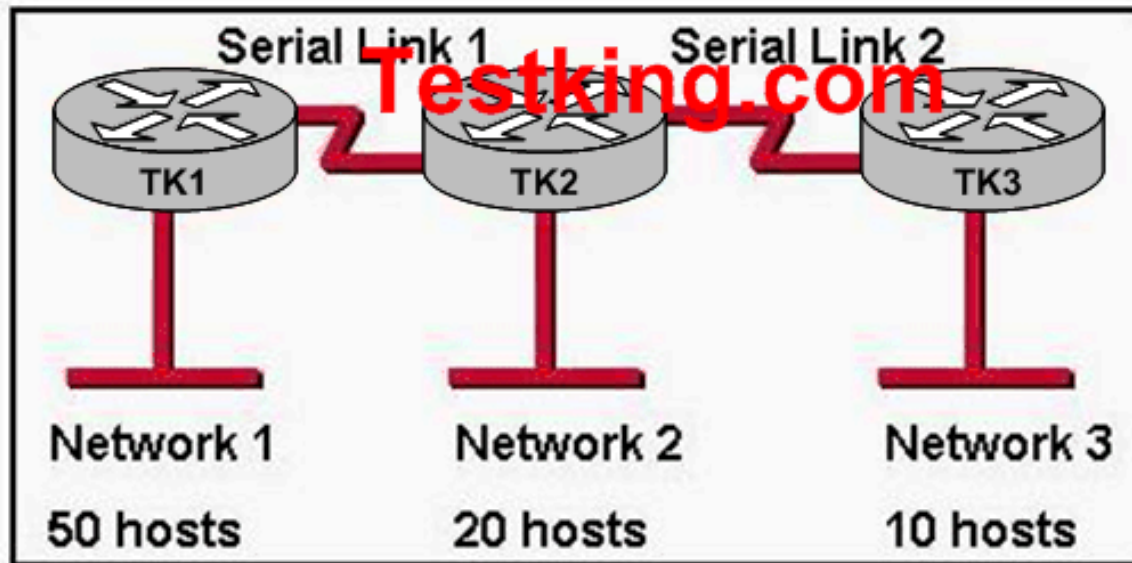
The routers in this network are running RIPv2. Which addressing scheme would satisfy the needs of this network yet waste the fewest addresses?

A. Network 1: 192.168.10.0/26Network 2: 192.168.10.64/26Network 3: 192.168.10.128/26Serial link 1: 192.168.20.0/24Serial link 2: 192.168.30.0/24
B. Network 1: 192.168.10.0/26Network 2: 192.168.10.64/28Network 3: 192.168.10.80/29Serial link 1: 192.168.10.88/30Serial link 2: 192.168.10.96/30
C. Network 1: 192.168.10.0/26Network 2: 192.168.10.64/27Network 3: 192.168.10.96/28Serial link 1: 192.168.10.112/30Serial link 2: 192.168.10.116/30
D. Network 1: 192.168.10.0/27Network 2: 192.168.10.64/28Network 3: 192.168.10.96/29Serial link 1: 192.168.10.112/30Serial link 2: 192.168.10.116/30

Answer: C
Explanation:
Network 1
Required Number of hosts :50
When We use the 26 bits for Network : 11111111.11111111.11111111.11000000 so 62 usable host can be in one network. 50 host for now and remaining hosts address for further growth.
Network 2
Required Number of Hosts: 20

When we use the 27 bits for Network: 11111111.11111111.1111111.11100000 so 30 usable hosts can be in one network.
Network 3
Required Number of Hosts: 10
When we use the 28 bits for Network: 11111111.11111111.11111111.11110000 so 14 usable hosts can be in one network.
Connection between TK1, TK2 and TK3 is WAN so when you use 30 bits network IP, you will not lose any IP addresses from network since this subnet allows for only 2 host addresses.

QUESTION NO: 32
A diagram depicting a TestKing user is shown below:
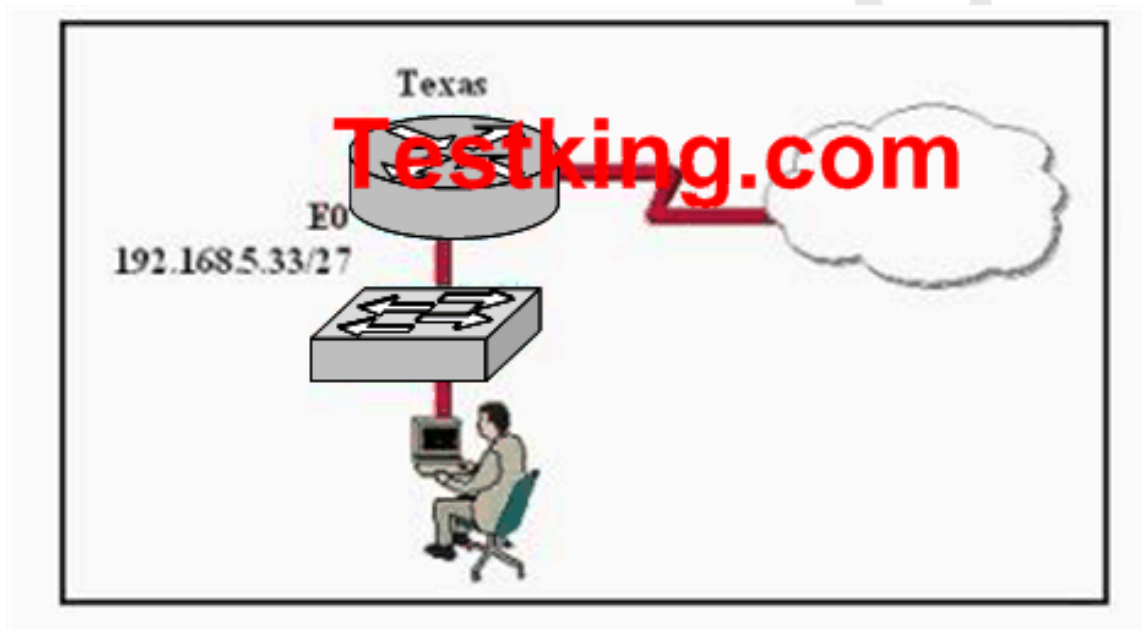
Based on the information above, which IP address should be assigned to the host?

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:
Host address should be in same subnet of Connected Router's Interface. In exhibit
Router's ethernet address is in 192.168.5.33/27 subnet then host address should be also in
same subnet.
27 bits used for network and 5 bits for host.
So Network Address=256-224=32
First Subnet 32-64
So Host address should be between 32-64 but 32, 64, 63 can't e sued in a host address, as
they are the network and broadcast addresses for the subnet, so only answer C is correct.

QUESTION NO: 33
A diagram depicting a TestKing user is shown below:
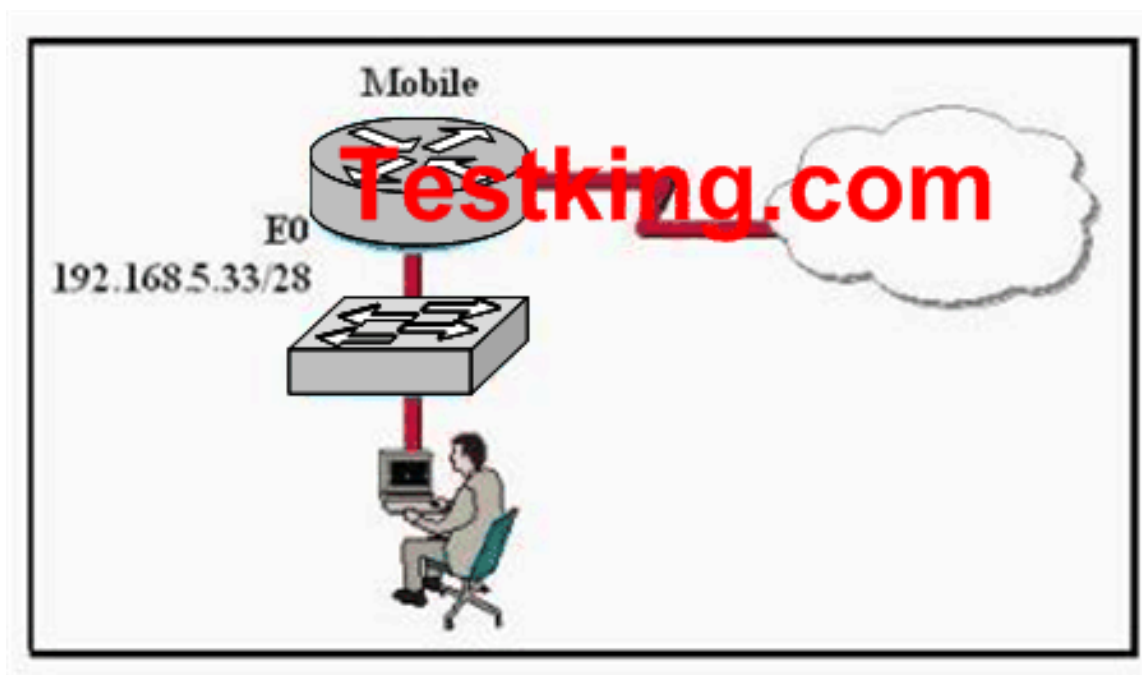
Based on the information above, which IP address should be assigned to the host?

A. 192.168.5.14
B. 192.168.5.32
C. 192.168.5.40
D. 192.168.5.47

E. 192.168.5.55
F. None of the above

Answer: C
Explanation:
Host address should be in same subnet of the connected router's interface. In this example the router's ethernet address is in the 192.168.5.33/28 subnet.
27 bits used for network and 5 bits for host.
So Network Address=256-240=16
First Subnet 32-48
So, host addresses should be in the 32-48 range but 32, 47, and 48 can't be used in a host address since they are the network and broadcast address for a subnet.

QUESTION NO: 34 DRAG DROP
TestKing is redesigning the network that connects its three locations. The administrator gave the networking team 192.168.3.0 to use for addressing the entire network. After subnetting the address, the team is ready to assign the addresses. 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. With those goals in mind, drag the host addresses on the left to the correct router interface. One of the routers is partially configured. Not all of the host address addresses on the left are necessary.
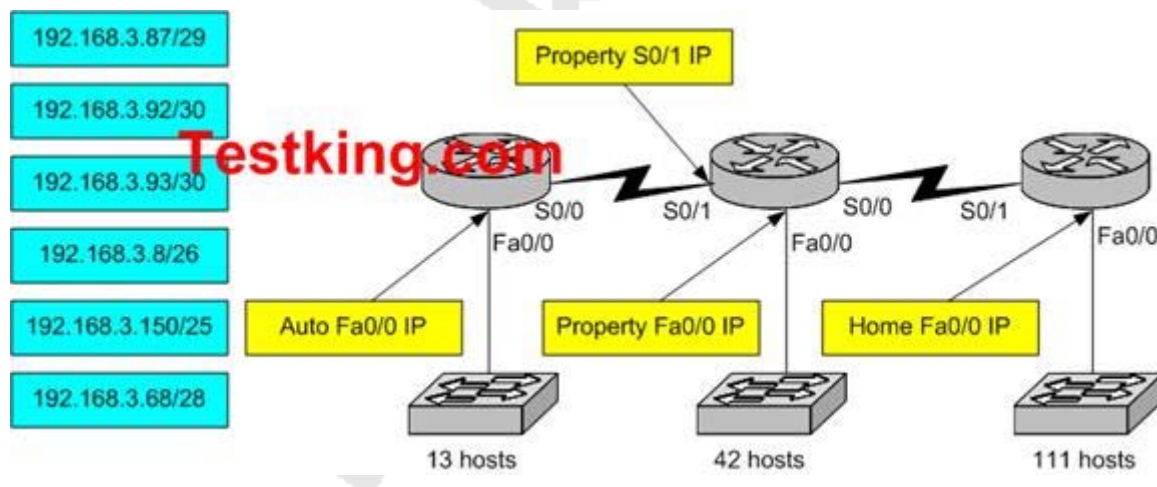
Answer:
Explanation:
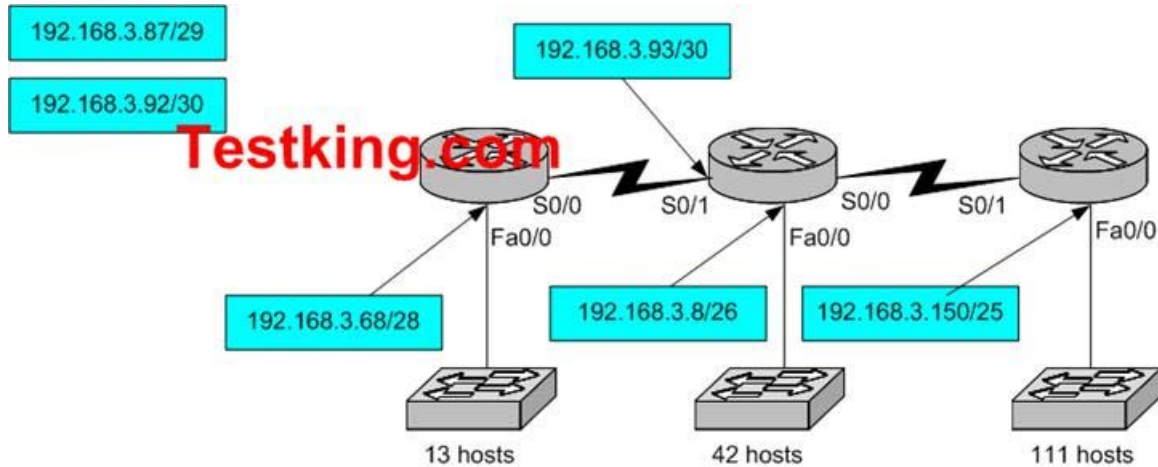
The Switch connected to Auto Fa0/0 Port requires a minimum of 13 IP addresses: When you use the 4 bits for Host and 28 Bits for network, you will get 14 usable IP addresses among them with one for further growth. So you should put 192.168.3.68/28 in Auto Fa0/0 IP.

For the WAN connection between routers, Property S0/1 IP if you use the /30 bits for Network address you will get 2 usable host address. So you should put 192.168.3.93/30 in Property of S0/1 IP.

For Property of Fa0/0 IP you require minimum 42 usable hosts address, When you use the 6 bits of host address you will get the 62 usable address can also use for further growth. So you should put 192.168.3.8/26.

For Home Fa0/0 IP you require 111 usable hosts address, when you use the 7 bits for host you will get 128 usable addresses among them recently you can use 111 address for hosts and remaining address for further growth.

QUESTION NO: 35 DRAG DROP
Construct the command sequence to configure an IP address on an Ethernet interface. Note: Not all options are used.

Lab# ip configure terminal	Enter preivileged EXEC mode
Lab(config-if)# ip address 192.168.3/24	Enter global configuration mode
Lab(config-if)# ip address 10.8.26.0 255.255.248.0	Enter interface configuration mode
Lab(config)# ip address 172.16.10.1 255.255.255.0	Configure the interface IP address
Lab# interface fa0/0	Enable the interface
Lab(config)# interface fa0/0	
Lab(config-if)# no shutdown	
Lab(config-if)# enable interface	
Lab# enable	
Lab> enable	

Lab# ip configure terminal	Enter preivileged EXEC mode
Lab(config-if)# ip address 192.168.3/24	Enter global configuration mode
Lab(config-if)# ip address 10.8.26.0 255.255.248.0	Enter interface configuration mode
Lab(config)# ip address 172.16.10.1 255.255.255.0	Configure the interface IP address
Lab# interface fa0/0	Enable the interface
Lab(config)# interface fa0/0	
Lab(config-if)# no shutdown	
Lab(config-if)# enable interface	
Lab# enable	
Lab> enable	

Answer:
Explanation:

Lab> **enable**

Lab# **ip configure terminal**

Lab(config)# **interface fa0/0**

Lab(config-if)# **ip address 10.8.26.0 255.255.248.0**

Lab(config-if)# **no shutdown**

The correct configuration tasks are:

1. Enter Privileged EXEC mode: lab>enable : First you will get the user mode where you can run only certain commands. After user mode you can enter into privileged EXEC mode by typing enable command then you will get the LAB# prompt.

2. Enter Global Configuration Mode : Lab#configure terminal : Enters into the global Configuration mode where you can configure the router.

3. Enter Interface Configuration Mode: Lab(Config)# interface fa0/0 : Enters into interface configuration mode, where you can enter interface configuration commands

4. Configure the interface ip address : Lab(config-if)# ip address 10.8.26.0 255.255.248.0 : When you entered into the interface configuration mode, you can assign the IP address for interface.

5. Enable the interface: Lab(config-if)#no shutdown : It enable the interface if you want to disable the interface use the shutdown command in interface configuration mode.

QUESTION NO: 36 DRAG DROP
TestKing is redesigning the network that connects its three locations. The administrator gave the network team 192.168.15.0 to use for addressing the entire network. After subnetting the address, the team is ready to assign the addresses. 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. With those goals in mind, 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 are necessary.
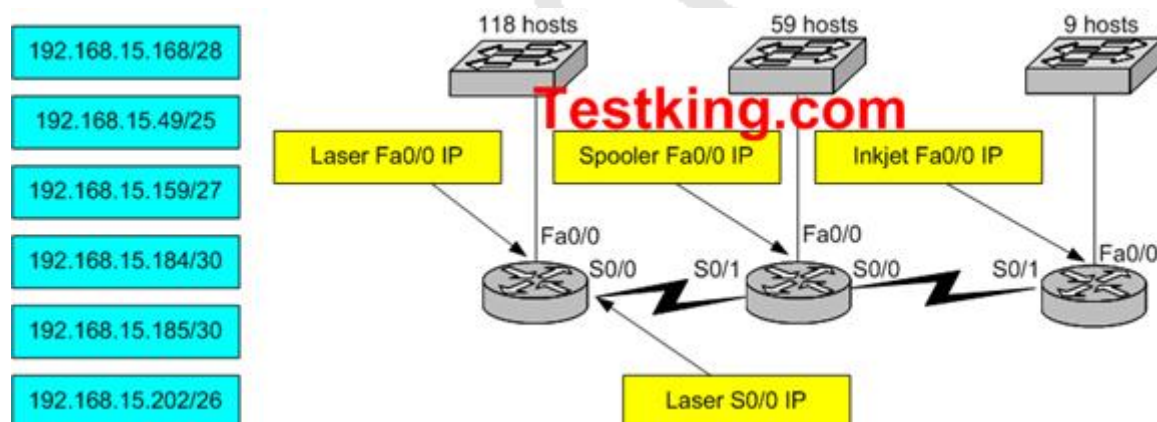
Answer:
Explanation:
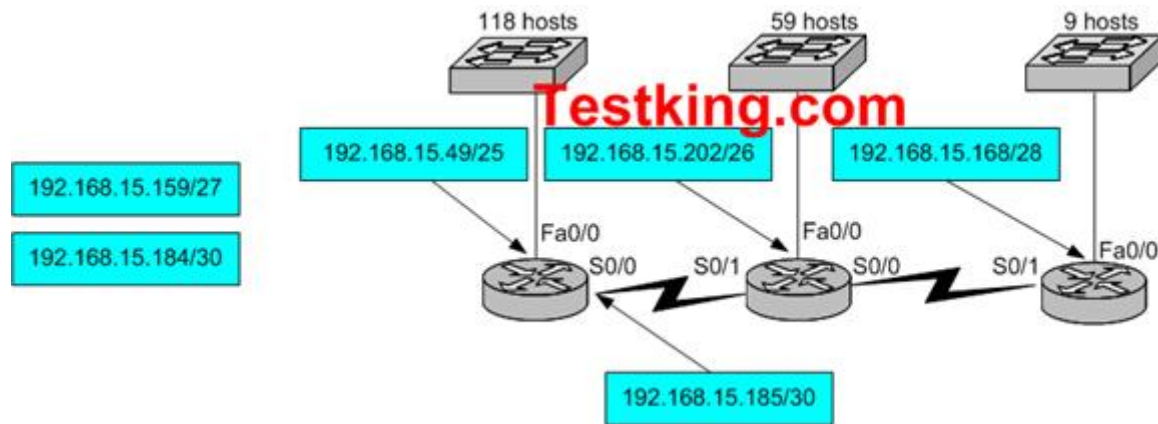
In the first switch 118 hosts are connected. When you use the 7 bits for the host you will get 128 usable hosts so the suitable subnet is 192.168.15.49/25.
The Connection between first Router and Second Router is the WAN, when you use the 30 bits for network you will get 2 usable hosts address so suitable subnet is 192.168.15.185/30.
In the second switch 59 hosts connected. If you use 6 bits for the host portion you will get 62 usable hosts, making the correct subnet 192.168.15.202/26.
In the last switch 9 hosts are connected. If you use 4 bits for hosts you will get 14 usable addresses, now you can use for the 9 hosts and the remaining for further growth. This makes the correct subnet for this network 192.168.15.168/28.

QUESTION NO: 37 DRAG DROP
Match the commands with their corresponding function.
Note: Not all commands are used.

Commands, select from these

telnet	ping 10.0.01
arp -a	tracert
Ipconfig /all	ping 127.0.0.1

Functions

Functions	Commands, place here
Displays PC network configuration	*Place here*
Displays the list of routers on a path to a network destination	*Place here*
Tests VTY configuration	*Place here*
Tests TCP/IP protocol stack	*Place here*
Displays IP to MAC address mappings on a Windows PC	*Place here*

Answer:

Explanation;
Displays PC Network Configuration à ipconfig/all
Displays the list of routers on a path to a network destination à tracert
Tests VTY configuration à telnet
Tests TCP/IP stack à ping 127.0.0.1
Displays IP to MAC address mappings on a Windows PC à arp -a

In Windows ipconfig/all commands displays all the network configuration information
and tracert command shows the internal and external path of the destination.
You can test whether telnet is enabled on router or not using telnet command.
You can check whether TCP/IP protocol is working or not in your PC by pinging to the
127.0.0.1 IP Address. This is the loopback address of any PC. Finally, the MAC address
table of your windows pc can be displayed using the arp -a command.

QUESTION NO: 38
A Class C network address has been subnetted with a /27 mask. Which of the
following addresses is a broadcast address for one of the resulting subnets?

A. 201.57.78.64
B. 201.57.78.87
C. 201.57.78.33
D. 201.57.78.254
E. 201.57.78.159
F. 201.57.78.97

Answer: E
Explanation:
A subnet mask of /27 (255.255.255.224) will have 3 bits used for the network portion and
5 bits for the host portion. This will create $2^3 = 8$ networks with $2^5 = 32$ hosts per
network. From this we know that the number of subnets will be a multiple of 32, making
the subnets:

201.57.78.32
201.57.78.64
201.57.78.96
201.57.78.128
201.57.78.160
201.57.78.192
201.57.78.224

201.57.78.256

Since the broadcast address is always the last IP address in the subnet we need to only subtract 1 from each of the IP addresses above to find the broadcast. From the list above we see that 201.57.78.159 is the only available option, as this is the broadcast address for the network previous to the 201.57.78.160 network.

QUESTION NO: 39
Which IP address would be appropriate for the S0/0 interface of the LCAG router shown in the diagram below?
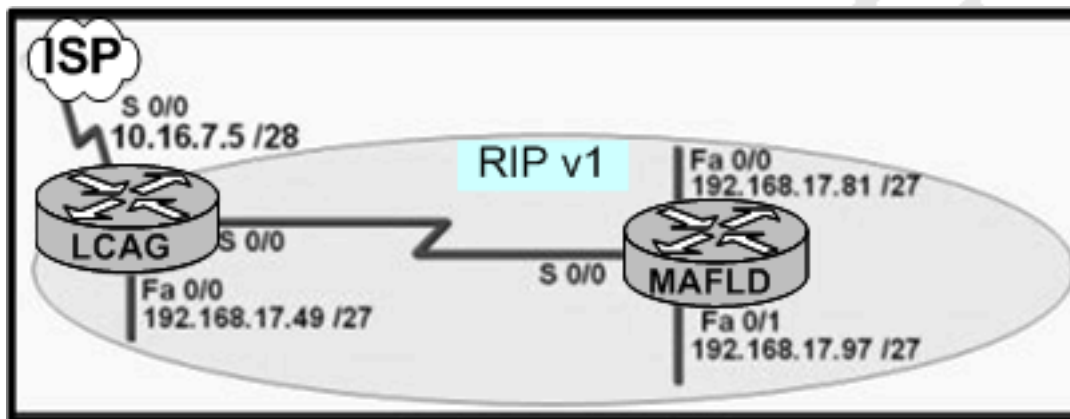
A. 172.16.0.25 /27
B. 192.168.17.125 /27
C. 10.16.7.13 /27
D. 192.168.17.17 /27
E. 10.16.7.129 /27
F. 172.18.7.49 /27

Answer: D
Explanation:
Since RIPv1 is being used, we need to ensure that the subnet mask is /27 like the other internal networks as RIPv1 does not support VLSM. We will also need to use something in the 192.168.17.X network since all the other networks are 192.168.17.X. This leaves only choices B and D viable at this point.

Since we can see from this that the 192.168.17.125 IP address lies within the 192.168.17.96/27 network, we can not use this network as it is already being used by the network attached to Fa 0/1 of the MAFLD router. This leaves choice D as the only correct option. This can be verified by the fact that the 192.168.17.0-31 IP addresses are not being used anywhere else within the enterprise.

QUESTION NO: 40
Refer to the exhibit. What IP address should be assigned to Workstation A?

Exhibit:

Workstation A

Fa0/0
192.168.1.158/28

A. 192.168.1.159/28
B. 192.168.1.160/28
C. 192.168.1.145/28
D. 192.168.1.144/28
E. 192.168.1.143/28

Answer: C
Explanation:
The available subnets and IP ranges that are available using a /28 (255.255.255.240) subnet mask is shown below:

/28 IP Bit Mask

Dotted Decimal Mask: 255.255.255.240
Hexadecimal Mask: FF.FF.FF.F0
Effective Hosts: 224
Effective Subnets: 16

Network Number	Broadcast	Usable IP Range	Usable IPs /subnet
0	15	1 - 14	14
16	31	17 - 30	14
32	47	33-46	14
48	63	49-62	14
64	79	65-78	14
80	95	81-94	14
96	111	97-110	14
112	127	113-126	14
128	143	129-142	14
144	159	145-158	14
160	175	161-174	14
176	191	177-190	14
192	207	193-206	14
208	223	209-222	14
224	239	225-238	14
240	255	241-254	14

Based on this information, we need to choose an IP address within the 145-158 range, since the IP address of the Fa0/0 on the router is 192.168.1.158, leaving only answer choice C as feasible.

Reference: http://www.more.net/technical/netserv/tcpip/subnet.html#28

Section 3: Configure a router for additional administrative functionality (16 questions)

QUESTION NO: 1
Which protocol automates all of the following TCP/IP functions: IP configuration, IP addresses, subnet masks, default gateways, and DNS server information for the hosts on a network?

A. SMTP
B. SNMP
C. DHCP
D. DARP
E. CDP

Answer: C
Explanation:
DHCP uses the concept of the client making a request and the server supplying the IP address to the client, plus other information such as the default gateway, subnet mask, DNS IP address, and other information.
Incorrect Answers:
A. SMTP is the Simple Mail Transfer Protocol, which is used by email servers
B. SNMP is the Simple Network Management Protocol, which is used for remotely managing network devices.
D. DARP does not exist.
E. 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.

QUESTION NO: 2

You are working as an administrator at TestKing, and you need to set the bandwidth of your routers serial port to 56K. Which of the following commands would you use?

A. Bandwidth 56000
B. Bandwidth 56000000
C. Bandwidth 56
D. Bandwidth 56kbps

Answer: C
Explanation:
Cisco IOS translates the bandwidth command to kbps, so after issuing the "bandwidth 56" interface command the router will display the bandwidth as 56 kbps.

QUESTION NO: 3
Which of the following commands can you issue if you want to configure a default route to any destination network not found on router TK1's routing table?

A. TK1(config)# ip default-route 0.0.0.0 255.255.255.255 s0
B. TK1(config)# ip route 0.0.0.0 255.255.255.255 s0
C. TK1(config)# ip default-route 0.0.0.0 s0
D. TK1(config)# ip route 0.0.0.0 0.0.0.0 s0
E. TK1(config)# ip route any any e0

Answer: D
Explanation:
There are two ways to specify a default static route. One is to specify the interface to use for forwarding packets, the other way is to specify the IP address of the next hop router. The ip route 0.0.0.0 0.0.0.0 command uses the fact that network 0.0.0.0 is used by Cisco IOS software to represent the default network.
Incorrect Answers:
A, B. All zero's must used for the subnet mask of a default route, not all 1's.
C. The default-route command does not exist.
E. The "any" keyword is used in access lists, not for configuring static routes.

QUESTION NO: 4

The TestKing network is displayed below:

You are a network administrator and you've just finished configuring the static route 10.5.6.0 /24 on router TestKing. Which command should you use if you want TestKing to consider this route the most reliable?

A. TestKing(config)# ip route 10.5.6.0 0.0.0.255 fa0/0
B. TestKing(config)# ip route 10.5.6.0 0.0.0.255 10.5.4.6
C. TestKing(config)# ip route 10.5.6.0 255.255.255.0 fa0/0
D. TestKing(config)# ip route 10.5.6.0 255.255.255.0 10.5.4.6
E. TestKing(config)# ip route 10.5.4.6 0.0.0.255 10.5.6.0
F. TestKing(config)# ip route 10.5.4.6 255.255.255.0 10.5.6.0

Answer: C, D
Explanation:
There are two ways to specify a default static route. One is to specify the interface to use for forwarding packets, like the example in C. The other way is to specify the IP address of the next hop router, such as the example in D.
Additional Info:
The following is the command you use to add a static route to a routing table:

Ip route [destination_network] [mask] [next-hop_address or exitinterface] [administrative_distance][permanent]

This list describes each command in the string:

ip route The command used to create the static route.

destination network The network you're placing in the routing table.

mask The subnet mask being used on the network.

next-hop address The address of the next-hop router that will receive the packet and forward it to the remote network. This is a router interface that's on a directory connected network.

administrative_distance By default, static routes have an administrative distance of 1. You can change the default value by adding an administrative weight at the end of the command.

QUESTION NO: 5
A new Internet T1 is being added to the TestKing network as shown:
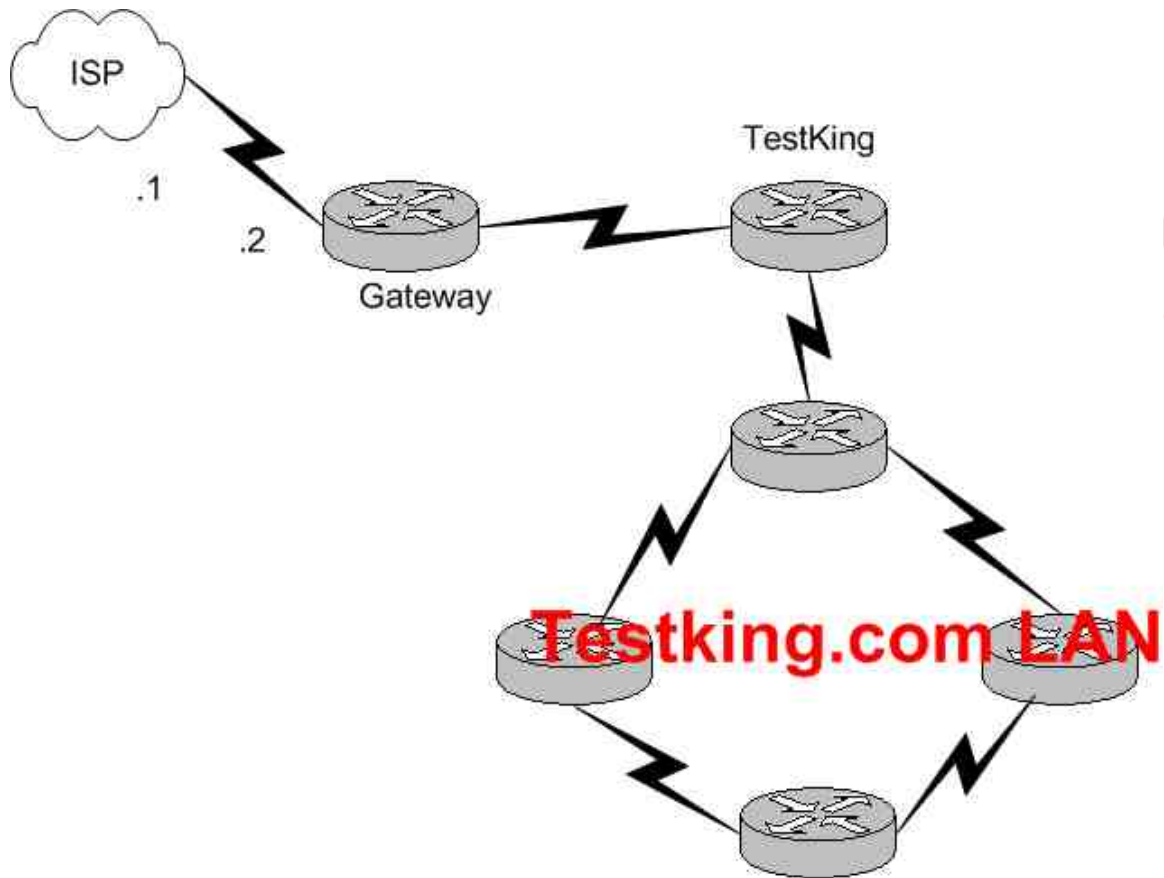
**The ISP assigned you the class CIP address 207.134.6.0/30 for this Internet
connection. A default route to the Internet should be set up. Which of the following
are acceptable ways to configure this on the Gateway router? (Select all that apply)**

A. Gateway(config)# ip route 0.0.0.0 0.0.0.0 207.134.6.1.

B. Gateway(config)# router rip
Gateway(config-router)# network 207.134.6.0 default
C. Gateway(config)# ip route 207.134.6.0 255.255.255.0 Serial0/0
D. Gateway(config)# router OSPF
Gateway(config-router)# network 207.134.6.0
E. Gateway(config)# ip default-network 207.134.6.0

Answer: A, E
Explanation:
This question only involves the configuration of the gateway router to the ISP, nothing
else. You have two choices to accomplish this: the command "ip route" or the command
"ip default-network". Both of these methods will configure a default route to the ISP as
desired.
Incorrect Answers:
B, D: RIP and OSPF are interior routing protocols. The T1 Internet connection that is
being set up here is between two different Autonomous Systems. The only routing
protocol that could be potentially used is BGP, but that is not an option.
C: This command will only set up a static route to the 207.134.6.0/24 network. We wish
to set up a static default route.

QUESTION NO: 6
**Which of the following commands would you execute if you wanted to enable others
to establish a Telnet session on a Cisco router?**

A. testking1(config)# line console 0
testking1(config-if)# enable password testking
B. testking1(config)# line vty 0
testking1(config-line)#enable password testking
C. testking1(config)# line vty 0
testking1(config-line)#enable secret testking
testking1(config-line)# login
D. testking1(config)# line console 0
testking1(config-line)#enable secret testking
testking1(config-line)#login
E. testking1(config)#line console 0
testking1(config-line)# password testking
testking1(config-line)#login
F. testking1(config)#line vty 0
testking1(config-line)#password testking

testking1(config-line)#login

Answer: F
Explanation:
Telnet sessions use virtual terminal sessions, which are configured under the "line vty" portion of the configuration. There are 5 total vty sessions that can be configured, numbered 0-4. In order to be prompted for a password, one must be configured. Choice F gives the 3 commands needed to allow a single telnet session.
Incorrect Answers:
A, B, C, D. The telnet password needs to be configured in addition to the enable password. Without the initial password configured, users that try to telnet to the router will receive a "password required, but none set" message.
D, E. Telnet uses VTY ports, not the console port.

QUESTION NO: 7 SIMULATION
The Testking network is displayed below:
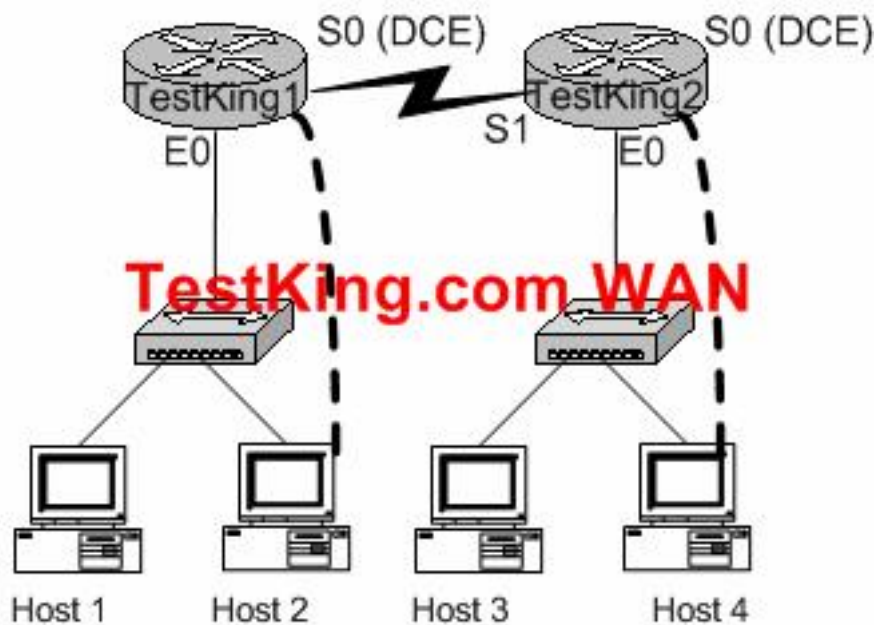
You need to perform the following functions on router Testking2:

1. **Login using the current enable password: Testking**

2. **Configure the console password to be: test**
3. **Configure all telnet line passwords to be: king**

To configure the router click on a host icon that is connected to a router by a serial cable.

Answer:
Explanation:

Click on Host 4:
Router Con0 is now available

Press RETURN to get started ! We press enter
Router TestKing2:

TestKing2> enable !We enter enable mode
Password: testking !We enter "testking"
TestKing2 # config terminal !We enter the terminal
Enter configuration commands, one per line. End with CTRL/Z
TestKing2 (config) # line console 0 !Configure the terminal connection
TestKing2 (config-line)# login
TestKing2 (config-line)# password test !Specify the terminal connection password
TestKing2 (config-line)# exit
TestKing2 (config) # line vty 0 4 !Configure the telnet connections. Numbered 0,1,2,3,4.
TestKing2 (config-line)# login
TestKing2 (config-line)# password king !specify the password
TestKing2 (config-line)# exit !Exit from configuration mode.
TestKing2 (config) # exit
TestKing2 # copy running-configstartup-config !Saves the running config to NVRAM.
Reference:
CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5) Page 177

QUESTION NO: 8 DRAG DROP
Your goal is to restrict all access to your router except for Telnet. To make this happen, move the commands on the left side to corresponding functions on the right side using the diagram below for reference. Note that not every option will be used.

line telnet 0	
line vty 0	
line vty 0 4	
login	
line login	**Testking.com**
exit	
service password-encryption	
password testking	
set password testking	

Enter the mode to configure Telnet access.	Place here
Enable Telnet login.	Place here
Set the password to testking.	Place here
Return to global configuration mode.	Place here
Encrypt passwords in show run/start output.	Place here

Answer:
Explanation:

| line telnet 0 |
| line vty 0 |
| line vty 0 4 |

| line login Testking.com |

| set password testking |

Enter the mode to configure Telnet access.	line vty 0 4
Enable Telnet login.	login
Set the password to testking.	password testking
Return to global configuration mode.	exit
Encrypt passwords in show run/start output.	service password-encryption

QUESTION NO: 9
You wish to increase the security of all of the routers within your network. What can be done to secure the virtual terminal interfaces on a router? (Choose two)

A. Administratively shut down the interface.
B. Physically secure the interface.
C. Create an access list and apply it to the virtual terminal interfaces with the access-group command.
D. Configure a virtual terminal password and login process.
E. Enter an access list and apply it to the virtual terminal interfaces using the access-class command.

Answer: D, E
Explanation:

There are a total of 5 logical Virtual terminal interfaces in a Cisco router (lines 0-4) and they are used for remote access into the device via telnet. Configuring these interfaces correctly with a login and password information can be used for security, as each user will be prompted for a password in order to obtain access. A second method is to use the "access-class" command. Combined with an access list, this command can be used to specify the hosts or networks that will be allow access to the device.

Incorrect Answers:
A. Virtual terminal interfaces are logical interfaces that can not be manually shut down.
B. Virtual terminal lines are logical interfaces that reside within a router, so there is nothing that can be physically secured.
C. This command is used with access-lists for LAN and WAN interfaces, but is not used for the VTY lines.

QUESTION NO: 10
You wish to limit telnet access into your Cisco router to only a single host. In order to accomplish this, access list 1 has been written to allow host 172.16.1.224 access to the router vty lines. What command would assign this access- list to the Virtual Terminal Lines?

A. router(config-line)# ip access-group 1 in
B. router(config-line)# access-class 1 in
C. router(config-line)# ip access-list 1 in
D. router(config-line)# access-line 1 in

Answer: B
Explanation:
To restrict incoming and outgoing connections between a particular vty (into a Cisco device) and the addresses in an access list, use the access-class command in line configuration mode.
Example:
The following example defines an access list that permits only the host 172.16.1.224 to connect to the virtual terminal ports on the router, as described in this question:

access-list 1 permit 172.16.1.224 0.0.0.0
line 1 5
access-class 1 in

QUESTION NO: 11 DRAG DROP
You need to allow only ONE Telnet connection to a router.
Match the commands on the left that will accomplish this task with their function on the right. (Note that not all answer choices will be used).

line telnet 0		
line vty 0	Enter the mode to configure Telnet access.	Place here
line vty 0 4	Enable Telnet login.	Place here
login	Set the password to testking.	Place here
line login	Return to global configuration mode.	Place here
exit	Encrypt passwords in show run/start output.	Place here
service password-encryption		
password testking		
set password testking		

Answer:
Explanation:

| line telnet 0 |
| line vty 0 |
| line vty 0 4 |

| line login Testking.com |

| set password testking |

Enter the mode to configure Telnet access.	line vty 0
Enable Telnet login.	login
Set the password to testking.	password testking
Return to global configuration mode.	exit
Encrypt passwords in show run/start output.	service password-encryption

QUESTION NO: 12
Which router console commands are used to manage telnet sessions to other routers? Select three.

A. TestKingD# disconnect 3
B. TestKingD# exit session 2
C. TestKingD# kill connection 1
D. TestKingD# show sessions
E. TestKingD# show connection all
F. TestKingD# resume 4

Answer: A, D, F
Explanation:

Function	Command Options
Telnet to another device	Use telnet exec command. Just type the host or IP address from exec mode.
Suspend a Telnet session	Press the key sequence Ctrl-Shift-6, then x
Discover currently suspended Telnet session	Use the where exec command Use the show sessions exec command
Resume a suspended Telnet session	Use the resume command, with no parameter, to reconnect to the most recently suspended Telnet. Use the resume x command, where x is the number of the suspended Telnet session based on the output of show sessions. Just press Enter in exec mode to resume to the most recently suspended Telnet session.
Terminate a suspended telnet	Resume connection, and log out using the quit command. Use the disconnect command on the router you Telnnetted from.

Reference: Cisco Press CCNA Study Guide, p.392

QUESTION NO: 13 SIMULATION
Network topology exhibit:
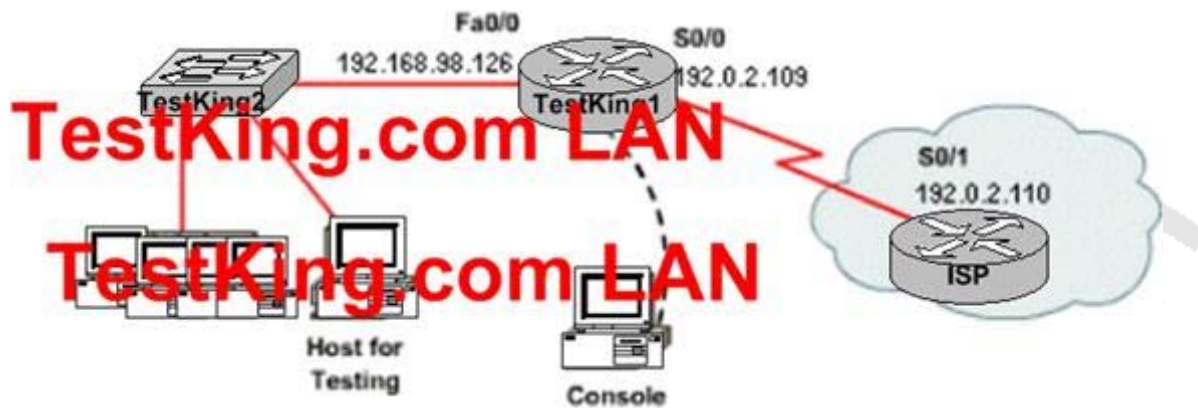
You work as a network administrator at TestKing.com. You are configuring a
router to provide Internet access. The ISP has provided TestKing.com with six
public IP addresses of 198.18.158.97, 198.18.158.97, 198.18.158.98, 198.18.158.99,
198.18.158.100, 198.18.158.101, and 198.18.158.102. TestKing.com has 62 hosts that
need access to the Internet simultaneously. The hosts in the TestKing.com LAN have
been assigned private space addresses in the range of 192.168.98.65 - 192.168.98.126.

The following have already been configured on the router:

1. **The basic router configuration**
2. **The appropriate interfaces have been configured for NAT inside an NAT outside.**
3. **The appropriate static routes have also been configured (since the company will
   be a stub network, no routing protocol will be required)**
4. **All passwords have been temporarily set to "testking"**

**The task is to complete the NAT configuration using all IP addresses assigned by the
ISP to provide Internet access to the hosts in the TestKing1 LAN. Functionality can
be tested by clicking on the host provided for testing.**

Configuration information:
Router name: TestKing1
inside global addresses: 198.18.158.97 198.18.158.102/29
inside local addresses: 192.168.98.65 - 192.168.98.126/26
Number of inside hosts: 62

password: testking
Simulation.

Answer:
Explanation:
TestKing1(config)#ip nat inside source list 1 pool nat-pool overload
TestKing1(config)#access-list 1 permit 192.168.98.64 0.0.0.63
TestKing1(config)#ip nat pool nat-pool 198.18.158.97 198.18.158.102 netmask
255.255.255.248
TestKing1(config)#int e0
TestKing1(config-if)#ip nat inside
TestKing1(config-if)#exit
TestKing1(config)#int s0
TestKing1(config-if)#ip nat outside
TestKing1(config-if)#end
TestKing1#copy run start

Previously the ip nat pool nat-pool was configured with /26 which is 255.255.255.192
which is incorrect because we are configuring inside global and it's /29 which is
255.255.255.248.

Note:
Variation #1:
Router name: TestKing1
inside global addresses: 198.18.32.217 192.18.32.222/29
inside local addresses: 192.168.57.33 - 192.168.57.62/27
Number of inside hosts: 30

TestKing1>enable
TestKing1# configure terminal
TestKing1(config)# ip nat pool testking 198.18.32.217
198.18.32.222 netmask 255.255.255.248
TestKing1(config)# ip nat inside source list 1 pool
testking overload
TestKing1(config)# ip access-list 1 permit
192.168.57.33 0.0.0.31

Variation #2:
Router name: TestKing1
inside global addresses: 198.18.169.121 198.18.169.126/29
inside local addresses: 192.168.2.33 - 192.168.2.62/27

Number of inside hosts: 30

TestKing1>enable
TestKing1# configure terminal
TestKing1(config)# ip nat pool testking 198.18.169.121
198.18.169.126 netmask 255.255.255.248
TestKing1(config)# ip nat inside source list 1 pool
testking overload
TestKing1(config)# ip access-list 1 permit
192.168.2.33 0.0.0.31

QUESTION NO: 14
The TestKing network is displayed below:
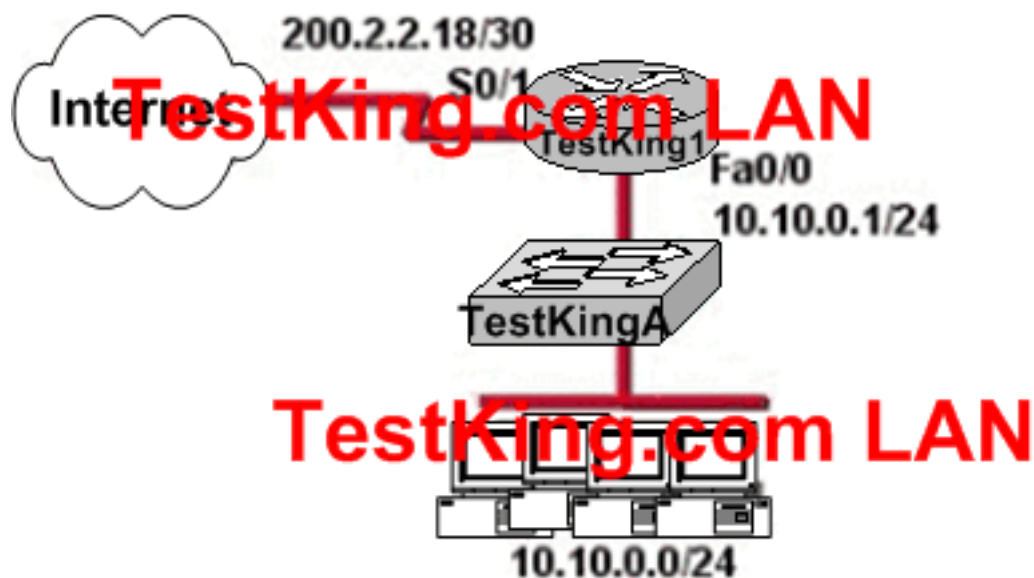
TestKing.com wants to use NAT in network displayed in the exhibit.
Which commands will apply the NAT configuration to the proper interfaces? Select two.

A. TestKing1(config)# interface serial0/1
TestKing1(config-if)# ip nat inside

B. TestKing1(config)# interface serial0/1

TestKing1(config-if)# ip nat outside

C. TestKing1(config)# interface fastethernet0/0
TestKing1(config-if)# ip nat inside

D. TestKing1(config)# interface fastethernet0/0
TestKing1(config-if)# ip nat outside

E. TestKing1(config)# interface serial0/1
TestKing1(config-if)# ip nat outside source pool 200.2.2.18 255.255.255.252

F. TestKing1(config)# interface serial0/1
TestKing1(config-if)# ip nat inside source 10.10.0.0 255.255.255.0

Answer: B, C
Explanation:
After creating the static NAT entries, the router needs to know which interfaces are
"inside" and which are "outside." The ip nat inside and ip nat outside interface
subcommands identify each interface appropriately.
Reference: Cisco CCNA ICND, p.271

QUESTION NO: 15

```
interface Serial1
  ip address 200.2.2.18 255.255.255.252
  ip nat outside
!
interface FastEthernet0
  ip address 10.10.0.1 255.255.255.0
  ip nat inside
  speed auto
!
ip nat pool test 199.99.9.40 199.99.9.62 netmask 255.255.255.224
ip nat inside source list 1 pool test

ip route 0.0.0.0 0.0.0.0 200.2.2.17
!
access-list 1 permit 10.10.0.0 0.0.0.255
```

TK1

S1

fa0

S1: 200.2.2.18/30
Fa0: 10.10.0.1/24

10.10.0.0

Refer to the topology and partial configuration output shown in the graphic. The ip subnet-zero configuration command is also in effect. After the router performs network address translation, which address is a valid "inside global address"?

A. 10.10.0.1
B. 10.10.0.17
C. 200.2.2.17
D. 200.2.2.18
E. 199.99.9.33
F. 199.99.9.47

Answer: F
Explanation:
Regarding NAT operation, Cisco defines these terms as follows:
1. Inside local address - The IP address assigned to a host on the inside network. This is
   the address configured as a parameter of the computer's OS or received via dynamic
   address allocation protocols such as DHCP. The address is likely not a legitimate IP
   address assigned by the Network Information Center (NIC) or service provider.
2.

Inside global address - A legitimate IP address assigned by the NIC or service provider that represents one or more inside local IP addresses to the outside world. In this case, the NAT pool is used to distribute the Inside Global IP addresses.

3. Outside local address - The IP address of an outside host as it appears to the inside network. Not necessarily a legitimate address, it is allocated from an address space routable on the inside.

4. Outside global address - The IP address assigned to a host on the outside network by the host's owner. The address is allocated from a globally routable address or network space.

Reference:
http://www.cisco.com/en/US/tech/tk648/tk361/technologies_tech_note09186a0080094837.shtml

QUESTION NO: 16
Which of the following options lists the steps in PPP session establishment in the correct order?

A. network layer protocol phase, optional authentication phase, link establishment phase
B. link establishment phase, network layer protocol phase, optional authentication phase
C. optional authentication phase, network layer protocol phase, link establishment phase
D. link establishment phase, optional authentication phase, network layer protocol phase
E. network layer protocol phase, link establishment phase, optional authentication phase
F. optional authentication phase, link establishment phase, network layer protocol phase

Answer: D
Explanation:
According to the related RFC on CHAP: In order to establish communications over a point-to-point link, each end of the PPP link must first send LCP packets to configure the data link during Link Establishment phase. After the link has been established, PPP provides for an optional Authentication phase before proceeding to the Network-Layer Protocol phase.
Reference: http://www.ietf.org/rfc/rfc1994.txt

Section 4: Configure a switch with VLANS and inter-switch communication (43 questions)

QUESTION NO: 1

Which of the following steps are necessary in order to add a new VLAN to a switched network? (Select all that apply.)

A. Create the VLAN.
B. Name the VLAN.
C. Configure an IP address for the VLAN.
D. Add the desired ports to the new VLAN.
E. Add the VLAN to the VTP domain.

Answer: A B D
Explanation:
The following are the basic requirements for creating VLANs:
* Creating the VLAN numbers and names
* Configuring each port's assigned VLAN
Incorrect Answers:
C. This is an optional feature, but not a necessary step for creating a VLAN.
E. Adding any VLAN to a Virtual Trunking Protocol (VTP) domain may be desired in a complex multi-switch and multi-VLAN network. However, it is not a necessary step for creating stand-alone VLANs on a single switch.

QUESTION NO: 2
You are bringing up a new Cisco Catalyst switch, and wish to connect it via a trunk to another switch from a different vendor, which uses the IEEE standard for the trunking method. When setting the encapsulation type on the trunk, what should you configure on the Cisco switch?

A. Switch(config)# switchport trunk encapsulation isl
B. Switch(config)# switchport trunk encapsulation ietf
C. Switch(config-if)# switchport trunk encapsulation isl
D. Switch(config-if)# switchport trunk encapsulation ietf
E. Switch(config-if)# switchport trunk encapsulation dot1q

Answer: E
Explanation:
The only real choices for setting up switching trunks are ISL and 802.1Q. ISL is Cisco proprietary, while 802.1Q uses the IEEE defined standard for trunking between switches. To configure the 802.1Q standard, the keyword "dot1q" is used in Cisco switches.
Incorrect Answers:

A, B, D. These are not valid options in a Cisco switch.

C. ISL is a Cisco proprietary method for setting up trunks, and will only work between Cisco switches.

QUESTION NO: 3
A new switch is being installed and you have been assigned the task of connecting it to an existing switch. In doing this, you want to set up the VLAN Trunking Protocol so that VLAN information can be passed between the switches. Which of the following must you do to accomplish this? (Choose all that apply).

A. You must set each end of the trunk line to IEEE 802.1e encapsulation.

B. You must set the same VTP management domain name on both switches.

C. You must set all ports on the two switches as access ports.

D. You must configure one of the switches as a VTP server.

E. You must use a rollover cable to connect the two switches.

Answer: B, D
Explanation:
The following describes what is needed in order to correctly set up VTP:

VTP operates in one of three modes:

■ Server mode
■ Client mode
■ Transparent mode

For VTP to exchange information, some switches act as servers, and some act as clients. VTP servers can create, modify, and delete VLANs and other configuration parameters for the entire VTP domain; this information, in turn, is propagated to the VTP clients and servers in that same domain. VTP servers save VLAN configurations in the Catalyst NVRAM, whereas in clients, the VLAN configuration is not stored at all. A VTP client cannot create, change, or delete VLANs, nor can it save VLAN configurations in nonvolatile memory.

Incorrect Answers:
A. The encapsulation can be either ISL or 802.1Q, and need to match at each end of the trunk.

C. Ports must only be assigned to VLANS. Once that is done and the trunk is up and running, the VLAN information will be passed between the switches.
E. A regular CAT5 cable is used to connect the switches, assuming 10/100 Ethernet is used.

QUESTION NO: 4
A new switch is installed into an existing LAN and a new VTP trunk is set up with an existing switch. Which VLANs will be allowed on this new trunk?

A. All defined VLANs are allowed on the trunk by default.
B. Each VLAN, or VLAN range, that is specified with the switchport mode command.
C. Each VLAN, or VLAN range, that is specified with the vtp domain command.
D. Each VLAN, or VLAN range, that is specified with the vlan database command.

Answer: A
Explanation:
The question does not state that there are multiple VTP Domains meaning that all defined VLANs are allowed on the trunk until a vtp domain command is issued.

QUESTION NO: 5
Which of the following a true statements regarding the use of VLANs to segment a network? (Select three.)

A. They increase the size of collision domains
B. They allow logical grouping of users by function.
C. They can enhance network security.
D. They increase the size of the broadcast domain while decreasing the number of collision domains.
E. They increase the number of broadcast domains while decreasing the size of the broadcast domains.
F. They simplify switch administration.

Answer: B, C, E
Explanation:

VLANs are used to segment a LAN into multiple, smaller LANs. This can be used to enhance security as local traffic from one VLAN will not be passed to users in other VLANS.

Incorrect Answers:

A. VLANs are used to decrease the size of a collision domain, not increase it.

D. The opposite is true.

F. The default operation of a switch is to allow all traffic and to enable all ports in VLAN 1. The use of VLANs will increase the complexity of the switch environment, making for more difficult administration.

QUESTION NO: 6
What is a characteristic of ISL and 802.1q frame tagging in a switched LAN environment?

A. They are used to find the best path through a network.

B. They allow the exchange of filtering tables.

C. They specify different implementations of the Spanning-Tree Protocol.

D. They allow the exchange of routing tables

E. They provide inter-switch VLAN communication.

Answer: E

Explanation: A trunk link is the other type of Layer 2 port supported on Cisco switches. When a trunk port is configured, it begins marking frames as they exit the port to indicate which VLAN each frame is associated with. The trunk port can also read the markings, called tags, as they enter the trunk port. This enables the switch to send a frame only to the ports for the given VLAN associated with the incoming frame.

The main purpose of trunking is to carry traffic between switches and maintain the VLAN information. Unlike an access link, the trunk link does not belong to a single VLAN but instead can carry traffic from several VLANs over a point-to-point link between two devices that understand the protocol. Two forms of trunking are used for Cisco switches on Ethernet networks: An IEEE industry standard called IEEE 802.1Q. This is a frame-tagging mechanism that adds a VLAN identifier to the frame by inserting a tag at Layer 2.

Another form of trunking on Cisco switches is called Inter-Switch Link (ISL), which is a Cisco proprietary trunking mechanism. ISL uses a frame encapsulation method that adds a header to identify the VLAN.

Incorrect Answers:

A, D. These are the functions of routers, not switches.

B. Filtering tables can be used on certain Catalyst switches via the use of VLAN access control lists, but this information is never shared between switches.

C. A separate STP instance is created for each VLAN, but the STP implementation remains the same.

QUESTION NO: 7

A new VLAN needs to be created for an existing network. Which of the following are the minimum tasks that must be accomplished in order to create the new VLAN? (Select three answer choices)

A. The VLAN must be created

B. The VLAN must be named

C. An IP address and subnet mask must be configured for the new VLAN

D. The desired ports must be added to the new VLAN

E. The VLAN must be added to the existing VTP Domain

Answer: A, B, D

Explanation:

The best answers are A, B, D. In order to create a simple VLAN, you must create the VLAN, name it, and then assign ports to it. These are the minimum requirements for a functioning VLAN.

Incorrect Answers:

C. Although an IP address is often configured, it is not required in order to create a functioning VLAN.

E. By default, the VLAN will already be added to the VTP domain. Even if the new VLAN was not part of the VTP domain, it would still work as a new VLAN on the switch.

QUESTION NO: 8

What are some of the characteristics of a typical VLAN arrangement? (Select all that apply)

A. VLANs logically divide a switch into multiple, independent switches at Layer 2.

B. Trunk links can carry traffic for multiple VLANs.

C. VLAN implementation significantly increases traffic due to added trunking information.
D. A VLAN can span multiple switches.
E. VLANs typically increase the number of switches needed
F. VLANs typically decrease the number of switches needed

Answer: A, B, D
Explanation:
VLANs give you the power of making virtual LAN networks to subdivide collision domains into smaller units of functionality, without being limited by physical location. A is correct because that is the exact function of a VLAN. B is correct because trunk links are used to carry traffic for multiple VLANs. D is correct because a VLAN can and often does span across multiple switches. VTP makes this possible.
Incorrect Answers:
C. Although trunking information does indeed add some level of overhead, the overall traffic overhead is greatly reduced though the use of VLANs.
E, F. The number of total switches needed in a network is the result of the number of devices on the entire LAN that need to be connected. Whether VLANs are used or not will have little, if any, impact on the total number of switches needed in a LAN.

QUESTION NO: 9
Which one of the following protocols allows the information about the configuration of a new VLAN to be distributed across entire switched network?

A. STP
B. VTP
C. EIGRP
D. SNMP
E. CDP
F. None of the above

Answer: B
Explanation:
Sybex CCNA Study Guide 4th Edition states on page 359:
"The basic goals of VLAN Trunking Protocol (VTP) are to manage all configured VLANs across a switched internetwork and to maintain consistency throughout that network. VTP allows an administrator to add, delete, and rename VLANs-information that is then propagated to all other switches in the VTP domain."

Incorrect Answers:
A. STP is the Spanning Tree Protocol, used to prevent bridging loops in a LAN.
C. EIGRP is a routing protocol used to exchange routing information, not VLAN information.
D. SNMP is the Simple Network Management Protocol, used to provide information to remote network management stations.
E. 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.
.

QUESTION NO: 10
Which encapsulation types are configurable on a Cisco switch for a trunk? (Select two answer choices)

A. VTP
B. ISL
C. CDP
D. 802.1Q
E. 802.1p
F. LLC
G. IETF

Answer: B, D
Explanation:
Trunks are used to carry traffic belonging to multiple VLANs between devices over the same link. A device can determine which VLAN the traffic belongs to by its VLAN identifier. The VLAN identifier is a tag that is encapsulated with the data. ISL and 802.1q are two types of encapsulations used to carry data from multiple VLANs over trunk links. ISL is a Cisco proprietary protocol for interconnecting multiple switches and maintaining VLAN information as traffic goes between switches. ISL provides VLAN trunking capabilities while maintaining full wire speed performance on Ethernet links in full-duplex or half-duplex mode. ISL operates in a point-to-point environment and will support up to 1000 VLANs. In ISL, the original frame is encapsulated and an additional header is added before the frame is carried over a trunk link. At the receiving end, the header is removed and the frame is forwarded to the assigned VLAN. .ISL uses Per VLAN Spanning Tree (PVST) which runs one instance of Spanning Tree Protocol (STP) per VLAN. PVST allows for optimal root switch placement for each VLAN and supports load balancing of VLANs over multiple trunk links.

802.1Q is the IEEE standard for tagging frames on a trunk and supports up to 4096 VLANs. In 802.1Q, the trunking device inserts a four-byte tag into the original frame and re-computes the Frame Check Sequence (FCS) before sending the frame over the trunk link. At the receiving end, the tag is removed and the frame is forwarded to the assigned VLAN. 802.1Q does not tag frames on the native VLAN. It tags all other frames transmitted and received on the trunk. While configuring a 802.1 trunk, you must make sure that the same native VLAN is configured on both sides of the trunk. IEEE 802.1Q defines a single instance of spanning tree running on the native VLAN for all the VLANs in the network which is called Mono Spanning Tree (MST). This lacks the flexibility and load balancing capability of PVST available with ISL. However, PVST+ offers the capability to retain multiple Spanning Tree topologies with 802.1Q trunking.

QUESTION NO: 11
You need to create a new VLAN on your Catalyst switch. This VLAN is to be named TESTKING. Which of the following need to be completed for the creation of this new VLAN? (Select all that apply)

A. The TESTKING VLAN must be created.
B. The desired ports must be added to the new TESTKING VLAN.
C. The TESTKING VLAN must be added to all of the domains.
D. The TESTKING VLAN must be named.
E. An IP address must be configured for the TESTKING VLAN.
F. None of the above. VLAN creations are automatic.

Answer: A, B, D
Explanation:
Creating a VLAN is done in 3 steps:
 1. Create the VLAN
 2. Name the VLAN
 3. Assign ports to the VLAN
From there, other features and functionality can be configured, but these are the only steps that are required for the addition of a VLAN.
Incorrect Answers:
C. The VLAN needs only to be added to a single switch, where it can act as a stand-alone VLAN, or it can be transferred to other switches in the network through the use of the VTP protocol.
E. VLANs operate at layer 2, and although many are configured with a layer 3 IP address, it is not absolutely necessary to do this.

QUESTION NO: 12
When a switch port is used as a VLAN trunk, which of the following trunk modes are valid? (Select all that apply.)

A. Blocking
B. Auto
C. Desirable
D. On
E. Transparent
F. Learning

Answer: B, C, D
Explanation:
A trunk port can be configured as one of the following 5 different modes: on, off, desirable, auto, or nonegotiate.
 The table below is a summary of the configuration modes.

Mode	Function	DTP Frames Transmitted	Final State (Local Port)
Auto(default)	Makes the port willing to convert the link to a trunk. The port becomes a trunk port if the neighboring port is set to on or desirable mode.	Yes, periodic.	Trunking
On	Puts the port into permanent trunking mode and negotiates to convert the link into a trunk. The port becomes a trunk port even if the neighboring port does not agree to the change.	Yes, periodic.	Trunking, **unconditionally.**
Nonegotiate	Puts the port into permanent trunking mode but prevents the port from generating DTP frames. You must configure the neighboring port manually as a trunk port to establish a trunk link. This is useful for devices that do not support DTP.	No	Trunking, **unconditionally.**
Desirable	Makes the port actively attempt to convert the link to a trunk link. The port becomes a trunk port if the neighboring port is set to on, desirable, or auto mode.	Yes, periodic.	It will end up in trunking state only if the remote mode is on, auto, or desirable.
Off	Puts the port into permanent non-trunking mode and negotiates to convert the link into a non-trunk link. The port becomes a non-trunk port even if the neighboring port does not agree to the change.	No in steady state, but will transmit informs to speed up remote end detection after the change from on.	Non-trunking

QUESTION NO: 13
Which of following VLAN frame encapsulation types are configurable on a Cisco switch? (Select two answer choices.)

A. VTP
B. 802.1Q

C. LLC
D. ISL
E. CDP
F. PAP

Answer: B, D
Explanation:
ISL and 802.1Q are the two trunking encapsulations that can be configured on a Cisco switch. ISL is Cisco proprietary and 802.1Q is the IEEE standard method.
Incorrect Answers:
A. VTP is the VLAN Trunking Protocol, which is used to carry VLAN information across the trunks. The question is asking for the encapsulation options for the trunk, which will be used by VTP.
C. LLC is the Logical Link Control, which is a sub-layer of the data link layer.
E. CDP is the Cisco Discovery Protocol, which is used by Cisco devices to discover information on neighboring Cisco devices.
F. PAP is the Password Authentication Protocol, which is used as an authentication mechanism on PPP links.

QUESTION NO: 14
Which VTP mode should a Cisco switch be set to if this switch is to add or delete VLANs to a management domain?

A. Transparent
B. Server
C. Auto
D. Client
E. User

Answer: B
Explanation:
VTP Modes:
If you intend to make a switch part of a VTP management domain, each switch must be configured in one of three possible VTP modes. The VTP mode assigned to a switch will determine how the switch interacts with other VTP switches in the management domain. The three VTP modes that can be assigned to a Cisco switch include server mode, client mode, and transparent mode. Each of these roles is outlined below:

Server Mode Once VTP is configured on a Cisco switch, the default mode used is Server Mode. In any given VTP management domain, at least one switch must be in Server Mode. When in Server Mode, a switch can be used to add, delete, and modify VLANs, and this information will be passed to all other switches in the VTP management domain. Client Mode When a switch is configured to use VTP Client Mode, it is simply the recipient of any VLANs added, deleted, or modified by a switch in Server Mode within the same management domain. A switch in VTP client mode cannot make any changes to VLAN information.

Transparent Mode A switch in VTP Transparent Mode will pass VTP updates received by switches in Server Mode to other switches in the VTP management domain, but will not actually process the contents of these messages. When individual VLANs are added, deleted, or modified on a switch running in transparent mode, the changes are local to that particular switch only, and are not passed to other switches in the VTP management domain.

Based on the roles of each VTP mode, the use of each should be more or less obvious. For example, if you had 15 Cisco switches on your network, you could configure each of them to be in the same VTP management domain. Although each could theoretically be left in the default Server Mode, it would probably be easier to leave only one switch in this configuration, and then configure all remaining switches for VTP Client Mode. Then, when you need to add, delete, or modify a VLAN, that change can be carried out on the VTP Server Mode switch and passed to all Client Mode switches automatically. In cases where you need a switch to act in a relatively standalone manner, or do not want it to propagate information about its configured VLANs, use Transparent Mode.

Incorrect Answers:
A. A switch in VTP Transparent Mode will pass VTP updates received by switches in Server Mode to other switches in the VTP management domain, but will not actually process the contents of these messages.
C, E. These are not valid VTP modes.
D. Client mode merely accepts changes made by the switch that is connected and in SERVER mode.

QUESTION NO: 15
What must an administrator do in order to successfully configure a VLAN trunk between two switches? (Select two answer choices)

A. Set each end of the trunk line to IEEE 802.1Q encapsulation.
B. Set the same VTP management domain name on both switches.
C. Set all ports on the two switched as access ports.
D. Configure one of the two switches as a VTP server.
E. Connect the two switches using a rollover cable.

F. Use a router to forward VTP traffic between the VLANs.

Answer: B, D
Explanation:
All servers that need to share VLAN information must use the same domain name, and a switch can only be in one domain at a time. This means that a switch can only share VTP domain information with other switches if they're configured into the same VTP domain. You can use a VTP domain if you have more than one switch connected in a network, but if you've got all your switches in only one VLAN, you don't need to use VTP. VTP information is sent between switches via a trunk port.

Switches advertise VTP management domain information, as well as a configuration revision number and all known VLANs with any specific parameters. There's also something called VTP transparent mode, in it, you can configure switches to forward VTP information through trunk ports, but not to accept information updates or update their VTP databases. At least one of the switches will need to be configured as the VTP server in order to pass the VLAN info.

Incorrect Answers:
A. Although this is a valid option, it is not a requirement since using ISL as the encapsulation type is also a valid option.
E. A rollover cable is not used between switches for any of the port types.
F. Routers will be required for sending traffic from one VLAN to the other, but not to forward the actual VTP traffic.

QUESTION NO: 16
Which of the following can be an expected outcome of a VLAN? (Select all that apply)

A. VLANs logically divide a switch into multiple, independent switches at Layer 2.
B. Trunk links can carry traffic for multiple VLANs.
C. VLAN implementation significantly increases traffic due to added trunking information.
D. VLANs can span multiple switches.
E. VLANs typically decrease the number of switches needed

Answer: A, B, D
Explanation:
VLANs give you the power of making virtual LAN networks to subdivide collision domains into smaller units of functionality, without being limited by physical location.

A is correct because that is the exact function of a VLAN. B is correct because trunk links are used to carry traffic for multiple VLANs. D is correct because a VLAN can and often does span across multiple switches. VTP makes this possible.

Incorrect Answers:

C. Although trunking information does indeed add some level of overhead, the overall traffic overhead is greatly reduced though the use of VLANs.

E, F. The number of total switches needed in a network is the result of the number of devices on the entire LAN that need to be connected. Whether VLANs are used or not will have little, if any, impact on the total number of switches needed in a LAN.

QUESTION NO: 17

How could a corporation benefit from using VLANs on their network? (Select three answer choices.)

A. VLANs allow access to network services based on department, not physical location.
B. VLANs utilize packet filtering to enhance network security.
C. VLANs provide a low-latency, high bandwidth internetworking alternative.
D. VLANs provide a method of communication between IP addresses in large networks.
E. VLANs establish segmented broadcast domains in switched networks.
F. VLANs can greatly simplify adding, moving, or changing hosts on the network.

Answer: A, E, F
Explanation:

VLANs establish broadcast domains in switched networks, so by virtue of having the option to create many efficient broadcast domains, congestion is reduced and network throughput is greatly enhanced. VLANs allow networks to be divided by department or resource needs, rather then by physical location. When people move departments, leave a department, or join a department, administration is easy and convenient with a few keystrokes.

Incorrect Answers:

B, D. These would be router functions at layer 3. Switches and VLANs operate at layer 2 of the OSI model.

C. The use of VLANs may actually increase the latency in some cases, as traffic from one VLAN to the other will need to be routed.

QUESTION NO: 18

Which commands, when used together, would create an 802.1Q link? (Select two answer choices)

A. Switch(vlan)# mode trunk
B. Switch(config)# switchport access mode trunk
C. Switch(config-if)# switchport mode trunk
D. Switch(config-if)# switchport trunk encapsulation dot1q
E. Switch(config)# switchport access mode 1
F. Switch(vlan)# trunk encapsulation dot1q

Answer: C, D
Explanation:
Creating this trunk link is a two step process. First you have to set the switchport mode to trunk, and then you configure the encapsulation. The giveaway on this question is the fact that to create a trunk on an interface, you have to be in interface configuration mode. So switchport mode trunk sets the trunk, and switchport trunk encapsulation dot1q sets the encapsulation.

QUESTION NO: 19
The TestKing LAN is displayed in the following diagram:
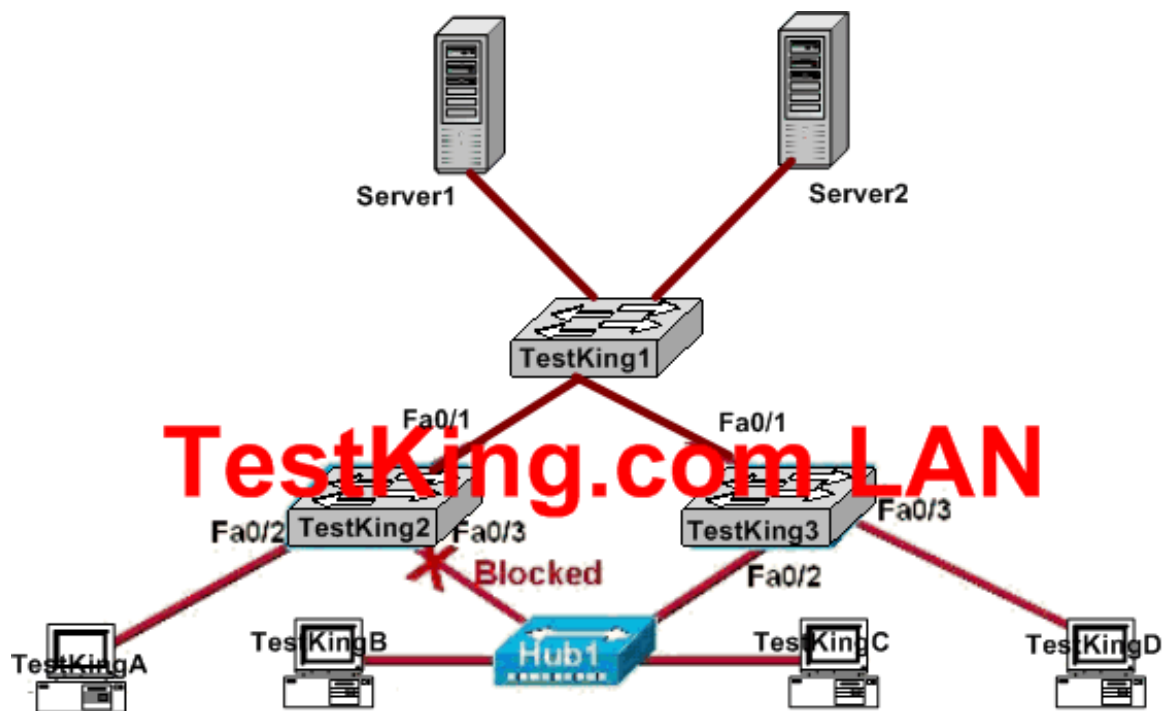
Assuming all hosts and servers are in the same VLAN, which statement is correct about the exhibit?

A. Switch TestKing2 is the root bridge.
B. Spanning Tree Protocol is not running.
C. Host TestKingD and Server1 are in the same network.
D. No collisions can occur in traffic between Host TestKingB and host TestKingC.

Answer: C
Explanation:
Since there are no routers in the network diagram, and it was stated that all hosts and servers are in the same VLAN, it can be assumed that these two devices are in the same IP network.
Incorrect Answers:
A. TestKing2 can not be the root bridge, since it contains a blocking port. On the root bridge, all ports are non-blocking.

B. STP has to be enabled, otherwise one of the ports would not be in blocking mode.
D. Since these devices are separated only by a layer 1 hub device, they will both be in the same collision domain.

QUESTION NO: 20
Which of the following are benefits of VLANs? (Choose three)

A. They increase the size of collision domains.
B. They allow logical grouping of users by function.
C. They can enhance network security,
D. The increase the size of broadcast domains while decreasing the number of the broadcast domains.
E. The increase the number of broadcast domains while decreasing the size of the broadcast domains.
F. They simplify switch administration.

Answer: B, C, E
Explanation:
There are many motivations for using VLANs, including these:

1. To group users by department, or by groups that work together, instead of by physical location. (B)
2. To reduce overhead by limiting the size of each broadcast domain (E)
3. To enforce better security by keeping sensitive devices on a separate VLAN (C)
4. To separate specialized traffic from mainstream traffic - for example, putting IP telephones on a separate VLAN form user PCs.

QUESTION NO: 21
When a new trunk link is configured on an IOS based switch, which VLANs are allowed over the link?

A. By default, all defined VLANs are allowed on the trunk.
B. Each single VLAN, or VLAN range, must be specified with the switchport mode command.
C. Each single VLAN, or VLAN range, must be specified with the vtp domain command.
D. Each single VLAN, or VLAN range, must be specified with the vlan database command.

Answer: A
Explanation:
By default, all VLANs are allowed over a trunk at all times. This is true for every Cisco IOS switch that is capable of VLAN trunking.

QUESTION NO: 22
An administrator is configuring a Catalyst switch with VLAN information that must be automatically distributed to other Catalyst switches in the network. What conditions must be met in order for the VLANs configured on this switch to be automatically configured on the other switches? (Choose three)

A. The switch that will share its VLAN configuration must be in VTP server mode.
B. The switches must be in the same VTP domain.
C. The switch that will share the VLAN information must be configured as the root bridge.
D. The switches must be connected over VLAN trunks.
E. The switches must be configured to use the same STP version.
F. The switches must have VTP pruning activated.

Answer: A, B, D
Explanation:
Choice A is correct because for a VTP server, you can create, delete, or modify a VLAN in the local VLAN database. After you make this change, the VLAN database changes are propagated out to all other switches in server or client mode in the VTP domain. A server will also accept changes to the VLAN database from other switches in the domain.
Choice B is correct because VTP messages are exchanged between switches within a common VTP domain.
Choice D is correct because VTP sends messages between trunked switches to maintain VLANs on these switches in order to properly trunk.

QUESTION NO: 23

```
Testking1# show vtp status
VTP Version                         :2
Configuration Revision              :0
Maximum VLANs supported locally     :64
Number of existing VLANs            :5
VTP Operating Mode:                 :Transparent
VTP Domain Name                     :Testking
VTP Pruning Mode                    :Disabled
VTP V2 Mode                         :Disabled
VTP Traps Generation                :Disabled
```

Refer to graphic and examine the output from the Tesking1 switch. What VTP functions will this switch perform?

A. Create, change, and delete VLANs for the VTP domain
B. Learn and save VTP configuration information in the running configuration only
C. Forward VTP configuration information
D. Backup the VTP database for the closest VTP server
E. Prevent VTP information from reaching workgroup switches

Answer: C
Explanation:
In this example, Testking1 is configured to operate in transparent mode. The various VTP modes are defined as follows:
Server-In VTP server mode, you can create, modify, and delete VLANs and specify other configuration parameters (such as VTP version and VTP pruning) for the entire VTP domain. VTP servers advertise their VLAN configuration to other network devices in the same VTP domain and synchronize their VLAN configuration with other network devices based on advertisements received over trunk links. VTP server is the default mode.
☐

Client-VTP clients behave the same way as VTP servers, but you cannot create, change, or delete VLANs on a VTP client.
☐

Transparent-VTP transparent network devices do not participate in VTP. A VTP transparent network device does not advertise its VLAN configuration and does not synchronize its VLAN configuration based on received advertisements. However, in VTP version 2, transparent network devices do forward VTP advertisements that they receive out their trunking LAN ports.

Reference:
http://www.cisco.com/en/US/products/hw/switches/ps708/products_configuration_guide_chapter09186a0080

QUESTION NO: 24
A group of hosts are physically connected to the same switch. The hosts are used by employees of different departments and therefore do not need to directly exchange data on a regular basis.
Which technology can a network administrator deploy to reduce unnecessary broadcast traffic between these hosts?

A. Micro segmentation
B. Transparent switching
C. peer-to-peer networking
D. port security
E. store-and-forward switching
F. virtual local area networks

Answer: F
Explanation: A VLAN is a logical grouping of network users and resources connected to administratively defined ports on a switch. When you create VLANs, you are given the ability to create smaller broadcast domains within a layer 2 switched internetwork by assigning different ports on the switch to different subnetworks. A VLAN is treated like its own subnet or broadcast domain, which means that frames broadcasted onto the network are only switched between the ports logically grouped within the same VLAN.

QUESTION NO: 25
What are two results of entering the Switch(config)# vtp mode client command on a Catalyst switch? (Choose two.)

A. The switch will ignore VTP summary advertisements

B. The switch will forward VTP summary advertisements
C. The switch will process VTP summary advertisements
D. The switch will originate VTP summary advertisements
E. The switch will create, modify and delete VLANs for the entire VTP domain

Answer: B, C
Explanation :
Server mode-VTP servers have full control over VLAN creation and modification for
their domains. All VTP information is advertised to other switches in the domain, while
all received
VTP information is synchronized with the other switches. By default, a switch is in VTP server
mode. Note that each VTP domain must have at least one server so that VLANs can be created,
modified, or deleted, and VLAN information can be propagated.

Client mode-VTP clients do not allow the administrator to create, change, or delete any
VLANs. Instead, they listen to VTP advertisements from other switches and modify their
VLAN configurations accordingly. In effect, this is a passive listening mode. Received VTP
information is forwarded out trunk links to neighboring switches in the domain, so the switch
also acts as a VTP relay.

Transparent mode-VTP transparent switches do not participate in VTP. While in
transparent
mode, a switch does not advertise its own VLAN configuration, and a switch does not
synchronize its VLAN database with received advertisements. In VTP version 1, a
transparent-mode switch does not even relay VTP information it receives to other switches,
unless its VTP domain names and VTP version numbers match those of the other switches. In
VTP version 2, transparent switches do forward received VTP advertisements out of their trunk
ports, acting as VTP relays. This occurs regardless of the VTP domain name setting.

QUESTION NO: 26
Exhibit:

TestKingA # show vtp status

VTP Version	: 2
Configuration Revision	: 232
Maximum VLANs supported locally :	: 64
Number of existing VLANs	: 5
VTP Operating Mode	: Server
VTP Domain Name	: Tokyo
VTP Pruning Mode	: Enabled
VTP V2 Mode	: Disabled
VTP Traps Generation	: Disabled

TestKingB # show vtp status

VTP Version	: 2
Configuration Revision	: 234
Maximum VLANs supported locally :	: 64
Number of existing VLANs	: 7
VTP Operating Mode	: Client
VTP Domain Name	: Tokyo
VTP Pruning Mode	: Disabled
VTP V2 Mode	: Disabled
VTP Traps Generation	: Disabled

Study the Exhibit carefully. Switch TestKingA sends a VTP advertisement and Switch TestKingB receives it.
Which statement accurately describes how Switch TestKingB will respond?

A. Switch TestKingB will add 2 VLANs to its VLAN database and change the configuration revision number to 232
B. Switch TestKingB will remove 2 VLANs from its VLAN database and change the configuration revision number to 232
C. Switch TestKingB will enable VTP pruning, add two VLANs, and increment the configuration revision number to 233
D. Switch TestKingB will ignore the VTP advertisement

Answer: D
Explanation:
Switches advertise VTP management domain information, as well as a configuration revision number and all known VLANs with any specific parameters. There's also something called VTP transparent mode; in it, you can configure switches to forward VTP information through trunk ports, but not to accept information updates or update their VTP databases. If you find yourself having problems with users adding switches to your VTP domain, you can include passwords, but don't forget that every switch must be set up with the same password-this can get ugly.

Switches detect the additional VLANs within a VTP advertisement and then prepare to receive information on their trunk ports with the newly defined VLAN in tow. This information would be VLAN ID, 802.10 SAID fields, or LANE information. Updates are sent out as revision numbers that are the notification plus 1. Any time a switch sees a higher revision number, it knows the information that it's receiving is more current, and it will overwrite the current database with that new information.

The Client synchronizes with the vtp server on every 5 minutes, if revision number is updated then client copy the configuration.

The client has a revision number of 234, but would receive an update number of 232 from the VTP server.

QUESTION NO: 27
The TestKing network is displayed in the diagram below:
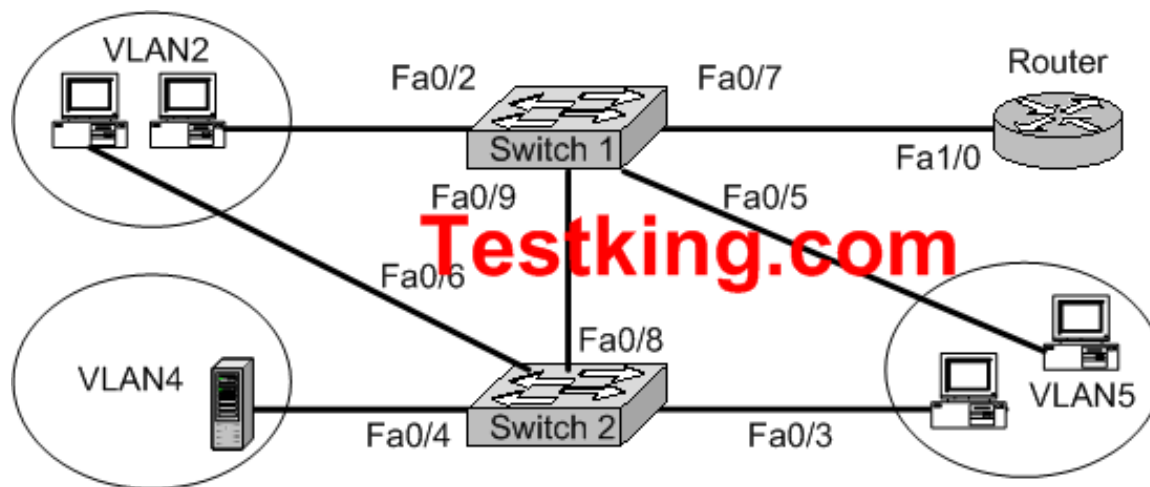
A network associate is trying to understand the operation of the TestKing network by studying the network in the exhibit. The associate knows that the server in VLAN 4 provides the necessary resources to support the user hosts in the other VLANs. The associate needs to determine which interfaces are access ports. Which interfaces are access ports? (Choose three.)

A. Switch1 - Fa0/2
B. Switch1 - Fa0/9

C. Switch2 - Fa0/3
D. Switch2 - Fa0/4
E. Switch2 - Fa0/8
F. Router - Fa1/0

Answer: A, C, D
Explanation:
Access links: This type of link is only part of one VLAN, and it's referred to as the native VLAN of the port. Any device attached to an access link is unaware of a VLAN membership the device just assumes it's part of a broadcast domain, but it does not understand the physical network.
Trunk links: Trunks can carry multiple VLANs and originally gained their name after the telephone system trunks that carry multiple telephone conversations.
The Host which connected to switch port can be access because no need to carry the other VLAN information. But the Port connected to another switch or connected to Router should be trunked.

QUESTION NO: 28
Which statements describe two of the benefits of VLAN Trunking Protocol?
(Choose two)

A. VTP allows routing between VLANs.
B. VTP allows a single switch port to carry information to more than one VLAN.
C. VTP allows physically redundant links while preventing switching loops.
D. VTP simplifies switch administration by allowing switches to automatically share
      VLAN configuration information.
E. VTP helps to limit configuration errors by keeping VLAN naming consistent across
      the VTP domain.
F. VTP enhances security by preventing unauthorized hosts from connecting to the VTP
      domain.

Answer: D, E
Explanation:

VTP minimizes the possible configuration inconsistencies that arise when changes are made. These inconsistencies can result in security violations, because VLANs can cross connect when duplicate names are used. They also could become internally disconnected when they are mapped from one LAN type to another, for example, Ethernet to ATM LANE ELANs or FDDI 802.10 VLANs. VTP provides a mapping scheme that enables seamless trunking within a network employing mixed-media technologies.

VTP provides the following benefits:

1. VLAN configuration consistency across the network
2. Mapping scheme that allows a VLAN to be trunked over mixed media
3. Accurate tracking and monitoring of VLANs
4. Dynamic reporting of added VLANs across the network
5. Plug-and-play configuration when adding new VLANs

QUESTION NO: 29
A college has a small campus where 25 faculty members are located. The faculty offices and student computers are currently on the same network. The faculty is concerned about students being able to capture packets going across the network and obtain sensitive material. What could a network administrator do to protect faculty network traffic from student connections?

A. Install anti-virus software on the student computers.
B. Put the faculty computers in a separate VLAN.
C. Power down the switches that connect to faculty computers when they are not in use.
D. Remove the student computers from the network and put them on a peer-to-peer network.
E. Create an access list that blocks the students from the Internet where the hacking tolls are located.

Answer: B
Explanation:
Main Functions of a VLAN:

1. The VLAN can group several broadcast domains into multiple logical subnets.
2. You can accomplish network additions, moves, and changes by configuring a port into the appropriate VLAN.
1. You can place a group of users who need high security into a VLAN so that no users outside f the VLAN can communicate with them.
2. As a logical grouping of users by function, VLANs can be considered independent from heir physical or geographic locations.
3. VLANs can enhance network security.

4. VLANs increase the number of broadcast domains while decreasing their size.

QUESTION NO: 30
What are three valid reasons to assign ports on VLANs on a switch? (Choose three.)

A. to make VTP easier to implement
B. to isolate broadcast traffic
C. to increase the size of the collision domain
D. to allow more devices to connect to the network
E. to logically group hosts according to function
F. to increase network security

Answer: B, E, F
Explanation:
Main Functions of a VLAN (see previous question):
1. The VLAN can group several broadcast domains into multiple logical subnets.
2. You can accomplish network additions, moves, and changes by configuring a port into the
   appropriate VLAN.
1. You can place a group of users who need high security into a VLAN so that no users outside f
   the VLAN can communicate with them.
2. As a logical grouping of users by function, VLANs can be considered independent from heir
   physical or geographic locations.
3. VLANs can enhance network security.
4. VLANs increase the number of broadcast domains while decreasing their size.

QUESTION NO: 31
Two TestKing switches are connected together as shown below:
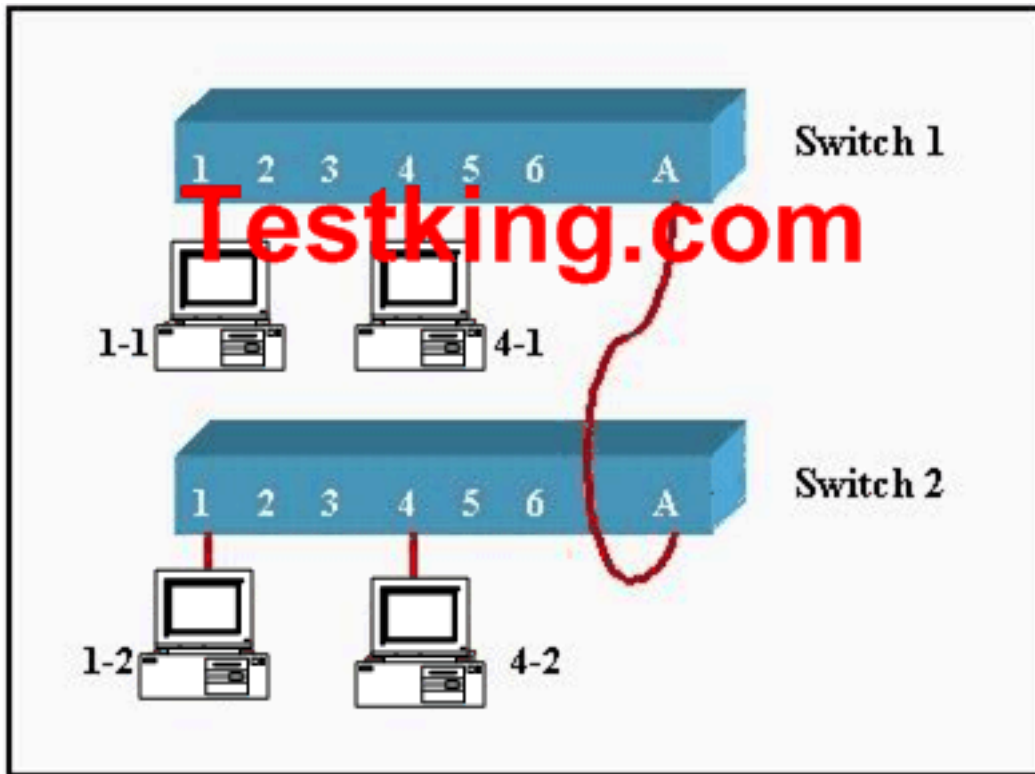
Given the network diagram above, assume that ports 1 through 3 are assigned to VLAN1 and ports 4 through 6 are assigned to VLAN2 on each switch. The switches are interconnected over a trunked link. Which of the following conditions would verify proper VLAN and trunk operation? (Choose three.)

A. Host 1-1 can ping Host 1-2
B. Host 1-1 can ping Host 4-2
C. Host 1-1 can not ping Host 1-2
D. Host 4-1 can not ping Host 1-2
E. Host 4-1 can ping Host 4-2

Answer: A, D, E
Explanation:
While we configure the VLAN by default member of same VLAN can ping to other member of same VLAN but can't ping to the member of other VLAN.
Answer A, D and E are correct because of the following:
1. Host1 of switch 1 can ping to host1 of switch 2 because on same VLAN
2. Host 4 of switch 1 can't ping to host1 of switch 2 because on different VLAN
3. Host 4 of switch 1 can ping to Host 4 of switch 2 because on same VLAN

QUESTION NO: 32
Which of the following are VLAN frame encapsulation types that may be configured on a Catalyst switch? (Choose two.)

A. VTP
B. ISL
C. CDP
D. 802.1Q
E. 802.1p
F. LLC

Answer: B, D
Explanation:
The two VLAN encapsulation types are:
Inter-Switch Link (ISL): This is proprietary to Cisco switches, and it's used for Fast Ethernet and Gigabit Ethernet links only. ISL routing can be used on a switch port, router interfaces, and server interface cards to trunk a server. ISL lets you explicitly tag VLAN information onto an Ethernet frame. This tagging information allows VLANs to be multiplexed over a trunk link through an external encapsulation method, which allows the switch to identify the VLAN membership of a frame over the trunked link.

IEEE 802.1Q: Created by the IEEE as a standard method of frame tagging, this actually inserts a field into the frame to identify the VLAN. If you're trunking between a Cisco switched link and a different brand of switch, you have to use 802.1Q for the trunk to work.

QUESTION NO: 33
A TestKing network is shown below:
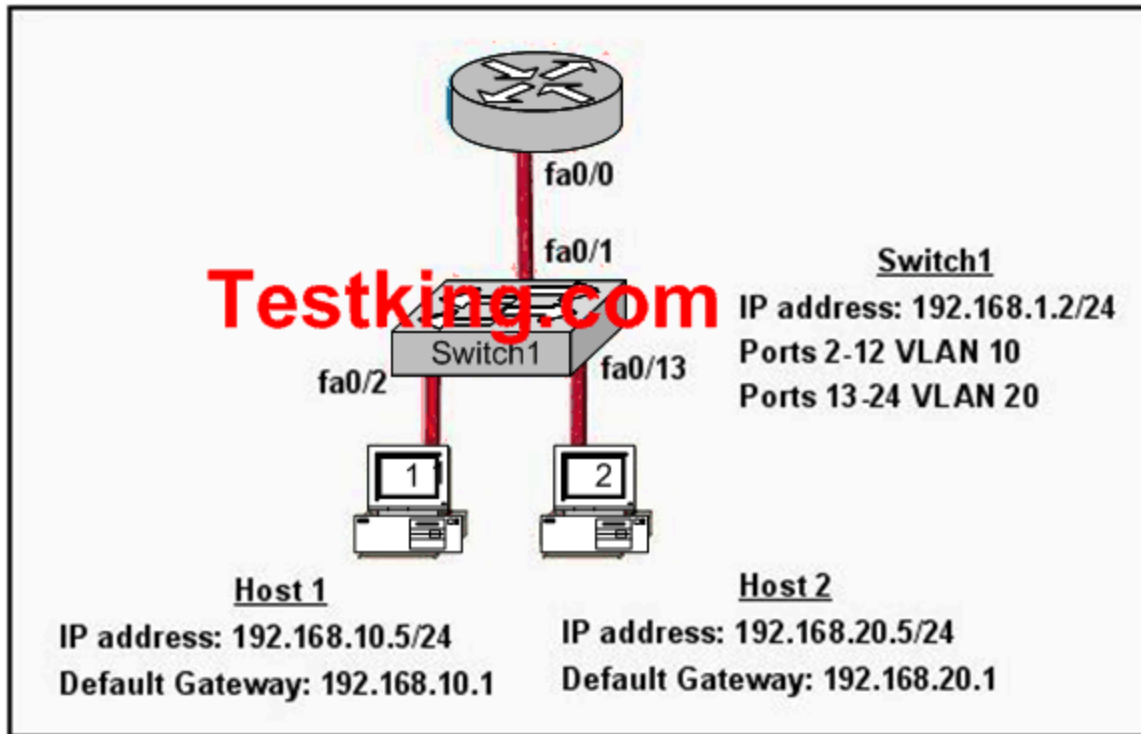
Based on the information shown above, what commands must be configured on the 2950 switch and the router to allow communication between host 1 and host 2? (Choose two)

A. Router(config)# interface fastethernet 0/0
 Router(config-if)# ip address 192.168.1.1 255.255.255.0
 Router(config-if)# no shut down
B. Router(config)# interface fastethernet 0/0
 Router(config-if)# no shutdown
 Router(config)# interface fastethernet 0/0.1
 Router(config-subif)# encapsulation dot1q 10
 Router(config-subif)# ip address 192.168.10.1 255.255.255.0
 Router(config)# interface fastethernet 0/0.2
 Router(config-subif)# encapsulation dot1q 20
 Router(config-subif)# ip address 192.168.20.1 255.255.255.0

C. Router(config)# router eigrp 100
 Router(config-router)# network 192.168.10.0
 Router(config-router)# network 192.168.20.0
D. Switch1(config)# vlan database
 Switch1(config-vlan)# vtp domain XYZ
 Switch1(config-vlan)# vtp server
E. Switch1(config)# interface fastethernet 0/1
 Switch1(config-if)# switchport mode trunk
F. Switch1(config)# interface vlan 1
 Switch1(config-if)# ip default-gateway 192.168.1.1

Answer: B, E
Explanation:
In this exhibit, there are two different VLANs (VLAN 10 and VLAN 20). In this case, the router is required for Inter-VLAN routing. In order to properly configure Inter-VLAN Routing, we need to assign the IP address and the encapsulation type. In the router we need two sub-interfaces created we need to assign the IP as well as defined the encapsulation type for each of these. In the switch, only a trunk port can carry the information of multiple VLANs so fa0/1 is trunked on the switch as shown by answer E.

QUESTION NO: 34
What is the purpose of the command "vtp password Fl0r1da"?

A. It is used to validate the sources of VTP advertisements sent between switches.
B. It is used to access the VTP server to make changes to the VTP configuration.
C. It allows two VTP servers to exist in the same domain, each configured with different passwords.
D. It is the password required when promoting a switch from VTP client mode to VTP server mode.
E. It is used to prevent a switch newly added to the network from sending incorrect VLAN information to the other switches in the domain.

Answer: A
Explanation:
VTP passwords help to authenticate the VTP clients as members of the same VTP domain, while authenticated VTP servers start advertisements to VTP clients. The VTP password and domain should be the same for both the VTP server and the VTP client.

QUESTION NO: 35
Two TestKing switches are connected together as shown in the diagram below:


```
                Fa0/5              Fa0/1          Fa0/1
[PC]                [Swicth1]            [Switch2]
                      Testking.com
Switch1# show vtp status
VTP Version                            : 2
Configuration Revision                 : 0
Maximum VLANs supported locally        : 250
Number of existing VLANs               : 7
VTP Operating Mode                     : Transparent
VTP Domain Name                        : Florida
VTP Pruning Mode                       : Disabled
VTP V2 Mode                            : Disabled
VTP Traps Generation                   : Disabled
MD5 digest                             : 0x78 0xBD 0x1E 0x44 0xE1 0xAA
Configuration last modified by 192.168.10.2 at 3-1-93 00:33:15
```
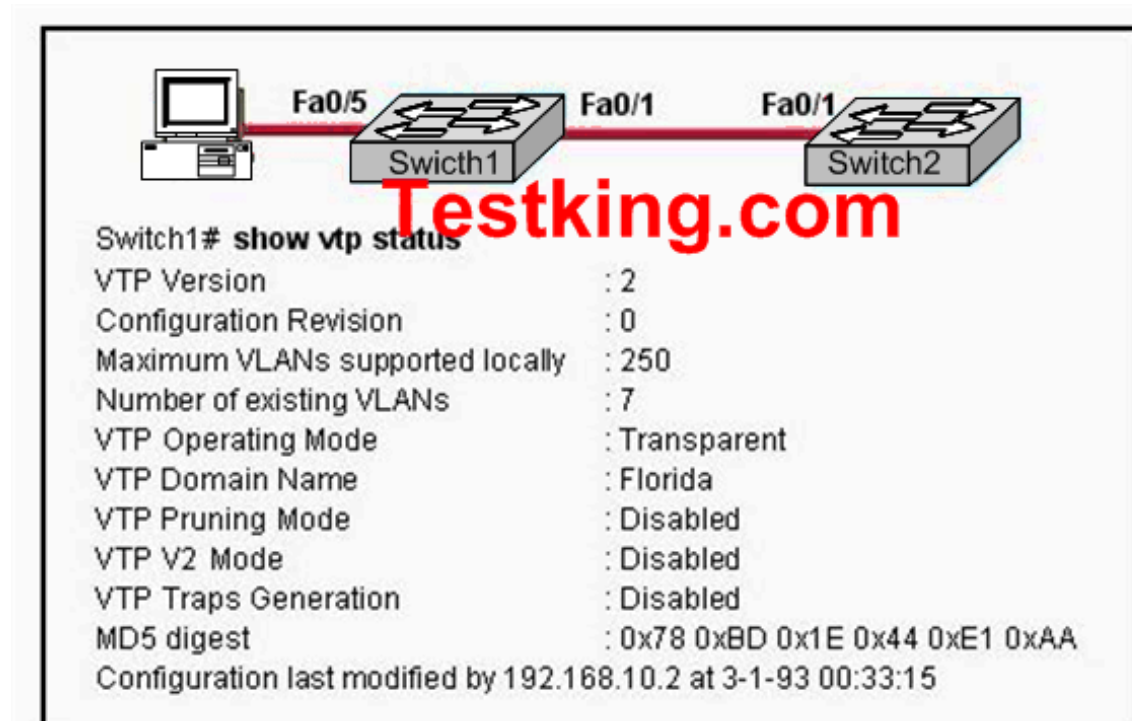
Refer to the exhibit. What will be the result of issuing the following commands?
Switch1(config)# interface fastethernet 0/5
Switch1(config-if)# switchport mode access
Switch1(config-if)# switchport access vlan 30

A. The VLAN will be added to the database, but the VLAN information will not be
passed on to the Switch2 VLAN database.
B. The VLAN will be added to the database and VLAN 30 will be passed on as a VLAN
to add to the Switch2 VLAN database.
C. The VLAN will not be added to the database, but the VLAN 30 information will be
passed on as a VLAN to the Switch2 VLAN database.

D. The VLAN will not be added to the database, nor will the VLAN 30 information be passed on as a VLAN to the Switch2 VLAN database.

Answer: A
Explanation:
The three VTP modes are described below:
Server: This is the default for all Catalyst switches. You need at least one server in your VTP domain to propagate VLAN information throughout the domain. The switch must be in server mode to be able to create, add, or delete VLANs in a VTP domain. You must also change VTP information in server mode, and any change you make to a switch in server mode will be advertised to the entire VTP domain.
Client: In client mode, switches receive information from VTP servers; they also send and receive updates, but they can't make any changes. Plus, none of the ports on a client switch can be added to a new VLAN before the VTP server notifies the client switch of the new VLAN. Here's a hint: if you want a switch to become a server, first make it a client so that it receives all the correct VLAN information, then change it to a server-much easier!
Transparent: Switches in transparent mode don't participate in the VTP domain, but they'll still forward VTP advertisements through any configured trunk links. These switches can't add and delete VLANs because they keep their own database-one they do not share with other switches. Transparent mode is really only considered locally significant.
In our example, the switch is configured for transparent mode. In transparent mode the local VLAN information can be created but that VLAN information will not be advertised to the other switch.

QUESTION NO: 36
Exhibit:
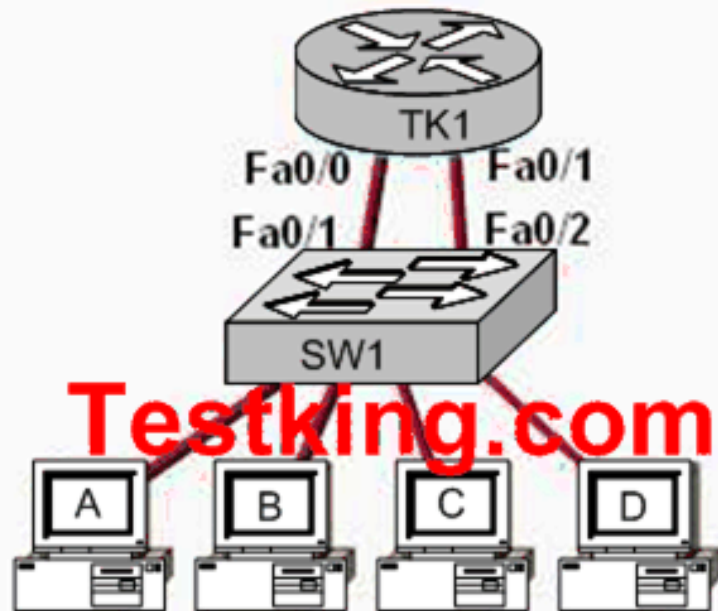
Hosts A, B, SW1 Fa0/1, andTK1Fa0/0 on VLAN1

Hosts C, D, SW1 Fa0/2, andTK1Fa0/1 on VLAN2

A network administrator needs to add a new VLAN, named VLAN3, to the network shown above. Unfortunately, there is not another FastEthernet interface on TK1 to connect to the new VLAN3. Which approach is the most cost effective solution for this problem?

A. Purchase a new FastEthernet module and install it on TK1.

B. Replace TK1 with a new router that has at least three FastEthernet interfaces.

C. Configure a second switch to support VLAN3 with a VLAN trunk between SW1 and the new switch.

D. Configure a single VLAN trunk between TK1 and SW1 and configure a subinterface on the TK1 interface for each VLAN.

E. Connect another router to a serial interface of TK1. Use a FastEthernet interface on the new router for VLAN3.

Answer: D

Explanation:

A Router is a Layer 3 device that plays the vital role for inter-VLAN communication. For inter-VLAN communication either we require multiple interfaces or we can create subinterfaces on the router for each VLAN.

Example router configuration for this scenario:

(config)# interface fa0.1
(config-if)#ip address 192.168.1.1 255.255.255.0
(config-if)#no shutdown
(config)#interface fa0.2
(config-if)#ip address 192.168.2.1 255.255.255.0

With this configuration, the switch can connect to the router's FastEthernet Interface by trunking, so one port of switch can carry the information of multiple VLANs.

QUESTION NO: 37
Which set of commands should be configured on a 2950 switch so that it can be pinged from a remote host on a different subnet?

A. Switch(config)# interface vlan 0/1
 Switch(config-if)# ip address 192.168.17.253 255.255.255.240
 Switch(config-if)# no shutdown
B. Switch(config)# interface vlan 1
 Switch(config-if)# ip address 192.168.17.253 255.255.255.240
 Switch(config-if)# no shutdown
 Switch(config-if)# exit
 Switch(config)# ip default-gateway 192.168.17.1
C. Switch(config)# interface fastethernet 0/1
 Switch(config-if)# ip address 192.168.17.253 255.255.255.240
 Switch(config-if)# no shutdown
 Switch(config-if)# exit
 Switch(config)# ip default-gateway 192.168.17.1
D. Switch(config)# interface fastethernet 0/1
 Switch(config-if)# ip address 192.168.17.253 255.255.255.240
 Switch(config-if)# no shutdown
 Switch(config-if)# exit
 Switch(config)# ip route 0.0.0.0 0.0.0.0 192.168.17.1

Answer: B
Explanation:

Beginning in privileged EXEC mode, follow these steps to manually assign IP information to multiple switched virtual interfaces (SVIs) or ports:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface vlan *vlan-id*	Enter interface configuration mode, and enter the VLAN to which the IP information is assigned. The range is 1 to 4094 when the enhanced software image is installed and 1 to 1001 when the standard software image is installed. Do not enter leading zeros.
Step 3	ip address *ip-address subnet-mask*	Enter the IP address and subnet mask.
Step 4	exit	Return to global configuration mode.
Step 5	ip default-gateway *ip-address*	Enter the IP address of the next-hop router interface that is directly connected to the switch where a default gateway is being configured. The default gateway receives IP packets with unresolved destination IP addresses from the switch. Once the default gateway is configured, the switch has connectivity to the remote networks with which a host needs to communicate. **Note** When your switch is configured to route with IP, it does not need to have a default gateway set.

Reference:
http://www.cisco.com/en/US/products/hw/switches/ps628/products_configuration_guide_chapter09186a00800

QUESTION NO: 38
A network administrator needs to configure a default route. Which of the following IOS commands will accomplish this task? (Choose two)

A. LTD(config)# ip route 0.0.0.0 0.0.0.0 E0
B. LTD(config)# ip route 0.0.0.0. 255.255.255.255 S0
C. LTD(config-router)# ip route 255.255.255.255 0.0.0.0 192.168.15.36
D. LTD(config)# ip route 0.0.0.0 0.0.0.0 192.168.15.36
E. LTD(config)# ip route 0.0.0.0 192.168.15.36 255.255.255.255
F. LTD# ip default-network 0.0.0.0 192.168.15.36 255.255.255.255

Answer: A, D
Explanation:
Also known as the gateway of last resort, a default route is a special type of static route with an all-0s network and network mask. The default route is used to direct any packets for which a next hop is not specifically listed in the routing table. By default, if a router receives a packet to a destination network that is not in its routing table, it drops the packet. When a default route is specified, the router does not drop the packet.
Instead, it forwards the packet to the IP address specified in the default route, or sends it out the interface that is specified.
To configure a default route on a Cisco router, enter the following global configuration command:
ip route 0.0.0.0 0.0.0.0 [ip-address-of-the-next-hop-router| outbound-interface]
For example:
TK1(config)#ip route 0.0.0.0 0.0.0.0 172.16.0.1
Or
TK1(config) ip route 0.0.0.0 0.0.0.0 ethernet0

QUESTION NO: 39
Two TestKing switches are connected as shown below:

Refer to the exhibit shown above. SwitchTK1 sends a VTP advertisement and SwitchTK2 receives it. Which statement accurately describes how SwitchTK2 will respond?

A. SwitchTK2 will add 2 VLANs to its VLAN database and change the configuration revision number to 232.
B. SwitchTK2 will remove 2 VLANs from its VLAN database and change the configuration revision number to 232.
C. SwitchTK2 will enable VTP pruning, add two VLANs, and increment the configuration revision number to 233.
D. SwitchTK2 will ignore the VTP advertisement.

Answer: D
Explanation:
The role of the VLAN Trunking Protocol (VTP) is to maintain VLAN configuration consistency across the entire network. VTP is a messaging protocol that uses Layer 2 trunk frames to manage the addition, deletion, and renaming of VLANs on a network-wide basis from a centralized switch that is in the VTP server mode. VTP is responsible for synchronizing VLAN information within a VTP domain. This reduces the need to configure the same VLAN information on each switch.
The 3 VTP Modes are:

1. Server: By default, a Catalyst switch is in the VTP server mode and in the "no management domain" state until the switch receives an advertisement for a domain over a trunk link or a VLAN management domain is configured. A switch that has been put in VTP server mode and had a domain name specified can create, modify, and delete VLANs. VTP servers can also specify other configuration parameters such as VTP version and VTP pruning for the entire VTP domain. VTP information is stored in NVRAM.

2. Client: The VTP client maintains a full list of all VLANs within the VTP domain, but it does not store the information in NVRAM. VTP clients behave the same way as VTP servers, but it is not possible to create, change, or delete VLANs on a VTP client. Any changes made must be received from a VTP server advertisement.

3. Transparent: VTP transparent switches do not participate in VTP. A VTP transparent switch does not advertise its VLAN configuration, and does not synchronize its VLAN configuration based on received advertisements. However, in VTP Version 2, transparent switches do forward VTP advertisements that the switches receive out their trunk ports. VLANs can be configured on a switch in the VTP transparent mode, but the information is local to the switch (VLAN information is not propagated to other switches) and is stored in NVRAM.

In this case, even though switch TK2 is the VTP client and the advertisement came from the VTP server, the revision number of the client is higher than the server. The revision number is used by switches so that they know if the VTP advertisements are valid or outdated. In this case, the advertisement arriving to TK2 will be considered outdated and will be ignored.

QUESTION NO: 40
A TestKing switch is configured with all ports assigned to VLAN 2. In addition, all ports are configured as full-duplex FastEthernet. What is the effect of adding switch ports to a new VLAN on this switch?

A. The additions will create more collisions domains.
B. IP address utilization will be more efficient.
C. More bandwidth will be required than was needed previously.
D. An additional broadcast domain will be created.
E. The possibility that switching loops will occur will increase dramatically.
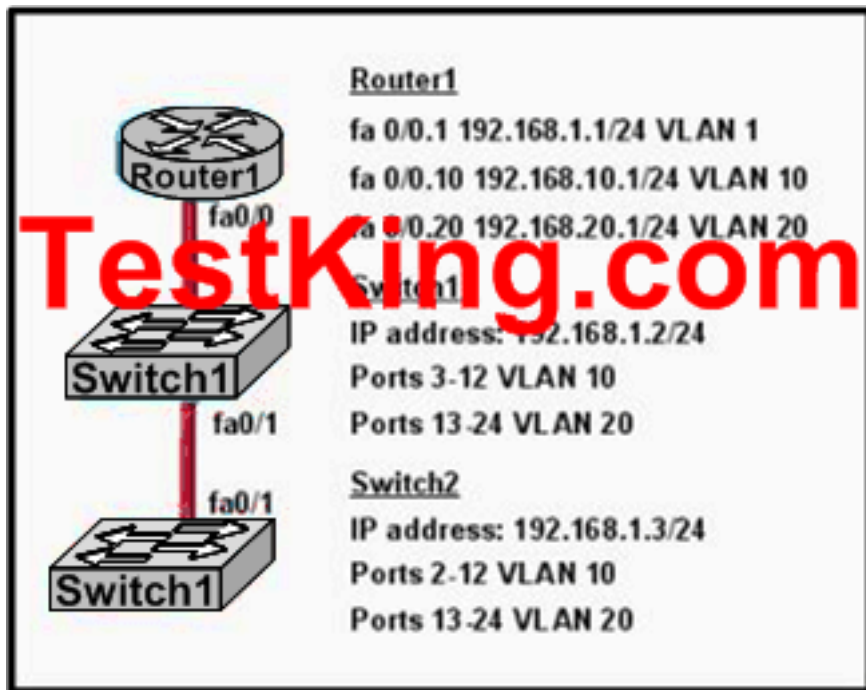
Answer: D
Explanation:

A VLAN is a group of hosts with a common set of requirements that communicate as if they were attached to the same wire, regardless of their physical location. A VLAN has the same attributes as a physical LAN, but it allows for end stations to be grouped together even if they are not located on the same LAN segment.

Networks that use the campus-wide or end-to-end VLANs logically segment a switched network based on the functions of an organization, project teams, or applications rather than on a physical or geographical basis. For example, all workstations and servers used by a particular workgroup can be connected to the same VLAN, regardless of their physical network connections or interaction with other workgroups. Network reconfiguration can be done through software instead of physically relocating devices. Cisco recommends the use of local or geographic VLANs that segment the network based on IP subnets. Each wiring closet switch is on its own VLAN or subnet and traffic between each switch is routed by the router. The reasons for the Distribution Layer 3 switch and examples of a larger network using both the campus-wide and local VLAN models will be discussed later.

A VLAN can be thought of as a broadcast domain that exists within a defined set of switches. Ports on a switch can be grouped into VLANs in order to limit unicast, multicast, and broadcast traffic flooding. Flooded traffic originating from a particular VLAN is only flooded out ports belonging to that VLAN, including trunk ports, so a switch that connects to another switch will normally introduce an additional broadcast domain.

QUESTION NO: 41
In the exhibit below, how should the FastEthernet0/1 ports on the 2950 model switches that are shown in the exhibit be configured to allow connectivity between all devices?

Router1
fa 0/0.1 192.168.1.1/24 VLAN 1
fa 0/0.10 192.168.10.1/24 VLAN 10
fa 0/0.20 192.168.20.1/24 VLAN 20

Switch1
IP address: 192.168.1.2/24
Ports 3-12 VLAN 10
Ports 13-24 VLAN 20

Switch2
IP address: 192.168.1.3/24
Ports 2-12 VLAN 10
Ports 13-24 VLAN 20

A. SwitchX(config)# interface fastethernet 0/1
 SwitchX(config-if)# switchport mode trunk
B. SwitchX(config)# interface fastethernet 0/1
 SwitchX(config-if)# switchport mode trunk
 SwitchX(config-if)# switchport trunk vlan 1
 SwitchX(config-if)# switchport trunk vlan 10
 SwitchX(config-if)# switchport trunk vlan 20
C. The ports only need to be connected by a crossover cable.
D. SwitchX(config)# interface fastethernet 0/1
 SwitchX(config-if)# switchport mode access
 SwitchX(config-if)# switchport access vlan 1

Answer: A
Explanation:

Trunk links are required to pass VLAN information between switches. A port on a Cisco switch is either an access port or a trunk port. Access ports belong to a single VLAN and do not provide any identifying marks on the frames that are passed between switches. Access ports also carry traffic that comes from only the VLAN assigned to the port. A trunk port is by default a member of all the VLANs that exist on the switch and carry traffic for all those VLANs between the switches. To distinguish between the traffic flows, a trunk port must mark the frames with special tags as they pass between the switches. Trunking is a function that must be enabled on both sides of a link. If two switches are connected together, for example, both switch ports must be configured for trunking, and they must both be configured with the same tagging mechanism (ISL or 802.1Q).

To enable trunking between the switches, use the following steps:

1. Enable trunking on a port.

Enable the trunk:

COS	set trunk *mod/port* [auto | desirable | on | nonegotiate | off]
IOS	(global) interface *type mod/port* (interface) switchport mode dynamic [auto | desirable] (interface) switchport mode trunk (interface) switchport nonegotiate

The most basic way to configure a trunk link is using the option on. This option enables the trunk and requires that you also specify a tagging mechanism for the trunk. For IOS devices, the command switchport mode trunk is equivalent to the set trunk mod/port on command. When specifying the option on, you must also choose a tagging mechanism. **Note**: Some IOS switches do not support Dynamic Trunking Protocol. For these switches, the only command that you can use to configure trunking is switchport mode trunk, which essentially turns trunking on.

QUESTION NO: 42
Given the output of the London switch displayed in the graphic below, what VTP functions will this switch perform?

```
London#show vtp status
VTP Version:                    2
Configuration Revision:         0
Maximum VLAN supported loc      64
Number of existing VLAN         5
VTP Operating Mode:             Client
VTP Domain Name:                London
VTP Pruning Mode:               Disabled
VTP V2 Mode:                    Disabled
VTP Traps Generation:           Disabled
```

A. It will pass on information about the VTP configuration
B. VTP is disabled on this device
C. It will learn and save VTP configuration in the running configuration but does not save it to NVRAM
D. It will create, change and delete VLANs

Answer: C
Explanation:
The 3 VTP Modes are:
1. Server: By default, a Catalyst switch is in the VTP server mode and in the "no management domain" state until the switch receives an advertisement for a domain over a trunk link or a VLAN management domain is configured. A switch that has been put in VTP server mode and had a domain name specified can create, modify, and delete VLANs. VTP servers can also specify other configuration parameters such as VTP version and VTP pruning for the entire VTP domain. VTP information is stored in NVRAM.
2. Client: The VTP client maintains a full list of all VLANs within the VTP domain, but it does not store the information in NVRAM. VTP clients behave the same way as VTP servers, but it is not possible to create, change, or delete VLANs on a VTP client. Any changes made must be received from a VTP server advertisement.
3. Transparent: VTP transparent switches do not participate in VTP. A VTP transparent switch does not advertise its VLAN configuration, and does not synchronize its VLAN configuration based on received advertisements. However, in VTP Version 2, transparent switches do forward VTP advertisements that the switches receive out their trunk ports. VLANs can be configured on a switch in the VTP transparent mode, but the information is local to the switch (VLAN information is not propagated to other switches) and is stored in NVRAM.

As can be seen by the output above, this switch is running in VTP client mode, making choice C correct.

QUESTION NO: 43
Refer to the exhibit. C-router is to be used as a "router-on-a-stick" to route between the VLANs. All the interfaces have been properly configured and IP routing is operational. The hosts in the VLANs have been configured with the appropriate default gateway. What can be said about this configuration?

Exhibit:
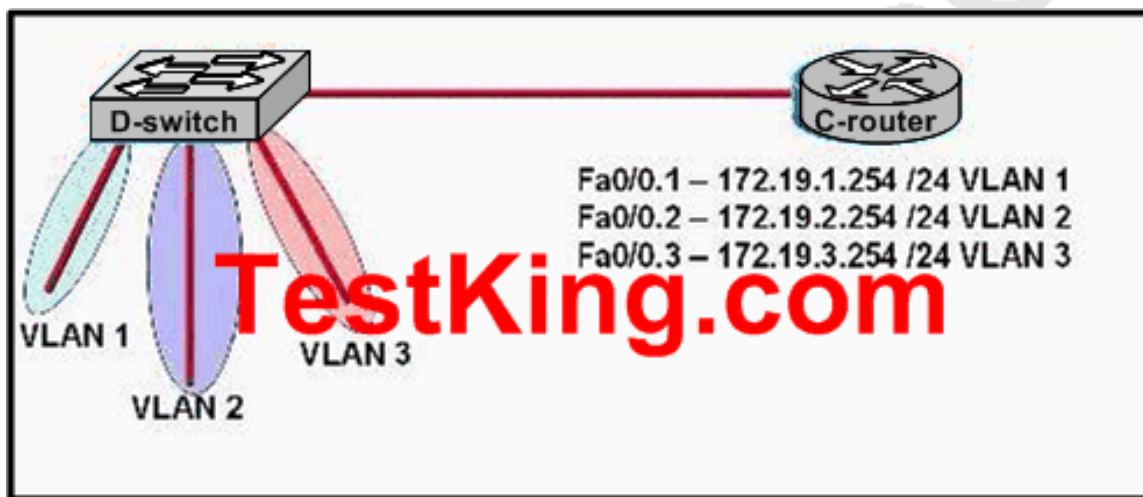
A. These commands need to be added to the configuration:
 C-router(config)# router eigrp 123
 C-router(config-router)# network 172.19.0.0
B. No further routing configuration is required.
C. These commands need to be added to the configuration:
 C-router(config)# router rip
 C-router(config-router)# network 172.19.0.0
D. These commands need to be added to the configuration:
 C-router(config)# router ospf 1
 C-router(config-router)# network 172.19.0.0 0.0.3.255 area 0

Answer: B

Explanation:

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

Section 5: Implement a LAN (18 questions)

QUESTION NO: 1

The TestKing network Topology is displayed in the exhibit below:
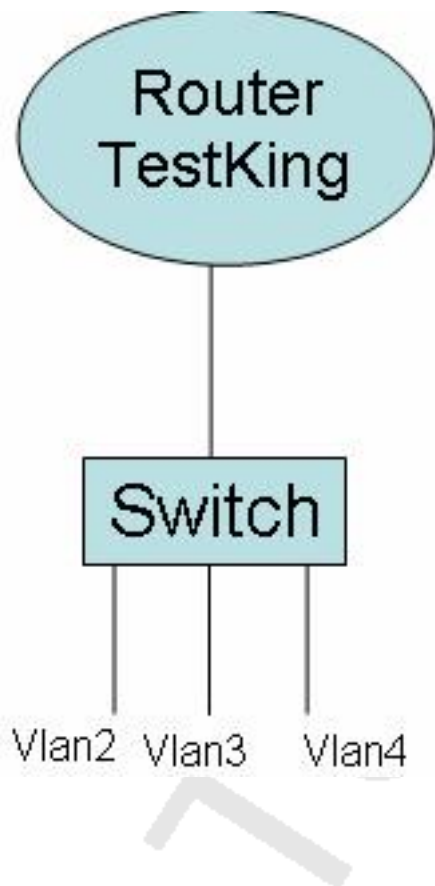
A switch has been configured for three different VLANs: VLAN 2, VLAN 3, and VLAN 4. For the purposes of communication between VLANs a router is to be added. Host from one VLAN should be able to reach the hosts in the other VLANs. Based on this requirement, what type of connection is acceptable between the router and switch?

A. 10 Mbps Ethernet
B. 56 kbps serial
C. 100 Mbps Ethernet
D. 1,544 Mbps serial
E. 1000 Mbps Ethernet

Answer: C, E
Explanation:
For all hosts to be able to reach each other, inter-VLAN routing will need to be configured. In order to provide Inter-VLAN routing between the router and the switch, a trunk will need to be set up. This trunk can be either ISL or 802.1Q. On a router, the interface that is to be used as the trunk can be 100 Mbps Ethernet, Gigabit Ethernet, or 10 Gigabit Ethernet. Therefore, only choices C or E are correct.

QUESTION NO: 2
A router has been configured to provide the nine users on the branch office LAN with Internet access, as shown in the diagram below:

Branch#show interfaces FastEthernet 0
FastEthernet0 is up, line protocol is up
Hardware address is 000c.ce8d.8860
Internet address is 192.168.10.30/30
MTU 1500 bytes, BW 10000 Kbit,
DLY 1000 usec, reliability 255/255,
txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Half-duplex, 10Mb/s, 100BaseTX/FX
(... output omitted ...)

It is found that some of the users on the LAN cannot reach the Internet. Other users are not having any problems. Based on the topology and router output shown, which of the following commands should be issued on the router to correct the problem? (Select one).

A. Branch(config-if)# no shutdown
B. Branch(config-if)# duplex full
C. Branch(config-if)# no keepalive
D. Branch(config-if)# ip address 192.168.10.30 255.255.255.240
E. Branch(config-if)# bandwidth 100
F. Branch(config-if)# encapsulation 802.3

Answer: D
Explanation:
Based on the output shown above, a /30 network mask has been applied to the Fast Ethernet interface. This will allow for only two hosts to reside on the network. Using the /28 mask as shown in choice D will allow for up to 14 hosts to reside on the LAN, which will be enough to accommodate for the 9 PC's used on the LAN.

QUESTION NO: 3

Router_A

```
Router_A(config-if)# interface fastethernet 0/0.1
Router_A(config-subif)# encapsulation dot1q 1
Router_A(config-subif)# ip address 192.168.1.1 255.255.255.0
Router_A(config-subif)# interface fastethernet 0/1.2
Router_A(config-subif)# encapsulation dot1q 2
Router_A(config-subif)# ip address 192.168.2.1 255.255.255.0
Router_A(config-if)# interface fastethernet 0/0.3
Router_A(config-subif)# encapsulation dot1q 3
Router_A(config-subif)# ip address 192.168.3.1 255.255.255.0
```

VLAN 2

A router is configured as shown in the graphic. The switch is connected to the router over a VLAN trunk. The switch has been configured with three VLANs: VLAN1, VLAN2, and VLAN3. In addition, the IP address of the switch is 192.168.1.2. A host is being added to the switch on VLAN 2.
What is the correct default gateway for this computer?

A. 192.168.1.1
B. 192.168.1.2
C. 192.168.2.1
D. 192.168.2.2
E. 192.168.3.1
F. 192.168.3.2

Answer: C
Explanation:
The default gateway for this host should be the IP address of the local router on that VLAN. Based on the router configuration, this IP address is 192.168.2.1. In the router configuration, the number that follows the "encapsulation dot1q" command is the VLAN that is assigned to it. In this case, the PC host belongs to VLAN 2, so the subinterface fast Ethernet 0/0.2 is the one that should be chosen.

Incorrect Answers:
A. This is the IP address that hosts in VLAN 1 should use as their default gateway.
B. Even though this is the IP address of the switch itself as stated in the question, it should not be chosen as the default gateway for any of the hosts in any of the VLANs. This IP address would be used only to administer and make changes to the switch.
D, F. These are incorrect choices.
E. This is the IP address that hosts in VLAN 3 should use as their default gateway.

QUESTION NO: 4
The LAN needs are expanding at the Testking corporate office, which is quickly growing. You are instructed to enlarge the area covered by a single LAN segment on the TestKing network.
Which of the following are layer 1 devices that you can use? (Choose all that apply.)

A. A switch.
B. A router.
C. A network adapter card.
D. A hub.
E. A repeater.

Answer: D E
Explanation:
A hub simply repeats the electrical signal and makes no attempt to interpret the electrical signal (layer 1) as a LAN frame (Layer 2). So, a hub actually performs OSI layer 1 functions, repeating an electrical signal, whereas a switch performs OSI layer 2 functions, actually interpreting Ethernet header information, particularly addresses, to make forwarding decisions. Hubs can be used to increase the number of stations that can be supported on a LAN.
Because the repeater does not interpret what the bits mean, but does examine and generate electrical signals, a repeater is considered to operate at Layer 1. Repeaters can be used to physically extend the LAN to greater distances.

QUESTION NO: 5
You are experiencing intermittent issues relating to congestion with your network.
What are the possible causes of congestion on a LAN? (Choose all that apply)

A. A broadcast domain with too many hosts.

B. Full duplex operation.

C. Broadcast storms.

D. Multicasting.

E. Network Segmentation.

F. Low bandwidth.

Answer: A, C, F

Explanation:

A LAN segment with too many hosts can mean that there are a large number of stations contending for bandwidth. It can also mean an increase in the number of collisions on the segment, which can cause further congestion issues. Broadcast storms are the result of a large number of broadcasts sent over the LAN. Because each station listens to these broadcast messages, congestion can occur quickly. Finally, low bandwidth can simply mean that the LAN can not process all of the LAN traffic that is being sent. This can mean that TCP sessions are retransmitted, which can lead to additional congestion.

Incorrect Answers:

B. This can alleviate congestion, as data can be sent and received at the same time. In addition, collisions are not possible in a full duplex LAN.

D. Multicasting can actually alleviate congestion issues, as single streams of information can reach multiple hosts at the same time, instead of using a series of point to point connections.

E. Segmentation breaks up a large LAN into multiple, smaller LANS. This will mean fewer hosts per broadcast domain.

QUESTION NO: 6

Which type of cable should be used to make a connection between the Fa0/0 port on a router and the Fa0/0 port switch?

A. Rollover cable

B. Console cable

C. Crossover cable

D. Straight-through cable

E. Serial cable

Answer: D

Explanation:

Straight-through cables are used to connect host to switch (or hub) and router to switch (or hub).

	Hub	Switch	Router	Workstation
Hub	Crossover	Crossover	Straight	Straight
Switch	Crossover	Crossover	Straight	Straight
Router	Straight	Straight	Crossover	Crossover
Workstation	Straight	Straight	Crossover	Crossover

QUESTION NO: 7
What components are required to directly connect two PCs so they are able to participate in a simple peer-to-per network? Choose three

A. Straight-through cable
B. Compatible network interfaces
C. Networking protocol
D. Hub
E. Crossover cable
F. router

Answer: B, C, E
Explanation:
This cable can be used to directly connect two computers to each other without the use of a hub or switch.
Crossover cables are terminated with CAT 5 RJ-45 (RJ stands for "Registered Jack") modular plugs. RJ-45 plugs are similar to those you'll see on the end of your telephone cable except they have eight versus four contacts on the end of the plug. Also, make sure the ends you select are rated for CAT 5 wiring.

QUESTION NO: 8
What kind of cable should be used to establish a trunked line between two Catalyst 2950 switches?

A. A straight-through cable

B. An EIA/TIA-232 serial cable
C. An auxiliary cable
D. A modem cable
E. A cross-over cable

Answer: E
Explanation:
A crossover cable is used to connect two of the same device types, or devices from the same OSI layer.

QUESTION NO: 9
When a new trunk link is configured on an IOS based switch, which VLANs are allowed over the link?

A. All defined VLANs are allowed on the trunk by default.
B. Each VLAN, or VLAN range, that is specified with the switchport mode command.
C. Each VLAN, or VLAN range, that is specified with the vtp domain command.
D. Each VLAN, or VLAN range, that is specified with the vlan database command.

Answer: A
Explanation:
By default a trunk link carries all the VLANs that exist on the switch. This is because all VLANs are active on a trunk link; and as long as the VLAN is in the switch's local database, traffic for that VLAN is carried across the trunks. You can elect to selectively remove and add VLANs from a trunk link.

QUESTION NO: 10
Why would a network administrator configure port security on a switch?

A. To prevent unauthorized Telnet access to a switch port.
B. To limit the number of Layer 2 broadcasts on a particular switch port.
C. To prevent unauthorized hosts from accessing the LAN.
D. To protect the IP and MAC address of the switch and associated ports.
E. To block unauthorized access to the switch management interfaces over common TCP ports.

Answer: C
Explanation:
You can use the port security feature to restrict input to an interface by limiting and
identifying MAC addresses of the stations allowed to access the port. When you assign
secure MAC addresses to a secure port, the port does not forward packets with source
addresses outside the group of defined addresses. If you limit the number of secure MAC
addresses to one and assign a single secure MAC address, the workstation attached to that
port is assured the full bandwidth of the port.
If a port is configured as a secure port and the maximum number of secure MAC
addresses is reached, when the MAC address of a station attempting to access the port is
different from any of the identified secure MAC addresses, a security violation occurs.
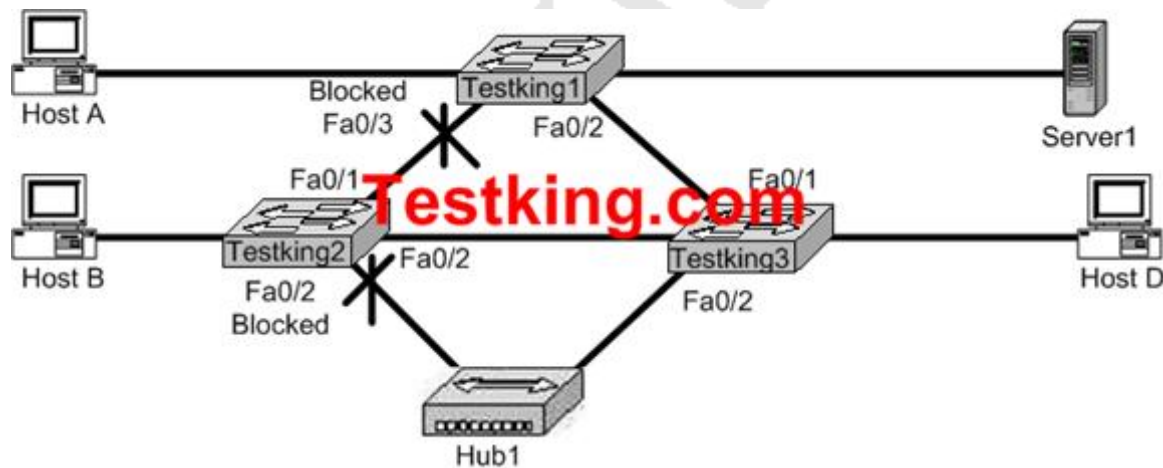Also, if a station with a secure MAC address configured or learned on one secure port
attempts to access another secure port, a violation is flagged.
Reference:
http://www.cisco.com/en/US/products/hw/switches/ps628/products_configuration_guide_chapter09186a00800

QUESTION NO: 11
The TestKing LAN network for one of the offices is displayed below:

Assuming there is only one VLAN in this network, which switch is acting as the root bridge?

A. Testking1
B. Testking2
C. Testking3
D. A root bridge is not required in this network.

Answer: C
Explanation:
A root switch has all ports in non-blocking mode. Based on the diagram above, Testking1 and Testking2 contain ports that have been blocked by the STP process, so Testking3 must be the root bridge.

QUESTION NO: 12
A workgroup switch is configured with all ports assigned to VLAN 2. In addition, all ports are configured as full-duplex FastEthernet. What is the effect of adding switch ports to a new VLAN on this switch?

A. The additions will create more collision domains.
B. IP address utilization will be more efficient.
C. More bandwidth will be required than was needed previously.
D. An additional broadcast domain will be created.
E. The possibility that switching loops will occur will increase dramatically.

Answer: D
Explanation:
Additional VLANs means additional broadcast domains. VLANs define broadcast domains in a Layer 2 network. A broadcast domain is the set of all devices that will receive broadcast frames originating from any device within the set. Broadcast domains are typically bounded by routers because routers do not forward broadcast frames. Layer 2 switches create broadcast domains based on the configuration of the switch. Switches are multiport bridges that allow you to create multiple broadcast domains. Each broadcast domain is like a distinct virtual bridge within a switch.
Incorrect Answers:
A. Creating new VLANs means that additional broadcast domains will be created, but not necessarily new collision domains. Besides, in a full duplex environment such as the one described here collisions are not possible.

B. Additional IP addresses will be needed in this network, as each VLAN will require a separate VLAN or a different default IP gateway to be configured.
C. This is not true, as the creation of new VLANs in no way will effect the amount of bandwidth that is required.
E. Since a separate Spanning Tree Process is used for each VLAN, this is not true.

QUESTION NO: 13
A network administrator wants to control which user hosts can access the network based on their MAC address. What will prevent workstations with unauthorized MAC addresses from connecting to the network through a switch?

A. BPDU
B. Port security
C. RSTP
D. STP
E. VTP
F. Blocking mode

Answer: B
Explanation:
UnderstandingHow PortSecurity Works:
You can use port security to block input to an Ethernet, Fast Ethernet, or Gigabit Ethernet port when the MAC address of the station attempting to access the port is different from any of the MAC addresses specified for that port. Alternatively, you can use port security to filter traffic destined to or received from a specific host based on the host MAC address.
When a secure port receives a packet, the source MAC address of the packet is compared to the list of secure source addresses that were manually configured or autoconfigured (learned) on the port. If a MAC address of a device attached to the port differs from the list of secure addresses, the port either shuts down permanently (default mode), shuts down for the time you have specified, or drops incoming packets from the insecure host. The port's behavior depends on how you configure it to respond to a security violation. If a security violation occurs, the Link LED for that port turns orange, and a link-down trap is sent to the Simple Network Management Protocol (SNMP) manager. An SNMP trap is not sent if you configure the port for restrictive violation mode. A trap is sent only if you configure the port to shut down during a security violation.
Reference:
http://www.cisco.com/en/US/products/hw/switches/ps700/products_configuration_guide_chapter09186a0080

QUESTION NO: 14
The TestKing network is shown in the following exhibit:

Study the Exhibit carefully. What kind of cable should be used to make each connection that is identified by the numbers shown?

A. 1- Ethernet crossover cable
2-Etherenet straight-through cable
3- fiber optic cable
4- rollover cable

B. 1- Ethernet rollover cable
2-Etherenet crossover cable
3- serial cable
4- rollover cable

C. 1- Ethernet rollover cable
2-Etherenet crossover cable
3- serial cable
4- null modem cable

D. 1- Ethernet straight-through cable

2-Etherenet crossover cable
 3- serial cable
 4- rollover cable

E. 1- Ethernet straight-through cable
 2-Etherenet crossover cable
 3- serial cable
 4- Ethernet straight-through cable

F. 1- Ethernet straight-through cable
 2-Etherenet straight-through cable
 3- serial cable
 4- rollover cable

Answer: F
Explanation:

1.   Crossover Cable Used to Connect :
       i.   Host to Host (Peer to Peer) Networking
       ii.   Switch to Switch
       iii.   Hub to Hub
       iv.   Computer to Router's Ethernet Port
2.   Straight through Cable:
       i.   Host to Switch
       ii.   Host to Hub
       iii.   Switch to Router
3.   Serial Cable
       i.   Router's Serial Port to Serial Port
4.   Rollover Cable :
       i.   To connect Router's Console port.

In the diagram one host is connect to a switch using a straight through cable. The switch is connected to a router using a straight through cable while router to router connections are made using a serial cable. One PC configures the router connects using a rollover cable, as well as a computer connected to the router's Ethernet port using a crossover cable.

QUESTION NO: 15
Four TestKing switches are connected as shown in the exhibit below:
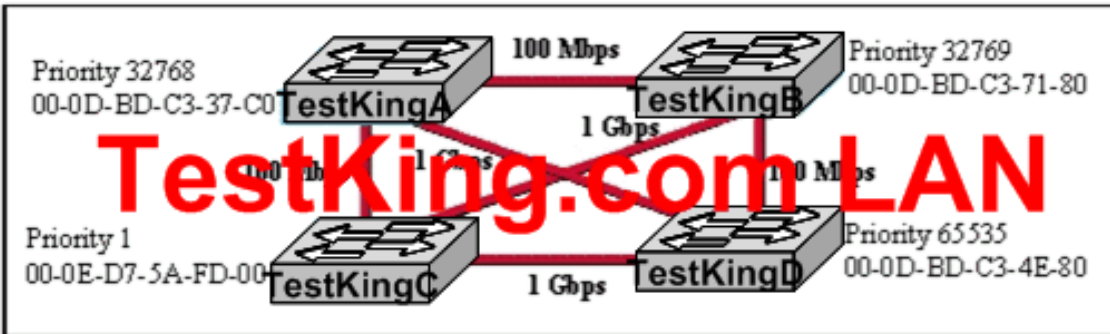
Refer to the exhibit above. Based on the information given, which switch will be elected root bridge and why?

A. Switch A, because it has the lowest MAC address
B. Switch A, because it is the most centrally located switch
C. Switch B, because it has the highest MAC address
D. Switch C, because it is the most centrally located switch
E. Switch C, because it has the lowest priority
F. Switch D, because it has the highest priority

Answer: E
Explanation:
To elect the root bridge in the LAN, first check the priority value. The switch having the lowest priority will win the election process. If Priority Value is the same then it checks the MAC Address; the switch having the lowest MAC Address will become the root bridge. In this case, switch C has the lowest MAC Address so it becomes the root bridge.

QUESTION NO: 16
The TestKing network is shown below:

Based on the diagram above, which destination addresses will Host A use to send data to Host B? (Choose two.)

A. The IP address of TestKing1
B. The IP address of TestKingA Fa0/0
C. The IP address of Host B
D. The MAC address of TestKing1
E. The MAC address of TestKingA Fa0/0
F. The MAC address of Host B

Answer: C, E
Explanation:
When sending data from one host to another, destination information will be added to every packet's header. The destination information will be the IP and MAC Address of destination host. If the destination is found outside the subnet the MAC address of the router is used. Note: The destination IP address will never change, unless NAT is involved.

QUESTION NO: 17
Exhibit:
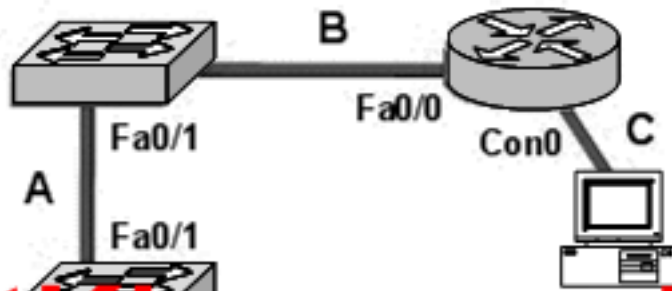
Which set of terms correctly identifies the cable types shown in the exhibit? Assume that none of the switches autoconfigure.

A. A: straight-through
   B: straight-through
   C: rollover
B. A: crossover
   B: crossover
   C: rollover
C. A: crossover
   B: straight-through
   C: straight-through
D. A: crossover
   B: straight-through
   C: rollover
E. A: straight-through
   B: crossover
   C: rollover

Answer: D
Explanation:
Crossover Cables are Used to Connect :
Host to Host (Peer to Peer) Networking
Switch to Switch
Hub to Hub
Computer to Router's Ethernet Port
Straight through Cable:
Host to Switch

Host to Hub
Switch to Router
Serial Cable:
Router's Serial Port to Serial Port
Rollover Cable :
To connect Router/Switch Console port.

Here one switch is connected with another switch using a crossover cable. The switch connected with the router uses a straight through cable and the PC Connects to the router's console port using the console rollover cable.

QUESTION NO: 18
The two TestKing Lab routers shown below are interconnected with back-to-back cables between their serial interfaces. How should the serial interface of the TestKing1 router be configured to establish Layer 3 connectivity between the two routers?

A. TestKing1(config)#interface serial 3
 TestKing1(config-if)# clock rate 64000
 TestKing1(config-if)# no shutdown
B. TestKing1(config)#interface serial 3

TestKing1(config-if)# ip address 192.168.10.3 255.255.255.0
TestKing1(config-if)# clock rate 64000
C. TestKing1(config)#interface serial 3
TestKing1(config-if)# ip address 192.168.10.3 255.255.255.0
TestKing1(config-if)# clock rate 64000
TestKing1(config-if)# no shutdown
D. TestKing1(config)#interface serial 3
TestKing1(config-if)# ip address 192.168.10.3 255.255.255.0
TestKing1(config-if)# no shutdown

Answer: D
Explanation:
When examining the interface using the show controllers command, the DTE cable is connected so there is no need to specify the clock rate and bandwidth; just specify the IP address and bring up the interface. Only the DCE side of the serial to serial connection is required to specify the clock rate.

Section 6: Customize a switch configuration to meet specified network requirements (6 questions)

QUESTION NO: 1
You have a server that's directly connected to a Cisco switch by way of its Fa0/1 port, and you don't want any other MAC addresses from any other servers to access this port. How would you accomplish this? (Select two answer choices)

A. Configure port Fa0/1 to accept connections only from the static IP address of the server.
B. Employ a proprietary connector type on Fa0/1 that is incompatible with other host connectors.
C. Configure the MAC address of the server as a static entry associated with port Fa0/1.
D. Bind the IP address of the server to its MAC address on the switch to prevent other hosts from spoofing the server IP address.
E. Configure port security on Fa0/1 to reject traffic with a source MAC address other than that of the server.
F. Configure an access list on the switch to deny server traffic from entering any port other than Fa0/1.

Answer: C, E

Explanation:

You can configure a MAC address to be associated only with a particular port, with the restriction that frames destined to that MAC address have to enter through that particular port. So answer choice C is correct.

Another feature you can use is port security. It can preset a limit to the number of sources (including limiting to one) that can forward frames into the said port switch. When a device with a different MAC address than the one configured for port security is connected to the switch, the port will administratively shut itself down. The port will only forward traffic again after an administrator manually enables it.

Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Pages 583-585.

QUESTION NO: 2

Which switching mode provides the highest level of integrity and error-free transport, rather then maximizing speed?

A. 802.1q forwarding
B. VTP transparent mode
C. Cut-through
D. Store-and-forward
E. Fragment-free
F. Frame-filtering

Answer: D

Explanation:

The Switch receives and stores all bits in the frame before forwarding the frame. This allows switch to check the FCS before forwarding the frame. The FCS is the frame check sequence, and the information contained in it is used by the switch to prevent frames with errors from being forwarded through the network.

Incorrect Answers:

E. The Switch performs the address table lookup as soon as the destination address field in the header is received. The first bits in the frame can be sent out to out port before the final bits in the incoming frame are received. This does not allow the switch to discard frames that fail the FCS check.

C. Cut through will not perform any error checking. This would be the best choice for ports where speed was most important.

QUESTION NO: 3
A new switch is installed in the Testking network. This switch is to be configured so that VLAN information will be automatically distributed to all the other Cisco Catalyst switches in the network.

Which of the conditions below have to be met in order for this to occur? (Choose all that apply).

A. The switch that will share the VLAN information must be in the VTP Server mode.
B. The switches must be in the same VTP domain.
C. The switch that will share the VLAN information must be configured as the root bridge.
D. The switches must be configured to use the same VTP version.
E. The switches must be configured to use the same STP version.
F. The switches must be configured to use the same type of ID tagging.
G. The switches must be connected over VLAN trunks.

Answer: A, B, F, G
Explanation:
For the VLAN information to pass automatically throughout the network, VTP must be set up correctly. In order for VTP to work, a VTP server is needed, the VLAN's must be in the same VTP domain, and the encapsulation on each end of the trunk must both set to either 802.1Q or ISL.
Incorrect Answers:
C. Root bridges and other functions of the Spanning Tree Protocol (STP) have no impact of the VTP configuration.
D, E. There is only one version of VTP and STP.

QUESTION NO: 4
The Testking Network consists of a router, switch, and hub as shown below:
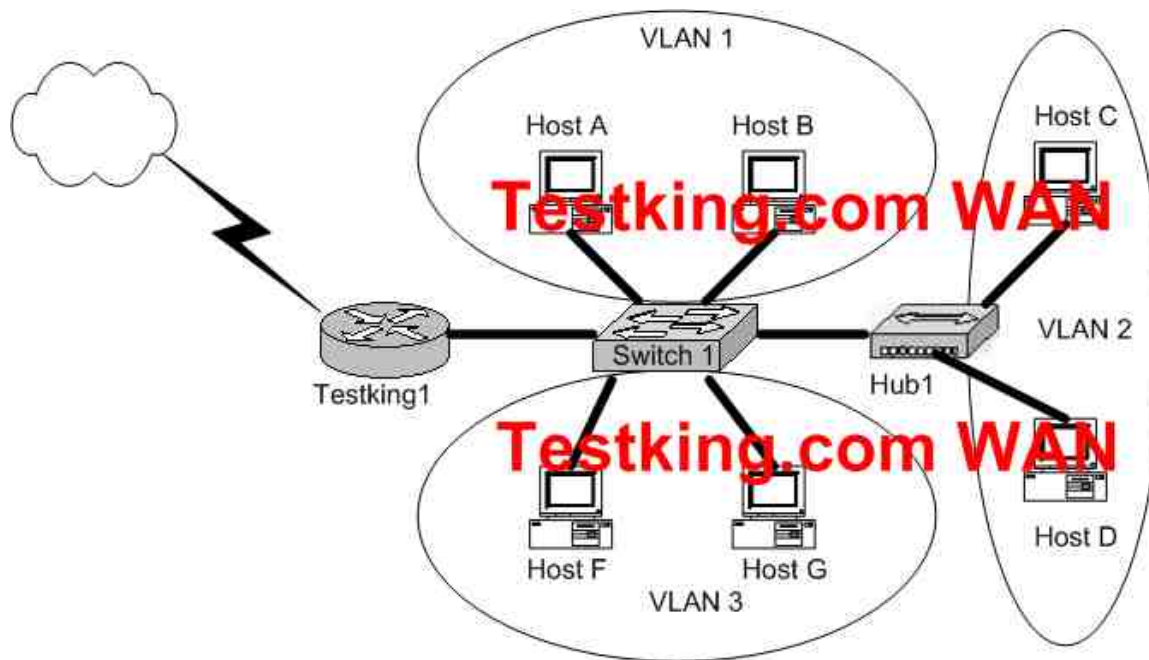
In accordance with the above diagram; which of the statements below correctly describe the switch port configuration and the router port configurations? (Select three answer choices)

A. The Testking1 WAN port is configured as a trunking port.
B. The Testking1 port connected to Switch1 is configured using subinterfaces.
C. The Testking1 port connected to Switch1 is configured as 10 Mbps.
D. The Switch1 port connected to Testking1 is configured as a trunking port.
E. The Switch1 port connected to Host B is configured as an access port.
F. The switch1 port connected to Hub1 is configured as full duplex.

Answer: B, D, E
Explanation:

B is correct because the diagram and the function match the description of a subinterface. Subinterfaces are needed because for inter-vlan communication, routing needs to take place. D is correct because all 3 VLAN's are trunked to reach the router. E is correct because access ports are correct in this case.

Incorrect Answers:

A. This is incorrect because trunks only work between switches, and not between a router and a WAN.

C, F. Although these may be true, we are not given enough information in this diagram to confirm it.

QUESTION NO: 5

The network security policy requires that only one host be permitted to attach dynamically to each switch interface. If that policy is violated, the interface should shut down. Which two commands must the network administrator configure on the 2950 Catalyst switch to meet this policy? (Choose two)

A. TestKing1(config-if)# switchport port-security maximum 1
B. TestKing1(config)# mac-address-table secure
C. TestKing1(config)# access-list 10 permit ip host
D. TestKing1(config-if)# switchport port-security violation shutdown
E. TestKing1(config-if)# ip access-group 10

Answer: A, D
Explanation

Catalyst switches offer the port security feature to control port access based on MAC addresses. To configure port security on an access layer switch port, begin by enabling it with the following interface configuration command:

Switch(config-if)# switchport port-security

Next, you must identify a set of allowed MAC addresses so that the port can grant them access. You can explicitly configure addresses or they can be dynamically learned from port traffic. On each interface that uses port security, specify the maximum number of MAC addresses that will be allowed access using the following interface configuration command:

Switch(config-if)# switchport port-security maximum max-addr

Finally, you must define how each interface using port security should react if a MAC address is in violation by using the following interface configuration command:

Switch(config-if)# switchport port-security violation {shutdown | restrict | protect}

A violation occurs if more than the maximum number of MAC addresses are learned, or if an unknown (not statically defined) MAC address attempts to transmit on the port. The switch port takes one of the following configured actions when a violation is detected:

shutdown-The port is immediately put into the errdisable state, which effectively shuts it down. It must be re-enabled manually or through errdisable recovery to be used again.
restrict-The port is allowed to stay up, but all packets from violating MAC addresses are dropped. The switch keeps a running count of the number of violating packets and can send an SNMP trap and a syslog message as an alert of the violation.
protect-The port is allowed to stay up, as in the restrict mode. Although packets from violating addresses are dropped, no record of the violation is kept.

QUESTION NO: 6
A network administrator needs to force a high-performance switch that is located in the MDF to become the root bridge for a redundant path switched network. What can be done to ensure that this switch assumes the role of the Root Bridge?

A. Configure the switch so that it has a lower priority than other switches in the network.
B. Assign the switch a higher MAC address than the other switches in the network have.
C. Configure the switch for full-duplex operation and configure the other switches for half-duplex operation.
D. Connect the switch directly to the MDF router, which will force the switch to assume the role of root bridge.
E. Establish a direct link from the switch to all other switches in the network.

Answer: A
Explanation:
For all switches in a network to agree on a loop-free topology, a common frame of reference must exist. This reference point is called the Root Bridge. The Root Bridge is chosen by an election process among all connected switches. Each switch has a unique Bridge ID (also known as the bridge priority) that it uses to identify itself to other switches. The Bridge ID is an 8-byte value. 2 bytes of the Bridge ID is used for a Bridge Priority field, which is the priority or weight of a switch in relation to all other switches. The other 6 bytes of the Bridge ID is used for the MAC Address field, which can come from the Supervisor module, the backplane, or a pool of 1024 addresses that are assigned to every Supervisor or backplane depending on the switch model. This address is hardcoded, unique, and cannot be changed.

The election process begins with every switch sending out BPDUs with a Root Bridge ID equal to its own Bridge ID as well as a Sender Bridge ID. The latter is used to identify the source of the BPDU message. Received BPDU messages are analyzed for a lower Root Bridge ID value. If the BPDU message has a Root Bridge ID (priority) of the lower value than the switch's own Root Bridge ID, it replaces its own Root Bridge ID with the Root Bridge ID announced in the BPDU. If two Bridge Priority values are equal, then the lower MAC address takes preference.

Section 7: Manage system image and device configuration files (38 questions)

QUESTION NO: 1
When you power up a Cisco router; in what memory is the start-up configuration normally stored in?

A. RAM
B. ROM
C. FLASH
D. NVRAM

Answer: D
Explanation:
The startup configuration is stored in the Non-Volatile RAM.
Incorrect Answers:
A, B: No configuration information is stored in RAM or ROM.
C. The IOS is normally stored in the flash memory, not the saved configuration.

QUESTION NO: 2
You are the administrator of the Testking network and you have forgotten the password to one of your routers. After completing the password recovery procedure the router returned to its normal operation. The config-register was set back to the initial default value. What is this value?

A. 0x2112
B. 0x2104
C. 0x2102

D. 0x2142
E. 0x2100

Answer: C
Explanation:
The config-register's default factory setting is 0x2102. The following display the possible configuration register values and their meanings:

Configuration Register Values and their Meaning:

The table below contains some common settings which are valid on most platforms.
Note:Before changing the configuration register on your router to one of the values below, verify that it can be used by checking the appropriate hardware installation guide.

Configuration Register Setting	Router Behavior
0x102	Ignores break 9600 console baud
0x1202	1200 baud rate
0x2101	Boots into bootstrap Ignores break Boots into ROM if initial boot fails 9600 console baud rate
0x2102	Ignores break Boots into ROM if initial boot fails 9600 console baud rate default value for most platforms
0x2120	Boots into ROMmon 19200 console speed
0x2122	Ignores break Boots into ROM if initial boot fails 19200 console baud rate
0x2124	NetBoot Ignores break Boots into ROM if initial boot fails 19200 console speed
0x2142	Ignores break Boots into ROM if initial boot fails 9600 console baud rate Ignores the contents of Non-Volatile RAM (NVRAM) (ignores configuration)
0x2902	Ignores break Boots into ROM if initial boot fails 4800 console baud rate

0x2922	Ignores break Boots into ROM if initial boot fails 38400 console baud rate
0x3122	Ignores break Boots into ROM if initial boot fails 57600 console baud rate
0x3902	Ignores break Boots into ROM if initial boot fails 2400 console baud rate
0x3922	Ignores break Boots into ROM if initial boot fails 115200 console baud rate

Incorrect Answers:
D. This is the setting that would be used during the password recovery procedure.
Reference:
http://www.cisco.com/en/US/products/hw/routers/ps133/products_tech_note09186a008022493f.shtml

QUESTION NO: 3
Which of the commands below would you enter if you wanted to see the
configuration register of your router?

A. show boot
B. show flash
C. show register
D. show version
E. show config

Answer: D
Explanation:

To display the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images, use the show version command in EXEC mode.

Example:

The following is sample output from the show version command:

Router1> show version

Cisco Internetwork Operating System Software

IOS (tm) 7200 Software (C7200-J-M), Experimental Version 11.3(19970915:164752) [

hampton-nitro-baseline 249]

Copyright (c) 1986-1997 by cisco Systems, Inc.

Compiled Wed 08-Oct-97 06:39 by hampton

Image text-base: 0x60008900, data-base: 0x60B98000

ROM: System Bootstrap, Version 11.1(11855) [beta 2], INTERIM SOFTWARE

BOOTFLASH: 7200 Software (C7200-BOOT-M), Version 11.1(472), RELEASE

Router1 uptime is 23 hours, 33 minutes

cisco 7206 (NPE150) processor with 57344K/8192K bytes of memory.

R4700 processor, Implementation 33, Revision 1.0 (512KB Level 2 Cache)

Last reset from power-on

Bridging software.

X.25 software, Version 3.0.0.

SuperLAT software copyright 1990 by Meridian Technology Corp).

TN3270 Emulation software.

8 Ethernet/IEEE 802.3 interface(s)

2 FastEthernet/IEEE 802.3 interface(s)

4 Token Ring/IEEE 802.5 interface(s)

4 Serial network interface(s)

1 FDDI network interface(s)

125K bytes of non-volatile configuration memory.

1024K bytes of packet SRAM memory.

20480K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).

20480K bytes of Flash PCMCIA card at slot 1 (Sector size 128K).

4096K bytes of Flash internal SIMM (Sector size 256K).

Configuration register is 0x2102

QUESTION NO: 4
Which three of the following basic network services are provided by the Cisco IOS? (Select three answer choices)

A. Defines the network topology

B. Access to network resources
C. Routing and switching functions
D. Content Filtering
E. Intrusion Detection

Answer: A, B, C
Explanation
These are all basic network services provided by all IOS versions. These services are included in all IOS versions and feature sets.
Incorrect Answers:
D. Content filtering, such as java applet stripping, URL filtering, virus removal, etc are not normally performed by Cisco router and switch IOS.
E. Intrusion detection and network security services are normally performed by firewalls and servers.
Reference:
CCNA Self-Study CCNA INTRO exam certification Guide (Cisco Press, ISBN 1-58720-094-5)

QUESTION NO: 5
After logging into a router, you type in "enable" and then enter the correct password when prompted. What is the current router prompt symbol at this point?

A. >
B. #
C. ?
D. *
E. All of the above
F. None of the above

Answer: B
Explanation:
When you enter the privileged mode by typing enable the router prompt will change to a # character.
Incorrect Answers:
A. This is the prompt given after initially logging on.
C, D. These are not valid router prompts.

QUESTION NO: 6
In the Cisco IOS, what is the definition of a global command?

A. A command that can be entered in any configuration mode.
B. A command that supports all protocols.
C. A command that is implemented in all IOS versions.
D. A command that is set once and affects the entire router.
E. A command that is available in every release of IOS.

Answer: D
Explanation:
When you enter global configuration mode and enter a command, it is applied to the running configuration file that is currently running in ram. The configuration of a global command affects the entire router. An example of a global command is one used for the hostname of the router.
Incorrect Answers:
A. Global configuration commands must be performed while in global configuration mode. For example, when you are in the interface configuration mode, you most likely will need to exit out into global mode to type in the commands.
B. Global commands do not necessarily support every protocol.
C. This is not necessarily true, since there are certain global commands that are supported on one feature set that are not on a different feature set of IOS.
E. Global commands can become outdated, and can be replaced by newer commands in the newer releases of IOS.

QUESTION NO: 7
You just purchased a refurbished router that contains a configuration from a previous deployment. What should you do, before entering a new configuration into the router?

A. RAM should be erased and the router restarted.
B. Flash should be erased and the router restarted.
C. NVRAM should be erased and the router restarted.
D. The new configuration should be entered and saved.

Answer: C

Explanation:
You should have no interest in running a router in your network that has a configuration file of another company's network.

QUESTION NO: 8
After logging into a router and typing in a few show commands, you press the up arrow key. What will this do?

A. It will recall the previous command line
B. It will move the cursor one line up
C. It will redisplay the current command line
D. It will capitalize the command line
E. None of the above

Answer: A
Explanation:
The up arrow key is used to recall the previous command line entry. The commands that were entered previously can be displayed by repeatedly pressing the up arrow key, or by entering the "show history" command.

QUESTION NO: 9
After working on a router, some problems arise and you wish to view the commands that you recently entered. Which IOS command opens the history buffer and displays the most recently entered commands?

A. Show history
B. Show buffers
C. Show typed commands
D. Show terminal buffer
E. Show command

Answer: A
Explanation:
The router will buffer previously entered commands. By default, the "show history" command will display the previous ten commands that were entered. To see the contents of the buffer you enter the show history command.

Incorrect Answers:
B. This command will show the memory buffer information
C, D. These are invalid commands.

QUESTION NO: 10
You have just purchased a brand new router and wish to have the router prompt you through the initial configuration commands. Which router mode does this describe?

A. ROM Monitor mode
B. SETUP mode
C. Autoflash mode
D. RXBOOT mode
E. None of the above

Answer: B
Explanation:
Setup mode is a convenient mode that walks you through the setup procedure by prompting you with specific questions and options one by one.

QUESTION NO: 11
After working all night and successfully configuring a Cisco router for the TestKing network you save your changes on the startup config, reboot the router, and go out for a cigarette. When you return, none of your changes are active and the router boots to the initial configuration mode! Which of the choices below indicates the source of your problem?

A. Hardware failure in NVRAM prevents the router from loading the config
B. Startup-config in flash is corrupt and cannot be analyzed
C. Router configuration-register set to bypass startup configuration
D. Startup-config in NVRAM is corrupt and cannot be analyzed
E. None of the above

Answer: C
Explanation:

The default configuration-register setting of 0x2102 loads the IOS from flash and the configuration from NVRAM.

However, for password recovery, you can set the register to 0x2142 and the startup-config file in NVRAM will be bypassed. The problem described here is that the config register was not changed back to 0x2102 before the router was rebooted, so the active configuration is bypassed. Simply setting the config register back to 0x2102 will fix this problem.

Incorrect Answers:

A, B, D. All of these describe hardware or software errors. In the event that this is the problem, errors will be generated and the router will fail to boot properly. In these cases, the router will not return to the initial startup configuration.

QUESTION NO: 12
While working in setup mode, a configuration line is typed incorrectly. What should you do to exit setup mode, without executing or saving any of the mistakes you made? (Select two answer choices)

A. Type exit at the setup dialog.
B. Type close at the setup dialog.
C. Press the Ctrl-C key combination.
D. Press the Ctrl-X key combination.
E. Issue the copy startup-config command.
F. Issue the 'write e" command.
G. Issue the "write mem" command

Answer: C
Explanation:
Here is the partial output from new router while it boots up:
At any point you may enter a question mark '?' for help.
Refer to the 'Getting Started' Guide for additional help.
Use ctrl-c to abort configuration dialog at any prompt.
Incorrect Answers:
A. The Exit command can not be used during setup mode.
B. This is an invalid command
E. This command is used to save the configuration stored on NVRAM to a location.
F. This will have the effect of erasing the running configuration, and setting the router configuration back to the factory default settings.

G. This is an old command that is still supported on the latest Cisco IOS. It is short for "write memory" and has the same effect as the "copy running-config startup-config" command.

QUESTION NO: 13
You are a senior network administrator at TestKing, and while performing the password recovery procedure on your 2500 series Cisco router, you type in the following command:

```
o/r 0x2142
```

What is the purpose of this command?

A. It is used to restart the router.
B. It is used to bypass the configuration in NVRAM.
C. It is used to enter ROM Monitor mode.
D. It is used to view the lost password.
E. It is used to save the changes to the configuration.

Answer: B
Explanation:
Theo/r 0x2142 command changes the value of config-register to 2142 in a Cisco 2500 series router, so that the Router ignores the NVRAM contents and reverts to the initial setup configuration mode when it boots.

QUESTION NO: 14
Which of the following commands will display the name of the IOS image file being used in a Cisco router?

A. `Router# show IOS`
B. `Router# show version`
C. `Router# show image`
D. `Router# show protocols`
E. `Router# show flash`

Answer: B, E

The IOS command "Show flash" displays all the image files in it. There could be more than one file. However, "show version" displays the one that is currently in use by the router.

Incorrect Answers:

A, C. These are invalid commands.

D. The command "show protocols" will show the routed protocols in use by the router and by interface conditions and their IP address, if configured.

QUESTION NO: 15

After making changes to the router, you issue the "copy running-config startup-config" command to save changes. After reloading the router, the router comes up in setup mode. You again make changes, save them, and reboot. Again, the router comes up in setup mode.

What is the most likely cause of this?

A. The NVRAM is corrupted.

B. The boot system commands were omitted in the configuration.

C. The configuration register setting is incorrect.

D. The upgraded configuration incompatible with the hardware platform.

E. The upgraded IOS incompatible with the hardware.

Answer: C

Explanation:

When you enter the command, "copy running-config startup-config" you save your current settings to NVRAM. The problem described in this question is that it appears the router is set to bypass the NVRAM, making it come up in the initial configuration dialog. The most likely cause of a router with the configuration register settings set incorrectly is that the router recently went through the password recovery procedure.

QUESTION NO: 16

You need to upgrade the IOS of an existing router on your network. The new IOS image is located on a TFTP server that you have set up within the network. What command should you issue in order to download the new IOS version?

A. Router# copy tftp flash

B. Router# copy flash run

C. Router(config)# restore flash
D. Router(config)# repair flash
E. Router#copy flash tftp
F. Router# copy start flash

Answer: A
Explanation:
The command "copy tftp flash" will copy the new IOS version upgrade from your
networks TFTP server (assuming of course you have a TFTP server with the new version
of IOS standing by).
Incorrect Answers:
C, D. The copy tftp flash command should be issued from the enable command prompt. It
is not necessary to go into configuration mode.
E. This will have the reverse effect, and will copy the IOS image on your router onto a
folder in your TFTP server.

QUESTION NO: 17
Study the exhibit below:
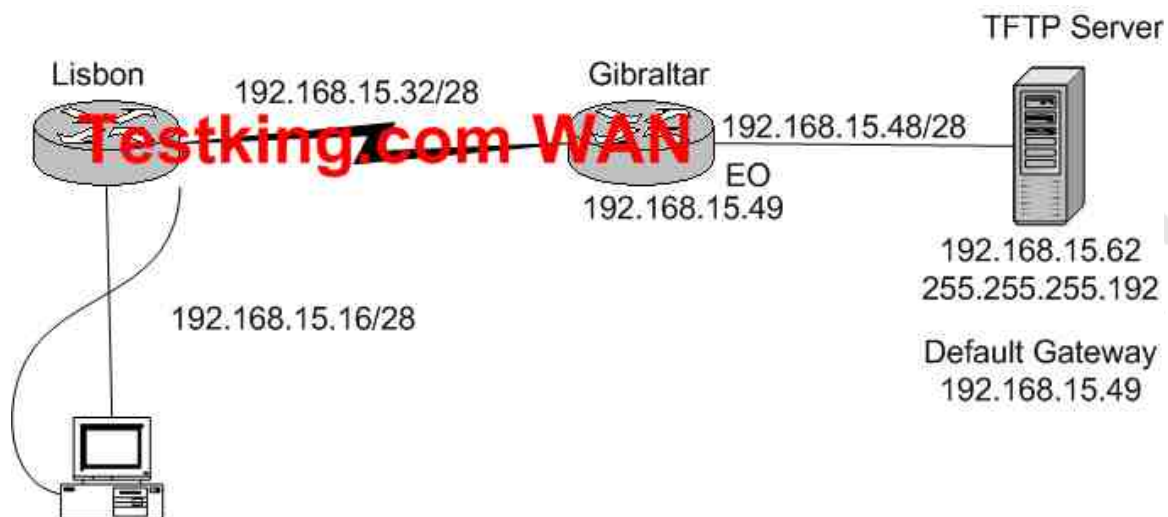
A systems administrator in Lisbon configured a new router to connect with his company's head office in Gibraltar. He attempted to create and save an image file of the new router on the TFTP server in Gibraltar but failed. Based on the information given by above exhibit, what is the underlying problem?

A. The IP address if the TFTP server not correct.
B. There is an incorrect subnet mask of the TFTP server.
C. The default gateway of the TFTP server not properly set.
D. The subnet mask on the Lisbon router not correct
E. There is an incorrect IP address configured on E0 of the Gibraltar router

Answer: B
Explanation:

An incorrect subnet mask on the TFTP server is the cause of this problem. If you look at the subnet masks of all the other devices you'll notice that they are /28. If you rewrite the subnet mask of the TFTP server, of 255.255.255.192 you'll notice that it translates to a subnet mask of /26. A subnet mask of 255.255.255.240, which is a /28, applied to the TFTP server will fix this problem.

QUESTION NO: 18
Study the exhibit below:
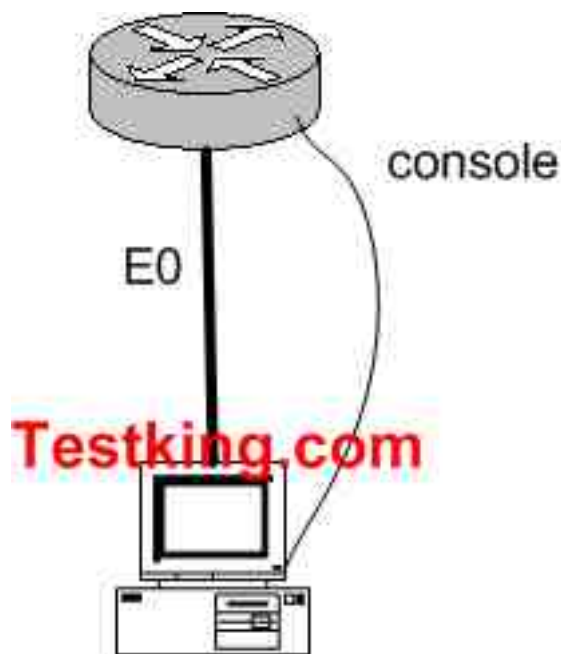
You just connected your computer directly to the E0 port of a router and you're running a console session. Which of the following steps below are required to successfully implement the "copy flash tftp" command and upload the flash image onto the TFTP server? (Select three answer choices)

A. TFTP server software must be activated.

B. TFTP server software must be running on the administrator's workstation.

C. There must be space in the flash memory of the router to accommodate the file to be copied.

D. The copy flash tftp command must provide the IP address of the administrator's workstation.

E. The administrator's workstation must be on the same subnet as the router E0 interface.

F. The Ethernet connection between the router and the administrator's workstation must be via straight-through cable.

Answer: B, D, E
Explanation:
The sole purpose of the 'copy flash tftp' command is to copy the routers configuration file to the TFTP server to save it. The first logical variable for this operation is that the TFTP software is actually running. So B is correct. D is correct because the IOS won't be able to send off if it doesn't even know where the TFTP server is. Finally, TFTP server must be on the same subnet as the connectivity must be direct and the TFTP and router will need to know how to reach each other.

Incorrect Answers:
A. The TFTP can't just be activated, it has to be running in the right place.
C. This is not valid because you aren't downloading into the flash, you're uploading out of the flash, so space isn't a concern.
F. A cross over cable must be used when connecting from a PC directly into the router's Ethernet interface.

QUESTION NO: 19
After issuing the "show version" command on your Cisco router, you notice that the image is named "C7200-ajs40-mx". What does the C7200 portion of the filename represent?

A. The memory capacity requirements
B. The hardware product platform
C. The distribution channel
D. The feature capabilities
E. The run location and compression status

Answer: B
Explanation:
Cisco has a Cisco IOS image naming convention for identifying the platform or board for which the binary software is built, the package feature content of the image, and the area of memory used by the image at run time. The image name follows a three-part format:

PPPPP-FFFF-MM

Where PPPPP represents the platform; FFFF represents features; and MM represents run-time memory and compression format. In this case, the C7200 means that it is a Cisco 7200 series router.

QUESTION NO: 20
What kind of information can you deduce from an IOS image file name? (Select three answer choices)

A. Distribution channel failures
B. Feature capabilities
C. Memory capacity needs
D. Hardware product platform
E. Programming language requirements
F. Run location and compression status

Answer: B, D, F
Explanation:
Image Naming Conventions:
You can identify the platform, features, and image location by the name of the image. The naming convention is platform-features-type for images that are stored on a UNIX system.

The platform variable indicates which platforms can use this image. Examples of platform variables include rsp (Cisco 7000 series with RSP7000 and Cisco 7500 series), c1600 (Cisco 1600 series), and c1005 (Cisco 1005).

The features variable identifies the feature sets supported by the image.

The type field can contain the following characters:

f-The image runs from Flash memory.
m-The image runs from RAM.
r-The image runs from ROM.
l-The image is relocatable.
z-The image is zip compressed.
x-The image is mzip compressed.

QUESTION NO: 21
After logging into the RtrB router, you issue the "show interface" command as displayed below:

RtrB#show interface serial0/0
Serial0/0 is up, line protocol is up
Hardware is PowerQUICC Serial
Internet address is 10.0.15.2/21
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
 Reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set
Keepalive set (10 sec)
LCP Open
Closed: IPXCP
Listen: CCP
Open: IPCP, CDPCP
Last input 00:00:00, output 00:00:00, output hang never
Last clearing of "show interface" counters 00:52:02
Input queue: 0/75/0/0 (size/max/drops/flushes): total output
drops: 0
Queuing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)

After considering the effects of the command output illustrated in the exhibit above, which of the following protocols are operational on the serial link? (Select two options)

A. PPP
B. IP
C. Compression
D. IPX
E. Multilink
F. ATX

Answer: A, B
Explanation:

The interface displays show that the line protocol is up, so we can safely assume that everything is working from layers one and two. This interface is configured with PPP encapsulation, which is a layer two protocol that appears to be operational on this interface. The interface is also configured with a valid IP address and subnet mask, so IP is also operational on this interface.

Incorrect Answers:

C. There is nothing in the output displayed that would suggest any type of compression has been enabled on this interface.

D. There is only an IP address configured on this interface. If IPX was enabled, there would be a layer 3 IPX address configured on it.

E. Although multilink works with PPP to provide for the bonding of interfaces into a larger, logical interface, there is nothing that suggests that multilink has been enabled. PPP multilink uses bundle interfaces, and the bundle interface would have the IP address assigned to it, not the physical serial interface.

F. There is nothing to suggest that this protocol has been enabled on this interface.

QUESTION NO: 22

You wish to upgrade the IOS of a router without removing the image currently installed.

What command will display the amount of memory that is being used by the current IOS image and whether there is enough room available to hold both the current and new images?

A. Router# show version
B. Router# show flash
C. Router# show memory
D. Router# show buffers
E. Router# show running-config
F. All of the above

Answer: B
Explanation:
The "show flash" command is used to display the layout and contents of the flash memory file system. It will show name of the file system, as well as the number of bytes used and the number available within the flash memory.

QUESTION NO: 23

The "show version" command was issued on a Testking router as shown below:

```
System Image file is "Flash: C2600-ik8035-m2.122-8.T5.bin"
Cisco 2620(MPC860)processor(revision 0x200) with 16384/2048K bytes of memory

Processor board ID JAD05076EF6
M860 processor part number 0 mask 49
Bridging software
X.25 Software, Version 3.0.0
2 FastEthernet/IEEE 802.3 interface(s)
2 Serial(sync/async)network interface(s)
2 Low speed serial(sync/async)network interface(s)

32K bytes of non-volatile confuration memory
16384 bytes of processor board system flash (Read/Write)

Configuration register is 0x2102
```

The Network administrator at TestKing.com wants to upgrade the IOS of this router. The new Image requires 64 MB of RAM & 16 MB for Storage of the File. Given the Output Shown in the Graphic, which of the following is true?

A. This router meets the requirements for the new image.
B. This router will require a DRAM upgrade to meet the requirements for the Image.
C. This router will require a FLASH upgrade to meet the requirements for the Image.
D. This router will require a NVRAM upgrade to meet the requirements for the Image.

Answer: B
Explanation:
Based on the output above, the router above will not require a Flash memory upgrade, as only 16 MB is required and the Testking router does indeed have 16 MB of flash (16384 bytes). However, a DRAM upgrade is required, as 64 MB of RAM is needed but this router has only slightly more than 16 MB as shown by the 16384/2048 value.

QUESTION NO: 24
You are a trainee technician at TestKing, Inc. Your instructor tells you to backup an IOS image of a Cisco device to a Windows 2003 server on the network.

What should you do first? (Choose three.)

A. Make sure that the network server can be accessed.
B. Check that the authentication for access is set.
C. Assure that the network server has adequate space for the code image.
D. Verify any file naming and path requirements.
E. Make sure that the server can load and run the bootstrap code.

Answer: A, C, D
Explanation:
In order to properly back up the Cisco IOS image onto a Windows server, you should
ensure that the server is reachable and that you have the proper permissions to save files
to the server. In addition to this, the server will need enough space to hold the backup file.
Incorrect Answers:
E. In order to simply back up the IOS file, the server needs to only be able to save it to a
hard disk. It does not need to load, read, or boot the image.

QUESTION NO: 25
**The relevant system information regarding a Testking router is shown in the
following display:**

System image file is "flash: c2600-das35-m2.120-5.T1"

Cisco2621(MPC860)processor(revision 0x600) with 53248K/12288K bytes of memory

Processor board ID JAD05280307(3536592999)
M860 processor part number 0, mark 49
Bridging Software
X.25 Software, Version 3.0.0
2 FastEthernet/IEEE 802.3 interface(s)
2 Serial(sync/async)network interface(s)
2 Low speed serial(sync/async)network interface(s)
16 terminal line(s)

32K bytes of non-volatile confuration memory
16384 bytes of processor board system flash (Read/Write)

Refer to the partial Command output shown. Which two statements are correct regarding the router hardware? (Choose Two)

A. Total RAM Size is 32 KB.
B. Total RAM Size is 16384 KB (16 MB)
C. Total RAM Size is 65536 KB (64 MB)
D. FLASH Size is 32 KB.
E. FLASH Size is 16384 KB (16 MB)
F. FLASH Size is 65536 KB (64 MB)

Answer: C, E
Explanation:
The RAM is found by adding up the memory, so in this case it is 53248K+12288K = 65536K. The Flash is found at the very bottom of the output, which is shown as 16384K

How Do I Know What Platform I Have?
Type the show version command at the enable command prompt of the router to see the platform, RAM, flash memory, and current version of code you are running.
This example shows a Cisco 2600 router with 48 MB of RAM (43617 K + 5534 K), 16 MB of flash memory (16384 K), and a code image called flash:c2600-jk8s-mz.122-6.bin.

```
wilson#show version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-JK8S-M), Version 12.2(6), RELEASE SOFTWARE (fc2)
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Wed 07-Nov-01 21:07 by pwade
Image text-base: 0x80008088, data-base: 0x814FF2C4

ROM: System Bootstrap, Version 11.3(2)XA3, PLATFORM SPECIFIC RELEASE SOFTWARE (fc1)

wilson uptime is 1 week, 2 days, 7 hours, 41 minutes
System returned to ROM by power-on
System image file is "flash:c2600-jk8s-mz.122-6.bin"

cisco 2611 (MPC860) processor (revision 0x202) with 43617K/5534K bytes of memory.
Processor board ID JAB03050692 (209339592)
M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
2 Ethernet/IEEE 802.3 interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102

wilson#
```

Reference:
http://www.cisco.com/en/US/products/sw/secursw/ps1018/products_tech_note09186a00800949e4.shtml

QUESTION NO: 26
Which is the correct fallback sequence for loading the Cisco IOS?

A. ROM, Flash, NVRAM
B. ROM, TFTP server, Flash
C. Flash, TFTP server, ROM
D. Flash, NVRAM, RAM

Answer: C

Explanation:
By default, a Cisco IOS router will normally boot up from flash where the IOS is stored.
If the IOS in not found or has become corrupted, the router will then send an all hosts
broadcast (255.255.255.255) to find a TFTP server to download the IOS from. Should
that fail, the router will boot up in ROM Monitor mode as a last resort.

QUESTION NO: 27
**The TestKing.com administrator has made changes to the router configuration but
cannot remember if those changes were saved.**
**Which of the following commands allows the administrator to see the configuration
that will load when the router is restarted?**

A. TestKingC# show memory
B. TestKingC# show startup-config
C. TestKingC# show running-config
D. TestKingC# show restart

Answer: B
Explanation:
Show startup-config command displays the contents of the NVRAM. When we reload a
router, it loads the configuration from NVRAM. So, the administrator can check from the
show startup-config command whether he has saved the temporary configurations from
Running-config (RAM) to Startup-config (NVRAM).

QUESTION NO: 28
Exhibit: The following are true with one of the TestKing routers:

1) The IOS image in flash is missing
2) No Network connectivity is available.
3) The router fallback IOS image is corrupt.

**How will this Cisco 2600 series router respond if the conditions listed in the exhibit
exist during the boot process?**

A. The router will enter setup mode.
B. The router will enter ROM monitor mode.
C. The router will enter global configuration mode.

D. The boot will hang until an IOS is available.

Answer: B
Explanation:
Cisco routers can look for IOS is FLASH, TFTP server, and ROM. **The default option is to look for IOS only in FLASH, and in case the IOS in flash is corrupt, to look in ROM.**
You can add the following commands to the configuration file to make a router to look for IOS image in FLASH, then TFTP server, then in ROM:
boot system flash ios_filename
boot system TFTP ios_filename TFTP_address
boot system rom
These 3 lines in the configuration file will force the router to look for IOS in the FLASH first, then in TFTP server, and then in rom.

QUESTION NO: 29
Which command will reinitialize the router and totally replace the running configuration with the current startup configuration?

A. TestKingB#reload
B. TestKingB# copy tftp startup-config
C. TestKingB# copy startup.-config running-config
D. TestKingB# copy running-config flash
E. TestKingB# setup

Answer: A
Explanation:
Enter the copy system:running-config nvram:startup-config command to save your configuration changes to your startup configuration so that they will not be lost if there is a system reload or power outage. For example:
 Router# copy system:running-config nvram:startup-config Building configuration...It might take a minute or two to save the configuration. After the configuration has been saved, the following output appears:
 [OK] Router#On most platforms, this task saves the configuration to NVRAM. On the Class A Flash file system platforms, this task saves the configuration to the location specified by the CONFIG_FILE environment variable. The CONFIG_FILE variable defaults to NVRAM.

QUESTION NO: 30
See the following exhibit below:

system image file is "flash;c2600-ik8033-mz.122-8.Ts.bin

cisco 2620 (MPC860 processor (revision Ox200) with 16384/2048k bytes of memory

processor board ID JAD05076EF6
M860 processor:part number 0, mask 49.
Bridging software
x.25 software version 3.0.0
1 Fast Ethernet (IEEE 802.3 interface (s)
2 Low speed serial (synch/asynch) network interface (s)
32k bytes of non-volatile configuration memory.
16384k bytes of processor board System Flash (Read/Write)
configuration register is 0x2142

A router consistently loses its configuration each time it reboots. Given the output shown in the graphic, what is the cause of this problem?

A. The processor is overheating.
B. Configuration register is misconfigured.
C. There is no problem.
D. Cisco products are inferior compared to Nortel products. Migrate to Nortel instead.

Answer: B
Explanation:
The value of the register 0x2142 means that the router should omit the startup configuration when it loads. To solve this problem change the value of the register to 0x2102

QUESTION NO: 31 DRAG DROP
As a TestKing.com instructor you are required to place the following items to the correct order they are used when Cisco IOS based hardware is booted.

Item	Items, place here in order
TFTP	1st
ROM	2nd
NVRAM	3rd
FLASH	4th

Answer:
Explanation:

As a TestKing.com instructor you are required to the following items to the correct order they are used when Cisco IOS based hardware is booted.

Item

Items, place here in order

| NVRAM |

| FLASH |

| TFTP |

TestKing.com

| ROM |

QUESTION NO: 32
A Cisco router has been configured, and the copy running-config startup-config command has been issued. When the router is power cycled, the router prompts with:

"Would you like to enter the initial configuration dialog? [yes/no]"

Why has this occurred?

A. There is an error in the router DRAM.
B. Te IOS image is corrupt.
C. The configuration register is set to 0x2142.
D. The TFTP server that contains the router configuration file is unreachable.
E. A boot system configuration command has placed the router into setup mode.

Answer: C

Explanation:

When the configuration setting is set to 0x2142, the router will ignore the contents of the NVRAM information. More specifically, this setting will:

1. Ignores break
2. Boots into ROM if initial boot fails
3. 9600 console baud rate
4. Ignores the contents of Non-Volatile RAM (NVRAM) (ignores configuration)

QUESTION NO: 33
What should be done prior to backing up an IOS image to a TFTP server? (Choose three)

A. Make sure that the server can be reached across the network.
B. Check the authentication for TFTP access to the server is set.
C. Assure that the network server as adequate space for the IOS image.
D. Verify file naming and path requirements.
E. Make sure that the server can store binary files.
F. Adjust the TCP window size to speed up the transfer.

Answer: A, C, D
Explanation:

In order to ensure proper uploading of the IOS to a TFTP server, the first step is to verify is actually reachable by the router. If so, the server will need adequate storage space to hold the IOS file, and the file path and naming conventions you wish to use should be verified.

QUESTION NO: 34
A CCNA candidate is working on a 2600 Cisco router. The person needs to verify that the configuration register is set to boot the router IOS from flash memory and use the commands saved in the startup-configuration file. Which command will display this information, and what is the configuration register value that should be displayed?

A. **show startup-config** and 0x2142
B. **show version** and 0x2102
C. **show flash** and 0x2102
D. **show version** and 0x2142

E. **show running-config** and 0x2142
F. **show flash** and 0x2142

Answer: B
Explanation:
To display the configuration of the system hardware, the software version, the names and
sources of configuration files, and the boot images, use the show version EXEC
command.
Example:
```
Router>show version
 Cisco Internetwork Operating System Software
 IOS (tm) C2600 Software (C2600-IS-M), Version 11.3(2)XA,
PLATFORM SPECIFIC RELE
 TAC:Home:SW:IOS:Specials for info
 Copyright (c) 1986-1998 by cisco Systems, Inc.
 Compiled Tue 10-Mar-98 13:42 by rnapier
 Image text-base: 0x80008084, data-base: 0x807B695C

  ROM: System Bootstrap, Version 11.3(1)XA, PLATFORM SPECIFIC RELEASE
SOFTWARE (f)
 ROM: C2600 Software (C2600-IS-M), Version 11.3(2)XA,
PLATFORM SPECIFIC RELEASE

 Router uptime is 1 minute
 System restarted by power-on
 System image file is "flash:c2600-is-mz.113-2.XA", booted
via flash

 cisco 2610 (MPC860) processor (revision 0x200) with
27853K/4915K bytes of memor.
 Processor board ID FFFF (48B25A24)
 M860 processor: part number 0, mask 32
 Bridging software.
 X.25 software, Version 3.0.0.
 1 Ethernet/IEEE 802.3 interface(s)
 4 Low-speed serial(sync/async) network interface(s)
 32K bytes of non-volatile configuration memory.
 8192K bytes of processor board System flash (Read/Write)

 Configuration register is 0x2102
```
In the example above, the boot register is set correctly for booting from the IOS flash.
The following table lists the various config register values and their meanings:

Configuration Register Setting	Router Behavior
0x102	• Ignores break • 9600 console baud
0x1202	• 1200 baud rate
0x2101	• Boots into bootstrap • Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate
0x2102	• Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate default value for most platforms
0x2120	• Boots into ROMmon • 19200 console speed
0x2122	• Ignores break • Boots into ROM if initial boot fails • 19200 console baud rate
0x2124	• NetBoot • Ignores break • Boots into ROM if initial boot fails • 19200 console speed
0x2142	• Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate • Ignores the contents of Non-Volatile RAM (NVRAM) (ignores configuration)
0x2902	• Ignores break • Boots into ROM if initial boot fails • 4800 console baud rate

0x2922	• Ignores break • Boots into ROM if initial boot fails • 38400 console baud rate
0x3122	• Ignores break • Boots into ROM if initial boot fails • 57600 console baud rate
0x3902	• Ignores break • Boots into ROM if initial boot fails • 2400 console baud rate
0x3922	• Ignores break • Boots into ROM if initial boot fails • 115200 console baud rate

Reference:
http://www.cisco.com/en/US/products/hw/routers/ps133/products_tech_note09186a008022493f.shtml

QUESTION NO: 35
What set of router configuration commands causes the message shown in the exhibit?

Press RETURN to get started.

User Access Verification

Password

A. TestKing1(config)# line console 0

TestKing1(config-line)# service password-encryption
TestKing1(config-line)# login
B. TestKing1(config)# line console 0
TestKing1(config-line)# enable password cisco
TestKing1(config-line)# login
C. TestKing1(config)# line console 0
TestKing1(config-line)# enable password cisco
TestKing1(config-line)# logging synchronous
D. TestKing1(config)# line console 0
TestKing1(config-line)# enable secret cisco
TestKing1(config-line)# login
E. TestKing1(config)# line console 0
TestKing1(config-line)# password cisco
TestKing1(config-line)# login

Answer: E
Explanation:
Use the line con 0 command to configure the console line. Use the login and password
commands to configure the console for login with a password. Here is an example using
the Battle Creek router:
Battle>enable
Password:*******
TK1#conf term
TK1(config)#line con 0
TK1(config-line)#login
TK1(config-line)#password oatmeal
Tk1(config-line)#^Z
The "login" command is needed to enforce users to log in to the router using the console
connection.

QUESTION NO: 36
**Refer to the exhibit below. A TestKing technician wants to upload a new IOS in the
router while keeping the existing IOS. What is the maximum size of an IOS file that
could be loaded if the original IOS is also kept in flash?**

Exhibit:

```
TK1# show flash
System flash directory
File Length Name/status
1 3802992 c827v-y6-mz.121-1.XB
[3803056 bytes used, 4585552 available, 8388608 total]

8192K bytes of processor board System flash (Read/Write)
```

A. 4 MB
B. 5 MB
C. 8 MB
D. 3 MB
E. 7 MB

Answer: A
Explanation:
Based on the output provided, the total amount of flash memory available is 8388608
bytes (8 MB), but the existing IOS is using up 3803056 bytes (3 MB), so in order to fit
both IOS files into the flash the new image must be no greater than the amount of
available memory, which is 4585552 bytes (4 MB).

QUESTION NO: 37
**Refer to the diagram. What is the largest configuration file that can be stored on
this router?**

Exhibit:

```
DD# show version
Cisco IOS Software, 1841 Software (C1841-IPBASE-M), Version 12.4(1a),
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Fri 27-May-05 12:32 by hqluong

ROM: System Bootstrap, Version 12.3(8r)T8, RELEASE SOFTWARE (fc1)

N-East uptime is 5 days, 49 minutes
System returned to ROM by reload at 15:17:00 UTC Thu Jun 8 2006
System image file is "flash:c1841-ipbase-mz.124-1a.bin"

Cisco 1841 (revision 5.0) with 114688K/16384K bytes of memory.
Processor board ID FTX0932W21Y
2 FastEthernet interfaces
2 Low-speed serial(sync/async) interfaces
DRAM configuration is 64 bits wide with parity disabled.
191K bytes of NVRAM.
31360K bytes of ATA CompactFlash (Read/Write)

Configuration register is 0x2102

DD#
```

A. 31369K bytes
B. 16384K bytes
C. 191K bytes
D. 114688K bytes
E. None of the above

Answer: C
Explanation:

Non-Volatile Random Access Memory (NVRAM) is used as the storage location for the router's startup configuration file. After the router loads its IOS image, the settings found in the startup configuration are applied. When changes are made to a router's running configuration, they should always be saved to the startup configuration (stored in NVRAM) or they will be lost when the router shuts down. Remember that the running configuration is stored in RAM, which is erased when the router is powered down. On a Cisco 2500 series router, NVRAM is a relatively tiny 32KB in size. In this example, the file size is only 191K, so the config file must not exceed this.

QUESTION NO: 38
Why might the TestKing network administrator set the configuration register to 0x2142 on a 2600 series Cisco router?

A. To boot the IOS from ROM
B. To reset the console password
C. To upload a new version of the configuration file
D. To upload a new version of the IOS
E. To allow a new memory upgrade to be recognized by the router

Answer: B
Explanation:
About 99 percent of the time someone uses a config-register, it's more than likely because of a lost router password. The two config-registers for recovering passwords are 0x2102 and 0x2142.
The first config-register, 0x2102, is the normal config-register if you boot the router from internal Flash. You can see this config-register by using the show version command.
In this output, you'll notice the last line says, "Configuration register is 0x2102." This is normal.
But let's say you forgot the router's password. To recover this password (as long as it's unencrypted), boot the router and bypass the startup-config using config-register 0x2142; you should then be able to see the password in the startup-config. You can use the same method for encrypted passwords, but you'll need to overwrite the original password with a new one. To change the configuration register, enter the following:
Router(config)# config-register 0x2142
This will instruct the router to bypass the configuration and boot up as if it were a brand new router using factory default settings.

Section 8: Perform an initial configuration on a router (30 questions)

QUESTION NO: 1
The TestKingA router is configured as shown below:

```
TestKingA(config)# interface loopback 0
TestKingA(config-if)# ip address 192.168.16.24 255.255.255.255
```

As a result of this change, which of the statements below are true? (Select all valid responses)

A. It creates a virtual, software only, interface.
B. It provides a way to test the convergence of OSPF routing updates.
C. The mask of 255.255.255.255 is called a host mask.
D. It uses a wildcard mask of 255.255.255.255.
E. It ensures that an interface is always active for OSPF processes.
F. Loopback interfaces must be numbered 0.

Answer: A, C, E
Explanation:
When the OSPF process starts, the Cisco IOS uses the highest local IP addresses its OSPF router ID. If a loopback interface is configured, that address is used regardless of its value.
A loopback interface is a logical, software interface that is always up.
A 32-bit mask is sometimes called a host mask, because it specifies a single host and not a network or subnetwork.
Incorrect Answers:
B. The addition of a loopback interface will in no way test the convergence speed of any OSPF process.
D. A wildcard mask of value 255.255.255.255 will not check any of the bit values in the IP address.
F. A loopback interface can be any number from 1-255.

QUESTION NO: 2
You want the text "Unauthorized access prohibited!" to be displayed before the login prompt every time someone tries to initiate a Telnet session to a router, as shown in the example below:

```
Router#telnet 192.168.15.1
Trying 192.168.15.1 ... Open

Unauthorized access prohibited!

User Access Verification

Password:
```

Which command can be used to configure this message?

A. login banner x Unauthorized access prohibited! X
B. banner exec y Unauthorized access prohibited! Y
C. banner motd x Unauthorized access prohibited! X
D. vtv motd "Unauthorized access prohibited!"

Answer: C
Explanation:
The message text that is displayed when users log into the router is called the "message of the day" banner, and is it can be changed with the "banner motd" command as shown in answer choice C.

QUESTION NO: 3
The following was seen on one of the TestKing routers:


```
Processor board ID JADU5U/6EF6
M850 processor part number 0, mask 49
Bringing software
X.25 software, Version 3.0.0
1 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(synch/asynch) network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash(Read/Write)

Configuration register is 0x2142
```

You need to troubleshoot a Cisco router at the Toronto office of TestKing.com. The router loses its configuration each time it is rebooted. You study the output displayed in the exhibit.
What is the cause of the problem?

A. The configuration register is misconfigured
B. NVRAM failed POST
C. There is insufficient flash memory
D. There is insufficient RAM for the IOSD image
E. There is insufficient NVRAM

Answer: A
Explanation:
The configuration register value of 0x2142 is used to bypass the saved NVRAM router configuration and is normally only used for password recovery procedures. The correct configuration register value is typically 0x2102. The following table displays some of the common values and their meanings:

Configuration Register Setting	Router Behavior
0x102	• Ignores break • 9600 console baud
0x1202	• 1200 baud rate
0x2101	• Boots into bootstrap • Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate
0x2102	• Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate default value for most platforms
0x2120	• Boots into ROMmon • 19200 console speed
0x2122	• Ignores break • Boots into ROM if initial boot fails • 19200 console baud rate
0x2124	• NetBoot • Ignores break • Boots into ROM if initial boot fails • 19200 console speed
0x2142	• Ignores break • Boots into ROM if initial boot fails • 9600 console baud rate • Ignores the contents of Non-Volatile RAM (NVRAM) (ignores configuration)
0x2902	• Ignores break • Boots into ROM if initial boot fails • 4800 console baud rate

0x2922	• Ignores break • Boots into ROM if initial boot fails • 38400 console baud rate
0x3122	• Ignores break • Boots into ROM if initial boot fails • 57600 console baud rate
0x3902	• Ignores break • Boots into ROM if initial boot fails • 2400 console baud rate
0x3922	• Ignores break • Boots into ROM if initial boot fails • 115200 console baud rate

QUESTION NO: 4
```
From the Remote27 router, you attempt to telnet to a router
named TESTKING1 as shown below:
Reemote27#
Remote27#telnet TESTKING1
Trying TESTKING1 (10.0.0.1)... Open


Password required, but none set
[Connection to TESTKING1 closed by foreign host]
Remote27#
```

You are unable to connect to the TESTKING1 router. Which of the following command sequences will correct this problem?

A. TESTKING1(config)# line console 0
TESTKING1(config-line)# password cisco
B. Remote27(config)# line console 0

Remote27(config-line)# login
Remote27(config-line)# password cisco
C. TESTKING1(config)# line vty 0 4
TESTKING1(config-line)# login
TESTKING1(config-line)# password cisco
D. Remote27(config)# line vty 0 4
Remote27(config-line)# login
Remote27(config-line)# password cisco
E. TESTKING1(config)# enable password cisco
F. Remote27(config)# enable password cisco

Answer: C
Explanation:
The following describes the correct configuration guidelines for setting up telnet access to a router:
Background Information
If you try to telnet to a router that does not have a Telnet password configured, you will get the following error message:
Router-1#telnet 10.3.3.1Trying 10.3.3.1 ... OpenPassword required, but none set[Connection to 10.3.3.1 closed by foreign host]**Configure**
In this section, you are presented with the information to configure a Telnet password.
Configurations
This document uses this configuration:
* Router-2
In order to set up the router to allow Telnet access, use the line vty command. This command allows for the configuration of Virtual Terminal (VTY) lines for remote console access. You can configure the router to accept one or more Telnet sessions. It is strongly suggested that you configure password checking with the login and password line configuration commands. The example below configures the router to accept five sessions, with the password "letmein":

```
                        Router-2
Router-2(config)#line vty 0 4
Router-2(config-line)#login
% Login disabled on line 66, until
'password' is set
% Login disabled on line 67, until
'password' is set
% Login disabled on line 68, until
'password' is set
% Login disabled on line 69, until
'password' is set
% Login disabled on line 70, until
'password' is set
Router-2(config-line)#password letmein
```

Verify

To verify that the router is correctly configured for Telnet, issue the show running-config
command.

Router-2#show running-configBuilding configuration...hostname Router-2..line vty 0
4password letmeinlogin..!endYou should now be able to telnet to the router.

Router-1#telnet10.3.3.1Trying10.3.3.1 ... OpenUserAccess
VerificationPassword:letmeinRouter-2#

Reference:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1831/products_configuration_example09186a00802026

QUESTION NO: 5
After making some network changes you power off and then power on your Cisco
router. What sequence of events occurs when a router is powered up?

A. Perform POST, locate configuration statements, apply configuration statements, locate
   Cisco IOS software, and load Cisco IOS software.
B. Locate Cisco IOS software, load Cisco IOS software, locate configuration statements,
   apply configuration statements, and perform POST.

C. Test software routines, POST, load configuration files, load Cisco IOS software, test Cisco IOS software.
D. POST, locate Cisco IOS software, load the Cisco IOS software, locate configuration statements, and apply configuration statements.
E. Load and test IOS, load configuration files, test software routines, POST.

Answer: D
Explanation:
Upon initial start up, Cisco routers perform the following steps in order:
1. The router performs a power-on self-test (POST) to discover and verify the hardware.
2. The router loads and runs bootstrap code from ROM.
3. The router finds the IOS or other software and loads it.
4. The router finds the configuration file and loads it into running config.

QUESTION NO: 6
You are trying to connect directly into an existing Cisco router. You want to telnet to the local Cisco router using TCP/IP but cannot create a session.

What should you do to resolve the problem?

A. Use a straight-through cable to connect your computer's COM port to the router's console port.
B. Use a crossover cable to connect your computer's COM port to the router's console port.
C. Use a straight-through cable to connect your computer's COM port to the router's Ethernet port.
D. Use a crossover cable to connect your computer's Ethernet port to the router's Ethernet port.
E. Use a rollover cable to connect your computer's Ethernet port to the router's Ethernet port.
F. Use a straight-through cable to connect your computer's Ethernet port to the router's Ethernet port.

Answer: D
Explanation:
In order to connect directly to a router via telnet, you must connect to the router via one of the LAN ports. When connecting directly to the Ethernet port with a PC without the use of a switch or hub, a crossover cable must be used.

Incorrect Answers:

A, B, C. In order to telnet directly into the router via a TCP/IP connection, the COM port of the PC can not be used. The COM port is used for direct terminal emulation programs such as HyperTerminal.

E. Rollover cables are used for console connections into the router, not for TCP/IP connections.

F. Straight through cables are used for connections into a switch or hub from the PC. It will not work for direct Ethernet connections into the router.

QUESTION NO: 7

A TestKing router was configured as shown below:

TestKingC(config)# enable password testking1
TestKingC(config)# enable secret testking2
TestKingC(config)# line vty 0 4
TestKingC(config-line)# password testking3
TestKingC(config-line)# exit
TestKingC(config)# no enable testking2

A TestKing.com technician is connected to the router console port. After configuring the commands displayed in the exhibit, the technician log out and then logs back in at the console. Which password does the technician need to enter at the router prompt get back into the privileged EXEC mode?

A. testking1
B. testking2
C. testking3
D. A password would not be required.

Answer: B
Explanation:

TestKing2 is the answer because the enable secret password is used to log back to the router. The enable password is used. The enable secret password always overwrites the enable password.

Answer C is incorrect because its for the vty, so it will be required for the initial telnet login.

QUESTION NO: 8 DRAG DROP
Your TestKing.com boss asks you tot match the descriptions to the corresponding router modes.

Router mode

Router mode	Place description here
User EXEC mode	Place here
priveleged EXEC mode	Place here
Global configuration mode	Place here
specific configuration mode	Place here
Setup mode	Place here

Descriptions, select from these

Interactive configuration dialog
Provides access to all other router commands
Commands that affect interfaces/processes only
Commands that affect the entire system
Limited to basic monitoring commands

Answer:
Explanation:

Your TestKing.com boss asks you to match the descriptions to the corresponding router modes.

Router mode   Place description here

User EXEC mode		Limited to basic monitoring commands
priveleged EXEC mode		Provides access to all other router commands
Global configuration mode		Commands that affect the entire system
specific configuration mode		Commands that affect interfaces/processes only
Setup mode		Interactive configuration dialog

QUESTION NO: 9
You are the network administrator at TestKing. You need to perform password recovery on Router TK1. What must you modify in the password recovery process? (Choose two.)

A. Configuration register
B. NVRAM
C. Boot flash
D. CMOS
E. Flash

Answer: A, B
Explanation:
Recovering a Lost Password
This section describes how to recover a lost enable

password and how to enter a new enable secret password.

Password recovery consists of the following major processes:

Determining the Configuration Register Value

1. With this process, you determine the configuration of the router, so that you may
   restore the configuration after the password is recovered.

Resetting the Router

1. With this process, you reconfigure the router to its initial startup configuration. You
   then display the enable password, if one is used.

Resetting the Password

1. If you are using an enable secret password, you enter a new password with this process.
   You then restore the router to its prior configuration.

Resetting the Configuration Register Value

1. If you are using an enable password, you use this process to restore the router to its
   prior configuration.

QUESTION NO: 10
Exhibit

```
TestKingC # show interfaces serial 0/0
Serial0/0 is administratively down , line protocol is down
 Hardware is HD64570
 Internet address is 192.168.100.1/24
 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
   reliability 255/255, txload 1/255, rxload 1/255
 Encapsulation HDLC, loopback not set
```

The result of the show interfaces serial 0/0 command is displayed in the exhibit.
What command should be executed to make this interface operational?

A. TestKingC(config-if)#enable
B. TestKingC(config-if)# no keepalive
C. TestKingC(config-if)# encapsulation ppp
D. TestKingC(config-if)# no shutdown
E. TestKingC(config-if)# clockrate 56000
F. TestKingC(config-if)# line protocol up

Answer: D
Explanation:

no shutdown	Enable the interface and the configuration changes you have just made on the interface.

| Serial0 is administratively down, line protocol is up. | The possible causes for this state are

 • The serial interface has been disabled with the **shutdown interface** configuration command.

 • Different interfaces on the router are using the same IP address. | The following are some steps you can take to isolate the problem:

 • Use the **show configuration** privileged EXEC command to display the serial port configuration. If "shutdown" is displayed after "interface Serial0," use the **no shutdown** interface configuration command to enable the interface.

 • Use the **show interface** privileged EXEC command to display the IP addresses for all router interfaces. Use the **ip address** interface configuration command to assign unique IP addresses to the router interfaces. |

QUESTION NO: 11 SIMULATION
Network topology exhibit:
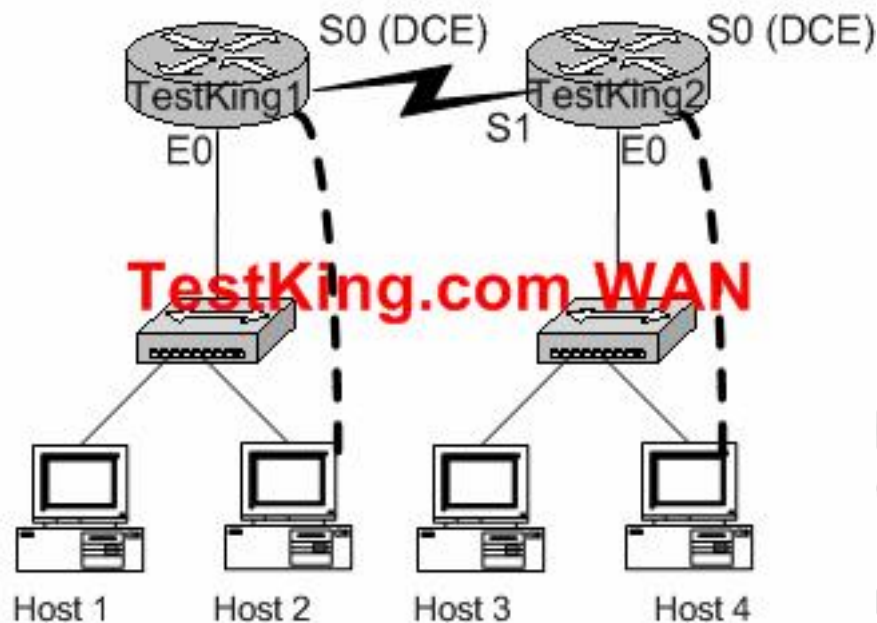
You work as a network engineer at TestKing.com. Assign the IP address of
**192.168.174.27 and the default subnet mask to the E0 interface of the TestKing1
router. The router have been configured with the following specifications.**

1. **The routers are named TestKing1 and TestKing2**
2. **The password on each router is "testking"**

**To configure the router click on a host icon that is connected to a router by a serial
cable.**

Answer:
Explanation:
testking1>
testking1>ena
testking1#config t
Enter configuration commands, one per line. End with CNTL/Z.
testking1(config)#interface ethernet 0
testking1(config-if)#ip address 192.168.174.27 255.255.255.0
testking1(config-if)#no shutdown
%LINK-3-UPDOWN: Interface Ethernet0, changed state to up
testking1(config-if)#^Z
%SYS-5-CONFIG_I: Configured from console by console

testking1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

The question is asking you to configure the ip address 192.168.174.27
255.255.2 for the ethernet 0
you do this by logging into the router using the following commands:

Enable
config terminal
specify interface which is ethernet 0
specify ip address
issue no shutdown to bring up the interface up
then exit or ctrl+z
finally save the configuration by using the command copy running-config
startup-config

QUESTION NO: 12
How can a TestKing administrator determine if a router has been configured when it is first powered up?

A. A configured router prompts for a password
B. A configured router goes to the privileged mode prompt
C. An un configured router goes into the setup dialog
D. An un configured router goes to the enable mode prompt

Answer: C
Explanation:
If a non-configured router is started, then it goes into setup mode and ask for the
minimum configuration parameters (hostname, IP address to interfaces, enable password,
etc). If the router is already configured it boots by implementing the saved startup-config.

QUESTION NO: 13
Exhibit:
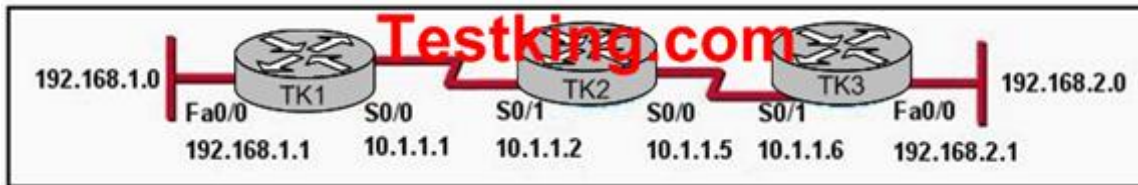
Refer to the exhibit. The network administrator has correctly configured the interfaces on TK1 and adds the following commands to configure the routing protocol on TK1: router rip version 2 network 192.168.1.0 network 10.0.0.0 Assuming TK2 and TK3 are also using RIP as the routing protocol and are otherwise configured correctly, what will be displayed by the show ip route command issued on router TK1?

Exhibit A.

Exhibit B.

```
TK1#show ip route
 <output omitted>
Gateway of last resort is not set
     10.0.0.0/30 is subnetted, 2 subnets
C       10.1.1.0 is directly connected, Serial0/0
R       10.1.1.4 [120/1] via 10.1.1.2, 1d00h, Serial0/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
R    192.168.2.0/24 [120/2] via 10.1.1.2, 1d00h, Serial0/0
```

Exhibit C.

```
TK1#show ip route
 <output omitted>
Gateway of last resort is not set
     10.0.0.0/30 is subnetted, 2 subnets
C       10.0.0.0 is directly connected, Serial0/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
R    192.168.2.0/24 [120/4] via 10.1.1.2, 1d00h, Serial0/0
```

Exhibit D.

```
TK1# show ip route
 <output omitted>
Gateway of last resort is not set
     10.0.0.0/30 is subnetted, 2 subnets
C       10.1.1.0 is directly connected, Serial0/0
R       10.1.1.4 [120/2] via 10.1.1.2, 1d00h, Serial0/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
```

Exhibit E.

```
TK1#show ip route
<output omitted>   Testking.com
Gateway of last resort is not set
C    10.1.1.0/30 is directly connected, Serial0/0
R    10.1.1.4/30 [120/2] via 10.1.1.2, 1d00h, Serial0/0
C    192.168.2.0/24 is directly connected, FastEthernet0/0
R    192.168.1.0/24 [120/4] via 10.1.1.2, 1d00h, Serial0/0
```

A. Exhibit A
B. Exhibit B
C. Exhibit C
D. Exhibit D
E. Exhibit E

Answer: B
Explanation:
In RIP Version 2 the 192.168.1.0 and 10.0.0.0 networks are published in the TK1 router.
RIP version 2 is correctly configured in all the other routers. The 192.168.1.0 and
10.1.1.0 networks are directly connected to Router TK1. The routing table showing the
path to get the remote network 10.1.1.4 needs to cross the one hop and 192.168.2.0 needs
to cross the 2 hop through 10.1.1.2 of TK2.

Remember that 192.168.2.0/24 is the remote network, [120/2] is called [administrative
distant/number of hops] via neighbor router's ip to get remote network.

QUESTION NO: 14
Two TestKing routers are connected as shown below:
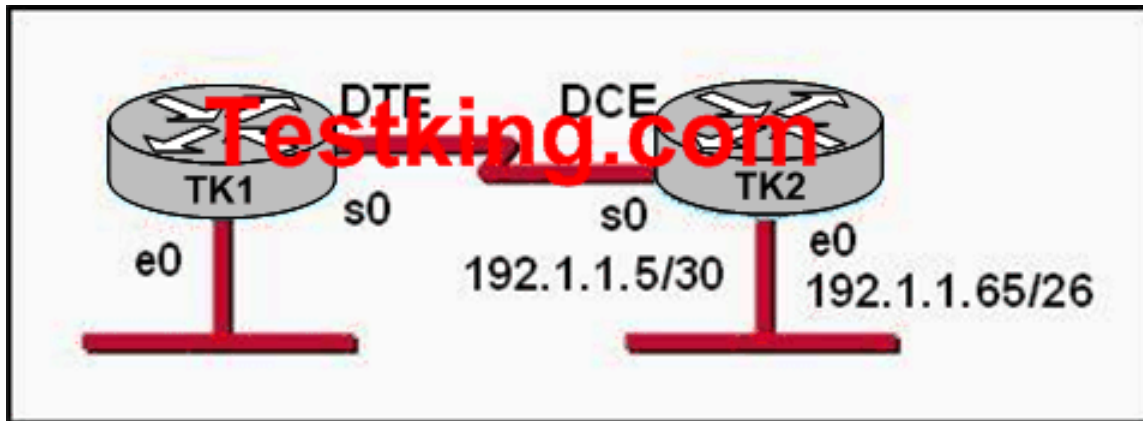
Which series of commands will configure router TK1 for LAN-to-LAN communication with router TK2? The network address is 192.1.1.0/24 and the routing protocol in use is RIP. (Choose three.)

A. TK1(config)# interface ethernet 0
 TK1(config-if)# ip address 192.1.1.129 255.255.255.192
 TK1(config-if)# no shutdown
B. TK1(config)# interface ethernet 0
 TK1(config-if)# ip address 192.1.1.97 255.255.255.192
 TK1(config-if)# no shutdown
C. TK1(config)# interface serial 0
 TK1(config-if)# ip address 192.1.1.4 255.255.255.252
 TK1(config-if)# clock rate 56000
D. TK1(config)# interface serial 0
 TK1(config-if)# ip address 192.1.1.6 255.255.255.252
 TK1(config-if)# no shutdown
E. TK1(config)# router rip
 TK1(config-router)# network 192.1.1.4
 TK1(config-router)# network 192.1.1.128
F. TK1(config)# router rip
 TK1(config-router)# version 2
 TK1(config-router)# network 192.1.1.0

Answer: A, D, F
Explanation:
Answer A is correct because first Subnet is 65 and address from first subnet is used in TK2. The first IP address of the second subnet is assigned in ethernet of TK1.

The WAN connection between TK1 and TK2 required two usable IP address so 30 bits is used for the network. RIP version 1 does not support variable length subnet masking so RIP version 2 needs to be used.

QUESTION NO: 15
Two TestKing routers are connected as shown below:
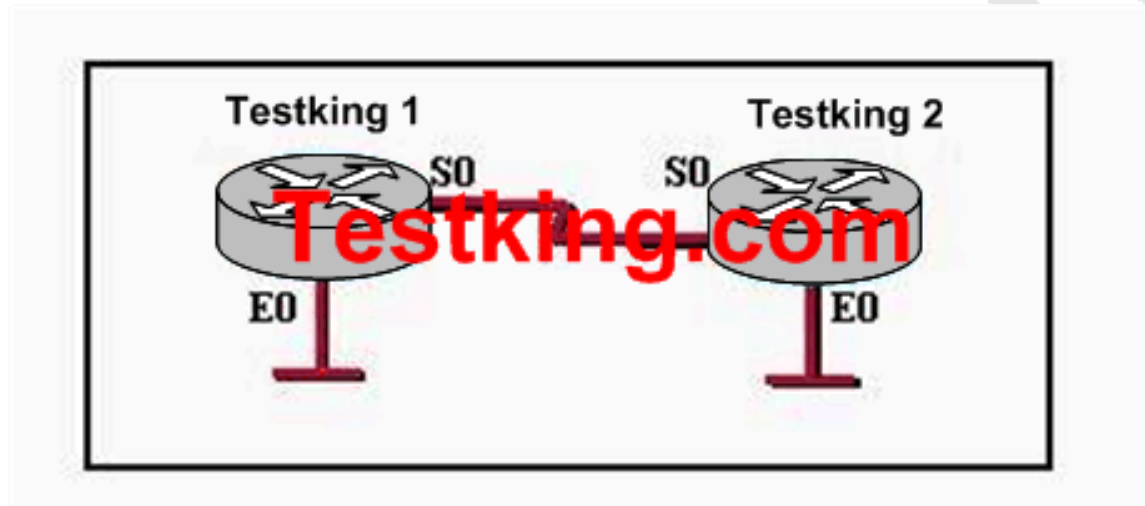
After configuring the routers shown in the graphic, the technician decides to test and document the network. Pings from the technician's laptop to all of the interfaces on each router were successful. If a technician initiates a Telnet session to Testking 1 and issues the "show arp" command, which of the following items will be among the entries displayed in the output?

A. The MAC address of the S0 interface on Testking 1
B. The MAC address of the E0 interface on Testking 1
C. The MAC address of the S0 interface on Testking 2
D. The MAC address of the E0 interface on Testking 2

Answer: B
Explanation:
To display the Address Resolution Protocol (ARP) cache, enter the show arp command in EXEC mode. ARP establishes correspondences between network addresses (an IP address, for example) and Ethernet hardware addresses. A record of each correspondence is kept in a cache for a predetermined amount of time and then discarded. Serial interfaces will not appear, only the local Ethernet interfaces on the router.

QUESTION NO: 16
Because of a security advisory, Cisco releases an IOS version with a security patch. An administrator needs to rapidly deploy this temporary version of the IOS to routers in the internetwork. The administrator prepares a server with this image for distribution to the routers. Which three commands are needed to configure a router to run this image as soon as possible? (Choose three)

A. router# reload
B. router(config)# service config
C. router# copy tftp startup-config
D. router(config)# boot system tftp
E. router(config-line)# logging synchronous
F. router# copy running-config startup-config

Answer: A, D, F
Explanation:
Cisco routers can boot Cisco IOS software from these locations:

1. Flash memory
2. TFTP server
3. ROM (not full Cisco IOS)

Boot System Commands:
Router(config)# boot system flash IOS filename - boot from FLASH memory
Router(config)# boot system tftp IOS filename tftp server ip address - boot from a TFTP server
Router(config)# boot system rom - boot from system ROM

After the configuration is updated, the config needs to be saved using the "copy running-config startup-config" command and then reloaded.

QUESTION NO: 17
An administrator would like to configure a switch over a virtual terminal connection from locations outside of the local LAN. Which of the following are required in order for the switch to be configured from a remote location? (Choose two)

A. The switch must be reachable through a port connected to its management VLAN.
B. The switch console port must be connected to the Ethernet LAN.
C. The switch must be fully configured as an SNMP agent.
D. The switch must be configured with an IP address, subnet mask, and default gateway.
E. The switch management VLAN must be created and have a membership of at least one switch port.
F. The switch must be connected to a router over a VLAN trunk.

Answer: A, D
Explanation:
In order the telnet to any Cisco device, the device must be reachable from the remote location. For a Cisco switch to be reachable from remote locations, it must have an IP address, subnet mask, and default gateway assigned.
Communication with the switch management interfaces is through the switch IP address. The IP address is associated with the management VLAN, which by default is VLAN 1

QUESTION NO: 18
What determines the IOS that the router will load?

A. The load register and the startup system command
B. The configuration register and the setup command
C. The start up register and startup system command
D. The configuration register and boot system commands
E. The boot register and the startup system command

Answer: D
Explanation:
Cisco routers can boot Cisco IOS software from these locations:

1. Flash memory
2. TFTP server
3. ROM (not full Cisco IOS)

Boot System Commands:
Router(config)# boot system flash IOS filename - boot from FLASH memory
Router(config)# boot system tftp IOS filename tftp server ip address - boot from a TFTP server

Router(config)# boot system rom - boot from system ROM
☐ The order in which the router looks for system bootstrap information depends on the boot field
☐ Setting is in the configuration register. The config register number is in NVRAM
☐ Default is usually 0x2102 or 0x102 for routers with built-in flash
☐ Router command "show version" will tell you what the Hex number is
Router(config)#config-register 0x101 (to boot from ROM)
Router(config)#config-register 0x102 (or 0x2102 to boot from NVRAM)

QUESTION NO: 19
What is the purpose of using the copy flash tftp command on a router?

A. To copy an IOS image to the router
B. To create a backup copy of the IOS
C. To move the IOS image from a server to the router
D. To backup the router configuration to a server

Answer: B
Explanation:
When upgrading the IOS on a router, if there is enough space to copy the system image file, then the original one can be retained and the new file can be copied in the additional memory space. If there is not enough space available, as in this case, then the existing file from the Flash is erased while downloading a new one. It is a good practice to backup the existing system image to the TFTP server using the "copy flash tftp" command.
Reference: http://www.cisco.com/warp/public/63/copyimage.html

QUESTION NO: 20
What will cause a TestKing router to enter setup mode? (Choose two)

A. The configuration file is missing in NVRAM.
B. The configuration register is set to 0x2100.
C. Boot system commands are misconfigured in the running-configuration.
D. The setup command was issued from the privileged mode prompt.
E. The IOS is missing.
F. The IOS is corrupt.

Answer: A, D
Explanation:
When router boots up, it checks the valid configuration into NVRAM and tries to load the configuration. If there is not configuration router automatically goes into setup dialog. From setup dialog, you able to configuration the basic configuration. As well you can run the setup command manually from privileged mode using the setup command.

QUESTION NO: 21
Which of the following commands displays the configurable parameters and statistics of all interfaces on a router?

A. show interfaces
B. show processes
C. show running-config
D. show versions
E. show startup-config

Answer: A
Explanation:
Use the **show interfaces** EXEC command to display statistics for all interfaces configured on the router or access server. The resulting output varies, depending on the network for which an interface has been configured.
The following is an example from theshow interfaces command. Because your display will depend on the type and number of interface cards in your router or access server, only a portion of the display is shown.
TK1#showinterfaces

Ethernet0isup,lineprotocolisup
HardwareisMCIEthernet,addressis0000.0c00.750c(bia0000.0c00.750c)
Internetaddressis131.108.28.8,subnetmaskis255.255.255.0
MTU1500bytes,BW10000Kbit,DLY100000usec,rely255/255,load1/255
EncapsulationARPA,loopbacknotset,keepaliveset(10sec)
ARPtype:ARPA,ARPTimeout4:00:00
Lastinput0:00:00,output0:00:00,outputhangnever
Lastclearingof"showinterface"counters0:00:00
Outputqueue0/40,0drops;inputqueue0/75,0drops
Fiveminuteinputrate0bits/sec,0packets/sec
Fiveminuteoutputrate2000bits/sec,4packets/sec
1127576packetsinput,447251251bytes,0nobuffer
Received354125broadcasts,0runts,0giants,57186*throttles

0inputerrors,0CRC,0frame,0overrun,0ignored,0abort
5332142packetsoutput,496316039bytes,0underruns
0outputerrors,432collisions,0interfaceresets,0restarts

Reference:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/12cgcr/inter_r/irshowin.htm

QUESTION NO: 22
Refer to the graphic. A network associate is planning to copy a new IOS image into the Paden router. This new image requires 8 MB of flash memory and 32 MB of RAM. How will the IOS proceed with the copy process?

```
TestKing1#show flash

System flash directory:
File  Length  Name/status
 1   8760520  c4500-js-mz.122-7b.bin
[8760584 bytes used, 16405240 available, 25165824 total]
24576K bytes of processor board System flash (Read/Write)
```

A. The new IOS will be copied into flash memory and the current image will remain.
B. IOS will issue an error message because flash memory is not large enough to hold the new image.
C. During the copy process, the current IOS image will be erased.
D. The current IOS image must be manually erased before IOS will allow the new image to be copied.

Answer: A
Explanation:
According to the output shown above, the existing IOS is 8760520 bytes (8M) and the total size of the flash on this device is 24567K (24M). The new IOS only requires an additional 8 MB, so it will be copied on to the flash directly and both images will reside on the flash. The existing IOS is only overwritten it there is insufficient space to hold both.

QUESTION NO: 23
What is the default configuration register setting on most Cisco routers?

A. 0x2104
B. 0x2012
C. 0x2210
D. 0x2102
E. 0x2142

Answer: D
Explanation:
About 99 percent of the time someone uses a config-register, it's more than likely because of a lost router password. Normally, the two config-registers for recovering passwords are 0x2102 and 0x2142.
The first config-register, 0x2102, is the normal config-register if you boot the router from internal Flash. You can see this config-register by using the show version command.
In this output, you'll notice the last line says, "Configuration register is 0x2102." This is normal.

QUESTION NO: 24
During the boot sequence, a TestKing 2600 series router needs to locate and load an operating system. What is the default order the router uses to find an operating system?

A. ROM, TFTP server, Flash
B. Flash, TFTP server, ROM
C. Flash, NVRAM, TFTP server
D. Flash, ROM, TFTP server
E. Flash, TFTP server, RAM

Answer: B
Explanation:
Booting up the Router:
Cisco routers can boot Cisco IOS software from these locations:

1. Flash memory
2. TFTP server
3. ROM (not full Cisco IOS)

Multiple source options provide flexibility and fallback alternatives.
Reference: http://www.svrops.com/svrops/documents/ciscoboot.htm

QUESTION NO: 25
The following commands are entered on the router:

TestKing1(config)# enable secret fortress
TestKing1(config)# line con 0
TestKing1(config-line)# login
TestKing1(config-line)# password n0way1n
TestKing1(config-line)# exit
TestKing1(config)# service password-encryption

What is the purpose of the last command entered?

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

Answer: B
Explanation:
Certain types of passwords, such as Line passwords, by default appear in clear text in the
configuration file. You can use the service password-encryption command to make them
more secure. Once this command is entered, each password configured is automatically
encrypted and thus rendered illegible inside the configuration file (much as the
Enable/Enable Secret passwords are). Securing Line passwords is doubly important in
networks on which TFTP servers are used, because TFTP backup entails routinely
moving config files across networks-and config files, of course, contain Line passwords.

QUESTION NO: 26
Refer to the graphic shown below. What is the purpose of the two numbers shown
following the exec-timeout command?

```
TestKing1 #show running-config
    <<output omitted>>
    line console 0
      exec-timeout 1 55
      pas.........7 094F60C0B.C1
      login
      transport in........
    <<output omitted>>
```

A. If connected to the router by Telnet, input must be detected within one hour and 55 seconds or the connection will be closed.
B. If no router activity has been detected in one hour and 55 minutes, the console will be locked out.
C. If no commands have been typed in 55 seconds, the console connection will be closed.
D. If connected to the router by Telnet, input must be detected within one minute and 55 seconds or the connection will be closed.
E. If no commands have been typed in one minute and 55 seconds, the console connection will be closed.

Answer: E
Explanation:
To set the interval that the EXEC command interpreter waits until user input is detected, use the exec-timeout line configuration command.
Syntax Description

| *minutes* | Integer that specifies the number of minutes. |
| *seconds* | (Optional) Additional time intervals in seconds. |

Default
10 minutes
If no input is detected during the interval, the EXEC facility resumes the current connection. If no connections exist, the EXEC facility returns the terminal to the idle state and disconnects the incoming session.
To specify no timeout, enter the exec-timeout 0 0 command.
Examples:
The following example sets a time interval of 2 minutes, 30 seconds:
line console
exec-timeout 2 30

The following example sets a time interval of 10 seconds:
line console
exec-timeout 0 10
Reference:
http://www.cisco.com/en/US/products/sw/iosswrel/ps1826/products_command_reference_chapter09186a008(

QUESTION NO: 27
According to the information provided in the exhibit, from where was the currently running version of IOS loaded into this TestKing router?

TestKing1 (boot)#show startup-config
    Using 877 out of 32762 bytes
    !
    version 11.0
    !
    hostname TestKing1
    !
    boot system flash
    --- output omitted ---

TestKing1 (boot)#show version
    Cisco Internetwork Operating System Software
    IOS (tm) 3000 Bootstrap Software IOS-BOOT-R Version 11.0(10c), RELEASE SOFTWARE (fc1)
    --- output omitted ---

    ROM: System Bootstrap, Version 11.0(10c), SOFTWARE

TestKing1 uptime is 2 minutes
    System restarted by reload
    Running default software

    Configuration register is 0x2101

TestKing1 (boot)#show flash

    System flash directory:
    File Length Name/status
    1 14051696 /c2500-is-l.122-11.T11.bin
    [14051760 bytes used, 2725456 available, 16777216 total]
    16384K bytes of processor board System flash (Read/Write)

A. ROM
B. NVRAM
C. TFTP server
D. Flash
E. None of the above

Answer: A
Explanation:
Based on the output above, the configuration register is set to 0x2101. This tells the
router to boot from ROM.
Some config-register valid settings are:
1. 0x2100 - ROM Monitor
2. 0x2101 - ROM Boot
3. 0x2102 - Boot From NVRam (default)
For a complete list of config-register settings and their meaning, see the reference link
below.
Reference:
http://www.cisco.com/en/US/products/hw/routers/ps133/products_tech_note09186a008022493f.shtml

QUESTION NO: 28
Refer to the graphic. Although the console password was set to "testking", it
displays in the router configuration as shown. What command caused the password
to be stored like this?


```
TestKing1 #show running-config
    <<output omitted>>
    line console 0
        exec-timeout 1 55
        password 7 094F60C0B1C1B
        gin
        transport  one  ne
        <o      ed
```

A. TestKing1(config)# encrypt password
B. TestKing1(config)# password-encryption md 7
C. TestKing1(config-line)# exec-timeout 1 55
D. TestKing1(config)# service password-encryption

Answer: D
Explanation:

Certain types of passwords, such as Line passwords, by default appear in clear text in the configuration text file. You can use the service password-encryption command to make them more secure. Once this command is entered, each password configured is automatically encrypted and thus rendered illegible inside the configuration file (much as the Enable/Enable Secret passwords are). Securing Line passwords is doubly important in networks on which TFTP servers are used, because TFTP backup entails routinely moving config files across networks-and config files, of course, contain Line passwords.

QUESTION NO: 29 DRAG DROP
As a network technician at TestKing.com you are required to construct the command sequence to configure an IP address on a serial interface.

Note: you are configuring a hub named TestKing1. You do not use all options.

Commands, select from these

TestKing1#interface s0/0	TestKing1(config)#interface s0/0
TestKing(config-if)#no shutdown	TestKing1(config)#ip address 172.16.20.21 255.255.255.0
TestKing1(config-if)#ip address 10.8.5.255 255.255.255.0	TestKing1(config-if)#enable interface
TestKing1(config-if)#ip address 1192.18.2.63 255.255.255.224	TestKing(config-if)#description T1 to WAN
TestKing(config-if)#banner motd ! T1 to WAN !	TestKing1#configure terminal

Definitions   Commands, place here

Definitions	Commands
Enter global configuration mode	Place here
Enter interface configuration mode	Place here
Configure the interface IP address	Place here
Enable the interface	Place here
Label the interface	Place here

Answer:
Explanation:

Commands, select from these

TestKing1#interface s0/0

TestKing1(config)#ip address 172.16.20.21 255.255.255.0

TestKing1(config-if)#enable interface

TestKing1(config-if)#ip address 1192.18.2.63 255.255.255.224

TestKing(config-if)#banner motd ! T1 to WAN !

Definitions	Commands, place here
Enter global configuration mode	TestKing1#configure terminal
Enter interface configuration mode	TestKing1(config)#interface s0/0
Configure the interface IP address	TestKing1(config-if)#ip address 10.8.5.255 255.255.255.0
Enable the interface	TestKing(config-if)#no shutdown
Label the interface	TestKing(config-if)#description T1 to WAN

1. Global configuration mode is the mode that allows you to configure the router and it takes effect immediately. You can enter into the global configuration mode using configure terminal command.

2. Interface configuration mode allows you to configure the interface on a particular interface such as setting the IP address, setting bandwidth, clock rate, encapsulation type, duplex, speed, etc. Use the "interface interface-name" command to enter into the interface configuration mode.

3. After entering into the interface configuration mode you can assign the IP Address into the interface using the ip address IPAddress subnet mask.

4. You have the option to shutdown the interface or bring up the interface, using the "shutdown" command will logically disable the interface and using the "no shutdown" command can bring up the interface up.

5. You can add the description of the interface using the "description" command.

QUESTION NO: 30 DRAG DROP
As a network administrator you are required to configure a Cisco router named TestKing1. You must match the commands with the appropriate use.

You do not use all commands.

Command, select from these

TestKing1#copy running-config startup config	TestKing1#copy flash running-config
TestKing1#copy tftp running-config	TestKing1#copy flash tftp
TestKing1#copy running-config tftp	TestKing1#copy tftp flash

Definitions

Options, place here

Definitions	Options
Merge a backup configureation with the configuration in RAM	Place here
Make the configuration in RAM the configuration the router will use at startup	Place here
Replace the IOS image	Place here
Make a backup copy of the configuration in RAM	Place here
Backup the current IOS image	Place here

Answer:

Explanation:

Command, select from these

TestKing1#copy flash running-config

Definitions	Options, place here
Merge a backup configureation with the configuration in RAM	TestKing1#copy tftp running-config
Make the configuration in RAM the configuration the router will use at startup	TestKing1#copy running-config startup config
Replace the IOS image	TestKing1#copy tftp flash
Make a backup copy of the configuration in RAM	TestKing1#copy running-config tftp
Backup the current IOS image	TestKing1#copy flash tftp

1. copy tftp running-config: This copies the running configuration into the RAM from tftp server.
2. copy running-config startup-config: This copies the running configuration into the startup configuration. When the router boots up it checks for the valid configuration on NVRAM, which is called the startup-configuration.
3. copy tftp flash: Which copies the IOS from tftp server to flash memory.
4. copy running-config tftp: This copies the running configuration on to the tftp server.
5. copy flash tftp: This copies the IOS image from flash into the tftp server.

Section 9: Perform an initial configuration on a switch (9 Questions)

QUESTION NO: 1
A TestKing Switch is connected as shown below:


```
Router configuration:
interface fastethernet 0/1.1
  encapsulation dot1q 1
  ip addr 192.1.1.65 255.255.225.192
interface fastethernet 0/1.10
  encapsulation dot1q 10
  ip addr 192.1.1.129 255.255.255.224
```

Fa0/1

switch configuration:
Port 0/1: dot1q trunk
Ports 0/2, 0/3: VLAN 1
Port 0/4: VLAN 10
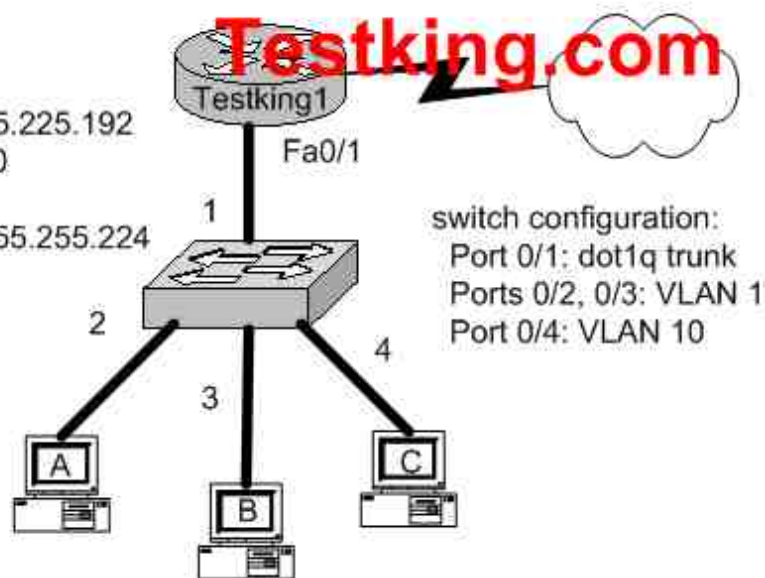
Which IOS commands should you enter if you wanted to link the router TestKing1 with switch port 1? (Select three answer choices)

A. Switch(config)# interface fastethernet 0/1

B. Switch(config-if)# switchport mode access

C. Switch(config-if)# switchport mode trunk

D. Switch(config-if)# switchport access vlan 1

E. Switch(config-if)# switchport trunk encapsulation isl

F. Switch(config-if)# switchport trunk encapsulation dot1q

Answer: A, C, F

Explanation:

Before you can begin, you have to get into the interface. Answer choice A is the only command in the selection that puts the IOS into interface mode. Once in the interface you have to set it to trunk mode, so choice C is correct. The switch port needs encapsulation. Answer choice E give you the choice of ISL and choice F gives you dot1q. Since the diagram suggests that the router is using 802.1Q, you must also use dot1q.

Incorrect Answers:

B, D: We wish to set up a trunk over this connection, not set up a single VLAN.

E. Both ends of the trunk must use the same trunk encapsulation type. Since the diagram shows that the router is set to 802.1Q, the switch must be set up similarly.

QUESTION NO: 2

Which interface commands would you enter on a Catalyst 2900 switch, if your goal was to bring all VLAN traffic to another directly connected switch? (Select the two valid responses)

A. Switch(config-if)# vlan all

B. Switch(config-if)# switchport trunk encapsulation dot1q

C. Switch(config-if)# switchport access vlan all

D. Switch(config-if)# switchport mode trunk

E. Switch(config-if)# switchport access vlan 303

Answer: C, D

Explanation:

In order to pass all VLAN traffic from one switch to another, a trunk is needed. In order to configure a trunk on a 2900 series switch, only these two commands are required.

Incorrect Answers:

A. This is an invalid command.

B. This command does not need to be entered, as the trunk encapsulation for the Catalyst 2900 by default is dot1q

E. This will only accomplish setting up a single VLAN, numbered 303.

QUESTION NO: 3
As a TestKing trainee you are required to set the default gateway on a Cisco switch to the IP address of 192.168.1.115. Which IOS command should you use?

A. TestKSwitch(config)# ip route-default 192.168.1.115
B. TestKSwitch(config)# ip default-gateway 192.168.1.115
C. TestKSwitch(config)# ip route 192.168.1.115 0.0.0.0
D. TestKSwitch(config)# ip default-network 192.168.1.115

Answer: B
Explanation:
Use the "ip default-gateway" command to enter the IP address of the next-hop router interface that is directly connected to the switch where a default gateway is being configured. The default gateway receives IP packets with unresolved destination IP addresses from the switch.
Once the default gateway is configured, the switch has connectivity to the remote networks with which a host needs to communicate.

QUESTION NO: 4 SIMULATION
The TestKing network is displayed in the following diagram:

You work as a network technician at TestKing.com. A new switch named TestKing2 is being added to TestKing.com LAN. You will work to complete this process by first configuring the TestKing2 switch with IP address and default gateway. For the switch host address you should use the first available IP address on the management subnet. In addition, the switch needs o be configure to be in the same VTP domain as the TestKing1 switch, and also needs to be configured as a VTP client.

Assume that the IP configuration and VTP configuration or completed and working.

You must accomplish the following-

1. **Determine and configure the IP host address of the new switch**
2. **Determine and configure the default gateway of the switch**
3. **Determine and configure the correct VTP domain name for the new switch**
4. **Configure the new switch as a VTP Client**

Answer:
Step 1: Determine & Configure the IP hot address for the New switch
TestKing2 (config-line)# interface vlan 1
TestKing2 (config-line)# ip address A.D.C.D 255.255.255.0
TestKing2 (config-line)# no shutdown

Step 2: Configure the default gateway
TestKing2 (config)# ip default-gateway A.B.C.D

Step 3 & 4: Configure the TestKing 2 switch as VTP Client and configure the correct VTP domain
TestKing2 (config)# vtp mode client
TestKing2 (config-line)# vtp domain TestKing
TestKing2 (config-line)# vtp password testking
TestKing2 (config-line)# vtp pruning

Explanation:
Even though we don't have enough information to deduce the IP address but at least we know the step by step procedure to configure the switch TestKing 2.

QUESTION NO: 5
What is the purpose of assigning an IP address to a switch?

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

Answer: B
Explanation:
Switch is a layer 2 device and doesn't use network layer for packet forwarding. The IP address may be used only for administrative purposes such as Telnet access or for network management purposes.

QUESTION NO: 6
What are the possible trunking modes for a switch port? (Choose three)

A. Transparent
B. Auto
C. On
D. Desirable
E. Client
F. Forwarding

Answer: B, C, D
Explanation:
Here, the trunk link is identified by its physical location as the switch module number and port number. The trunking mode can be set to any of the following:

☐ on-This setting places the port in permanent trunking mode. The corresponding switch port at the other end of the trunk should be similarly configured because negotiation is not allowed. The encapsulation or identification mode should also be manually configured.

☐ off-This setting places the port in permanent non-trunking mode. The port will attempt to convert the link to non-trunking mode.

☐ desirable-Selecting this port will actively attempt to convert the link into trunking mode. If the far end switch port is configured to on, desirable, or auto mode, trunking will be successfully negotiated.

☐ auto-The port will be willing to convert the link into trunking mode. If the far end switch port is configured to on or desirable, trunking will be negotiated. By default, all Fast Ethernet and Gigabit Ethernet links that are capable of negotiating using DTP are configured to this mode. Because of the passive negotiation behavior, the link will never become a trunk, if both ends of the link are left to the auto default.

☐ nonegotiate-The port is placed in permanent trunking mode, but no DTP frames are generated for negotiation. The far end switch port must be manually configured for trunking mode.

QUESTION NO: 7
Refer to the exhibit. A technician has installed SwitchB and needs to configure it for remote access from the management workstation connected to SwitchA. Which set of commands is required to accomplish this task?

Exhibit:
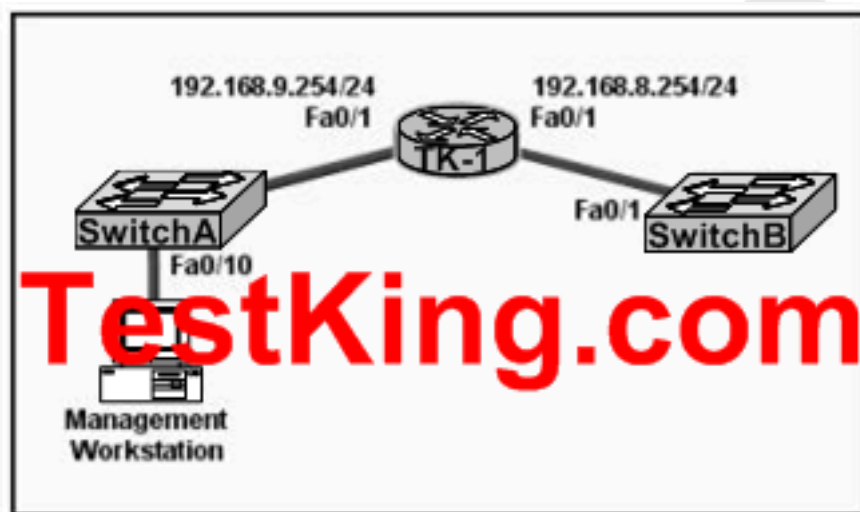
A. SwitchB(config)# interface FastEthernet 0/1
 SwitchB(config-if)# ip address 192.168.8.252 255.255.255.0
 SwitchB(config-if)# no shutdown
B. SwitchB(config)# ip default-network 192.168.8.254
 SwitchB(config)# interface vlan 1
 SwitchB(config-if)# ip address 192.168.8.252 255.255.255.0
 SwitchB(config-if)# no shutdown
C. SwitchB(config)# ip route 192.168.8.254 255.255.255.0
 SwitchB(config)# interface FastEthernet 0/1

SwitchB(config-if)# ip address 192.168.8.252 255.255.255.0
SwitchB(config-if)# no shutdown
D. SwitchB(config)# ip default-gateway 192.168.8.254
SwitchB(config)# interface vlan 1
SwitchB(config-if)# ip address 192.168.8.252 255.255.255.0
SwitchB(config-if)# no shutdown
E. SwitchB(config)# interface vlan 1
SwitchB(config-if)# ip address 192.168.8.252 255.255.255.0
SwitchB(config-if)# ip default-gateway 192.168.8.254 255.255.255.0
SwitchB(config-if)# no shutdown

Answer: D
Explanation:
IP default-gateway address is a global command that sets the default gateway so that the management interface can be reached from a remote network. This is the correct command used on Cisco switches. In this example, the interface also needs to be enable using the "no shut" command.

Incorrect Answers:
A: The default gateway of the switch needs to be specified.
B: The correct command for a switch is "ip default-gateway" not "ip default-network"
C: This static route is not valid, and does not correctly specify the default route.
E: "IP default-gateway" is a global command, not an interface command.

QUESTION NO: 8
A Catalyst 2950 needs to be reconfigured. What steps will ensure that the old configuration is erased? (Choose three)

A. Modify the configuration register.
B. Restart the switch.
C. Erase the running configuration.
D. Delete the VLAN database.
E. Erase the startup configuration.
F. Erase flash.

Answer: B, D, E
Explanation:

For switches such as the 2950, the process is much the same as a router, but you should delete the VLAN.DAT file before reloading the router. This file contains VLAN information and is kept in flash, so it will still be present after a reload.

switch1#write erase

Erasing the nvram filesystem will remove all files! Continue? [confirm]

[OK]

Erase of nvram: complete

switch1#delete vlan.dat

Delete filename [vlan.dat]?

Delete flash:vlan.dat? [confirm]

switch1#reload

Make sure to hit for the two questions regarding the deletion - if you answer "y" instead, the switch thinks you're trying to erase a file named "y"!

After the reload is complete, you'll be prompted to enter setup mode. As you did with the router, enter "N" and begin to configure the router from user exec mode.

QUESTION NO: 9
The TestKing switches shown in the diagram, Core and Core2, are both Catalyst 2950s. The addressing scheme for each company site is as follows: Router Ethernet port - 1st usable address Core - 2nd usable address Core2 - 3rd usable address For this network, which of the following commands must be configured on Core2 to allow it to be managed remotely from any subnet on the network? (Choose three)
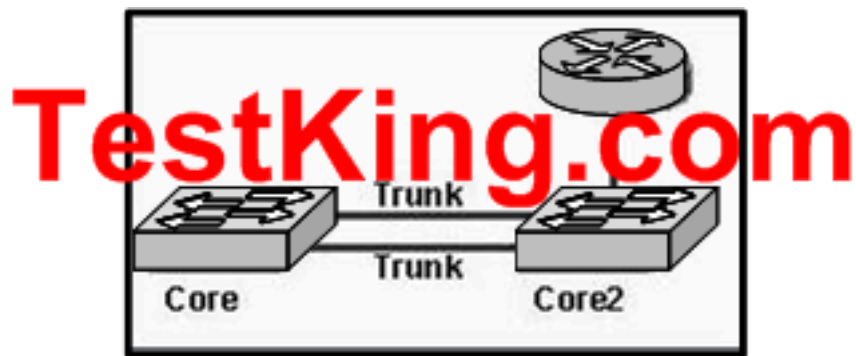
A. Core2(config)# ip default-gateway 192.168.1.9
B. Core2(config)# interface f0/0
 Core2(config-if)# ip address 192.168.1.10 255.255.255.248
C. Core2(config)# line con 0
 Core2(config-line)# password cisco
D. Core2(config)# interface vlan 1
 Core2(config-if)# ip address 192.168.1.11 255.255.255.248
E. Core2(config)# ip route 0.0.0.0 0.0.0.0 192.168.1.8
F. Core2(config)# line vty 0 4
 Core2(config-line)# password cisco

Answer: A, D, F
Explanation:
IP default-gateway address is a global command that sets the default gateway so that the management interface can be reached from a remote network. This is the correct command used on Cisco switches. In order to be reachable, the IP address of VLAN 1 must also be specified and must be in the same subnet as the default gateway IP address. Finally, in order to remotely connect via telnet to any Cisco device the password must e set or you will get a "password required, but none set" error message when you try to telnet to it.

Section 10: Implement access lists (36 questions)

QUESTION NO: 1

You are securing a network for TestKing and want to apply an ACL (access control list) to an interface of a router. Which one of the following commands would you use?

A. permit access-list 101 out
B. ip access-group 101 out
C. apply access-list 101 out
D. access-class 101 out
E. ip access-list e0 out
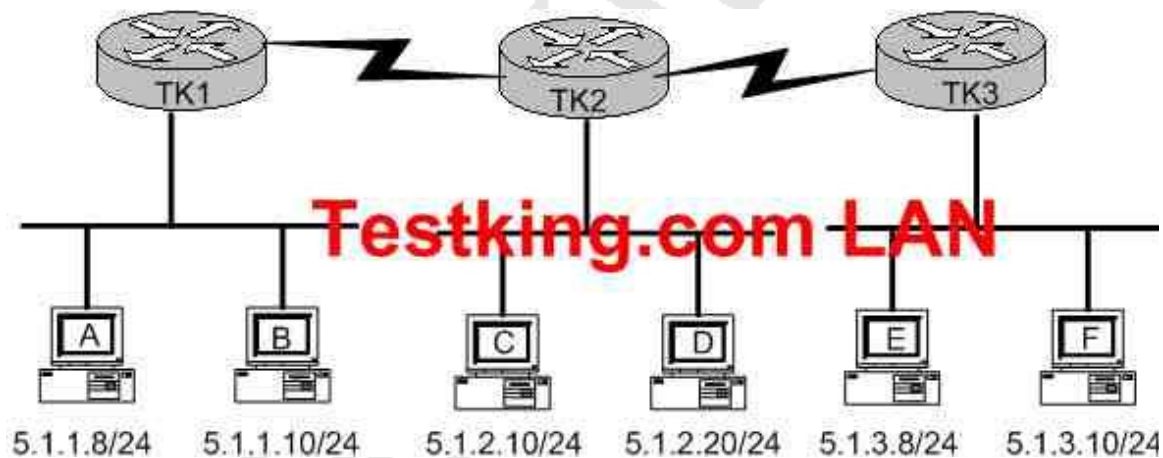

Answer: B
Explanation:
To enable an ACL on an interface and define the direction of packets to which the ACL is applied, the `ip access-group` command is used. In this example, the access list is applied to packets going out of the interface. Packets coming in on the interface are not checked against access list 101.

QUESTION NO: 2
The TestKing LAN is depicted below:

You're the systems administrator at Testing, and you create the following access control lists.

```
access-list 101 deny tcp 5.1.1.10 0.0.0.0 5.1.3.0 0.0.0.255 eq telnet
access-list 101 permit any any
```

You then enter the command "ip access-group 101 in" to apply access control list 101 to router TK1s e0 interface.

Which of the following Telnet sessions will be blocked as a result of your access lists? (Select all that apply)

A. Telnet sessions from host A to host 5.1.1.10
B. Telnet sessions from host A to host 5.1.3.10
C. Telnet sessions from host B to host 5.1.2.10
D. Telnet sessions from host B to host 5.1.3.8
E. Telnet sessions from host C to host 5.1.3.10
F. Telnet sessions from host F to host 5.1.1.10

Answer: D, F
Explanation:
All the telnet sessions from host B to network 5.1.3.0/24 will be denied. In addition, all telnet traffic to host B from the 5.1.3.0/24 network will not work, because the return telnet traffic will be denied.

QUESTION NO: 3
Which of the following statements regarding the use of multiple access lists are valid when configuring a single interface on a Cisco router?

A. Application of up to three access lists per protocol to a single interface.
B. No more than two access lists per interface.
C. One access list may be configured per direction for each Layer 3 protocol configured on an interface.
D. The maximum number allowed varies due to RAM availability in the router.
E. An infinite number of access lists that can be applied to an interface, from most specific to most general.
F. Cisco IOS allows only one access list to an interface.

Answer: C
Explanation:
For each interface, one access list for each protocol (IP, IPX, etc) can be applied in the inbound direction, and one for the outbound direction.
Incorrect Answers:
B. It is true that no more than two access lists can be applied per interface (inbound and outbound). However, this applies per layer 3 protocol, so it is possible to configure more than 2 access lists per interface.

QUESTION NO: 4
On the serial interface of a router, an inbound access list is configured to deny all traffic from UDP and TCP ports 21, 23, and 25. All other traffic is permitted. Based on this information, which types of traffic will be allowed through this interface? (Choose three)

A. SMTP
B. DNS
C. FTP
D. Telnet
E. HTTP
F. POP3

Answer: B, E, F
Explanation:
Since all traffic that is not using the three ports specified is permitted, the correct answers are B, E and F. (DNS port 53, HTTP port 80, POP3 port 110).
Incorrect Answers:
A. SMTP uses port 25, which is prohibited.
C. FTP uses port 21, which is prohibited.
D. Telnet uses port 23, which is prohibited.

QUESTION NO: 5
The following access list below was applied outbound on the E0 interface connected to the 192.169.1.8/29 LAN:

```
access-list 135 deny tcp 192.169.1.8 0.0.0.7 eq 20 any
access-list 135 deny tcp 192.169.1.8 0.0.0.7 eq 21 any
```

How will the above access lists affect traffic?

A. FTP traffic from 192.169.1.22 will be denied.
B. No traffic, except for FTP traffic will be allowed to exit E0.
C. FTP traffic from 192.169.1.9 to any host will be denied.
D. All traffic exiting E0 will be denied.
E. All FTP traffic to network 192.169.1.9/29 will be denied.

Answer: D
Explanation:
When an access list is created, an implicit deny all entry is created at the end. Therefore, each access list created needs to have at least one permit statement, otherwise it will have the effect of prohibiting all traffic. If the intent in this example was to block only certain hosts from being able to FTP, then the following line should have been included at the end of the access list:

Router(config)#access-list 135 permit ip any any

QUESTION NO: 6
Study the information and the relevant configuration file below for the Testking Branch router.

Hostname: Branch
PH# 123-6000, 123-6001
SPID1: 32055512360001
SPID2: 32055512360002

isdn switch-type basic-ni1
username Remote password cisco
interface bri0
ip address 10.1.1.1 255.255.255.0
encapsulation ppp
ppp authentication chap
isdn spid1 32055512360001
isdn spid2 32055512360002
dialer map ip 10.1.1.2 name Remote 1238001
dialer-list 1 protocol ip permit

What additional command must be executed on the Branch router before interesting traffic will initiate an ISDN call?

A. (config-if)# dialer-group 1
B. (config-if)# dialer-list 1
C. (config-if)# dialer map 1
D. (config-if)# dialer-route 1

Answer: A
Explanation:
The "dialer-group #" command tells the access-list (used with the dialer-list # command), which interface to activate when it finds interesting traffic. The numbers at end of each command must match.

QUESTION NO: 7
Study the following network diagram displaying the Testking network:
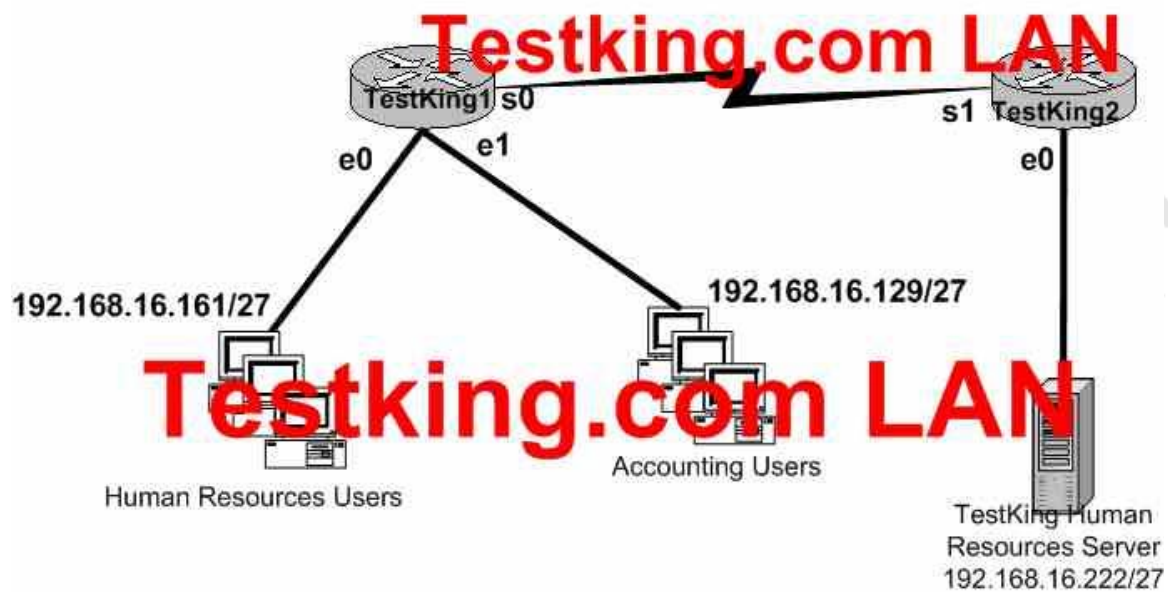
With the goal of preventing the accounting department from gaining access to the HR server, the following access list is created:

```
access-list 19 deny 192.168.16.128 0.0.0.31
access-list 19 permit any
```

All other traffic is to be permitted through the network. On which interface and in what direction should the access list be applied?

A. TestKing1 S0, out.
B. TestKing1 E1, in.
C. TestKing1 E1, out.
D. TestKing2 S1, in.

E. TestKing2 E0, out.
F. TestKing2 E0, in.

Answer: E
Explanation:
Since this is a standard access list it should be placed near the destination. Standard access lists only match against the source IP address, so placing this access list anywhere else will prevent traffic from the Accounting department to other areas of the network.

QUESTION NO: 8
Which of the following commands would successfully implement an access list on a routers virtual terminal line? (Select only one answer choice)

A. RouterTK(config-line)# access-class 10 in
B. RouterTK(config-if)# ip access-class 23 out
C. RouterTK(config-line)# access-list 150 in
D. RouterTK(config-if)# ip access-list 128 out
E. RouterTK(config-line)# access-group 15 out
F. RouterTK(config-if)# ip access-group 110 in

Answer: A
Explanation:
To configure VTY you must be in the config-line mode. Virtual terminal sessions use VTY lines 0-4, and VTY access lists use the access-class command.
Incorrect Answers:
B. This is placed in the wrong configuration mode
C, D, E, F. The correct syntax for VTY lines is the access-class command, not the access-group or access-list commands.

QUESTION NO: 9
The Testking network is displayed below:

Production Department
172.16.16.0/24

HR Server
172.17.17.252/24

Web Server
172.17.18.252/24
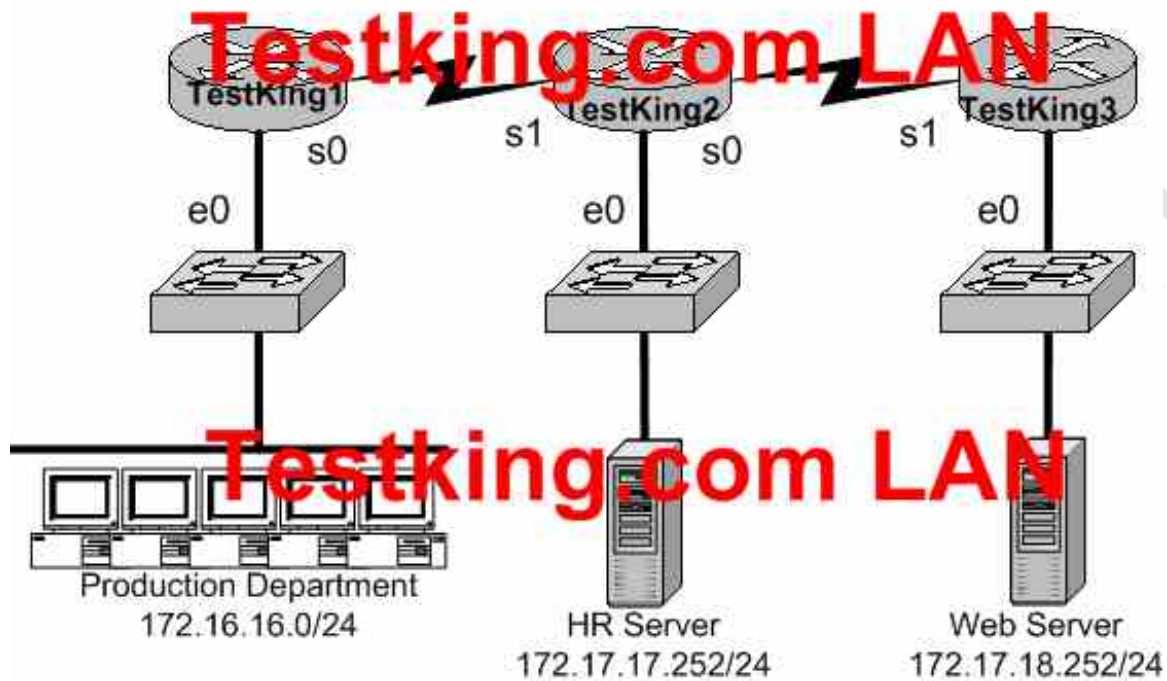
You want to apply an access list to the e0 interface on the TestKing1 router, with the goal of halting HTTPS traffic from the Production Department from reaching the HR server via the TestKing2 router. Which of the following access lists would you use?

A. Permit ip any any
 Deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 443
B. Permit ip any any
 Deny tcp 172.17.17.252 0.0.0.0 172.16.16.0 0.0.0.255 eq 443
C. Deny tcp 172.17.17.252 0.0.0.0 172.16.16.0 0.0.0.255 eq 443
 Permit ip any any
D. Deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 443
 Permit ip any any

Answer: D

Explanation:
This access problem is very simple; it tells you where to put the access list, all you have to do is to select the right one. You have to deny all HTTP traffic (TCP port 80) from crossing router 1's e0 while, allowing everything else. This is accomplished by Deny tcp 172.16.16.0 0.0.0.255 172.17.17.252 0.0.0.0 eq 443, Permit ip any any.

Incorrect Answers:
Either the order of the statements are reversed. Since all traffic checked against an access list is performed in order from the top down, all traffic will match the first statement and be permitted or the source addresses are incorrect.

QUESTION NO: 10
What are some general guidelines regarding the placement of access control lists? (Select two answer choices)

A. You should place standard ACLS as close as possible to the source of traffic to be denied.
B. You should place extended ACLS as close as possible to the source of traffic to be denied.
C. You should place standard ACLS as close as possible to the destination of traffic to be denied.
D. You should place extended ACLS should be places as close as possible to the destination of traffic to be denied.

Answer: B, C
Explanation:
The question you have to ask yourself is: Do you want the access list before the routing decision, or after the routing decision? If an access list is extended, then it would restrict a lot of traffic, so it would be better to have such a list at the source so it could filter out the traffic before the router has to go through the trouble of sending it off. If an access list is standard, then it would be more efficiently placed closer to the destination.

QUESTION NO: 11
Study the exhibit below:

Research Network
172.16.102.0/24

TestKing Sales Server
172.16.103.252/24

TestKing Support Server
172.16.104.252/24
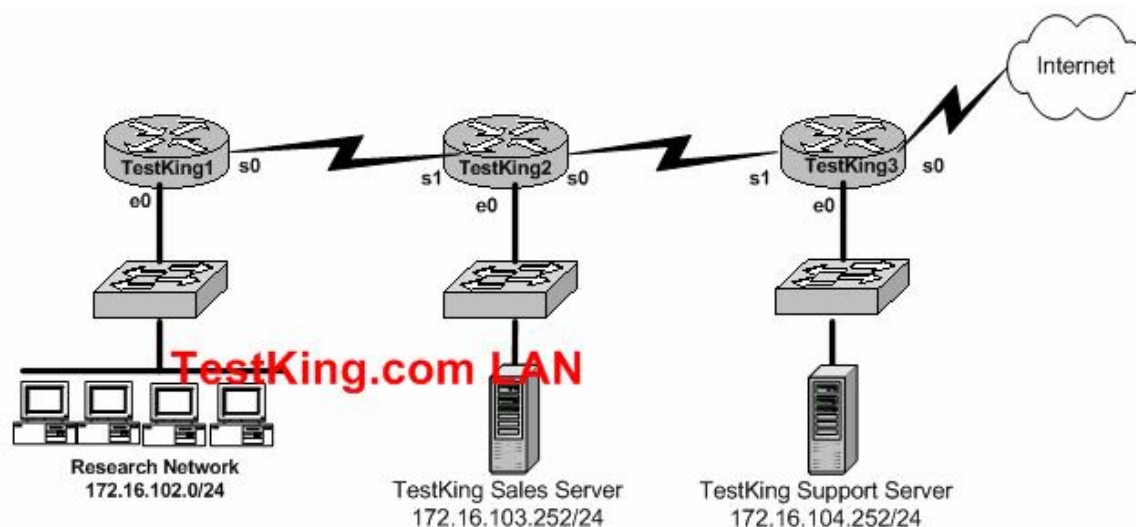
You are a network security consultant and you've been contracted to prevent users on the Research Network and general Internet surfers from accessing the TestKing Support server. However, you must allow access to all the other TestKing users. So you create an access control list called research_network which contains the following lines:

```
deny 172.16.102.0 0.0.0.255 172.16.104.255 0.0.0.0
permit 172.16.0.0 0.0.255.255 172.16.104.252 0.0.0.0
```

Which of the following command sequences can satisfy your goals?

A. TestKing1(config)#interface e0
TestKing1(config-if)# ip access-group research_network in
B. TestKing2(config)# interface s1
TestKing2(config-if)#ip access-group research_network in
C. TestKing3(config)#interface s1
TestKing3(config-if)#ip access-group research_network in
D. TestKing1(config)# interface s0
TestKing1(config-if)# ip access-group research_network out
E. TestKing2(config)# interface s0

TestKing2(config-if)# ip access-group research_network out
F. TestKing3(config)# interface e0
TestKing3(config-if)# ip access-group research_network out

Answer: F
Explanation:
To enable the ACL on an interface and define the direction of packets to which the ACL
is applied, the ip access-group command is used.

When referring to a router, these terms have the following meanings.
1. **Out** - Traffic that has already been through the router and is leaving the interface; the
source would be where it's been (on the other side of the router) and the destination is
where it's going.
2. **In** - Traffic that is arriving on the interface and which will go through the router; the
source would be where it's been and the destination is where it's going (on the other side
of the router).
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN
1-58720-083-X) Page 433

QUESTION NO: 12
A portion of the Testking network is shown below:

Graphics Department
192.168.16.0/24

Web Server
192.168.18.252/24
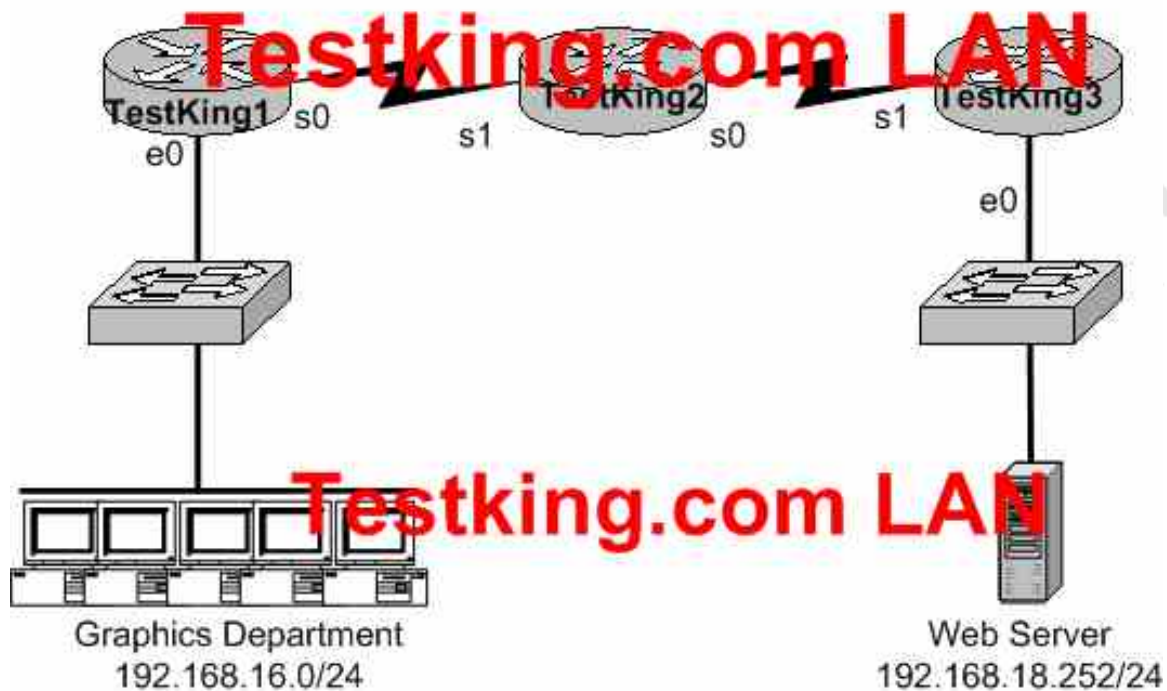
In order to prevent the Web Server from receiving telnet traffic from the Graphics Dept. users, an access is created denying this traffic. On which router, which interface and in which direction should you place the access list for maximum efficiency? (Select all that apply)

A. TestKing1 Router
B. TestKing3 Router
C. serial 0
D. Ethernet 0
E. in
F. out

Answer: A, D, E
Explanation:

For maximum efficiency, the access list should be placed closest to the source of the traffic that you want to deny. The access list should be an inbound access list, on the e0 interface, on router TestKing1.

Incorrect Answers:

B, C, F. Placing the access list anywhere else would mean that the traffic would be permitted through the network, at least partially, before being dropped. This would result in inefficiency.

QUESTION NO: 13

The Testking network consists of Cisco routers and switches as shown below:
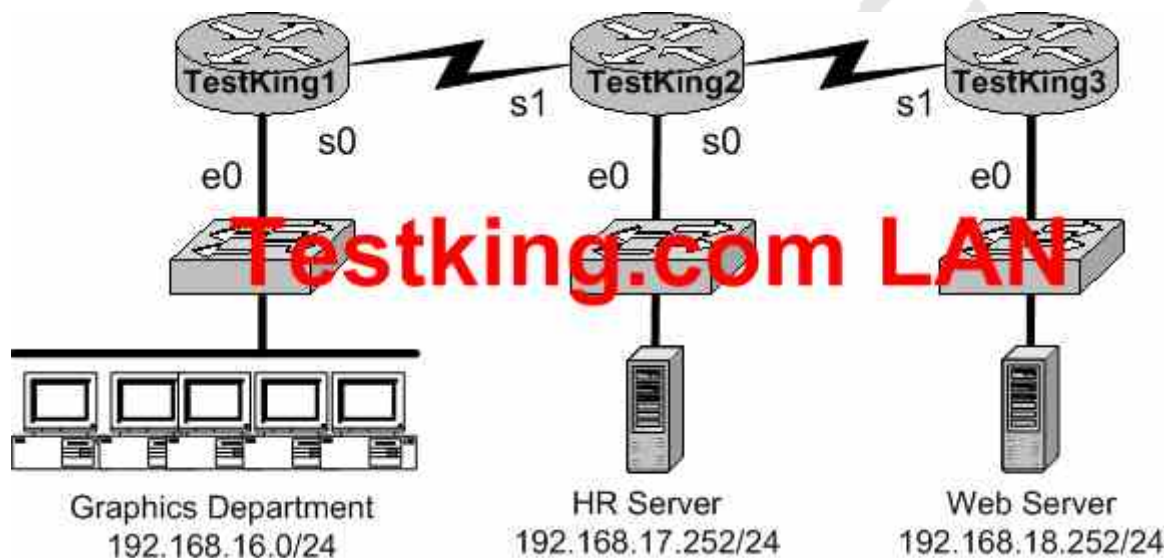
Your goal is to prevent Telnet traffic originating from the Graphics Department to reach the Web server attached to TestKing3. However, you want to allow Telnet traffic to other destinations. To accomplish this, you configure the following access control list:

access-list 101 deny tcp any any eq 23
permit ip any any

On which router, in what direction, and which interface, should the access list be placed to most efficiently implement the above list? (Select three options)

A. TestKing1
B. TestKing2
C. serial 0
D. ethernet 0
E. in
F. out

Answer: A, D, E
Explanation:
If the ACL is placed on TestKing2 anywhere else than serial 1 this will prevent the HR server from communicating with the Web server.

QUESTION NO: 14 SIMULATION
You are the administrator of the TestKing network which is composed of three routers connected together via a WAN as shown in the diagram. Your assignment is to configure and apply an access control list that will block telnet access to the TestKing1 router without inhibiting all other traffic. The access list won't need more then 3 statements and it should be applied to the TestKing3 router. The three routers are already connected and configured as follows:

* The routers are named: TestKing1, TestKing2, and TestKing3 respectively.
* All three of them are using RIP as the routing protocol.
* The serial 0 interfaces are providing clocking.
* The default subnet mask is used on every interface.
* The IP addresses and passwords are listed below.

TestKing1
E0 192.168.1.1
S0 192.168.118.1
Secret password: testking

TestKing2
E0 192.168.121.1
S0 192.168.5.1

S1 192.168.118.2
Secret password: testking

TestKing3
E0 192.168.134.1
S1 192.168.5.2
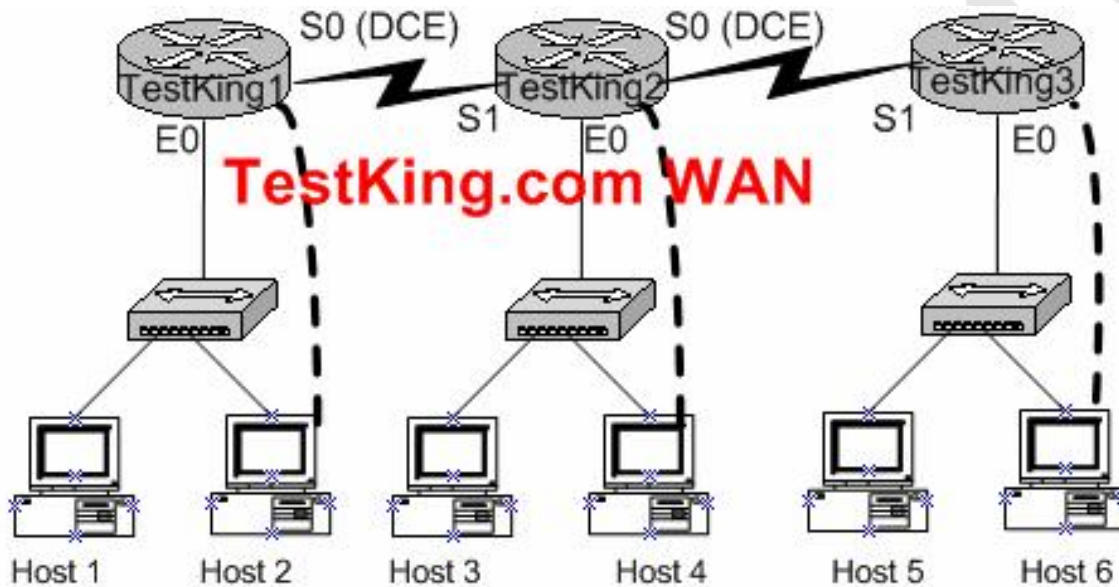
To configure the router click on the host icon that is connected to a router by a serial console cable.

 Answer:
Explanation:
TestKing3>enable
:password
TestKing3#show access-lists (** redundant **)
TestKing3#config t
.Enter configuration commands, one per line. End with END
TestKing3(config)#access-list 101 deny tcp any 192.168.1.1 0.0.0.0 eq 23
TestKing3(config)#access-list 101 deny tcp any 192.168.118.0 0.0.0.0 eq 23
TestKing3(config)#access-list 101 permit ip any any
TestKing3(config)#interface Ethernet 0
TestKing3(config-if)#ip access-group 101 in

TestKing3(config-if)#exit
TestKing3(config)#interface serial 0
TestKing3(config-if)#ip access-group 101 in
TestKing3(config-if)#<CTRL-Z
..
TestKing3#copy running-config startup-config

You should deny access to telnet to the tesking1 router and the access list should be applied in testking3 router (if the wording is correct). The destination addresses of TestKing1, namely 192.181.1.1 0.0.0.0 and 192.168.118.0, should be used.

QUESTION NO: 15
Observe the following access list configuration:


```
access-list 10 permit 172.29.16.0 0.0.0.255
access-list 10 permit 172.29.17.0 0.0.0.255
access-list 10 permit 172.29.18.0 0.0.0.255
access-list 10 permit 172.29.19.0 0.0.0.255
```

An access list was written with the four statements shown in the graphic. Which single access list statement will combine all four of these statements into a single statements that will have exactly the same effect?

A. access-list 10 permit 172.29.16.0 0.0.0.255
B. access-list 10 permit 172.29.16.0 0.0.1.255
C. access-list 10 permit 172.29.16.0 0.0.3.255
D. access-list 10 permit 172.29.16.0 0.0.15.255
E. access-list 10 permit 172.29.0.0 0.0.255.255

Answer: C
Explanation:
172.29.16.0 is an aggregate address for those 4 networks. If you would write all these addresses in binary form and will mark the equal part, than you will see that it is 172.29.16.0.

QUESTION NO: 16
Two TestKing routers are connected together as shown below:
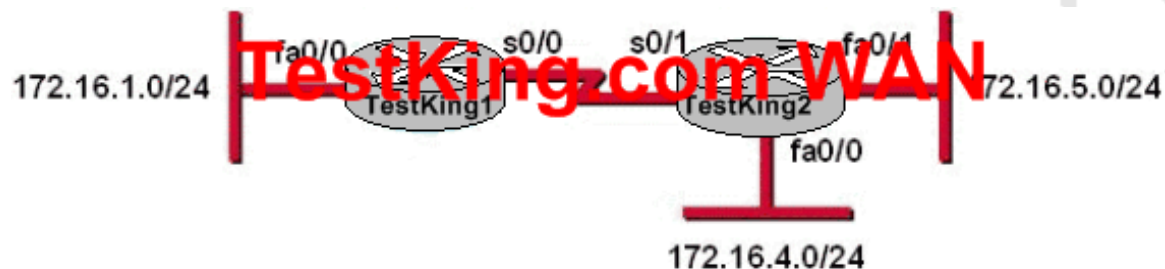

```
access-list 10 permit host 172.16.1.5
access-list 10 deny 172.16.1.0 0.0.0.255
access-list 10 permit any
```

The access list shown should deny all hosts located on network 172.16.1.0, except host 172.16.1.5, from accessing the 172.16.4.0 network. All other networks should be accessible. Which command sequence will correctly apply this access list?

A. TestKing1(config)#interface fa0/0
TestKing1(config-if)#ip access-group 10 in

B. TestKing1(config)#interface s0/0
TestKing1(config-if)#ip access-group 10 out

C. TestKing2(config)#interface fa0/1
TestKing2(config-if)#ip access-group 10 out

D. TestKing2(config)#interface fa0/0
TestKing2(config-if)#ip access-group 10 out

E. TestKing2(config)#interface s0/1

TestKing2(config-if)#ip access-group 10 out

Answer: D
Explanation:
In order to only deny access to the 172.16.4.0 network while permitting all other access as specified in this question, we need to apply this access list to router TestKing2, and it must be placed in the outbound direction of interface fa0/0. Applying this access list to any other interface or any other router would result in making other network unreachable from the 172.16.1.0 network, except of course for 172.16.1.5.

QUESTION NO: 17
A network administrator wants to add a line to an access list that will block only Telnet access by the hosts on subnet 192.168.1.128/28 to the server at 192.168.1.5. What command should be issued to accomplish this task?

A. access-list 101 deny tcp 192.168.1.128 0.0.0.15 192.168.1.5 0.0.0.0 eq 23
access-list 101 permit ip any any
B. access-list 1 deny tcp 192.168.1.128 0.0.0.15 host 192.168.1.5 eq 23
access-list 1 permit ip any any
C. access-list 1 deny tcp 192.168.1.128 0.0.0.255 192.168.1.5 0.0.0.0 eq 21
access-list 1 permit ip any any
D. access-list 101 deny tcp 192.168.1.128 0.0.0.240 192.168.1.5 0.0.0.0 eq 23
access-list 101 permit ip any any
E. access-list 101 deny ip 192.168.1.128 0.0.0.240 192.158.1.5 0.0.0.0 eq 23
access-list 101 permit ip any any
F. access-list 101 deny ip 192.168.1.128 0.0.0.15 192.168.1.5 0.0.0.0 eq 23
access-list 101 permit ip any any

Answer: A
Explanation:
Only choice specifies the correct TCT port and wildcard mask, and uses a valid access list number.
Incorrect Answers:
B, C. Access list 1 is used for these choices, which is a standard access list. In this example, an extended access list is required. Choice C also specifies port 21, which is used by FTP not Telnet.
D, E: These choices use an incorrect wildcard mask of 0.0.0.240. It should be 0.0.0.15 for a /28 subnet.

F. IP is specified as the protocol, when it should be TCP.

QUESTION NO: 18 SIMULATION
The TestKing WAN is displayed below:
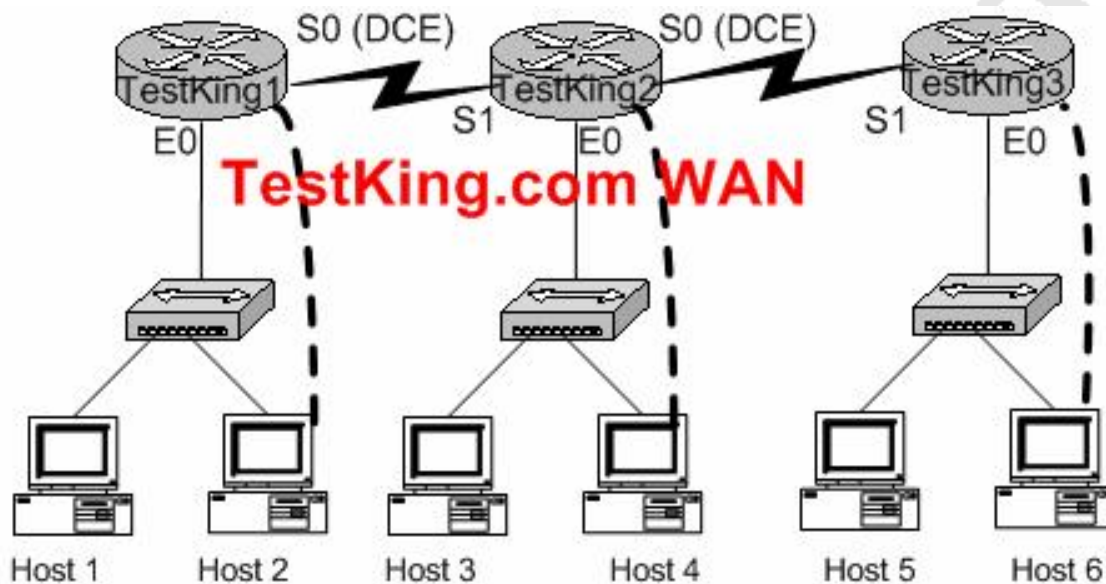
You work as a network engineer at TestKing.com. Three TestKing stores have established network connectivity. The routers are named TestKing1, TestKing2, and TestKing3. The manager at the TestKing site, Tess King, has decided to deny the ability of anyone from any other network to connect to the TestKing3 router with the ping command. Implement an access list on the TestKing3 router to deny this detection but allow all other types of traffic to pass. The access list should contain no more than three statements. The routers have been configured with the following specifications:

* The routers are named TestKing1, TestKing2, and TestKing3.
* RIP is the routing protocol.
* Clocking signal is provided on the serial 0 interfaces.
* The password on each router is "testking".
* The subnet mask on all interfaces is the default mask.
* The IP addresses are listed in the chart below.

```
TestKing1
E0 192.168.49.1
S0 192.168.51.1.


TestKing2
E0 192.168.53.1
S0 192.168.55.1
S1 192.168.51.2


TestKing3
E0 192.168.57.1
S1 192.168.55.2
```

To configure the router click on the host icon that is connected to a router by a serial console cable.

Answer:
Explanation:
Click on Host 6 to connect to and configure TestKing3.
configure terminal
access-list 101 deny icmp any 192.168.57.1 0.0.0.0
access-list 101 deny icmp any 192.168.55.2 0.0.0.0
access-list 101 permit ip any any
Interface s1
Ip access-group 101 in
interface ethernet0
ip access-group 101 out
ctrl z
copy running-config startup-config

QUESTION NO: 19
You are the network administrator at TestKing. You apply the following access list on the E0 outbound interface connected to the 192.168.1.8/29 LAN:

access-list 21 deny tcp 192.168.1.8 0.0.0.7 eq 20 any
access-list 21 deny tcp 192.168.1.8 0.0.0.7 eq 21 any

What will the effect of this access list be?

A. All traffic will be allowed to out of E0 except FTP traffic.

B. FTP traffic from 192.168.1.22 to any host will be blocked.

C. FTP traffic from 192.168.1.9 to any host will be blocked.

D. All traffic will be prevented from leaving E0.

E. All FTP traffic to network 192.168.1.9/29 from any host will be blocked.

Answer: D

Explanation:

By default access lists contain an implicit deny statement at the end. In this example there is no permit statement, so it will deny all traffic exiting E0 Interface. Any useful access list must contain at least one permit statement, or everything will be denied.

QUESTION NO: 20

A network administrator has configured access list 172 to prevent Telnet and ICMP traffic from reaching a server with the address if 192.168.13.26. Which command can the administrator issue to verify that the access list is working properly? (Choose three)

A. Router# ping 192.168.13.26

B. Router# debug access-list 172

C. Router# show open ports 192.168.13.26

D. Router# show access-list

E. Router# show ip interface

Answer: A, D, E

Explanation:

To display the contents of current access lists, use the show access-lists command in privileged EXEC mode.

show access-lists [access-list-number | access-list-name]

Syntax Description:

access-list-number	(Optional) Number of the access list to display. The system displays all access lists by default.
access-list-name	(Optional) Name of the IP access list to display.

The following is sample output from the show ip interface command:
Router# show ip interface Ethernet0 is up, line protocol is up Internet address is 192.195.78.24, subnet mask is 255.255.255.240 Broadcast address is 255.255.255.255 Address determined by non-volatile memory MTU is 1500 bytes Helper address is not set Secondary address 131.192.115.2, subnet mask 255.255.255.0 Directed broadcast forwarding is enabled Multicast groups joined: 224.0.0.1 224.0.0.2 Outgoing access list is not set **Inbound access list is not set**---output omitted---
Ping command is used to verify connectivity.

So choices A, D and E will be used to verify that the access-list is working correctly.

QUESTION NO: 21 DRAG DROP
On the left are access list conditions and on the right design goals. Match up the corresponding pairs. (Please note: Not all options are used)

deny icmp any 192.168.47.5 0.0.0.0

permit ip 192.168.45.32 0.0.0.31 192.168.47.32 0.0.0.15

deny icmp any 192.168.47.5 0.0.0.31

permit tcp any 192.168.47.4 0.0.0.0 eq 80

permit tcp 192.168.47.4 0.0.0.0 any eq

deny ip any 192.168.47.32 0.0.0.15

Allow all web access to server 192.168.47.4

Block all IP access to subnet 192.168.47.32/28

Block all ping messages only to server 192.168.47.5/27

Allow access from subnet 192.168.45.32/27 to subnet 192.168.47.32/28

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Answer:
Explanation:

QUESTION NO: 22
Which of the following are characteristics of named access lists? (Choose three)

A. Individual statements in a named access list may be deleted.
B. They require a numbered range from 1000 to 1099.
C. When created, they must be specified as standard or extended.
D. They are created with the ip access-list command.
E. The entire access list must be deleted before editing.
F. They are applied with the ip name-group command.

Answer: A, C, D
Explanation:
You can identify IP access lists with an alphanumeric string (a name) rather than a
number. Named access lists allow you to configure more IP access lists in a router than if
you were to use numbered access lists. If you identify your access list with a name rather
than a number, the mode and command syntax are slightly different. Currently, only
packet and route filters can use a named list.
Consider the following guidelines before configuring named access lists:

□

Access lists specified by name are not compatible with Cisco IOS Releases prior to 11.2.

□

Not all access lists that accept a number will accept a name. Access lists for packet filters and route filters on interfaces can use a name.

□

A standard access list and an extended access list cannot have the same name.

To configure a named access list (standard and extended):

Router(config)# ip access-list standard *name*	Defines a standard IP access list using a name and enters standard named access list configuration mode.

Router(config)# ip access-list extended *name*	Defines an extended IP access list using a name and enters extended named access list configuration mode.

Reference:

http://www.cisco.com/en/US/products/ps6350/products_configuration_guide_chapter09186a0080430e5b.html

QUESTION NO: 23
Which command is required to apply an access list on a virtual terminal line of a router?

A. Router(config-line)# access-class 10 in
B. Router(config-if)# ip access-class 23 out
C. Router(config-line)# access-group 15 out
D. Router(config-if)# ip access-group 110 in
E. Router(config-line)# access-list 150 in
F. Router(config-if)# ip access-list 128 out

Answer: A
Explanation:

To configure a VTY access lists:

1. Create a standard IP access list that permits only the host or hosts you want to be able to telnet into the routers.

2. Apply the access list to the VTY line with the access-class command.

Here is an example of allowing only host 172.16.10.3 to telnet into a router:

routera(config)#access-list 50 permit 172.16.10.3

routera(config)#line vty 0 4

routera(config-line)#access-class 50 in

QUESTION NO: 24

The following access control list needs to be applied to one of the routers shown in the graphic:

access-list 101 permit tcp 192.168.1.16 0.0.0.15 192.168.2.16 0.0.0.15 eq 23
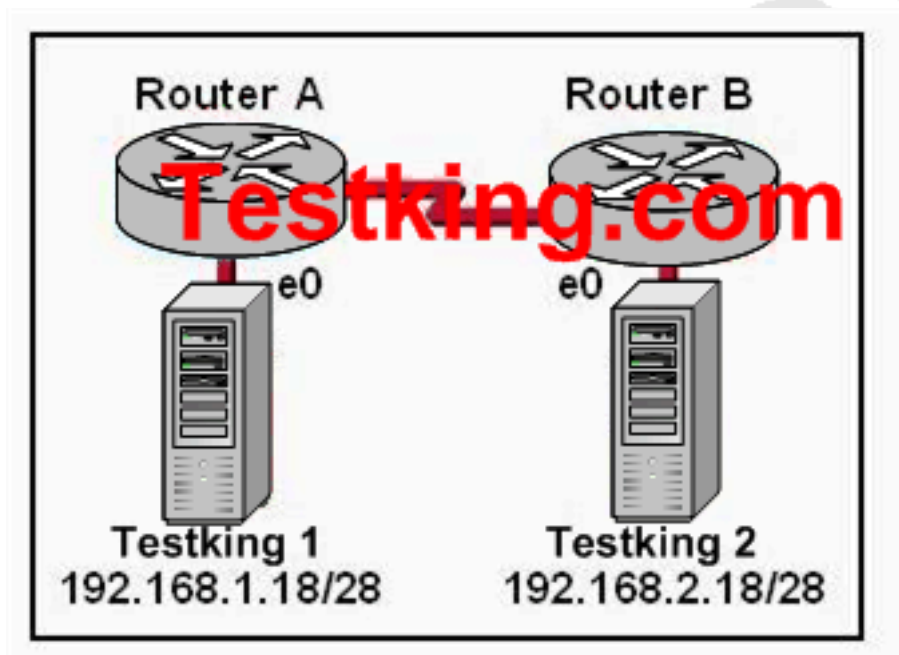
What can be concluded about this ACL? (Choose two.)

A. Telnet traffic from 192.168.1.16 0.0.0.15 to 192.168.2.16 0.0.0.15 is allowed.

B. SMTP traffic from 192.168.2.16 0.0.0.15 to 192.168.1.16 0.0.0.15 is allowed.

C. The ACL is configured to allow traffic from one specific host to another.

D. When the ACL is applied, Testking 1 will be able to ping Testking 2.

E. The ACL should be applied inbound to the e0 interface of Router A.
F. The ACL should be applied outbound to the e0 interface of Router A.

Answer: A, E
Explanation:
The given extended ACL allow the telnet traffic from 192.168.1.16 0.0.0.15 to
192.168.2.16 0.0.0.15. Telnet uses TCP port 23. With access lists, the first network
specified is the source of the traffic and the second is the destination, so since this access
list says to allow telnet traffic from the Tessking1 network to the Testking2 network, it
should be placed on the inbound interface of E0.

QUESTION NO: 25
Two TestKing routers are connected as shown below:
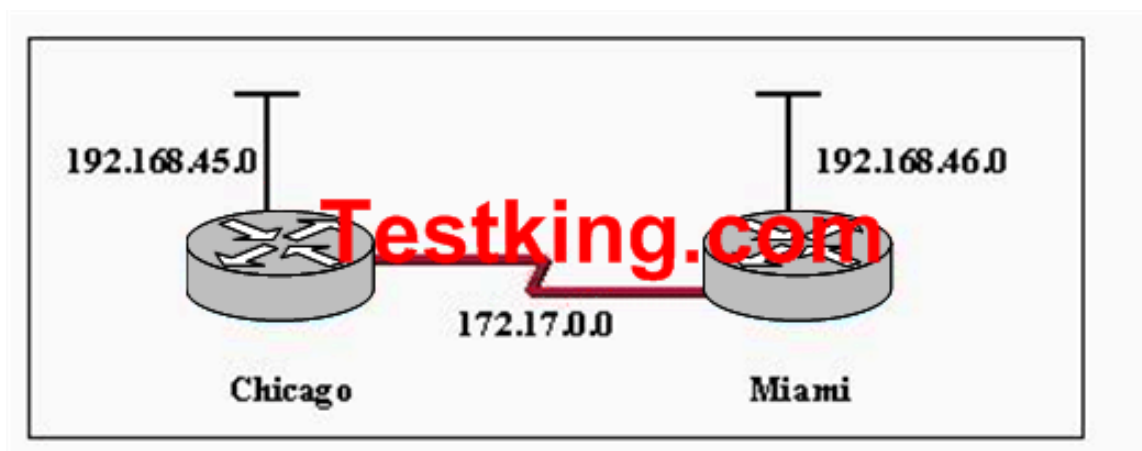
**A network administrator in Miami has been instructed to prevent all traffic
originating on the Chicago LAN from entering the Miami router. Which statement
would accomplish this filtering?**

A. access-list 101 deny ip 192.168.45.0 0.0.0.255 any
B. access-list 101 deny ip 192.168.45.0 0.0.0.0 any
C. access-list 101 deny ip 192.168.46.0 0.0.0.255 192.168.45.0 0.0.0.255
D. access-list 101 deny ip 192.168.46.0 0.0.0.255 any

Answer: A

Explanation:

Using access-list we can allow or deny the packets from different hosts or networks.
There are two types of access-list standard and extended access list.
Standard. Standard Access List can allow or deny the request only on the basis of source
address. Extended Access list can allow or deny on the basis of source, destination,
protocol, port etc.
Syntax of standard Access List:
access-list ACL number permit | deny protocol source address netmask service

QUESTION NO: 26
The TestKing network is shown in the following exhibit:
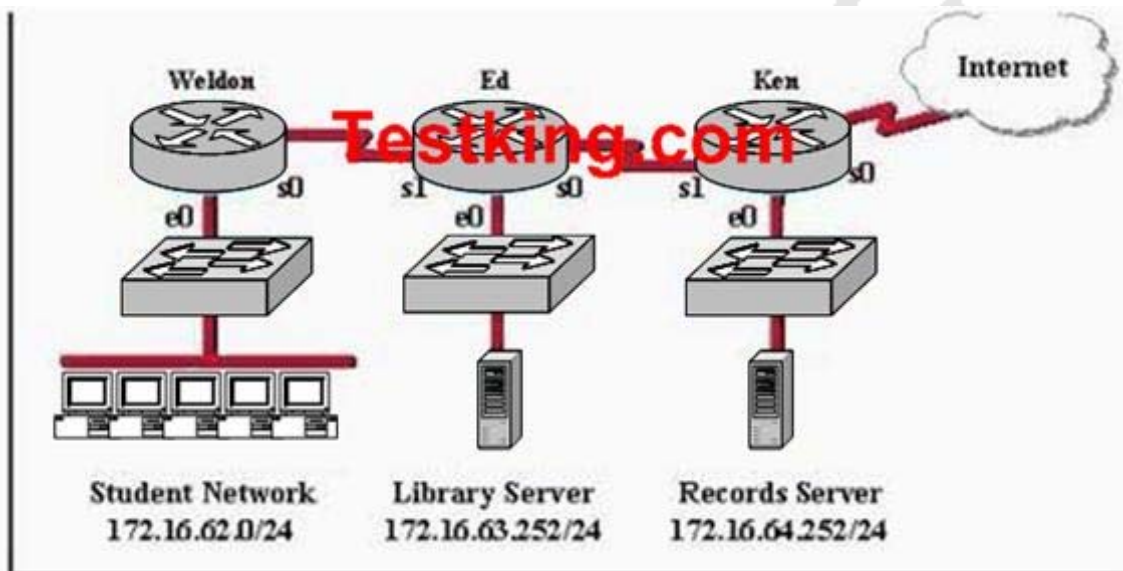
**Refer to the graphic. A named access list called records_block has been written to
prevent student and Internet access to the records server. All other users within the
enterprise should have access to this server. The list was applied to the e0 interface
of the Ken router in the outbound direction. Which of the following conditions
should the access list contain to meet these requirements? (Choose two.)**

A. deny 172.16.64.252 0.0.0.0 172.16.62.0 0.0.0.255
B. deny 172.16.62.0 0.0.0.255 172.16.64.252 0.0.0.0
C. deny 172.16.64.252 0.0.0.0 any
D. permit 172.16.64.252 0.0.0.0 172.16.0.0 0.0.255.255
E. permit 172.16.0.0 0.0.255.255 172.16.64.252 0.0.0.0
F. permit any any

Answer: B, E
Explanation:
When you create the named access list, you can start your policy from permit or deny. As per the question, traffic from the internet access and student networks need to be blocked, with the student network lies on 172.16.62.0/24 network.
The "deny 172.16.62.0 0.0.0.255 172.16.64.0 0.0.0.255" command will deny access from the student network accessing the Record Server. If you don't permit to any other network then at last explicit deny to all.
The "permit 172.16.0.0 0.0.255.255 172.16.64.252 0.0.0.0" allows all other hosts from the 172.16 network to access the Record Server. The implicit deny all will then block Internet users from accessing the records server.

QUESTION NO: 27
The TestKing network is displayed in the following exhibit:

Westfield   Eastfield   Northfield

s0   s1   s0   s1

e0   e0

Graphics Department
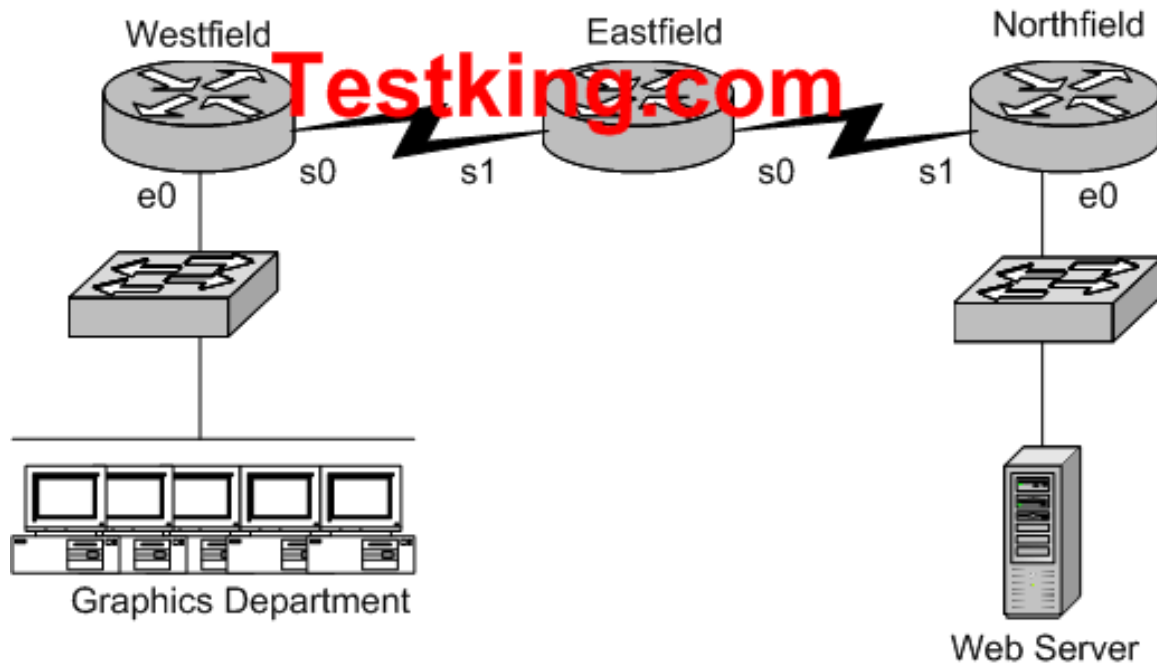
Web Server

An access list has been designed to prevent Telnet traffic from the Graphics Department from reaching the web server attached to the Northfield router. On which router, interface, and in what direction should the access list be placed to most efficiently implement this list? (Choose three.)

A. Westfield router
B. Northfield router
C. s0
D. e0
E. in
F. out

Answer: A, D, E
Explanation:

Extended Access list is used to deny or permit the certain traffic to certain host or network. It is a best practice to implement the extended access list as near to the source of the traffic as possible. So it is better when you apply the access list in e0 interface of Westfield router inbound. This traffic will be inbound on the E0 interface of the Westfield router.

QUESTION NO: 28
What are the general recommendations regarding the placement of access control lists? (Choose two)

A. Standard ACLs should be placed as close as possible to the source of traffic to be denied.
B. Extended ACLs should be placed as close as possible to the source of traffic to be denied .
C. Standard ACLs should be placed as close as possible to the destination of traffic to be denied .
D. Extended ACLs should be placed as close as possible to the destination of traffic to be denied .

Answer: B, C
Explanation:
Standard Access Lists:
l Access-list list# {permit/deny} source IP [wildcard mask]
l interface [router port]
l ip access-group [list#] in|out (out is the default)
l If a match is made, the action defined in this access list statement is performed.
l If no match is made with an entry in the access list, the deny action is performed (implicit deny)
l Should be put close to the destination address because you can not specify the destination address, only the source information is looked at.

Extended Access List:
l Access-list list# {permit/deny} protocol source [source mask] destination [destination mask] operator [port]
l Should be put close to the source
l Since extended ACLs have destination information, you want to place it as close to the source as possible.
l Place an extended ACL on the first router interface the packet enters and specify inbound in the access-group command.

QUESTION NO: 29 DRAG DROP

All hosts in the same subnet with 172.16.5.118/26 must be denied Telnet access to hosts outside the LAN. To complete the bracketed command, [access-list list-number deny tcp 172.16.5.address 0.0.0.mask any eq port], drag each appropriate option on the left to its proper placeholder on the right. (Not all options are used.)

0	**list-number**
	Place here
1	
	address
23	Place here
63	**mask**
64	Place here
80	**port**
	Place here
128	
255	

Answer:
Explanation:

list-number
128

address
64

mask
63

port
23
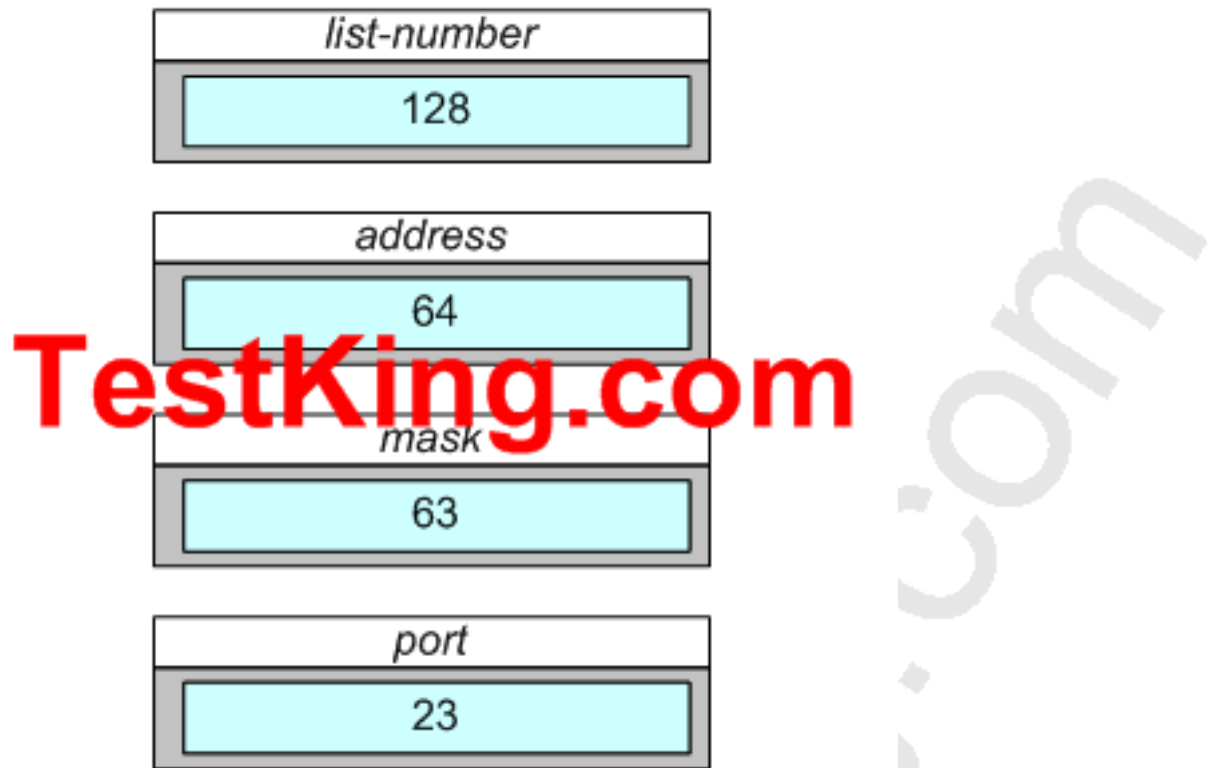
QUESTION NO: 30
**Unauthorized users have used Telnet to gain access to a company router. The
network administrator wants to configure and apply an access list to allow Telnet
access to the router, but only from the network administrator's computer. Which
group of commands would be the best choice to allow only the IP address 172.16.3.3
to have Telnet access to the router?**

A. access-list 101 permit tcp any host 172.16.3.3 eq telnet
 access-list 101 permit ip any any
 interface s0/0
 ip access-group 101 in
B. access-list 3 permit host 172.16.3.3
 line vty 0 4
 ip access-group 3 in
C. access-list 101 permit tcp any host 172.16.3.3 eq telnet
 interface s0/0ip access-group 101 in
D. access-list 3 permit host 172.16.3.3
 line vty 0 4

access-class 3 in

Answer: D
Explanation:
To restrict incoming and outgoing connections between a particular vty (into a Cisco device) and the addresses in an access list, use the access-class command in line configuration mode.
Example:
The following example defines an access list that permits only hosts on network 192.89.55.0 to connect to the virtual terminal ports on the router:
access-list 12 permit 192.89.55.0 0.0.0.255
line 1 5
access-class 12 in
Reference:
http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_command_reference_chapter09186a0080

QUESTION NO: 31 DRAG DROP
An interface has been configured with the access list that is shown below. On the basis of that access list, drag each information packet on the left to the appropriate category on the right.

access-list 107 deny tcp 207.16.12.0 0.0.3.255 any eq http
access-list 107 permit ip any any

| source IP 207.16.32.14, destination application http |
| source IP 207.16.15.9, destination port 23 |
| source IP 207.16.14.7, destination port 80 |
| source IP 207.16.13.14, destination application http |
| source IP 207.16.16.14, destination port 53 |

Permitted
Place here
Place here

Denied
Place here
Place here
Place here

Answer:
Explanation:

Permitted
source IP 207.16.15.9, destination port 23
source IP 207.16.32.14, destination application http

Denied
source IP 207.16.16.14, destination port 53
source IP 207.16.14.7, destination port 80
source IP 207.16.13.14, destination application http

QUESTION NO: 32

In the TestKing network shown below, a network technician enters the following line into the router:

Tidmore1(config)# access-list 106 deny tcp 192.168.254.0 0.0.0.255 any eq www.

What is the effect of this configuration, given that the router was already configured as shown below?

access-list 106 permit ip host 192.168.254.7 any
access-list 106 deny icmp 192.168.254.0 0.0.0.255 any echo
access-list 106 permit ip any any
interface Fa0/0
  ip access-group 106 in
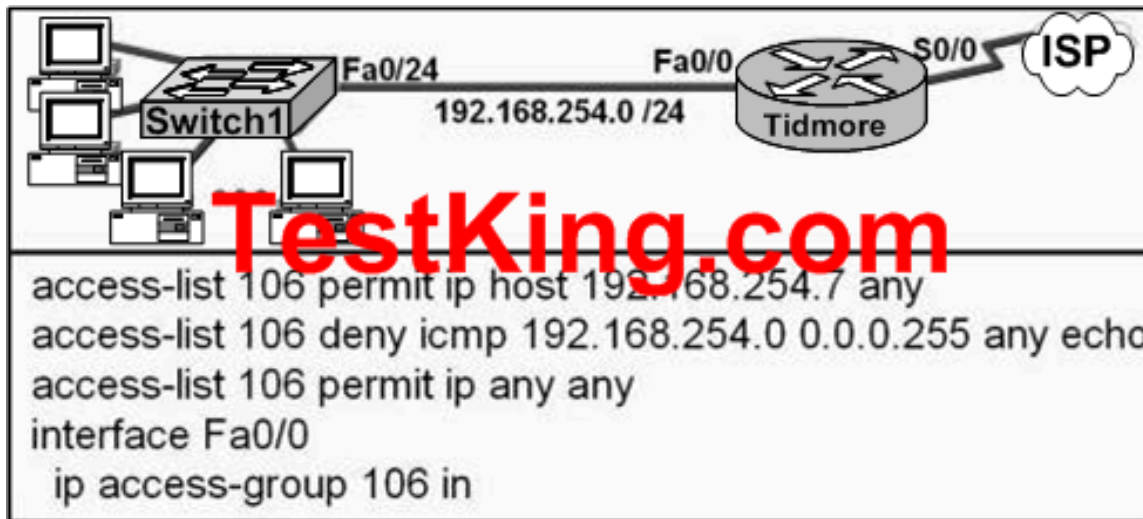
A. Web pages from the Internet cannot be accessed by hosts in the 192.168.254.0 LAN.
B. No hosts in the 192.168.254.0 LAN except 192.168.254.7 can access web pages from the Internet.
C. The change has no effect on the packets being filtered.
D. All traffic from the 192.168.254.0 LAN to the Internet is permitted.

Answer: C
Explanation:
Traffic that comes into the router is compared to ACL entries based on the order that the entries occur in the router. New statements are added to the end of the list. The router continues to look until it has a match. If no matches are found when the router reaches the end of the list, the traffic is denied. For this reason, you should have the frequently hit entries at the top of the list. There is an "implied deny" for traffic that is not permitted. A single-entry ACL with only one "deny" entry has the effect of denying all traffic. You must have at least one "permit" statement in an ACL or all traffic is blocked. In this example, since the statement will be added to the end of the access list, and since there is already an entry that permits all IP traffic, the www traffic will be allowed, all traffic will never reach this access list entry.

QUESTION NO: 33

For security reasons, the network administrator needs to prevent pings into the corporate networks from hosts outside the internetwork. Which protocol should be blocked with access control lists?

A. UDP
B. ICMP
C. IP
D. TCP

Answer: B
Explanation:
ICMP is used for error and control messages within the IP world and is very much integrated with IP. Ping is a computer network tool used to test whether a particular host is reachable across an IP network. Ping works by sending ICMP "echo request" packets to the target host and listening for ICMP "echo response" replies.

QUESTION NO: 34 DRAG DROP
The hosts in the VLAN with the subnet address of 172.16.4.0/22 need to be prevented from accessing websites on the internet. Drag the appropriate options from the left to complete this command:
access-list 156 deny protocol 172.16.4.0 mask any eq port. (Note that not all options are used)

Exhibit:

23	protocol
80	Place here
ip	mask
tcp	Place here
udp	port
0.0.0.3	Place here
0.0.0.255	
0.0.3.255	

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Answer:
Explanation:

protocol
tcp

mask
0.0.3.255

port
80
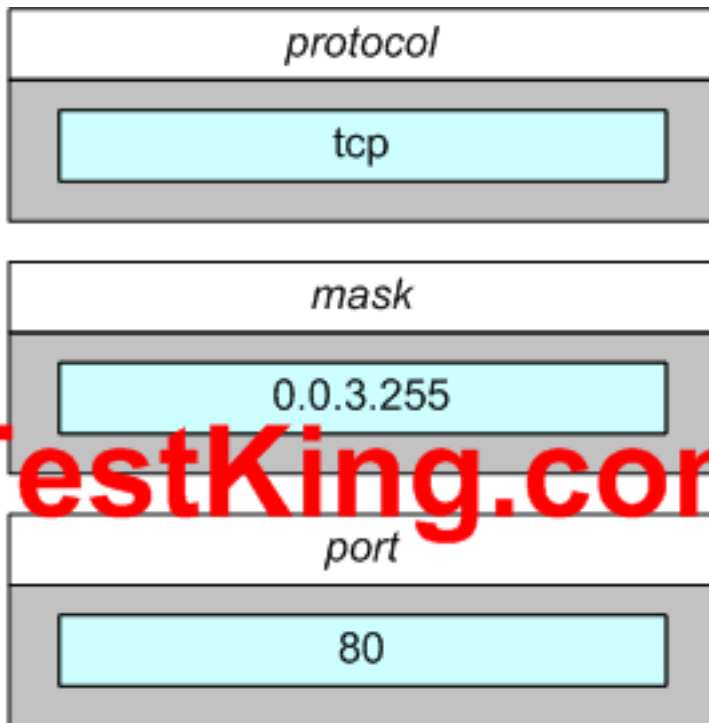
QUESTION NO: 35
**A TestKing network administrator has been instructed to prevent all traffic
originating on the Chicago LAN from entering the Miami router. Which command
would implement the access list on the interface of the Miami router?**

A. access-list 101 out
B. access-list 101 in
C. ip access-group 101 in

D. ip access-group 101 out

Answer: C
Explanation:
To control access to an interface, use the ip access-group command in interface configuration mode.

Access lists are applied on either outbound or inbound interfaces. For standard inbound access lists, after receiving a packet, the Cisco IOS software checks the source address of the packet against the access list. For extended access lists, the router also checks the destination access list. If the access list permits the address, the software continues to process the packet. If the access list rejects the address, the software discards the packet and returns an ICMP host unreachable message.

For standard outbound access lists, after receiving and routing a packet to a controlled interface, the software checks the source address of the packet against the access list. For extended access lists, the router also checks the destination access list. If the access list permits the address, the software sends the packet. If the access list rejects the address, the software discards the packet and returns an ICMP host unreachable message.

In our example, we need to prevent traffic from coming in to the Miami router, so the "in" keyword must be used to specify incoming traffic.

QUESTION NO: 36
Refer to the exhibit. A network associate creates the configuration shown in the exhibit. What will be the results of this configuration?

Exhibit:

```
access-list 100 permit ip 172.16.232.253 0.0.0.0 any
access-list 110 deny tcp 172.16.232.0 0.0.0.255  any eq telnet
access-list 120 deny icmp 172.16.232.0 0.0.0.255 any echo
access-list 130 permit ip any any
```

A. The configuration creates an access list that allows all the hosts in the 172.16.232.0/24 subnet to use Telnet but not to access web pages.

B. The configuration creates an access list that allow all traffic from the host 172.16.232.253 except Telnet and ping traffic.
C. The fourth line of the configuration creates an access list that allows only traffic from the host172.16.232.253 to anywhere in the network.
D. The configuration creates four access lists.

Answer: D
Explanation:
With all access list entries, the order of entries is important. Normally, when a packet is evaluated against entries in an access list, the entries are evaluated in sequential order, and when a match occurs, no more entries are evaluated. However, this applies to access lists with the same number, but has multiple lines. When a different number is specified for each line, a different, separate, access list is actually created as is the case here.

Section 11: Implement simple WAN protocols (22 questions)

QUESTION NO: 1
When configuring Frame Relay using point-to-point subinterfaces, which of the following must not be configured? (Select one)

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

Answer: C
Explanation:
Frame Relay does not require IP addresses on physical interfaces. A subnet address is usually assigned to each point-to-point connection. Therefore, only one DLCI can be configured per point-to-point subinterface. On point-to-point subinterfaces, the destination is identified and configured with the frame-relay interface-dlci command beginning in interface configuration mode. When configured on a point-to-point subinterface, the command associates the selected point-to-point subinterface with a DLCI. The command also allows users to select the type of Frame Relay encapsulation to be used on the specific VC. The command can be executed without specifying the Frame Relay encapsulation type to be used. By default, the Cisco Frame Relay encapsulation type will be used.

QUESTION NO: 2
You are in the midst of configuring a router for a Frame Relay network. What could you do to prevent split horizon problems? (Select all that apply)

A. Configure a separate sub-interface for each PVC. Assign a unique DLCI and subnet to each sub-interface.
B. Configure each Frame Relay circuit as a point-to-point line to support multicast and broadcast traffic.
C. Configure one sub-interface to disperse into multiple PVC connections to multiple remote router interfaces.
D. Configure as many as possible sub-interfaces on the same subnet.
E. Use the "no ip split-horizons" command on the physical interface.

Answer: A, E
Explanation:
The best solution is to configure subinterfaces for each virtual connection, because the individual virtual circuits can be maintained and split horizon can remain on.Routing update information that is received through one subinterface can be propagated to other subinterfaces, because each sub-interface is treated as a completely separate interface. Configuring Frame Relay subinterfaces ensures that a single physical interface is treated as multiple virtual interfaces. This capability allows you to overcome split horizon rules so packets received on one virtual interface can be forwarded to another virtual interface, even if they are configured on the same physical interface. Another alternative to using sub-interfaces is to simply disable the split horizon mechanism as shown in choice E.
 Reference: http://www.cisco.com/warp/public/116/fr_faq.html

QUESTION NO: 3
A new frame-relay network is being implemented and inverse ARP does not appear to be operating correctly. Which alternative command can be used to provide connectivity?

A. frame-relay arp
B. frame-relay map
C. frame-relay interface-dlci
D. frame-relay lmi-type
E. frame-relay pvc

Answer: B
Explanation:
When using dynamic address mapping, Inverse ARP requests a next-hop protocol address for each active PVC. Once the requesting router receives an Inverse ARP response, it updates its DLCI-to-Layer 3 address mapping table. Dynamic address mapping is enabled by default for all protocols enabled on a physical interface. If the Frame Relay environment supports LMI autosensing and Inverse ARP, dynamic address mapping takes place automatically. Therefore, no static address mapping is required.
If the environment does not support LMI autosensing and Inverse ARP, a Frame Relay map must be manually configured. Use the frame-relay map command to configure static address mapping. Once a static map for a given DLCI is configured, Inverse ARP is disabled on that DLCI.

QUESTION NO: 4
Which of the following Frame-Relay encapsulation commands would you use, if you had to connect your Cisco router to a non-Cisco router?

A. TestKRouter(config-if)# Encapsulation frame-relay dot1q
B. TestKRouter(config-if)# Encapsulation frame-relay aal5snap
C. TestKRouter(config-if)# Encapsulation frame-relay ietf
D. TestKRouter(config-if)# Encapsulation frame-relay isl
E. None of the above

Answer: C
Explanation:
In general, the IETF Frame Relay encapsulation should be used when connecting a Cisco router to non-Cisco equipment across a Frame Relay network. The IETF Frame Relay encapsulation allows interoperability between equipment from multiple vendors.
Both Cisco and IETF encapsulations for Frame Relay can be configured on a per-virtual-circuit (VC) basis. This gives greater flexibility when configuring Frame Relay in a multi-vendor environment. A user can specify the Frame Relay encapsulation types to be used on different virtual circuits configured under the same physical interface.
Incorrect Answers:
 A, D: 802.1Q and ISL are trunking encapsulation types and have nothing to do with frame relay.
B. AAL 5 SNAP is an ATM encapsulation and is not related to frame relay.

QUESTION NO: 5
The Testking Network is using ISDN to provide connectivity between TestKing1 and TestKing2 as shown below:

Assuming that the ISDN switch doesn't require SPIDs, which of the following commands would you implement to bring up the ISDN connection and provide connectivity between the two routers? (Select three answer choices)

A. Router(config-if)# encapsulation HDLC
B. Router(config)# dialer-list 1 protocol ip permit
C. Router(config)# **isdn switch-type type**
D. Router(config)# **dialer map ip address name** connection number
E. Router(config-if)#dialer-group 1
F. Router(config-if)# **ip address address subnet mask**

Answer: B, E, F
Explanation:
The dialer group number enables dialer-list on this interface. The dialer-list is to be defined in global configuration mode as shown in B. Finally, the interfaces should be configured with the proper IP address and subnet mask.
Incorrect Answers:
A. ISDN BRI interfaces should be configured with PPP encapsulation.
C. This is not always required, as the default switch type may be sufficient. In addition, if no SPIDs are required, then there is a good chance that the ISDN switch-type does not need to be explicitly defined.
D. This command is using the incorrect syntax.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 310+337

QUESTION NO: 6
You are about to configure PPP n the interface of a Cisco router. Which authentication methods could you use? (Select two answer choices)

A. SSL
B. SLIP
C. PAP
D. LAPB
E. CHAP
F. VNP

Answer: C, E
Explanation:
Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP) authenticate the endpoints on either end of a point-to-point serial link. Chap is the preferred method today because the identifying codes flowing over the link are created using a MD5 one-way hash, which is more secure that the clear-text passwords sent by PAP.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 314

QUESTION NO: 7
Which of the following can LCP successfully negotiate during the establishment of a PPP connection? (Select three answer choices)

A. Q.931
B. IPCP
C. multilink
D. CHAP
E. callback

Answer: C, D, E
Explanation:
PPP protocol constitutes of LCP and NCP whose functions are:

1. LCP negotiates control options:
authentication, multilink, callback, compression and error detection.

2. IPCP(IP Control protocol) is supported by NCP.

QUESTION NO: 8 DRAG DROP
Your goal is to illustrate the five necessary steps of configuring dial-on-demand routing (DDR) on an ISDN BRI. Place the parameters on the right to the proper slot on the left. (Note: not all the parameters will be used)

Place here	Select from these	
Place 1st parameter here	unicast	\<next-hop-address\>
Place 2nd parameter here	dial string	dialer
Place 3rd parameter here	map	group
Place 4th parameter here	dialer-list	\<protocol\>
Place 5th parameter here		

Answer:
Explanation:
Place 1st - dialer
Place 2nd - map
Place 3rd - protocol
Place 4th - next-hop-address
Place 5th - dial string
Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 342

QUESTION NO: 9

You have just obtained a modular Cisco router with 2 serial connections and a BRI/U interface. What other physical piece of hardware is required in order to establish an ISDN connection?

A. Nothing. The router is already suitable.
B. A BRI WAN interface in the router.
C. An external NT1 to terminate the local loop.
D. A TA/NT1 device on the router.

Answer: A
Explanation:
For routers with an integrated BRI/U interface no other device needs to be installed; the line supplied by the telephone company is simply plugged directly into the router's BRI interface. This is true for modern router interfaces. Legacy ISDN connections required the use of additional hardware, such as an NT1 device in order to provide the correct ISDN signaling between the router and the carrier's ISDN network.
Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 331

QUESTION NO: 10
In a lab, two routers are connected directly together using serial interfaces in a back-to-back configuration. No external DCE devices are being used. What additional command is needed to bring this link up?

A. serial up
B. clockrate
C. clock rate
D. dce rate
E. dte rate

Answer: C
Explanation:
The clock rate command (two words), is used to provide clocking on a line where no DCE device is located. Clocking must be provided by one end of this link. Normally in a point to point HDLC or PPP connection the clock rate is supplied by the network provider.
Incorrect Answers:
A. This is an invalid command
B. This command will not work. The clock rate command must use two words.

D, E: These are invalid commands.

QUESTION NO: 11
An ISDN link can be encapsulated using either PPP or HDLC. What are the advantages of using PPP? (Select two answer choices)

A. PPP is easier to configure and maintain than HDLC.
B. PPP is consistently implemented among different equipment vendors.
C. PPP will run faster and more efficiently than HDLC on circuit-switched ISDN links.
D. PPP authentication will prevent unauthorized callers from establishing an ISDN circuit.
E. PPP can be routed across public facilities, while HDLC is not routable in circuit-switched networks.
F. PPP supports asynchronous communication.

Answer: B, D
Explanation:
PPP has numerous advantages over HDLC. Unlike HDLC which is Cisco proprietary, PPP was designed for multi-protocol interoperability. Secondly, PPP supports authentication, using either PAP or CHAP. Finally, PPP supports error correction and the use of bonded multilink circuits.

Incorrect Answers:
A. The default encapsulation is HDLC. PPP must be explicitly configured and there are many more options available with it, so it is more complicated than HDLC.
C. HDLC is slightly more efficient than PPP.
E. Neither PPP nor HDLC work in public circuit switched environments.
F. Although this is true, it would not be considered an advantage on an ISDN link, as ISDN signaling is not asynchronous.
Reference: CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) Page 308-310

QUESTION NO: 12
A new frame relay connection is being brought up. Which of the following are frame relay LMI type options that can be configured on this new link? (Select all that apply.)

A. EIA/TIA

B. Q.932
C. Q.933A
D. IEEE
E. Cisco
F. Annex D

Answer: C, E, F
Explanation:
There are three options for frame relay LMI types. The default is Cisco, which is
proprietary to Cisco routers. The second option is ANSI, which is also known as Annex
D. The final option is the ITU standard, which is known as Annex A or Q.933A.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN
1-58720-083-X) Page 382

QUESTION NO: 13
You are troubleshooting a frame relay connection and wish to view the LMI traffic
stats. Which command should you issue?

A. Show interface lmi
B. Show frame-relay lmi
C. Show interface frame-relay
D. Debug frame-relay interface.

Answer: B
Explanation:
To view Frame-Relay LMI statistics, enter the command "show frame-relay lmi"
This will view various statistics on the link, including the LMI status enquiries that were
sent and received on the interface.

QUESTION NO: 14
You have a TestKing router that is connected to a frame relay WAN link using a
serial DTE interface. What determines the interface clock rate?

A. It is determined by the CSU/DSU.
B. It is determined by the far end device.

C. It is specified in the clock rate command.
D. It is determined by the Layer 1 bit stream timing.

Answer: A
Explanation:
When connecting a router to a frame relay service provider, the clock rate is determined
by the provider network. When connecting Cisco routers back to back using frame relay,
the clock rate must be determined by the DCE side, not the DTE side. Either way, the
clock rate is determined by the far end device. With a router using a DTE serial interface,
the clock rate is determined by the attached CSU/DSU.

QUESTION NO: 15
The Testking network consists of 3 frame relay sites as shown in the diagram below:
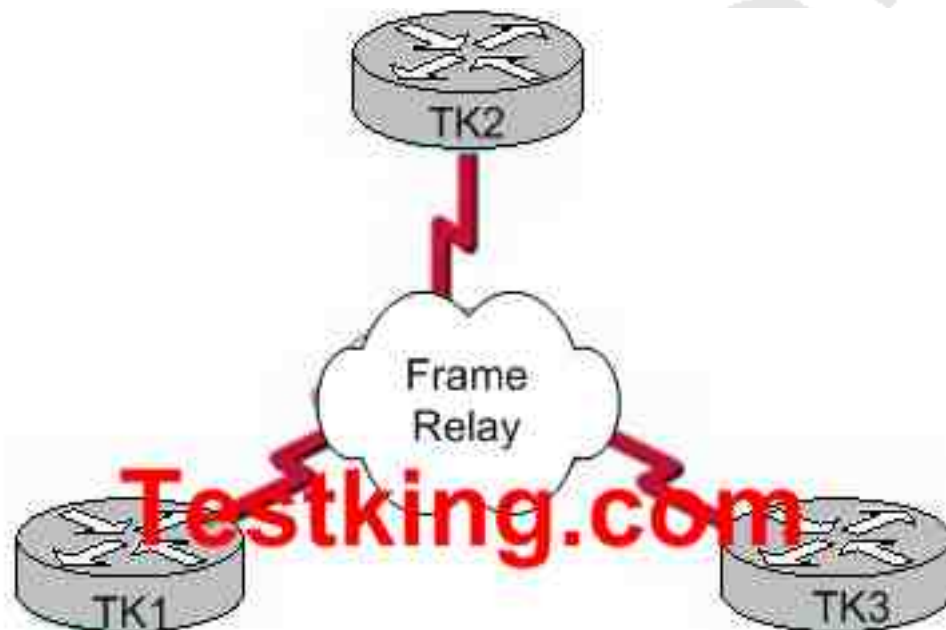
**Which encapsulation type is appropriate to use in this design if the routers are all
from different vendors?**

A. IETF

B. Cisco
C. ANSI
D. Q953A
E. IEEE

Answer: A
Explanation:
Cisco routers use the Cisco frame relay encapsulation type for all frame relay interfaces. This is perfectly acceptable in all routers within the network are Cisco routers, but problems can arise for frame relay networks when a router from a different vendor is used. To prevent these problems, the industry standard IETF frame relay encapsulation should be used. To configure this, use the "encapsulation frame-relay ietf" interface command.

QUESTION NO: 16
Which statements are true about EIGRP successor routes? (Choose two)

A. A successor route is used by EIGRP to forward traffic to a destination.
B. Successor routes are saved in the topology table to be used if the primary route fails.
C. Successor routes are flagged as "active" in the routing table.
D. A successor route may be backed up by a feasible successor route.
E. Successor routes are stored in the neighbor table following the discovery process.
F. Successors are not used in EIGRP.

Answer: A, D
Explanation:
The following are some terms relating to EIGRP:
1. Feasible Distance: The lowest calculated metric to each destination
2. Feasibility Condition: A condition that is met if a neighbor's advertised distance to a destination is lower that the router's Feasible Distance to that same destination.
3. Successor: The neighbor that has been selected as the next hop for a given destination based on the Feasibility Condition.
Reference: Jeff Doyle, Routing TCP/IP, Volume I, Chapter 8: Enhanced Interior Gateway Routing Protocol (EIGRP), p.336-337, Cisco Press, (ISBN 1-57870-041-8)
Additional info:

The Feasible Condition is met when the receiving router has a Feasible Distance (FD) to a particular network and it receives an update from a neighbor with a lower advertised or Reported Distance (RD) to that network. The neighbor then becomes a Feasible Successor (FS) for that route because it is one hop closer to the destination network. There may be a number of Feasible Successors in a meshed network environment. The RD for a neighbor to reach a particular network must always be less than the FD for the local router to reach that same network. In this way EIGRP avoids routing loops. This is why routes that have RD larger than the FD are not entered into the Topology table.
Reference: Ravi Malhotra, IP Routing, Chapter 4: Enhanced Interior Gateway Routing Protocol (EIGRP), O'Reilly Press, January 2002 (ISBN 0-596-00275-0)

QUESTION NO: 17
The Testking network is planning to utilize both the IGRP and EIGRP routing protocols in their network as shown below:

Router TK3 is using IGRP, while router TK1 is using EIGRP. TestKing plans to add new routers and run EIGRP on them, but TestKing does not want to configure redistribution.
Which AS numbering scheme should TestKing implement?

A. IGRP AS number 40; EIGRP AS number 41
B. IGRP AS number 41; EIGRP AS number 40
C. IGRP AS number 22; EIGRP AS number 22

D. IGRP AS number 0; EIGRP AS number 0
E. IGRP AS number 1; EIGRP AS number 255

Answer: C
Explanation:
EIGRP and IGRP will redistribute routes automatically, as long as the autonomous
system numbers are the same for each protocol. With automatic redistribution, all
networks shown in the network above will be reachable, with no additional configuration
changes needed on the TK2 router.

Incorrect Answers:
A, B, E: The AS numbers should be the same for both EIGRP and IGRP
D. EIGRP and IGRP both require an AS number greater than 0.

QUESTION NO: 18
**A network administrator needs to configure a router for a Frame Relay connection
to a non-Cisco router.**
**Which of the following commands will prepare the WAN interface for this
connection?**

A. Router(config-if)# encapsulation frame-relay q933a
B. Router(config-if)# encapsulation frame-relay ansi
C. Router(config-if)# encapsulation frame-relay ietf
D. Router(config-if)# encapsulation frame-relay isl
E. None of the above

Answer: C
Explanation:
The IETF Frame Relay encapsulation should be used when
connecting a Cisco router to non-Cisco equipment across a Frame Relay
network. The IETF Frame Relay encapsulation allows interoperability between
equipment from multiple vendors.
Both Cisco and IETF encapsulations for Frame Relay can be configured on a
per-virtual-circuit (VC) basis. This gives greater flexibility when
configuring Frame Relay in a multi-vendor environment. A user can specify the
Frame Relay encapsulation types to be used on different virtual circuits
configured under the same physical interface.

Incorrect Answers:
A, B: These are frame relay LMI types and are not used as encapsulation types.

D. ISL is a trunking encapsulation type and has nothing to do with frame relay.

QUESTION NO: 19
In the context of configuring dial-on-demand routing using ISDN, what is the purpose of the dialer-list command?

A. to identify valid numbers for incoming calls
B. to define the type of ISDN switch at the central office
C. to specify the list of outgoing phone numbers used by the router
D. to associate a dial configuration with a physical interface
E. to define interesting traffic that will enable the link

Answer: E
Explanation:
To define a DDR dialer list to control dialing by protocol or by a combination of a protocol and a previously defined access list, use the dialer-list protocol global configuration command. This is used to define the interesting traffic. Dialing occurs when an interesting packet (one that matches access list specifications) needs to be output on an interface. Using the standard access list method, packets can be classified as interesting or uninteresting. In the following example, IGRP TCP/IP routing protocol updates are not classified as interesting and do not initiate calls:

access-list 101 deny igrp 0.0.0.0 255.255.255.255 255.255.255.255 0.0.0.0

The following example classifies all other IP packets as interesting and permits them to initiate calls:

access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255

Then the following command places list 101 into dialer access group 1:
dialer-list 1 protocol ip list 101

QUESTION NO: 20
While troubleshooting a link problem on one of the TestKing routers, the following output was seen:

```
TestKing3# show interfaces serial 0/0
Serial0/0 is up, line protocol is down
  Hardware is HD64570
  Internet address is 192.168.100.1/24
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set
  Keepalive set (10 sec)
```

Based on the information above, what are possible causes for the status of this interface? (Select three)

A. The interface is shut down.
B. No keepalive messages are received.
C. The clockrate is not set.
D. No loopback address is set.
E. No cable is attached to the interface.
F. There is a mismatch in the encapsulation type.

Answer: B, C, F
Explanation:
Table 15-1: Serial Lines: show interfaces serial Status Line Conditions - This table shows the interface status conditions, possible problems associated with the conditions, and solutions to those problems.

Status Line Condition	Possible Problem	Solution
Serial x is up, line protocol is up		This is the proper status line condition. No action required.
Serial x is down, line protocol is down (DTE mode)	• Typically indicates that the router is not sensing a CD signal (that is, CD is not active). • Telephone company problem-Line is down or line is not connected to CSU/DSU • Faulty or incorrect cabling • Hardware failure (CSU/DSU)	1. Check the LEDs on the CSU/DSU to see if CD is active, or insert a breakout box on the line to check for the CD signal. 2. Verify that you are using the proper cable and interface (see your hardware installation documentation). 3. Insert a breakout box and check all control leads. 4. Contact your leased-line or other carrier service to see if there is a problem. 5. Swap faulty parts. 6. If you suspect faulty router hardware, change the serial line to another port. If the connection comes up, the previously connected interface has a problem.
	• Local or remote	1. Put the modem, CSU, or DSU in local loopback mode and use the **show interfaces serial** command to see if the line protocol comes up. If the line protocol comes up, a telephone company problem or a failed remote router is the likely problem. 2. If the problem appears to be on the remote end, repeat Step 1 on the remote modem, CSU, or DSU. 3. Verify all cabling. Make sure that the cable is attached to the correct interface, the correct CSU/DSU, and the correct telephone company network termination point. Use the **show controllers** EXEC command to determine which cable is

| Serial x is up, line protocol is down (DTE mode) | • misconfigured
• Keepalives are not being sent by remote router
• Leased-line or other carrier service problem- Noisy line, or misconfigured or failed switch
• Timing problem on cable (SCTE not set on CSU/DSU) Failed local or remote CSU/DSU
• Failed local or remote CSU/DSU
• Router hardware failure (local or remote) | 4. Enable the **debug serial interface** EXEC command.
Caution: Because debugging output is assigned a high priority in the CPU process, it can render the system unusable. For this reason, use debug commands only to troubleshoot specific problems or during troubleshooting sessions with Cisco technical support staff. Moreover, it is best to use **debug** commands during periods of low network traffic and fewer users. Debugging during these periods decreases the likelihood that increased **debug** command processing overhead will affect system use.
5. If the line protocol does not come up in local loopback mode and if the output of the **debug serial interface** EXEC command shows that the keepalive counter is not incrementing, a router hardware problem is likely. Swap router interface hardware.
6. If the line protocol comes up and the keepalive counter increments, the problem is not in the local router. Troubleshoot the serial line as described in the sections "Troubleshooting Clocking Problems" and "CSU and DSU Loopback Tests," later in this chapter.
7. If you suspect faulty router hardware, change the serial line to an unused port. If the connection comes up, the previously connected interface has a problem. |

|		
Serial x is up, line protocol is down (DCE mode)	• Missing **clockrate** interface configuration command • DTE device does not support or is not set up for SCTE mode • Failed remote CSU or DSU • Failed or incorrect cable • Router hardware failure	1. Add the **clockrate** interface configuration command on the serial interface. **Syntax:** **clock rate** *bps* **Syntax Description:** ○ *bps*-Desired clock rate in bits per second: 1200, 2400, 4800, 9600, 19200, 38400, 56000, 64000, 72000, 125000, 148000, 250000, 500000, 800000, 1000000, 1300000, 2000000, 4000000, or 8000000. 2. Set the DTE device to SCTE mode if possible. If your CSU/DSU does not support SCTE, you may have to disable SCTE on the Cisco router interface. See the section "Inverting the Transmit Clock," later in this chapter. 3. Verify that the correct cable is being used. 4. If the line protocol is still down, there is a possible hardware failure or cabling problem. Insert a breakout box and observe leads. 5. Replace faulty parts as necessary.
Serial x is up, line protocol is up (looped)	A loop exists in the circuit. The sequence number in the keepalive packet changes to a random number when a loop is initially detected.	1. Use the **show running-config** privileged EXEC command to look for any loopback interface configuration command entries. 2. If you find a **loopback** interface configuration command entry, use the **no loopback** interface configuration command to remove the loop. 3. If you do not find the **loopback** interface configuration command, examine the CSU/DSU to see if they are configured in manual loopback

	If the same random number is returned over the link, a loop exists.	mode. If they are, disable manual loopback. 4. Reset the CSU or DSU, and inspect the line status. If the line protocol comes up, no other action is needed. 5. If the CSU or DSU is not configured in manual loopback mode, contact the leased-line or other carrier service for line troubleshooting assistance.
Serial x is up, line protocol is down (disabled)	• High error rate due to telephone company service problem • CSU or DSU hardware problem • Bad router hardware (interface)	1. Troubleshoot the line with a serial analyzer and breakout box. Look for toggling CTS and DSR signals. 2. Loop CSU/DSU (DTE loop). If the problem continues, it is likely that there is a hardware problem. If the problem does not continue, it is likely that there is a telephone company problem. 3. Swap-out bad hardware as required (CSU, DSU, switch, local or remote router).
Serial x is administratively down, line protocol is down	• Router configuration includes the **shutdown** interface configuration command • Duplicate IP address	1. Check the router configuration for the **shutdown** command. 2. Use the **no shutdown** interface configuration command to remove the **shutdown** command. 3. Verify that there are no identical IP addresses using the **show running-config** privileged EXEC command or the **show interfaces** EXEC command. 4. If there are duplicate addresses, resolve the conflict by changing one of the IP addresses.

Reference:
http://www.cisco.com/en/US/tech/tk713/tk628/technologies_tech_note09186a00800a758d.shtml

QUESTION NO: 21
Exhibit:
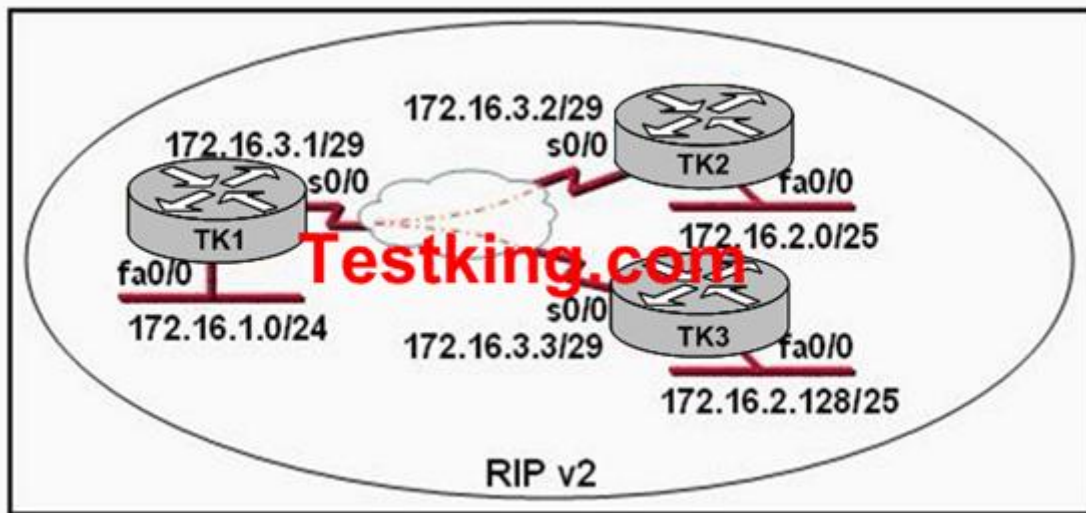
S0/0 on TK1 is configured as a multipoint interface to communicate with TK2 and TK3 in the hub-and-spoke Frame Relay topology shown in the exhibit. Originally, static routes were configured between these routers to successfully route traffic between the attached networks. What will need to be done in order to use RIP v2 in place of the static routes?

A. Configure the no ip subnet-zero command on TK1, TK2, and TK3.
B. Dynamic routing protocols such as RIP v2 cannot be used across Frame Relay networks.
C. Configure the s0/0 interface on TK1 as two subinterfaces and configure point-to-point links to TK2 and TK3.
D. Change the 172.16.2.0/25 and 172.16.2.128/25 subnetworks so that at least two bits are borrowed from the last octet.

E. Change the network address configurations to eliminate the discontiguous 172.16.2.0/25 and 172.16.2.128/25 subnetworks.

Answer: C
Explanation:
For Dynamic Routing in Hub-and spoke topology, configure the subinterface for each link then define the link as point to point. One reason for the use of subinterfaces is to circumvent the rule of split horizon. Split horizon dictates that a route cannot be advertised out the same interface upon which it was learned in the first place. This can be a problem in hub and spoke frame relay networks, but by using pt-pt subinterfaces this problem will be eliminated.

QUESTION NO: 22
A network administrator needs to configure a router for a Frame Relay connection to a non-Cisco router. Which of the following commands will prepare the WAN interface for this connection?

A. Router(config-if)# encapsulation frame-relay q933a
B. Router(config-if)# encapsulation frame-relay ansi
C. Router(config-if)# encapsulation frame-relay ietf
D. Router(config-if)# encapsulation frame-relay isl

Answer: C
Explanation:
The default encapsulation is Cisco unless you manually type in IETF, and Cisco is the type used when you are connecting two Cisco devices. You'd want to opt for the IETF-type encapsulation if you needed to connect a Cisco device to a non-Cisco device with Frame Relay. Whichever you choose, make sure that the Frame Relay encapsulation is the same on both ends.

Topic 3: TROUBLESHOOTING (205 questions)

Section 1: Utilize the OSI model as a guide for systematic network troubleshooting (10 questions)

QUESTION NO: 1
You are logged into a router and with to view the layer 3 information about your neighboring Cisco routers. What IOS command gives layer 3 information for of the directly connected router interfaces?

A. show ip links
B. show cdp neighbor
C. show cdp neighbor detail
D. show ip clients
E. show ip route
F. None of the above

Answer: C
Explanation:
To display detailed information about neighboring devices discovered using Cisco Discovery Protocol (CDP), use the show cdp neighbors privileged EXEC command. Detail - (Optional) Displays detailed information about a neighbor (or neighbors) including network address, enabled protocols, hold time, and software version.
Incorrect Answers:
A, D. These are invalid commands.
B. The "show cdp neighbor" command, without the "detail" keyword will not display the additional layer 3 protocol information.
E. This will show all routes from all other routers within the domain. We wish to see information from just the direct interface neighbors.

QUESTION NO: 2
While troubleshooting a connectivity problem on the network, you issue the ping command from your PC command prompt, but the output shows "request times out."

At which OSI layer is this problem associated with?

A. The data link layer
B. The application layer

C. The access layer
D. The session layer
E. The network layer

Answer: E
Explanation:
TCP/IP includes ICMP, a protocol designed to help manage and control the operation of a TCP/IP network. The ICMP protocol provides a wide variety of information about a network's health and operational status. Control message is the most descriptive part of a name. ICMP helps control and manage IP's work and therefore is considered part of TCP/IP's network layer.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN 1-58720-083-X) page 277.

QUESTION NO: 3
You download a file from an FTP site on the Internet. What is the highest layer in the OSI model used in this FTP operation?

A. Application
B. Presentation
C. Session
D. Transport
E. Internet
F. Data Link
G. Physical

Answer: A
Explanation:
Layer 7 is the application layer, which is the highest layer in the OSI model. This layer describes the use of end user applications, such as opening movie files (avi, mpeg, etc) used Microsoft Office applications, using WWW browsers, using Telnet, and using FTP.

QUESTION NO: 4

A host computer has been correctly configured with a static IP address, but the default gateway is incorrectly set. Which layer of the OSI model will be first affected by this configuration error?

A. Layer 1
B. Layer 2
C. Layer 3
D. Layer 4
E. Layer 5
F. Layer 6
E. Layer 7

Answer: C
Explanation:
IP Addressing and IP routing resides on the OSI Network layer, which is layer 3.

QUESTION NO: 5
Which layer of the OSI reference model is responsible for ensuring reliable end-to-end delivery of data?

A. Application
B. Presentation
C. Session
D. Transport
E. Network
F. Data-Link

Answer: D
Explanation:
A key function of the transport layer is to provide connection services for the protocols and applications that run at the levels above it. These can be categorized as either connection-oriented services or connectionless services. Some protocol suites, such as TCP/IP, provide both a connection-oriented and a connectionless transport layer protocol, to suit the needs of different applications.

The transport layer is also the place in the layer stack where functions are normally included to add features to end-to-end data transport. Where network layer protocols are normally concerned with just "best effort" communications, where delivery is not guaranteed. Transport layer protocols are given intelligence in the form of algorithms that ensure that reliable and efficient communication between devices takes place. This encompasses several related jobs, including lost transmission detection and handling, and managing the rate at which data is sent to ensure that the receiving device is not overwhelmed.

Transmission quality, meaning ensuring that transmissions are received as sent, is so important that some networking references define the transport layer on the basis of reliability and flow-control functions. However, not all transport layer protocols provide these services. Just as a protocol suite may have a connection-oriented and a connectionless transport layer protocol, it may also have one that provides reliability and data management services, and one that does not. Again, this is the case with TCP/IP: there is one main transport layer protocol; TCP, that includes reliability and flow control features, and a second, UDP, that doesn't.

QUESTION NO: 6 DRAG DROP
As a TestKing.com network technician you are required to drag the network problems to the correct OSI layers.

Physical Layer Problems

Place here
Place here
Place here

Data Link Layer Problems

Place here
Place here
Place here
Place here

Select from these

router serial line down	router serial line up; no CDP neighbors
router serial line protocol down	dialup authentication failure
switch port link light is off	router serial line encapsulation failure
excessive Ethernet collisions	

Answer:
Explanation:

As a TestKing.com network technician you are required to drag the network problems to the correct OSI layers.

Physical Layer Problems

router serial line down

switch port link light is off

excessive Ethernet collisions

Data Link Layer Problems

router serial line protocol down

router serial line up; no CDP neighbors

dialup authentication failure

router serial line encapsulation failure

QUESTION NO: 7
A TestKing.com technician is troubleshooting connectivity problems between two routers that are directly connected through the serial line. The technician notices that the serial line is up but cannot see any neighbors displayed in the output of the show cdp neighbors command.
In which OSI layer is the problem most likely occurring?

A. Physical
B. Data link
C. Network layer
D. Transport layer
E. Application layer

Answer: B
Explanation:
As the question states that serial line is up, it means the problem is not on the Network layer. The administrator cannot see any output by issuing the show cdp neighbors command. It means that CDP is disabled and CDP is a protocol that runs over Layer2 (the data link layer) on all Cisco routers, bridges, access servers, and switches.

QUESTION NO: 8
Two TestKing routers are connected together as shown in the diagram below:

PPP configuration:
authentication: chap
chap password: testking

TestKing1 — DTE — s0 — 192.1.2.2/30 — DCE — s0 — 192.1.2.1/30 — TestKing2
e0 — 192.1.2.129/26   e0 — 192.1.2.65/26

You work as a network administrator at TestKing.com. You attempt to telnet from the console port on Router TestKing1 to 192.1.2.65. The Telnet connection is unsuccessful.
However, a ping to 192.1.2.65 is successful.
What could cause this problem? (Select two)

A. PPP authentication configuration problem
B. IP address/subnet mask configuration error
C. access control list filtering
D. defective serial cable
E. no clock rate on interface s0 on TestKing2
F. missing VTY password

Answer: C, F
Explanation:
Since a ping to 192.1.2.65 is successful we can eliminate IP configuration being incorrect, however a telnet session is not successful could indeed be because the vty password is not set or missing.
To be able to telnet to the router you need the set the telnet with "line vty
0 4" command.

Also, C is correct because an access list that was placed on the router could be configured to deny the telnet traffic, while at the same time permitting ICMP ping traffic.

QUESTION NO: 9 DRAG DROP
Drag the network problems on the left under the correct OSI layer on the right.

	Physical Layer Problems
router serial line down	
router serial line protocol down	
switch port link light is off	
	Data Link Layer Problems
excessive Ethernet collisions	
router serial line up; no CDP neighbors	
dialup authentication failure	
router serial line encapsulation failure	

Answer:
Explanation:

Physical Layer Problems

> router serial line down

> excessive Ethernet collision

> switch port link light is off

Physical Layer Problems

> router serial line protocol down

> router serial line up; no CDP neighbors

> dialup authentication failure

> router serial line encapsulation failure

Physical Layer problem will get when cable is not connected, link light is off etc. Data Link Layer problem occurs when encapsulation type is different or failure, cdp is layer 2 protocol so it require data link connection, ethernet collisions, authentication failure.

QUESTION NO: 10
A network administrator is connecting PC hosts TestKingA and TestKingB directly through their Ethernet interfaces as shown in the graphic. Ping attempts between the hosts are unsuccessful. What can be done to provide connectivity between the hosts? (Choose two.)

Straight-through cable

TestKingA
IP address:192.1.1.20
Subnet mask: 255.255.255.240

TestKingB
IP address: 192.1.1.201
Subnet mask: 255.255.255.240

A. The subnet masks should be set to 255.255.255.0.
B. The hosts must be reconfigured to use private IP addresses for direct connections of this type.
C. A default gateway needs to be set on each host.
D. A rollover cable should be used in place of the straight-through cable
E. A crossover cable should be used in place of the straight-through cable.
F. The subnet masks should be set to 255.255.255.192.

Answer: A, E
Explanation:
This problem is due to the misconfiguration of subnet mask as well as the fact that a straight-through cable is used to connect the two devices. To ensure connectivity, the correct subnet mask needs to be used so that the two devices are in the same subnet and when connecting two PC's back to back a crossover cable should be used.

Section 2: Perform LAN and VLAN troubleshooting (42 questions)

QUESTION NO: 1
There are 2 switches in the Testking LAN, with no routers. Ports 1, 2 & 3 are assigned to VLAN 1 in switch 1 and 2 and ports 4, 5 & 6 are assigned to VLAN 2 in both switches. These two switches are connected together via a trunked link. Which of the conditions below would verify trunk and VLAN operation? (Select all valid answers)

A. Host 1 on VLAN 1 can ping Host 2 on VLAN 1
B. Host 1 on VLAN 1 can ping Host 4 on VLAN 2
C. Host 1 on VLAN 1 can not ping Host 2 on VLAN 1
D. Host 4 on VLAN 2 can not ping Host 1 on VLAN 1
E. Host 4 on VLAN 2 can ping Host 2 on VLAN 2

Answer: A, D, E
Explanation:
If there is no router present, only hosts in the same VLAN will be able to ping each other. In order for any host on one VLAN to communicate with a host on another VLAN, the traffic must pass through a router. Host within the same VLAN will be able to ping each other, even though they reside on different switches, as long as the switches have a trunk connection configured between them.

QUESTION NO: 2
Study the exhibit below, which displays 2 Testking switches in the LAN:
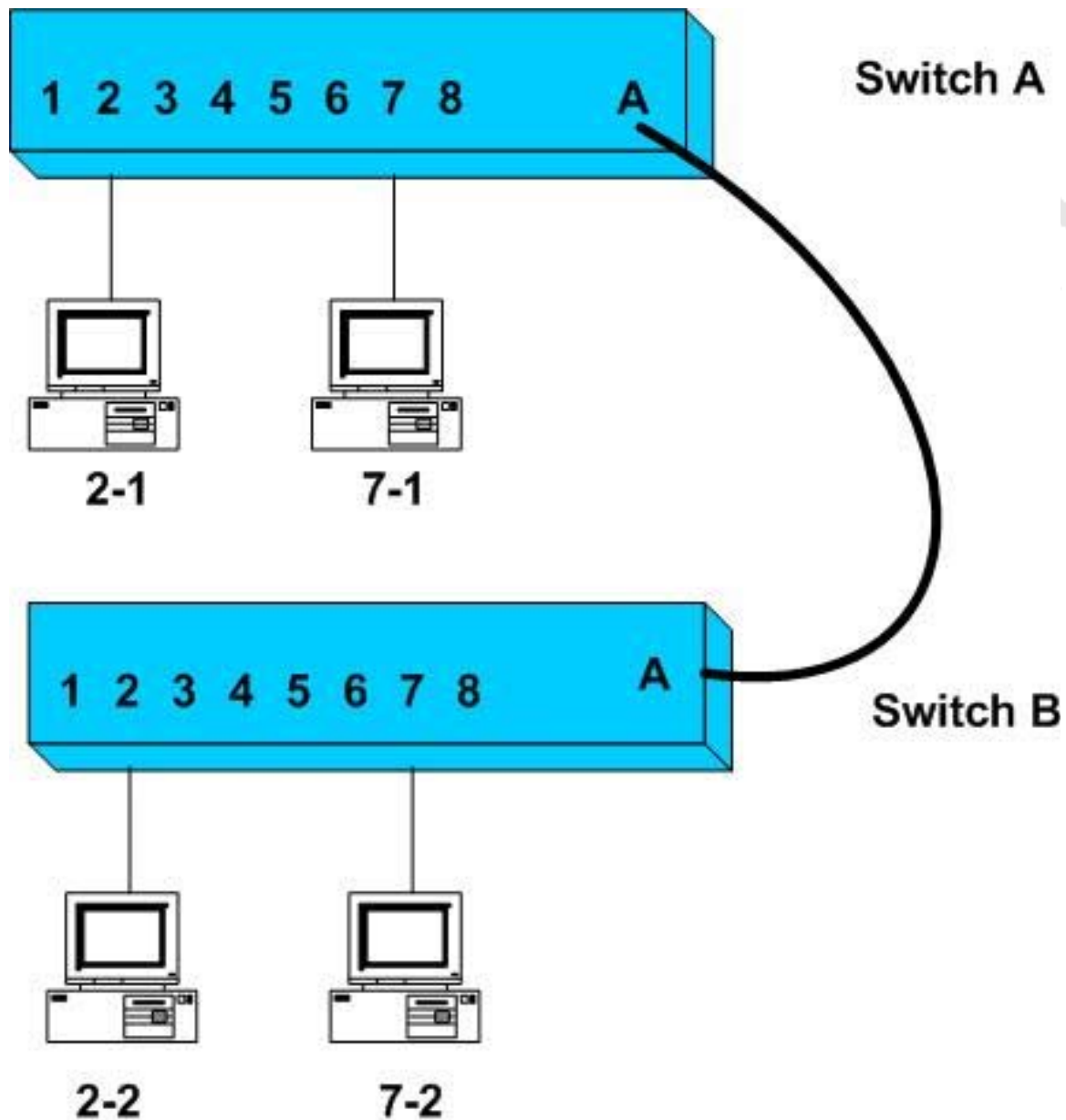
You are a network analyst on a network which contains two VLAN's as portrayed in the exhibit.

* Ports 1 through 4 on each switch are assigned to VLAN1
* Ports 5 through 8 on each switch are assigned to VLAN2.
* An ISL trunk link connects the two switches.

Based on this information, which of the following will be true? (Select all that apply)

A. Host 2-1 can ping Host 2-2
B. Host 2-1 can ping Host 7-2
C. Host 2-1 can not ping Host 2-2
D. Host 7-1 can not ping Host 2-2
E. Host 7-1 can ping Host 7-2

Answer: A, D, E.
Explanation:
Without any routing taking place, hosts in one VLAN will only be able to reach other hosts in the same VLAN.
A. Host 2-1 and Host 2-2 are both in VLAN1 and a ping should be successful.
D. Host 7-1 is in VLAN3 while Host 2-2 is in VLAN1. A ping between those hosts should fail.
E. Host 7-1 and Host 7-2 are both in VLAN1 and a ping should be successful.
Incorrect Answers:
B. Host 2-1 and Host 7-2 are in different VLANs and a ping should fail.
C. Host 2-1 and Host 2-2 are both in VLAN1 and a ping should be successful.
Reference: Steve McQuerry, "Interconnecting Cisco Network Devices" (Cisco Press: 2000) pages 184 - 198 and 124.

QUESTION NO: 3
You are a senior network administrator at TestKing and your trusty junior administrator tells you that he failed his task of adding VLAN 50 to a Catalyst switch in the network.

You enter in the 'show vtp status' command and get this output:

TK2# show vtp status

VTP Version :2
Configuration Revision :7
Maximum VLANs supported local :68
Number of existing VLANs :8
VTP Operating Mode :Client
VTP Domain Name :corp
VTP Pruning Mode :Disabled

VTP V2 Mode :Disabled
VTP Traps Generation :Disabled
MD5 digest :0x22 0xF3 0x1A
Configuration last modified by 172.18.22.15 at 5-28-03 1t:53:20

What commands must be issued on this switch to add VLAN 50 to the database?
(Choose two.)

A. TK2(config-if)# switchport access vlan 50
B. TK2(vlan)# vtp server
C. TK2(config)# config-revision 20
D. TK2(config)# vlan 50 name Tech
E. TK2(vlan)# vlan 50
F. TK2(vlan)# switchport trunk vlan 50

Answer: B, E
Explanation:
VTP operates in one of three modes:

* Server mode
* Client mode
* Transparent mode

For VTP to exchange information, some switches act as servers, and some act as clients.
VTP servers can create, modify, and delete VLANs and other configuration parameters
for the entire VTP domain; this information, in turn, is propagated to the VTP clients and
servers in that same domain. VTP servers save VLAN configurations in the Catalyst
NVRAM, whereas in clients, the VLAN configuration is not stored at all. A VTP client
cannot create, change or delete VLANs, nor can it save VLAN configurations in
non-volatile memory.

switchport mode {access	dynamic {auto	desirable}	trunk}	Interface subcommand that configured the Interface for trunking.

QUESTION NO: 4
Study the Exhibit below carefully:

```
London#show vtp
VTP Version: 2
Configuration Revision: 0
Maximum VLANs supported locally: 64
Number of existing VLANs: 5
VTP Operating Mode: Client
VTP Domain Name: London
VTP Pruning Mode: Disabled
VTP V2 Mode: Disabled
VTP Traps Generation: Disabled
```

Based on the information given above, what is the VTP function of this particular switch?

A. Learn and save VTP configuration in the running configuration.
B. Create and change VLANs.
C. Forwards information about VTP configuration.
D. VTP is disabled on this device.
E. VTP is not saved to NVRAM.

Answer: C
Explanation:
From the output this switch is operating merely as VTP client, so it basically does as the VTP server says, and passes on information about VTP configuration to the next switch in line.
Incorrect Answers:
A. This is incorrect because the function is redundant.
B. This incorrect because the switch must be in server or transparent mode to create and change VLANs.
D. This is incorrect because if VTP would be disabled, it wouldn't appear on the command output.
E. If this were true, the VTP configuration information would not be displayed after being powered on.

QUESTION NO: 5
Which of the following IOS commands could you use to troubleshoot a router connectivity problem on an IP network? (Select all valid answers)

A. show ip route
B. ipconfig
C. tracert
D. show interfaces
E. traceroute
F. ping
G. All of the above

Answer: A, D, E, F
Explanation:
A. The show ip route command displays the IP route table.
D. The show interfaces EXEC command to display statistics for all interfaces configured on the router or access server.
E. Traceroute is a valid router command, used to trace the path to a destination, and provide the latency associated with each hop.
F. The ping command tests connectivity to a remote node.
Incorrect Answers:
B, C. These are commands used on PC hosts. They are invalid router commands.

QUESTION NO: 6
A new Catalyst switch is connected to an existing switch using a crossover cable. As a result of this, what would the switch port link lights display?

A. The switch port link lights will be off on both switches indicating the ports are not connected.
B. The switch port link light will be off on one switch indicating that STP has disabled the port.
C. The switch port link lights will flash amber indicating an error.
D. The switch port link lights will be green indicating normal operation.

Answer: D
Explanation:
To connect one Cisco switch to another Cisco switch, the crossover cable is the proper cable to use. So if you were to use one, the lights would be green indicating that all is well. If you were to connect a switch to a router, a server, or a PC host then a straight through cable should be used.
Reference:
http://www.cisco.com/en/US/products/hw/switches/ps211/products_quick_start09186a00800ea827.html

QUESTION NO: 7
What command verifies connectivity between two hosts by sending and receiving ICMP echo messages?

A. ping
B. tracert
C. netstat
D. show cdp neighbors detail
E. show ip route
F. traceroute

Answer: A
Explanation:
Packet Internet Groper (PING) uses ICMP echo requests and replies to verify network connectivity. It is most commonly used to verify connectivity to another device and to monitor the operational status of a device.

QUESTION NO: 8
You are working as a network technician at TestKing University, when you get a call from the Engineering Faculty. They're complaining that they're receiving obsolete information from the Business Faculty's network traffic broadcasts. What can you do to contain the Business Faculty's broadcast while still keeping it connected to the internet and the enterprise services of the University? (Select all valid answer choices)

A. Use half and full-duplex Ethernet on the Engineering Department LAN
B. Establish a VTP domain to minimize the obsolete traffic
C. Change the switch IP address of the switch
D. Create separate VLANs and subnets for the two departments and route between the two
E. Provide greater bandwidth to the Engineering Department LAN
F. Place the business department on a separate subnet and route between networks

Answer: D, F

Explanation:

In order to prevent the broadcast and link level multicast traffic separated between the departments, they need to be isolated at layer two. This can be accomplished in two ways. The first is to create separate VLANs and place each department into a different one. The second method would be to separate the two departments into two completely different networks, and route between them.

Incorrect Answers:

A. Mixing the use of half and full duplex will make no difference to the number of broadcasts sent.

B. Trunking is only useful in networks that already contain VLANs.

C. This will make no difference, as all users will still be contained within the same IP subnet.

E. The amount of bandwidth involved will not have any impact on the amount of broadcasts that are sent and received.

QUESTION NO: 9
The TestKing network is shown below:
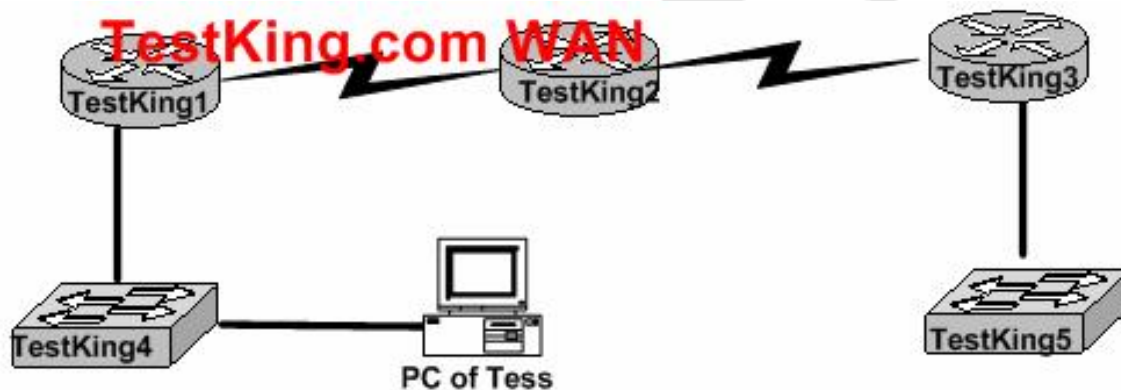
You are unable to log into the TestKing5 switch, as you have forgotten its IP address and you are too far away to log into it via the console port. You are unsure what the IP address of Testking 5 is and need to get this information.

How can you find the IP address of switch TestKing5?

A. Issue the show ip route command on Router TestKing1.

B. Issue the show cdp neighbors detail command on Router TestKing2.
C. Issue the show arp command on Router TestKing3.
D. Issue the show cdp neighbors detail command on Router TestKing3.
E. Issue the show arp command on Router TestKing1.
F. Issue the show ip route command on Router TestKing2.

Answer: D
Explanation:
To display detailed information about neighboring devices discovered using Cisco
Discovery Protocol (CDP), use the show cdp neighbors privileged EXEC command.
Detail - (Optional) Displays detailed information about a neighbor (or neighbors)
including network address, enabled protocols, hold time, and software version.

QUESTION NO: 10
Study the exhibit below:

London# show vtp status		Madrid# show vtp status	
VTP Version	: 2	VTP Version	: 2
Configuration Revision	: 0	Configuration Revision	: 0
Maximum VLANs supported locally	: 64	Maximum VLANs supported locally	: 64
Number of existing VLANs	: 5	Number of existing VLANs	: 5
VTP Operating Mode	: Server	VTP Operating Mode	: Server
VTP Domain Name	: London	VTP Domain Name	: Madrid
VTP Pruning Mode	: Disabled	VTP Pruning Mode	: Disable
VTP V2 Mode	: Disabled	VTP V2 Mode	: Disable
VTP Traps Generation	: Disabled	VTP Traps Generation	: Disable

**The London switch and Madrid switch have both been configured for VTP, but they
aren't sharing any VTP messages. Based on the above output, what do you suspect
is the cause of this problem?**

A. VTP V2 mode is not in operation.
B. VTP pruning mode is disabled.
C. The VTP domain name is configured incorrectly.
D. The VTP operating mode is not configured.
E. The VTP version is configured incorrectly.

Answer: C
Explanation:
In order for VTP information to be shared between switches, they must be in the same
VTP domain. Based on the output above, the switches appear to belong in completely
separate domains, as their VTP domains are different, and they are both VTP servers.

QUESTION NO: 11
The Testking switched LAN is displayed in the exhibit below:
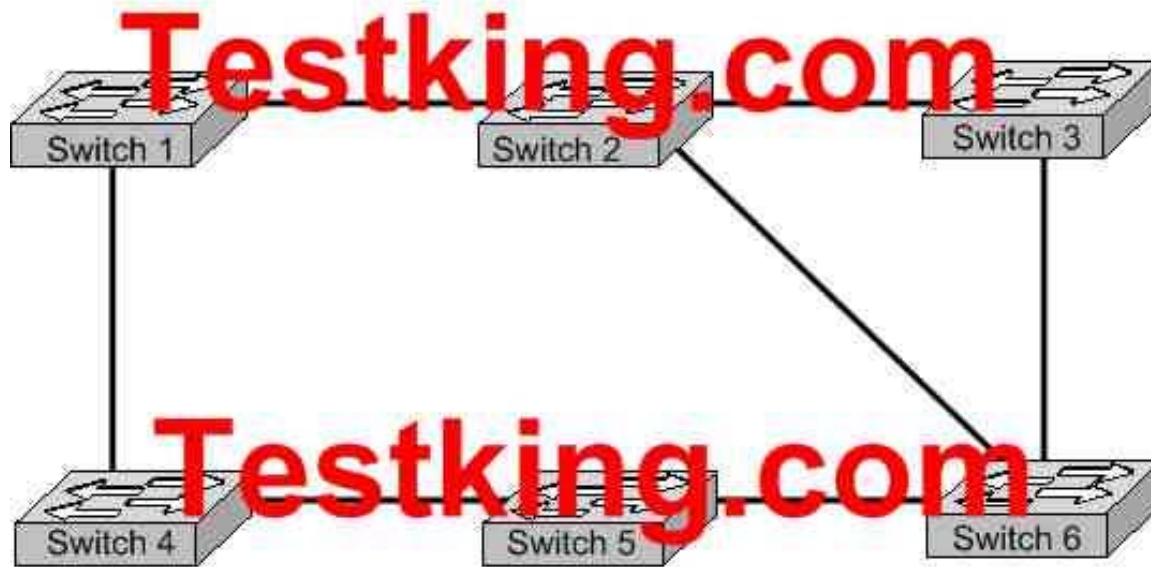
**The switches are connected together as shown above, crating a loop. What is the
type of loop that is caused in this setup, and what is the name of the protocol that
prevents this from becoming a problem?**

A. routing loops, hold down timers
B. switching loops, split horizon
C. routing loops, split horizon
D. switching loops, VTP

E. routing loops, STP
F. switching loops, STP

Answer: F
Explanation:
The Spanning-Tree Protocol (STP) prevents loops from being formed when switches or bridges are interconnected via multiple paths. Spanning-Tree Protocol implements the 802.1D IEEE algorithm by exchanging BPDU messages with other switches to detect loops, and then removes the loop by shutting down selected bridge interfaces. This algorithm guarantees that there is one and only one active path between two network devices.

Incorrect Answers:
A, C, E. Switches operate at layer two, and only bridging or switching loops can be created.
B. Split Horizons are used to prevent routing loops in distance vector protocols.
D. VTP is the VLAN Trunking Protocol, which alone has no mechanism to prevent loops in the network from becoming an issue. The VTP process relies on the STP for loop detection and prevention.

QUESTION NO: 12
After connecting a PC to an available port on a switch, you find that the PC can not access any of the resources on the LAN. No other PC's connected to the switch appear to be having any issues. What is the most likely cause for this problem?

A. The router lacks a routing table entry for the new host
B. The host switch port is assigned to the incorrect VLAN
C. The host MAC address is incorrectly configured
D. A STP instance for the new host has not been initialized
E. The switch does not have the MAC address hard coded in the CAM table.

Answer: B
Explanation:
Virtual LANs break up broadcast domains in a layer-two switched internetwork. If a host is in a different VLAN then the network services it needs to use, the packets must go through a router. If routing does not take place, the PC will be unable to communicate with any other devices not in the same VLAN. Answer B is the best answer for this question.
Incorrect Answers:

A. The PC is unable to communicate with other LAN users. No router needs to even be installed for this to work.
C, E. The MAC address of the PC does not need to be entered manually into the switch. The switch will dynamically learn of the MAC address of the PC.
D. The STP algorithm does not need to have any end host information added in order for it to work.

QUESTION NO: 13
You are attempting to troubleshoot some problems within your local network. Which of the following are router IOS commands that can be used to troubleshoot LAN connectivity problems? (Choose all that apply)

A. ping
B. tracert
C. ipconfig
D. show ip route
E. winipcfg
F. show interfaces
G. All of the above

Answer: A, D, F
Explanation:
All three of these are valid Cisco IOS commands that can be used to verify and troubleshoot connectivity issues on a LAN or WAN.
Incorrect Answers:
B. "Tracert" is not a valid Cisco IOS command. This command can be used while at the command prompt window of a PC, but the corresponding Cisco command is "traceroute."
C, E: These are commands that can be useful in troubleshooting connectivity problems with an individual PC, but they are not valid commands within a Cisco router.

QUESTION NO: 14
Which router IOS commands can be used to troubleshoot LAN connectivity problems? (Select three)

A. Ping
B. Tracert
C. Ipconfig

D. Show ip route

E. Winipcfg

F. Show interfaces

Answer: A, D, F

Explanation:

While all of the above commands are useful in gathering network information and troubleshooting, only choices A, D, and F are Cisco IOS problems, while the other choices are DOS command prompt commands used by windows based stations.

QUESTION NO: 15

Exhibit

```
TestKing1#show vtp stat
VTP Version                     : 2
Configuration Revision          : 1
Maximum VLANs supported locally : 250
Number of existing VLANs        : 6
VTP Operating Mode              : Server
VTP Domain Name                 : TeftKing
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xBF 0x92 0x87 0xB0 0xA8 0x8F 0xDA 0x86
Configuration last modified by 0.0.0.0 at 3-1-93 00:03:32
Local updater ID is 0.0.0.0 (no valid interface found)

TestKing2#show vtp stat
VTP Version                     : 2
Configuration Revision          : 0
Maximum VLANs supported locally : 250
Number of existing VLANs        : 5
VTP Operating Mode              : Server
VTP Domain Name                 : TestKing
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xF3 0x03 0x4C 0x72 0xC8 0x6B 0x29 0x62
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 0.0.0.0 (no valid interface found)
```

Study the exhibit shown above. Two switches named TestKing1 and TestKing2, connect through ports configured as trunks. The trunk ports on both switches have been configured correctly and both interfaces are up. VTP, however, is not passing VLAN information between the two switches. Based on the output of the show vtp status command from both switches, what is the problem?

A. The domain names do not match.
B. Only one switch can in VTOP server mode in a domain
C. The configuration revision numbers must match on the two switches.
D. The local updater IP address has not been configured.
E. The VTP timer settings must match.

Answer: A
Explanation:
Note that the domain names do not match. They are TeftKing and TestKing. For VTP to function properly, the VTP domain names must match exactly.

QUESTION NO: 16
To configure the VLAN trunking protocol to communicate VLAN information between two switches, what two requirements must be met? (Select two)

A. Each end of the trunk line must be set to IEEE 802.1E encapsulation.
B. The VTP management domain name of both switches must be set the same.
C. All ports on both the switches must be set as access port.
D. One of the two switches must be configured as a VTP server.
E. A rollover cable is required to connect the two switches together.
F. A router must be used to forward VTP traffic between VLANs.

Answer: B, D
Explanation:
In order for VTP to function, the VTP domain name of all switches within the domain must match exactly, and at least one of the switches must be configured to be in server mode, so that VTP information can be propagated throughout the LAN.

QUESTION NO: 17 DRAG DROP

As a network technician at TestKing.com you are required to match the characteristics to the correct category of Ethernet collisions on the right. Not all characteristics are used.

Characteristics, select from these

| damaged frame retransmitted |
| considered abnormal network operation |
| caused by excessive media latency |
| occasionally occur in normal network operation |
| cannot occur on a shared media segment |
| occurs after the first 64 bytes of a frame are transmitted |
| frequently occurs in full-duplex operation |
| jam signal sent to intentionally corrupt frame |

Late collision

| place here |
| place here |
| place here |

Local collision

| place here |
| place here |
| place here |

Answer:

Late collision

caused by excessive media latency

considered abnormal network operation

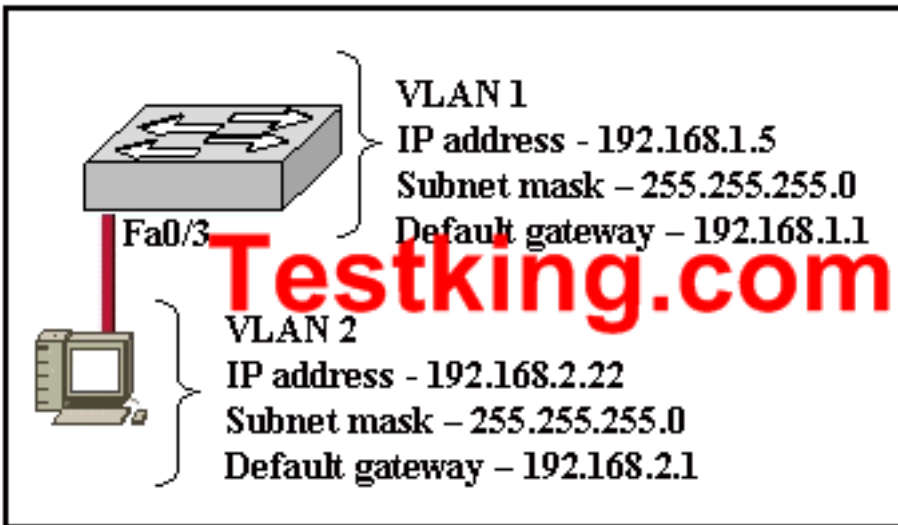occurs after the first 64 bytes of a frame are transmitted

Local collision

damaged frame retransmitted

occasionally occur in normal network operation

jam signal sent to intentionally corrupt frame

QUESTION NO: 18
Exhibit:

VLAN 1
IP address - 192.168.1.5
Subnet mask – 255.255.255.0
Default gateway – 192.168.1.1

Fa0/3

VLAN 2
IP address - 192.168.2.22
Subnet mask – 255.255.255.0
Default gateway – 192.168.2.1

Refer to the graphic. A host is connected to switch port Fa0/3 with a crossover cable. The host and switch have been fully configured for IP connectivity as shown. However, the port indicator on switch port Fa0/3 is not on, and the host can not communicate with any other hosts including those connected to VLAN 2 on the same switch. Based on the information given, what is the problem?

A. Switch port Fa0/3 is not configured as a trunk port.
B. The cable is the wrong type.
C. The switch has been assigned an incorrect subnet mask.
D. Switch port Fa0/3 has been blocked by STP.
E. The switch and the hosts must be in the same subnet.

Answer: B
Explanation:
To connect two different devices, we use straight-through cables. In the scenario, a host is connected to a switch with a cross-over cable, so there will be no communication between them. Choice B is correct. Cross over cables should be used between two devices in the same layer of the OSI model, such as when connected together two routers, two switches, etc.

QUESTION NO: 19
Exhibit:

```
Labs# show vtp status
VTP Version                        : 1
Configuration Revision             : 2
Maximum VLANs supported locally    : 64
Number of existing VLANs           : 9
VTP Operating Mode                 : Server
VTP Domain Name                    : Labs
VTP Pruning Mode                   : Disabled
VTP V2 Mode                        : Disabled
VTP Traps Generation               : Disabled
MD5 digest                         : 0xF3 0x6D 0x21 0x7C 0x0F 0xA9 0xE9 0x60
```

Testking.com

```
Offices# show vtp status
VTP Version                        : 1
Configuration Revision             : 3
Maximum VLANs supported locally    : 64
Number of existing VLANs           : 9
VTP Operating Mode                 : Server
VTP Domain Name                    : Offices
VTP Pruning Mode                   : Disabled
VTP V2 Mode                        : Disabled
VTP Traps Generation               : Disabled
MD5 digest                         : 0x07 0x35 0xFA 0xD5 0xF8 0xBA 0xE5 0xD8
```

Study the Exhibit carefully. The network administrator has configured the switches in the school network to use VTP. The switches are not sharing VLAN information. Which sequence of commands should be issued to correct this problem?

A. Offices(config)# vtp mode client
Labs(config)# vtp mode client
B. Offices(config)# vtp domain School
Labs(config)# vtp domain School
C. Offices(config)# vtp pruning
Labs(config)# vtp pruning
D. Offices(config)# vtp version 2
Labs(config)# vtp version 2

Answer: B
Explanation:
For switched to share vlan information, there VTP domain names must be same. In the Output shown, VTP domain name of LABS router is Labs and VTP domain name of Offices router is Offices. As the domain names are different, they are unable to communicate with each other. In order to correct this problem, we have to change their names to a single common name.

QUESTION NO: 20
Two TestKing switches are connected together as shown below:
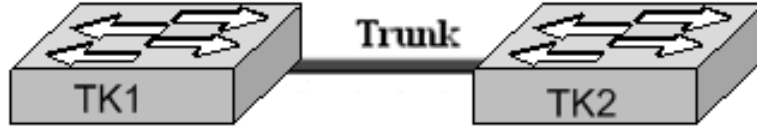
```
TK1#show vtp status
    VTP Version                      : 2
    Configuration Revision           : 5
    Maximum VLANs supported locally  : 68
    Number of existing VLANs         : 8
    VTP Operating Mode               : Server
    VTP Domain Name                  : JAX
    VTP Pruning Mode                 : Disabled
    VTP V2 Mode                      : Disabled
    VTP Traps Generation             : Disabled
    MD5 digest                       : 0x2D 0x88 0xA9 0x2A 0xC4 0xF8 0x77 0xEF
    Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

TK2#show vtp status
    VTP Version                      : 2
    Configuration Revision           : 3
    Maximum VLANs supported locally  : 68
    Number of existing VLANs         : 8
    VTP Operating Mode               : Server
    VTP Domain Name                  : JAK
    VTP Pruning Mode                 : Disabled
    VTP V2 Mode                      : Disabled
    VTP Traps Generation             : Disabled
    MD5 digest                       : 0xA8 0x67 0xF9 0xA8 0x92 0xE9 0x30 0x6B
    Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
```

**Switches TK1 and TK2 have been configured with a trunked line that has been
verified as working correctly. However, VTP is not propagating VLANs from one
switch to the other. Based on the command output shown, what is the problem?**

A. The revision number is not the same on both switches.
B. Only one switch can be in server mode.
C. The VTP domain name is not correctly configured.
D. VLANs have not been configured on the VTP server.
E. The VTP pruning mode is not correctly configured.

Answer: C
Explanation:
VTP messages are exchanged between switches within a common VTP domain. In the output shown, VTP domain name of switch TK1 is JAX and domain name of switch TK2 is JAK. As the VTP domain names are different so these two switches will not exchange the VTP Information.
Reference: http://www.ciscopress.com/articles/article.asp?p=29803&seqNum=4&rl=1

QUESTION NO: 21
A simple TestKing network is displayed in the diagram below:
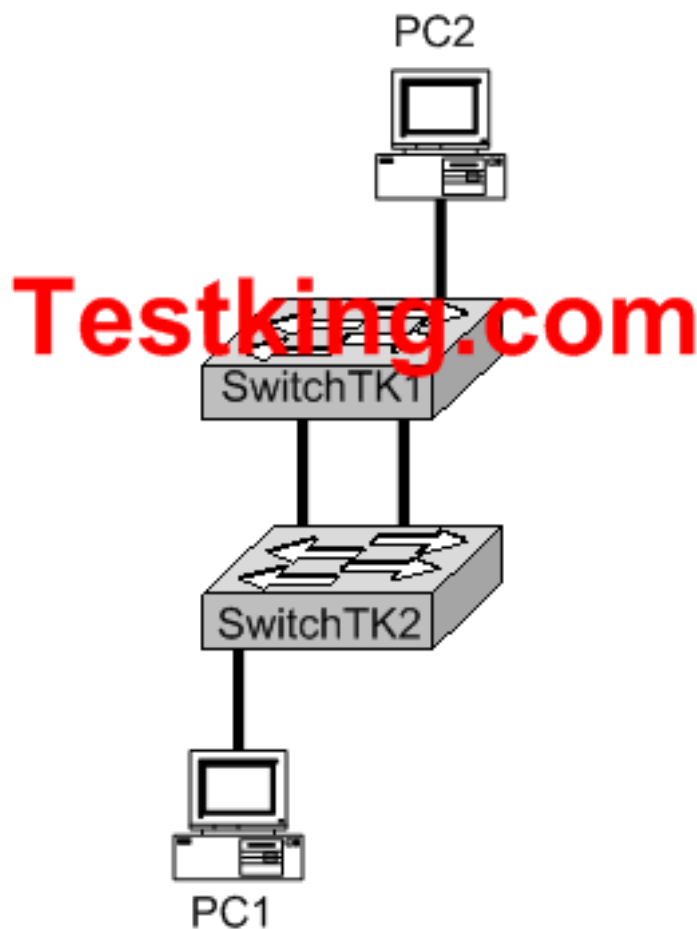
When PC1 sends an ARP requests for the MAC address of PC1, network performance slows dramatically, and the switches detect an unusually high number of broadcast frames. What is the most likely cause of this?

A. The portfast feature is not enabled on all switch ports.
B. The PCs are in two different VLANS.
C. Spanning Tree Protocol is not running on the switches.
D. PC2 is down and is not able to respond to the request.
E. The VTP version running on the two switches do not match.

Answer: C
Explanation:
As the switches TK1 and TK2 are connected with each other via two links, spanning tree must be enabled on both switches to avoid switching loops and broadcast storms. An ARP request is a broadcast message. If Spanning tree is not running, broadcast loops will form reducing the performance of the network.

QUESTION NO: 22
The Testking network is shown below:
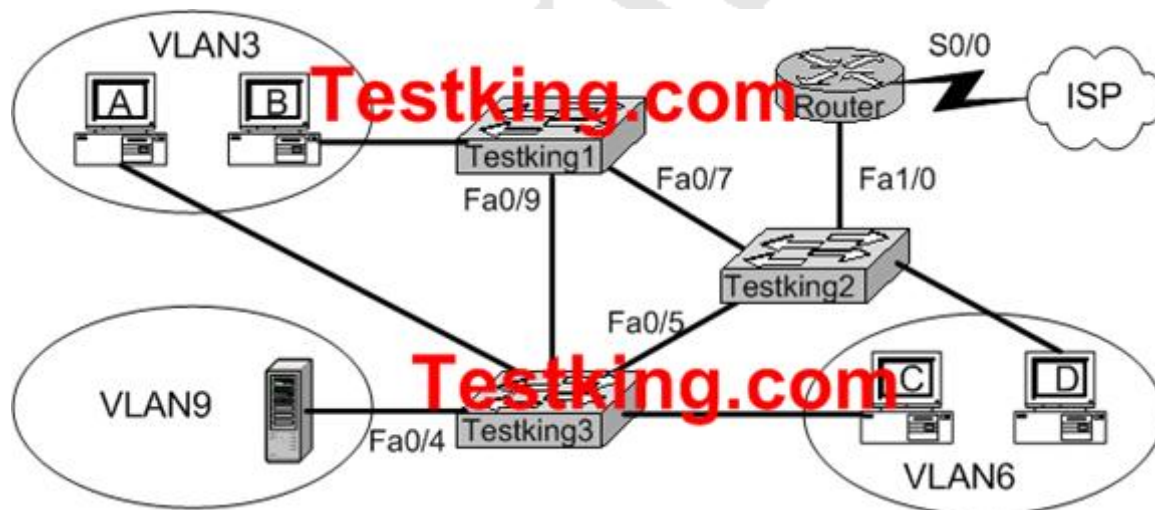
A technician is investigating a problem with the network shown above. These symptoms have been observed:

1. **All of the user hosts can access the Internet.**
2. **None of the user hosts can access the server in VLAN9**
3. **All of the hosts can ping each other.**

What could cause the symptoms?

A. Interface S0/0 on the router is down.
B. Interface Fa0/1 on the router is down.
C. Interface Fa0/5 on Testking3 is down.
D. Interface Fa0/4 on Testking3 is down.
E. Testking2 is turned off.
F. Trunking is not enabled on the link between Testking1 and Testking3.

Answer: D
Explanation:
Since all user hosts have access to internet, link to router has to be up. Therefore, router interface (Fa0/1 - believe it is labeled incorrectly on diagram as Fa1/0) must be up. Since all hosts can ping each other, but none can get to VLAN 9 which is through single interface Fa0/4, this interface must be down.

Choice A: incorrect, S0/0 must be up if internet access available.
Choice B: incorrect, Fa0/1 must be up if internet access (through router) available.
Choice C: incorrect, would not prevent access to VLAN9 via other routes (i.e Fa0/7, Fa0/9, Fa0/4)
Choice D: correct
Choice E: incorrect: TestKing2 must be up if internet access (through switch and then router) available
Choice F: incorrect: Disabled trunking on link between TestKing1 and TestKing3 would not prevent access to VLAN9 via other routes

QUESTION NO: 23
The following was seen on a TestKing router in Huntsville:

```
Huntsville#show interfaces FastEthernet 0/0
FastEthernet0/0 is up, line protocol is up
  Hardware is AmdFE, address is 000c.ce8d.8720 (bia 000c.ce8d.8720)
  Internet address is 10.1.1.2/24
  MTU 1500 bytes, BW 10000 Kbit, DLY 100 usec, reliability 255/255,
txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mbps, 100BaseTX/FX
  ARP tupe: ARPA, ARP Timeout 04:00:00
      < - output omitted ->
  119413 packets input, 52453050 bytes
  Received 117055 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 watchdog
  0 input packets with dribble condition detected
  67922 packets output, 9993123 bytes, 0 underruns
  0 output errors, 0 collisions, 6 interface resets
      < - output omitted ->
```

**Refer to the router output shown in the graphic. What can be assumed about the
network attached to this router interface?**

A. The network hosts are attached to a hub.
B. The interface is being used at near maximum capacity.
C. There should never be any collisions in this network.
D. The network has an excessive number of errors.
E. The network is using an unusual Ethernet encapsulation.

Answer: C
Explanation:
Based on the output shown, this interface is configured to operate in full duplex mode.
Full-duplex is a data communications term that refers to the ability to send and receive
data at the same time.

Legacy Ethernet is half-duplex, meaning information can move in only one direction at a time. In a totally switched network, nodes only communicate with the switch and never directly with each other. Switched networks also employ either twisted pair or fiber optic cabling, both of which use separate conductors for sending and receiving data. In this type of environment, Ethernet stations can forgo the collision detection process and transmit at will, since they are the only potential devices that can access the medium. This allows end stations to transmit to the switch at the same time that the switch transmits to them, achieving a collision-free environment.
Reference: http://computer.howstuffworks.com/ethernet15.htm

QUESTION NO: 24
A network administrator needs to verify that switch interface 0/5 has been assigned to the Sales VLA.N. Which command will accomplish this task?

A. Show vlan
B. Show mac-address-table
C. Show vtp status
D. show spanning-tree root
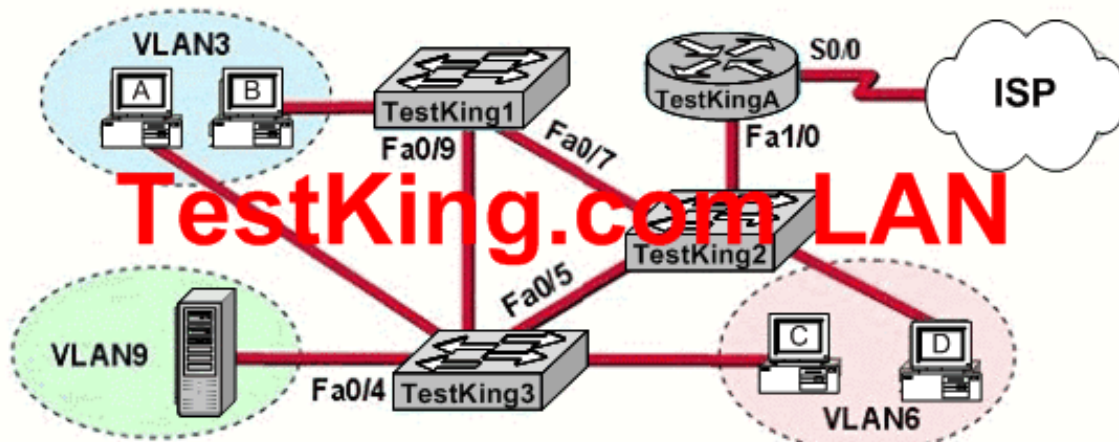E. show ip interface brief

Answer: A
Explanation:
The "show vlan" command displays the configured vlan name and ID as well as the ports that belong to each VLAN, etc. By default all ports belongs to VLAN 1
Note: You can also use: show vlan brief, show vlan ID where ID is the VLAN ID.

QUESTION NO: 25
Exhibit:

Refer to the exhibit. A problem with network connectivity has been observed. It is suspected that the cable connected to switch port Fa0/9 on the switch TestKing1 is disconnected. What would be an effect of this cable being disconnected?

A. Host B would not be able to access the server in VLAN9 until the cable is reconnected.

B. Communication between VLAN3 and the other VLANs would be disabled.

C. The transfer of files from Host B to the server in VLAN9 would be significantly slower.

D. For less than a minute, Host B would not be able to access the server in VLAN9. Then normal network function would resume.

Answer: D
Explanation:
Spanning-Tree Protocol (STP) is a Layer 2 protocol that utilizes a special-purpose algorithm to discover physical loops in a network and effect a logical loop-free topology. STP creates a loop-free tree structure consisting of leaves and branches that span the entire Layer 2 network. The actual mechanics of how bridges communicate and how the STP algorithm works will be discussed at length in the following topics. Note that the terms bridge and switch are used interchangeably when discussing STP. In addition, unless otherwise indicated, connections between switches are assumed to be trunks.

STP keeps the port either in block or in forward states, when forward port disconnect then within the less then a minute blocked port comes into forward state so packets starts to go through new forward port.

The Spanning Tree Protocol (STP) would identify the best path as well as alternate path to reach in proper destination. In a redundant link, if the primary link fails then the secondary links will automatically start after few minutes. If port Fa0/9 became disconnected, then the packets would be re-routed automatically using the TestkingA-Testking2-TestKing3 path.

QUESTION NO: 26
Exhibit:

```
TestKing1# show vlan
VLAN Name                          Status      Ports
-------- ------------------------  ----------  ------------------------------
1        default                   active      Fa0/1, Fa0/2, Fa0/6, Fa0/7
                                               Fa0/8, Fa0/10, Fa0/11, Fa0/12
                                               Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                               Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                               Fa0/21, Fa0/22, Fa0/23, Fa0/24
86       VLAN0086                  active      Fa0/9
1002     fddi-default              active
1003     token-ring-default        active
1004     fddinet-default
1005     trnet-default
```

Refer to the exhibit. The switch that generated this output has 24 ports. Why are some of the ports missing from VLAN1?

A. The missing ports are in VLAN 86.
B. The missing ports are administratively disabled.
C. The missing ports are not participating in spanning tree.
D. The missing ports are configured as trunk ports.
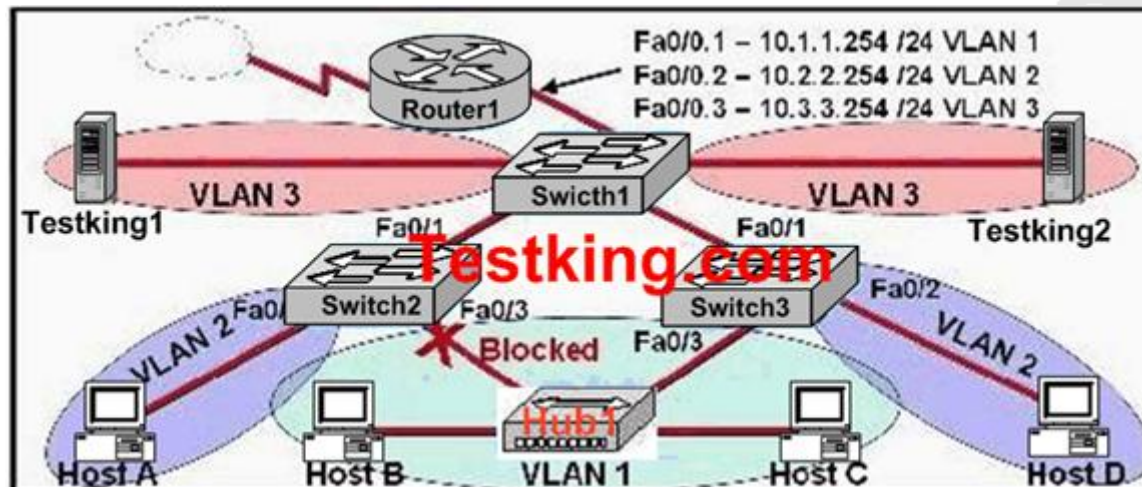E. The missing ports have a status problem such as a speed or duplex mismatch.

Answer: D
Explanation:
The show vlan command displays the VLAN information and ports in all VLANs. This command displays only the ports in access mode. The missing ports must be configured as trunks.

QUESTION NO: 27
Exhibit:

Which statement is correct about the internetwork shown in the diagram?

A. Switch 2 is the root bridge.
B. Spanning Tree is not running.
C. Host D and Server 1 are in the same network.
D. No collisions can occur in traffic between Host B and Host C.
E. If Fa0/0 is down on Router 1, Host A cannot access Testking1.
F. If Fa0/1 is down on Switch 3, Host C cannot access Testking2.

Answer: E
Explanation:
In the Figure three different VLANs are created, with router1 playing a major role for
inter-VLAN routing. IF fa0/0 interface will down host A can't access the testking1 host
because any packets for different VLAN should go through the fa0/0 of router1. This is
an example of a router on a stick, which means a single point of failure in a switching
environment.

QUESTION NO: 28
A TestKing switch is connected as shown below:
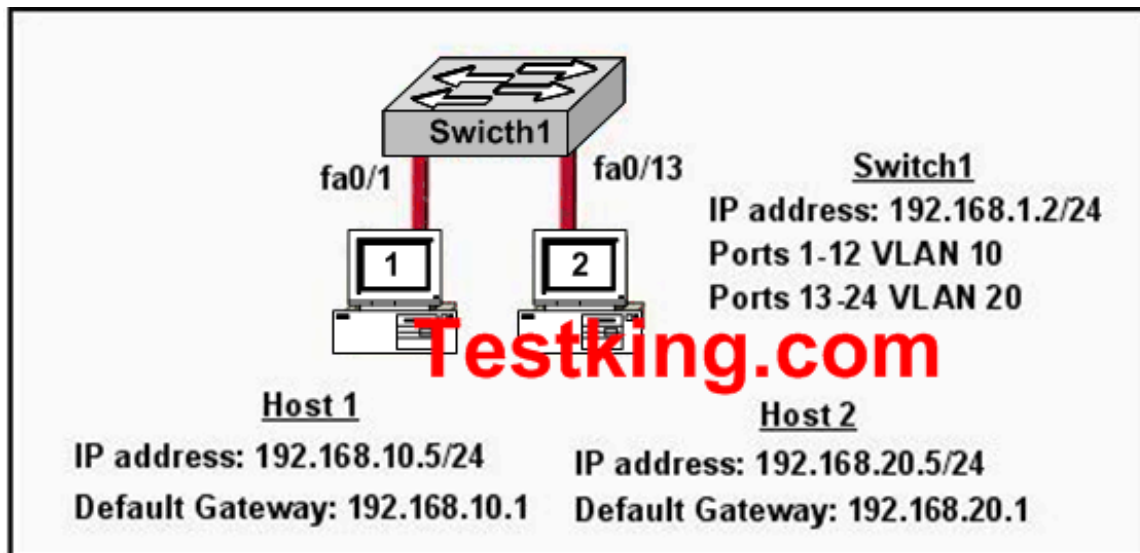
In the network above Host 1 cannot ping Host 2. What needs to be configured to allow host 1 and host 2 to communicate?

A. The switch needs to be configured with an IP address on the correct subnet.
B. The default gateway of the hosts should be configured to 192.168.1.2.
C. Spanning Tree Protocol needs to be configured on the switch.
D. A router needs to be configured to route between the VLANs.
E. VTP needs to be configured on the switch to create a trunk between the VLANs.

Answer: D
Explanation:
By default only members of the same VLAN can communicate with each other. For inter-VLAN communication we require a router to route between the different VLANs. Alternatively, if Host1 and Host2 were in the same subnet and the same VLAN, then they would also be able to communicate.

QUESTION NO: 29
Part of the configuration of a TestKing switch is shown below:

```
ALSwitch1# show running-config
<<output omitted>>
interface FastEthernet0/24
 no ip addresss
<<output omitted>>

ALSwitch1# show interfaces fastethernet0/24 switchport
Name: Fa0/24
Switchport:Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Operational private-vlan: none
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed:  ALL

Protected: false

Voice VLAN: none (Inactive)
Appliance trust: none
```

Switch port FastEthernet 0/24 on ALSwitch1 will be used to create an IEEE
802.1Q-compliant trunk to another switch. Based on the output shown, what is the
reason the trunk does not form, even though the proper cabling has been attached?

A. VLANs have not been created yet.

B. An IP address must be configured for the port.
C. The port is currently configured for access mode.
D. The correct encapsulation type has not been configured.
E. The "no shutdown" command has not been entered for the port.

Answer: C
Explanation:
According to the output shown the switchport (layer 2 Switching) is enabled and the port is in access mode. To make a trunk link the port should configured as a trunk port, not an access port, by using the following command:
(Config-if)#switchport mode trunk

QUESTION NO: 30
A company is experiencing network delays. The network administrator discovers that a worker in a location far from the MDF has connected an old 10BASE-T switch with redundant links to the existing network. How could this action be responsible for the impaired network performance?

A. Connecting a host to the old switch has created a broadcast storm.
B. The 10BASE-T switch forced the entire network to be reduced to 10 Mbps operation.
C. The old switch does not support VLANs, which has disabled the VLAN configuration of the entire the network.
D. The old switch does not support full-duplex operation, effectively forcing half-duplex operation throughout the network.
E. Spanning Tree Protocol has elected the old switch as the root bridge, creating inefficient data paths through the switched network.

Answer: E
Explanation:
Without the Spanning Tree Protocol (STP), frames would loop for an indefinite period of time in networks with physically redundant links. To prevent looping frames, STP blocks some ports from forwarding frames so that only one active path exists between any pair of LAN segments (collision domains). The result of STP is good: Frames do not loop infinitely, which makes the LAN usable. However, the network uses some redundant links in case of a failure, but not for balancing traffic.

To avoid loops, all bridging devices, including switches, use STP. STP causes each interface on a bridging device to settle into a blocking state or a forwarding state. Blocking means that the interface cannot forward or receive data frames. Forwarding means that the interface can send and receive data frames. By having a correct subset of the interfaces blocked, a single currently active logical path will exist between each pair of LANs. STP behaves identically for a transparent bridge and a switch. So, the terms bridge, switch, and bridging device all are used interchangeably when discussing STP.

Root bridge The root bridge is the bridge with the best bridge ID. With STP, the key is for all the switches in the network to elect a root bridge that becomes the focal point in the network. All other decisions in the network-like which port is to be blocked and which port is to be put in forwarding mode-are

QUESTION NO: 31
Two TestKing switches are connected as shown below:
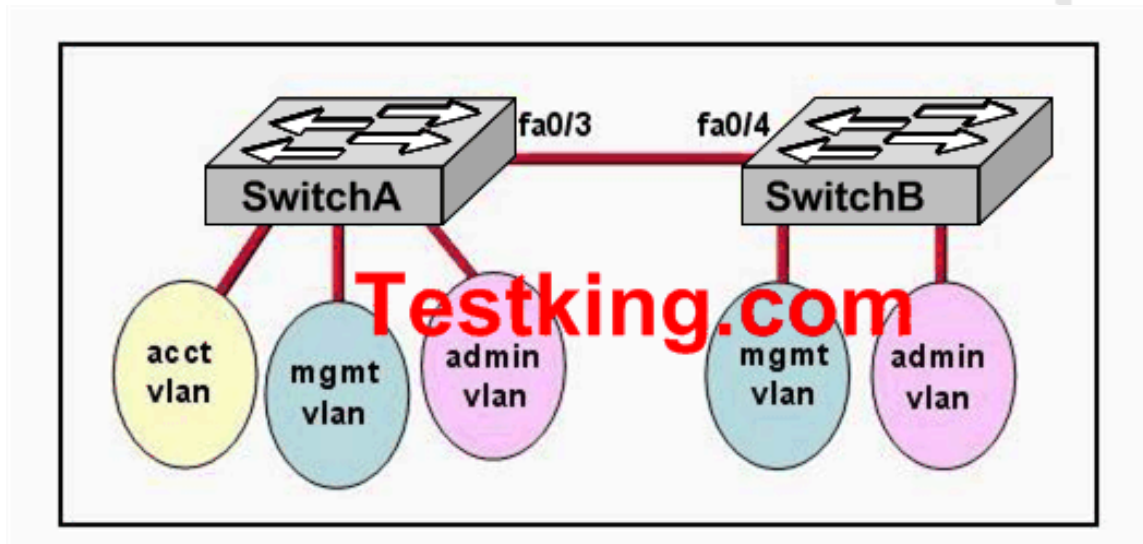
Refer to the exhibit. Configuration of both switches has been completed. During testing, the network administrator notices that users on SwitchA can not connect with users in the same VLAN on SwitchB. What should be done to solve this problem?

A. Ensure that the IP address of SwitchA is on the same network as the IP address of SwitchB.
B. Ensure that the same interface number is used to connect both switches.
C. Ensure that the ports connecting the two switches are configured to trunk.
D. Ensure that SwitchA and SwitchB are connected with a straight-through cable.

Answer: C
Explanation:
Ports can be in two states on a switch:

Access ports: This type of link is only part of one VLAN, and it's referred to as the native VLAN of the port. Any device attached to an access link is unaware of a VLAN membership the device just assumes it's part of a broadcast domain, but it does not understand the physical network.

Trunk links: Trunks can carry multiple VLANs and originally gained their name after the telephone system trunks that carry multiple telephone conversations.

So to carry the VLAN information from one switch to another switch, a trunk link needs to be configured between the two switches, using the "showtchport mode trunk" command.

Note: By default all ports are in access mode.

QUESTION NO: 32
The TestKing network is shown below:
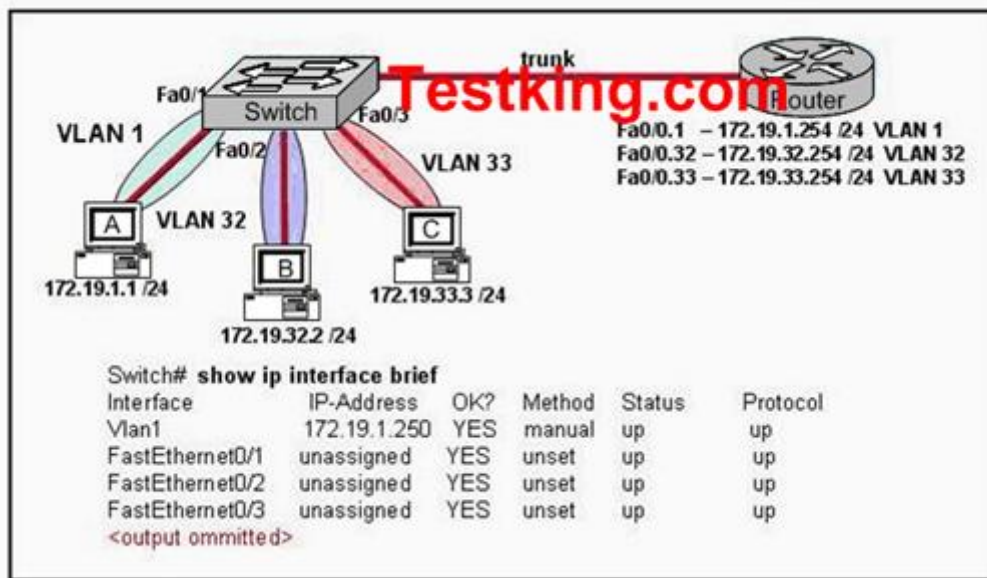
The network administrator normally establishes a Telnet session with the switch from host A. However, host A is unavailable. The administrator's attempt to telnet to the switch from host B fails, but pings to the other two hosts are successful. What is most likely the issue?

A. Host B and the switch need to be in the same subnet.
B. The switch interface connected to the router is down.
C. Host B needs to be assigned an IP address in VLAN 1.
D. The switch needs an appropriate default gateway assigned.
E. The switch interfaces need the appropriate IP addresses assigned.

Answer: D
Explanation:
This scenario requires inter-VLAN routing, which requires a layer three device. Based on the information above, a trunk has indeed been set up to route traffic between VLAN's so the only logical explanation why a host in VLAN 32 can not reach a host in VLAN1 (which is where the IP address of the switch is) would be because no default gateway has been specified in the switch.

Incorrect Answers:
A, C: This is not a requirement, as a number of VLAN's can be configured within a switch, while the management IP address can reside in a different VLAN on a different subnet.
B: Based on the output above, the trunk link (fa 0/3) is indeed up and active.
E: Since switches operate at layer 2, each individual VLAN does not need its own IP address.

QUESTION NO: 33
Information from two TestKing switches in London and Madrid are shown below:

London# show vtp status		Madrid# show vtp status	
VTP Version	: 2	VTP Version	: 2
Configuration Revision	: 0	Configuration Revision	: 0
Maximum VLANs supported locally	: 64	Maximum VLANs supported locally	: 64
Number of existing VLANs	: 5	Number of existing VLANs	: 5
VTP Operating Mode	: Server	VTP Operating Mode	: Server
VTP Domain Name	: London	VTP Domain Name	: Madrid
VTP Pruning Mode	: Disabled	VTP Pruning Mode	: Disabled
VTP V2 Mode	: Disabled	VTP V2 Mode	: Disabled
VTP Traps Generation	: Disabled	VTP Traps Generation	: Disabled

A network administrator has configured two switches, named London and Madrid, to use VTP. However, the switches are not sharing VTP messages. Given the command output shown in the graphic, why are these switches not sharing VTP messages?

A. The VTP version is not correctly configured.
B. The VTP operating mode is not correctly configured.
C. The VTP domain name is not correctly configured.
D. VTP pruning mode is disabled.
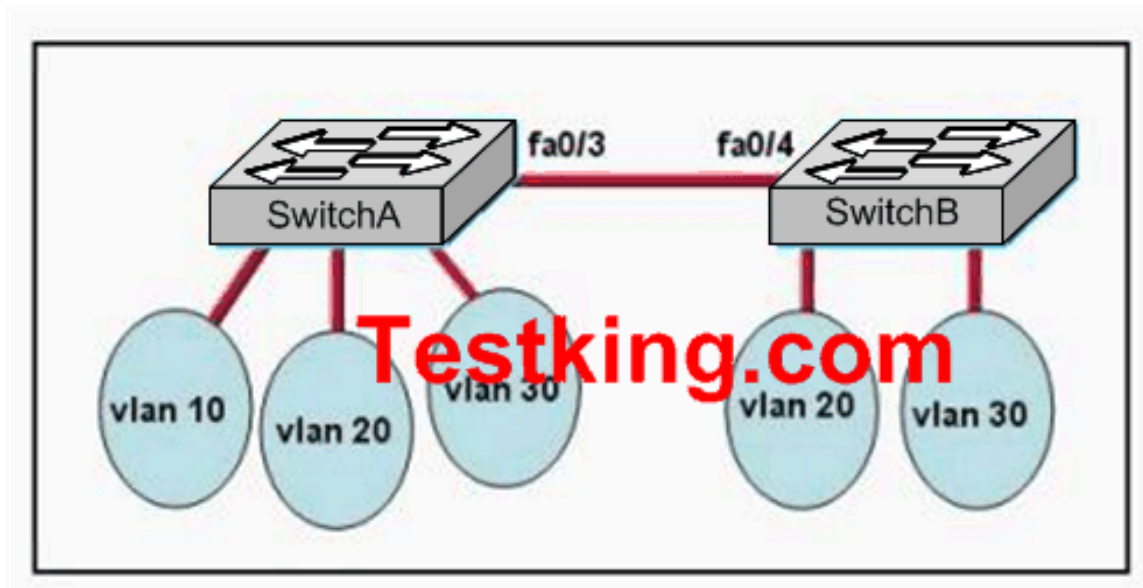E. VTP V2 mode is disabled.
F. VTP traps generation is disabled.

Answer: C
Explanation:
In order to share VTP messages the switches must belong to the same VTP Domain. In this example, the VTP domain name is London in London and Madrid in Madrid. These names need to be the same.

QUESTION NO: 34
Two TestKing switches are shown below:

The switches have been configured with static VLANs as shown. During testing, the network administrator notices that VLAN 20 on SwitchA has no connectivity with VLAN 30 on SwitchB. What should the network administrator do?

A. Configure the interconnected ports on SwitchA and SwitchB into access mode.
B. Connect the two switches with a straight-through cable.
C. Add a Layer 3 device to connect VLAN 20 and VLAN 30.
D. Configure the management VLAN with IP address.
E. Ensure that the VIP passwords match on both switches.

Answer: C
Explanation:
Network devices in different VLANs cannot communicate with one another without a router to route traffic between the VLANs. In most network environments, VLANs are associated with individual networks or subnetworks.
For example, in an IP network, each subnetwork is mapped to an individual VLAN. Configuring VLANs helps control the size of the broadcast domain and keeps local traffic local. However, when an end station in one VLAN needs to communicate with an end station in another VLAN, interVLAN communication is required. This communication is supported by interVLAN routing. You configure one or more routers to route traffic to the appropriate destination VLAN.

The diagram below shows a basic interVLAN routing topology. SwitchA is in VLAN 10 and SwitchB is in VLAN20. The router has an interface in each VLAN.
Basic InterVLAN Routing Topology:
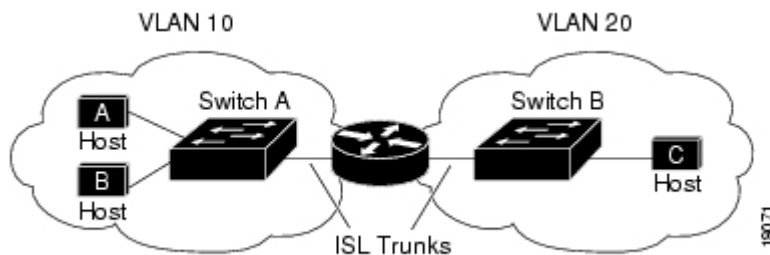
When HostA in VLAN10 needs to communicate with HostB in VLAN10, it sends a packet addressed to that host. SwitchA forwards the packet directly to HostB, without sending it to the router.

When HostA sends a packet to HostC in VLAN20, SwitchA forwards the packet to the router, which receives the traffic on the VLAN10 interface. The router checks the routing table, determines the correct outgoing interface, and forwards the packet out the VLAN20 interface to SwitchB. SwitchB receives the packet and forwards it to HostC.

Reference:

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat5000/rel_5_2/layer3/routing.htm#wp13354

QUESTION NO: 35
The TestKing network is shown below:
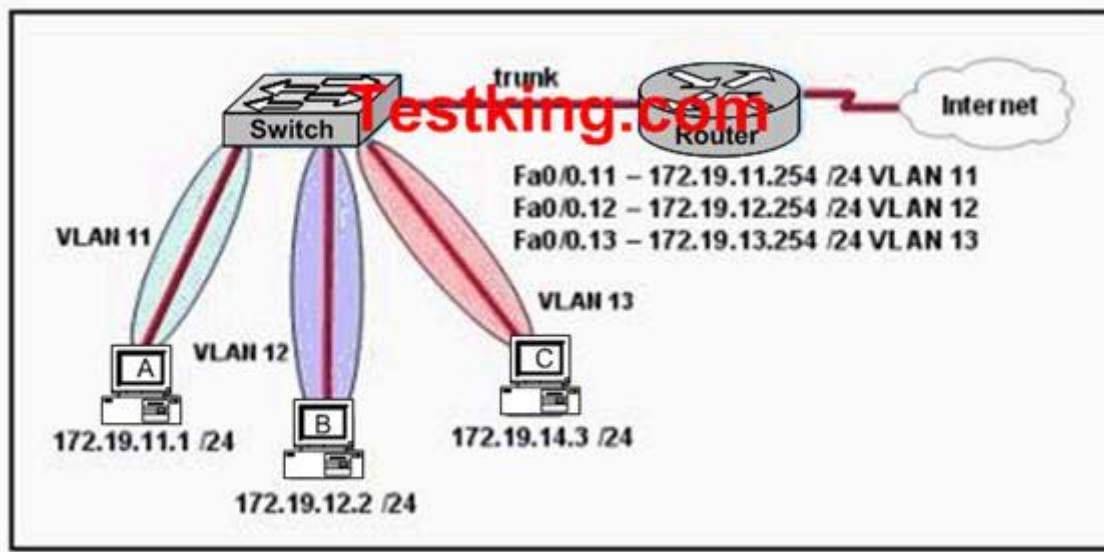
Refer to the exhibit. The network shown in the exhibit has just been installed. Host B can access the internet, but it is unable to ping host C. What is the problem with this configuration?

A. Host B should be in VLAN 13
B. The address of host C is incorrect.
C. The gateway for host B is in a different subnet than the host is on.
D. The switch port that sends VLAN 13 frames from the switch to the router is shut down.
E. The switch port connected to the router is incorrectly configured as an access port.

Answer: B
Explanation:
The Fa0/0.13 interface of the router is the subinterface used for VLAN 13. The IP address of this interface is 172.19.13.254, so all devices in VLAN 13 will have their default gateway set to this 172.19.13.254 which means that all devices in VLAN13 need to be in the 172.19.13.0/24 subnet. As can be seen in the output above, Host C is in VLAN 13 but its IP address has been incorrectly configured for the 172.19.14.0/24 subnet.

QUESTION NO: 36
A host is connected to the TestKing network as displayed below:
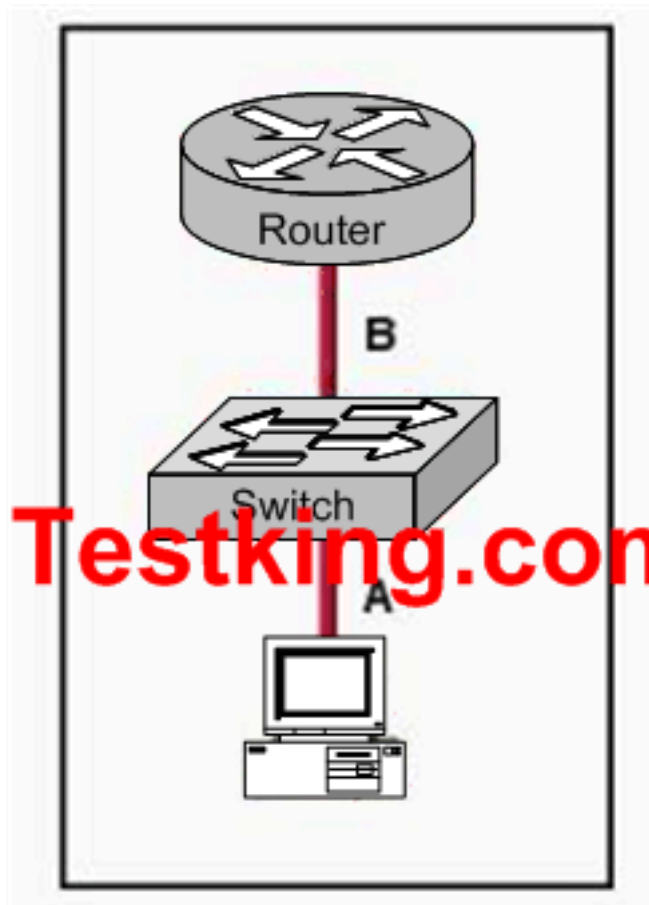
The two connected ports on the switch are not turning orange or green. What would be the most effective steps to troubleshoot this physical layer problem? (Choose three)

A. Ensure that the Ethernet encapsulations match on the interconnected router and switch ports.
B. Ensure that cables A and B are straight-through cables.
C. Ensure cable A is plugged into a trunk port.
D. Ensure that switch has power.
E. Reboot all of the devices.
F. Reseat all cables.

Answer: B, D, F
Explanation:
Straight-through cables are used to connect hosts to a switch (or hub) and routers to a switch (or hub). See the table below:

	Hub	Switch	Router	Workstation
Hub	Crossover	Crossover	Straight	Straight
Switch	Crossover	Crossover	Straight	Straight
Router	Straight	Straight	Crossover	Crossover
Workstation	Straight	Straight	Crossover	Crossover

Incorrect Answers:
A: This would mean that there was a layer 2 issue, not layer 1. If the problem was related to the encapsulation, the lights on the switch would indicate layer 1 activity.
C: A trunk port is not required, and again if this was the problem the link lights on the switch would be on.
E: This should only be used as a last resort, as this will affect all users on the switch.

QUESTION NO: 37
An elementary school has a computer in every classroom. One entire wing of the school connects to a centrally located hub. The teachers have reported a slowdown in the past few weeks to the network administrator. The network administrator has analyzed the network and documented a steep increase in utilization as the teachers use a new network-based classroom management application. Which solution will improve the performance the most?

A. Install a router and install another hub in the affected wing.
B. Reboot the router that connects to the hub.
C. Replace the hub with a switch.
D. Ensure all devices in the affected wing have a default gateway.
E. Install a repeater in the affected wing.

Answer: C
Explanation:

By default, switches break up collision domains. Collision domain is an Ethernet term used to describe the following network scenario. One particular device sends a packet on a network segment, forcing every other device on that segment to pay attention to it. At the same time, a different device tries to transmit, which leads to a collision, after which both devices must retransmit, one at a time. Not good-very inefficient! You'll typically find this situation in a hub environment where each host segment connects to a hub that represents only one collision domain and only one broadcast domain. By contrast, each and every port on a switch represents its own collision domain. In contrast, a hub can't break collision domains or broadcast domains. Similarly hub provides low bandwidth where switch provides more bandwidth to all ports. Suppose there are 10 ports with 100 mbps bandwidth then the hub provides only 10 mbps to each port but switch provides 100mbps to all ports aggregated.

QUESTION NO: 38
The TestKing internetwork shown in the diagram is experiencing network delays.
On the basis of the information provided in the exhibit, what is the problem?
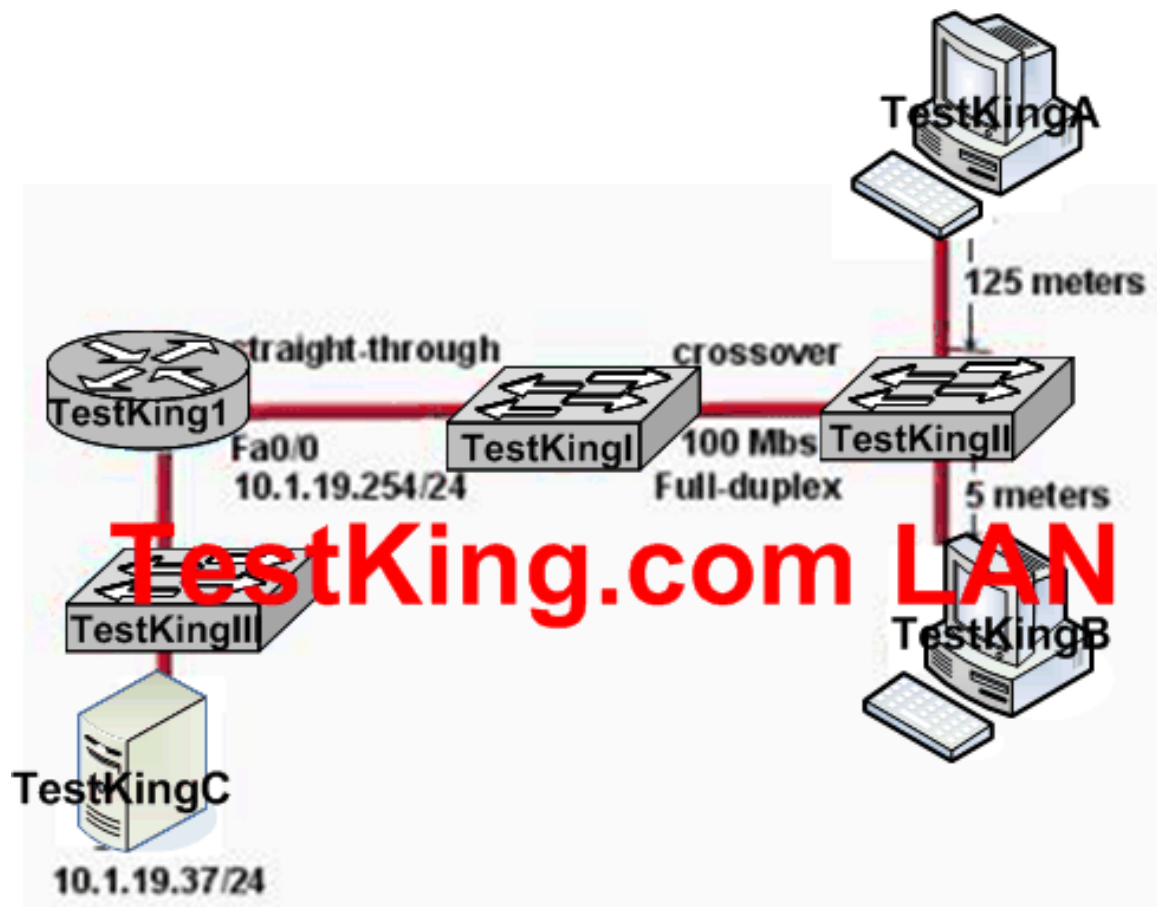
A. The connection between Switch1 and Switch2 should be half-duplex.
B. The cable between Router1 and Switch1 should be a crossover.
C. The cable connecting Host A to Switch2 is too long.
D. The server is on a different subnet than router interface Fa0/0.
E. The cable between Switch1 and Switch2 should be straight-through.

Answer: C
Explanation:

According to IEEE specifications, the maximum segment length of an Ethernet cable should not exceed 100 meters. The total distance between an Ethernet Transmitter and Receiver at the absolute end points of the network (maximum diameter from origin to final destination, if the wires were stretched out to form a straight line) should be no more than100 Meters (328 ft., 109 yards, or about the length of a football field). This limitation results from the timing of the Ethernet signals on the cable and not necessarily the cable characteristics, and is, therefore, a "hard" number.

QUESTION NO: 39
In which circumstance are multiple copies of the same unicast frame likely to be transmitted in a switched LAN?

A. After broken links are re-established
B. When a dual ring topology is in use
C. When upper-layer protocols require high reliability
D. During high traffic periods
E. In an improperly implemented redundant topology

Answer: E
Explanation:
Designing a redundant network is one of the primary methods of keeping your network available at all times. Unfortunately, this can cause loops in a Layer 2 network, which often results in serious problems including a complete network shut down.
The Spanning-Tree Protocol prevents looping traffic in a redundantly switched or bridged network by only allowing traffic through a single path to other parts of the network. Any redundant paths are blocked until they are needed (typically when the primary link goes down).
Although redundancy can prevent a single point of failure from causing the entire switched network to fail, it can also cause problems such as broadcast storms, multiple copies of frames, and MAC address table instability.
Multiple Copies of the Same Frame:
Many protocols cannot correctly handle duplicate transmissions. In particular, protocols that use sequence numbering such as TCP/IP will assume the sequence has reached its maximum value and has begun to recycle the sequence. Other protocols will process the duplicate frame with unpredictable results.
**Reference:**
http://www.cisco.com/application/pdf/en/us/guest/netsol/ns24/c643/cdccont_0900aecd800d813a.pdf#

QUESTION NO: 40
Refer to the exhibit. Host 1 and host 2 can communicate with each other. Host 3 and host 4 can communicate with each other. However, the hosts cannot communicate between VLANs. Which device is needed to allow communication between the VLANs?

Exhibit:
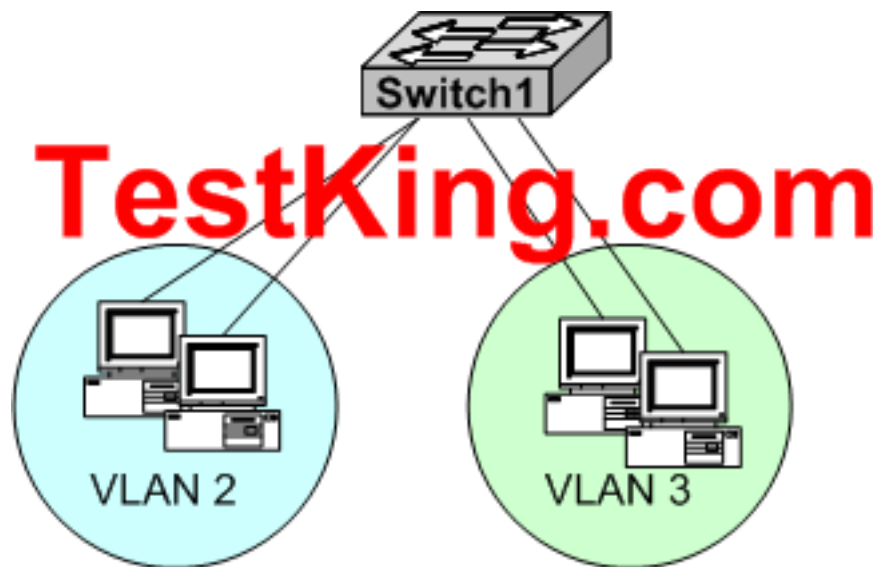
A. An additional switch
B. A transceiver
C. A router
D. A repeater
E. A hub

Answer: C
Explanation:
Network devices in different VLANs cannot communicate with one another without a router to route traffic between the VLANs. In most network environments, VLANs are associated with individual networks or subnetworks.
Reference:
http://www.cisco.com/univercd/cc/td/doc/product/lan/cat5000/rel_5_2/layer3/routing.htm#wp13354

QUESTION NO: 41
Refer to the exhibit. After SwitchB was added to the network, VLAN connectivity problems started to occur. What caused this problem?

Exhibit:

```
SwitchA# show vtp status              SwitchB# show vtp status
VTP version                : 2        VTP version                  : 2
Configuration Revision     : 1        Configuration Revision       : 7
Maximum VLANs supported locally  64   Maximum VLANs supported locally : 64
Number of existing VLANs              Number of existing VLANs     : 4
VTP Operating Mode          : Server  VTP Operating Mode           : Server
VTP Domain Name            : cisco    VTP Domain Name              : cisco
VTP Pruning Mode           : disabled VTP Pruning Mode             : disabled
V2 Mode                    : disabled VTP V2 Mode                  : disabled
```

A. V2-mode is not enabled.
B. SwitchA was not rebooted prior to adding SwitchB to the network.
C. VTP pruning is not activated, so the new paths in the network have not been recalculated.
D. The revision number of SwitchB was higher than the revision number of SwitchA.
E. Both switches are in server mode in the same domain.

Answer: D
Explanation:
By default, switches share VLAN information without any authentication. Thus, inaccurate VLAN settings can propagate throughout a VTP domain. Compounding this problem, switches come with VTP in server mode by default, and a server with a higher configuration revision number in its VTP database supersedes one with a lower number. It is entirely possible for a single switch, which has undergone a sufficient number of VTP reconfigurations, to completely overwrite or eliminate all VLAN assignments of an operational network by just connecting it to the network.

QUESTION NO: 42

Refer to the exhibit. Users on Segment B cannot connect to the Internet as quickly as users on Segment A. What is a possible cause of the problem and what can be done to correct it?

Exhibit:
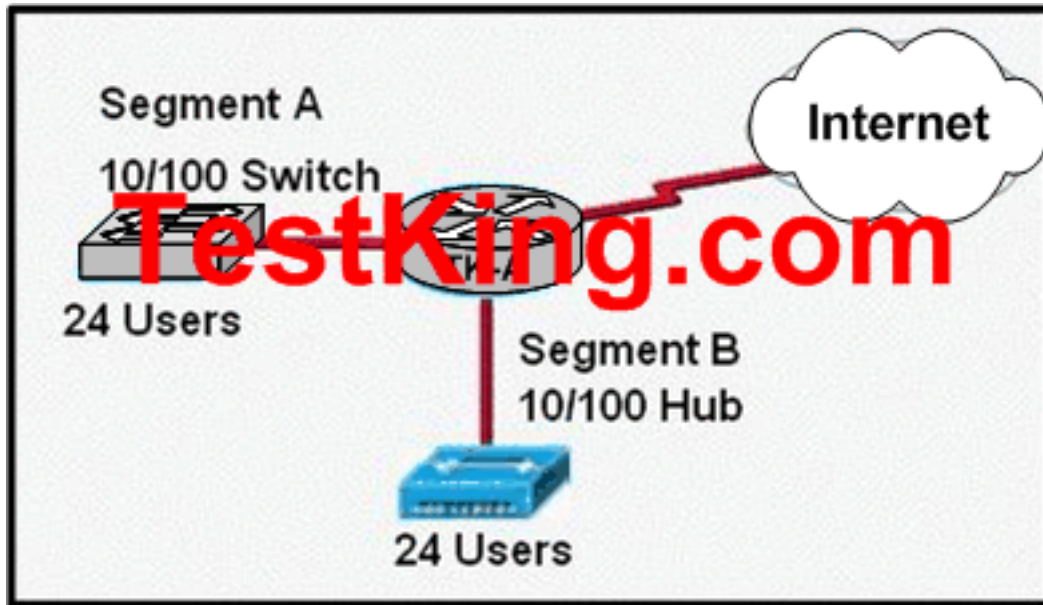
A. There are too many users on both segments. Another router needs to be added for better traffic control.
B. The Internet connection has a low bandwidth problem. The bandwidth should be increased.
C. Segment B is experiencing collision problems. The hub should be replaced with a switch.
D. Segment B has too many users for a single hub. An additional hub should be added to Segment B.

Answer: C
Explanation:

By default, switches break up collision domains. Collision domain is an Ethernet term used to describe the following network scenario. One particular device sends a packet on a network segment, forcing every other device on that segment to pay attention to it. At the same time, a different device tries to transmit, which leads to a collision, after which both devices must retransmit, one at a time. You'll typically find this situation in a hub environment where each host segment connects to a hub that represents only one collision domain and only one broadcast domain. By contrast, each and every port on a switch represents its own collision domain. In contrast, a hub can't break collision domains or broadcast domains. Similarly hub provides low bandwidth where switch provides more bandwidth to all ports. Suppose there are 10 ports with 100 mbps bandwidth then the hub provides only 10 mbps to each port but switch provides 100mbps to all ports aggregated. One of the best ways to increase network performance is to replace the network hubs with network switches.

Section 3: Troubleshoot routing protocols (49 questions)

QUESTION NO: 1
Which one of the following privileged EXEC mode IOS show commands will display the state of the OSPF DR/BDR (designated router / backup designated router) election process?

A. TK1# show ip ospf interface
B. TK1# show ip ospf priority
C. TK1# show ospf neighbor detail
D. TK1# show ospf processes
E. TK1# show ospf neighbor state

Answer: A
Explanation:
This command will display the router ID of both the DR and the BDR on the network segment that the particular interface is connected to.
Example:
Router1#show ip ospf interface ethernet 0Ethernet0 is up, line protocol is upInternet Address 10.10.10.1/24, Area 0Process ID 1, Router ID 192.168.45.1, Network Type BROADCAST, Cost: 10 Transmit Delay is 1 sec, State BDR, Priority 1**Designated Router (ID) 172.16.10.1, Interface address 10.10.10.2 Backup Designated router (ID) 192.168.45.1, Interface address 10.10.10.1**

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:06 Index 1/1, flood queue length 0 Next 0x0(0)/0x0(0) Last flood scan length is 2, maximum is 2 Last flood scan time is 0 msec, maximum is 4 msec Neighbor Count is 1, Adjacent neighbor count is 1**Adjacent with neighbor 172.16.10.1 (Designated Router) Suppress hello for 0 neighbor(s)**

QUESTION NO: 2
After logging into a router, you issue the "show ip route" command as shown below:

```
RouterTestKing# Show ip route

<some output text omitted>

Gateway of last resort is not set.

1  172.16.0.0[110/84632] via 192.168.6.3,00:00:13, FastEthernet0/0
R  192.168.3.0 [120/3] via 192.168.2.2,00:00:09, Serial0/0
C  192.168.2.0 is directly connected, Serial0/0
C  192.168.6.0 is directly connected, FastEthernet0/0
```

Based on the information above, what does the expression [120/3] represent in the second line of the routing table?

A. 120 is the bandwidth allocation and 3 is the routing process number.
B. 120 is the administrative distance and 3 is the metric for that route.
C. The number 120 is the value of the update timer and 3 is the number of updates received.
D. The number 120 is the UDP port for forwarding traffic and 3 is the number of bridges.

Answer: B
Explanation:
To decide which route to use, IOS uses a concept called Administrative Distance. Administrative distance is a number that denotes how believable an entire routing protocol is on a single router. The lower the number, the better, or more believable the routing protocol.

Route Type Administrative Distance

* Connected 0
* EIGRP 90
* IGRP 100
* OSPF 110
* RIP 120

For RIP, the metric is the hop count, so in this case the route is 3 hops away.
Reference:
CCNA Self-Study CCNA ICND exam certification Guide (Cisco Press, ISBN
1-58720-083-X) Page 177

QUESTION NO: 3
While trying to diagnose a routing problem in the network, you issue RIP
debugging as displayed below:

RtrA#debug ip rip
Rip protocol debugging is on
RtrA#
1d05h: RIP: sending v1 update to 255.255.255.255 via FastEthernet0/0 (172.16.1.1)
1d05h: RIP: build update entries
1d05h: network 10.0.0.0 metric 1
1d05h: network 192.168.1.0 metric 2
1d05h: RIP: sending v1 update to 255.255.255.255 via Serial0/0 (10.0.8.1)
1d05h: RIP: build update entries
1d05h: network 172.16.0.0 metric 1
RtrA#
1d05h: RIP: received v1 update from 10.0.15.2 on Serial0/0
1d05h: 192.168.1.0 in 1 hops
1d05h: 192.168.0 in 16 hops (inaccessible)

Based on the output of the above exhibit, which two of the following statements are
true? (Select two answer choices)

A. A ping to 10.0.15.2 will be successful.
B. RtrA has three interfaces that will take part in the RIP process.
C. There are at least two routers participating in the RIP process.
D. A ping to 192.168.168.2 will be successful.

Answer: A, C

Explanation:

By virtue of RIP receiving an update from 10.0.15.2 on Serial0/0, we know that there has to be another router in the picture, so C is a correct choice. Since the router received an update from the neighbor address, we know that there's a connection. Therefore, a ping can be successful, making answer choice A correct as well.

Incorrect Answers:

B. This is incorrect because there isn't conclusive evidence to support this.

D. This is incorrect because from the exhibit above the router is inaccessible, therefore the success of a ping would be unknown.

QUESTION NO: 4

On your OSPF network, routers TK1 and TK2 belong to the same Ethernet network. However, they are unable to establish an adjacency over this link. While troubleshooting this problem, you issue the "show ip ospf interface Ethernet 0" command on each router. The output from these commands is displayed below:

TK1: Ethernet is up, line protocol is up

Internet address 192.168.1.2/24, Area 0

Process ID 1, Router ID 192.168.31.33, Network Type BROADCAST, Cost: 10

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 192.168.31.33, Interface address 192.168.1.2

No backup designated router on this network

Time intervals configured, Hello 5, Dead 20, Wait 20, Retransmit 5

TK2: Ethernet0 is up, line protocol is up

Internet address 192.168.1.1/24, Area 0

Process ID 2, Router ID 192.168.31.11, Network Type BROADCAST, Cost: 10

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 192.168.31.11, Interface address 192.168.1.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

What is the underlying cause of the routers failing to become adjacent?

A. The OSPF area is misconfigured.
B. The priority on TK2 should be set lower.
C. The cost on TK2 should be set lower.
D. The hello and dead timers are misconfigured.
E. You need to add a backup designated router to the network.

F. The OSPF process ID numbers do not match.

Answer: D
Explanation:
OSPF routers must have the same hello intervals and the same dead intervals to exchange information. By default, the dead interval is four times the value of the hello interval. This means that a router has four chances to send a hello packet before being declared dead.

On broadcast OSPF networks, the default hello interval is 10 seconds and the default dead interval is 40 seconds. On nonbroadcast networks, the default hello interval is 30 seconds and the default dead interval is 120 seconds. These default values result in efficient OSPF operation and seldom need to be modified. As shown in the output, the hello timer on router TK1 was changed to 5 seconds, with the dead timer being set to 20 seconds.

Incorrect Answers:
A. Both routers are configured to be in area 0.
B. In this example the adjacency should come up regardless of which one was the DR/BRD. Therefore, setting the priority on one router will not solve this problem.
C. This will not solve the adjacency issue.
E. Only the DR is absolutely required on the Ethernet subnet, not the BDR.
F. Unlike other protocols, the routing process ID's do not necessarily need to match in OSPF for routing to work.

QUESTION NO: 5
A new router, named TK1, is being installed. You wish to add this router to your existing OSPF network. In doing so, you configure the following:

```
TK1(config)# router ospf 1
TK1(config-router)# network 10.10.10.0 255.255.255.0 area 0
```

After making this change, you notice that the networks attached to TK1 are not being learned by the other OSPF routers. What could be the cause of this?

A. The AS is not correctly configured
B. The network subnet mask is incorrectly configured
C. The network wildcard mask is configured incorrectly
D. The network number is not correctly configured
E. The process id is configured incorrectly
F. None of the above

Answer: C
Explanation:
The network command specifies the IP address (10.10.10.0) followed by the wildcard mask (not the subnet mask) and the area that is to be associated with the OSPF address range (in this case, area 0). The wildcard mask indicates in binary how much of the IP address much be matched with 0s indicating that the bits must match and 1 indicating that they may vary. Thus 0.0.0.255 or 00000000.00000000.00000000.11111111 indicates that any bit in the last octet can vary while all bits in the first 3 octets must match the network address (in other words, 10.10.10.xx)

QUESTION NO: 6
Which one of the following EIGRP commands can check the IP addresses of the adjacent neighbors, as well as verifying the EIGRP retransmit intervals and queue counts?

A. TK1#show ip eigrp adjacency
B. TK1#show ip eigrp topology
C. TK1#show ip eigrp interfaces
D. TK1#show ip eigrp neighbors
E. None of the above

Answer: D
Explanation:
The topology database contains information from all of the LSA packets that have been received for an area. The topology database is updated by the LSAs. Each router within the area has exactly the same topology database. All routers must have the same vision of the networks; otherwise, confusion, routing loops, and loss of connectivity will result.
Note: The topology database is the router's view of the network within the area. It includes every OSPF router within the area and all the connected networks. This database is indeed a routing table, but a routing table for which no path decisions have been made; it is at present a topology database.
Reference: "CCNP BSCI Exam Certification Guide Third Edition" by Clare Gough, CCIE No. 2893, Page 197.

QUESTION NO: 7
The Testking network consists of two routers as shown below:
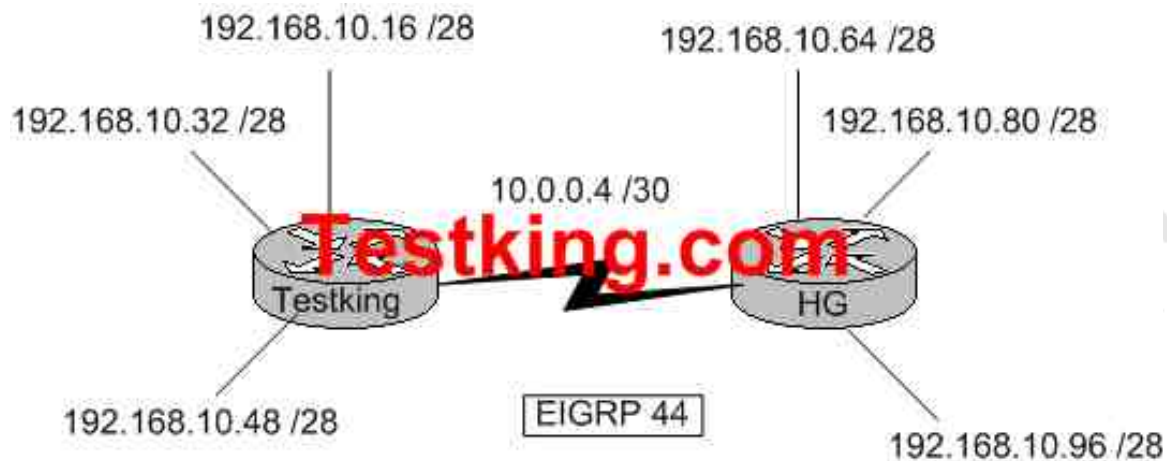
Both routers Testking and HG are configured for EIGRP. Unfortunately, users on the Testking networks are unable to reach users on the HG networks. Which command could you enter on Testking to correct this problem?

A. Testking(config-router)# version 2
B. Testking(config-router)# no auto-summary
C. Testking(config-router)# redistribute eigrp 44
D. Testking(config-router)# EIGRP log-neighbor-changes
E. Testking(config-router)# default-information originate

Answer: B
Explanation:
By default, EIGRP will auto-summarize IP information at the network boundaries. In this example, the 192.168.10.0 network is subnetted into 6 separate networks. Therefore, each router will only advertise the 192.168.10.0/24 network to each other by default. To disable this function and transmit sub-prefix routing information across classful network boundaries, auto summarization must be disabled.

Incorrect Answers:
A. There is only one version of EIGRP.
C. Based on the diagram, each router is already configured for EIGRP 44.
D. This will have no impact on the routes.
E. This will generate a default route, which will be advertised to the other router. However, a default route is not needed, as the individual subnets need to be advertised, not a default route.

QUESTION NO: 8

While troubleshooting a routing problem in your network, you utilize RIP debugging as shown below:

```
RtrA#debug ip rip
RIP protocol debugging is on
RtrA#
1d05h: RIP: sending v1 update to 255.255.255.255 via FastEthernet0/0 (172.16.1.1)
1d05h: RIP: build update entries
1d05h:   network 10.0.0.0 metric 1
1d05h:   network 192.168.1.0 metric 2
1d05h: RIP: sending v1 update to 255.255.255.255 via Serial0/0 (10.0.8.1)
1d05h: RIP: build update entries
1d05h:   network 172.16.0.0 metric 1
RtrA#
1d05h: RIP: received v1 update from 10.0.15.2 on Serial0/0
1d05h:      192.168.1.0 in 1 hops
1d05h:      192.168.168.0 in 16 hops (inaccessible)
```

Based on the information provided, which of the following are true? (Select two answer choices)

A. This router was configured with the commands:
RtrA(config)#router rip
RtrA(config-router)# network 172.16.0.0
RtrA(config-router)# network 10.0.0.0
B. This router was configured with the commands:
RtrA(config)# router rip
RtrA(config-router)# network 192.168.1.0
RtrA(config-router)# network 10.0.0.0
RtrA(config-router)# network 192.168.168.0
C. This router was configured with the commands:
RtrA(config)# router rip
RtrA(config-router)# version 2
RtrA(config-router)# network 172.16.0.0
RtrA(config-router)# network 10.0.0.0

D. Split horizon was disabled on this router.
E. Network 192.168.168.0 will be displayed in the routing table.
F. Network 10.0.0.0 will be displayed in the routing table.

Answer: A, F
Explanation:
Based on the information provided, this RIP network is routing the 192.168.1.0,
172.16.0.0, and 10.0.0.0 networks. However, the 10.0.0.0 and 172.16.0.0 networks show
that they are being advertised to the other router with a metric of 1, meaning that it is
directly connected. Therefore, choice A is correct. Also, the 192.168.1.0 network was
received on the serial 0/0 interface with a valid metric of 1 so this route will indeed be
installed into the routing table.
Incorrect Answers:
B. The 192.168.0.0 networks are being received from other routers, so this particular one
will not have this locally configured.
C. The output shows that RIP version 1 is being used, not RIP version 2.
D. There is no information to support this.
E. This network shows a metric of 16, which is the maximum number of hops for RIP so
it is deemed inaccessible.

QUESTION NO: 9
**The Testking network consists of two routers, Peanut and Popcorn, as shown in the
display below:**
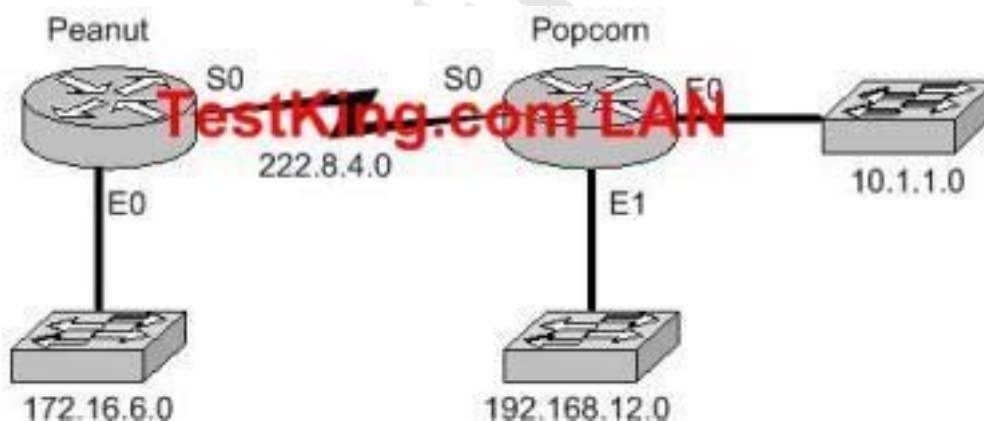
**While troubleshooting a routing problem, you issue the "show ip protocols"
command:**

```
Popcorn# show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 13 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is
Incoming update filter list for all interfaces is
Redistribution: rip
Default version control: send version 1, receive any
version
 Interface Send Recv Triggered RIP Key-chain
 Ethernet0 1 12
 Ethernet1 1 12
 Serial 1 12
Routing for Networks:
 222.8.4.0
 10.1.1.0
Routing Information Sources:
 Gateway Distance Last Update
 222.8.4.1 120 00:00:04
```

The Peanut router is able to successfully ping the Serial 0 and Ethernet 0 interface of the Popcorn router, but a ping issued to the Ethernet 1 interface fails. Based on the above output, what are the potential causes of this problem? (Select two answer choices)

A. The Popcorn router is not forwarding RIP updates.
B. The Popcorn router did not include network 192.168.12.0 in its routing configuration.
C. The Ethernet1 interface of the Popcorn router is shutdown.
D. The clockrate is not present in the configuration of one of the routers.
E. The Serial interface of the Popcorn router is not operating.

Answer: B, C
Explanation:
If the Popcorn router did not include the 192.168.12.0 network in the RIP configuration, then this network would not be advertised to the Peanut router, which would make it unreachable. Similarly, if the interface were administratively shut down, the Peanut router would not have a route to this network.
Incorrect Answers:
A, D, E. If any of these were true, then all of the Ethernet networks connected to the Popcorn router would be unreachable to the Peanut router, and not just Ethernet 1.

QUESTION NO: 10
While troubleshooting network connectivity problems, the following two show
commands were issued as shown below:

```
Test_King#show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistribution rip
Default version control: send version 1, receive any version
 Interface Send Recv Triggered RIP Key-chain
 Serial0/0 1 1 2
 Serial0/1 1 1 2
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
 10.0.0.0
Routing Information Sources:
 Gateway Distance Last Update
 10.168.11.14 120 00:00:22
Distance: (default is 120)

Testking#show ip interfaces brief
Interface IP-Address OK? Method Status
FastEthernet0/0 192.168.18.1 YES manual up
Serial0/0 10.168.11.15 YES manual up
FastEthernet0/1 unassigned YES NVRAM administratively down
Serial0/1 192.168.11.21 YES manual up
```

Based on the output of the above exhibit, which two of the following statements are
correct? (Select two answer choices)

A. Router Testking will get routing updates on the Serial0/1 interface.
B. Router Testking will issue routing updates out the Serial0/0 interface.
C. Router Testking makes use of a link-state routing protocol.
D. Router Testking will get routing updates on the Serial0/0 interface.
E. Router Testking will issue routing updates out the FastEthernet0/0 interface.

Answer: B, D
Explanation:
Based on the information given, routing updates are being sent and received only from the directly connected neighbor with IP address 10.168.11.14. The locally connected interface in this case is Serial 0/0, as shown by the fact that this interface is using IP address 10.168.11.15, so it is on the same network.
Incorrect Answers:
A, E. Only interface Serial 0/0 appears to be passing routing information.
C. The only protocol that is being used here is RIP, which is a distance vector protocol.

QUESTION NO: 11
Regarding the extended ping command; which of the statements below are true? (Select all valid answer choices)

A. The extended ping command is supported from user EXEC mode.
B. The extended ping command is available from privileged EXEC mode.
C. With the extended ping command you can specify the TCP and UDP port to be pinged.
D. With the extended ping command you can specify the timeout value.
E. With the extended ping command you can specify the datagram size.

Answer: B, D, E
Explanation:
The extended ping command works only at the privileged EXEC command line.
Some of the extended ping command values include the datagram size and timeout value as shown:
Datagram size [100]: Size of the ping packet (in bytes). Default: 100 bytes.
Timeout in seconds [2]: Timeout interval. Default: 2 (seconds). The ping is declared successful only if the ECHO REPLY packet is received before this time interval.
Incorrect Answers:
A. Regular pings are available in both user and privileged mode, but not extended pings.
C. Ports can not be specified.

QUESTION NO: 12
After executing the "show host" command, which of the information below would you see? (Select two answer choices.)

A. The IP addresses of workstations allowed gain access to the router via an access list
B. Permanent name-to-address mappings created using the ip host command.
C. Temporary and permanent DNS entries.
D. The names of the routers created using the hostname command.
E. The length of time of users logged into the router, as well as the duration

Answer: B, D
Explanation:
The "show host" command lists all host names and corresponding IP addresses, as configured in the router.
Incorrect Answers:
A, C. These are invalid.
E. This is the result of the "show users" command, not the "show ip hosts" command.

QUESTION NO: 13
When you use the ping command to send ICMP messages across a network, what's the most common request/reply pair you'll see? (Select one answer choice)

A. Echo request and Echo reply
B. ICMP hold and ICMP send
C. ICMP request and ICMP reply
D. Echo off and Echo on
E. None of the above

Answer: A
Explanation:
The ICMP protocol uses Echo request and Echo reply with the Ping command. The PING utility is the most commonly used message to verify connectivity to a remote device within the network.

QUESTION NO: 14
Three networks lie behind serial 0/0 interface of the Testking router: 172.16.10.0, 172.16.20.0, and 172.16.30.0. Unfortunately, users are unable to reach the 172.16.20.0 network. To troubleshoot the problem, you issue the "debug ip rip" and "show ip route" commands as shown below:

```
<some output text is omitted>


testking1# debug ip rip


ld00h: RIP:received vl update from 172.16.100.2 on Serial0/0
ld00h: 172.16.10.0 in 1 hops
ld00h: 172.16.20.0 in 1 hops
ld00h: 172.16.30.0 in 1 hops


testking1# show ip route


Gateway of last resort is not set


172.16.0.0/24 is subnetted, 8 subnets
C 172.16.150.0 is directly connected, FastEthernet0/0
C 172.16.220.0 is directly connected, Loopback2
C 172.16.210.0 is directly connected, Loopback1
C 172.16.200.0 is directly connected, Loopback0
R 172.16.30.0 [120/1] via 172.16.100.2, 00:00:07, Serial0/0
S 172.16.20.0 [1/0] via 172.16.150.15
R 172.16.10.0 [120/1] via 172.16.100.2, 00:00:07, Serial0/0
C 172.16.100.0 is directly connected, Serial0/0
```

What could be the underlying cause of the problem?

A. The 172.16.20.0 network is not located in testking1's routing table.
B. There is no gateway of last resort on testking1.
C. The static route for 172.16.20.0 is incorrect.
D. The testking1 router is not receiving 172.16.20.0 updates.
E. None of the above

Answer: C
Explanation:
The static route of 172.16.20.0 is incorrect. The "show ip route" shows that the network is
connected via 172.16.150.15 instead of 172.16.100.2.
Incorrect Answers:
A. The network is displayed in the table. The problem is that the route shows up as an
incorrect static route, instead of a RIP route.
B. Although the default route is not set, this done not explain why the 172.16.20.0 route
is inaccessible.

D. The RIP debugging shows that the route is indeed being learned via RIP. The problem is that a static route was configured, and the static route has a lower administrative distance than the RIP route. Therefore, the incorrect static route is installed into the routing table, rather than the correct RIP route.

QUESTION NO: 15
You are a network administrator at TestKing, Inc. and you're getting complaints that users on the TestKing2 Ethernet network can't access the TestKing1 site. To troubleshoot this, you begin by looking at the Testking1 and Testking2 router configurations as shown below:

```
TestKing1# Show running-config

<some output text omitted>

interface serial0/0
 ip address 10.0.1.1 255.255.255.0
 encapsulation frame-relay
!
router igrp 1
network 10.0.0.0

TestKing2# show running-config

<some output text omitted>

interface fastethernet0/0
 ip address 10.10.2.1 255.255.255.0

interface serial0/0
 ip address 10.10.1.2 255.255.255.0
 encapsulation frame-relay
!
router igrp 2
network 10.0.0.0
```

Based on the above output, what is the underlying cause of this problem?

A. Link state routing protocol is missing.
B. Incorrectly configured IP addresses

C. IGRP is incorrectly configured.
D. Frame relay is not configured.
E. None of the above

Answer: C
Explanation:
To configure the Interior Gateway Routing Protocol (IGRP) routing process, use the router igrp global configuration command as shown below:
router igrp autonomous-system
autonomous-system- Autonomous system number that identifies the routes to the other IGRP routers. It is also used to tag the routing information. The autonomous system must match for all IGRP routers in the network. The problem in this case is that Testking1 is using IGRP 1, while Testking2 is using IGRP 2.

QUESTION NO: 16
You are a network technician at TestKing, Inc. You are currently troubleshooting a routing issue on the Testking1 router. You issue the show ip route command. The output from the command is displayed in the following exhibit:

```
testking1#show ip route
Codes: C - connected, S - static, I - IGRP, R- RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inner area
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - Candidate
default
U - per-user static route

Gateway of last resort is not set

R 192.168.8.0/24 [120/1] via 192.168.2.2, 00:00:10, Serial0
C 192.168.9.0/24 is directly connected, Serial1
R 192.168.10.0/24 [120/7] via 192.168.9.1, 00:00:02, Serial1
R 192.168.11.0/24 [120/7] via 192.168.9.1, 00:00:03, Serial1
C 192.168.1.0/24 is directly connected, Ethernet0
C 192.168.2.0/24 is directly connected, Serial0
R 192.168.3.0/24 [120/1] via 192.168.2.2, 00:00:10, Serial0
R 192.168.4.0/24 [120/15] via 192.168.2.2, 00:00:10, Serial0
```

```
R 192.168.5.0/24 [120/15] via 192.168.2.2, 00:00:10, Serial0
R 192.168.6.0/24 [120/15] via 192.168.2.2, 00:00:10, Serial0
R 192.168.7.0/24 [120/1] via 192.168.2.2, 00:00:10, Serial0
```

Which one of the following routes WILL NOT be entered into its neighboring routers routing table?

A. R 192.168.11.0/24 [120/7] via 192.168.9.1, 00:00:03, Serial1
B. C 192.168.1.0/24 is directly connected, Ethernet0
C. R 192.168.8.0/24 [120/1] via 192.168.2.2, 00:00:10, Serial0
D. R 192.168.5.0/24 [120/15] via 192.168.2.2, 00:00:10, Serial0
E. None of the above

Answer: D
Explanation:
RIP has the maximum hop count of 15. This route already has a hop count of 15 and adding one would make it unreachable (see below). This route will be discarded.

R 202.30.5.0/24 [120/15] via 202.30.2.2, 00:00:10, Serial0

QUESTION NO: 17
The Testking network consists of two routers connected via a point to point serial connection as shown below:

TestKing1 #sh int s0
 Serial0 is up, line protocol is up
 Hardware is HD64570
 Internet address is 192.168.10.1/24
 MTU 1500 bytes, BW 1433 Kbit
 reliability 255/255
 Encapsulation HDLC, loopback not set
 Keepalive set (10 sec)

TestKing2 #sh int s1
 Serial1 is up, line protocol is up
 Hardware is HD64570
 Internet address is 192.168.11.2/24
 MTU 1500 bytes, BW 56000 Kbit
 reliability 255/255
 Encapsulation HDLC, loopback not set
 Keepalive set (10 sec)

Users on TestKing1 are unable to connect to the TestKing2 network. Based on the configurations shown above, what could be the cause of this?

A. The Maximum Transmission Unit size is too large.
B. No loopback is set.
C. The subnet mask is incorrect
D. The encapsulation does not match at each end.
E. There is an incorrect IP address.
F. There is an incompatible bandwidth statement between routers.

Answer: E
Explanation:
The IP addresses are both on different subnets but are connected on Serial link. For the connection to work, the two interfaces must belong to the same IP subnet.
Incorrect Answers:
A. The MTU is set at 1500 on each end, which is acceptable.
B. Loopbacks are not required for this serial connection to function.
C. The masks match, but the IP addresses do not.
D. Based on the diagram above, both serial interfaces are set to HDLC encapsulation, which is the default encapsulation for serial interfaces.
F. Although this is true, the bandwidth statements do not need to be set the same in order for this connection to work. The bandwidth statement is used by certain routing protocols, such as OSPF and EIGRP, but they have no impact on the actual function of the serial line.

QUESTION NO: 18
The following routes exist in the TestKing router:

A. R 12.18.8.0/24 [120/1] via 12.18.2., 00:00:10, Serial0
B. R 12.18.11.0/24 [120/7] via 12.18.9.1, 00:00:03, Serial1
C. C 12.18.1.0/24 is directly connected, Ethernet0
D. R 12.18.5.0/24 [120/15] via 12.18.2.2, 00:00:10, Serial0

Based on the above information, which route will not be entered into the routing table of a neighboring router?

Answer: D
Explanation:

The number values inside of the brackets indicate the administrative distance and metric of the route. In this case the [120/15] means that the route has an AD of 120, which is the default for RIP, and a metric of 15. Since hop counts are used as the metric for RIP, it means that this route was learned by RIP and it is 15 hops away. When this route is advertised to a neighbor an additional hop is added, meaning that it will be advertised with a metric of 16. Since a RIP route with a metric of 16 is considered unreachable, it will not be added to the routing table of the neighbor router.

QUESTION NO: 19
The routing table of the Corp router is displayed below:

```
Corp#show ip route
***
Gateway of last resort is not set

C    192.168.13.0/24 is directly connected, Serial0/1
C    192.168.14.0/24 is directly connected, FastEthernet0/0
C    192.168.15.0/24 is directly connected, Serial0/0.102
C    192.168.20.0/24 is directly connected, Serial0/0.117
R    192.168.16.0/24 [120/1] via 192.168.15.2, 00:00:05, Serial0/0.102
R    192.168.17.0/24 [120/1] via 192.168.15.2, 00:00:05, Serial0/0.102
R    192.168.30.0/24 [120/2] via 192.168.20.2, 00:00:25, Serial0/0.117
R    192.168.19.0/24 [120/1] via 192.168.20.2, 00:00:25, Serial0/0.117
R    192.168.21.0/24 [120/3] via 192.168.20.2, 00:00:25, Serial0/0.117
R    192.168.214.0/24 [120/1] via 192.168.14.2, 00:00:22, FastEthernet0/0
```

The Corp router receives an IP packet with a source IP address of 192.168.214.20 and a destination address of 192.168.22.3. Based on the information above, what will the router do with this packet?

A. It will encapsulate the packet as Frame Relay and forward it out interface Serial 0/0.117.
B. It will discard the packet and send an ICMP Destination Unreachable message out interface FastEthernet 0/0.
C. It will forward the packet out interface Serial 0/1 and send an ICMP Echo Reply message out interface serial 0/0.102.

D. It will change the IP packet to an ARP frame and forward it out FastEthernet 0/0.

E. It will forward the packet out the default route.

F. None of the above.

Answer: B

Explanation:

The destination IP address of 192.168.22.3 is not in the routing table of the Corp router. Since there is no default route set, as shown by the "gateway of last resort is not set" statement, the packet will be dropped by the router and an ICMP Destination Unreachable message will be sent back to the source, which is Fast Ethernet 0/0 in this case.

QUESTION NO: 20

You try to add a new router into the established TestKing OSPF network. The networks attached to the new router do not appear in the routing tables of the other OSPF routers.

The new router was configured for OSPF in the following way:

Router(config)# router ospf 99

Router(config-if)# network 10.0.0.0 255.0.0.0 area 0

Based on this information, what is the most likely problem?

A. The process id is configured improperly.

B. The OSPF area is configured improperly.

C. The network wildcard mask is configured improperly.

D. The network number is configured improperly.

E. The AS is configured improperly.

F. The network subnet mask is configured improperly.

G. All of the above are likely problems.

Answer: C

Explanation:

When configuring OSPF, the mask used for the network statement is a wildcard mask similar to an access list. In this specific example, the correct syntax would have been "network 10.0.0.0 0.0.0.255 area 0."

Incorrect Answers:

A. Here the process ID is 99, which is valid.

B. Area 0 is the backbone area, so configuring the network to be in area 0 should be acceptable.

D. This is not the problem, assuming that all 10.X.X.X networks are to be configured for OSPF.

E. The AS number, as called the process ID in OSPF is 99.

F. OSPF uses wildcard masks, not the usual subnet masks

QUESTION NO: 21
Which command will display all the EIGRP feasible successor routes known to a router?

A. Router# show ip eigrp routes *
B. Router# show ip eigrp summary
C. Router# show ip eigrp topology
D. Router# show ip eigrp adjacencies
E. Router# show ip eigrp neighbors detail

Answer: C
Explanation:
The "show ip eigrp topology" command is used to display the entries in the EIGRP topology table. The topology table contains the feasible successors for each route, along with the feasible distance, each feasible successor's advertised distance to the route, and the locally calculated distance and cost to the destination.

QUESTION NO: 22
Which IOS commands can a network technician use to verify all RIP, IGRP, EIGRP, and OSPF routing protocol configurations? Select two.

A. debug ip routing
B. show running-config
C. show ip route protocols
D. show ip protocols
E. show protocols all

Answer: B, D
Explanation:

To display the parameters and current state of the active routing protocol process, use the "show ip protocols" command in EXEC mode. The information displayed by the show ip protocols command is useful in debugging routing operations. Information in the Routing Information Sources field of the "show ip protocols" output can help you identify a router suspected of delivering bad routing information.

Alternatively, you could view the entire configuration by issuing the "show running-configuration" command. This will provide the entire configuration, including the routing protocol portions.

Incorrect Answers:

A. This will not display the way the protocols are configured in the router.

C. Although the different protocols can be specified using this command, this syntax is invalid. For example, you can view the routing table for all IGRP routes using the "show ip route igrp" but you can not issue the "show ip route protocols" command.

E. This is an invalid command.

QUESTION NO: 23
While troubleshooting a TestKing router, the following command was issued:

```
TestKing3# show ip route
....output omitted....
Gateway of last resort is 140.8.100.5 to network 0.0.0.0
R 140.8.7.0/24 [120/3] via 150.8.12.9:00:00:20 serial 01
O 140.8.5.5/24 [110/782] via 140.8.100.5 , 00:38:34 serial 0/0
R 140.8.78.8/29 [120/2] via 150.8.12.9 : 00:00:22 serial 0/1
C 140.8.100.0/28 is directly connected, serial 0/0
     150.8.0.0/15 is variable subnetted, 2 subnets, 2 masks
                  directly connected serial 01
R 150.8.0.0/16 [120/4] via 150.8.12.9,00:00:23 serial 0/1
O 0.0.0.0/0 [110/2738] via 140.8.100.5,00:38:34, serial 0/0
```

In the route highlighted in the graphic, what does the number 782 represent?

A. Administrative distance
B. Delay to the destination
C. Cost of the route
D. Hop count

Answer: C
Explanation:
The exhibit shows OSPF is been used as the routing protocol and OSPF uses Cost.
The cost (also called metric) of an interface in OSPF is an indication of
the overhead required to send packets across a certain interface. The cost
of an interface is inversely proportional to the bandwidth of that
interface. A higher bandwidth indicates a lower cost.

QUESTION NO: 24
The TestKing OSPF Backbone network is displayed below:
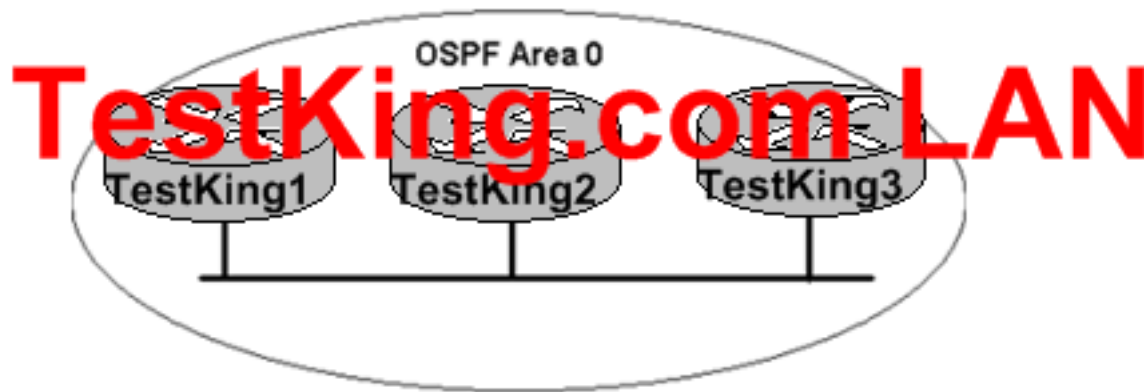
**TESTKING1 is unable to establish an OSPF neighbor relationship with
TESTKING3. What are possible reasons for this problem? (Choose Two).**

A. All of the routers need to be configured for backbone Area1.
B. TESTKING1 and TESTKING2 are the DR and BDR, so OSPF will not establish
   neighbor adjacency with TESTKING3
C. A static route has been configured from TESTKING1 to TESTKING3 and prevents
   the neighbor adjacency from being established.
D. The hello and dead interval timers are not set to the same values on TESTKING1 and
   TESTKING3.
E. EIGRP is also configured on these routers with a lower administrative distance.
F. TESTKING1 and TESTKING3 are configured in different areas.

Answer: D, F

Explanation:
In order for two OSPF routers to establish a neighbor adjacency, they must agree on a number of things, including the hello intervals, dead intervals, and the area ID's. Although a router can be configured for multiple OSPF areas, a neighbor relationship will only be built on interfaces that share the same area.

QUESTION NO: 25 SIMULATION
Network topology exhibit
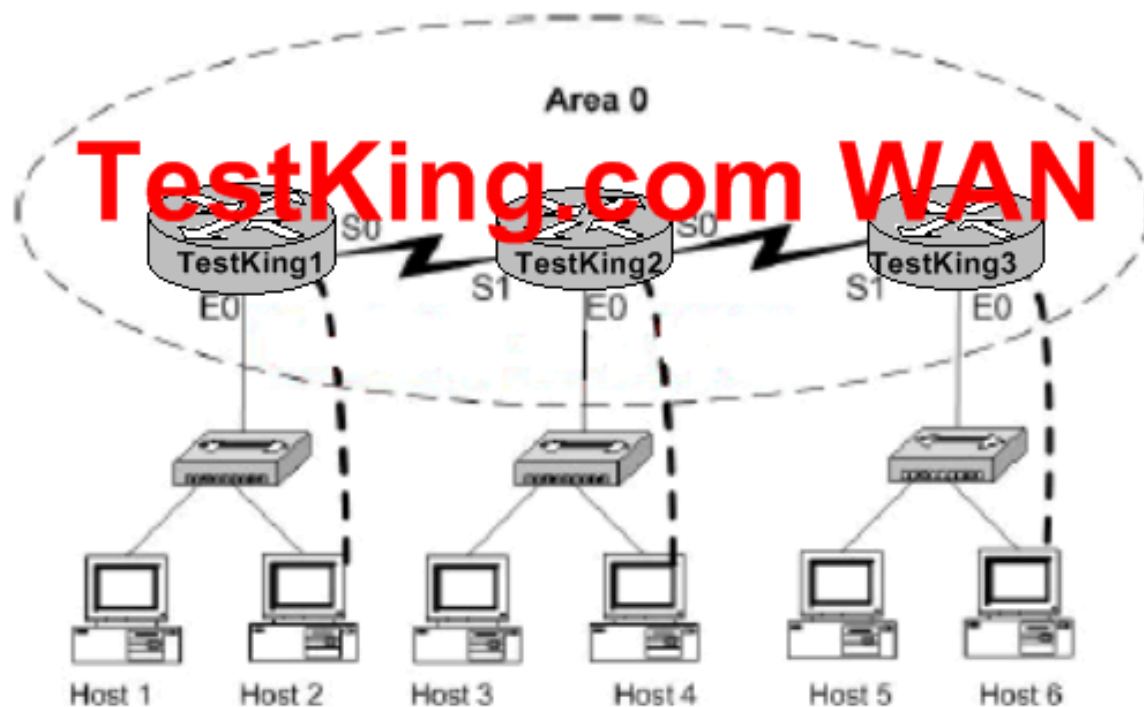
TestKing.com has decided to network three locations to improve efficiency in inventory control. The routers have been named TestKing1, TestKing2, TestKing3. The necessary networking has been completed at each location, and the routers have been configured with single area OSPF as the routing protocol. The TestKing1 router was recently installed but connectivity is not complete because in incomplete routing tables. Identify and correct any problem you see in the configuration.

Note: The OSPF process must be configured to allow interfaces in specific subnets to participate in the routing process.

The IP address and passwords are listed in the chart.

LAB A
Name : TestKing1
E0 : 192.168.15.0 /24
S0 : 192.168.161.5 /30
Secret Password : testking

LAB B
Name : TestKing2
E0 : 192.168.26.1 /24
S0 : 192.168.161.10 /30
S1 : 192.168.161.6 /30
Secret Password : testking

LAB C
Name : TestKing3
E0 : 192.168.32.1 /24
S1 : 192.168.161.9 /30
Secret Password : testking

Answer:
To configure:
en
testking
conf t
int eo
ip address 192.168.15.0 255.255.255.0
no shut
exit

int s0
ip address 192.168.161.5 255.255.255.252
no shut
exit

router ospf 1
network 192.168.15.0 0.0.0.255 area 0

network 192.168.161.4 0.0.0.3 area 0
exit

Copy run start

Note. Variation #1
LAB A
Name : TestKing1
E0 : 192.168.1.1 /24
S0 : 192.168.197.5 /30
Secret Password : testking

LAB B
Name : TestKing2
E0 : 192.168.27.1 /24
S0 : 192.168.197.10 /30
S1 : 192.168.197.6 /30
Secret Password : testking

LAB C
Name : TestKing3
E0 : 192.168.39.1 /24
S1 : 192.168.197.9 /30
Secret Password : testking

Note. Variation #2
LAB A
Name : TestKing1
E0 : 192.168.12.1 /24
S0 : 192.168.172.5 /30
Secret Password : testking

LAB B
Name : TestKing2
E0 : 192.168.17.1 /24
S0 : 192.168.172.10 /30
S1 : 192.168.172.6 /30
Secret Password : testking

LAB C
Name : TestKing3

E0 : 192.168.36.1 /24
S1 : 192.168.172.9 /30
Secret Password : testking

QUESTION NO: 26 SIMULATION
Network topology exhibit
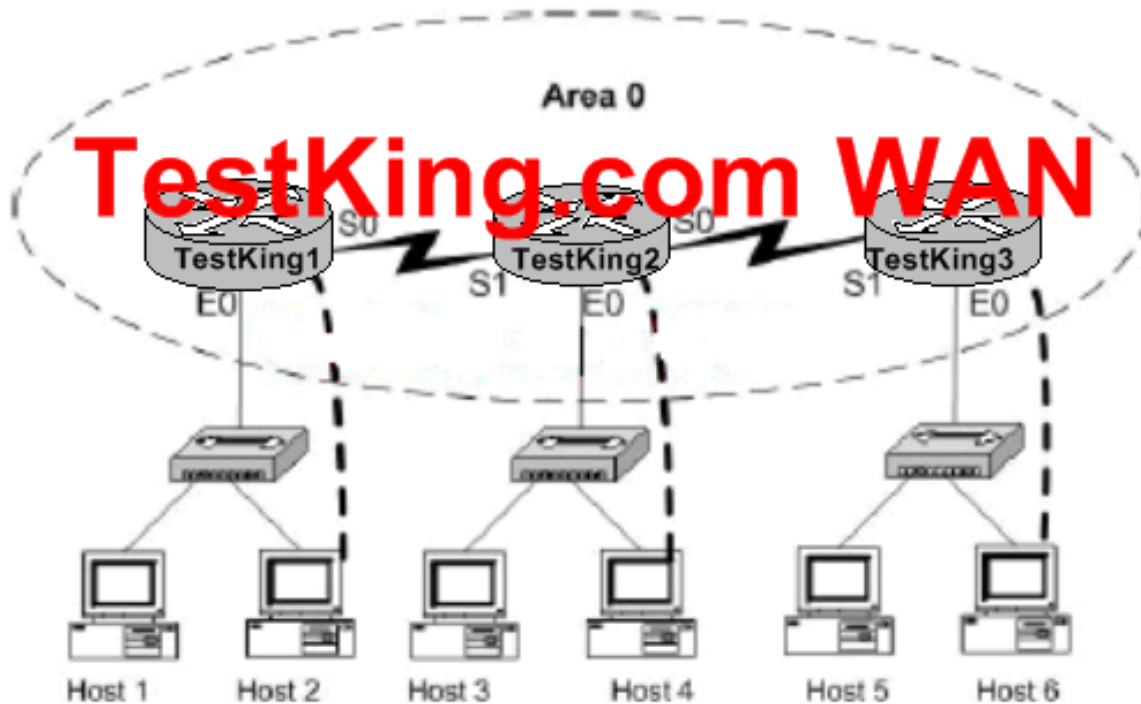
TestKing.com has decided to network three locations to improve efficiency in inventory control. The routers have been named TestKing1, TestKing2, TestKing3. The necessary networking has been completed router was recently installed but connectivity is not complete because in incomplete routing tables. Identify and correct any problem you see in the configuration.

Note: The OSPF process must be configured to allow interfaces in specific subnets to participate in the routing process.

The IP address and passwords are listed in the chart.

LAB A
Name : TestKing1
E0 : 192.168.4.1 /24
S0 : 192.168.163.5 /30
Secret Password : testking

LAB B
Name : TestKing2
E0 : 192.168.24.1 /24
S0 : 192.168.163.10 /30
S1 : 192.168.163.6 /30
Secret Password : testking

LAB C
Name : TestKing3
E0 : 192.168.40.1 /24
S1 : 192.168.163.9 /30
Secret Password : testking

Answer:
Explanation:
TestKing1
router ospf 1
network 192.168.4.0 000 255 area 0
network 192.168.63.4 0.0.0.3 area 0

TestKing2
Router ospf 2
network 192.168.163.8 0.0.0.3 area 0
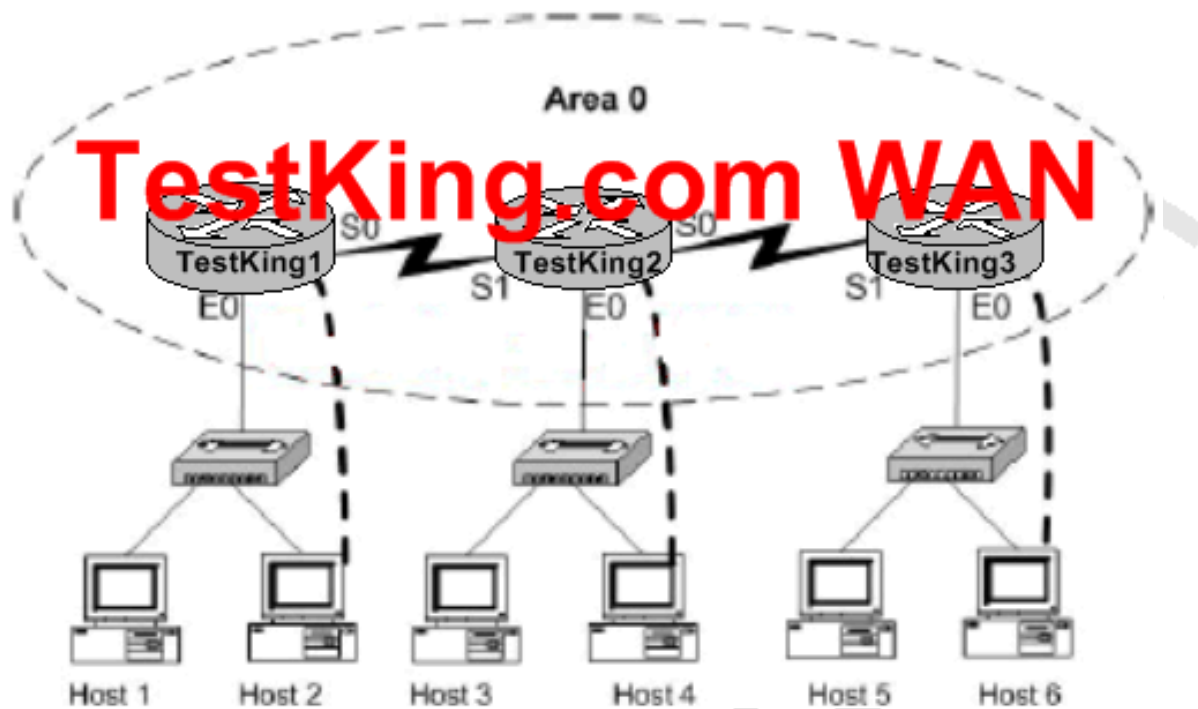network192.168.163.4.0.0.0.3 area0

TestKing3
router ospf 3
network192.168.40.0 0 0 0 255 area 0
network 192.168.163.8 0.0.0.3 area 0

QUESTION NO: 27 SIMULATION
Network topology exhibit

TestKing.com has decided to network three locations to improve efficiency in inventory control. The routers have been named TestKing1, TestKing2, TestKing3. The necessary networking has been completed router was recently installed but connectivity is not complete because in incomplete routing tables. Identify and correct any problem you see in the configuration.

Note: The OSPF process must be configured to allow interfaces in specific subnets to participate in the routing process.

The IP address and passwords are listed in the chart.

LAB A
Name : TestKing1
E0 : 192.168.0.1 /24
S0 : 192.168.135.5 /30
Secret Password : testking

LAB B
Name : TestKing2

E0 : 192.168.24.1 /24
S0 : 192.168.135.10 /30
S1 : 192.168.135.6 /30
Secret Password : testking

LAB C
Name : TestKing3
E0 : 192.168.43.1 /24
S1 : 192.168.135.9 /30
Secret Password : testking

Answer:
Full configuration for 3 routers working with OSPF.

Testking1:
conf t
int e0
ip addr 192.168.0.1 255.255.255.0
no shut
int s0
ip addr 192.168.135.5 255.255.255.252
no shut
ex
router ospf 1
network 192.168.0.0 0.0.0.255 area 1
network 192.168.135.0 0.0.0.255 area 1
end

Testking2:
conf t
int e0
ip addr 192.168.24.1 255.255.255.0
no shut
int s0
ip addr 192.168.135.10 255.255.255.252
no shut
int s1
ip addr 192.168.135.6 255.255.255.252
no shut
ex
router ospf 1