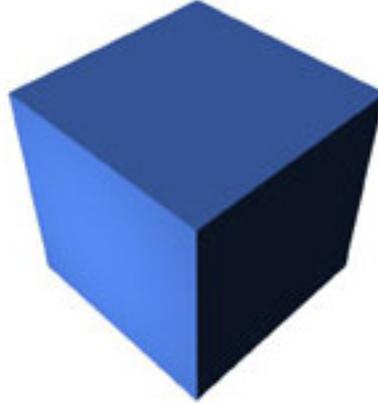


640-901

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Note: Section A has 74 questions, Section B has 280 questions. There are 354 questions in total.

Section A

QUESTION NO: 1

Exhibit: `ip router isis`

Your trainee is configuring a router. He wants to configure Integrated IS-IS to route IP. He knows that he must use the command listed in the exhibit. In which mode should he use this command?

- A. Line configuration mode
- B. Router configuration mode
- C. Global configuration mode
- D. Interface configuration mode

Answer: D

Explanation: To configure an IS-IS routing process for IP on an interface, use the **ip router isis** interface configuration command.

Note: To enable IS-IS, perform the following tasks starting in global configuration mode:

Step 1: router isis

Enable IS-IS routing and specify an IS-IS process for IP, which places you in router configuration mode.

Step 2: net *network-entity-title*

Configure NETs for the routing process; you can specify a name for a NET as well as an address.

Step 3: interface *type number*

Enter interface configuration mode.

Step 4: ip router isis [*tag*]

Specify the interfaces that should be actively routing IS-IS.

Reference: Cisco, Configuring Integrated IS-IS

Incorrect Answers

A, B; C: The **ip router isis** cannot be used in either line, router or Global configuration mode.

QUESTION NO: 2

You want to retrieve the Level-2 routing table in Integrated IS-IS. Which IOS command should you use?

- A. show isis route
- B. show clns route
- C. show isis database
- D. show clns neighbors

Answer: B

Explanation: The **show clns route** command is used to display all of the destinations to which this router knows how to route packets. The output includes the IS-IS Level 2 routing table as well as static and ISO-IGRP learned prefix routes.

Reference: Cisco, ISO CLNS Commands

Incorrect Answers

- A:** The **show isis routes** command is used to display the IS-IS Level 1 forwarding table for IS-IS learned routes.
- C:** The **show isis database** command is used to display the IS-IS link state database.
- D:** The **show clns neighbors** command displays both ES and IS neighbors.

QUESTION NO: 3

Your trainee is curious why Integrated IS-IS Level-3 area routing is not supported by Cisco routers. What should you tell her?

- A. The System ID on a Cisco router is limited to 6 bytes.
- B. The NET on a Cisco router is restricted to a maximum of 8 bytes.
- C. The lack of Domain portion of the NSAP only accommodates for 2 levels of routing hierarchy.
- D. Cisco routers cannot route CLNS data that use the ISO/IEC 10589 standard of NSAP addressing.
- E. Since the NSAP service identifier (N-SEL) must always be set to 00, no other service types are available.

Answer: C?

Explanation:

Note: Integrated IS-IS is a version of the OSI IS-IS routing protocol that uses a single routing algorithm to support more network layer protocols than just CLNP. Integrated IS-IS sometimes is called Dual IS-IS, named after a version designed for IP and CLNP networks. Only one IS-IS process is allowed whether you run it in integrated mode, ISO CLNS only, or IP only.

QUESTION NO: 4

What representation is used in IS-IS to identify LAN interfaces?

- A. broadcast
- B. point-to-point
- C. pseudo-node
- D. non-broadcast
- E. point-to-multipoint

Answer: A

Explanation: The types of networks that IS-IS defines include Point-to-point networks and Broadcast networks.

Reference: Cisco, Introduction to Intermediate, System-to-Intermediate System Protocol

http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

Incorrect Answers

B: Point-to-point networks, such as serial lines, connect a single pair of routers.

C: A Designated Intermediate System (DIS) creates a pseudonode (a virtual node), and all the routers on a LAN, including the DIS, form an adjacency with the pseudonode instead of forming $n*(n-1)$ order adjacencies with each other in a full mesh. DIS are not used by default however.

D: Non-broadcast is not used by IS-IS.

E: Point-to-multipoint is not used by IS-IS.

QUESTION NO: 5

IS-IS routers can be classified into different types. Which two IS-IS router types provide intra-area routing services? (Choose two)

- A. L1 IS
- B. L1 ES
- C. L2 IS
- D. L2 ES
- E. L1/L2 IS

Answer: A, E

Explanation: L1 IS and L1/L2 IS routers provide intra-area routing services.

Reference: RFC2966

QUESTION NO: 6

As many routing protocols IS-IS use areas. To what must each IS-IS area be connected?

- A. Area 0
- B. Area 1
- C. Level-1 backbone
- D. Level-2 backbone
- E. External IS-IS areas

Answer: D

Explanation: Small IS-IS networks are built as a single area that includes all the routers in the network. As the network grows larger, it is usually reorganized into a backbone area made up of the connected set of all Level 2 routers from all areas, which is in turn connected to local areas.

Reference: Cisco, IS-IS Multiarea Support

Incorrect Answers

A, B: Area 0 or Area 1 has no special significance in IS-IS.

C: Level 2, not Level 1.

E: This is not a requirement.

QUESTION NO: 7

An IS-IS router can form adjacencies to different types of IS-IS routers depending on which type it is. To which routers can a Level 1-IS router establish an adjacency? (Select two.)

- A. Any Level-1 IS in any area.
- B. Any Level-2 IS in any area.
- C. Any Level-1 IS in the same area.
- D. Any Level-2 IS in the same area.
- E. Any Level-1/Level-2 IS in the same area.

Answer: C, E

Explanation: A Level-1 IS router can establish adjacencies with other routers Level-1 and Level-1/Level-2 IS routers within the same area.

Incorrect Answers

A: Level-1 adjacencies can only be established within one single area.
B, D: Level-2 adjacencies require Level-2 IS routers.

QUESTION NO: 8

What use are PSNPs on a point-point IS-IS network connection?

- A. Acknowledge LSPs.
- B. Replace IIIH packets.
- C. Establish adjacencies.
- D. Send link-state changes.

Answer: A

Explanation: Partial sequence number PDUs (PSNPs) are used to request an LSP (or LSPs) and acknowledge receipt of an LSP (or LSPs).

Reference: Cisco, Introduction to Intermediate, System-to-Intermediate System Protocol
http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

QUESTION NO: 9

Both IS-IS and OSPF use the notion of a backbone. OSPF use the Area 0 as the backbone. What area number does IS-IS use for the backbone?

- A. Area 0
- B. Area 1
- C. Any legal area number.
- D. There is no backbone area number.

Answer: D

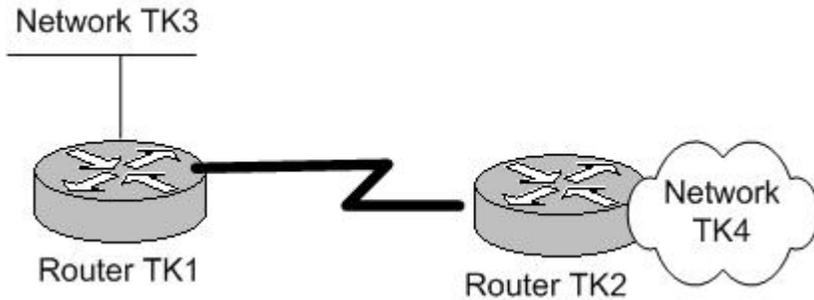
Explanation: IS-IS does not have a backbone area like the OSPF area 0. The IS-IS backbone is a contiguous collection of Level 2-capable routers, each of which can be in a different area

Reference: Cisco, Introduction to Intermediate, System-to-Intermediate System Protocol
http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

QUESTION NO: 10

Exhibit:

```
RouterTK1 (config) #ip default-network Network TK3
```

Diagram

Your networks, as shown in the diagram above, have all been configured with RIP. You use the command shown the exhibit at Router TK1. Where will *Network T3* appear as the default network?

- A. Router TK1 only-
- B. Router TK2 only.
- C. Both routers.
- D. Neither routers.

Answer: B

Explanation: The `ip default-network` command is used as a method of distributing default route information to other routers. When running RIP, you can create the default route by using the `ip defaultnetwork` command. If the router has a directly connected interface onto the network specified in the `ip default-network` command, RIP will generate (or source) a default route to its RIP neighbor routers.

Reference:**Incorrect Answers**

- A, C:** The command provides no functionality for the router on which it is configured.
D: Router TK2 will be configured with the default-network as configured on Router TK1.

QUESTION NO: 11

Your TestKing trainee Bob wants you to tell him some facts on Cisco IS-IS NSAP address System IDs. What three things should you tell him? (Select three.)

- A. System IDs can vary in size within a domain.
- B. The System ID identifies a node in an IS-IS network.
- C. The System ID must be unique within a Level-1 area.

- D. The System ID must be unique within a Level-2 area.
- E. The System ID must be the MAC address of the router,

Answer: B, C, D

Explanation:

C: All Level 1 routers and hosts in an area must have an NSAP with the same area address.

D: Level 2 routers advertise their own area addresses (NSAP) to the other Level 2 routers in the backbone.

Reference: Introduction to Intermediate System-to-Intermediate System Protocol

http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

Incorrect Answers

A: All ISs and ESs in a routing domain must have system IDs of the same length. Furthermore, Cisco implements a fixed length of 6 bytes for the system ID.

B: Each system ID within an area must be unique. It is used to identify a IS-IS node.

E: There are several techniques for creating unique system IDs

- * Start numbering 1, 2, 3, 4, and so on.

- * Use Media Access Control (MAC) addresses.

- * Convert and use the loopback IP address: 192.168.11.1 --> 192.168.011.001--> 1921.6801.1001.

QUESTION NO: 12

IS-IS routers can be classified into different types. Each type of IS-IS router can establish adjacencies to certain types of IS-IS routers.

In particular, with which types of routers can a Level-1/Level-2 IS router establish adjacencies? (Choose four)

- A. Any Level-1 IS in any area.
- B. Any Level-2 IS in any area.
- C. Any Level-1 IS in the same area.
- D. Any Level-1/Level-2 IS in any area.
- E. Any Level-1/Level-2 IS in the same area.

Answer: B, C, D, E

Explanation: A Level-1/Level-2 IS routers can establish adjacencies with Level-1 in the same area, and with Level-1/Level-2 IS or Level 2 IS routers in any area.

Incorrect Answers

A: Level 1 IS routers can only form adjacencies with routers within the same area.

Reference: Introduction to Intermediate System-to-Intermediate System Protocol
http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

QUESTION NO: 13

You have two autonomous systems. They use different routing protocols and there are redundant paths between them. Which feature in IOS would prevent routing loops between these two autonomous systems?

- A. Route filtering.
- B. Passive interfaces.
- C. Static redistribution.
- D. Two-way redistribution.

Answer: A

Explanation: Multiple autonomous systems or routing domains can share route information through the redistribution process. Proper implementation of redistribution requires route filters to prevent feedback loops from forming. It is strongly recommended that redistribution between multiple ASs or multiple routing protocols be accompanied by route filters.

Reference: CCNP #640-503 Building Scalable Cisco Networks (Cisco Press), More EIGRP Scalability Rules

QUESTION NO: 14

Every route map ends with an implicit “deny any” rule. What is the effect of this implicit rule?

- A. Packets that reach the end of the route map are discarded.
- B. Packets are forwarded to the null interface for special handling.
- C. Packets that reach the end of the route map are routed in a normal fashion.
- D. Packets that reach the end of the route map are returned in the originating interface.

Answer: A

Explanation: The implicit deny any in every route map makes packages be discarded if no matching criteria are met.

QUESTION NO: 15

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As a network administrator at TestKing you must select a routing protocol for a large network. What would permit EIGRP to facilitate large scalable networks? (Choose three)

- A. A tiered network design model.
- B. Sufficient memory on the router.
- C. Multiple EIGRP autonomous systems.
- D. Good address space allocation schema.

Answer: A, B, D

Explanation:

A: A tiered network design model such as Core, Distribution, Access is also needed for large networks.

B: Sufficient capacity of the routers, in particular the memory, is required for large networks.

D: Good allocation of address space is required- Each region should have an unique address space so route summarization is possible

QUESTION NO: 16

You want to configure your Cisco router with EIGRP for IP. With what IOS command should you start this configuration task?

- A. `ip eigrp routing`
- B. `router eigrp process-id`
- C. `ip eigrp autonomous-system-number`
- D. `router eigrp autonomous-system-number`

Answer: D

Explanation:

Perform the following steps to configure EIGRP for IP:

Step 1 Enable EIGRP and define the autonomous system.

```
routerTK(config)#router eigrp autonomous-system-number
```

Step 2 Indicate which networks are part of the EIGRP autonomous system.

```
routerTK(config-router)#network network-number
```

Step 3 Define bandwidth of a link for the purposes of sending routing update traffic on the link.

```
routerTK(config-if)#bandwidth kilobits
```

QUESTION NO: 17

Your TestKing trainee Bob wants to know why OSPF is preferred over RIP Version 1. What should you tell Bob? (Select two.)

- A. OSPF maintains smaller routing tables.
- B. OSPF cost metric is based on number of hops.
- C. OSPF only sends routing updates when necessary.
- D. OSPF VLSM allows more efficient use of IP addresses.

Answer: C, D

Explanation:

C: RIP use periodic broadcast of the entire routing table, while OSPF use event-triggered announcements.

D: RIP Version 1 does not support VLSM.

Incorrect Answers

A: The size of the routing table is of the same magnitude.

B: RIP uses hop as cost metric.

QUESTION NO: 18

You are configuring a Frame Relay connection between two Cisco routers. You want the routers to use OSPF in an NBMA environment. Which configuration should you use?

- A. Point-to-point over sub-interfaces.
- B. Point-to-multipoint star configuration.
- C. Point-to-multipoint using a single subnet.
- D. Point-to-multipoint nonbroadcast using a single subnet.

Answer: A

Reference: RFC1586, Guidelines for Running OSPF Over Frame Relay Networks

QUESTION NO: 19

Your TestKing trainee Bob knows that OSPF supports VLSM. He is curious how OSPF accomplishes this support of VLSM. What should you tell him?

- A. Uses route summarization.
- B. Maintains a topological database.
- C. Carries subnet mask information in the route updates.
- D. Allocates addresses in groups to support multiple areas.

Answer: C

Explanation: Each route update includes subnet mask information.

Incorrect Answers

A: VLSM allows route summarization, but VLSM does not use route summarization.

B: A topological database does not contain VLSM information.

D: This is not the way VLSM work.

QUESTION NO: 20

You are configuring a totally stubby area in OSPF. What configuration must the ABR have that are not required on the internal area routers?

- A. A virtual link to area 0.
- B. OSPF summarization command.
- C. default-cost extension to the area command.
- D. no-summary extension to the area stub command.

Answer: A

Explanation: The ABR must have a link to Area 0. In stub and totally stub areas, the ABR to the stub area generates a summary LSA with the link-state ID 0.0.0.0. The routers inside these areas use the default route generated by the ABR to reach destinations outside of the area.

Reference: How Does OSPF Generate Default Routes?, <http://www.cisco.com/warp/public/104/21.html>

QUESTION NO: 21

You have configured the route summarization 172.17.200.0/21. Which of the following four addresses would be included in your route summarization?

- A. 172.17.198.0
- B. 172.17.206.0
- C. 172.17.217.0
- D. 172.17.224.0

Answer: B

Explanation: We list the network address binary and see which subnet address match the 21 leftmost bits of the route summarization..

Decimal	1 st Octet	2 nd Octet	3 rd Octet	4 th Octet
172.17.200.0	10101100	00010001	11001000	00000000
172.17.198.0	10101100	00010001	11000110	00000000
172.17.206.0	10101100	00010001	11001110	00000000 Match!
172.17.217.0	10101100	00010001	11011001	00000000
172.17.224.0	10101100	00010001	11100000	00000000

QUESTION NO: 22

BGP communities are a means of tagging routes to ensure consistent filtering or route-selection policy. BGP communities are configured with the BGP community attribute. What properties does this attribute have?

- A. Optional and transitive.
- B. Optional and non-transitive.
- C. Well-known and mandatory.
- D. Well-known and discretionary.

Answer: A

Explanation: The community attribute is an optional transitive attribute that can be in the range 0 to 4,294,967,200. Each network can be a member of more than one community.

QUESTION NO: 23

You are configuring BGP on your Cisco router. What can be said about the network command?

- A. Local routers matching the network command are filtered from the BGP routing table.
- B. Local routers matching the network command can be installed into BGP's routing table.
- C. Sending and receiving BGP updates is controlled by using a number of different filtering methods.
- D. The route to a neighbor autonomous system must have the correct MED applied to be installed into BGP's routing table.

Answer: B

Explanation: The **network** command allows BGP to advertise an IGP route if it is already in the IP table. A matching route must exist in the routing table before the network is announced. The **network** command is used to permit BGP to advertise a network if it is present in the IP routing table.

QUESTION NO: 24

Select three classless routing protocols. (Choose three)

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

Answer: A, D, E

Explanation: IS-IS, Open Shortest Path First (OSPF) and Enhanced IGRP are all classless routing protocols.

Note: RIPv2 and BGP are also classless routing protocols.

Incorrect Answers

B, C: IGRP and RIPv1 are not classless.

QUESTION NO: 25

You want to configure your router so that it receives BGP routes from several Internet Service Providers. How should you configure your router to achieve this goal?

- A. Accept full routes from the ISPs.
- B. Accept only IGP routes from the ISPs
- C. Accept an external route from the ISPs.
- D. Accept only redistributed routes from the ISPs.

Answer: A

Explanation:

The configuration of the multiple connections to the ISPs can be classified depending on the routes that are provided to the AS from the ISPs. Three common ways of the configuring the connections are:

- All ISPs pass only default routes to the AS.
- All ISPs pass default routes, and selected specific routes (for example, from customers with who the AS exchanges a lot of traffic) to the AS.

- All ISPs pass all routes to the AS (A).

QUESTION NO: 26

You are configuring BGP on your router. In particular you want to advertise the subnet 154.2.1.0 255.255.255.0 to the EBGP neighbors. Which command should you use?

- A. Router (config-router)#network 154.2.1.0
- B. Router (config-router)#network 164.2.1.0
- C. Router (config-router)#network-advertise 154.2.1.0
- D. Router (config-router)#network 154.2.1.0 mask 255.255.255.0

Answer: D

Explanation: The **network** command is used to specify the networks to be advertised by the Border Gateway Protocol (BGP) and multiprotocol BGP routing processes.

Syntax: **network** *network-number* [**mask** *network-mask*] [**route-map** *map-name*]

Mask and route-map are optional. If the **mask** keyword is configured, then an exact match must exist in the routing table.

Reference: Cisco, BGP commands

Incorrect Answers

- A:** If we do not specify the subnet mask then additional networks are allowed to be advertised. The classful subnet mask of 154.2.1.0 is 255.255.0.0 – a Class B network.
- B:** Incorrect IP address.
- C:** There is no **network-advertise** command.

QUESTION NO: 27

EIGRP packets does not utilize 100% of the bandwidth on an interface by default, instead there is a maximum limit. What is the default maximum bandwidth utilization for EIGRP?

- A. 10%
- B. 25%
- C. 50%
- D. 75%

Answer: C

Explanation: By default, EIGRP will limit itself to using no more than 50% of the available bandwidth.

Reference: Cisco, Configuration Notes for the Enhanced Implementation of EIGRP.
<http://www.cisco.com/warp/public/103/12.html>

QUESTION NO: 28

Your TestKing trainee Bob is interested in BGP. In particular he is curious about communities. What should you tell him?

- A. Communities are tagged by default in outgoing updates.
- B. Communities can only be used within one autonomous system.
- C. Communities are a means of tagging routes to ensure consistent filtering.
- D. Communities perform summarization of blocks of contiguous network prefixes.

Answer: C

Explanation: A community is a group of destinations which share some common property. No tag is used by default. Communities are a means of tagging routes to ensure consistent filtering or route-selection policy.

Reference: RFC 1997, BGP Communities Attribute

Incorrect Answers

A: By default, all destinations belong to the general Internet community.

B: Each autonomous system administrator may define which communities a destination belongs to.

D: No summarization is performed by communities. Communications can be aggregated however.

QUESTION NO: 29

You have told Bob, your trainee that OSPF neighbor relationship allows the networks to scale well. He is not convinced, and asks you why. What should you tell him? (Select two.)

- A. Neighbor adjacencies control distribution of routing protocol updates.
- B. Routing table information does not flood the network until holddown timers have expired.
- C. The hello protocol is a more efficient means of sending routing updates than table exchange used in RIPv1.
- D. Topological database is maintained with incremental updates, with full exchange occurring only every 30 minutes.

Answer: A, C

Explanation:

- A:** Adjacency refers to the relationship, which exists between a router and its DR/BDR. Neighbor adjacencies control how updates are propagated.
- C:** The Hello Protocol used by OSPF to establish and maintain neighbor relationship.

Incorrect Answers

B, D: This is not related to the neighbor relationship.

QUESTION NO: 30

You are troubleshooting OSPF on of your routers. In particular, you want to find out how many Shortest Path First (SPF) calculations that have occurred. Which command should you use?

- A. show ip ospf
- B. show ip route
- C. show ip ospf interface
- D. show ip ospf protocols

Answer: A

Explanation: The **show ip ospf** command displays summary information regarding the global OSPF configuration. The output includes the number of times the Shortest Path First (SPF) algorithm has been run.

Sample output:

```
routerTestK#show ip ospf
OSPF is running, process id: 1, router id: 10.1.2.136
  Number of areas: 1, normal: 1, stub: 0
Area: 1.2.3.4
Number of interfaces in this area is 1
Type of authentication none
SPF algorithm has run 3 times
SPF interval 5 seconds
```

Incorrect Answers

- B:** The **show ip route** command displays IP routing table entries.
- C:** The **show ip interface** command displays information about one or more interfaces.
- D:** There is no such command.

QUESTION NO: 31

Exhibit:

```
interface serial 0
  ip address 30.1.1.1 255.255.255.0
```

```

encapsulation frame-relay
ip ospf network point-to-multipoint
router ospf 5
network 30.1.1.0 0.0.0.255 area 0

```

You have configured your router according to the exhibit. What can you said about your configuration? (Select two.)

- A. DR/BDR elections do not take place.
- B. It is restricted to a hub and spoke topology-
- C. Neighbor statements are not necessary.
- D. The area 0 NBMA cloud is configured as more than one subnet.

Answer: A, C

Explanation: On an OSPF point-to-multipoint interface no DR/BDR elections takes place and not neighbor statements are necessary.

Incorrect Answers

B: The point-to-multipoint mode can be used with a Star topology.

D: On an OSPF point-to-multipoint interface the cloud is configured as one subnet.

QUESTION NO: 32

Exhibit:

```

router igrp 100
network 197.135.20.0
network 197.135.24.0
network 197.135.27.0
redistribute rip
default-metric 10 100 255 1 1500
distance 140 0.0.0.0 255.255.255.255 9

```

```

access-list 9 permit 197.135.20.0
access-list 9 permit 197.135.24.0
access-list 9 permit 197.135.27.0

```

You have configured your router according to the exhibit. What can be said about your configuration? (Choose two)

- A. Networks 197.135.20.0, 197.135.24.0, and 197.135.27.0 are allowed into the routing table.

- B. The RIP learned routes to networks 197.135.20.0, 197.135.24.0, and 197.135.27.0 will be assigned an administrative distance of 140.
- C. The IGRP learned routes to networks 197.135.20.0, 197.135.24.0, and 197.135.27.0 will be assigned an administrative distance of 140.
- D. Changing the administrative distance to a number larger than the default value makes networks 197.135.20.0, 197.135.24.0, and 197.135.27.0 unreachable.

Answer: B, D

Explanation:

B: We are redistributing RIP into IGRP. The **redistribute rip** command specifies that routes learned via RIP will be advertised in the IGRP updates.

D: This might occur.

We examine the following command:

```
distance 140 0.0.0.0 255.255.255.255 9
```

140 defines the administrative distance that specified routes will be assigned.

0.0.0.0 255.255.255.255 defines the source address of the router supplying the routing information, in this case any router.

9 defines the access-list to be used to filter incoming routing updates to determine which will have their administrative distance changed.

And one of the access-list statements:

```
access-list 9 permit 197.135.27.0
```

9 is the access-list number.

permit allows all networks that match the address to be permitted, in this case to have their administrative distance changed.

197.135.27.0 A network to be permitted, in this case to have its administrative distance changed.

Reference:

Incorrect Answers

A: The access list is applied on **distance** statement. Distance is only used to change the administrative distance, not to enter routes into the routing table.

C: RIP routes are redistributed into IGRP; not vice versa.

QUESTION NO: 33

Exhibit:

```
interface serial 0.122 point-to-point
 ip address 192.168.1.1 255.255.255.0
 encapsulation frame-relay
 frame-relay interface-dlci 122
```

You are configuring your router. The router has one serial interface configured for WAN connectivity as shown in the exhibit. The router also has one Ethernet interface connected to your LAN. You want hosts on the LAN interface to be able to receive and transmit data traffic, but you want to disable all routing traffic on that interface. Which command should you use?

- A. interface serial 0.122 point-to-point
passive-interface ethernet 0
- B. interface ethernet 0
ip address 192.168.12.1 255.255.255.0
passive-interface
- C. router ospf 172
area 1 nssa
network 192.168.1.0 0.0.0.255 area 0
network 192.168.12.0 0.0.0.255 area 1
- D. router ospf 172
passive-interface ethernet 0
network 192.168.1.0 0.0.0.255 area 0
network 192.168.12.0 0.0.0.255 area 1

Answer: D

Explanation: We use the passive-interface command to configure the ethernet interface to be passive.

Note: The **passive-interface** router configuration command is used to disable sending routing updates on an interface.

Syntax: passive-interface [default] {interface-type number}

Incorrect Answers

- A:** We are not configuring the serial interface. Furthermore, the passive-interface command is a router configuration command, not an interface configuration command.
- B:** We cannot use the **passive-interface** command like this.
- C:** We should configure the Ethernet interface as passive, not the area as a not-so-stubby area (NSSA).

QUESTION NO: 34

You have configured a new OSPF area and want to connect to the backbone area. Which type of router must you use?

- A. ABR
- B. stub
- C. internal router

D. backbone router

Answer: A

Explanation: ABRs connect OSPF area, other than area 0, to the backbone area (area 0).

Incorrect Answers

B: Stub routers do not apply. An area is stub, not a router.

C: Internal routers are only used within an area.

D: Backbone routers sit on the perimeter of the backbone area. They have at least one interface connected to area 0. However, backbone do not necessarily connect to other areas.

QUESTION NO: 35

You are troubleshooting OSPF on your router. You want to view neighbor adjacencies. Which two commands would be useful? (Select two.)

- A. show ip ospf database
- B. show ip ospf neighbors
- C. show ip ospf protocols
- D. show ip ospf interfaces

Answer: B, D

Explanation:

B: Using the **show ip ospf neighbor** command, you can observe the neighbor data structure. This command displays OSPF-related neighbor information. The Interface field shows the interface on which the OSPF neighbor has formed adjacency.

Sample:

```
RouterTK2#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
192.168.45.1	1	FULL/DR	00:00:36	10.0.0.1	Ethernet0

D: The **show ip ospf interface** command displays area ID and adjacency information

Reference:

What Does the show ip ospf neighbor Command Reveal?, <http://www.cisco.com/warp/public/104/16.html>

Incorrect Answers

A: The **show ip ospf database** command displays the link-state database.

C: There is no show ip ospf protocol command.

QUESTION NO: 36

You are required to configure an area 3 border router. In particular, you must configure network summarization of the 172.16.20.192 to 172.16.20.223 address range. Which IOS command should you use? (Select two.)

- A. network 172.16.20.192 0.0.0.31 area 3
- B. area 3 range 172.16.20.192 172.16.20.223
- C. area 3 range 172.16.20.192 255.255.255.224
- D. network 172.16.20.192 255.255.255.224 area 3

Answer: A, C

Explanation:

- A:** When configuring multiple OSPF areas, make sure to associate the correct network addresses with the desired area ID. **Syntax: network** address wildcard-mask area area-id
We must use a wildcard mask (0.0.0.31) and not a network mask (255.255.255.224)
- C:** We must instruct the ABR to summarize routes for a specific area before injecting them into a different area. **Syntax: area** area-id **range** address mask

Incorrect Answers

- B:** This is the wrong syntax. We should use a network mask to specify the address range.
- D:** We should use a wildcard mask, not a network mask with the **network** command.

QUESTION NO: 37**Exhibit**

172.18.129.0/24
172.18.130.0/24
172.18.132.0/24
172.18.133.0/24

You must summarize the networks listed in the exhibit. Which route summarization should you use?

- A. 172.18.128.0/21
- B. 172.18.128.0/22
- C. 172.18.130.0/22
- D. 172.18.132.0/20

Answer: A

Explanation: We list the network address binary and see how many leftmost bits match.

Decimal	1 st Octet	2 nd Octet	3 rd Octet	4 th Octet
172.18.129.0	10101100	00010010	10000001	00000000
172.18.130.0	10101100	00010010	10000010	00000000
172.18.132.0	10101100	00010010	10000100	00000000
172.18.133.0	10101100	00010010	10000101	00000000
172.18.128.0	10101100	00010010	10000000	00000000

We see that the 21 leftmost bits match and that 172.18.128.0/21 can summarize the four networks.

Incorrect Answers

B, C: Only the 21 leftmost bits match, not 22.

D: This is an illegal summarization. It is host address, not a network address.

QUESTION NO: 38

You are configuring BGP on your Cisco router. You have configured a BGP prefix list and now you want to apply it. Which command you use?

(Select a command from the Command Line Exhibit at the end of this document)

Answer: Router(config-router)# neighbor address prefix-list list-name

Explanation: To distribute Border Gateway Protocol (BGP) neighbor information as specified in a prefix list the **neighbor prefix-list** command is used in address family or router configuration mode.

Syntax: neighbor {ip-address | peer-group-name} prefix-list prefix-listname {in | out}

Reference: Cisco, BGP Commands

Incorrect Answers

Router(config)# neighbor address prefix-list list-name

The neighbor address prefix-list command should be used in address family or router configuration mode.

ip prefix-list

The **ip prefix-list** global configuration command is used to create an entry in a prefix list, not to apply an already existing BGP prefix list.

QUESTION NO: 39

Your company TestKing uses several ISPs to provide Internet connectivity. The company use BGP to connect the multiple ISPs. You want to configure BGP to make outbound Internet traffic prefer one particular ISP. How should you achieve your goal?

- A. Configure weight
- B. Enable route reflector
- C. Create a distribute list
- D. Enable the Longer Autonomous System path option.

Answer: A

Explanation: If the router learns about more than one route to the same destination, the route with the highest weight will be preferred.

Incorrect Answers

B: A route reflector cannot be used to solve the problem.

Note: A route reflector modifies the BGP split horizon rule by allowing the router configured as the route reflector to propagate routes learned by IBGP to other IBGP peers. This saves on the number of BGP TCP sessions that must be maintained, and also reduces the BGP routing traffic.

C: Distribute lists restrict the routing information that the router learns or advertises. By itself a distribute list cannot make routes from one ISP be preferred to routers from another ISP.

D: Does not applu.

QUESTION NO: 40

Exhibit

```
router bgp 6500
  redistribute static

ip route 164.20.0.0 255.255.0.0 null 0
```

You have configured your Cisco router as shown in the exhibit. What is true about the configuration?

- A. It allows BGP to advertise the 164.20.0.0 /16 network.
- B. It results in all traffic for all subnets of 172.16.0.0 being dropped at this router.
- C. Cisco prefers that you use the `aggregate-address` command to distribute IGP routes into BGP.
- D. Cisco prefers this method of distributing IGP routes into BGP over using the `network` command.

Answer: C

Explanation: Redistribution of static routes configured to the null 0 interface into BGP is done to advertise aggregate routes rather than specific routes from the IP table. However, Cisco recommends the use of the aggregate-address-command instead.

QUESTION NO: 41

The word domain has many different interpretations in different contexts. What is a domain in OSI terminology?

- A. A set of non-routing network nodes.
- B. A contiguously connected area that can reach all other areas.
- C. All devices configured for OSI protocols within an internetwork.
- D. A contiguous set of routers and hosts and the data links that connect them.
- E. Any portion of an OSI network that is under a common administrative authority.

Answer: B

Explanation: In OSI terminology a domain is a collection of connected areas. Routing domains provide full connectivity to all end systems within them.

Reference: ISO TR 9575

QUESTION NO: 42

What is the benefit of mesh groups when configuring Integrated IS-IS?

- A. Mesh groups optimize LSP flooding.
- B. Mesh groups keep the routers more secure.
- C. Mesh groups help the routers from adjacencies.
- D. Mesh group speed the flow of data across WAN links.

Answer: A

Explanation: The mesh group feature is a mechanism to reduce flooding of LSPs in some IS-IS topologies.

Reference: RFC2973, IS-IS Mesh Groups

QUESTION NO: 43

You have configured your Cisco router with the Integrated IS-IS routing protocol. You are troubleshooting your configuration and want to display adjacencies. Which IOS command should you use?

- A. show isis route
- B. show clns route
- C. show isis database
- D. show clns neighbors

Answer: D

Explanation: The **show clns neighbors** command displays ES and IS neighbors. The output includes adjacency information.

Reference: Cisco, ISO CLNS Commands

Sample output:

```
routerTestK# show clns neighbors
System Id      SNPA          Interface State Holdtime Type Protocol
0000.0000.0007 aa00.0400.6408 Ethernet0 Init 277 IS ES-IS
0000.0C00.0C35 0000.0c00.0c36 Ethernet1 Up 91 L1 IS-IS
0800.2B16.24EA aa00.0400.2d05 Ethernet0 Up 29 L1L2 IS-IS
0800.2B14.060E aa00.0400.9205 Ethernet0 Up 1698 ES ES-IS
0000.0C00.3E51 *HDLC*       Serial1 Up 28 L2 IS-IS
0000.0C00.62E6 0000.0c00.62e7 Ethernet1 Up 22 L1 IS-IS
0A00.0400.2D05 aa00.0400.2d05 Ethernet0 Init 24 IS ES-IS
```

Incorrect Answers

- A:** The **show isis routes** command is used to display the IS-IS Level 1 forwarding table for IS-IS learned routes.
- B:** The **show clns route** command is used to display all of the destinations to which this router knows how to route packets.
- C:** The **show isis database** command is used to display the Intermediate System-to-Intermediate System (IS-IS) link state database.

QUESTION NO: 44

There are many similarities between the IS-IS and the OSPF routing protocols. Which of the following are true for both IS-IS and OSPF? (Select four)

- A. link-state database
- B. backbone area design
- C. Shortest Path First (SPF) algorithm

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- D. Update, Decision, and Flooding Process
- E. Hello protocol to establish and maintain adjacencies

Answer: A, C, D, E

Explanation:

A: IS-IS use a link-state database.

C: The IS-IS decision process runs shortest-path-first (SPF) algorithm on the link-state database, and creates the forwarding database.

D: The Update, Decision, and Flooding Process of IS-IS and OSPF are similar.

E: Routers running IS-IS will send hello packets out all IS-IS-enabled interfaces to discover neighbors and establish adjacencies. This is similar to OSPF.

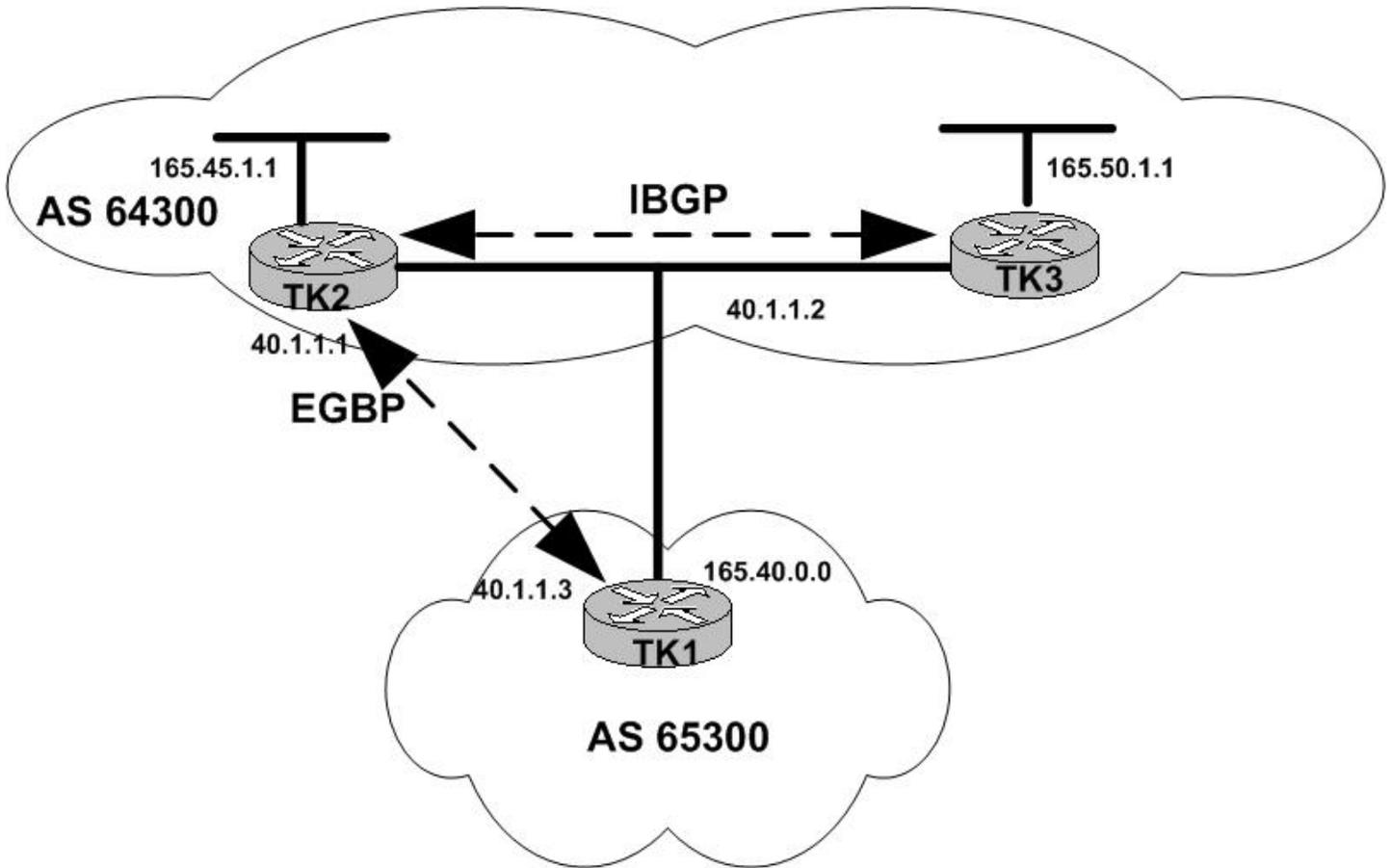
Reference: Introduction to Intermediate System-to-Intermediate System Protocol

http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

Incorrect Answers

B: IS-IS does not have a backbone area like the OSPF area 0. The IS-IS backbone is a contiguous collection of Level 2-capable routers, each of which can be in a different area.

QUESTION NO: 45



Router TK2 advertises network 165.5.0.0 to Router TK1 using BGP. What is the default value of the next-hop attribute?

- A. 40.1.1.1
- B. 40.1.1.2
- C. 40.1.1.3
- D. Router TK1 does not accept the advertisement from Router TK2 because Router TK1 is not peering with Router TK3 via BGP.
- E. Router TK2 does not advertise network 165.5.0.0 to Router TK1 because the network is not directly connected to Router TK2.

Answer: B

Explanation: The BGP next-hop attribute is a well-known mandatory attribute that indicates the next hop IP address that is to be used to reach a destination. For EIGRP, the next hop is the IP address of the neighbor specified who sent the update, Router TK2 in this scenario. However, since Router TK2 learned this route through IBGP with the next-hop of 40.1.1.2, this value will be used instead. This avoids an unnecessary hop.

Incorrect Answers

- A:** Router TK2 learned this route through IBGP with the next-hop of 40.1.1.2, this value will be used instead of 40.1.1.1.. This avoids an unnecessary hop.
- C:** This is the local interface on Router TK1 itself.
- D:** The advertisement is accepted.
- E:** The route is advertised.

QUESTION NO: 46

What can be said about BGP policy-based routing? (Select two.)

- A. Policy routing is configure on the inbound interface.
- B. Policy routing can be used to alter the final destination of the packet.
- C. Policy routing can be used to alter the next hop in the path to the destination.
- D. Policy routing does not allow traffic to be directed based on the source address.

Answer: B, C

Explanation: Policy routing can alter the final destination of a packet and alter the next hop in the path to the destination.

Incorrect Answers

- A:** Policy routing can be configure both on the inbound and on outbound interfaces.
- D:** Policy routing allows traffic to be directed based on the source address.

QUESTION NO: 47

Exhibit:

```
router bgp 64000
  neighbor 172.16.1.1 remote-as 64000
  neighbor 10.1.1.2 remote-as 64550
  network 200.52.1.192 mask 255.255.255.224
  no synchronization
  aggregate-address 200.52.1.0 255.255.255.0
```

You have configured your router TestK as shown in the exhibit and the interfaces 200.52.1.192, 172.16.1.1 and 10.1.1.2 are active. What can be said about the configuration of TestK?

- A. Router TestK has an IBGP connection with neighbor 10.1.1.2.
- B. Router TestK has an EBGP connection with the neighbor 172.16.1.1.
- C. Router TestK advertises only a route 200.52.1.0 255.255.255.0 in BGP.

- D. Router TestK advertises only a route 200.52.1.192 255.255.255.224 in BGP.
- E. Router TestK advertises routes to 200.52.1.0 255.255.255.0 and 200.52.1.192 255.255.255.224 in BGP.

Answer: E

Explanation: The aggregate route, 200.52.1.0 255.255.255.0, and the more specific route, 200.52.1.192 255.255.255.224, will both be advertised. To only advertise the aggregate route the **summary-only** option of the **aggregate-address** command must be used.

Note: The **aggregate-address** command is used to create an aggregate, or summary, entry in the BGP table.

Incorrect Answers

- A:** The neighbor 10.1.1.2 belongs to another autonomous system and is a EBGP neighbor, not an IBGP neighbor.
- B:** Router A and neighbor 172.16.1.1 belongs to the same autonomous system and is a IBGP neighbor, not an EBGP neighbor.
- C:** The **summary-only** option of the **aggregate-address** command is used to only advertise the summary and not the specific routes.
- D:** The aggregate route, 200.52.1.0 255.255.255.0, will be advertised as well.

QUESTION NO: 48

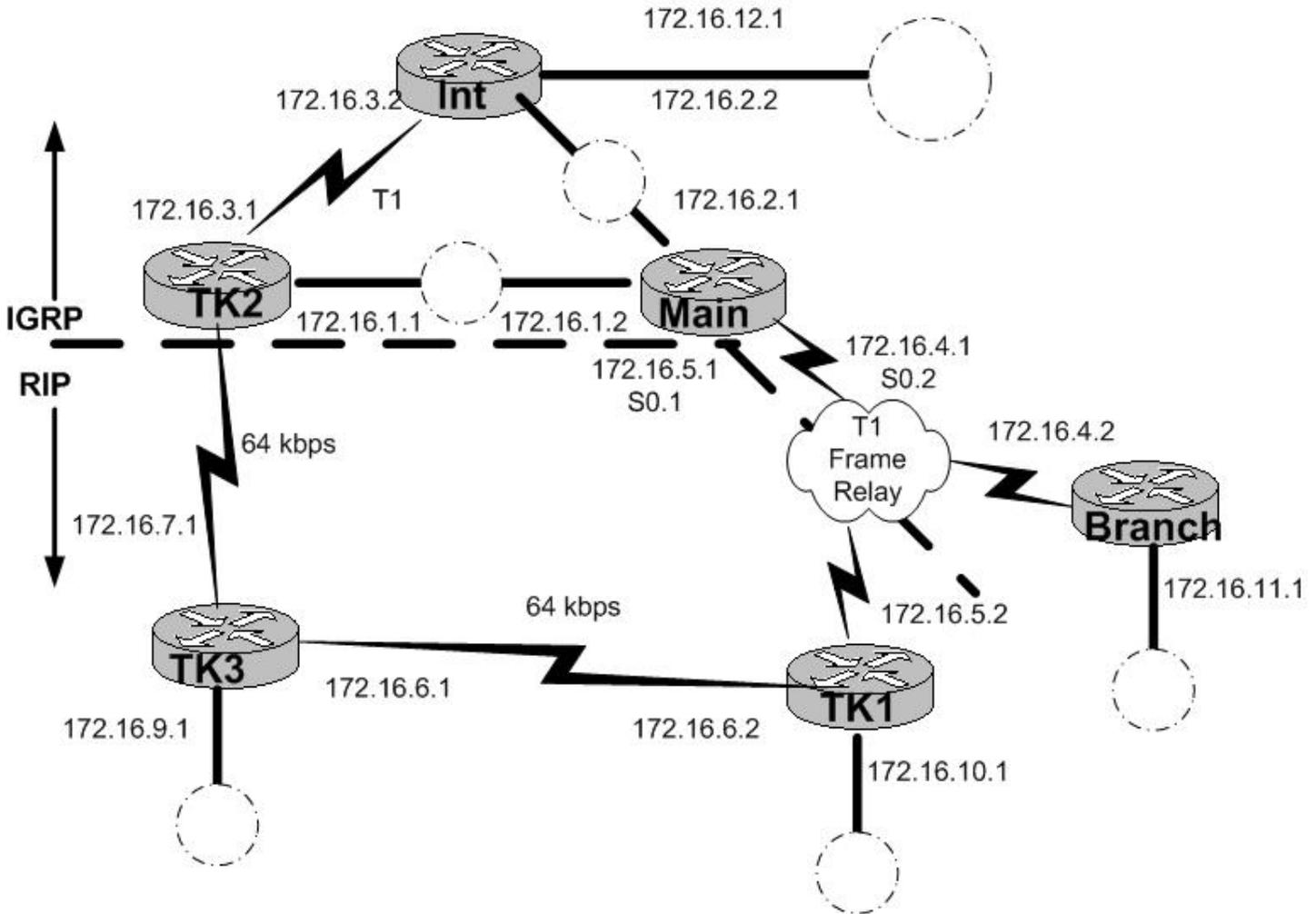
You configuration a router in an NBMA cloud. You want to create a static list of the other routers in the cloud. Which IOS command should you use?

- A. network
- B. neighbor
- C. ip route
- D. router ospf

Answer: B

Explanation: The **neighbor** command is used to create a static list of other routers in the cloud.

QUESTION NO: 49



You are the network administrator for the WAN network shown in the exhibit above. Both RIP and IGRP are used. You must ensure that if one link goes down, routing will occur through the remaining link. Furthermore, you must ensure that proper metrics are distributed through the IGRP network. What command can you use to ensure that the appropriate metric is applied?

- A. applying the `distance` command to Main
- B. applying the `distance` command to TK2
- C. applying the `distribute-list` command to Main
- D. applying the `distribute-list` command to TK2

Answer: B

Explanation: Most routing protocols, including IGRP and RIP, use the **distance** command to modify the administrative distance. We need to change the metric of the RIP routes learned by TK2.

Incorrect Answers

A: We change the administrative distance of RIP routes on TK2.

C, D: We should use the `distance` command, not the `distribute-list` command.

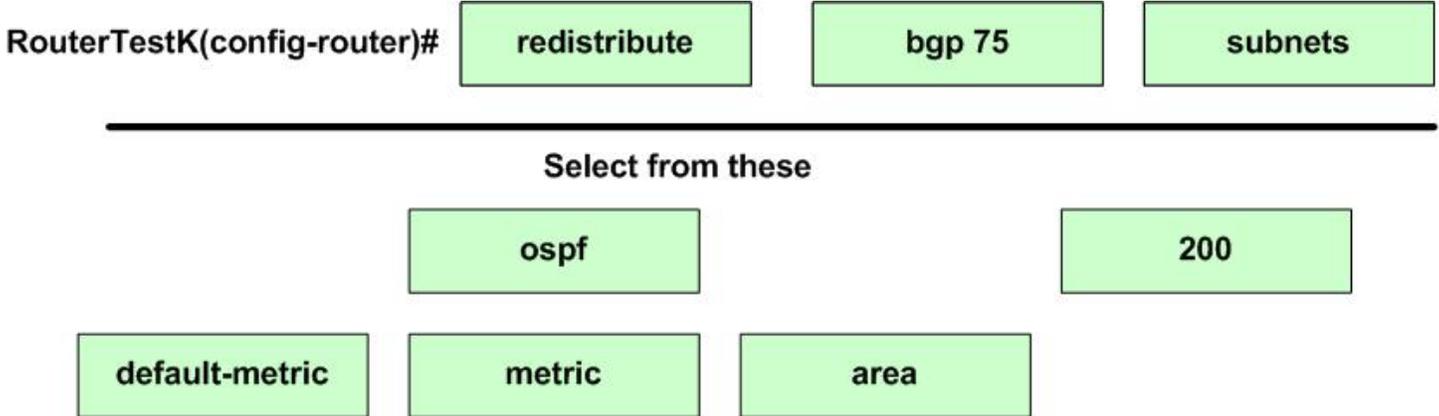
QUESTION NO: 50

You are configuring a gateway route named RouterTestK. You enable OSPF. You must configure the router to redistribute the routes to various subnets learned through BGP AS75. Furthermore, you must ensure that the default metric is used. Which command should you use?

RouterTestK(config-router)#

Select from these

Answer:



Explanation: We want to redistribute BGP AS 75 into OSPF.

Syntax of redistribution command

```
router(config-router)#redistribute protocol [process-id] [metric [metric-type type-value] [route-map map-tag] [subnets] [tag tagvalue]
```

We specify the BGP protocol and the Autonomous System number 75. We also use the **subnets** keyword, which is an optional OSPF parameter that specifies that subnetted routes should also be redistributed. Only routes that are not subnetted are redistributed if the **subnets** keyword is not specified.

Incorrect Answers

ospf: We want to redistribute the routes learned from BGP AS 75 into OSPF so we should specify the BGP protocol.

area: Is not used in the redistribute command.

default-metric: Default-metric is a separate command.

metric, 200: We don't have to specify a metric since we want to use a default metric.

QUESTION NO: 51

You are troubleshooting on of your routers and you want to examine the route maps configured on a specific interface. Which command should you use?

- A. show interface
- B. show route-map
- C. show ip policy
- D. show ip route map

Answer: C

Explanation: The **show ip policy** command is used to display which route map is associated with which interface.

Incorrect Answers

- A:** The **show interface** command shows detailed information about the Cisco router/switch. However, the output does not include information on configured route maps.
- B:** The **show route-map** command displays the contents of all route maps or the specified route map.
- D:** No such commands.

QUESTION NO: 52

You are required to plan a configuration of large internetwork. You decide to use a routing protocol that supports a hierarchical topology. Your TestKing trainee Bob asks you which routing protocols not only supports but also requires a hierarchical topology. What should you tell him? (Select two.)

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

Answer: A, C

Explanation: IS-IS and OSPF both require a hierarchical topology.

QUESTION NO: 53

You are troubleshooting BGP on your routers. You must check if a particular router is a route reflector or not. Which IOS command should you use?

- A. `show bgp neighbor`
- B. `show running-config`
- C. `show route-reflector`
- D. `show route-reflector-client`

Answer: A

Explanation: The **show bgp neighbor** command indicates that a particular neighbor is a route reflector client.

Note: Route reflectors modify the BGP split horizon rule by allowing the router

configured as the route reflector to propagate routes learned by IBGP to other IBGP peers.

Reference:

Incorrect Answers

B: Displaying the current configuration would not be useful in finding information in the route reflector status.

C, D: There are no such commands.

QUESTION NO: 54

You are troubleshooting BGP on one of your routers. You want to monitor a BGP peer. In particular you need to find out the reason for the last TCP connection reset.

Which command should you use?

Select the command from the exhibit at the end of the document. Type the command below.

Answer: show ip bgp neighbors

Explanation: The **show ip bgp neighbors** command displays information about the TCP and BGP connections to neighbors.

Sample output:

```
RouterTestK#show ip bgp neighbor
BGP neighbor is 10.1.1.1, remote AS 200, external link
Index 1, Offset 0, Mask 0x2
BGP version 4, remote router ID 172.16.10.1
BGP state = Established, table version = 5, up for 00:10:47
Last read 00:00:48, hold time is 180, keepalive interval is 60 seconds
Minimum time between advertisement runs is 30 seconds
Received 16 messages, 0 notifications, 0 in queue
Sent 15 messages, 1 notifications, 0 in queue
Prefix advertised 1, suppressed 0, withdrawn 0
Connections established 1; dropped 0
Last reset 00:16:35, due to Peer closed the session
2 accepted prefixes consume 64 bytes
0 history paths consume 0 bytes
```

Note: BGP peers, also known as neighbors, are routers with which a router has established a BGP connection.

Incorrect Answers:

show ip bgp

Displays entries in the BGP routing table for one network prefix or the entire BGP routing table.

show ip bgp summary

Displays the status on all BGP connections.

QUESTION NO: 55

You must redistribute BGP routes into an IGP protocol, for example OSPF or EIGRP. What should you take into consideration?

- A. IGP's are limited to 250 routes
- B. A full BGP routing table may contain 100,000+ routes
- C. Because of possible routing loops, Cisco router configuration does not allow BGP routes to be redistributed into an IGP.
- D. Because BGP routes are not advertised unless they are known by the IGP, Cisco automatically redistributes routes into IGP's.

Answer: B

Explanation: The size of the BGP routing table must be taken into consideration.

Incorrect Answers

- A:** There is no such limit.
- C:** BGP routes can very well be distributed into an IGP.
- D:** BGP routers are not redistributed automatically.

QUESTION NO: 56

Your router has been configured with the manual route summarization of 153.25.200.0/21. Which of the following addresses would be included in the route summarization?

- A. 153.25.198.0
- B. 153.25.206.0
- C. 153.25.208.0
- D. 153.25.224.0

Answer: B

Explanation: The 21 leftmost bit must match. In particular we should study the 3rd octet.

Decimal	1 st Octet	2 nd Octet	3 rd Octet	4 th Octet
153.25.200.0	10011001	00011001	11001000	00000000
153.25.198.0	10011001	00011001	11000110	00000000
153.25.206.0	10011001	00011001	11001110	00000000

153.25.208.0	10011001	00011001	11010000	00000000
153.25.224.0	10011001	00011001	11100000	00000000

QUESTION NO: 57

Your TestKing trainee Bob asks you about route summarization. What should you tell him (Select two.)

- A. Private addresses cannot be summarized.
- B. Summarization is not compatible with VLSM.
- C. RIP v.1 automatically summarizes routes on network class boundaries.
- D. Classless routing protocols support summarization on any address bit boundary.

Answer: C, D

Explanation:

C: RIP V.1 is only able to summarize routes on network class boundaries.

D: Classless routing protocols support summarization on any address bit boundary.

Incorrect Answers

A: Private address ranges can be summarized.

B: Summarization is compatible with VLSM.

QUESTION NO: 58

You are configuring your OSPF router network. You separate a large area into multiple smaller areas. What is phrase used for this action?

- A. interior areas
- B. OSPF subarea
- C. link-state protocol
- D. hierarchical routing

Answer: D

Explanation: OSPF's ability to separate a large internetwork into multiple areas is referred to as hierarchical routing.

QUESTION NO: 59

OSPF is used internally, and BGP is used externally. TestKing1 and TestKing2, gateway routers, redistributes external BGP routes. TestKing1 redistributes subnets in the 163.150.64.0 through 163.150.95.0 range, while TestKing2 redistributes subnets in the 163.150.96.0 through 163.150.127.0 range.

You are now required to configure TestKing1 so that it summarizes these subnets into one range before redistributing them into OSPF. You configure TestKing1 as shown in the exhibit below.

What further command should you use on TestKing1?

Exhibit:

```
TestKing1(config)#router ospf 100
TestKing1(config-router)#redistribute bgp 70 metric 500 subnets
```

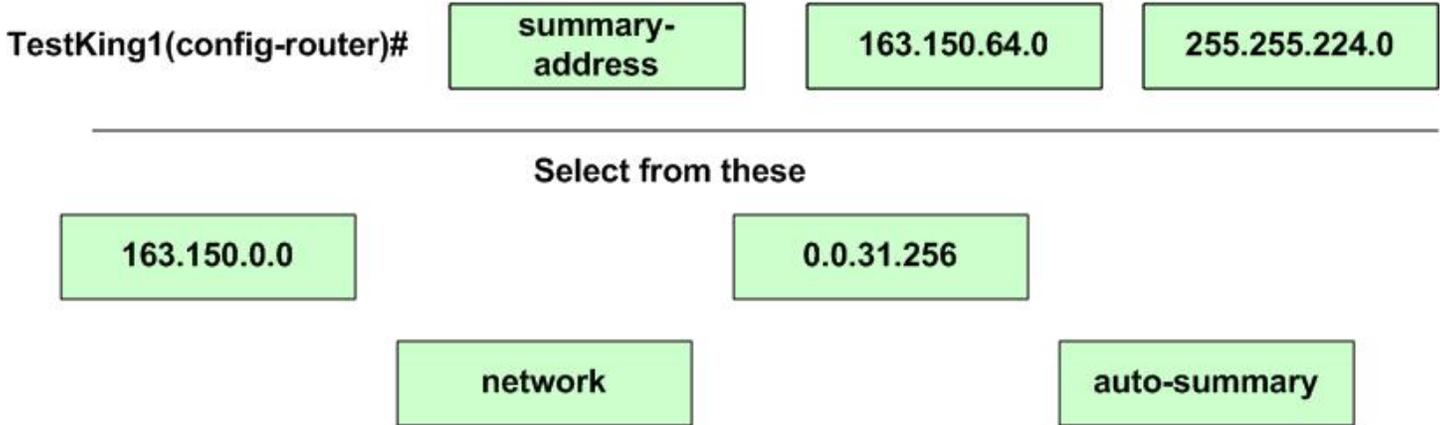
TestKing1(config-router)#

<i>Drop keyword here</i>	<i>Drop keyword here</i>	<i>Drop keyword here</i>
--------------------------	--------------------------	--------------------------

Select from these

163.150.0.0	255.255.224.0	0.0.31.256	
163.150.64.0	network	summary-address	auto-summary

Answer:



Explanation: External route summarization, external routes that are injected into OSPF via redistribution, is done via the following **router ospf** subcommand:

```
summary-address ip-address mask
```

This command is effective only on ASBRs doing redistribution into OSPF as in this scenario..

We should summarize most matching leftmost bits as indicated below.

Decimal	1 st Octet	2 nd Octet	3 rd Octet	4 th Octet	
163.50.64.0	10100011	00110010	01000000	00000000	
163.50.95.0	10100011	00110010	01011111	00000000	
163.50.64.0	10000000	00110010	01000000	00000000	IP address
255.255.224.0	11111111	11111111	11000000	00000000	Subnet mask

Incorrect Answers

network

The **network** command is not used to summarize routes.

auto-summary

The auto-summary command is used to turn autosummarization on.

128.213.0.0

We should use a more specific summarization.

0.0.31.256

For summurazation we should specify a network mask, not a wildcard.

QUESTION NO: 60

You are troubleshooting one OSPF router. In particular you want to identify which networks are routed by a given OSPF process. What IOS command should you use?

- A. show ospf
- B. show ip route
- C. show ip protocols
- D. show ip ospf database

Answer: C

Explanation: The **show ip protocols** command display current routing protocols. It displays the parameters and current state of the active routing protocol process. The output includes a list of the networks routing for individual ospf processes.

Sample output:

```
RtTestKing# show ip protocols
Routing Protocol is "ospf 200"
Sending updates every 0 seconds
Invalid after 0 seconds, hold down 0, flushed after 0
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: ospf 200
Routing for Networks:
172.6.31.5/32
Routing Information Sources:
Gateway Distance Last Update
Distance: (default is 110)
```

Incorrect Answers

- A:** The **show ospf** command displays summary information regarding the global OSPF configuration.
- B:** The **show ip route** command displays the IP routing table.
- C:** The **show ip ospf database** command displays the contents of the topological database maintained by the router. The command also shows the router ID and the OSPF process ID. However, the output does not include the networks routing for individual ospf processes.

QUESTION NO:61

The OSI model accomplishes network layer addressing through a(n) _____,

- A. Internet Protocol address
- B. Media Access Control address
- C. Packet Layer Protocol address
- D. Network Service Access Point address
- E. Authority and Format Identifier address

Answer: D

Explanation: The term "network address" is used to refer to the Network Service Access Point (NSAP) at which the OSI Network Service is made available to a Network Service user by the Network Service provider.

Reference: RFC 941, Addendum to the Network Service Definition Covering Network Layer Addressing

Incorrect Answers

A: IP is a protocol that is based on the OSI model.

B: MAC addresses operate at a lower level in the OSI model.

C, E: Do not apply.

QUESTION NO: 62

You are teaching your TestKing trainee Bob some facts about the IS-IS routing protocol. You tell him that is important to configure the link costs manually. He is not convinced and asks you why. What should you tell him?

- A. By default, all links have a cost of 10.
- B. It is not important because the default provides for optimal routing.
- C. There is no default link cost, link cost must be configured on each interface.
- D. By default, all LAN interfaces have a cost of 10 and all WAN interfaces have a cost of 50.

Answer: A

Explanation: The original IS-IS specification defines four different types of metrics: cost, delay, expense, and error. The Cisco implementation uses cost only. All links use the metric of 10 by default.

Reference: Introduction to Intermediate System-to-Intermediate System Protocol,
http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

Incorrect Answers

B: While some routing protocols calculate the link metric automatically based on bandwidth (OSPF) or bandwidth/delay (Enhanced Interior Gateway Routing Protocol [EIGRP]), there is no automatic calculation for IS-IS.

C: The default link cost is 10.

D: There is no such distinction between LAN and WAN interfaces.

QUESTION NO: 63

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Exhibit

47.040C.0061.040C.0056.0D12.00

What is the Area ID of the OSI IS-IS NSAP address shown in the exhibit?

- A. 00
- B. 47
- C. 47.040C
- D. 47.040C.0061
- E. 040C.0056.0D12

Answer: D**Explanation:**

SEL is the rightmost octet:

47.040C.0061.040C.0056.0D12.**00**

SystemID is next six octet:

47.040C.0061.**040C.0056.0D12**.00

The AreaID is the remaining leftmost octets:

47.040C.0061.040C.0056.0D12.00**Note:** There are several NSAP formats. This is an OSI NSAP format (the second in the sample below).**Sample:**

Area System ID SEL
 ┌───┬──────────┬──────────┬───┐
 07.0000.3090.c7df.00
 (a)

Domain Area System ID SEL
 ┌──────────┬───┬──────────┬──────────┬───┐
 47.0004.30ac.0007.0000.3090.c7df.00
 (b)

AFI ICD DFI AAI Reserved RDI Area System ID SEL
 ┌──┬──┬──┬──┬──┬──┬──┬──────────┬──────────┬──┬──┐
 47.0005.80.0000a7.0000.ffdd.0007.0000.3090.c7df.00
 (c)

AFI: Authority and Format Identifier

ICD: International Code Designator

DFI: Domain Specific Part (DSP) Format Identifier

AAI: Administrative Authority Identifier

RDI: Routing Domain Identifier (Autonomous System Number)

SEL: Network Service Access Point (NSAP) Selector

Reference: Introduction to Intermediate System-to-Intermediate System Protocol,
http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

Incorrect Answers

- A: 00 is the SEL.
- B, C: 47 and 47.040C is just a part of the Domain
- E: 040C.0056.0D12 is the SystemID.

QUESTION NO: 64

Name a distinguishing feature of the backbone in IS-IS?

- A. a router in all areas
- B. all routers in one area
- C. a chain of L2 and L1/L2 IS-IS routers
- D. an unbroken string of L1 and L2 IS-IS routers
- E. a central area to which all other areas are attached.

Answer: C

Explanation: IS-IS backbone is a contiguous collection of Level 2-capable routers, each of which can be in a different area

Reference: Introduction to Intermediate System-to-Intermediate System Protocol,
http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/insys_wp.htm

QUESTION NO: 65

You have two Level-1/Level-2 IS-IS routers named TK1 and TK2. They are connected with a WAN link and they belong to the same area. How can TK1 and TK2 establish adjacency?

- A. Level-1 only
- B. Level-2 only
- C. both Level-1 and Level-2
- D. none unless statically configured
- E. WAN links do not support IS-IS adjacencies

Answer: A

Explanation: Within an Area Level 1 routing is used. Routing between areas is referred to as Level 2 routing.

QUESTION NO: 66

Your TestKing trainee Bob asks you what the use of Partial Sequence Number Packets (PSNPs) are on a point-to-point network connection?

- A. acknowledge LSPs
- B. replace IIH packets
- C. establish adjacencies
- D. send link-state changes

Answer: A

Explanation: There are four types of IS-IS packets: IS-IS Hello Packets, Link State Packets (LSPs), Complete Sequence Number Packets (CSNPs), and Partial Sequence Number Packets (PSNPs). PSNPs function as ACKs. Loss of a PSNP may result in an unnecessary retransmission of an LSP, but does not prevent correct operation of the routing protocol.

Reference: RFC 1377 - The PPP OSI Network Layer Control Protocol (OSINLCP)

QUESTION NO: 67

What is the maximum number of Level-2 routing processes that an IS-IS Level 1-2 router can belong to?

- A. 1
- B. 2
- C. 30
- D. 40
- E. limited only by the router's resources

Answer: A

Explanation: The Cisco IOS software can handle simultaneous operation of up to 30 dynamic IP routing processes. The combination of routing processes on a router or access server consists of the following protocols (with the limits noted):

- Up to 30 IGRP routing processes
- Up to 30 OSPF routing processes
- One RIP routing process
- **One IS-IS process**

- One BGP routing process
- Up to 30 EGP routing processes

QUESTION NO: 68

What two EIGRP features allow EIGRP to support Variable Length Subnet Masking (VLSM)? (Select two.)

- A. It advertises a routing mask
- B. It is a classful routing protocol
- C. It is a classless routing protocol
- D. It does not advertise a routing mask.

Answer: A, C

Explanation: EIGRP includes the routing mask when it advertises routes. EIGRP is a classless protocol. These two features make EIGRP support VLSM.

Incorrect Answers

B: Classful routing protocols do not support VLSM.

D: The subnet mask must be included in the route to support VLSM.

QUESTION NO: 69

You are configuring point-to-point subinterfaces on an EIGRP Frame-Relay network. What is the default link speed on a WAN interface on this network?

- A. 256 Kbps
- B. 1.544 Mbps
- C. set by the PVC
- D. set by the DLCI

Answer: B

Explanation: The default EIGRP link speed is 1.544 Mbps for serial media.

Note: The enhanced code uses the "bandwidth" subcommand on interfaces and subinterfaces in order to determine the rate at which to generate EIGRP packets. This parameter is automatically set on fixed-bandwidth interfaces (such as LANs), but defaults to T1 (1544 Kbps) for all serial media.

Incorrect Answers

A: The default speed is 1.544 Mbps, not 256 Kbps.

C, D: The default speed is not set by the PVC or the DLCI.

QUESTION NO: 70

Where is the best place to perform route summarization on an EIGRP network?

- A. at area border routers
- B. at autonomous system boundary routers
- C. automatically by the DR router in each area
- D. manually at any interface of any EIGRP router within the network

Answer: B

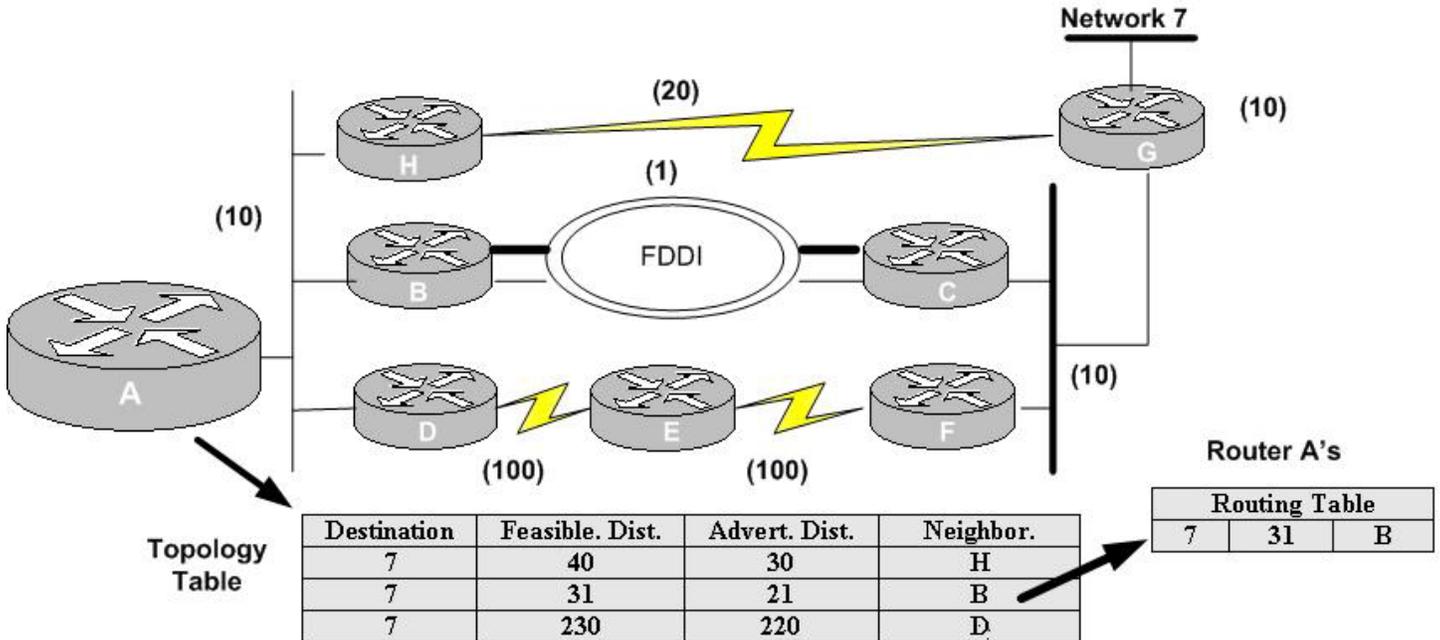
Explanation: . Enhanced IGRP performs route summarization at classful network boundaries by default. Automatic route summarization occurs at major network boundaries. ASBRs (autonomous system boundary routers) are used at the major network boundaries.

Incorrect Answers

A, C: Area Border Router and DR are used in OSPF, but not in EIGRP.

D: Manual summarization can be done in any interface at any router within network. However, this is not the preferred solution.

QUESTION NO: 71



You have configured an EIGRP network as shown in the exhibit above. The FDDI-interface shuts down. Which router or router then becomes the next-hop to Network 7 for Router A?

- A. B
- B. D only
- C. H only
- D. D and H

Answer: C

Explanation: Router H will be the successor, and that route will be placed in the Routing table. Router A detects the link failure between Router B and network 7. It checks the topology table for a successor. It finds that H is the successor since the advertised distance for H (30) is less than the feasible distance for B (31). However, there is no next best route – no feasible successor. The candidate route through D has an advertised distance (220) that is higher than the feasible distance of the successor route (40).

QUESTION NO: 72

You are configuring an ABR in an OSPF area. You want to summarize networks advertised out of the OSPF area. Which IOS configuration command should you use?

- A. `summary-address address mask`

- B. area area-id range *address mask*
- C. auto-summary *address mask* area *area-id*
- D. network *network-number wildcard mask* area *area-id*

Answer: B

Explanation: The area area-id range *address mask* command consolidates IA (intra-area) routes on an ABR. The command instructs the ABR to summarize routes for a specific area before injecting them into a different area.

Incorrect Answers

- A:** The summary-address *address mask* command consolidates external routes (interarea) on an ASBR
- C:** Auto-summarization is not useful here.
- D:** The network command cannot be used for this purpose.

QUESTION NO: 73

You work as a network administrator at TestKing. TestKing has one main office and one regional office that are connected. All routes at the main office are filtered.

You are required to configure the regional office router such that:

- the main office learn all routes from the regional office.
- the regional office should not learn all routes from the main office.
- the most scalable solution should be selected.

What should you do?

- A. configure static routes pointing to the network behind the central office router
- B. configure a default route pointing to the networks behind the central office router
- C. make the interface that is connected to the central office a passive interface to block incoming updates
- D. enable route update filtering on the interface that is connected to the central office to block incoming updates

Answer: B

Explanation: The most scalable solution is to use a default route to the networks behind the central office router. This enables access to dynamic routes at the central office.

Incorrect Answers

- A:** We still might want to use some dynamic routes.
- C:** A passive interface would prevent all route updates.
- D:** We still might want to use some dynamic routes.

QUESTION NO: 74**Exhibit**

```

ip route 30.0.0.0 255.0.0.0 172.16.1.2
ip route 192.168.1.0 255.255.255.0 172.10.1.2

router eigrp 100
  redistribute ospf 100
  network 172.19.1.0

router ospf 108
  redistribute static
  redistribute eigrp 100
  network 172.16.1.0 00.0.25 area 0
  distribute-list 5 out static

access-list 5 permit 30.0.0.0 0.255.255.255

```

You have configured your router as shown in the exhibit above. Your TestKing Trainee Bob asks you what the purpose of the distribute-list 3 out static is. What should you tell him?

- A. It denies the route to 30.0.0.0 via ospf
- B. It denies the route to 30.0.0.0 via eigrp
- C. It propagates the route to 30.0.0.0 via ospf
- D. It propagates the route to 30.0.0.0 via eigrp

Answer: C

Explanation: The distribute-list 5 out static command filters routes learned from static entries by using access list 3, before those routes are passed to the ospf process.

Incorrect Answers

- A, B:** Access-list permits, not denies, routes.
D: The route is propagated via ospf not via eigrp.

Section B

QUESTION NO: 1

When all of the Frame Relay interfaces belong to area 0 in a multiarea OSPF network. What will most likely occur?

- A. Type-5 LSA's will not be delivered.
- B. External summary routes can't be used.
- C. Summary LSA's will be flooded throughout the area and all area 0 routers will recalculate their routing tables in response to a topology change in area 0.
- D. This topology will never be implemented because the full time circuit tariffs are prohibited.

Answer: C.

Explanation: By placing all of the Frame Relay interfaces into Area 0 a network benefits as all remote locations and the central locations are able to have transit areas or stub areas but it may cause summary LSAs to be flooded throughout the Frame Relay network and results in a large number of routers performing recalculation if any topology change takes place in Area 0.

Incorrect answers:

- A:** Link State Advertisement (LSA) Type 5 are in fact flooded in the AS (Autonomous System) OSPF to advertise external routes.
- B:** This type of network can communicate with external route through redistribution.
- D:** Full time circuit tariffs have no bearing on this question. This option is meant to distract the test taker.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 185-7, 177.

QUESTION NO: 2

Which command is used to verify the status of an OSPF virtual link?

- A. Show IP OSPF.
- B. Show IP OSPF database.
- C. Show IP OSPF interface.
- D. Show IP OSPF virtual-links.

Answer: D.

Explanation: The show IP OSPF virtual-links command is used to display the current status of OSPF virtual links.

Incorrect answers:

- A:** Show IP OSPF command only displays general parameters that relate to the OSPF Process. For example this command will provide the router ID.
- B:** Show IP OSPF database command shows information about a router's OSPF database, such as router's route link states and network links.
- C:** Show IP OSPF interface command will allow you to verify that interfaces have been configured in the intended areas. You can also see the timer and Hello intervals with this command.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 204 and 683.

QUESTION NO: 3

What does an OSPF ABR connect?

- A. Multiple OSPF areas.
- B. OSPF and RIP networks.
- C. OSPF and EIGRP networks.
- D. Multiple designated routers.

Answer: A.

Explanation: An Area Border Router (ABR) is located on the border of one or more OSPF areas that connects those areas to the backbone network. ABRs are considered members of both the OSPF backbone and the attached areas. Therefore, they maintain routing tables describing both the backbone topology and the topology of the other areas.

Incorrect answers:

- B:** In order for an OSPF and a RIP networks a boundary router must be utilized to ensure that redistribution occurs as designed.
- C:** In order for an OSPF and an EIGRP networks a boundary router must be utilized to ensure that redistribution occurs as designed.
- D:** Each multi-access OSPF network that has at least two attached routers has a designated router (DR) that is elected by the OSPF Hello protocol. An ABR is not required to connect multiple DRs.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pages 175-178 and 453-458.

QUESTION NO: 4

Which OSPF feature allows you to separate a single large area into smaller areas?

- A. Link-state.
- B. Hierarchical.
- C. Interior area.
- D. OSPF stub area.

Answer: B.

Explanation: OSPF's capability to separate a large Internetworks into multiple areas is also known as hierarchical routing. Hierarchical routing enables you to separate a large Internetworks (autonomous system) into smaller Internetworks that are called areas.

Incorrect answers:

A: Routers that use a link state protocols, OSPF is one of these protocols, maintains a copy of the network topology and when a change occurs a link state advertisement (LSA) will be generated and sent to it's neighbours.

C: An interior area is not a feature of OSPF.

D: The purpose of an OSPF stub area is to prevent the broadcast of external routes within the area.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 178.
http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/ospf.htm

QUESTION NO: 5

Which two operational modes of OSPF over NBMA are considered to be RFC-compliant? (Choose two)

- A. Hub and spoke
- B. Point-to-multipoint nonbroadcast
- C. Broadcast
- D. Point-to-multipoint
- E. Nonbroadcast multiaccess
- F. Point-to-point

Answer: D and E.

Explanation: NBMA (nonbroadcast multiaccess) networks are those networks that support many (more than two) routers but have no broadcast capability. When a single interface is used to interconnect multiple sites

over an NNBA network, you may have reachability issues because of the nonbroadcast nature of the network. The RFC-complaint modes are NBMA mode and point-to-multipoint mode.

Incorrect answers:

- A:** A hub and spoke network is not a NBMA mode rather it is a type of network. In a hub and spoke configuration, one router is designated as the hub and all other routers are considered as spokes. The hub must be able to reach all spokes. The hub ideally should be configured as a point-to-multipoint but as OSPF is concerned, and the spokes should be configured as point-to-point spokes.
- B:** Point-to-multipoint nonbroadcast mode is an example of a Cisco defined NBMA mode.
- C:** Broadcast mode is an example of a Cisco defined NBMA mode.
- F:** Point-to-point mode is an example of a Cisco defined NBMA mode.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 120-9.

QUESTION NO: 6

Which property identifies the OSPF designated router (DR)?

- A. It has the lowest router ID
- B. It is connected to more than one area
- C. It has the highest priority value
- D. It is the first order that attaches to the network

Answer: C.

Explanation: To elect a designated router (DR) and a backup designated router (BDR), the router views each other's priority value during the hello packet exchange process. The first thing that is considered to determine the DR is the priority value. Specifically the router with the highest priority value is the DR.

Incorrect answers:

- A:** If the priority values are tied, the router ID is used but the router with the highest router ID then becomes the DR.
- B:** A router using OSPF can be connected to more than one area but this will not be determinative in selecting a DR.
- D:** The first router is not the DR by default. If it meets one of the criterias for DR selection it could be the DR.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 106-9.

QUESTION NO: 7

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Which capability allows OSPF to support variable-length subnet mask (VLSM)?

- A. OSPF can perform route summarization.
- B. OSPF carry subnet mask confirmation in the link advertisements.
- C. OSPF is a link-state protocol and all link-state protocols support VLSMs.
- D. OSPF design requires addresses to be allocated in groups to support multiple areas.

Answer: B.

Explanation: OSPF carries subnet mask information thus providing OSPF with the ability to support VLSMs (Variable Length Subnet Masks). As OSPF can support VLSM, OSPF can have a truly hierarchical structure. Providing a different subnet mask to each subnet accomplishes VLSM. The result is each subnet has a different number of host spaces available.

Incorrect answers:

- A:** OSPF can indeed perform route summarization but this only provides the summarization of routes in a routers routing table. Route summarization allows multiple networks to be advertised as one network address and mask.
- C:** OSPF is a link state protocol but the question asks for the OSPF capability that allows VLSM thus making this incorrect.
- D:** This is the OSPF capability that allows VLSM.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 197-202.

QUESTION NO: 8

Router R1 uses a subnet mask 255.255.255.0 and sits on the boundary of area 0 and area 1. Given the following router in configuration:

```

Router OSPF 76
Network 172.12.32.0 0.0.15.255 area 1.
Network 172.12.96.0 0.0.15.255 area 0.
Area 0 range 172.12.96.0 255.255.224.0
Area 1 range 172.12.32.0 255.255.224.0
  
```

Which three statements are true? (Choose three)

- A. An interface on this router with IP address 172.12.32.124 is an area 1.
- B. An effect of the fourth line is to reduce the number of route table entries.
- C. All networks within a range of 172.12.64.0 to 172.12.95.0 will be summarized from area 0 into area 1.

- D. All networks within the range of 172.12.32.0 to 172.12.63.0 will be summarized from area 1 into area 0.
- E. Area 0 can act as a stub or transit area for routes including networks in the range 172.12.96.0 to 255.255.224.0.

Answers: A, B, and D.

Explanation: The router configuration above identifies the following information by line:

Line 1 enable OSPF on the router with a process ID of 76.

Line 2 and Line 3 identifies which IP networks are part of the OSPF.

Line 4 instructs the router to summarize routes for area 0 before they are injected into another area.

Line 5 instructs the router to summarize routes for area 1 before they are injected into another area.

Incorrect answers:

C: Networks of this range would in fact be summarized from area 1 into area 0.

E: For a stub area to be configured the following command would need to be used – area area-id stub [no-summary].

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 188-200.

QUESTION NO: 9

In addition to viewing routing table which command can you use to determine if a router is using the best path to forward packets on a specific network?

- A. Ping.
- B. Show space path.
- C. Trace route.
- D. Ping with record option.

Answer: C.

Explanation: Traceroute is used verify that the shortest path is being used for routing. It is important to ensure you trace routes to networks that have a number of paths. The command would be: traceroute [IP-address].

Incorrect answers:

A: The ping command is used to confirm is a host is reachable and network connectivity.

B: Show space path is not a valid command.

D: With ping this option turns on route recording for the Echo Request packets, and displays the route buffer on returned packets (ignored by many routers).

BSCN, 485,495

http://www.livinginternet.com/?i/ia_tools_ping.htm

QUESTION NO: 10

You want to modify the OSPF router ID to 10.3.3.11. Which commands should you use to do this?

- A. Router loopback 0
IP address 10.3.3.11 255.255.0.0
- B. OSPF interface loopback 0
IP address 10.3.3.11 255.255.0.0
- C. interface loopback 0
IP address 10.3.3.11 255.255.0.0
- D. OSPF loopback 0
IP address 10.3.3.11 255.255.0.0

Answer: C.

Explanation: The highest IP address on an interface is normally used as the OSPF router ID. This can be overridden by configuring an IP address on a loopback interface. In this case, the highest such loopback IP address becomes the OSPF router ID. This can be done by using the interface loopback {number} command.

Incorrect answers:

- A:** Router loopback 0 is not a valid command.
- B:** OSPF interface loopback 0 is not a valid command.
- D:** OSPF loopback 0 is not a valid command.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 126.

QUESTION NO: 11

You are configuring redistribution to advertise EIGRP routes into OSPF on a boundary router.

Given the configuration:

```
Router ospf7
  Redistribute EIGRP 300 metric 20 subnets.
```

What is the function of 20 parameter in the redistribute command?

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- A. It is the seed cause to be applied to the redistributed routes.
- B. It places an administrative distance of 20 on the newly learned routes.
- C. If the process-id for the PSEUDO processes that injects the EIGRP routes into OSPF.
- D. It replaces a metric limit of 20 subnets to be included in each OSPF route advertisement.

Answer: B.

Explanation: The number that follows the metric-value command (in this case 20) is the metric used for the redistributed route. The configuration found above can be explained as follows:

Incorrect answers:

Line 1 identifies the routing protocol you want routes distributed into to. 7 in this line is used to signify the process id.

Line 2 determines that EIGRP AS (autonomous system) 300 will be redistributed with a metric of 20. The command subnet is used to ensure that the subnets are also redistributed. If the subnet command is not used, only routes are that are not subnet will be redistributed.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 458-9.

QUESTION NO: 12

You are configuring the static route on a router. You want to configure it so that if the interface associated with route goes down it will still remain in the routing table. Which IP route command parameter cause this to happen?

- A. Keep.
- B. Backup.
- C. Permanent.
- D. Continuous.

Answer C.

Explanation: The permanent command is used to specify that a route will not be removed even if the interfaces associated with the route go down.

Incorrect answers:

A: The no keep command is used to turnoff keepalives.

B: The backup command is used to assign a backup server for a real or virtual server.

D: Continuous is not IP route command parameter.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 464.
http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120s/120s5/ds3_fm.htm
<http://www.cisco.com/univercd/cc/td/doc/product/iaabu/localdir/ldv42/421guide/42ch05.htm#1368708>

QUESTION NO: 13

Given the IP routing table in the exhibit, which two statements about the routing table are true? (Choose two)

- A. The area is stub.
- B. The area is totally stub.
- C. Network 10 is using VLSM.
- D. The routing table is for an Area Border Router (ABR).

Answer: C, ?

Explanation: Without any exhibit it is hard to tell.

QUESTION NO: 14

You have configured policy-based routing on interface serial 0. Given the configuration:

```
Interface serial 0
IP policy route-map demo
Route-map demo permit 10
Match IP address 4
Set interface serial 2 serial 3
Access list for permit 10.3.3.2 0.0.0.0.
```

Which statement about a packet arriving on serial 0 is MOST correct?

- A. If the packets were sourced from 10.3.3.2, it is a candidate for fast-switch policy routing.
- B. If the packet was sourced from 10.3.3.2, it will be routed out interface serial 2 and interface serial 3 in a load-sharing fashion.
- C. If the packet was destined for 10.3.3.2, it will be routed out interface serial 2 and interface serial 3 in a load-sharing fashion.
- D. If the packet was sourced from 10.3.3.2, it will be routed out interface serial 2. If interface serial 2 is not up, the packet will be routed out interface serial 3.

Answer: D.

Explanation: The key to this question is the command set interface serial 2 serial 3. This command provides a list of interfaces that packets can be routed through. When there is more than one serial listed the first one will be used for the forwarding of packets when it is up.

Incorrect answers:

A: As the question asked for the answer that was more correct.

B, C:As the interface serials are not load balanced. In fact, the first interface will always be used as long as it is up.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 488-494.

QUESTION NO: 15

You are asked to interconnect networks that use different routing protocols. One network uses IGRP and the other network uses OSPF. You connect the networks using redistribution at the boundary routers. If the routers were to receive route information for the same networks from IGRP and OSPF, from which protocol will they select the route and why?

- A. OSPF, because it is a link state protocol.
- B. OSPF, because it has a better seed matrix.
- C. IGRP, because it is a hybrid protocol.
- D. IGRP, because it has better administrative distance.

Answer: D.

Explanation: When a router receives information from a network from different protocols (for example IGRP and OSPF), the router will determine which route is more believable based on the administrative distance of each protocol. The smaller the administrative distance the better (more believable) a route is. In this case, the administrative distance for IGRP is 100 and the administrative distance for OSPF is 110.

Incorrect answers:

A: It is true that OSPF is a link state protocol but this not why IGRP was selected. The reason the IGRP route was selected was it’s smaller administrative distance.

B: As IGRP and OSPF have different types of metrics there needs to be a means for these metrics to be translated/understood. The seed metric is the value that protocols understands and uses as the metric for routes learned from another protocol. Therefore a seed metric would be needed for OGRP to understand the metric of IGRP but this would not be the reason that the IGRP would be selected.

C: IGRP is in fact a distance vector protocol and is not the reason IGRP is selected.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 456-7 and 23.

http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/igrp.htm

QUESTION NO: 16

Which command must be redistributed if you want the route 10.1.1.0 advertised?

- A. IP route 10.1.1.0 255.255.255.0 static.
- B. IP route 10.1.1.0 255.255.255.0 10.2.1.1.
- C. IP route 10.1.1.0 255.255.255.0 interface e1.
- D. IP route 10.1.1.0 255.255.255.0 access-group 1.

Answer: B.

Explanation: The IP route command must contain the following parameters (after IP route) IP route prefix and mask (10.1.1.0 255.255.255.0) and the IP address of the next-hop router (10.2.1.1) or the local interface that will be used to reach the destination network.

Incorrect answers:

A: Incorrect.

C: Is incorrect; the word interface is not required in this command.

D: Incorrect.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 317-9.

QUESTION NO: 17

What is the purpose of route summarization?

- A. To use hierarchical routing to allow one route update to represent many down stream networks.
- B. To control route updates, to lower their frequency to leave more bandwidth for applications.
- C. To use an addressing scheme that will assign networks sequentially allowing them not to fragment.
- D. To use a compression logarithm on the routing table to lower memory constraints on the router.

Answer: A.

Explanation: In large Internetworks, hundreds or even thousands of networks can exist. In these environments, it is often not desirable for routers to maintain all these routes in their routing table. 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.

Incorrect answers:

B, C, and D: The purpose of route summarization is to reduce the number of routes (that are contiguous) in a routing table by representing them by a single route. These routes can therefore be updated by one update.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 75-9.

QUESTION NO: 18

Which three statements about BGP are true? (Choose three)

- A. Periodic keepalive are sent to verify TCP connectivity.
- B. Reliability comes from using TCP port 179 as its transport.
- C. Topology awareness is kept current by routine, periodic update.
- D. A rich set of metrics, called path vectors, enables BGP to support various routing policies.

Answers: A, B, and D.

Explanation: Border Gateway Protocol (BGP) is an inter-Autonomous System routing protocol. BGP is able to communicate by the exchanging of routing information. This communication is possible as the BGP router exchanging reachability data with other BGP routers. As a result, the routers are able to create an AS reachability graph from which loops and can be pruned. BGP communicates by using TCP port 179, path vector messages and keepalive messages.

Incorrect answers:

C: As the link established between routers is reliable there is no need to exchange periodical updates. In fact, BGP routers only exchange incremental updates.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pages 538-9.

QUESTION NO: 19

What is the characteristic of variable-length subnet masking (VLSM)?

- A. It allows a 32B-bit subnet mask.
- B. It is supported by all routing protocols because they carry the subnet mask within their routing table updates.
- C. It allows a way of controlling the number of reliable hosts on the network by manipulating the mask in attempt to efficiently allocate IP addresses.

- D. It allows the concurrent use of several different subnets masks on a single interface, providing multiple networks on a single interface.

Answer: C.

Explanation: VLSM allows hosts to use different length subnet masks within the same Internetworks. To run VLSM on a network, you must use a routing protocol that sends prefix-length subnet mask information with routing updates, which is considered a classless routing protocol. VLSM allow different subnet masks to be used with different subnets. The main purpose of VLSMs is to conserve IP addresses, because when you subnet, IP addresses are lost in the math. The benefits of VLSM include even more efficient use of IP addresses and greater capability to use route summarization.

Incorrect answers:

- A:** It is impossible to have a 34-bit subnet mask.
- B:** VLSM is only supported by classless routing protocols, OSPF for example, as for VLSM to work the protocol must be able to send prefix-length subnet mask information with their routing updates.
- D:** VLSM does permit the use of several different subnets masks on a single interface but this allows multiple hosts on a single interface.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 71-75.
<http://www.cisco.com/univercd/cc/td/doc/product/voice/ics7750/tblshoot/tstcp.htm>

QUESTION NO: 20

By default what happens to the next hop attribute advertised by EGBP?

- A. It is ignored by IBGP.
- B. It is carried into IBGP.
- C. It is a NDED with the subnet mask before being carried into IBGP.
- D. It is modified by IBGP to be the address of the router that receives the update.

Answer: B.

Explanation: BGP sends update messages about destinations routers. Parts of these messages are BGP metrics (also known as path attributes). There are several types of attributes including AS-path attributes, next-hop attributes, and MED attribute. The BGP next-hop attribute contains information of the next-hop IP address that can be used by a destination. For EGRP, the next-hop router is the IP address of the router that sent the update. For IBGP, the protocol states that the next hop advertised by EGBP should be carried into IBGP. As a result a BGP router (for example router Z) will advertise an external router (for example router Y) to an internal

neighbor (for example router X). Router X will know that to reach router Y, Router Y's IP address will need to be used and not router Z.

Incorrect answers:

- A:** IBGP will pass this information onto its neighbor. For the neighbor to communicate with this external route it will need to either use IGP or a static route.
- C:** NDED is not a term that is related to neither IBGP nor EBGP.
- D:** Most people would assume that the address modified by IBGP to be the address of the router that receives the update but in reality EBBP next hop attribute is carried into IBGP.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 321-334.

QUESTION NO: 21

What is the purpose of 'default-information originate always' command?

- A. It is used to create a default static route on a router running a RIP.
- B. It is used to create a default static route on a router running OSPF.
- C. It is used to create a default static route on a router running EIGRP.
- D. It is required whenever you want propagate a default route into an RIP autonomous system.
- E. It is required when ever whenever you want propagate a default route into an EIGRP autonomous system.
- F. It is required when ever whenever you want propagate a default route into an OSPF autonomous system.

Answer: F.

Explanation: The default-information originate always command in OSPF is used to propagate a default route into the OSPF routing domain. The always keyword causes the default route to always be advertised, whether or not the router has a default route. This ensures that the default route will get advertised into OSPF, even if the path to the default route goes down.

Incorrect answers:

- A:** The command for a default static route for a router using RIP is IP route 0.0.0.0.0.0.0 so (if the interface was so).
- B:** The command for a default static route for a router using OSPF is IP route 0.0.0.0.0.0.0 so (if the interface was so).
- D:** Default-information originate always command can only be used for OSPF, BGP, EGP, and IS- IS not with RIP.
- E:** Default-information originate always command can only be used for OSPF, BGP, EGP, and IS- IS not with EIGRP.

BSCN, 317-9

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios112/sbook/siprout.htm>

QUESTION NO: 22

Which two statements about BGP communities are true? (Choose two)

- A. They are restricted to one AS.
- B. They are restricted to one class A or B or C network.
- C. They allow router to filter incoming or outgoing updates.
- D. They are indicators used by a router to allow other routers to make decisions based upon these indicators.

Answers: C and D.

Explanation: BGP communities are one of the ways to filter incoming or outgoing BGP routes. The BGP communities' function allows routers to tag routes with an indicator (the community) and allows other routers to make decisions (filter) based upon the tag. BGP communities are used for destinations (routes) that share some common properties and that therefore share common policies; routers, therefore, act on the community rather than on individual routes.

Incorrect answers:

A: BGP communities are not restricted to one AS.

B: BGP communities are not restricted to one class A or B or C network.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 635-7.

QUESTION NO: 23

What are the two characteristics of an autonomous system? (Choose two)

- A. It uses only Interior Gateway Protocols (IGPs).
- B. It uses only Exterior Gateway Protocols (EGPs).
- C. It is a set of routers under a single technical administration.
- D. It uses IGPs to route packets to other autonomous systems and EGPs to route packets within the autonomous system.
- E. It uses EGPs to route packets to another autonomous system and IGPs to route packets within the autonomous system.

Answers: C and E.

Explanation: Autonomous system is a collection of routers under a common administration sharing a common routing strategy. Autonomous system can be subdivided into areas. IGP is the routing protocol used to exchange routing information within an AS and EGP is the routing protocol used to communicate between ASs.

Incorrect answers:

A: Autonomous system uses both IGP and EGP to communicate.

B: Autonomous system uses both IGP and EGP to communicate.

D: IGP is the routing protocol used to exchange routing information within an AS and EGP is the routing protocol used to communicate between ASs.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 311-2.

QUESTION NO: 24

Which 2 statements about routers running EBGP are true? (Choose two)

- A. They are usually directly connected.
- B. They are not usually directly connected.
- C. They need to be able to reach each other.
- D. They do not need to be able to reach other.

Answer: A and C.

Explanation: Autonomous Systems (AS) use EBGP to exchange routing information. Further, ASs use EBGP to insert routes owned by one AS into another AS within the enterprise network. For EBGP to function they are usually directly connected and they need to be able to reach each other.

Incorrect answers:

B: EBGP are usually directly connected.

D: EBGP must be able to communicate with each other.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 321-2.

QUESTION NO: 25

Which two statements about BGP are true? (Choose two)

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- A. BGP policy-based routing allows policy decisions at the AS level to be enforced.
- B. BGP can only advertise routers that it uses to be its peers in other autonomous system.
- C. BGP can advertise routers that it can't use to its peers other autonomous systems.
- D. BGP allows an AS to send traffic to a neighboring AS, intending that the traffic take a different route than from the traffic originating in the neighboring AS.

Answers: A and B.

Explanation: BGP allows policy decisions at the AS level to be enforced. This setting of policies or rules for routing is known as policy-based routing. Policy-based routing is the process of defining a route for a packet, which could possibly supersede the routing table. Policy based routing is completed on the interface that the packets are received on. EBGP can only advertise routers that it uses to peers in another AS.

Incorrect answers:

- C:** BGP specifies that a BGP router can advertise to its peers in neighboring AS only those routes that it itself uses.
- D:** Some policies cannot be supported by the hop-by-hop paradigm and thus require techniques such as source routing to enforce. For example, BGP does not allow an AS to send traffic to a neighboring AS intending that the traffic take a different route than from the traffic originating in the neighboring AS. You cannot influence how the neighbor AS will route your traffic; but you can influence how your traffic gets to a neighbor AS.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p. 322.
http://www.cisco.com/warp/public/cc/techno/protocol/tech/policy_wp.htm

QUESTION NO: 26

Which statement about EBGP is true?

- A. Routers run EBGP in order to exchange BGP information with routers in other autonomous systems.
- B. Routers run EBGP in order to exchange IGP information with routers in other autonomous systems.
- C. Routers run EBGP in order to exchange EGP information with routers in other autonomous systems.
- D. Routers run EBGP in order to exchange BGP information with routers within autonomous systems.
- E. Routers run EBGP in order to exchange EGP information with routers within autonomous systems.

Answer: A.

Explanation: BGP is an exterior routing protocol. That is, it is used to connect different networks to the Internet. BGP message can be either internal or external. Internal BGP (IGBP) is used to exchange information

between peers within an Autonomous Systems (ASs) and external BGP (EGBP) is used to exchange information between ASs.

Incorrect answers:

- B:** IGP (Interior Gateway Protocol) are used to exchange routing information in an AS. Examples of IGP are EIGRP and OSPF, to name a few.
- C:** EGP stands for Exterior Gateway Protocol. BGP is an example of EGP but EGBP is used to exchange BGP between ASs.
- D:** IBGP is run by routers in order to exchange BGP information with routers within autonomous systems.
- E:** EGP is a routing protocol that is used to connect between ASs. Therefore, routers do not run EGBP in order to exchange BGP information with routers within autonomous systems.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 321, 537

QUESTION NO: 27

Which two statements are true about a router running BGP with all the default settings? (Choose two)

- A. It will not run an IGP.
- B. It will always use a route learned by IBGP.
- C. It will not use a route learned by IBGP, unless that route is learned from an IGP.
- D. It will not advertise a route learned by IBGP to an external neighbor, unless that route is learned from an IGP.
- E. It will always advertise a route learned by IBGP to an external neighbour, once connectivity to the external neighbour has been established.

Answer: C and D.

Explanation: The BGP synchronization rule states that a BGP router should not use or advertise to an external neighbor a route learned by IBGP, unless the route is local or it is learned from the IGP. If your autonomous system is passing information from one AS to another AS, BGP should not advertise a route before all routers in your AS have learned about the route via IGP.

Incorrect answers:

- A:** A router running BGP can also run IGP. BGP would be used to communicate to other autonomous systems and IGP would be used to communicate within the AS.
- B:** A router running BGP will not use a route learned from IBGP unless it was learned from IGP.
- E:** In order for a router running BGP to advertise an IBGP route to its external neighbors the route would need to be learned by IGP. Even if connectivity was established with the external neighbor a IBGP that wasn't learned by IGP would not be advertised.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 333-4.

QUESTION NO: 28

Routers run EBGP in order to exchange _____ information with routers _____ autonomous systems.

- A. BGP; in other
- B. IGP; in other
- C. EGP; in other
- D. BGP; within
- E. EGP; within

Answer: A.

QUESTION NO: 29

Which method of sending route information into BGP routing protocol is not recommended?

- A. Using the null 0 interface.
- B. Using the network command.
- C. Redistributing static routes into BGP.
- D. Redistributing dynamic routes into the BGP.
- E. Using the redistribute BGP command.
- F. Changing the administrative distance of the routes.

Answer: D.

Explanation: Route information is sent into an AS into BGP in one of the following ways:

Using the network command. This command allows BGP to advertise a network already in the IP table. The list of network commands must include all the networks in the AS that you want to advertise.

Redistributing static routes to null 0 into BGP. Redistribution occurs when a router running different protocols advertises routing information received between the protocols. Static routes in this case are considered to be a protocol, and static information is advertised to BGP.

Redistributing dynamic IGP routes into BGP. This solution is not recommended because it may cause instability. The instability is possible as any time an IGP route changes, goes down for example, a BGP update could result.

- A: The question was asking for methods that are not recommended to send routes into BGP. Using the null 0 interface is a recommended way.
- B: The question was asking for methods that are not recommended to send routes into BGP. Using the network command is a recommended way of sending route information into BGP.
- C: The question was asking for methods that are not recommended to send routes into BGP. Redistribution of static routes configured to the null 0 interface into BGP is done to advertise aggregate route rather than specific routes from the IP table.
- E: The question was asking for methods that are not recommended to send routes into BGP.
- F: The question was asking for methods that are not recommended to send routes into BGP.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 407-410.

QUESTION NO: 30

The quantity of information contained in a routing update can be changed by implementing a route filter (distribute list). Which two statements about distribute list are true? (Choose two)

- A. Distribute list are applied to interfaces or to routing processes.
- B. If no match is found in the access list, the routing update is dropped.
- C. Distribute list are capable of changing the attributes of a received route.
- D. A distribute list consist of a standard or extended access list that has an "implicit deny any" statement at the end.

Answer: A, D.

Explanation:

- A: Distribute list are applied to interfaces or to routing processes.
- D: An "implicit deny any" statement is present.

Reference: Filtering Routing Updates on Distance Vector IP Routing Protocols
<http://www.cisco.com/warp/public/105/34.html>

Incorrect Answers

- B: This is not is not necessarily true, since there could be multiple "out" distribute lists.
- C: Distribute list are not capable of changing the attributes of a received route.

QUESTION NO: 31

When trying to determine whether a serial interface is connected to a DTE or DCE cable, with IOS command. Which IOS command should you use?

Enter the number that corresponds to the command.

Answer: show controllers

Explanation: The show controller command displays the Layer 1 information about an interface (including cable type and DCE/DTE status for serial interfaces).

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 678.

QUESTION NO: 32

Which command is used to change the BGP wait attribute of updates coming from a neighbour router? Enter the number that corresponds to the command?

Answer: neighbor {ip-address/peer-group-name} weight {weight}

Explanation: The neighbor {ip-address/peer-group-name} weight {weight} router configuration command is used to assign a weight to a neighbor connection. The following is a command description:

ip-address – IP address of the BGP neighbor.

peer-group-name – Name of a BGP peer group

weight – Weight to assign. Acceptable values are 0 to 65535. The default is 32768 for local routes (route that the router originates); other weights of 0 by default.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p. 403.

QUESTION NO: 33

Which two events take place when a full event mesh of BGP session is configured within an autonomous system? (Choose two.)

- A. The configuration is not permitted by default.
- B. Configuration may be permitted if route reflectors are used.
- C. This may result in many BGP sessions being created.
- D. This may result in many switched virtual circuits (SVCs) being created.
- E. This may result in many permanent virtual circuits (PVCs) being created.
- F. This may result in using a significant amount of bandwidth on slow WAN links.

Answer: C and F.

Explanation: A full governing IBGP behavior is BGP split horizon rule. Simply put this means that routes learned from IBGP can never be sent to IBGP peers. This split horizon rule is necessary to prevent loops within the autonomous system. As a result, a full mesh of IBGP peers is required within an AS. The more routers there are in an AS, the more BGP session will be required. To determine how many session will be required one can use the formula: $n(n-1)/2$. (n = the number of routers) In addition to this problem with required session they may also be a problem with routing traffic due to the amount of replication required. For example, if the physical topology of a large AS includes some WAN links, the IBGP sessions running over the links may consume a large amount of bandwidth.

Incorrect answers:

A: A full mesh topology is not only permitted but is required for IBGP peers.

B: Is incorrect; if route reflectors are used then a full mesh of IBGP neighbors is no longer required. The reason that a full mesh is no longer required is that route reflectors can advertise routes learned by IBGP to other IBGP peers.

D: SVCs are most commonly used with a partially meshed network.

E: PVCs are most commonly used with a partially meshed network.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 381-4.

QUESTION NO: 34

You have decided to make an OSPF area 2 a stub area. All routers in the area exchange routing information. However, once you configure the ABR as stub. It no longer exchanges information with other routers in the area. What is the most likely problem?

- A. There is an ASBR in area 2.
- B. The area 2 is a transit area for virtual links.
- C. The router in area 2 also needs to be configured for stub.
- D. The area 2 has multiple exit points ABR's and only one is configured for stub.

Answer: C.

Explanation: For an area to be qualified as a stub area it must meet a number of criteria. One of these requirements is that all routers in the stub must be configured as stub routers. Once the routers are configured as stub routers they will be become neighbors and exchange information.

Incorrect answers:

A: It is true that for an area to be a stub or a totally stubby area it must not have an ASBR in it but an ASBR will not prevent the exchange of information. In fact, the ASBR would provide the stub with information on external routes. (Remember the very reason for a stub area is to prevent the area from carrying external routes.)

B: It is true that for an area to be a stub or a totally stubby area it must not be need to be a transit area for virtual links but this fact would not prevent the exchange of information. In fact, if it was a transit area for a virtual link the area will have external route information injected into it. (Remember the very reason for a stub area is to prevent the area from carrying external routes.)

D: A stub area can have multiple exit points. If this is the case, the result is that routing to other areas may end up taking the sub optimal path.

<http://www.cisco.com/warp/public/104/3.html#13.0>

QUESTION NO: 35

What do you call an autonomous system connected via BGP to more than one ISP?

- A. Multihop
- B. Multihomed
- C. Multisource
- D. Multiassessed

Answer: B.

Explanation: Multihoming is the term used to describe when an AS is connected to more than one ISP. This is usually done for one of two reasons:

To increase the reliability of the connection to the Internet so that if one connection fails, another will still be available; and to increase the performance so that better paths can be used to certain destinations.

Incorrect answers:

A: Multihop is most often used in reference to Virtual Private Dialup Network (VPDN) and is not used in reference to connecting to an ISP multiple times.

C: Mutlisource, in general, may be used to describe to having multiple source for something but Cisco uses the term multihome to reference when an AS is connected to more than one ISP.

D: A multi-access network allows multiple devices to connect and communicate at the same time.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 397-400.

QUESTION NO: 36

Which three IP protocols support variable length subnet masks (VLSM)? (Choose three)

- A. RIPv.1.

- B. RIPv.2.
- C. IGRP.
- D. OSPF.
- E. EIGRP.

Answer: B, D and E.

Explanation: The ability to specify a different subnet mask for the same network number on different subnets is called Variable-Length Subnet Mask (VLSM). VLSM can help optimize available address space. Classless routing protocols support VLSM. Routing protocols that include the prefix length with routing updates; routers running classless routing do not have to determine the prefix themselves. Examples of classless protocols include RIP v. 2, OSPF and EIGRP.

Incorrect answers:

- A:** RIP v. 1 is a classful routing protocol. Classful routing protocols do not transmit any information about the prefix length.
- C:** IGRP is a classful routing protocol. Classful routing protocols do not transmit any information about the prefix length.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 15-20.

QUESTION NO: 37

Which three elements are required for a router to forward a packet? (Choose three)

- A. The best route.
- B. Possible routes.
- C. Destination address.
- D. Summarized route entry.
- E. Encryption key for routed data.

Answer: A, B and C.

Explanation: The router must know three items in order to route:

The router must determine whether it has the protocol suite active.

The router must know the destination network.

The router must know which outbound interface is the best path to the destination.

For a routing device to make a routing decision, it must first understand the logical destination address. For this to happen, the protocol suite that uses that logical addressing scheme must be enabled and currently active on the router.

After the router can understand the addressing scheme, the second decision is to determine whether the destination logical network is a valid destination within the current routing table.

The final decision that the routing device must make if the destination is in the routing table is to determine through which outbound interface the packet will be forwarded. The routing table will contain only the best path (or paths) to any given destination logical network.

Incorrect answers:

D: A router does not need to know a route summarization entry to forward a packet. If it does have a route summarization entry it can route more efficiently but a route summarization entry is not required.

E: It does not need an encryption key to route traffic.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 6-7.

QUESTION NO: 38

In a routing table entry which value indicates the best route to reach a destination network?

- A. Cost.
- B. Metric.
- C. Bandwidth.
- D. Hop count.

Answer: B.

Explanation: The metric, or cost metric, is a value associated with a route. This value is the cost to reach the destination.

Incorrect answers:

A: Costs are primarily associated with links, not with routes..

C: Bandwidth is the difference between the highest and lowest frequencies available for network signals. The term is also used to describe the rated throughput capacity of a given network medium or protocol.

D: Hop count used to measure the distance between a source and destination. IP RIP uses hop count as its sole metric.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 762-777.

QUESTION NO: 39

Which show command should you use to verify that a particular router was selected as the designated router and which timer intervals were configured.

Enter the number that corresponds to the command?

Answer: show ip ospf interface

Explanation: The show ip ospf interface command verifies that interfaces have been configured in the intended areas. If no loopback address is specified, the interface with the highest address is taken as router ID. It also give the time intervals, including the hello interval, shows neighbor adjacencies, DR ID and BDR ID.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 134.

QUESTION NO: 40

What are two characteristics of link-state routing? (Choose two)

- A. It is utilized by OSPF and IGRP.
- B. It determines path by bandwidth-based value.
- C. It sends updates to directly attached routers only.
- D. It sends updates rather than complete routing tables when a network change occurs.

Answer: C and D.

Explanation: Link state routing protocols generate routing updates only when there is a change in the topology. When a link changes state, the device that detects the change creates a link state advertisement (LSA) concerning that link (route); the LSA is then propagated to all neighboring devices using a special multicast address. Each routing device takes a copy of the LSA, forwards the LSA to all neighboring devices (this process is called flooding), and then updates its topological database (a table containing all the link state information for the network). This flooding of the LSA is required to ensure that all routing devices learn about the change so that they can update their databases and create updated routing table that reflects the new topology.

Incorrect answers:

A: OSPF is a link state routing protocol but IGRP is a distance vector routing protocol.

B: Link state routing protocols select paths based on algorithm. OSPF uses the Dijkstra algorithm, also known as the shortest path first (SPF) algorithm.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 22-3.

QUESTION NO: 41

Which two statements about variable-length subnet mask (VLSMs) are true? (Choose two)

- A. VLSMs is a characteristic of classful network.
- B. They have a greater capability to use route summarization.
- C. RIP 1 network supports multiple subnets per network address.
- D. VLSMs allow for more hierarchical levels within an addressing plan.

Answer: B and D.

Explanation: VLSMs allow hosts to use different length subnet masks within the same Internetworks. To run VLSM on a network, you must use a routing protocol that sends prefix-length subnet mask information with the route updates, which is considered a classless routing protocol. If you configure the same subnet mask on all devices in your Internetworks, this is considered classful routing. VLSMs allow for more hierarchical levels within your addressing plan and thus allows for better route summarization within routing tables.

Incorrect answers:

- A:** VLSMs are only possible on classful network but is not a characteristic of a classful network.
- C:** RIP v 1 cannot support multiple subnets per network address.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 76-77.

QUESTION NO: 42

Given the route summarization entry 192.168.16.0/20. How many class C addresses can be summarized?

- A. 4.
- B. 8.
- C. 16.
- D. 20.
- E. 32.
- F. 64.

Answer: C.

Explanation: In order to determine the answer to this question we convert the Network number to binary:
Network address

172.30.16.0 10101100 00011110 00010000 00000000

As the summarized route is /20 the the first 20 bits must be the same. A Class C subnet mask has 24 bits so the lower 4 bits in the 3rd octet can be changed. There are 16 possible combinations (0000, 0001,, 1111) so 192.168.16.0/20 can summarize 16 class C addresses.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 75-81.

QUESTION NO: 43

Given the configuration

```
Interface Ethernet 0
IP address 172.16.80.77 255.255.255.0
IP helper-address 172.16.90.255
```

Which two statements are true? (Choose two)

- A. 172.16.90.255 is an alternate address from 172.16.80.77.
- B. Host 172.16.90.255 is the backup router for 172.16.80.70.
- C. All non-routable protocols will be forwarded to 172.16.90.255.
- D. Host 172.16.90.255 will provide IP tunnelling for non-IP protocols.
- E. BOOTP request on the interface Ethernet 0 will be forwarded to network 172.16.90.0.
- F. NetBIOS broadcast from 172.16.80.0 will be sent as directed broadcast to network 172.16.90.0.

Answer: E and F.

Explanation: Use the ip-helper-address {address} interface configuration command to configure an interface on which broadcasts are expected or can be received. In the command {address} indicates the destination address to be used when forwarding User Datagram Protocol broadcasts. The specified address can be unicast address of a remote server or a directed broadcast address.

Incorrect answers:

- A:** 172.16.90.255 is the address that broadcasts from 172.16.80.77 are sent and not an alternative address.
- B:** 172.16.90.255 is the address that broadcasts from 172.16.80.77 are sent and not a backup router.
- C:** Non-routable are not forwarded to 172.16.90.255. 172.16.90.255 is where broadcasts are sent.
- D:** Host 172.16.90.255 will not provide IP tunnelling on IP protocols rather 172.16.90.255 is where broadcasts are sent.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 88-91.

QUESTION NO: 44

Which two statements about variable length subnet masking VLSM are true? (Choose two)

- A. It supports hierarchical addressing.
- B. It is specifically used in the IP environment.
- C. It is specifically used in the IPX environment.
- D. It is specifically used in both the IP and IPX environments.

Answer: A and B.

Explanation: VLSMs offer the capability to specify a different subnet mask for the same network number on different subnets. VLSM can help optimize available address space. VLSM is supposed to assist with IP addressing issues.

Incorrect answers:

C: IPX is a Novell proprietary network layer protocol that deals with the transferring of data from server to workstation and VLSM was not designed to assist with IPX addressing.

D: IPX is a Novell proprietary network layer protocol that deals with the transferring of data from server to workstation and VLSM was not designed to assist with IPX addressing.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 1 and 785.

QUESTION NO: 45

In a multipoint WAN topology using EIGRP, which guideline is used for configuring bandwidth on a serial interface?

- A. Configure the bandwidth to be the sum of all virtual circuits.
- B. Configure the bandwidth to be equal to the lowest CIR in the topology.
- C. Configure the bandwidth equal to the link capacity divided by the number of its shared circuits.
- D. Configure the bandwidth to be the product of a number of circuits multiplied by CIR provisioned for each circuit in the topology.

Answer: C.

Explanation: When configuring multipoint interfaces (especially for Frame Relay) remember that all neighbors share the bandwidth equally. That is, EIGRP used bandwidth statement of the physical interface divided by the number of Frame Relay neighbors connected on that physical interface to get the bandwidth attributed to each

neighbour. EIGRP configuration should reflect the correct percentage of the actual available bandwidth on the line.

Incorrect answers:

- A:** When configuring EIGRP on multiple circuits, virtual circuits share the available bandwidth of a serial interface.
- B:** When a frame relay multipoint has different CIR values, the interface should be configured for the bandwidth that represents the lowest CIR multiplied by the number of circuits being supported. This configuration will prevent the slowest speed circuit from being overwhelmed.
- D:** When a frame relay multipoint has different CIR values, the interface should be configured for the bandwidth that represents the lowest CIR multiplied by the number of circuits being supported. This configuration will prevent the slowest speed circuit from being overwhelmed.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 270-1.

QUESTION NO: 46

Which two statements about route maps are true? (Choose two)

- A. The order of the route map statements is optimized by the parser
- B. Route maps must check for multiple criteria and pattern themselves after extended access lists (not after simple access list)
- C. Statements can be added and deleted once a route map is created
- D. They can modify the next-hop address and outgoing interface (the route a packet takes) based upon a match condition

Answer: C, D.

Explanation:

C: A route map may be made up of multiple route maps statements. The statements are processed top-down, similar to an access list. The first match found for a route is applied. The sequence number is used to determine the order they are applied and the sequence number is also used for inserting or deleting specific route map statements (C) in a specific place in a route map.

D: Each entry in a route-map statement contains a combination of match and set statements. The match statements define the criteria for whether appropriate packets meet the particular policy (that is, the conditions to be met). The set clauses define how the packets should be routed once they have met the match criteria.

Incorrect answers:

A: There is no parser optimizing the route map.

B: Route maps may need to check multiple criteria to determine a match but once a match is determined then it is applied.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 486-7.

QUESTION NO: 47

You are using routes with EIGRP route section. Which is a feasible distance? (Choose two)

- A. The next-hop router for the backup path.
- B. The next-hop router selected as the best path.
- C. The cost between the local router and the destination.
- D. The cost between the next hop router and the destination.

Answer: C and D.

Explanation: EIGRP uses DUAL to make route selection. DUAL uses the distance information, known as a metric, to select an efficient, loop-free path to each destination and inserts that choice in the routing table. The lowest-cost route is calculated by adding the cost between the next-hop router and the destination router (advertise distance) to the cost between the local router and the next-hop router. The sum of this is referred to as the feasible distance.

Note: The cost between the next-hop router and the destination is referred to as *advertised distance*. The cost between the local router and the next-hop router is referred to as *feasible distance*.

Incorrect answers:

- A:** The next-hop router for the backup path is referred to as the feasible successor.
- B:** The next-hop router is required when determining the feasible distance but it is used in conjunction with the destination router and the local router.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 258-9.

QUESTION NO: 48

When does in an EIGRP router discover its neighbors?

- A. When it receives a hello packet from its neighbour.
- B. When it receive a full routing table from its neighbour.
- C. When it receives an acknowledgement for one of the transmitted hello packets.
- D. Due to the reliable nature of EIGRP, neighbour relationships are not required.

Answer: A.

Explanation: The router sends hello packets out of the interfaces configured for EIGRP. When a router receives a hello packet from a router belonging to the same autonomous system, it establishes a neighbor relationship (adjacency). Through the Hello protocol, an EIGRP router dynamically discovers other routers directly connected to it.

Incorrect answers:

- B:** For EIGRP to establish an adjacency it only requires to receive a hello packet and note the other routers entire routing table.
- C:** When a router receives an ACK it is only used to indicate that an update, query or reply has been received.
- D:** EIGRP requires neighbor relationships to function properly.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 2851-3.

QUESTION NO: 49

When a static route is configured on a router, that router must advertise it to the other routers in the network. How is the static route advertised?

- A. Automatically by the configured routing protocol
- B. Using the redistribute command
- C. Using the static route advertise command
- D. Using the distribute-list command

Answer: B.

Explanation: If you want a router to advertise a static route in a routing protocol, you will need to redistribute it.

- A:** Static routes are not automatically redistributed when they are configured. Static routes must be redistributed manually.
- C:** There is no static route advertise command.
- D:** There is no distribute-list command.

Catherine Paquet and Diane Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 465.

QUESTION NO: 50

When policy-based routing is configured on a router, which interfaces participate in the implementation of policy?

- A. All interfaces
- B. An incoming and outgoing pair defined in the configuration
- C. Only incoming interfaces
- D. Only outgoing interfaces

Answer: C.

Explanation: Policy based routing is applied to incoming packets. All packets received on an interface with policy-based routing enabled are considered policy based routing. The router passes the packets through a route map. Based on the criteria defined in the route map, packets are forwarded to the appropriate next hop.

A: Policy based routing is only applied to incoming interfaces.

B: Policy based routing is only applied to incoming interfaces.

D: Policy based routing is only applied to incoming interfaces.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 488-9.

QUESTION NO: 51

Which feature in EIGRP enables it to reduce the size of the routing table?

- A. Query scoping.
- B. Hierarchical designs.
- C. Route summarization.
- D. Variable-length subnet mask (VLSM).

Answer: C.

Explanation: Some EIGRP features have distance vector characteristics, such as summarizing routes at a major network boundary. Summarizing routes at the major boundary creates smaller routing tables.

Incorrect answers:

A: Query scoping does not help reduce the size of the routing table. Query scoping is the limiting of the scope of query propagation through the network and it helps to reduce the incidences of SIA.

B: Hierarchical design helps with VLSM but does not help reduce the size of the routing table.

D: VLSM assist with the more efficient use of IP address spacing.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 265-275.

QUESTION NO: 52

When a route is set to Stuck-in-active which EIGRP condition has occurred?

- A. The feasible successor route is not responding to update packets.
- B. The route compilation process is taking longer than usual to complete.
- C. The whole time has expired and a neighbouring router has been marked as inactive.
- D. A neighbouring router has failed to response to a query about the route within three minutes.

Answer: D.

Explanation: If a router does not receive a reply to all outstanding queries within 3 minutes, the route goes to the stuck in active (SIA) state. The router then resets the neighbors that fail to reply by going active on all routes known through that neighbor, and it readvertises all routes to that neighbor.

Incorrect answers:

- A:** If the primary route fails and the feasible successor route stops responding to update packets, then the route goes into the inactive state.
- B:** The only impact that a longer compilation has is that the convergence time will increase.
- C:** SIA will not be directly affected by this option.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 253, 275.

QUESTION NO: 53

Given the configuration commands:

1. Router EIGRP 110.
2. Network 172.16.0.0.
3. Network 3.0.0.0.

Which two statements are true? (Choose two)

- A. Line 1 defines EIGRP as an IP routing process.
- B. Network 172.16.0.0 becomes the path to the default gateway.
- C. The number at the end of line 1 indicated the routing process ID.
- D. Line 2 causes all interfaces connected to network 172.16.0.0 to send EIGRP updates to other EIGRP routers.

Answer: A and D.

Explanation: The first line of the configuration enables EIGRP as the routing protocol and defines the autonomous system as 110. The second line and third line of the configuration identifies which networks is part of the EIGRP AS.

Incorrect answers:

B: 172.16.0.0 do not identify the path to the default gateway rather it identifies that 172.16.0.0 is part of the EIGRP AS.

C: The number at the end of the first line does not indicate the process ID rather it defines the autonomous system.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 264-5.

QUESTION NO: 54

You are configuring EIGRP for NBMA operation. What is the purpose of the IP bandwidth-percentage EIGRP command?

- A. It adjusts the percentage of bandwidth that EIGRP packets can use on all of the router’s interfaces.
- B. It adjusts the percentage of bandwidth that EIGRP packets can use on an individual router interface.
- C. It overrides the bandwidth setting on an interface to ensure that EIGRP packets receive 50% of the available bandwidth on the router’s interface.
- D. It limits the percentage of bandwidth that EIGRP packets can use. That percentage cannot exceed 50% of the configured bandwidth on all of the router’s interface.

Answer: C.

Explanation: By default, EIGRP will use up to 50 percent of the bandwidth on an interface or subinterface. This percentage can be adjusted on an interface or subinterface with the ip bandwidth-percentage command.

Incorrect answers:

A: To adjust the percentage of bandwidth that EIGRP packets can use on all of the routers interfaces the bandwidth command should be used.

B: To adjust the percentage of bandwidth that EIGRP packets can use on an individual router interface one can also use the bandwidth command.

D: Ip bandwidth-percentage command does not limit the percentage of bandwidth that EIGRP packets can use that percentage can’t exceed 50% of the configured bandwidth on all of the routers interface.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 265-270.

QUESTION NO: 55

For purpose of participating in an OSPF DR/BDR election, what is the default router priority?

- A. 1.
- B. 0.
- C. 255.
- D. 32768.

Answer: A.

Explanation: To elect a designated router (DR) and a backup designated router (BDR), the router views each other's priority value during the hello packet exchange process. The first thing that is considered to determine the DR is the priority value. Specifically the router with the highest priority value is the DR and the one with the second highest priority value is the BDR. The default for the interface OSPF priority is 1.

Incorrect answers:

B: A router with a priority set to 0 is ineligible to become a DR or a BDR.

C: 255 is the highest possible router priority is 255 but 1 is the default router priority.

D: 32768 is not a valid router priority.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 106-8.

QUESTION NO: 56

What are two advantages for using subinterfaces in an NBMA topology? (Choose two)

- A. IP addressing space is conserved.
- B. Routing protocols avoid split-horizon issues.
- C. Logical interfaces are more reliable than physical interfaces.
- D. When a subinterfaces state changes to down, the physical interface remains up.

Answer: B and D.

Explanation: When configuring routers in an NBMA topology, subinterfaces are typically used. A physical interface can be split into multiple logical interfaces, called subinterfaces, with each subinterface being defined as a point-to-point and point-to-multipoint interface. Subinterfaces originally were created to better handle issues caused by split horizon over NBMA and distance vector-based routing protocol.

If you are running OSPF over subinterfaces, however, and a subinterface goes down, the physical interface remains up, so the router does not reflect that the link has gone down and that a connectivity problem exists.

Incorrect answers:

A: Subinterfaces do not conserve ip-addressing space.

C: Logical interfaces add reliability to physical interfaces.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 120-2.

QUESTION NO: 57

When configuring serial 1 for OSPF in NDMA mode, what is the correct combination of commands?

- A. Interface serial 0
IP OSPF network non-broadcast
Neighbour address.
- B. Interface serial 0
IP OSPF network non-broadcast
OSPF process-ID
Neighbour address.
- C. Interface serial 0
IP OSPF network NBMA route
Router OSPF process-ID
Network number wildcard-mask area number.
Neighbour address.
- D. Interface serial 0
IP OSPF network non-broadcast
Router OSPF process ID
Network number Wildcard-mask area number
Neighbour address.

Answer: D.

Explanation: In the NBMA mode, the selection of the DR is an issue because the DR and BDR need to have full physical connectivity with all routers connected to the cloud. Also, because of the lack of broadcast capabilities, the DR and BDR need to have a static list of all other routers attached to the cloud—that is, a list of the OSPF neighbors. This is achieved with the use of the neighbor command. The commands to configure OSPF in NBMA mode the following commands are required:

Interface serial 0

Ip ospf network non broadcast
Router ospf process id
Network number Wildcard mask area number
Neighbour address

Incorrect answers:

- A:** This combination of commands is incomplete. For OSPF to be configured in NBMA mode the following commands must also be included: router ospf process id and network number wildcard mask area number.
B: This combination of commands is incomplete. For OSPF to be configured in NBMA mode the following commands must also be included the following command; network number wildcard mask area number.
C: Is not a valid combination of commands as ip OSPF network NBMA route is not a valid command.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 120, 129-131.

QUESTION NO: 58

You have a branch office that is attached to a central office. You want the central office to learn all routes in the branch office. However, you do not want the branch office to learn about all routes from the central office.

What is the most scalable option you should use on the branch office router?

- A. Static routes
- B. Route update filtering
- C. Passive interface
- D. Default route

Answer: A.

Explanation: When define routes to destinations over a WAN link as static this eliminates the need for a dynamic routing protocol—that is, when you do not want routing updates to enable or cross a link. If you are configuring static routes on a WAN router that is connecting the central office to the branch office, you should select the branch office network to be static.

Incorrect answers:

- B:** Route filters are most effective when you want to filter the incoming and outgoing routing updates by using access list. Route filters would not produce the desired result.
C: Passive interfaces prevents all routing updates for a given protocol from being sent into a network, but it does not prevent the specified interface from receiving updates.
D: Default routes forward any packets destined for a destination that does not appear in its routing table to the default route configured.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 462-473.

QUESTION NO: 59

Why is OSPF better the RIPV 1.1 in a large network? (Choose two)

- A. OSPF has fewer tables to manage.
- B. OSPF is a simpler protocol than RIP V.
- C. OSPF has virtually no reachability limits.
- D. OSPF selects the best path using a metric that is based on bandwidth.

Answer: C and D.

Explanation: OSPF is a link state protocol. OSPF was written to address the needs of large, scalable Internetworks that RIP could not. OSPF addresses the following issues: speed of convergence, support of VLSM, network reachability (OSPF has no reachability limitations), use of bandwidth and method for path selection (OSPF uses a cost value: the speed of the connection).

Incorrect answers:

A: Not only does OSPF maintain a routing table but it also maintains a topology database.

B: OSPF is fact a more robust/complex routing protocol than RIP.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 99-101.

QUESTION NO: 60

What happens when a router on an Ethernet learns of a link-state change?

- A. It floods the change to all other routers in the Internetworks.
- B. Broadcast the link-state change through each of its interfaces.
- C. It multicasts the links-state change to the designated router (DR) and BDR.
- D. It updates its routing table and floods the updated table to all other routers in the Internetworks.

Answer: C.

Explanation: Link-state routing protocols generate routing updates only when there is a change in the topology. When a link changes states, the device that detects the changes creates a link-state advertisement (LSA) concerning the link (route); the LSA is then propagated to the designated router (DR) and the backup designated routers (BDRs).

Note: Flooding process.

1. A router notices a change in a link state and multicasts an LSU packet that includes the updated LSA entry to 224.0.0.6, the “all OSPF DRs” (and BDR) address. .
2. The DR acknowledges the receipt of the change and floods the LSU to others on the network using the OSPF multicast address 224.0.0.5. To make the flooding procedure reliable, each LSA must be acknowledged separately. After receiving the LSU, each router responds to the DR with an LSAck.
3. If a router is connected to another network, it floods the LSU to other networks by forwarding the LSU to the DR of the multi-access network, or adjacent router if in a point-to-point network. The DR, in turn, multicasts the LSU to the other routers in the network.
4. When a router receives the LSU that includes the changed LSU, the router updates its link-state database. It then computes the SPF algorithm with then ew database to generate a new routing table. After a short delay, it switches over to the new routing table.

Incorrect answers:

A: The link update LSA is not send to all routers, only to the DR and the BDRs.

B: The LSAs are sent via a special multicast address, they are not broadcasted.

D: The detecting devices first creates and then sends LSAs to its neighbors before it updates its own topology database.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp. 22-3.
Cisco, Designing Large-Scale IP Internetworks

QUESTION NO: 61

Which are mandatory to configure OSPF?

- A. Router OSPF network address.
- B. Router OSPF area ID, network address wildcard-mask.
- C. Router OSPF process ID, network address wildcard mask area ID.
- D. Router OSPF process ID, interface address wildcard-mask area-ID.

Answer: C.

Explanation: To configure OSPF, you must perform the following steps:

1. Enable OSPF on the router using `router ospf process-id` configuration command.
2. Identify which IP networks on the router is part of the OSPF network using the `network area router` configuration command. The command is: `network address wildcard mask area area id.`

Incorrect answers:

A: This is an incomplete command. The `router ospf` command must identify the process id and network area command must also include the following parameters: `wildcard mask area ID.`

- B:** The router ospf command identifies the process id and not the area id and network area command must also include the following parameters: area ID.
- D:** The proper command identifies the network address and not the interface address.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 125-6.

QUESTION NO: 62

**Given the network/subnet work: 172.22.44.16/30
How many valid host IP addresses are available?**

- A. 2
- B. 4
- C. 16
- D. 30
- E. 122

Answer: A.

Explanation: As there are only four bits left for addresses and two can not be used (due to routing requirements only 2 addresses are available.

In more detail:

The subnet uses 30 bits for the subnetmask and only 2 bits for the hosts. We have the following four bit patters for the hosts:

- 00 – reserved IP address
- 01 – valid host IP address
- 10 – valid host IP address
- 11 – broadcast address, reserved IP address

We can only use 2 out of 4 possible IP addresses for hosts.

Incorrect answers:

B, C, D and E: Due to the parameters provided these answers are mathematically impossible.

Catherine Paquet and Diane Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 578.

QUESTION NO: 63

The 172.20.0.0 had an 8-bit subnet mask extension applied to create all of its subnets. One unused subnet is being used to create several additional subnets in support of a WAN deployment effort. Which subnet mask should be used to support two host addresses on each WAN segment?

- A. 255.255.252.0
- B. 255.255.255.30
- C. 255.255.255.192
- D. 255.255.255.252

Answer: D.

Explanation: When you have a Class B IP address and you want two host addresses then the subnet mask is 255.255.255.252.

Incorrect answers:

- A:** This subnet mask provides for 1022 hosts.
- B:** This is not a valid subnet mask.
- C:** This subnet mask provides for 62 hosts.

Catherine Paquet and Diane Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 578.

QUESTION NO: 64

When a helper address has been configured on a router, which command is used to prevent TACACS UDP port 49 requests from being forwarded by the router?

- A. No IP forward-protocol UDP 49
- B. IP forward-protocol UDP NEQ 49
- C. No IP helper-address UDP TACACS.
- D. Access-list 101 UDFP or deny any EQ TACACS.

Answer: A.

Explanation: The no ip forward-protocol udp {port or port name} command turns off any automatically forwarded ports.

Incorrect answers:

- B:** If NEQ was not in this command the effect would have been to automatically forward these ports.
- C:** There is no “no ip helper-address” command.
- D:** This access list would not have the desired effect.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 87-90.

QUESTION NO: 65

Which two addresses can be summarized by the address 172.30.16.0/20? (Choose two)

- A. 172.30.15.0/24
- B. 172.30.17.0/24
- C. 172.30.31.0/24
- D. 172.30.32.0/24

Answer: B and C.

Explanation: To determine the answer to this question you need to convert the decimal numbers to binary:

172.30.16.0	10101100	00011110	00010000
172.30.15.0	10101100	00011110	00001111
172.30.17.0	10101100	00011110	00010001
172.30.31.0	10101100	00011110	00011111
172.30.32.0	10101100	00011110	00100000

As the summarized route is /20 then the first 20 bits must be the same. This is true of 172.30.16.0, 172.30.17.0, and 172.30.31.0.

Incorrect answers:

- A:** The first 20 bits of this address does not match the first 20 bits of the summarized route.
- D:** The first 20 bits of this address does not match the first 20 bits of the summarized route.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 580-7.

QUESTION NO: 66

In which three instances is it appropriate to use BGP? (Choose three.)

- A. When there are multiple connections to the Internet.
- B. When there is low-bandwidth connection between autonomous systems.
- C. When route selection to routes outside of your autonomous system is not a concern.
- D. When the flow of traffic entering and leaving an autonomous system must be manipulated.
- E. When an autonomous system allows packets to transit through it to reach other autonomous systems.

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Answer: A, D and E.

Explanation: BGP use in an AS is most appropriate when the effects of BGP are well understood and at least one of the following conditions exists:

The AS allows packets to transit through it to reach other ASs (for example an ISP).

The AS has multiple connections to other ASs.

The flow of traffic entering and leaving the AS must be manipulated.

Incorrect answers:

B: When there is a low bandwidth connection between autonomous systems it is inappropriate to use BGP.

C: When route selection to routes outside of your autonomous system is not a concern then a static route would be appropriate and BGP would not be.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 315-7.

QUESTION NO: 67

In which three situations is it NOT appropriate to use BGP? (Choose three)

- A. When there is a single connection to the Internet.
- B. When there is a low bandwidth connection between autonomous systems.
- C. When a route selection to a route outside of your autonomous system is not a concern.
- D. When the flow of traffic entering and leaving an autonomous system must be manipulated.
- E. When an autonomous system allows packets to transit through it reach other autonomous systems.

Answer: A, B and C.

Explanation: BGP is not to be used when one or more of the following conditions apply:

A single connection to the Internet or another AS;

No concern for routing policy and route selection;

Lack of memory or processor power on routers to handle constant BGP updates;

A limited understanding of route filtering and BGP path selection process; and

Low bandwidth between ASs.

In these instances, static routes would be more appropriate.

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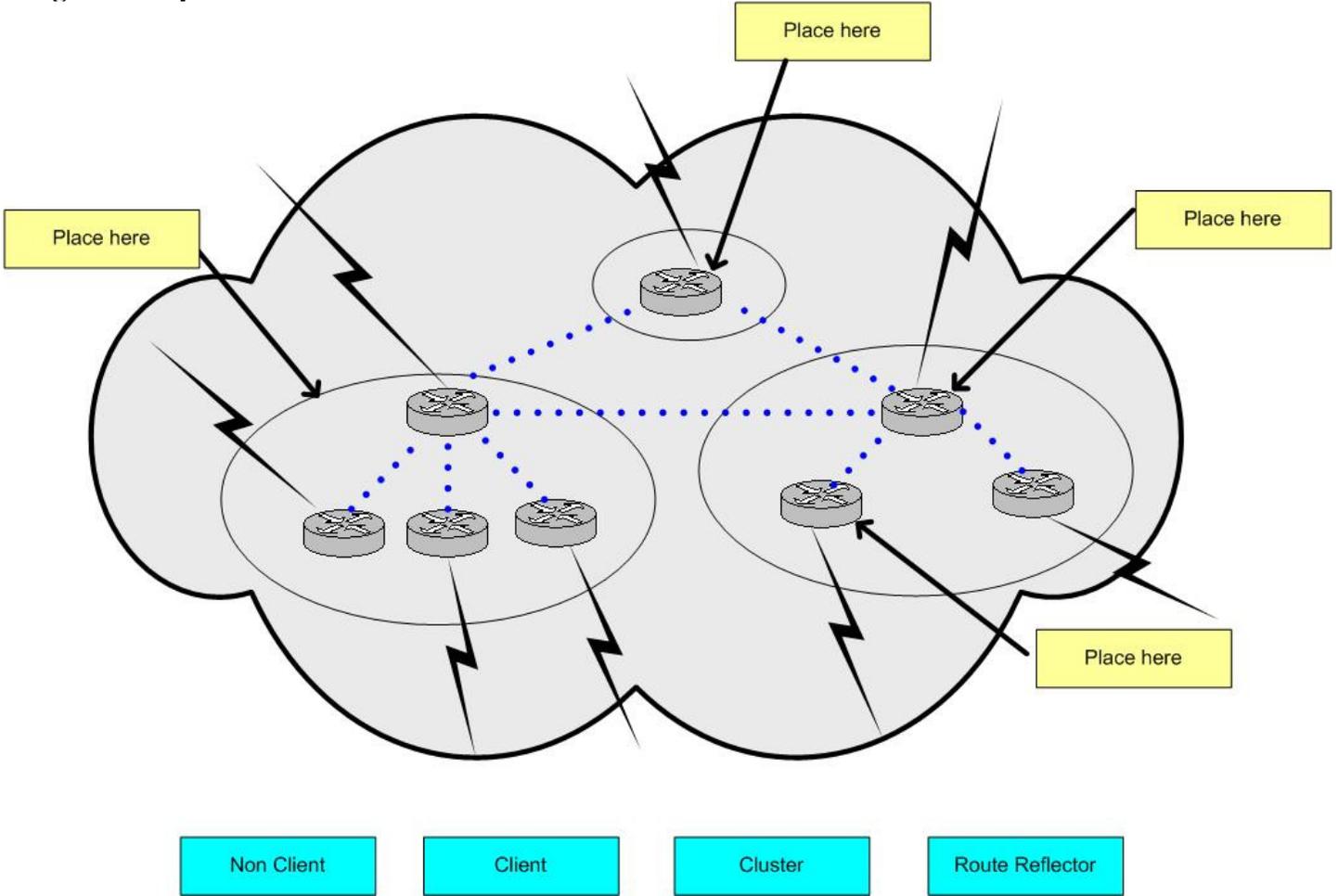
Incorrect answers:

D: This is one of the situations for which BGP is appropriate.

E: This is one of the situations for which BGP is appropriate.

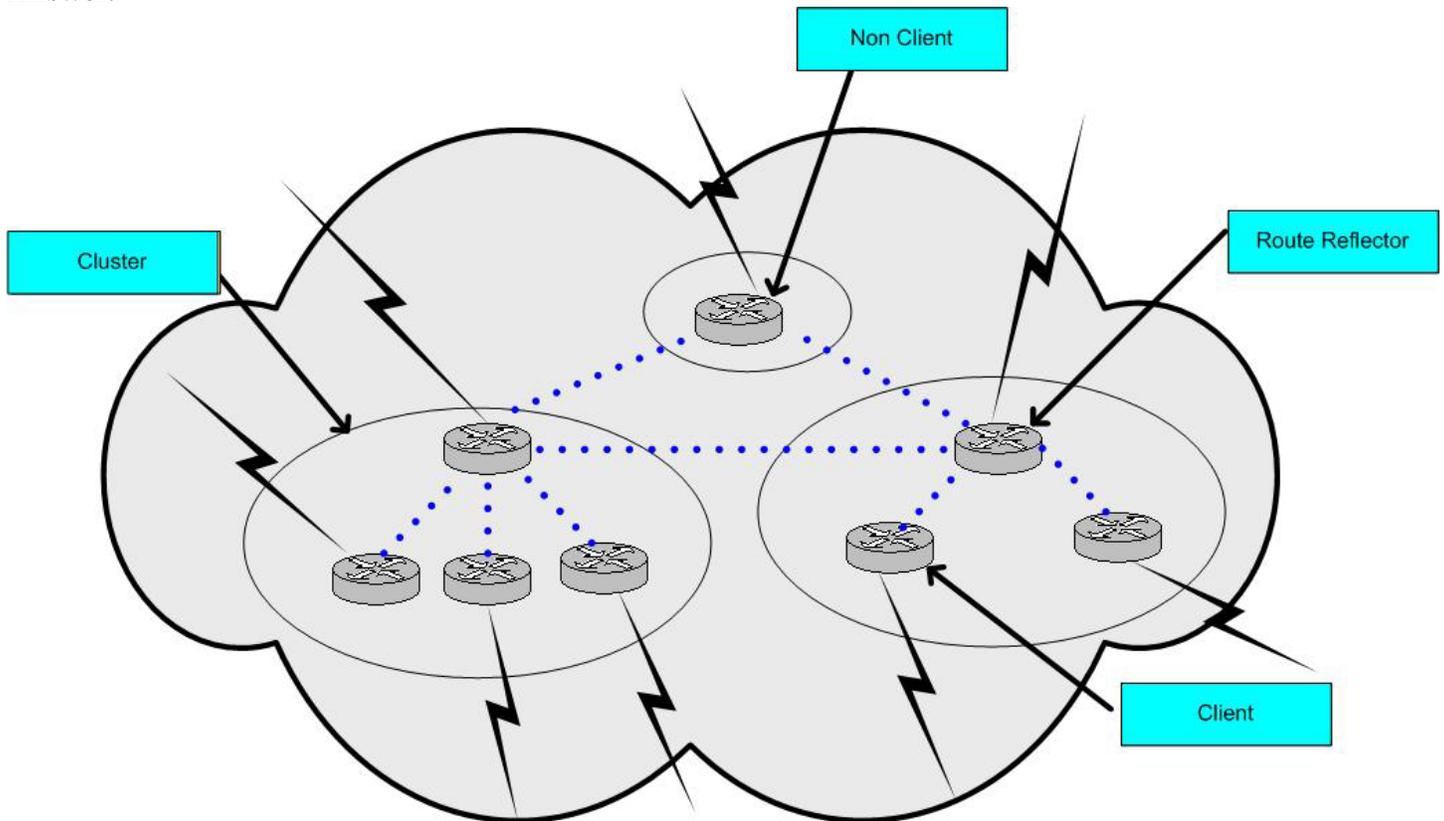
Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp.317-9.

QUESTION NO: 68
Drag and Drop



Place each label in its place

Answer:



Explanation: The combination of the route reflector and its client is called a cluster thus the left most AS is a cluster. The top most AS only has one router and therefore cannot have a route reflection. Finally, the router that advertises the routes is called a route reflector. The route reflector will have a partial IBGP peering with the other routers in the AS, which are called clients.

QUESTION NO: 69

Which two statements about BGP are true? (Choose two)

- A. BGP policy based routing allows policy decisions at the AS level to be enforced.
- B. BGP can only advertise routes that it allows to its peers in its other autonomous systems.
- C. BGP can advertise routes that it does not use to its peers in other autonomous systems.
- D. BGP allows an AS to sent traffic to a neighbouring AS intending that the traffic takes a different route from that taken by traffic originating in the neighbouring AS.

Answers: A and B.

Explanation: BGP allows policy decisions at the AS level to be enforced. This setting of policies or rules for routing is known as policy-based routing. Policy-based routing is the process of defining a route for a packet, which could possibly supersede the routing table. Policy based routing is completed on the interface that the packets are received on. EBGP can only advertise routers that it uses to peers in another AS.

Incorrect answers:

C: BGP specifies that a BGP router can advertise to its peers in neighboring AS only those routes that it itself uses.

D: Some policies cannot be supported by the hop-by-hop paradigm and thus require techniques such as source routing to enforce. For example, BGP does not allow an AS to send traffic to a neighboring AS intending that the traffic take a different route than from the traffic originating in the neighboring AS. You cannot influence how the neighbor AS will route your traffic; but you can influence how your traffic gets to a neighbor AS.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p. 322.

http://www.cisco.com/warp/public/cc/techno/protocol/tech/policy_wp.htm

QUESTION NO: 70

Given the following router A configuration:

Router BGP 6500

Network 10.0.0.0

Neighbor 172.17.1.1 remote-as 65000

What are two effects of above configuration on router A? (Choose two)

- A. Line three identifies a peer router to router A.
- B. The 65000 in line three identifies the AS that router A is in.
- C. The 6500 in line one identifies the AS that router A is in.
- D. Line 2 starts up the routing of BGP packets into network 10.10.0.0.
- E. The line one starts up the routing BGP packets into networks 10.0.0.0.

Answer: A and C.

Explanation: Use the router BGP autonomous-system global configuration command to activate the BGP protocol and identify the local AS (done with the autonomous-system command).

The use of the neighbor 172.17.1.1 remote-as 65000 router configuration command is for the identification of a peer router with which the local router, A in this case, will establish a session.

Incorrect answers:

- B:** The 65000 in line three actually indicates to things: a peer router and as the values are different (6500 and 65000) then BGP will initiate an external session.
- D:** Network 10.0.0.0 is used to permit BGP advertisement of a network if it is present in the IP routing table.
- E:** Line one actually to activate BGP and to identify the local AS (6500).

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp. 341-4.

QUESTION NO: 71

Which table(s) does a router running BGP have?

- A. The IP routing table.
- B. One table that contains BGP information received from and sent to other routers.
- C. One table that contains IP routes and BGP information received from and sent to other routers.
- D. One table that contains BGP information received from and sent to other routers, and another table that contains IP routing information.
- E. One table that contains BGP information receive from and sent to other routers, one table that contains IP routing information, and a third table that contains a mapping between the other two.

Answer: D.

Explanation: A router running BGP keeps its own table for storing BGP information received from and sent to other routers. This table is separate from the IP routing table in the router. The router can be configured to share information between the tables.

Incorrect answers:

- A:** The IP routing table is only one of the table a router running BGP contains. A router running BGP also contains a BGP table.
- B:** The table that contains BGP information received from and send to other routers is only one of the tables a router running BGP contains. The other table is the IP routing table.
- C:** IP routing information and BGP information are kept in separate tables. It is true that this information may be shared but two tables must be maintained.
- E:** A router running BGP only contains two table: IP routing and BGP. A router running BGP does not contain a table that maps the other two tables.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp. 320-1.

QUESTION NO: 72

What are BGP peers also known as?

- A. IBGP.
- B. EBGP.
- C. Clients.
- D. Reflectors.
- E. Neighbors.

Answer: E.

Explanation: Any two routers that have formed a TCP connection to exchange BGP routing information—in other words, that have formed a BGP connection—are called peers or neighbors. BGP peers can either be internal or external to the autonomous system.

Incorrect answers:

- A:** IBGP stands for interior Border Gateway Protocol and this term does not necessarily identify a neighbor.
- B:** EBGP stands for exterior Border Gateway Protocol and this term does not necessarily identify a neighbor.
- C:** A client is a node or software program that requests services from a server.
- D:** A route reflector is a router that is configured to be a router allowed to advertise (or reflect) routes that are learned via IBGP to other IBGP peers.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp. 321 and 384

QUESTION NO: 73

You are configuring bi-directional redistribution between dissimilar routing protocols. There is more than one traffic path connecting the domains.

Which three techniques can be used to prevent routing feedback loops? (Choose Three)

- A. Passive null interface
- B. Route filter
- C. Change administrative distance
- D. Static metric
- E. Default loopback
- F. Default metric

Answer: A, B and F.

Explanation: Depending on how you employ redistribution, routers can send routing information from one AS back into the same AS. There are a number of techniques that can prevent this. These techniques are: passive null interface, route filters and default metric.

Incorrect answers:

- C:** Changing the administrative distance for a protocol so that it is preferred but this will not prevent a feedback loop.
- D:** There is no such thing as static metric in regards to redistribution.
- E:** A default loopback could not prevent feedback loop.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 455-467.

QUESTION NO: 74

Which two statements are true about a router running BGP with all the default settings? (Choose two)

- A. It will not run an IGP.
- B. It will always use a route learned by IBGP.
- C. It will not use a route learned by IBGP unless that route is learned by IGP.
- D. It will not advertise a route learned by IBGP to an external neighbour unless that route is learned from an IGP.
- E. It will always advertise a route learned by IBGP to an external neighbour once connectivity to external neighbour has been established.

Answer: C and D.

Explanation: The BGP synchronization rule states that a BGP router should not use or advertise to an external neighbor a route learned by IBGP, unless the route is local or it is learned from the IGP. If your autonomous system is passing information from one AS to another AS, BGP should not advertise a route before all routers in your AS have learned about the route via IGP.

Incorrect answers:

- A:** A router running BGP can also run IGP. BGP would be used to communicate to other autonomous systems and IGP would be used to communicate within the AS.
- B:** A router running BGP will not use a route learned from IBGP unless it was learned from IGP.
- E:** In order for a router running BGP to advertise an IBGP route to its external neighbors the route would need to be learned by IGP. Even if connectivity were established with the external neighbor a IBGP that wasn't learned by IGP would not be advertised.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 333-4.

QUESTION NO: 75

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Which two statements about routers running IBGP are true? (Choose two)

- A. They are usually directly connected.
- B. They are not usually directly connected.
- C. They need to be able to reach each other.
- D. They do not need to be able to reach other.

Answer: B and C.

Explanation: When BGP is running between routers within an AS, this is called internal BGP (IBGP). IBGP is run within an AS to exchange BGP information within the AS so that it can be passed to another autonomous system. Routers running IBGP do not have to be directly connect to each other, as long as they can reach each other (for example, when an IGP is running within the AS).

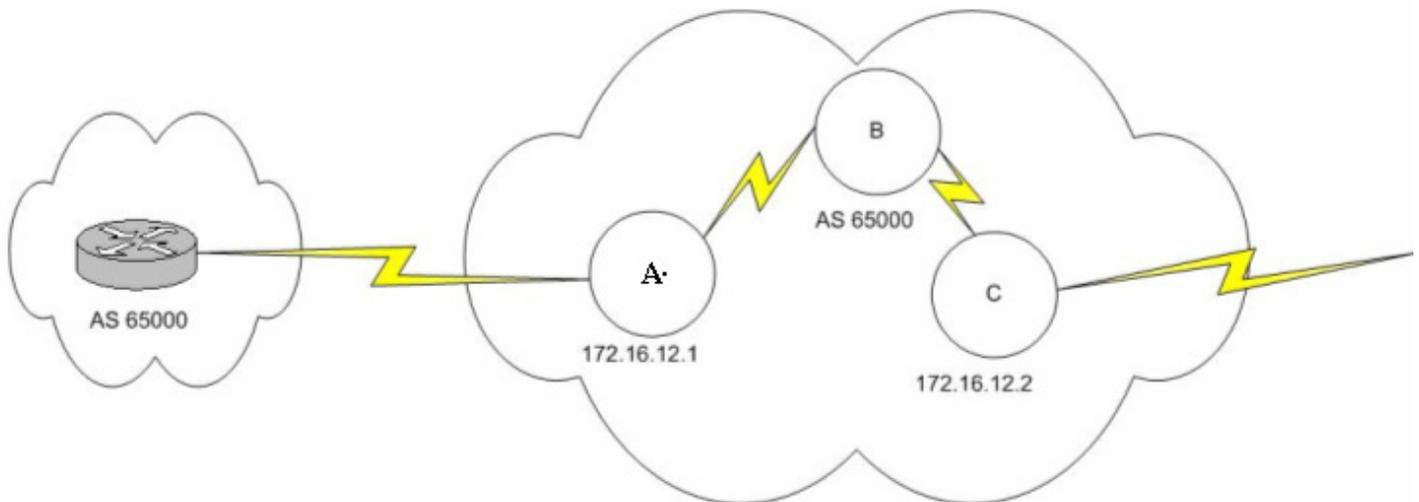
Incorrect answers:

A: IBGP are not necessarily directly connected.

D: IBGP to function the routers must be able to reach each other.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 320-1.

QUESTION NO: 76



You want to configure router B as a BGP route reflector and router A as its client. Which three commands are necessary on router B? (Choose three)

- A. Router BGP 65000.
- B. Neighbour 172.16.12.1 as 65000.

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- C. Route-reflector client 172.16.12.1.
- D. Neighbour 172.16.12.1 remote-as 65000.
- E. Neighbour 172.16.12.2 remote-as 65000.
- F. Neighbour 172.16.12.1 route-reflector-client.
- G. Neighbour 172.16.12.2 route-reflector-client.

Answer: A, D and F.

Explanation: Route reflectors modify the BGP split horizon rule by allowing the router configured as the route reflector to propagate routes learned by IBGP to other IBGP peers. The end result is a saving of BGP TCP sessions that must be maintained and also reduces the BGP routing traffic. To establish a route reflector three commands are required:

Router BGP 65000 – this global configuration command is used to activate the BGP protocol and identify the local autonomous system (65000).

Neighbour 172.16.12.1 remote-as 65000 – this router configuration command is used to identify the a peer router (172.16.12.1) with which the local router will establish a session with.

Neighbour 172.16.12.1 route-reflector-client – this router configuration command is used to configure the router as a BGP router reflector and to configure the specified neighbor (172.16.12.1) as its client.

Incorrect answers:

B: As the line is missing the “remote-” command before the “as” command.

C: Route-reflector client 172.16.12.1 is not a valid command to identify the router reflector common. The proper command is illustrated above.

E: Neighbour 172.16.12.2 remote-as 65000 would have been a valid command if you wanted to identify router C as the router you wanted to establish a session with. The question wanted you to establish communication with router B.

G: Neighbour 172.16.12.2 route-reflector-client would have been a valid command if the client was to be router C.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 340-3 and 388-9.

QUESTION NO: 77

Given the following partial information from the output of a BGP command on a router A?

Network	Next HOP	Metric	Locprf	Weight	Patch		
172.20.0.0	10.10.10.2			100	65250	65000	I

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	10.10.20.2	0		120	65200	65000	I
	10.10.30.2	0		130	65000	I	
	10.10.40.2	0		140	65000	I	
	10.10.50.2	0		150	65300	65000	I

Which next-hop address will router A use when it sends data to network 172.20.0.0?

- A. 10.10.10.2
- B. 10.10.20.2
- C. 10.10.30.2
- D. 10.10.40.2
- E. 10.10.50.2
- F. There is not enough information available to determine the answer.

Answer: E.

Explanation: The weight attribute is a Cisco-defined attribute used for the path selection process. The weight is configured locally to a router, on a per-peer basis. The weight attribute provides local routing policy only and is not propagated to any BGP neighbors.

The weight can have a value of 0 to 65535. Paths that the router originates have a weight of 32768 by default, and other paths have a weight of 0 by default. Routers with a higher weight are preferred when multiple routes exist to the same destination.

Incorrect answers:

- A:** This route will be the least preferred route as it has the lowest weight value.
- B:** This route will be the second least preferred route as it has the second lowest weight value.
- C:** This route will be the third least preferred route as it has the third lowest weight value.
- D:** This route is the second preferred route as it has the second highest weight value.
- F:** In this case route selection will be done based on the weight attribute.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp. 331-2.

QUESTION NO: 78

An autonomous system is connected via BGP to more than one ISP. The ISPs sends only default routes into the autonomous system. What path will non-BGP routers in the autonomous system use as the best path to any external address?

- A. The shortest AS path.
- B. The path with lowest weight.

- C. The path with the lowest IGP metric to the default.
- D. The path leading to the router with the lowest BGP router ID.

Answer: C.

Explanation: There are three ways that connections to multiple ISP can be configured: all ISPs only send default routes to the AS, all ISPs pass default routes and selected specific routes to the AS and all ISPs pass all routes to the AS. In the question above the ISP is only sending the default routes. This situation requires the minimum amount of resources (memory and CPU usage) within the routers in the AS because only default routes will have to be processed. The AS will send all its routes to the ISPs, which will process them and pass them onto other ASs, as required.

The ISP that a specific router within an AS uses to reach any external address will be decided by the IGP metric used to reach the default route within the AS. Specifically the path with the lowest IGP metric to the default will be used.

Incorrect answers:

- A:** The shortest AS path is only selected when all ISPs pass default routes and selected specific routes to the AS.
- B:** In the case where all ISPs pass all routes to the AS the path selection will usually be the shortest AS path but this can be changed. Routers in the AS could be configured to influence the path selection. One of the ways the path selection could be influenced is the weight of a neighbor connection could be changed.
- D:** In the case where all ISPs pass all routes to the AS the path selection will usually be the shortest AS path but this can be changed. Routers in the AS could be configured to influence the path selection. One of the ways the path selection could be influenced is the local preference of a certain route could be changed

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 398-403.

QUESTION NO: 79

Which two events take place when a full mesh of BGP session is configured in an autonomous system? (Choose two)

- A. The configuration is not permitted by default.
- B. The configuration may be permitted if route reflectors are used.
- C. This may result in many BGP sessions being created.
- D. This may result in many switched virtual circuits (SVCs) being created.
- E. This may result in many permanent virtual circuits (PVCs) being created.
- F. This may result in significant amount of bandwidth on slow WAN links.

Answer: C and F.

Explanation: A full governing IBGP behavior is BGP split horizon rule. Simply put this means that routes learned from IBGP can never be sent to IBGP peers. This split horizon rule is necessary to prevent loops within the autonomous system. As a result, a full mesh of IBGP peers is required within an AS. The more routers there are in an AS, the more BGP session will be required. To determine how many session will be required one can use the formula: $n(n-1)/2$. (n = the number of routers) In addition to this problem with required session they may also be a problem with routing traffic due to the amount of replication required. For example, if the physical topology of a large AS includes some WAN links, the IBGP sessions running over the links may consume a large amount of bandwidth.

Incorrect answers:

A: A full mesh topology is not only permitted but is required for IBGP peers.

B: If route reflectors are used then a full mesh of IBGP neighbors is no longer required. The reason that a full mesh is no longer required is that route reflectors can advertise routes learned by IBGP to other IBGP peers.

D: SVCs are most commonly used with a partially meshed network.

E: PVCs are most commonly used with a partially meshed network.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 381-4.

QUESTION NO: 80

An autonomous system is connected via BGP to more than one ISP. What is the results when the ISPs send only default routes to the autonomous system?

- A. Low memory but high CPU usage.
- B. High memory but low CPU usage.
- C. Low memory and low CPU usage.
- D. High memory and high CPU usage.

Answer: C.

Explanation: As only default routes are being sent to the AS, the minimum amount of resources (memory and CPU) within the routers in the AS are required because only default routes will have to be processed.

Incorrect answers:

A: As only the default routes are being processed there would not be a high usage of the CPU.

B: As only the default routes are being processed there would not be a high usage of memory.

D: If the ISP was sending all routes to the AS then there would be high memory and high CPU usage.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 398-402.

QUESTION NO: 81

Which method of sending route information into the BGP routing protocol is NOT recommended?

- A. Using the null zero interface.
- B. Using the network command.
- C. Redistributed static routes in to BGP.
- D. Redistributing dynamic routes into the BGP.
- E. Using the redistribute BGP command.
- F. Changing the administrative distance of the route.

Answer: D.

Explanation: Route information is sent into an AS into BGP in one of the following ways:

Using the network command. This command allows BGP to advertise a network already in the IP table. The list of network commands must include all the networks in the AS that you want to advertise.

Redistributing static routes to null 0 into BGP. Redistribution occurs when a router running different protocols advertises routing information received between the protocols. Static routes in this case are considered to be a protocol, and static information us advertised to BGP.

Redistributing dynamic IGP routes into BGP. This solution is not recommended because it may cause instability. The instability is possible as any time an IGP route changes, goes down for example, a BGP update could result.

Incorrect answers:

A: The question was asking for methods that are not recommended to send routes into BGP. Using the null 0 interface is a recommended way.

B: The question was asking for methods that are not recommended to send routes into BGP. Using the network command is a recommended way of sending route information into BGP.

C: The question was asking for methods that are not recommended to send routes into BGP. Redistribution of static routes configured to the null 0 interface into BGP is done to advertise aggregate route rather than specific routes from the IP table.

E: The question was asking for methods that are not recommended to send routes into BGP.

F: The question was asking for methods that are not recommended to send routes into BGP.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 407-410.

QUESTION NO: 82

IP RIP routing is configured on a router but not on interfaces attached to RIP networks. What should you use to prevent all RIP routing updates from being sent through selected interfaces without using access list?

- A. Static routes.
- B. Default routes.
- C. Passive interface.
- D. Route update filtering.

Answer C.

Explanation: The passive interface command can be used in conjunction with redistribution. It prevents all routing updates for a given routing protocol from being sent into a network, but it does not prevent the specified interface from receiving updates.

Incorrect answers:

A: A static route is a route that explicitly configured and entered into a routing table.

B: Default routes are routing table entries that are used to direct when a next hop is not explicitly listed in a routing table

D: Filtering will not achieve the desired result.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 462-3.

QUESTION NO: 83

You have configured a policy-based routing on a router running Cisco IOS release 11.2 or later. By default, in which switching mode will the router forward packets that match the establish policy?

- A. Fast.
- B. Slow.
- C. Process.
- D. Packets will be routed, but not switched.

Answer: C.

Explanation: Since Cisco IOS 11.2, IP policy routing can now be fast-switched. Prior to this feature, policy routing could only be process-switched. Policy routing must be configured before you configure fast-switched policy routing.

Incorrect answers:

A: The IP route-cache policy command must be used to have fast-switched routing. Without this command they will be processed switched.

B: Policy based routing is either fast or process switched.

D: The policy will be switched.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 493.

QUESTION NO: 84

You have configured policy based routing on serial interface 0. Given the configuration:

Interface serial 0

IP policy route-map demo

Route-map demo permit 10

Match IP address 4

Set interface serial 12 serial 13

Access list 4 permit 10.3.3.2 0.0.0.0

Which statement about a package arriving on serial 0 is most correct?

- A. If the packet was sourced from 10.3.3.2 is a candidate for fast switch policy routing.
- B. If the packet was sourced from 10.3.3.2 it will be routed out interface serial 2 and interface serial 3 in a load sharing fashion.
- C. If the packet were detonate for 10.3.3.2 it will be routed out serial interface serial 2 and interface serial 3 in a load sharing fashion.
- D. In the packet were sourced from 10.3.3.2 it will be routed out interface serial two. If interface serial two is not up the packet will be routed out interface serial three.

Answer: D.

Explanation: The key to this question is the command "Set interface serial 12 serial 13". This command provides a list of interfaces through which the packets can be routed. If more than one interface is provided, the first interface that is found to be up will be used for forwarding the packets.

Incorrect answers:

A: For their to be fasts switched routing the ip route-cache policy command must be used.

B: As two interfaces where identified in the set interface command, if a packet were sourced from the correct address then the packet would go out the first up interface and it would not be load shared.

C: As the was a standard access list it identified the match criteria for the source address and not the destination address.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 488-494.

QUESTION NO: 85

Which three statements about BGP peer groups are true? (Choose three)

- A. The peer group name is only local to the router on which it is configured
- B. A peer group is a more efficient way to update BGP than configuring individual neighbors (outgoing updates are filtered only once per peer group, then replicated to each peer group member)
- C. A peer group is a group of BGP neighbors with the same update policies
- D. A peer group allows options that affect outbound updates to be overridden
- E. The peer group name is passed to other routers in the peer group

Answer: A, B and C.

Explanation: A BGP peer group is a group of BGP neighbors of the router being configured that all have the same update policies. Instead of separately defining the same policies for each neighbor, a peer group can be defined with these policies assigned to the group. The peer group name is only local to the router it is configured on, it is not passed to the other router.

Incorrect answers:

D: Members of the peer group inherit all the configuration options of the peer group. The router can also be configured to override these options for some members of the peer group if the options do not affect outbound updates.

E: The peer group name is only local to the router it s configured on, it is not passed to the other router.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 340-1.

QUESTION NO: 86

You are configuring redistribution between dissimilar routing protocols. There is more than one traffic path connecting the domains. Which two statements are true? (Choose two)

- A. This approach can confuse the router in the network and should be avoided.
- B. A combination of route filters and default routes could control the effects of feed back loops.
- C. By directional distributions were both protocols provide, alternate routes for opposite paths could be configured.

- D. Changing the default administrative distance and establishing large default metrics can establish large path through the Internetwork.

Answer: B and D.

Explanation: If you must allow two-way redistribution, enable some mechanism to reduce routing loops. The mechanism could include default routes, route filters, and modification of the metrics advertised. When using route redistribution, you may want to modify the administrative distance so that one path is preferred.

Incorrect answers:

- A: As long as a controlling mechanism is used then the router should not be confused.
- C: This would not assist in this situation.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 465-471.

QUESTION NO: 87

You are configuring redistribution to advertise RIP routes into EIGRP on a boundary router. You specify a speed metric with the default-metric command.

What is the format of the Metric being specified?

- A. Hop-count.
- B. Bandwidth delay hop-count load.
- C. Load delay hop-count reliability mtu.
- D. Bandwidth delay reliability loading mtu.

Answer: D.

Explanation: When redistributing into IGRP or EIGRP the following command is used:

Default-metric {bandwidth delay reliability loading mtu}

Where

Bandwidth is the minimum bandwidth available of the route, in kilobits per second.

Delay is the delay of the route, in tens of microseconds.

Reliability is the likelihood of successful packet transmission expressed in a number from 0 to 255, where 255 means that the route is 100 percent reliable.

Loading is the effective loading of the route expressed in a number from 2 to 255, where 255 means the route is 100 percent loaded.

MTU stands for Maximum Transmission Unit. The maximum packet size along the route in bytes; an integer greater than or equal to 1.

Incorrect answers:

A, B and C: Are not proper format for this type of seed metric.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 460-1.

QUESTION NO: 88

Which statement about route filtering is true?

- A. Only outbound routes can be filtered.
- B. Routes to be filtered are selected using standard-access list.
- C. Routes to be filtered are selected using only extended access list.
- D. Routes to be filtered or selected using the distribute-list command.

Answer: D.

Explanation: The Cisco IOS software can filter incoming and outgoing routing updates by using access list. This is done with either the distribute-list in command or the distribute-list out command.

Incorrect answers:

A: Incoming and outgoing updates can be filtered.

B, C: As both standard access list and extended access list can be used.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 472-5.

How to Block One or More Networks From a BGP Peer, <http://www.cisco.com/warp/public/459/22.html>

QUESTION NO: 89

You have configured redistribution between RIP and OSPF on your network and want to verify that redistribution is operating correctly. Which command can provide the information necessary to verify proper operation?

- A. Ping.
- B. Show IP route.
- C. Show CDP neighbour.
- D. Show IP OSPF neighbour.

Answer: B.

Explanation: The show IP route command displays the routes known to the router and how they were learned. This is one of the best ways to determine connectivity between the local router and the rest of the Internetwork.

Incorrect answers:

- A:** The ping command to check host reachability and network connectivity. You can use the extended mode of the ping command to specify the supported header options by entering the command without any arguments. (p.495)
- C:** The show CDP neighbors to display a summary of CDP information received from neighbors. (p.695)
- D:** Only displays OSPF neighboring information on a perinterface basis.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 139, 495, 678 and 695.

QUESTION NO: 90

Route distribution is required for two routing domains with dissimilar metric structures to have complete topology awareness. Which two statements about route distribution are true? (Choose two)

- A. It is a requirement of redistribution that route summarization occur at class A, B and C network boundaries.
- B. In good network design, the routing domains only interconnect at the routers where the distribution is configured.
- C. Routes from one domain are assigned a speed metric to indicate their reachability prior to being injected into other domain.
- D. If sufficient bandwidth is available to handle the routing updates associated with both protocols running concurrently, route redistribution may not have to be configured.

Answer: B and C.

Explanation: Do not run two different protocols in the same Internetwork. Instead, have distinct boundaries between networks that use different protocols. In it crucial that the networks only connect at routers on which redistribution is configured.

Redistributed routes are not physically connected to a router; they are learned from other protocols. If a boundary router want to redistribute information between information between routing protocols, it must be capable of translating the metric of the received route from the source routing protocol into the other routing protocol (cost metric). Cost metric, referred to as the seed or default metric, is defined during configuration.

Incorrect answers:

- A:** Redistribution is not implemented at the boundaries between the different classes of networks. For redistribution to function properly there is no requirement for route summarization to occur between different network types.
- D:** Bandwidth is not the reason redistribution is configured. Redistribution is configured to ensure compatibility. Without redistribution dissimilar protocols would not know how to communicate properly.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 457-472.

QUESTION NO: 91

Which statement most accurately describes the difference between the classful and classless routing protocols?

- A. Classless routing protocols send event-trigger updates and classful routing protocols send routine, periodic router advertisement.
- B. Classful routing protocols use simple metrics, while classless routing protocols use more complex metrics in their best path selection process.
- C. Classful routing protocols do not carry the subnet mask within routing updates. Classless routing protocols use the subnet mask for each network in their routing updates.
- D. Classless routing protocols require route summarization to occur at class A, B and C network boundaries. Classful routing protocols allow route summarization to occur at any point within the network.

Answer: C.

Explanation: One of the most serious limitations in a classful network environment is that the subnet mask is not exchange during the routing update process. This approach requires the same mask to be used on all subnetworks of a major network. The classless approach advertises the subnet mask for each route, so a more precise (sophisticated) lookup can be performed in the routing table.

Incorrect answers:

- A:** Distance vector protocols send routine routing updates and link state routing protocols send trigger updates.
- B:** The difference between classful and classless is not the metrics of their protocols rather it is the ability of the protocols to carry subnet masks with their updates.

D: Classful protocols must perform summarization at the major network boundaries and classless can summarize at any point.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 15-23.

QUESTION NO: 92

A route map can be used to control and modify routing information. Which two statements about map routes are true? (Choose two)

- A. Route maps can be defined either by name or by number.
- B. Route maps can use standard or extended access list to define match conditions.
- C. Route maps can change the attributes of a received route, but do not block the advertisement from reaching the routing table.
- D. Once a match condition occurs, and the corresponding set condition has been applied, execution of the route map is terminated.

Answer: B and C.

Explanation: Route maps are complex access list (either extended or a standard access list) that allow some conditions to be tested against a packet or route in question using match command. If the conditions match, some actions can be taken to modify attributes of the packet or route.

Incorrect answers:

- A:** Route maps must be defined by name. They can have a sequence number to identify the order in which route maps are applied.
- D:** The route map is not terminated after it has been executed. A route map continues to function until it has been removed.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 485-495.

QUESTION NO: 93

In a router that can learn the network topology using both RIP and IGRP, which routes will be placed in the routing table and why?

- A. The RIP routes because they have a smaller metric value.
- B. The IGRP routes because they have a larger metric value.
- C. The RIP because they have a large administrative distance.
- D. The IGRP routes because they have smaller administrative distance.

Answer: D.

Explanation: Cisco routers to measure the trustworthiness of the source of the IP routing information use administrative distance. Lower values of administrative distance are preferred over higher values. The administrative distance for IGRP and RIP are 100 and 120 respectively.

Incorrect answers:

A: Metric values are not used to determine which route will be placed in the routing table.

B: Metric values are not used to determine which route will be placed in the routing table.

C: RIP does have the larger administrative distance but this why the RIP route is not used.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 8-9.

QUESTION NO: 94

What are three characteristics of a distance vector routing? (Choose three)

- A. It uses SPF algorithm.
- B. It is utilized by RIP and IGRP.
- C. It sends updates to all routers in an area.
- D. It is a simplest routing protocol to configure.
- E. It sends periodic updates even when no network change has occurred.

Answer: B, D and E.

Explanation: The periodic, routine updates generated by most distance routing vector protocols only go to directly connected routing devices. Examples of distance vector routing protocols are RIP and IGRP. These are the simplest routing protocols to configure.

Incorrect answers:

A: Distance routing vector protocols use the Bellman-Ford routing algorithm and DBF.

C: Distance routing vector protocols routing protocols are in fact only sent to directly connected routers.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 20-1, 768.

QUESTION NO: 95

Which three elements are required for a router to forward packet? (Choose three)

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- A. The best route.
- B. Possible routes.
- C. Destination address.
- D. Summarized routes entry.
- E. Encryption key for routed data.

Answer: A, B and C.

Explanation: The router must know three items in order to route:

The router must determine whether it has the protocol suite active.

The router must know the destination network.

The router must know which outbound interface is the best path to the destination.

For a routing device to make a routing decision, it must first understand the logical destination address. For this to happen, the protocol suite that uses that logical addressing scheme must be enabled and currently active on the router.

After the router can understand the addressing scheme, the second decision is to determine whether the destination logical network is a valid destination within the current routing table.

The final decision that the routing device must make if the destination is in the routing table is to determine through which outbound interface the packet will be forwarded. The routing table will contain only the best path (or paths) to any given destination logical network.

Incorrect answers:

D: A router does not need to know a route summarization entry to forward a packet. If it does have a route summarization entry it can route more efficiently but a route summarization entry is not required.

E: Does not need an encryption key to route traffic.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 6-7.

QUESTION NO: 96

Which field is missing from the RIPv1 routing update for supporting variable-length subnet masks (VLSMs)?

- A. Cost metric.
- B. Subnet mask.
- C. Hop count limit.

- D. Network layer address.

Answer: B.

Explanation: As RIPv1 is a classful routing protocol it does not carry subnet mask information within its routing updates. Subnet mask information is required in order to implement VLSMs.

Incorrect answers:

- A:** RIP updates do include cost metric within its updates but this does not allow for VLSM support.
C: Hop count limits are not usually included within routing updates. Hop counts often are included but this does not allow for VLSM support.
D: Network layer addresses are not required for the support of VLSMs.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 15-25.

QUESTION NO: 97

In a routing entry table, what does the time value represent?

- A. The amount of time that has since the routing table was created.
B. Incrementing counter indicating when the next routing update is expected for this route.
C. The amount of time since a hello packet was received from a neighbor that advertised this route.
D. An incrementing router indicating how long the route has been in the table since the last update.

Answer: D.

Explanation: Routing tables include a great deal of information including how current it is. This field indicates the amount of time the information has been in the routing table since the last update. Depending on the routing protocol in use, route information may be refreshed periodically to ensure that it is current.

Incorrect answers:

- A:** How long the routing table has been in existence is not available in the routing table.
B: The time shown in the routing table is for determining how old the table is and is not for determining when the next update will occur.
C: Not all routing require the tracking of hello packets thus this is not contain within all routing tables.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 7.

QUESTION NO: 98

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Router R1 uses a subnet mask of 255.255.255.0 and sits on the boundary of the area 0 and area 1. Given the following router configuration:

Router OSPF 76

Network 172.12.32.0 0.0.15.255 area 1

Network 172.12.96.0 0.0.15.255 area 0

Area 0 range 172.12.96.0 255.255.224.0

Area 1 range 172.12.32.0 255.255.224.0

Which three statements are true? (Choose three)

- A. An interface on this router with IP address 172.12.32.0124 is in area 1.
- B. An effect of the fourth line is to reduce the number of routes table entry.
- C. All networks within the range of 172.12.64.0 to 172.12.95.0 will be summarized from area 0 into area 1.
- D. All networks within the range of 172.12.32.0 to 172.12.63.0 will be summarized from area 1 to area 0.
- E. An area 0 can act as a stub or transit area for router including networks in the range 172.12.96.0 to 255.255.224.0

Answers: A, B, and D.

Explanation: The router configuration above identifies the following information by line:

Line 1 enable OSPF on the router with a process ID of 76.

Line 2 and Line 3 identifies which IP networks are part of the OSPF.

Line 4 instructs the router to summarize routes for area 0 before they are injected into another area.

Line 5 instructs the router to summarize routes for area 0 before they are injected into another area.

Incorrect answers:

C: Networks of this range would in fact be summarized from area 1 into area 0.

E: For a stub area to be configured the following command would need to be used – area area-id stub [no-summary].

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 188-200.

QUESTION NO: 99

Given the following router configuration:

Router OSPF 76

Network 172.22.23.34 0.0.0.0 area 1

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Network 172.18.0.0 0.0.255.255 area 0

Which three statements are true? (Choose three)

- A. The OSPF router ID is 76.
- B. This is the Destination Router (DR).
- C. This is an Area Border Router (ABR).
- D. This area connects area 1 to backbone.
- E. Any router interface with an address of 172.18.x.x are in area 0.

Answer: C, D, and E.

Explanation: An interface may belong to only one area. If a router has multiple interfaces and if any of those interfaces belong to different areas, the router is considered as an area border router. The networks that follow the network command are connected to each other and Area 0 is always the backbone area. Finally the command network 172.18.0.0 0.0.255.255 area 0 identifies that all interfaces with IP address of 172.18.0.0 area within Area 0.

Incorrect answers:

A: The command router ospf 76 identifies the process ID as 76 and not the router ID.

B: There are a number of factors that will be used to determine a designated router (DR) but none of the information provided above would identify this.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 178-181.

QUESTION NO: 100

Given the router R3 configuration command:

Router OSPF 110

Network 192.168.32.0 0.0.0.255 area 2

Network 192.168.33.0 0.0.0.255 area 0

Area 2 stub no-summary

Area 2 default-cost 10

Which three statements are true? (Choose three)

- A. Area 2 is a totally stubby area.
- B. If the backbone becomes discontinuous, traffic can be routed through area 2.
- C. R3 add 10 to the internal cost when it injects the default route in to the stub area.
- D. Redistribution of other routing protocols takes place at the area designated router.
- E. Area 2 non-ABR routers will contain only intra-area routing information and a default route.

Answer: A, C and E.

Explanation: The keys to the questions are the following two commands: area 2 stub no-summary and area 2 default-cost 10. The command area 2 stub no-summary identifies the area as a totally stub area the is the command no summary. Further, the command area 2 default-cost 10 identifies is how 10 is added to the cost. Now that the area has been identified the area is a totally stubby area a number of points must be remembered. To reduce the number of routes in a routing table, you can create a totally stubby area. A totally stubby area is a stub area that blocks external type 5 LSAs and summary LSAs from going into the area. This way, intra-area routes and the default of 0.0.0.0 are the only routes known to the stub area.

Incorrect answers:

B: Stub areas by their nature cannot be used to route traffic.

D: Stub areas are not generally used for redistribution.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp. 189-195.

QUESTION NO: 101

Which command is used to verify the status of an OSPF virtual link?

- A. Show IP OSPF.
- B. Show IP OSPF database.
- C. Show IP OSPF interface.
- D. Show IP OSPF virtual-link.

Answer: D.

Explanation: The show IP OSPF virtual-link displays parameters about the current state of OSPF virtual links.

Incorrect answers:

- A:** The show IP OSPF command displays OSPF-specific parameters on the router, including the router ID, information about each area to which the router is connected, and the number of times the SPF algorithm has been executed.
- B:** The show IP OSPF database displays the contents of the OSPF topological database maintained by the router. This command also shows the router ID and OSPF process ID. Use additional keywords to view detailed information in each part of the database.
- C:** Displays details of the OSPF protocol on the interfaces, including the area, state, timers, neighbors, neighbors, router ID, and network type.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 204 and 683.

QUESTION NO: 102

Which two statements about OSPF support of VLSM are true? (Choose two)

- A. The use of VLSM enables a truly hierarchical addressing scheme to be developed.
- B. A multiple area design ensures that addresses are allocated in an efficient manner.
- C. Summarization can be performed with different prefix length throughout the network.
- D. OSPF's support for VLSM does not compensate for OSPF's inability to handle discontinuous subnets.

Answer: A and C.

Explanation: OSPF carries subnet mask information and therefore supports multiple subnets for the same major network. Because OSPF supports VLSM, it is possible to develop a true hierarchical addressing scheme. This hierarchical scheme results in very efficient summarization of routes throughout the network through the use of different prefix length.

Incorrect answers:

B: The multiple area design is not what ensures that addresses are allocated in an efficient manner. Addresses are used more efficiently as VLSM is able to subnet already subnetted addresses.

D: OSPF is able to handle discontinuous subnets. VLSM can not use discontinuous subnets if it wants to take advantage of VLSMs.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 71-75.

QUESTION NO: 103

To reset all BGP sessions on a router, which command should you use?

Answer: clear ip bgp *

The clear ip bgp privileged EXEC command is used to remove entries from the BGP table and reset BGP sessions. Use this command after every configuration change to ensure the change is activated and that peers routers are informed. The * keyword to specify that all connections be reset.

Syntax: clear ip bgp {* | neighbor-address | peer-group-name} soft out

Incorrect Answer

The clear ip bgp command does not reset all sessions.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 346-7.

QUESTION NO: 104

What are two possible problems that can occur when a large number of routers operate in a single OSPF area? (Choose two)

- A. Excess LSA traffic.
- B. More reachability errors.
- C. Frequent routing table recalculation.
- D. Frequent adjacencies table recalculation.

Answer: A and C.

Explanation: LSAs (link state advertisements) are OSPF packets containing link state and routing information that is shared among routers in an area. Whenever there is a change in the topology a LSA will be sent. The more the routers in the area the more LSA there will be. If there is a large number of routers within an area an excessive amount of LSAs will result. Based on these LSA routing tables will be recalculated frequently.

Incorrect answers:

B: As the routers are within the same area there will not be more reachability errors.

D: It is not the adjacencies tables that are recalculated rather it is the routing tables.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 184-188.

QUESTION NO: 105

A multi area OSPF network places which restriction on the use of an NBMA topology?

- A. The NBMA portion of the network must be in area 0.
- B. The NBMA portion of the network must NOT be in area 0.
- C. There are no restrictions of NBMA topologies.
- D. All areas that incorporate NBMA topology must be full-mesh, but can not be configured as stub areas.

Answer: D.

Explanation: In order to achieve a broadcast implementation of OSPF on an NBMA network, a full mesh must exist among the routers. This configuration guarantees that all routers have connectivity and will be able to

participate in the DR/BDR election process. Once the DR and BDR have been chosen, the meshed networks act as a broadcast network. All LSA updates are sent to the DR and BDR, and the DR floods the updates out to every interface. As a stub area separates its routers from external router's LSA by their very nature a stub area could not be part of a fully meshed environment.

A: There is no restriction on where the NBMA portion of the network must be configured.

B: There is no restriction on where the NBMA portion of the network must be configured.

C: For NBMA to function in an OSPF environment the routers must have a full meshed configuration and there cannot be a stub area.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 121-5.

QUESTION NO: 106

Which entries are kept in EIGRP routing table?

- A. All learned routers.
- B. Successor routers only.
- C. Feasible successor routes only.
- D. Successor and feasible successor routers.

Answer: B.

Explanation: A successor is a neighboring router used for packet forwarding that has a least-cost path to the destination that is guaranteed not to be part of a routing loop. Multiple successors can exist if they have the same feasible distance. All successors are added to the routing table.

Incorrect answers:

A: With EIGRP all learned routes are not entered into the routing table. EIGRP routing tables only contain successor routes.

C: Feasible successor routes are actually kept in the topology table.

D: Successor route are contain in the routing table but feasible successor route are not.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p. 258.

QUESTION NO: 107

Which two tables does a router running BGP have? (Choose two)

- A. A BGP topology table

- B. An IP routing table
- C. A table that contains BGP information received from and sent to other routers
- D. A table that contains both IP routes and BGP information received from and sent to other routers.

Answer: A and B.

Explanation: A router running BGP keeps its own table for storing BGP information received from and sent to other routers. This table is separate from the IP routing table in the router. The router can be configured to share information between the tables.

Incorrect answers:

- C:** The table that contains BGP information received from and sent to other routers is only one of the tables a router running BGP contains. The other table is the IP routing table.
- D:** IP routing information and BGP information are kept in separate tables. It is true that this information may be shared but two tables must be maintained.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 320-1.

QUESTION NO: 108

In a multi point WAN topology using EIGRP, which guideline is used for configuring bandwidth on a serial interface?

- A. Configure the bandwidth to be the sum of all virtual circuits.
- B. Configure the bandwidth to be equal to the lowest CIR in the topology.
- C. Configure the bandwidth equal to the link capacity divided by the number of virtual circuits.
- D. Configure the bandwidth to be the product of the number of circuits multiplied by the CIR provisioned for each circuit in the topology.

Answer: C.

Explanation: When configuring multipoint interfaces (especially for Frame Relay) remember that all neighbors share the bandwidth equally. That is, EIGRP used bandwidth statement of the physical interface divided by the number of Frame Relay neighbors connected on that physical interface to get the bandwidth attributed to each neighbour. EIGRP configuration should reflect the correct percentage of the actual available bandwidth on the line.

Incorrect answers:

- A:** When configuring EIGRP on multiple circuits, virtual circuits share the available bandwidth of a serial interface.

- B:** When a frame relay multipoint has different CIR values, the interface should be configured for the bandwidth that represents the lowest CIR multiplied by the number of circuits being supported. This configuration will prevent the slowest speed circuit from being overwhelmed.
- D:** When a frame relay multipoint has different CIR values, the interface should be configured for the bandwidth that represents the lowest CIR multiplied by the number of circuits being supported. This configuration will prevent the slowest speed circuit from being overwhelmed.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 270-1.

QUESTION NO: 109

What is the primary benefit provided by EIGRP support of VLSM?

- A. Private addressing.
- B. Secondary addressing.
- C. Discontiguous subnets.
- D. Efficient address allocation.

Answer: D.

Explanation: EIRGP supports both hierarchical and nonhierarchical IP addressing. EIRGP also supports VSLM, thus promoting efficient allocation of IP addresses.

Incorrect answers:

A: Private addressing is not a benefit.

B: Secondary addressing is possible for EIGRP but it is not the primary benefit provided by EIGRP support of VLSM. Secondary addressing can be applied to interfaces to solve particular addressing issues, although all routing overhead traffic will be generated through the primary interface addresses.

C: It is impossible for the combination of VLSM and discontiguous subnets.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 253-4.

QUESTION NO: 110

When a route is said to be stuck in active, which EIGRP condition has occurred?

- A. The feasible successor is not responding to update packets.
- B. The route compilation process is taking longer than usual to complete.
- C. The hold time has expired and a neighbouring router has been marked as inactive.
- D. A neighbouring router has failed to respond to a query about the route within three minutes.

Answer: D.

Explanation: If a router does not receive a reply to all outstanding queries within 3 minutes, the route goes to the stuck in active (SIA) state. The router then resets the neighbors that fail to reply by going active on all routes known through that neighbor, and it readvertises all routes to that neighbor.

Incorrect answers:

- A:** If the primary route fails and the feasible successor route stops responding to update packets, then the route goes into the inactive state.
- B:** The only impact that a longer compilation has is that the convergence time will increase.
- C:** SIA will not be directly affected by this option.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 253, 275.

QUESTION NO: 111

You are configuring EIGRP for NBMA operation. What is the purpose of IP bandwidth-percentage EIGRP command?

- A. It adjusts the percentage of bandwidth that EIGRP packets can use on all of the routers interfaces.
- B. It adjusts the percentage of bandwidths that EIGRP packets can use on an individual router interface.
- C. It over write the bandwidth settings on an interface to ensure that EIGRP packets receive 50% of the available bandwidth on the routers interface.
- D. It limits the percentage of bandwidth that EIGRP packets can use. That percentage can not exceed 50% of configured bandwidth on all the router’s interfaces.

Answer: C.

Explanation: By default, EIGRP will use up to 50 percent of the bandwidth on an interface or subinterface. This percentage can be adjusted on an interface or subinterface with the ip bandwidth-percentage command.

Incorrect answers:

- A:** To adjust the percentage of bandwidth that EIGRP packets can use on all of the routers interfaces the bandwidth command should be used.
- B:** To adjust the percentage of bandwidth that EIGRP packets can use on an individual router interface one can also use the bandwidth command.
- D:** IP bandwidth-percentage command does not limit the percentage of bandwidth that EIGRP packets can se that percentage can’t exceed 50% of the configured bandwidth on all of the routers interface.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 265-270.

QUESTION NO: 112

How does an EIGRP router determine when a neighbour is unavailable?

- A. When the hold time is exceeded.
- B. When the queue value exceeds zero.
- C. When the queue value is constantly at zero.
- D. When the round trip time exceeds 500 milliseconds.

Answer: A.

Explanation: If a packet is not before the expiration of the hold time, then the topology change is detected. The neighbor adjacency is deleted, and all topology table entries learned from the neighbor are removed as if the neighbor had sent an update stating that all routes are unavailable.

B, C: There is no such thing as a queue value in relation to a neighbor being marked as unavailable.

D: Round trip time as nothing to do with a neighbor being marked as unavailable.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 252-3.

QUESTION NO: 113

Which routing protocol supports multiple link network-layer routed protocols?

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

Answer: B.

Explanation: EIGRP was designed to operate in both a LAN and WAN environment. In multi-access topologies neighboring relations are formed and maintained using reliable multicasting.

A, C and D: None of these protocols support multiple link network-layer routed protocols.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 249.

QUESTION NO: 114

You want to configure EIGRP for IP. Which command enables EIGRP and defines the autonomous system?

- A. Router EIGRP autonomous-system-number.
- B. Config EIGRP autonomous-system-number.
- C. Router IP EIGRP autonomous-system-number.
- D. Config IP EIGRP autonomous-system-number.

Answer: A.

Explanation: The router EIGRP {autonomous system-number} command is used to define EIGRP and to define the autonomous system.

Incorrect answers:

- B:** The command is missing router at the beginning and config is not required.
- C:** IP is not required for the router EIGRP command.
- D:** IP is not required for the router EIGRP command and router is required.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 264.

QUESTION NO: 115

How can route summarization be performed in a EIGRP network?

- A. Manually at any interface within the network.
- B. Only at autonomous system boundary routers.
- C. Automatically by the master router in each area.
- D. Route summarization is not required because of EIGRP support of VLSM.

Answer: A.

Explanation: EIGRP has its routes in IGRP and, therefore, summarizes at the network boundary by default but this can be turned off. EIGRP can create summary routes at arbitrary boundaries within the network.

Incorrect answers:

- B:** By default summarization occurs at the network boundary but this can be disabled.

C: The master router has no role in route summarization in an EIGRP network.

D: EIGRP supports VLSM but this does not negate the possibility of route summarization.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 265-8.

QUESTION NO: 116

What are two advantages of using subinterfaces in an NBMA topology? (choose two)

- A. IP addressing space is conserved.
- B. Routing protocols avoid split horizon.
- C. Logical interfaces are more reliable than physical interfaces.
- D. When a sub interfaces states changes to down the physical interface remains up.

Answer: B and D.

Explanation: When configuring routers in an NBMA topology, subinterfaces are typically used. A physical interface can be split into multiple logical interfaces, called subinterfaces, with each subinterface being defined as a point-to-point and point-to-multipoint interface. Subinterfaces originally were created to better handle issues caused by split horizon over NBMA and distance vector-based routing protocol.

If you are running OSPF over subinterfaces, however, and a subinterface goes down, the physical interface remains up, so the router does not reflect that the link has gone down and that a connectivity problem exists.

Incorrect answers:

A: Subinterfaces do not conserve IP addressing space.

C: Logical interfaces add reliability to physical interfaces.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 120-2.

QUESTION NO: 117

OSPF routers can route when they are in which state?

- A. Full state.
- B. Two-way state.
- C. Exchange state.
- D. Forwarding state.

Answer: A.

Explanation: When everything has been satisfied for a given router, the adjacent routers are considered synchronized and in a full state. Routers must be in a full state before they can route traffic. At this point, the routers should all have identical link-state database.

Incorrect answers:

- B:** This state designates that bi-directional communication has been established between two routers. Bi-directional means that each router has seen the other's hello packet. At this state, a router decides whether to become adjacent with this neighbor.
- C:** The second step of OSPF routers discovering routes is when the master and slave routers exchange one of more database description packets. The routers are in the exchange state.
- D:** For OSPF routers there are no forwarding state.

QUESTION NO: 118

When configuring serial 0 for OSPF in a point-to-point mode using sub interfaces. Which is the correct combination of commands?

- A. Interface serial 0.1 point-to-point
Router OSPF process-ID
Network number wildcard-mask area number
- B. Interface serial0
IP OSPF network point-to-point
Router OSPF process-ID
Network number wildcard-mask area number.
- C. interface serial 0.1 point-to-point
Router OSPF process-ID
Network number wild cards-mask area number
Neighbour address
- D. Interface serial router 0.1 point-to-point
Router OSPF process-ID
Neighbour ID

Answer: A.

Explanation: When configuring routers in an NBMA topology, subinterfaces are typically used. A physical interface can be split into multiple logical interfaces, called subinterfaces, with each subinterface being defined as a point-to-point or point-to-multipoint. The commands required to do this are:

```
Interface serial {number.subinterface-number} point-to-point
```

```
Router ospf {process-id}
Network {address wildcard-mask} area {area-id}
```

Incorrect answers:

- B:** In this combination of commands the first command is missing the following information “.1 point-to-point”.
- C:** This series of commands is incorrect as it contains an extra command that is not required (Neighbour address).
- D:** This series of commands third line is incorrect. The command on the third line should be “Network number wildcard-mask area number”.

QUESTION NO: 119

What is the effect of configuring a static route to 172.16.0.0 to the null 0 interface?

- A. It results in all traffic for all subnets of 172.16.0.0 being dropped
- B. It can be used to fool BGP into believing that a route for 172.16.0.0 actually exists
- C. It will have no effect if the router does not have any routes to any of the subnets of 172.16.0.0
- D. It is preferable to configure the aggregate-address command

Answer: B.

Explanation: Any route redistributed into BGP must already be known in the IP table. Using the static route to null 0 is a way of fooling the process into believing that a route actually exists for the aggregate. A static route to null 0 is not necessary if you are using a network command with a non-aggregated network—in other words, a network that exists in the IP table.

Incorrect answers:

- A:** The configuring a static route to 172.16.0.0 to the null 0 interface will not cause subnets to be dropped.
- C:** As stated above even if there are no routes to 172.16.0.0 in the IP table configuring a static route to 172.16.0.0 to the null 0 interface will have an effect.
- D:** The preferred method of advertising a summary route is to use the aggregate-address command. With this command, as long as a more specific route exists in the BGP table the aggregate gets sent. This is not an effect of configuring a static route to 172.16.0.0 to the null 0 interface.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 408.

QUESTION NO: 120

Why is OSPF better than RIPv1 in a large network? (Choose two)

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- A. OSPF requires less memory.
- B. OSPF is a simpler protocol than RIPv.1
- C. OSPF has virtually no reachability limits.
- D. OSPF supports variable-length subnet masks (VLSMs).

Answer: C and D.

Explanation: OSPF is a link state protocol. OSPF was written to address the needs of large, scalable Internetworks that RIP could not. OSPF addresses the following issues: speed of convergence, support of VLSM, network reachability (OSPF has no reachability limitations), use of bandwidth and method for path selection (OSPF uses a cost value: the speed of the connection).

Incorrect answers:

- A:** Due to the fact that OSPF was designed to be used in large networks, routers utilizing OSPF actually requires more memory than those running RIP.
- B:** OSPF is fact a more robust/complex routing protocol than RIP.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 99-101.

QUESTION NO: 121

Which OSPF configuration is correct?

- A.
 - Interface Ethernet 0
 - IP address 10.1.3.2 255.255.255.0
 - !
 - Interface Ethernet 1
 - IP address 10.1.2.2 255.255.255.0
 - !
 - Router ospf
 - Network 10.1.2.2 0.0.0.0 area 0
 - Network 10.2.3.2 0.0.0.0 area 0
- B.
 - Interface Ethernet 0
 - IP address 10.1.3.2 255.255.255.0
 - !
 - Interface Ethernet 1
 - IP address 10.1.2.2 255.255.255.0
 - !
 - Router ospf network 10.1.2.2 0.0.0.0 area 0
 - Router ospf network 10.2.3.2 0.0.0.0 area 0

- C. Interface Ethernet 0
 IP address 10.1.3.2 255.255.255.0
 Router ospf 100
 !
 Interface Ethernet 1
 IP address 10.1.2.2 255.255.255.0
 Router ospf 100
- D. Interface Ethernet 0
 IP address 10.1.3.2 255.255.255.0
 !
 Interface Ethernet 1
 IP address 10.1.2.2 255.255.255.0
 !
 Router ospf 100
 Network 10.1.2.2 0.0.0.0 area 0
 Network 10.2.3.2 0.0.0.0 area 0

Answer: D.

Explanation: When configuring a router with OSPF there are a number of commands that are required. First the interfaces must be configured individually. This is done with the commands:

```
Interface Ethernet {interface number}
IP address {IP address wildcard mask}
```

After this OSPF must be enabled on the router. This is achieved with the following command:

```
Router ospf {process-id}
```

Finally, one must identify the IP networks on the router are part of the OSPF network. For each network, you must identify what area the network belongs to. When configuring multiple OSPF areas, make sure to associate the correct network addresses with the desired area ID. This is achieved with the following command:

```
Network {address wildcard-mask} area {area-id}
```

Incorrect answers:

- A:** The router ospf command is incorrect in this series of commands. The command should have also included the process id.
- B:** This series of commands is totally missing the router ospf command. For router to use OSPF it must be enabled with the router ospf command.
- C:** This series of commands is not only incomplete but the router ospf is misplaced.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 188-9.

QUESTION NO: 122

Once the OSPF routing process is enabled, which command will select only the router's network 10.0.0.0 interfaces to participate in OSPF area 0?

- A. Network 10.0.0.0 0.0.0.0 area 0
- B. Area 0 range 10.0.0.0 255.0.0.0
- C. Network 10.0.0.0 0.255.255.255 area 0
- D. Network 10.0.0.0 255.255.255.255 area 0

Answer: C.

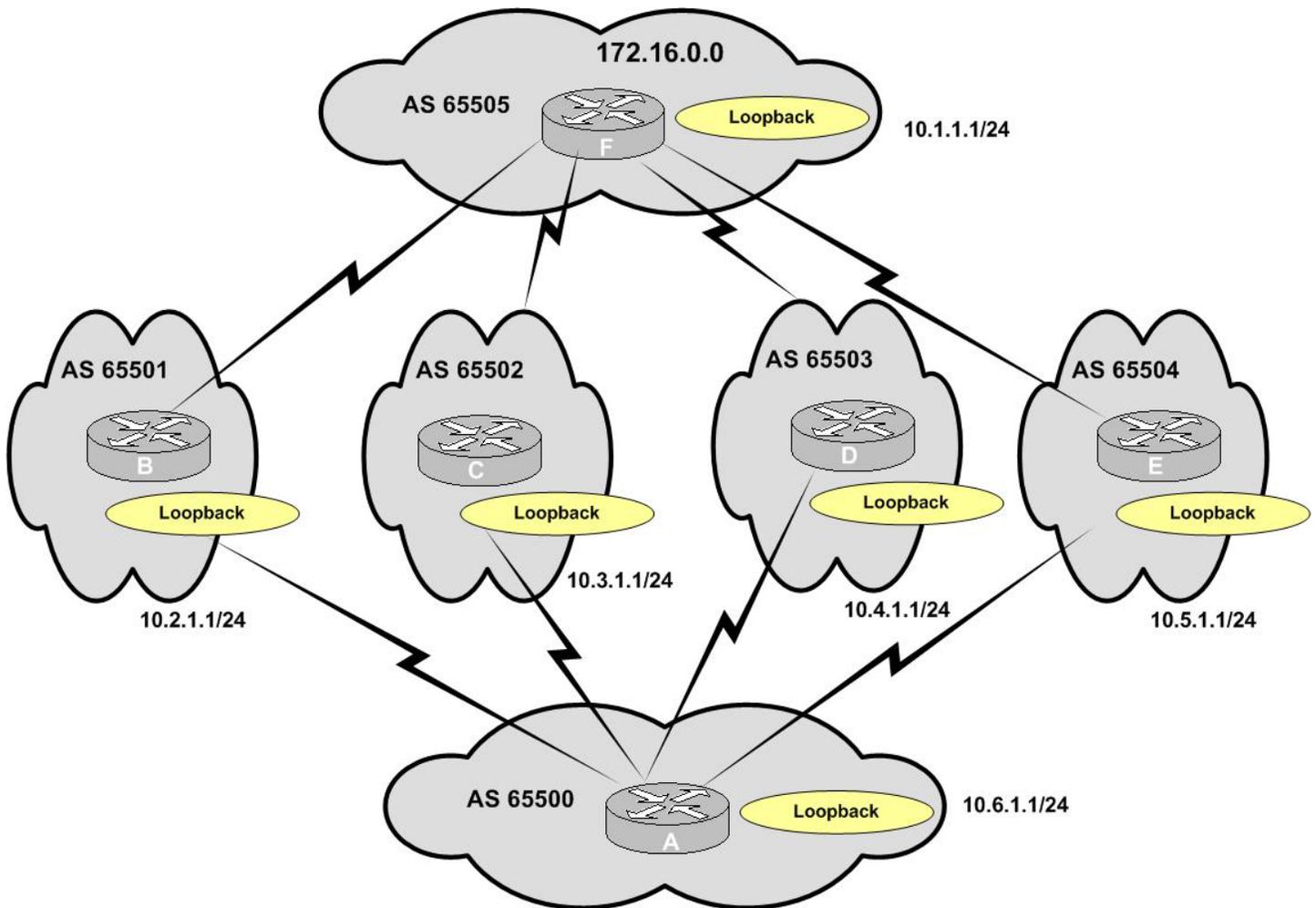
Explanation: Once OSPF has been enabled then the network area command must be used to identify the networks that will participate in the OSPF area. When you want to limit the networks that participate in this one can use the proper wildcard mask. When a 0 appears in the wildcard mask the corresponding number in the ip address must be matched. Therefore the 10 in the IP address must be matched and the other number could be any number—the desired result is achieved.

Incorrect answers:

- A:** This command is incorrect for 2 reasons. First the area id is not provided and with the wildcard mask only the network 10.0.0.0 would be allowed to participate in the area.
- B:** This is not a valid command.
- D:** With a wildcard mask of 255.255.255.255 all networks would be allowed to participate in area 0.

QUESTION NO: 123

Exhibit.



All routers are in their own autonomous system and are running BGP on the connections shown. Each router has one loopback address configured.

If all policies are set to default, which path will router A take in order to get to 172.16.0.0?

- A. Through router C then to router F
- B. Through router E then to router F
- C. It will load balance over all four of the paths, through routers B, C, D and E, and then to router F
- D. Through router B then to router F
- E. Through router D then to router F

Answer: D.

Explanation: There is a process that a Cisco router will follow to select the best route. In this case, the router was selected as they router will prefer the route with the lowest neighbor router ID value.

Incorrect answers:

- A: Router C does not have the lowest router ID value.
- B: Router E does not have the lowest router ID value.
- C: BGP chooses only a single path to reach a specific destination.
- E: Router D does not have the lowest router ID value.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 336-7.

QUESTION NO: 124

What is the primary benefit provided by EIGRP support of VLSM?

- A. Private addressing
- B. Secondary addressing
- C. Discontiguous subnets
- D. Efficient address allocation

Answer: D.

Explanation: EIRGP supports both hierarchical and nonhierarchical IP addressing. EIRGP also supports VSLM, thus promoting efficient allocation of IP addresses.

Incorrect answers:

- A: Private addressing is not a benefit.
- B: Secondary addressing is possible for EIGRP but it is not the primary benefit provided by EIGRP support of VLSM. Secondary addressing can be applied to interfaces to solve particular addressing issues, although all routing overhead traffic will be generated through the primary interface addresses.
- C: It is impossible for the combination of VLSM and discontiguous subnets.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 253-4.

QUESTION NO: 125

Which statement about BGP route reflectors is true?

- A. A cluster is a group of route reflectors
- B. BGP route reflectors must be configured on all routers in the autonomous system at the same time

- C. A route reflector propagates IBGP routes to other IBGP peers
- D. There can be only one reflector within an autonomous system.

Answer: C.

Explanation: Route reflectors modify the BGP split horizon rule by allowing the routers configured as the route reflector to propagate routes learned by IBGP to other IBGP peers.

Incorrect answers:

A: The combination of the route reflector and its client is called a cluster.

B: Route reflectors do not need to be configured at the same time but care must be taken in selecting which router to start with.

D: AS can have multiple route reflectors for redundancy.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), pp 383 – 5.

QUESTION NO: 126

In which three situations is it NOT appropriate to use BGP? (Choose Three)

- A. When there is a single connection to the Internet.
- B. When there is a low bandwidth connection between autonomous systems
- C. When route selection to routers outside of your autonomous system is not a concern
- D. When the flow of traffic entering and leaving an autonomous system must be manipulated
- E. When an autonomous system allows packets to transit through it to reach other autonomous system.

Answer: A, B and C.

Explanation: BGP is not to be used when one or more of the following conditions apply:

A single connection to the Internet or another AS;

No concern for routing policy and route selection;

Lack of memory or processor power on routers to handle constant BGP updates;

A limited understanding of route filtering and BGP path selection process; and

Low bandwidth between ASs.

In these instances, static routes would be more appropriate.

Incorrect answers

D: This is one of the situations for which BGP is appropriate.

E: This is one of the situations for which BGP is appropriate.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp.317-9.

QUESTION NO: 127

How are neighbor relationships formed in an NBMA topology utilizing EIGRP as its routing protocol?

- A. They are automatically formed when a hello packet is received
- B. They are established when the router reaches the two-way state during router startup
- C. They are manually configured with neighbor statements
- D. Neighbor relationships are not established in EIGRP

Answer: A.

Explanation: No matter what the technology, EIGRP routers establish the neighbor relationship as soon as a hello packet is received.

Incorrect answers

B: In OSPF a two state is reached when the routers have exchange their hello packets.

C: The neighbor command is used to configure OSPF routers interconnecting to nonbroadcast networks.

D: Neighbor relationships are established in EIGRP.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 109, 130 and 252-4.

QUESTION NO: 128

Which EIGRP information is added to a routing table?

- A. Feasible successor only
- B. Successor only
- C. All learned networks
- D. Successor and feasible successor

Answer: B.

Explanation: A successor is a neighboring router used for packet forwarding that has a least-cost path to the destination that is guaranteed not to be part of a routing loop. Multiple successors can exist if they have the same feasible distance. All successors are added to the routing table.

Incorrect answers

A: Feasible successor routes are actually kept in the topology table.

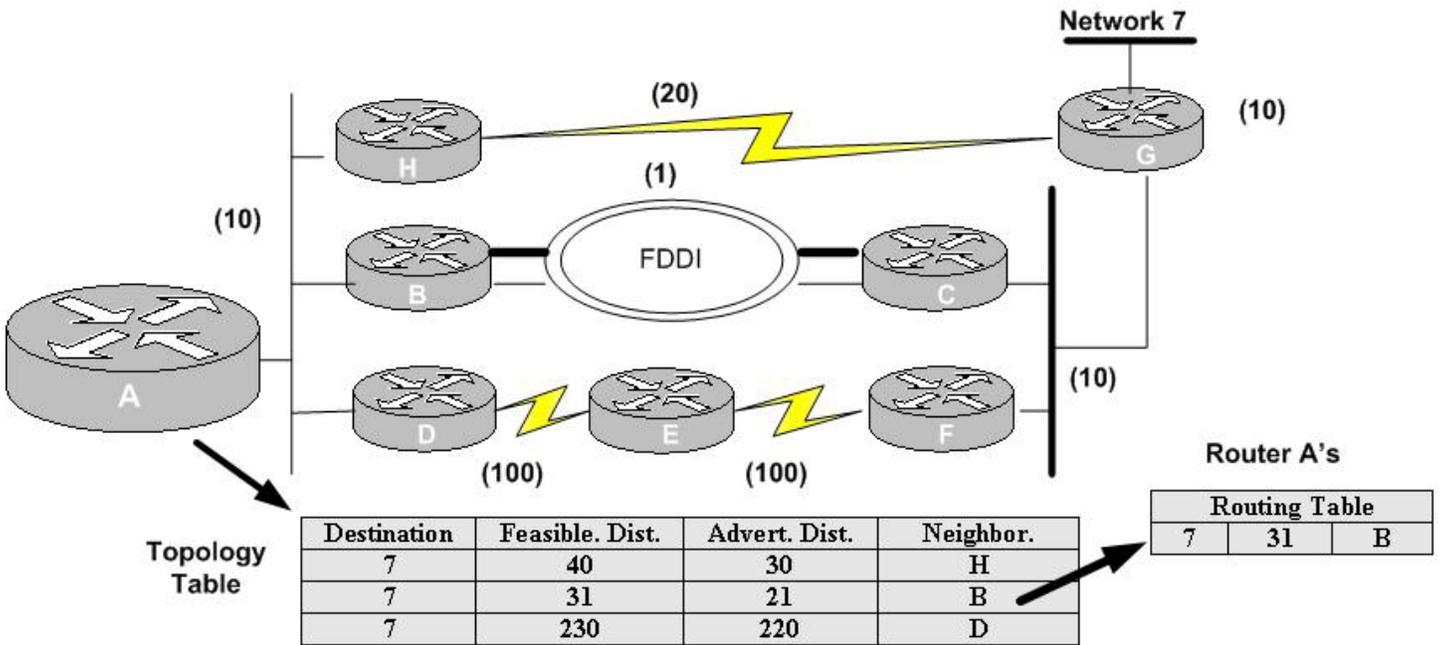
C: With EIGRP all learned routes are not entered into the routing table. EIGRP routing tables only contain successor routes.

D: Successor routes are contained in the routing table but feasible successor routes are not.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p. 258.

QUESTION NO: 129

Exhibit



You are choosing routers with EIGRP route selection. In the exhibit, which router is the successor from router A to network 7?

- A. C
- B. H.
- C. D.
- D. B.
- E. G.

F. F.

Answer: D.

Explanation: A successor is a neighboring router used for packet forwarding that has a least-cost path to the destination that is guaranteed not to be part of a loop. As router B has the lowest feasible distance (FD) of 31, router B is the successor.

Incorrect answers:

A: C is not a neighboring router and therefore cannot be a successor to A.

B: Router H does not have the lowest FD and therefore cannot be a successor to A.

C: Router D has the highest FD and therefore cannot be a successor to A.

E: G is not a neighboring router and therefore cannot be a successor to A.

F: F is not a neighboring router and therefore cannot be a successor to A.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 258-264.

QUESTION NO: 130

Command Line Exhibit.

```

01  show cdp neighbors
02  show cdp neighbors detail
03  show controllers serial
04  show interface
05  show interface serial
06  show ip interface
07  show ip policy
08  show ip prefix-list
09  show ip prefix-list detail
10  show ip prefix-list summary
11  show ip protocols
12  show ip route
13  show path
14  show policy statistics
15  show prefix-list
16  show prefix-list detail
17  show prefix-list summary
18  show route-map
19  show route-reflector
20  show ip policy
21  show ip ospf

```

```

22 show ip ospf area
23 show ip ospf database
24 show ip ospf interface
25 show ip ospf neighbor
26 show ip ospf process-id
27 show ip ospf timers
28 show ospf process-id
29 show eigrp adjacencies
30 show eigrp neighbors
31 show eigrp route
32 show eigrp successors
33 show ip eigrp neighbors1
34 show ip eigrp route
35 show ip route eigrp
36 clear bgp *
37 clear bgp all
38 clear ip bgp *
39 clear ip bgp * soft
40 clear ip bgp sessions *
41 clear ip bgp sessions all
42 show ip bgp
43 show ip bgp attributes
44 show ip bgp neighbors
45 show ip bgp origin
46 show ip bgp route reflector
47 show ip bgp summary

```

Configuration

```

=====
60 Router (config-router)# bgp neighbor address weight weight
61 Router (config)# bgp set neighbor address weight weight
62 Router (config)# interface loopback number
63 Router (config-router)# ip maximum-paths 0
64 Router (config)# ip prefix-list list-name
65 Router (config-router)# ip prefix-list list-name
66 Router (config-if)# ip prefix-list list-name
67 Router (config)# neighbor address prefix-list list-name
68 Router (config-router)# neighbor address prefix-list list-name
69 Router (config-if)# neighbor address prefix-list list-name
70 Router (config-router)# neighbor address weight weight
71 Router (config-router-map)# neighbor address weight weight
72 Router (config)# ip default route
73 Router (config-router)# default route

```

```
74 Router (config-router)# no auto-summary
75 Router (config-router)# no eigrp summary
76 Router (config-router)# no ip summary
77 Router (config)# ospf interface loopback number
78 Router (config) ospf loopback number
79 Router (config)# router loopback number
80 Router (config-route-map)# set ip default next-hop
81 Router (config-route-map)# set interface
82 Router (config-route-map)# set ip precedence
83 Router (config)# set neighbor address weight weight
84 Router (config-router)# set neighbor address weight weight
85 Router (config-route-map)# set ip next-hop address
86 Router (config)# set ip classless
87 Router (config-router)# ip classless
```

Testing

```
=====
88 debug eigrp adjacencies
89 debug eigrp neighbors
90 debug ip bgp origin
91 debug ip bgp summary
92 debug ip policy
93 ping (extended)
94 ping (record option)
95 ping (standard)
```

You want to turn off automatic summarization for EIGRP routes which command does this?

Enter the number that corresponds to the command.

Answer: no-auto summary (number 74)

Explanation: The no-auto summary command turns off EIGRP's automatic summarization.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 266.

QUESTION NO: 131

When does in an EIGRP discover its neighbours?

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- A. When it receives a hello packet from its neighbour.
- B. When it receive a full routing table from its neighbour.
- C. When it receives an acknowledgement for one of the transmitted hello packets.
- D. Due to the reliable nature of EIGRP neighbour relationships are not required.

Answer: A.

Explanation: The router sends hello packets out of the interfaces configured for EIGRP. When a router receives a hello packet from a router belonging to the same autonomous system, it establishes a neighbor relationship (adjacency). Through the Hello protocol, an EIGRP router dynamically discovers other routers directly connected to it.

Incorrect answers:

- B:** For EIGRP to establish an adjacency it only requires to receive a hello packet and note the other routers entire routing table.
- C:** When a router receives an ACK it is only used to indicate that an update, query or reply has been received.
- D:** EIGRP requires neighbor relationships to function properly.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 2851-3.

QUESTION NO: 132

Why is EIGRP support of VLSM possible?

- A. The subnet mask is carried with the route advertisement.
- B. EIGRP supports hierarchical designs.
- C. Efficient address allocation requires flexibility to satisfy different host populations on each subnet.
- D. Point-to-point WAN links only require two host addresses.

Answer: A

Explanation: EIGRP carries subnet mask information thus providing EIRGP with the ability to support VLSMs (Variable Length Subnet Masks). As EIGRP can support VLSM, EIGRP can have a truly hierarchical structure. Providing a different subnet mask to each subnet accomplishes VLSM. The result is each subnet has a different number of host spaces available.

Incorrect answers:

- B:** EIGRP supports hierarchical designs but this is not why VLSM is possible.
- C:** Through VLSM efficient address allocation is possible. This is important as flexibility is required to satisfy different host populations on each subnet.

D: This is not relevant to why EIGRP supports VLSM.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 249-50, 279.

QUESTION NO: 133

Which technique most effectively limits the EIGRP query range (also known as query scooping)?

- A. Establishing separate autonomous systems.
- B. A hierarchical scheme.
- C. Route filters.
- D. Automatic or manually created route summarization points.

Answer: D.

Explanation: The best solution to control queries is to reduce their reachability in the Internetwork. This is achieved by summarization.

Incorrect answers:

- A:** By establishing separate ASs when the original query reaches the boundary of the AS it will be answered. Then a new query will be initiated in the other AS by the edge router. However, the query process has not been stopped because the query continues in the other AS, where the route can go potentially SIA.
- B:** This approach on move the possible problem to another area of the Internetwork.
- C:** Route filters are examples of a mechanism used to limit what information is provided to other routers but it is not the most effective way to limit the EIGRP query range.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 275-6.

QUESTION NO: 134

Which statement about distance vector protocols is true?

- A. An adjacency is established with each directly connected neighbor
- B. The periodic routing update interval ranges from one to five seconds
- C. They detect when a neighbor is unavailable because the neighbor does not respond to the watchdog packet
- D. Each router creates a routing table that includes its directly connected networks and sends the routing table to its directly connected neighbors

Answer: D.

Explanation: Distance vector routing protocols communicate their routing table with their directly connected neighbors. Distance vector routing protocols track their neighbors in their routing table.

Incorrect answers:

A: EIGRP (an advanced distance vector routing protocol) establishes adjacency with its neighbor but distance vector routing protocols do not.

B: By default the routing update intervals are 30 seconds for RIP and 90 seconds for IGRP.

C: Distance vector routing protocols determine that their neighbors are unavailable when 3 consecutive keepalive messages are missed or when 3 consecutive hello messages are missed.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 20-29.

QUESTION NO: 135

Which two statements about RIPv1 networks are true? (Choose two)

- A. RIPv1 networks are referred to as classful networks
- B. RIPv1 route updates have a subnet mask field
- C. RIPv1 networks are referred to as classless networks
- D. RIPv1 route updates do not have a subnet mask field

Answer: A and D.

Explanation: RIPv1 is a classful routing protocol and as such its updates do not contain a subnet mask field.

Incorrect answers:

B: RIPv1 does not have a subnet mask field in its update.

C: RIPv1 is actually a classful routing protocol.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp. 16-20.

QUESTION NO: 136

Which statement about OSPF support of route summarization is true?

- A. Summarization prevents type-1 link LSAs from being propagated into the backbone area 0
- B. Route summarization can be performed at any point in the network where enough contiguous addresses are present

- C. Route summarization reduces the amount of bandwidth, CPU, and memory resources consumed by the OSPF process
- D. Type-3 and type-4 LSAs carry external summarized routes

Answer: C.

Explanation: Route summarization 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. Well-planned route summarization directly reduces the amount of bandwidth, CPU, and memory resources consumed by the OSPF process.

Incorrect answers:

- A:** Route summarization does not prevent the propagation of type 1 LSAs into the backbone area 0. Route summarization does only allow summarized routes from entering the backbone.
- B:** Route summarization must be done at the network boundary.
- D:** Type 3 and type 4 LSAs are only used within an OSPF area.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 459.

QUESTION NO: 137

By default, which information does an OSPF summary line Type 3 entry includes?

- A. Network addresses for an area that are summarized at their classful boundary
- B. Summarized entries for network addresses in an area
- C. Network addresses for all networks in an area
- D. Network addresses for all networks in the OSPF autonomous system

Answer: B.

Explanation: To take advantage of summarization network numbers in areas should be assigned in a contiguous way, thus enabling the grouping of addresses into one range. In OSPF, summarization is off by default. The command does indeed identify the area containing the networks to be summarized into another area.

Incorrect answers:

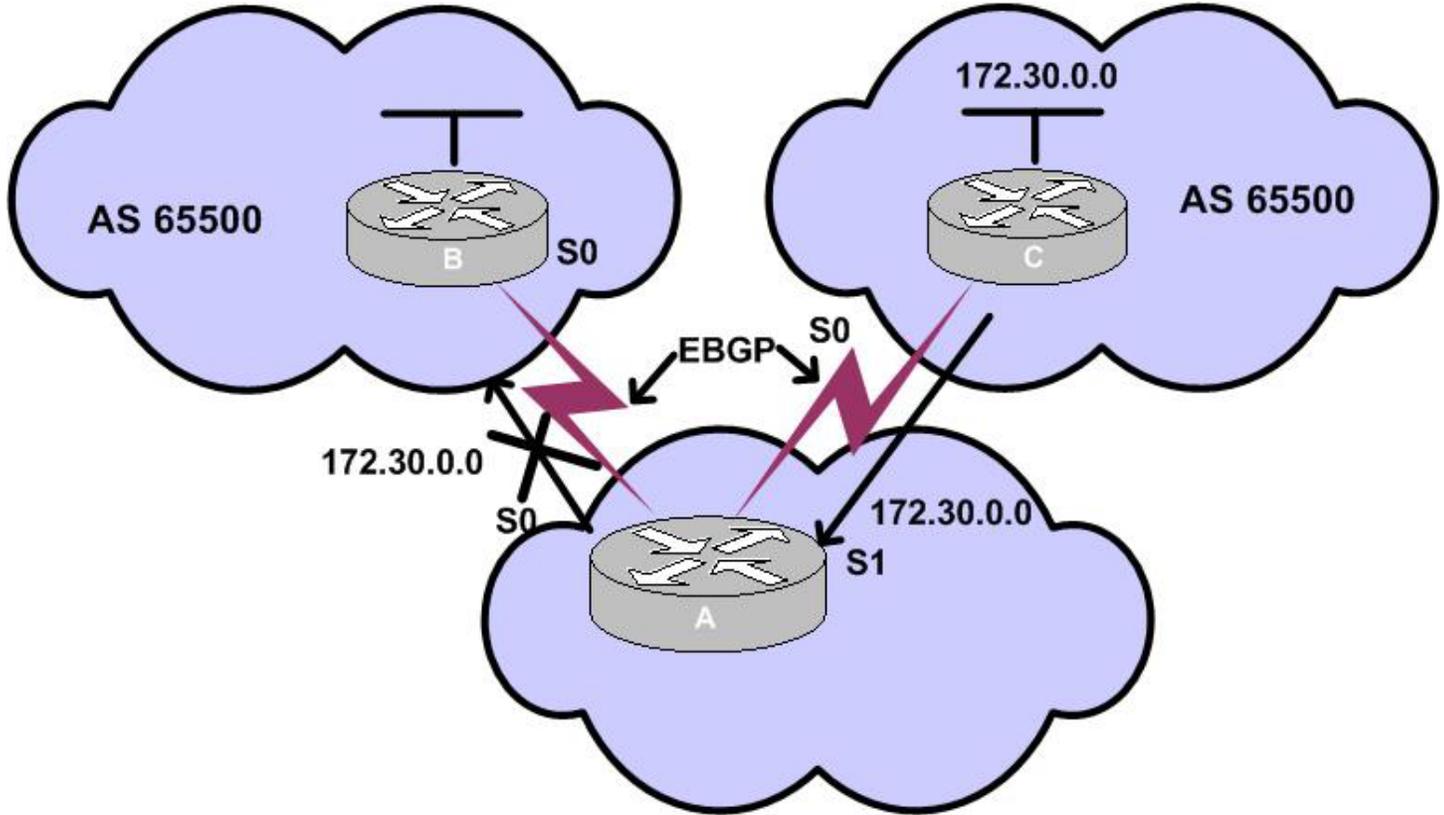
- A:** Network addresses are summarized at their boundary but this is not the information contain in the summary line.
- C:** The command only contains the summarization of the networks not all of their addresses.

D: The command only contains the summarization of the network and not the network addresses for all networks in the OSPF autonomous system works not all of their addresses.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 198-201

QUESTION NO: 138

Exhibit



Router A is currently blocking the network 172.30 from propagating to Router B. In addition, what can be used to restrict updates from Router B propagating to Router A?

Old:

Which list can be used to restrict updates about 172.30.0.0 from propagated from router A and Router B?

- A. A prefix list configured on Serial 0 of Router A
- B. A prefix list configured on Serial 0 of Router B
- C. A prefix list configured under `router BGP` on router A
- D. A prefix list configured under `router BGP` on router B

Answer: C.

Explanation: If you want to restrict the routing information that the Cisco IOS software learns or advertises, you can filter BGP routing updates to and from particular neighbors. To do this, you can define a prefix list and then apply it to the updates. Prefix lists are applied to the router itself.

Incorrect answers:

A, B: A prefix list must be configured on the router itself and not a specific interface to be effective.

D: An access is meant for packer filtering and not route filtering.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), 390-4 and 590-5,

QUESTION NO: 139

Which three statements about prefix list sequence numbers is true? (Choose Three)

- A. They start at 10 by default
- B. They are displayed in the show IP prefix-list
- C. They automatically increment by five by default
- D. They are used to indicate the order in which the statements in the prefix list will be processed
- E. They must be configured manually

Answer: B, C and D.

Explanation: A prefix list is an ordered list. The sequence number is significant when a given prefix list is matched by multiple entries of a prefix list, in which case the one with the smallest sequence number is considered a real match. By default, the entries of a prefix list will sequence values of 5, 10, 15 and so on. The prefix list numbers may be displayed with the command show ip prefix-list.

Incorrect answers:

A: By default the numbers start at 5 and increase by 5 as they continue.

E: Prefix list sequence numbers are generated automatically, unless you disable this automatic generation.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 395-7.

QUESTION NO: 140

Which command displays only the current EIGRP entries in the routing table?

Answer: show ip route eigrp

Explanation: The **show ip route eigrp** command display the EIGRP topology table. This command shows the topology table, the active or passive state of routes, the number of successors, and the feasible distance to the destination.

Incorrect Answers

show ip eigrp route

There is no such command.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 254.

QUESTION NO: 141

You want to turn off automatic summarization for EIGRP routes which command does this?

Enter the number that corresponds to the command.

Answer: no-auto summary

Explanation: The no-auto summary command turns off EIGRP’s automatic summarization.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 266.

QUESTION NO: 142

Router TestKing is the main office router in a hub and spoke topology supporting 24 regional offices. Point-to-point Frame Relay EIGRP network is deployed between the main office and the regional offices. The CIR for each Frame Relay PVC is different and that there is no bandwidth command configured under either the major serial interface nor the subinterfaces on Router TestKing.

What is a possible fix for the potential EIGRP packet pacing problem because of the different CIR and PVC has?

- A. convert each Frame Relay PVC to point-to-multipoint connection
- B. manually configure the bandwidth of the major interface to the lowest CIR x 24
- C. manually configure the bandwidth of the major interface to the highest CIR x 24
- D. manually configure the bandwidth of each of these PVCs to equal to their respective CIR.

Answer: D

Explanation: This is a possible solution, but it is not elegant and requires some administrative effort.

Incorrect Answers

A: Not necessary-

B: This will force all PVC to run at a low speed.

C: This would give too high a bandwidth.

QUESTION NO: 143

An EIGRP router has not established an adjacency with a neighbor. Which debug command would help most to troubleshoot this problem?

Answer: debug eigrp neighbor

Explanation: To display neighbors discovered by Enhanced Interior Gateway Routing Protocol (EIGRP) and their interactions, use the **debug eigrp neighbors** command in privileged EXEC mode.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 677.

QUESTION NO: 144

Which command can be used to determine the origin code for BGP routes learned from other routers?

Answer: show ip bgp

Explanation: The show ip bgp command displays entries in the BGP routing table. Specify a network number to get more detail information about a specific network.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), pp 348-9.

QUESTION NO: 145

Which command verifies that OSPF interfaces are configured in the proper area, and displays neighbour adjacencies?

Answer: show ip ospf interface

Explanation: The output of the **show ip ospf interface** command includes among other data: The areas to which this interface belongs and list of all neighbor adjacencies.

Note: Example output:

```
RouterTestKing#show ip ospf interface e0
  Ethernet0 is up, line protocol is up
<some output deleted>
  Neighbor Count is 3, Adjacent neighbor count is 2
    Adjacent with neighbor 1.2.2.2 (Designated Router)
    Adjacent with neighbor 4.2.2.2 (Designated Router)
```

Reference: What Does the show ip ospf neighbor Command Reveal?

<http://www.cisco.com/warp/public/104/16.html>

What Does the show ip ospf interface Command Reveal?

<http://www.cisco.com/warp/public/104/17.html>

Incorrect answers

The output of the **show ip ospf neighbor** command includes: Neighbor ID, PRI, State, Dead Time, Address, Interface. The Interface output include the Interface on which the OSPF neighbor has formed adjacency. However, no Area information is included in the output.

QUESTION NO: 146

An EIGRP router has not established an adjacency with the neighbour. Which debug command would help most to trouble shoot this problem?

Answer: debug eigrp neighbor

Explanation: To display neighbors discovered by Enhanced Interior Gateway Routing Protocol (IGRP) and their interactions, use the **debug eigrp neighbors** command in privileged EXEC mode.

Catherine Paquet and Daine Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 677.

QUESTION NO: 147

When a match occurs which set command will forward the packet only if there is no explicit route for the packet destination address in the routing table. Enter the number that corresponds to the command answer.

Answer: set default interface

Explanation: set default interface command defines the default interface. If there is no explicit route available to the destination address of the packets being considered for policy routing, it will be routed to the first up interface in the list of specified default interfaces.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), 491.

QUESTION NO: 148

Which command enables RIP or IGRP routers to select default route when the default path is used for non-connected subnets for the same classful network?

Answer: ip default-network

Explanation: The **ip default-network** command is used to select a network as a candidate route for computing the gateway of last resort.

Incorrect answers

The **ip classless** command is required on all RIP/IGRP routers that must use a default route to get to other subnets of a network. At times the router might receive packets destined for a subnet of a network that has no network default route. To have the Cisco IOS software forward such packets to the best supernet route possible, use the **ip classless** global configuration command.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 469.

QUESTION NO: 149

Which command is used to display information on a prefixed list, including the number of times a prefixed list entry has matched a route?

Answer: show ip prefix-list detail

Explanation: The show ip prefix-list command displays information on all prefix lists. Specifying the detail keyword includes the description and the hit count (the number of times the entry has matched a route) in the display.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p 397.

QUESTION NO: 150

Which command version the OSPF interfaces are configured in the proper area and displays neighbour adjacencies. Enter the correct number?

Answer: show ip ospf interface

Explanation: The show ip ospf interface command verifies that interfaces have been configured in the intended areas. If no loopback address is specified, the interface with the highest address is taken as the router ID. It also gives the timer intervals, including the hello interval, and shows neighbor adjacencies.

Catherine Paquet and Daine Teare, “Building Scalable Cisco Networks” (Cisco Press 2001), p. 134.

QUESTION NO: 151

You are setting up a redistributed network at TestKing. However, you are worried about possible routing loops. What should you do to reduce this problem?

- A. Using multiple default gateways for redundancy.
- B. Using one-way redistribution for greater stability.
- C. Using two-way redistribution for greater stability.
- D. Using overlapped routing protocols for redundancy.

Answer: B

Explanation: One-way redistribution would help avoiding the routing loops problem.

Incorrect Answers

- A:** Multiple default gateways would increase the risk of routing loops.
- C:** Two-way redistribution would increase the risk of routing loops.
- D:** Using several routing protocols would increase the risk of routing loops.

QUESTION NO: 152

Your company TestKing Inc. has the address space of 172.28.100.0/24. You divide this address using a 30-bit VLSM mask: 172.28.100.0/30. How many subnets will you have?

You have an address space of 172.28.100.0/24. You want to use this address space for your WAN links by dividing the address space using a VLSM mask of 30 as follows: 172.28.100.0/30

How many subnets will this provide for WAN links?

- A. 14
- B. 30
- C. 62
- D. 126
- E. 254

Answer: C

Explanation:

First octet	Second octet	Third Octet	Fourth Octet	Comments
172	28	100	0	
10101100	00011110	01100100	00000000	This is the entire address space
172	28	100	0	
10101100	00011110	01100100	00000000	This is the 30-bit VLSM mask

We can use 6 bits in the fourth octet for subnets. This gives us $2^6 - 2 = 62$ subnets

QUESTION NO: 153

As a network Technician at TestKing inc. you are required to subnet a class B network. You decide to use the network 172.29.100.0/28.

Which of the listed alternatives is a valid VLSM subnet derived from your network?

- A. 172.29.100.8
- B. 172.29.100.32
- C. 172.29.100.60
- D. 172.29.100.104

Answer: A

Explanation: We have the network 172.29.100.0/28 which is a subnetted Class B network. We want to identify a valid VLSM subnet mask of this network, which subnets this network further.

We recalculate the subnetted network in binary to better study it. We must make sure that only the host bits, and not the network bits, are used in the fourth octet.

First octet	Second octet	Third Octet	Fourth Octet	Comments
172	29	100	0	
10101100	00011101	01100100	00000000	This is the network address
172	29	100	8	
10101100	00011101	01100100	00000100	This is a valid subnet of the 172.29.100.0/28 network.
172	29	100	32	
10101100	00011101	01100100	00100000	This is a supernet of 172.29.100.0/28.

172	29	100	60	This is a supernet of 172.29.100.0/28.
10101100	00011101	01100100	00111100	
172	29	100	104	This is a supernet of 172.29.100.0/28.
10101100	00011101	01100100	01101000	

QUESTION NO: 154

Exhibit

```
RouterTestK(config)#access-list 30 deny any
RouterTestK(config)#access-list 40 permit ip any any
RouterTestK(config)#router eigrp 1
```

You are configuring a router named RouterTestK. RouterTestK is configured for EIGRP and you have also used the commands shown in exhibit.

Now you must configure the Serial 0/0 interface. You must make sure that RouterTestK

- does not send routing updates out of this interface.
- form and maintain neighbor adjacencies the interface

RouterTestK(config-router)#

Select from these

in	distribute-list 40	distribute-list 30	out
serial 0/0	interface	passive interface	

Answer:

RouterTestK(config-router)#

distributed-list 30

out

serial 0/0

Select from these

in

distributed-list 40

interface

passive interface

Explanation: We use distribute list 30, which stops IP traffic, on outward traffic on the serial 0/0 interface. RouterTK continues receiving routing updates from its neighbor, but the distribute-list prevents routes from being advertised out of serial 0. Furthermore, neighbor adjacencies are allowed to be formed between RouterTK and its neighbor on serial 0/0.

Reference: How Does the Passive Interface Feature Work in EIGRP?

<http://www.cisco.com/warp/public/103/16.html>

Incorrect Answers

passive interface serial 0/0

On EIGRP, passive interface causes the router to stop sending and receiving hello packets. This will prevent the interface from maintaining neighbor adjacencies.

distributed-list 40 out serial 0/0

We must stop outgoing traffic, not allow it.

distributed-list 30 in serial 0-0

We must stop outgoing traffic, not incoming traffic.

QUESTION NO: 155

You are configuring redistribution of EIGRP into another routing protocol. You want to use altered EIGRP parameters when redistributing into the second routing protocol. Which command should you use to accomplish this?

- A. default-metric eigrp *metric*
- B. distance eigrp *administrative-weight*
- C. distance eigrp *internal-distance external-distance*
- D. distance eigrp *external-distance internal-distance*

Answer: C

Explanation: The distance eigrp command is used to allow the use of two administrative distances---internal and external---that could be a better route to a node.

Syntax: distance eigrp *internal-distance external-distance*

Note: Use the **distance eigrp** command if another protocol is known to be able to provide a better route to a node than was actually learned via external Enhanced IGRP or if some internal routes should really be preferred by Enhanced IGRP.

Incorrect Answers

A: Incorrect usage of the **default-metric** command. Furthermore, this command would not be of use here.

Note, syntax: default-metric *bandwidth delay reliability loading mtu*

B, D: Incorrect use of the **distance eigrp** command.

QUESTION NO: 156

You are carrying out a configuration task and you have just used the route-map command. Your TestKing trainee asks you what will be the last command you will use to complete the current configuration task. What should you tell him?

- A. set
- B. match
- C. map-list
- D. ip policy

Answer: A

Explanation: Route maps are complex access lists: A collection of route-map statements that have the same route-map name are considered one route-map.

Step 1: RouterTestKing(config)# **route-map** map-tag [permit | deny] [sequence-number]

First we define the conditions for policy routing.

Step2: RouterTestKing(config-route-map)#**match** { conditions}

Then we define the conditions to match

Step 3: RouterTestKing(config-route-map)# **set** { actions}

Finally we define the action to be taken on a match.

QUESTION NO: 157

Why would you configure subinterfaces in an OSPF NBMA topology?

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- A. to conserve IP addressing space
- B. to avoid split-horizon issued with the routing protocol
- C. because logical interfaces are more reliable than physical interfaces
- D. because the subinterfaces remains up when the physical interface changes

Answer: B

Explanation: A subinterface is a logical way of defining an interface. The same physical interface can be split into multiple logical interfaces, with each subinterface being defined as point-to-point. This was originally created in order to better handle issues caused by split horizon over NBMA and vector based routing protocols.

Reference: OSPF Design Guide

<http://www.cisco.com/warp/public/104/3.html>

QUESTION NO: 158

Which two characteristics does the `network` command define? (Choose two.)

- A. the OSPF area ID
- B. the OSPF router ID
- C. the OSPF process ID
- D. which interface is in which OSPF area

Answer: A, D

Explanation: The network command designates the OSPF area for an interface with the specified IP address.

Syntax:

network *address wildcard-mask* **area** *area-id*

QUESTION NO: 159

A fast food chain is planning to provide network connectivity for two of its restaurants: Berlin and Nurnberg. Each restaurant will have a single LAN. You have been asked to configure the first router at the Berlin location. The Berlin router has been configured completely except the routing protocol. Configure OSPF as the routing protocol in a single area to allow a host on the LAN on the Berlin router to communicate with a host on the LAN for the Nurnberg router. Due to the fact that adjacent subnets are in use or are planned for the future growth on other routers in the AS, make sure you use specific subnet information in your configuration. Please note, the Nurnberg router will be installed at a later time. The Berlin router has been configured with the following specifications:

- The router is named Berlin.
- The clocking is provided on the Berlin router's serial 0/0 interface.
- The secret password in the Berlin router is "TestKing".
- Area 0 should be used for the routing protocol.
- Use 1 for the process ID of the routing protocol.
- The IP addresses and subnet masks are listed in the chart.

Berlin

FA0/0 10.60.2.1/23

S0/0 10.60.4.1/30

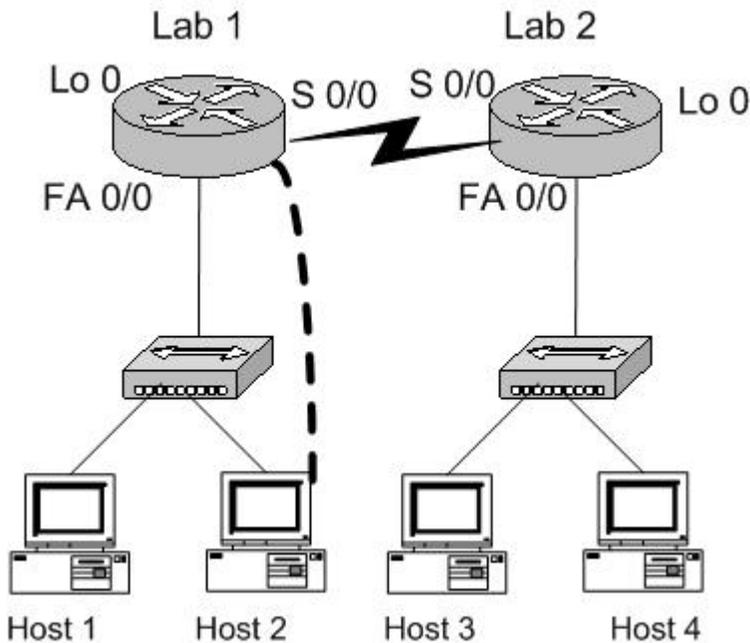
Lo 0 10.90.20.10/32

Nurnberg

FA0/0 10.60.6.1/24

S0/0 10.60.4.2/30

Lo 0 10.90.20.20/32



Please provide the complete configuration and also the prompt where the configuration is to be done.

Start by clicking on host that is connected to the router you want to configure.

Lab A

Berlin

FA0/0 10.60.2.1/23

S0/0 10.60.4.1/30

Lo 0 10.90.20.10/32

Secret Password: TestKing

Lab B

Nurnberg

FA0/0 10.60.6.1/24

S0/0 10.60.4.2/30

Lo 0 10.90.20.20/32

Answer:

<Click on Host2, which is connected to the Lab 1 router>

Berlin#enable

Password: **TestKing**

Berlin#configure terminal

Berlin(config)#router ospf 1

Berlin(config-router)#network 10.60.2.1 0.0.0.0 area 0

Berlin(config-router)#network 10.60.4.1 0.0.0.0 area 0

Berlin(config-router)#network 10.90.20.10 0.0.0.0 area 0

Berlin(config-router)#exit

Berlin(config)#^z

Berlin#copy running-config startup-config

Explanation: We are configuring the Berlin router with OSPF. The networks it will advertise will those of its own (10.60.2.1, 10.60.4.1, and 10.90.20.10).

Note: comments are added in text after the !-sign. They will not be shown during simulation.

First we click on Host2, which is connected to the Lab1 router.

Berlin Con0 is now available

! The Berlin router starts

Press RETURN to get started.

! Here we press return

Berlin>enable

! We must enter EXEC mode (or enable mode as it also

Password:

! We enter the password: **TestKing**

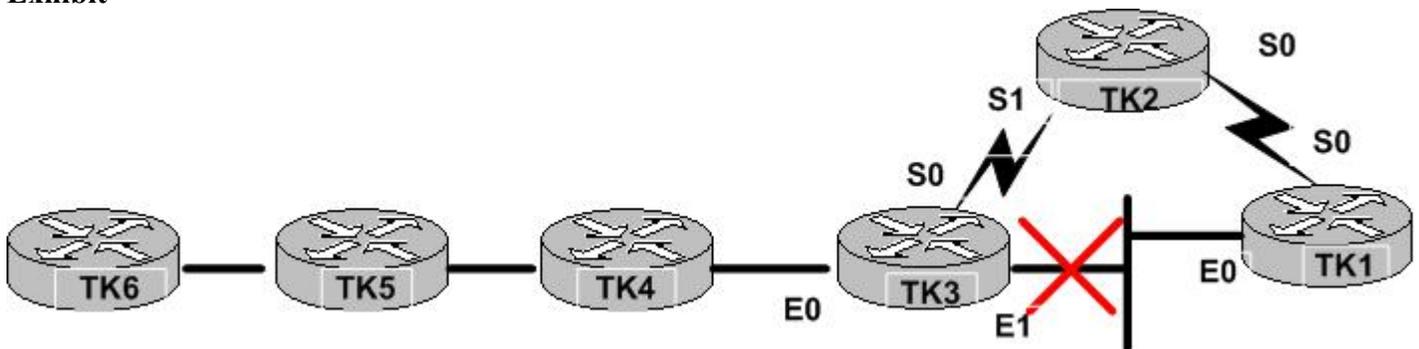
Berlin#configure terminal

```

Enter configuration commands, one per line. End with CNTL/Z.
Berlin(config)#router ospf 1      ! We enable ospf process 1 and
                                   ! Enters router OSPF configuration mode
                                   ! Now we enter the networks that Berlin that berlin router
                                   ! will advertise. We specify the backbone area, area 0.
                                   ! We must all three networks on Berlin in three separate statements.
Berlin(config-router)#network 10.60.2.1 0.0.0.0 area 0
Berlin(config-router)#network 10.60.4.1 0.0.0.0 area 0
Berlin(config-router)#network 10.90.20.1 0.0.0.0 area 0
Berlin(config-router)#exit        ! Exit OSPF router configuration mode
Berlin(config)#^z                 ! We exit configuration mode and return to enable mode.
Berlin#copy running-config startup-config ! We save our configurations to NVRAM
Destination filename [startup-config]? ! We confirm with Enter.
Building configuration...

[OK]
Berlin#                            ! We are finished.

```

QUESTION NO: 160**Exhibit**

Your network uses the EIGRP routing protocol. Which two actions does TK3 take when the link between Router TK3 and Router TK1 goes down? (Choose two)

- A. It elects a new designated router.
- B. It sends a flash update with poison reverse.
- C. It checks its topology table for an alternate route.
- D. It re-broadcasts its routing table to all other neighboring routers.
- E. It sends a query to neighboring routers for other routes to the failed link.

Answer: C, E

Explanation:

Steps of convergence:

1. Router TK3 detects the link failure between TK1 and TK3. It checks the topology table for a feasible successor, but it doesn't find a qualifying alternate route and enters in an active convergence state. (C)
2. TK3 sends a Query out all interfaces for other routes to the failed link (E). The neighboring routers acknowledge the query.
3. The reply from TK4 indicates no other route to the failed link.
4. TK2's reply contains a route to the failed link, although it has a higher feasible distance.
5. Router TK3 accepts the new path and metric information, places it in the topology table, and creates an entry for the routing table.
6. TK3 sends an update about the new route out all interfaces.

QUESTION NO: 161**Exhibit**

```

S      62.99.153.0/24 [1/0] via 209.177.64.130
      172.209.12.0/32 is subnetted, 1 subnets
D EX   172.209.1
      [170/2590720] via 209.179.2.114, 06:47:28, Serial0/0/0.1239
      62.113.17.0/24 is variably subnetted, 2 subnets, 2 masks
D EX   99.3.215.0/24
      [170/27316] via 209.180.96.45, 09:52:10, FastEthernet11/0/0
      [170/27316] via 209.180.96.44, 09:52:10, FastEthernet11/0/0
25.248.17.0/24
      [90/1512111] via 209.179.66.25, 10:33:13, Serial0/0/0.1400001
      [90/1512111] via 209.179.66.41, 10:33:13, Serial0/0/0.1402001
      62.113.1.0/24 is variably subnetted, 12 subnets, 2 masks
D      62.113.1.227/32
      [90/2611727] via 209.180.96.45, 10:33:13, FastEthernet1/0/0
      [90/2611727] via 209.180.96.44, 10:33:13, FastEthernet1/0/0
S*    0.0.0.0/0 [1/0] via 209.180.96.14

```

The exhibit shows a partial display of the show ip route command on a Cisco router. What is the administrative distance of the external EIGRP routes?

- A. 24
- B. 32
- C. 90
- D. 170
- E. 27316

Answer: D

Explanation: By default an external EIGRP route has a value of 170. By examining the exhibit we see that this default value of the external EIGRP routes (see D-EX in exhibit) indeed is set to 170.

Reference: What Is Administrative Distance?

http://www.cisco.com/warp/public/105/admin_distance.html

QUESTION NO: 162

Your company uses the RIP v2 routing protocol. Your core router detects a flapping link to a neighboring router.

How does the core router react?

- A. It recalculates the network topology.
- B. It purges that link from its routing table.
- C. It places a hold-down on the routes from that link.
- D. It sends a LSA to other router requesting an RIP update.

Answer: C

Explanation: The purpose of the hold-down state is to ensure the validity of any new routes for the same destination.

Reference:

Incorrect Answers

- A:** RIP does not calculate a network topology.
- B:** The purged link would then reappear.
- D:** This does not occur.

QUESTION NO: 163

Which configuration requirement to summarize routes does an ASBR have that ABRs do not?

- A. **area range** command
- B. **ospf summarize** command
- C. **aggregate-route** command
- D. **summary-address** command

Answer: D

Explanation: Using this command for OSPF causes an OSPF autonomous system boundary router (ASBR) to advertise one external route as an aggregate for all redistributed routes that are covered by the address. For OSPF, this command summarizes only routes from other routing protocols that are being redistributed into OSPF.

Reference: OSPF Commands

Incorrect Answers

A: The **area range** command is used only with area border routers (ABRs). It is used to consolidate or summarize routes for an area. The result is that a single summary route is advertised to other areas by the ABR.

B, C: There are no such commands.

QUESTION NO: 164

Why is stability of routes a consideration when designing OSPF areas?

- A. Instability causes more LSAs to be sent, requiring more CPU to recalculate routes.
- B. Convergence cannot happen until holddown timers expire, so routing loops can occur.
- C. Flooding the area topological database instances consumes excessive bandwidth.
- D. Summary link LSAs cannot be sent until all routers in the OSPF area have the same topological database.

Answer: A

Explanation: Instability of routes (links) would force sending of LSAs (Link State Advertisements), and CPU time would be required to recalculate the routes.

Reference: RFC2328, OSPF Version 2

<http://www.faqs.org/rfcs/rfc2328.html>

Incorrect Answers

B: OSPF does not use holddown timers as RIP for example.

C: The topological database is not distributed, only link changes.

D: Summary-link LSAs are not sent to all routers.

Summary-link LSAs originates by area border routers, and flood through-out the LSA's associated area. Each summary-LSA describes a route to a destination outside the area, yet still inside the AS

640-901

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QUESTION NO: 165**Exhibit**

TK#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
 D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
 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

<Some output deleted>

Gateway of last resort is 30.64.0.2 to network 0.0.0.0

```

    30.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O IA   30.2.0.0/16 [110/74] via 30.64.0.2, 00:09:13, Ethernet0
C      30.1.3.0/24 is directly connected, Serial0
O IA   30.3.0.0/16 [110/148] via 30.64.0.2, 00:05:22, Ethernet0
C      30.1.2.0/24 is directly connected, Serial1

```

Given the output of a show ip route command shown in the exhibit, which two statements about the routing table are true? (Choose two.)

- A. The area is a stub area.
- B. The area is totally stubby.
- C. Network 30 is using VLSM
- D. The routing table is for an ABR

Answer: A, C**Explanation:****Incorrect Answers****A:** This is a stub area.**C:** The exhibit states that the 30.0.0.0/8 subnet is variable subnetted, in other words it is subnetted with VLSM (Variable length subnet mask).**Reference:** How Does OSPF Generate Default Routes?<http://www.cisco.com/warp/public/104/21.html>

What Are OSPF Areas and Virtual Links?

<http://www.cisco.com/warp/public/104/8.html>**Incorrect Answers****B:** The area is stub, not totally stubby..**D:** This is not an ABR (Area border router) since there are no external routes, only internal and directly connected.

QUESTION NO: 166

Which two statements about VLSM support in OSPF are true? (Choose two.)

- A. A multiple area OSPF design dictates that VLSM be used throughout the AS.
- B. Summarization can be performed with different prefix lengths throughout the network.
- C. The use of VLSM enables a truly hierarchical addressing scheme to be developed.
- D. OSPF's support for VLSM does not compensate for its inability to handle discontinuous subnets.

Answer: B, C

Explanation:

B: Summarization can be performed with different prefix lengths throughout the network, as long as the ranges don't overlap.

C: VLSM enables a true hierarchical addressing scheme.

Reference: OSPF Design Guide

<http://www.cisco.com/warp/public/104/3.html>

Incorrect Answers

A: VLSM can be used locally only. VLSM is not required to be used throughout multiple areas.

D: In order to take advantage of summarization, network numbers in areas should be assigned in a contiguous way to be able to lump these addresses into one range.

QUESTION NO: 167

Which redistribution method can be used to prevent routing loops between two autonomous systems from running different routing protocols and having redundant paths?

- A. static redistribution
- B. passive redistribution
- C. two-way redistribution
- D. one-way redistribution

Answer: A

Explanation: Static routes, routes add to interface null0, are the safest and simplest solution in this scenario.

Reference: Redistributing Routing Protocols

<http://www.cisco.com/warp/public/105/redist.html>

QUESTION NO: 168

Which three commands can be used to verify route redistribution? (Choose three.)

- A. debug
- B. traceroute
- C. show summary
- D. show ip route

Answer: A, B, D

Explanation:

A: The **debug** command can be used to debug redistribution.

B: We can verify connectivity, and the presence of a route, with the traceroute command.

D: We can verify that the routes have been redistributed with the **show ip route** command. The routes will be shown.

Reference:

Incorrect Answers

C: The **show summary** command displays a summary of relationships among owners, content rules, and services. It is not of help in this scenario.

QUESTION NO: 169

You are configuring redistribution to advertise EIGRP routes into OSPF on a boundary router. Given the configuration:

```
router ospf 1
 redistribute eigrp 1 metric 33 subnets
```

What is the function of the 33 parameter in the redistribute command?

- A. It specifies the seed cost to be applied to the redistributed routes.
- B. It specifies the administrative distance on the redistributed routes.
- C. It specifies the metric limit to 33 subnets in each OSPF route advertisement.
- D. It specifies the process-id for the pseudo process that injects the EIGRP routes into OSPF.

Answer: B

Explanation: In this example the IP enhanced IGRP-derived metric will be remapped to 33.

Reference: Redistributing Routing Protocols
<http://www.cisco.com/warp/public/105/redist.html#examples>

Incorrect Answers

- A: The seed cost is not defined.
- C: The metric, not the metric limit, is defined.
- D: Process id does not apply.

QUESTION NO: 170

You are using multiple routing protocols in different Autonomous Systems (AS). You need to redistribute between the systems. You are using two-way redistribution.

Which action should help you avoid routing loop issues?

- A. manually configuring route filters
- B. manually configuring static routes
- C. manually configuring passive interfaces
- D. manually configuring the default gateway

Answer: A

Explanation: Multiple autonomous systems or routing domains can share route information through the redistribution process. Proper implementation of redistribution requires route filters to prevent feedback loops from forming. It is strongly recommended that redistribution between multiple ASs or multiple routing protocols be accompanied by route filters.

Reference: CCNP #640-503 Building Scalable Cisco Networks (Cisco Press), More EIGRP Scalability Rules

QUESTION NO: 171

How should you configure a BGP prefix list to permit all prefixes between /10 and /18 for the 207.0.0.0 network?

- A. ip prefix-list 207.0.0.0/8 ge 10 le 18
- B. ip prefix-list 207.0.0.0/8 ge 18 le 10
- C. ip prefix-list 207.0.0.0/24 ge 10 le 18
- D. ip prefix-list 207.0.0.0/24 ge 18 le 10

Answer: A

Explanation: Greater than (ge) 10 and less than (le) 18. Furthermore we must specify an 8 bit network mask, not a 24 bit network mask.

Reference: Cisco, BGP Commands

QUESTION NO: 172

Why is it necessary to redistribute or advertise IGP (such as OSPF and EIGRP) routes into BGP?

- A. so BGP can propagate this information to other IGP neighbors.
- B. so BGP can propagate this information to other IBGP neighbors.
- C. so BGP can propagate this information to other EBGP neighbors.
- D. so BGP can propagate this information to other OSPF neighbors.

Answer: C

Explanation: When BGP is used between autonomous systems (AS), the protocol is referred to as External BGP (EBGP).

Note: Customer networks usually employ an Interior Gateway Protocol (IGP) such as RIP or OSPF for the exchange of routing information within their networks

Reference: Border Gateway Protocol

http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/bgp.htm

QUESTION NO: 173

What are two valid reasons that require an IBGP router to be peered with all IBGP routers within an AS? (Choose two.)

- A. IBGP routes are not propagated to other EBGP peers.
- B. IBGP routes that a router originates are propagated to other IBGP peers.
- C. IBGP routes are propagated to other IBGP speakers in the AS that are not peers.
- D. IBGP routes that are learned from an IBGP neighbor are propagated to only EBGP peers.

Answer: A, B

Explanation: IBGP routes are propagated to all IBGP peers and only the IBGP peers.

Note: You can configure Border Gateway Protocol (BGP) either within an autonomous system or between different autonomous systems. When run within an autonomous system, it's called internal BGP (IBGP). When run between different autonomous systems, it's called external BGP (EBGP).

QUESTION NO: 174

What happens if a BGP route reflector receives updates from a peer in another autonomous system?

- A. It discards the update.
- B. It sends the update to all IBGP peers.
- C. It sends update only to nonclients.
- D. It sends the update only to route reflector clients.
- E. It sends the update to all routers in the autonomous system.

Answer: E

Explanation: Any route received from another autonomous system, a route from an external BGP speaker, is advertised to all clients and nonclient peers.

Note: The internal peers of the route reflector are divided into two groups: client peers and all the other routers in the autonomous system (nonclient peers).

When the route reflector receives an advertised route, depending on the neighbor, it does the following:

- A route from an external BGP speaker is advertised to all clients and nonclient peers.
- A route from a nonclient peer is advertised to all clients.
- A route from a client is advertised to all clients and nonclient peers. Hence, the clients need not be fully meshed.

The main point of route reflector is that the routers of the autonomous system do not need to be fully meshed.

Reference: Cisco, Configuring BGP

QUESTION NO: 175

Exhibit

```
RTR TK1
router bgp 200
neighbor 183.215.22.1 remote-as 200
neighbor 183.215.22.1 update-source loopback 1
```

```
RTR TK2
router bgp 200
neighbor 147.229.1.1 remote-as 200
```

Which three statements are correct about the configuration in the exhibit above? (Choose three.)

- A. RTR TK1 and RTR TK2 are running IBGP inside AS 200
- B. The IP address of RTR TK1's Loopback 1 interface is 147.229.1.1.
- C. The IP address of RTR TK1's Loopback 1 interface is 183.215.22.1.
- D. RTR TK1 and RTR TK2 are running EBGP between the autonomous systems.
- E. RTR TK1 has forced BGP to use the loopback IP address as the source in the TCP neighbor connection.

Answer: A, B, E

Explanation:

- A:** The two statements that define a remote AS (autonomous) use the same AS number. Both routers must belong to the same AS and there IBGP is used.
- B:** The IP address of the TK1 loopback address is 147.229.1.1 as specified in the neighbor statement of the TK2 router: **neighbor 147.229.1.1 remote-as 200**
- E:** The “**neighbor 183.215.22.1 update-source loopback 1**” command issued at TK1 make TK1 use this loopback for the BGP connection to TK2. See Note 2 below.

Note 1: Syntax of neighbor command:

```
Router(config-router)#neighbor
{ip-address | peer-group-name} remote-as as-number
```

This command specifies a BGP neighbor.

Note 2: For iBGP, you might want to allow your BGP connections to stay up regardless of which interface is used to reach a neighbor. To enable this configuration, you first configure a *loopback* interface and assign it an IP address (neighbor 183.215.22.1 update-source loopback 1). Next, configure the BGP update source to be the loopback interface (we have to assume this step – it is not indicated by the exhibit). Finally, configure your neighbor to use the address on the loopback interface (neighbor 147.229.1.1 remote-as 200).

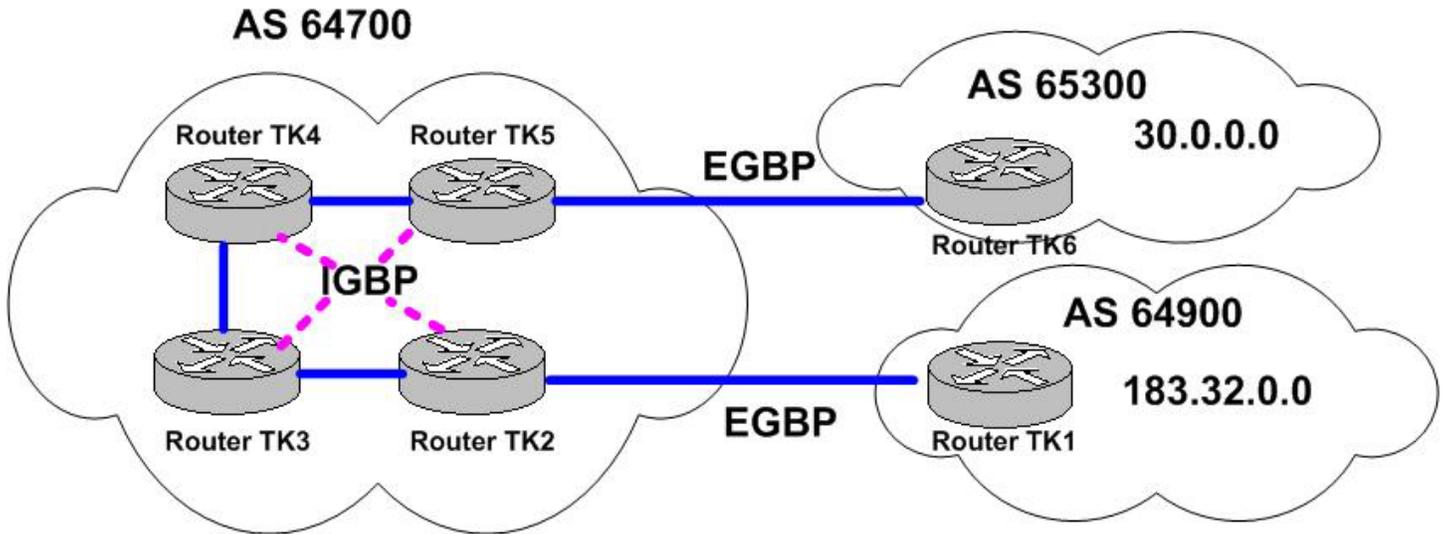
Reference: Cisco, Configuring BGP

Incorrect Answers

- B:** TK1 is defining the loopback address for TK2, not for itself.
- C:** 183.215.22.1 is the IP address of TK2, not TK1.
- D:** There is only one AS and the routers belong to that AS. Within an AS IBGP is used, not EBGP.

QUESTION NO: 176

Exhibit



No IGP is running as AS 64700. Which router(s) in AS 64700 will advertise a route to 183.32.0.0 if synchronization is OFF?

- A. TK2 only
- B. TK5 only
- C. TK2 and TK5 only
- D. TK2, TK3, and TK4 only
- E. TK2, TK3, TK4, and TK5

Answer: E

Explanation: We need to run IGP on AS 64700 to control the exit points from the AS. All routers in AS 64700 will advertise the route.

Reference: Using the Border Gateway Protocol for Interdomain Routing
<http://www.cisco.com/univercd/cc/td/doc/cisintwk/ics/icsbgp4.htm>

QUESTION NO: 177

Exhibit:

```
interface serial 0
 ip address 185.64.1.1 255.255.255.0
!
```

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```
interface ethernet 0
    ip address 15.10.10.1 255.255.255.0
!
router rip
    network 15.10.10.0
!
ip route 0.0.0.0 0.0.0.0 serial0
```

What would happen with the configuration as in the exhibit above?

- A. RIP updates are sent and received on interface serial0 of the router.
- B. A default route is sent to neighbors on interface serial0 of the router.
- C. A default route is sent to neighbors on interface ethernet0 of the router.
- D. RIP updates are sent and received on interfaces serial0 and ethernet0 of the router.

Answer: B

QUESTION NO: 178

Which two statements about BGP peer groups are true? (Choose two.)

- A. The peer group name is passed to other routers in the peer group.
- B. A peer group is a group of BGP neighbors with different update policies.
- C. The peer group name is only local to the router on which it is configured.
- D. A peer group allows options that affect outbound updates to be overridden.
- E. A peer group is a more efficient way to update BGP than configuration individual neighbors.

Answer: C, E

Explanation:

C: The peer group name is only local to the router it is configured on, it is not passed to any other router.

E: Neighbors with the same update policies can be grouped into peer groups to simplify configuration and make update calculation more efficient.

Reference: RFC 1771, A Border Gateway Protocol 4 (BGP-4)

Incorrect Answers

A: A BGP peer group does not necessarily have a name, it might have a number.

B: BGP peers use the same update policy.

D: A peer group does not have this option.

QUESTION NO: 179

What appear in a routing table after EIGRP route summarization is configured on a router's Serial0 interface summarizing routes learned from Ethernet0 interface?

- A. a summary route pointing to the Null0 interface.
- B. a summary route pointing to the Serial0 interface.
- C. a summary route pointing to the Ethernet0 interface.
- D. a summary route pointing to the Loopback0 interface.

Answer: C

Explanation: The summarization is learned from the Ethernet0 interface.

Incorrect Answers

- A:** The Null0 interface is used for default routes.
- B:** The summarization is learned from the Ethernet0 interface.
- D:** The Loopback0 interface is not used this way.

QUESTION NO: 180

On a slow NBMA media, what is the default hold time for EIGRP hellos?

- A. 30 seconds
- B. 60 seconds
- C. 90 seconds
- D. 180 seconds

Answer: D

Explanation: EIGRP sends hello packets every 5 seconds on high bandwidth links and every 60 seconds on low bandwidth multipoint links. The hold time is typically three times the hello interval. In this scenario, on slow NBMA media, hold time will be 180 seconds.

Reference: Enhanced Interior Gateway Routing Protocol
<http://www.cisco.com/warp/public/103/eigrp1.html>

QUESTION NO: 181

There are four paths to Network A, and the Feasible Distance is 3. Which link will become a feasible successor?

- A. Link A, Feasible Distance 3 and Advertise Distance 1
- B. Link B, Feasible Distance 5 and Advertise Distance 4
- C. Link C, Feasible Distance 4 and Advertise Distance 2
- D. Link D, Feasible Distance 4 and Advertise Distance 4

Answer: C

Explanation: Link A is the best link and it therefore the successor. Link C is the next best link, and it is therefore the feasible successor.

Note: Feasible distance is the best metric along a path to a destination network, including the metric to the neighbor advertising that path. Reported distance, or advertised distance, is the total metric along a path to a destination network as advertised by an upstream neighbor. A feasible successor is a path whose reported distance is less than the feasible distance.

Reference: Enhanced Interior Gateway Routing Protocol
<http://www.cisco.com/warp/public/103/eigrp1.html>

Incorrect Answers

A: Link A is the successor, not the feasible successor.

B: Both Link A and Link C are better than Link B..

D: The feasible successor must have Advertised Destination that is less than the Feasible Distance.

QUESTION NO: 182

You have the subnet/mask of 186.37.100.0/26 set aside for use by some small branch offices. You want to use VLSM to further subnet this block of addresses so that you will have six usable host addresses in each branch subnet.

Which VLSM mask should you use?

- A. /24
- B. /28
- C. /29
- D. /30
- E. /31

Answer: C

Explanation: 3 bits (32-29) for the host would provide for $2^3-2=6$ hosts as is required.

QUESTION NO: 183

Subnets 172.16.94.0/24 through 172.16.118.0/24 are used in your network. A correctly configured summary statement with a network value of 172.16.96.0 and mask of 255.255.240.0 has summarized some of the subnets.

Which subnet is the last subnet to be included by the summary element?

Answer: 172.16.111.0

Explanation: We verify it: 111 (3rd octet) decimal is 01101111. This is within the summarization. However, 172.16.112.0 would not be ok: 112 decimal is 01110000 (see below).

Decimal	1 st Octet	2 nd Octet	3 rd Octet	4 th Octet	
255.255.240.0	11111111	11111111	11110000	00000000	subnet mask
172.16.96.0	10101100	10101100	01100000	00000000	summarized network
172.16.111.0	10101100	10101100	01101111	00000000	Included in summary element
172.16.112.0	10101100	10101100	01110000	00000000	Not included in summary element

QUESTION NO: 184

What are two classless routing protocol features supported by EIGRP? (Choose two,)

- A. Dijkstra's algorithm
- B. discontinuous subnets
- C. variable length subnet masks
- D. periodic update announcements
- E. unequal path-cost load balancing

Answer: B, C

Explanation:

B: Discontiguous subnets not are supported by EIGRP. This is a classless routing protocol feature.

C: EIGRP support variable length subnet masks (VLSM). This is a classless routing protocol feature.

Note: Classless routing protocols include the routing mask with the route advertisement. This enables discontinuous subnets and variable length subnet masks.

Reference: Introduction to Enhanced IGRP (EIGRP)

<http://www.cisco.com/warp/public/103/1.html>

How Does Unequal Cost Path Load Balancing (Variance) Work in IGRP and EIGRP?

<http://www.cisco.com/warp/public/103/19.html>

Incorrect Answers

A: EIGRP use the DUAL algorithm, not the Djikstra's algorithm.

D: EIGRP use periodic hello messages, not update announcements.

EIGRP use update packets to convey reachability of destinations. When a new neighbor is discovered, Update packets are sent so the neighbor can build up its. These are not periodic however.

E: IGRP and EIGRP support unequal cost path load balancing, which is known as variance. However, this is not a classless feature of EIGRP.

QUESTION NO: 185

Router TK is the main office router in a hub and spoke topology supporting 24 regional offices. Point-to-multipoint Frame Relay EIGRP network is deployed between the main office and the regional offices. There is no bandwidth command configured under either the major or the subinterfaces on router TK.

What is the bandwidth of each Frame Relay connection perceived by the EIGRP process?

- A. 64 kbps
- B. 128 kbps
- C. 1 544 Mbps
- D. 1 536 Mbps

Answer: C

Explanation: EIGRP by default assumes the bandwidth is a T1 (1.544 Mbps) if not specified (including subinterfaces).

QUESTION NO: 186

Which three statements are true regarding the information of EIGRP peer relationships? (Choose three.)

- A. EIGRP will form neighbors if the routers are not adjacent
- B. EIGRP will not form neighbors if the metric K-values do not match.
- C. EIGRP will not form neighbors if the router AS numbers do not match.
- D. EIGRP will form neighbors over primary and secondary interface addressing.

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E. EIGRP will form neighbors even though hello and hold timers do not match on the peering interfaces.

Answer: B, C, E

Explanation:

B: To become neighbors the routers metric must be comparable.

C: EIGRP neighbors must have the same AS number.

E: It is possible for two routers to become EIGRP neighbors even though the hello and hold timers don't match.

Reference: Cisco White Paper, Enhanced Interior Gateway Routing Protocol
<http://www.cisco.com/warp/public/103/eigrp1.html>

Incorrect Answers

A: Neighbor discovery/recovery is the process that routers use to dynamically learn of other routers on their directly attached networks.

D: EIGRP doesn't build peer relationships over secondary addresses.

QUESTION NO: 187

Which three statements about BGP attributes are true? (Choose three.)

- A. MED is an optional attribute.
- B. Origin is an optional attribute.
- C. Next-hop is an optional attribute.
- D. Local Preference is an optional attribute.
- E. AS-Path is a well-known mandatory attribute.
- F. Community is a well-known mandatory attribute.

Answer: A, D(?), E

Explanation:

A: The Multiple Exit Discriminator (MED) attribute is optional.

D: The local preference attribute is used to prefer an exit point from the local autonomous system (AS). It is a well-known discretionary attribute. an optional attribute

E: When a route advertisement passes through an autonomous system, the AS number is added to an ordered list of AS numbers that the route advertisement has traversed. The AS-Path attribute is mandatory.

Note: BGP metrics are called path attributes. Optional attributes are recognized by some implementations, but are expected not to be recognized by everyone. A well-known mandatory attributes must be present in all update messages.

The attributes defined by BGP include:

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Well-known mandatory attributes:

- AS-path
- Next-hop
- Origin

Well-known discretionary attributes:

- Local preference
- Atomic aggregate

Optional transitive attributes:

- Aggregator
- Communities

Optional non-transitive attribute:

- Multi-Exit-Discriminator (MED)

Reference: Border Gateway Protocol

http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/bgp.htm

Incorrect Answers

- B:** The origin attribute indicates how BGP learned about a particular route. It can have three values: IGP, EGP or incomplete. It is a required attribute.
- C:** The EBGP next-hop attribute is the IP address that is used to reach the advertising router. It is a required attribute.
- F:** The community attribute provides a way of grouping destinations, called communities, to which routing decisions can be applied. It is not mandatory.

QUESTION NO: 188

Which two statements are true about BGP peering? (Choose two.)

- A. Periodic keepalives are used to verify connectivity.
- B. Incremental keepalives are used to verify connectivity.
- C. It provides a reliable connection between two BGP routers.
- D. It provides a “best effort” connection between two BGP routers.

Answer: A, C

Explanation:

Incorrect Answers

- A:** The default keepalive frequency is 60 seconds.
- C:** BGP peering provides a reliable connection between BGP routers.

Reference: BGP Peer Groups

<http://www.cisco.com/warp/public/459/29.html>

Incorrect Answers

- B:** Keepalives messages are not incremental.
- D:** BGP peers form a reliable connection.

QUESTION NO: 189

You have limited router memory. What does Cisco suggest as the best way to connect to multiple ISPs using BGP?

- A. receive only default routes.
- B. receive only partial BGP routes.
- C. receive only internal BGP routes.
- D. receive only redistributed routes.

Answer: A

Explanation: By only accepting default routes from the ISPs ensures a minimal impact on the system. There is no risk of having your autonomous system (AS) becoming a transit AS.

Note: One recommendation of Cisco, not listed here, is to use AS_PATH filters for accepting only routes originated from an ISP and its directly connected Autonomous Systems (AS), instead of receiving the full BGP routing table from an ISP.

Reference: Achieve Optimal Routing and Reduce BGP Memory Consumption
<http://www.cisco.com/warp/public/459/41.shtml>

QUESTION NO: 190

Which command displays the IBGP and EBGP neighbors that are configured?

- A. show ip bgp
- B. show ip bgp paths
- C. show ip bgp peers
- D. show ip bgp summary

Answer: D

Explanation: The **show ip bgp summary** command displays the status of all BGP connections. Neighbors with corresponding AS value will be listed, both interior and external.

Reference: BGP Commands

http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/12cgr/np1_r/1rprt1/1rbgp.htm

Incorrect Answers

A: The **show ip bgp** command displays routes in the BGP routing table, not the neighbors.

B: The **show ip bgp paths** command is used to display all the BGP paths in the database. However, it does not list the neighbors.

C: There is no such command.

QUESTION NO: 191

You explain to your TestKing trainee Bob that hierarchical IP addressing is preferred in larger internetworks. Bob asks to name to specific advantages. What should you tell him? (Choose two.)

- A. smaller routing tables
- B. efficient address allocation
- C. translation of private addresses
- D. support for link-state routing protocols

Answer: A, B

Explanation: Hierarchical IP addressing uses the addresses more conservatively. This also reduce the size of the routing tables.

QUESTION NO: 192

Which three UDP ports are enabled automatically when the ip helper-address commands is used on a router? (Choose three.)

- A. 53 (DNS)
- B. 69 (TFTP)
- C. 515 (LPR)
- D. 161 (SNMP)
- E. 49 (TACACS)

Answer: A, B, E

Explanation: To forward the BootP/DHCP request from the client to the DHCP server, the **ip helper-address interface** command is used. The IP helper-address can be configured to forward any UDP broadcast based on UDP port number. By default, the IP helper-address will forward the following UDP broadcasts:

- DNS (port 53), time service (port 37)
- Trivial File Transfer Protocol (TFTP) (port 69)
- Terminal Access Control Access Control System (TACACS) service (port 49)
- NetBIOS name server (port 137)
- NetBIOS datagram server (port 138)
- Boot Protocol (DHCP/BootP) client and server datagrams (ports 67 and 68)
- IEN-116 name service (port 42)

Reference: Understanding and Troubleshooting DHCP in Catalyst Switch or Enterprise Networks
<http://www.cisco.com/warp/public/473/100.html>

QUESTION NO: 193

You have configured multiple IP routing protocols on a single router and need to check the filtering of protocols. Which command lists the filters applied to inbound and outbound routing updates on a routing protocol basis?

- A. show ip
- B. show ip route
- C. show ip protocols
- D. show ip interface

Answer: C

Explanation: The command **show ip protocols** command is used to display the parameters and current state of the active routing protocol process. The information is presented on a routing protocol basis and include applied inbound and outbound filters.

Incorrect Answers

A: Show ip is an incomplete command.

B: The **show ip route** command displays active routes, not information on filters.

D: The **show ip interface** command lists a summary of an interface's IP information and status. However, it does not list the filters applied on a routing protocol basis.

QUESTION NO: 194

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Which two routing protocols support load balancing over unequal cost paths? (Choose two.)

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

Answer: A, C

Explanation: IGRP and EIGRP support unequal cost path load balancing, which is known as variance. OSPF, RIP v1 and RIP v2 do not support this.

Reference: How Does Unequal Cost Path Load Balancing (Variance) Work in IGRP and EIGRP?
<http://www.cisco.com/warp/public/103/19.html>

QUESTION NO: 195

Which three protocols support variable-length subnet masks (VLSM)? (Choose three.)

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

Answer: A, C, D

Explanation: IS-IS, EIGRP, OSPF, RIP V2 and static route support VLSM.

Reference: Cisco, Configuring IP Routing Protocols

QUESTION NO: 196

What must a router determine in order to route data?

- A. the route age of the next-hop device
- B. the subnet mask of the source network
- C. the cost metric of the path of the destination

D. the outbound interface of the best path to the destination

Answer: D

Explanation: In order to route the data to the correct destination the router must know the outbound interface that provides the best destination.

The other alternatives do no apply.

QUESTION NO: 197

Which two Cisco IOS commands are used to view the state of the link, such as exstart, exchange, or full? (Choose two.)

- A. show ip ospf
- B. show ip protocols
- C. show ip ospf neighbor
- D. show ip ospf interface

Answer: C, D

Explanation: The link state exstart is an OSPF link state (see note below). We need retrieve OSPF link state information.

C: The output of the **show ip ospf neighbor** command is used To display OSPF-neighbor information on a per-interface basis. It includes link state information.

D: The **show ip ospf interface** command is used to display OSPF-related interface information for a particular interface. This includes the link state of the specified interface.

Note, exstart state: After two OSPF neighboring routers establish bi-directional communication and complete DR/BDR election (on multi-access networks), the routers transition to the exstart state.

Reference: Cisco, IP Routing Protocols Commands

Incorrect Answers

A: The **show ip ospf** command is used to display general information about OSPF routing processes. However, it does not include any link state information.

B: The command **show ip protocols** displays the parameters and current state of the active routing protocol process. It does not show any link state information.

QUESTION NO: 198

Which command should you use to verify what networks are being routed by a given OSPF process?

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- A. show ospf
- B. show ip route
- C. show ip protocols
- D. show ip ospf database

Answer: B

Explanation: We should simply display the routing table with the **show ip route** command. The process-id can be specified.

Note: Syntax

show ip route [*address* [*mask*] [**longer-prefixes**]] | [*protocol* [*process-id*]]

Reference: Cisco, IP Routing Protocols Commands

Incorrect Answers

A: The **show ip ospf** would be good, but there is no **show ospf** command.

C: The command **show ip protocols** displays the parameters and current state of the active routing protocol process.

D: The **show ip ospf database** command is used to display lists of information related to the OSPF database for a specific router.

QUESTION NO: 199

Which kind of router has an interface in two or more OSPF areas?

- A. ABR
- B. ASBR
- C. internal router
- D. backbone router

Answer: A

Explanation: An ABR (Area Border Router) share an interface with at least one other OSPF area.

Incorrect Answers

B: An ASBR (Autonomous System Border Router) have at least one interface in a non-OSPF network.

C: An internal router is only connected to routers in the internal area.

D: A backbone router has at least one interface in the backbone, also known as Area 0.

QUESTION NO: 200

Which statement about route summarization in OSPF is true?

- A. Type 3 and type 4 LSAs carry external summarized routes.
- B. Summarization prevents type 1 link LSAs from being propagated into the backbone area0.
- C. Route summarization can be performed at any point in the network where enough contiguous addresses are present.
- D. Route summarization reduces the amount of bandwidth, CPU, and memory resources consumed by the OSPF process.

Answer: D

Explanation: Route summarization will increase performance by reducing the workload on the router.

QUESTION NO: 201

You are configuring an ABR in an OSPF network. What does it connect to?

- A. multiple OSPF areas
- B. OSPF and RIP networks
- C. multiple designated routers
- D. multiple OSPF autonomous systems

Answer: A

Explanation: An ABR (Area Border Router) share an interface with at least one other OSPF area.

QUESTION NO: 202

The following example is a configuration on a 256kbps HDLC interface.

```
interface serial 0/0
bandwidth 56
ip bandwidth-percent eigrp 1 200
```

Based on this example, how much bandwidth is allocated for EIGRP traffic?

- A. 56 kbps
- B. 112 kbps
- C. 128 kbps
- D. 200 kbps

E. 256 kbps

Answer: B

Explanation: The ip bandwidth-percent eigrp command is used to configure the percentage of bandwidth that may be used by Enhanced IGRP (EIGRP) on an interface. In this scenario 200% of 56 kbps is chosen. This is 112 kbps.

Note: Syntax

ip bandwidth-percent eigrp *as-number percent*

The percent can be higher than 100%.

Reference: Cisco, Enhanced IGRP Commands

QUESTION NO: 203

What state must an OSPF router be in to route traffic?

- A. full state
- B. active state
- C. two-way state
- D. forwarding state

Answer: A

Explanation: Full is the normal state for an OSPF router. In this state, routers are fully adjacent with each other and the router is routing traffic.

Note: An OSPF router can be in one of the following states: down, attempt, init, 2-way, exstart, exchange, loading, or full.

Reference: OSPF Neighbor States

<http://www.cisco.com/warp/public/104/13.html>

RFC2328, OSPF Version 2

Incorrect Answers

B: An IGRP or EIGRP router can be in an active state, but an OSPF cannot be in an active state.

C: At the two-way state, a router decides whether to become adjacent with this neighbor. However, routes are not exchanged between the routers.

D: An interface (link) can be in a forwarding state, but not a router.

QUESTION NO: 204

When a static route is configured on a router and that router must advertise it to the other routers in the network, which statement is true?

- A. The router automatically advertises static routes to RIP routers.
- B. You should configure redistribution using the **redistribute** command.
- C. You should enable static advertisement using the **static routes advertise** command.
- D. You should include the static route in a distribution list using the **distribute-list** command.

Answer: B.

Explanation: If you want a router to advertise a static route in a routing protocol, you will need to redistribute it.

- A:** Static routes are not automatically redistributed when they are configured. Static routes must be redistributed manually.
- C:** There is no static route advertise command.
- D:** There is no distribute-list command.

Catherine Paquet and Diane Teare, "Building Scalable Cisco Networks" (Cisco Press 2001), p 465.

QUESTION NO: 205

Which command ensures that permanently created route entries are injected into the routing process?

- A. inject static
- B. inject permanent
- C. redistribute all
- D. redistribute static

Answer: D

Explanation: If you define a static route to an interface that is not one of the networks defined in a network command, no dynamic routing protocols will advertise the route unless a redistribute static command is specified for these protocols.

Reference: Cisco, Configuring IP Routing Protocol-Independent Features

Incorrect Answers

A: The **inject static** is used to configure legacy DECnet systems.

- B: There is no such command.
- C: The command does not apply here.

QUESTION NO: 206

Exhibit Router TK:

```
router bgp 65300
network 27.0.0.0
neighbor 192.23.1.1 remote-as 65300
```

What type of relationship is neighbor 192.23.1.1 to Router TK?

- A. a peer router running IBGP
- B. a peer router running EBGP
- C. a community member running IBGP
- D. a peer group member running IBGP
- E. a peer group member running EBGP

Answer: A

Explanation: Both the local and remote router has the same AS number so they are peer routers running IBGP.

QUESTION NO: 207

You would like to configure a route map that will modify the metric for the network in the following access list:

```
access-list 5 permit 176.234.5.0
```

Drag the commands in the proper order to configure the route map. You are not required to apply the route map at this time.

Place here

Router(config)#

Place here

Router(config-route-map)#

Place here

Router(config-route-map)#

Place here

Select from these

Set distance 30

Set administrative- distance 30

Set metric 30

Match network 5

Match ip-class 5

Match ip address 5

Route-map permit ip 10 **testk**

Route-map **testk** permit 10

Answer:

	Place here	Select from these
Router(config)#	Route-map testk permit 10	Set distance 30
Router(config-route-map)#	Match ip address 5	Set administrative- distance 30
Router(config-route-map)#	Set metric 30	Match network 5
		Match ip-class 5
		Route-map permit ip 10 testk

Explanation:

Step 1: First we must enter Route-Map Configuration mode. We issue the following command
route-map testk permit 10

Testk is the tag, we permit (the alternative is to deny), and we use the sequence number 10.

Step 2: We define the match condition.

Match ip address 5

We match the IP address to the IP address of access-list 5, namely 176.234.5.0.

Step 3: We apply the set statement.

set metric 30

We should simply change the metric.

Note: Syntax route-map

route-map map-tag [[permit | deny] | [sequence-number]]

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Each route map will consist of a list of match and set configuration. The match will specify a match criteria and set specifies a set action if the criteria enforced by the match command are met.

The related commands for **match** are: match as-path, match community, match clns, match interface, match ip address, match ip next-hop, match ip route-source, match metric, match route-type, match tag.

The related commands for **set** are: set as-path, set clns, set automatic-tag, set community, set interface, set default interface, set ip default next-hop, set level, set local-preference, set metric, set metric-type, set next-hop, set origin, set tag, set weight.

Reference: RSM and RSFC Command-Line Interface

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat5000/rel_5_2/layer3/cli.htm

Incorrect Answers:

Route-map permit ip 10 testk

The command has the wrong syntax. The tag (here: word), must be immediately after the keyword route-map.

Match ip-class 5 and Match ip-class 5

There are no such commands.

Set distance 30 and Set administrative- distance 30

There are no such commands.

QUESTION NO: 208

Your trainee is unsure on the concept of classless routing protocols. What should you tell him about classless routing protocols?

- A. A default gateway is required.
- B. Variable-length subnet masks are not supported.
- C. Routers are automatically summarized to class boundaries.
- D. Networks with different subnet masks can exist in the same address class.

Answer: D

Explanation: Classless routing protocols understand that different routes within a major network can have different masks.

Incorrect Answers

A: There is no requirement for a default gateway.

- B:** Classless routing protocols advertise the routing mask for each route. This enables VLSM (variable length subnet masks).
- C:** With class routing the summarization process is manually controlled and can be invoked at any point within the network. It is not limited to class boundaries.

QUESTION NO: 209

The local technician is curious about routing tables on Cisco routers. What should you tell him?

- A. Entries are listed in the order of the route cost metric.
- B. Only the active link is shown for load-balanced routers.
- C. Privileged EXEC mode is required to view the routing table.
- D. The `clear ip route *` command refreshes the entire routing table.

Answer: C

Explanation: The `show ip route` command is used to display IP routing table entries. It can only be run in privileged (enable) mode.

Incorrect Answers

- A:** Entries are not listed in route cost order.
- B:** The other links in the load balanced bundle are also shown.
- D:** The `clear ip route` command is used to delete IP routing table entries. In particular the `clear ip route *` (or `clear ip route all`) command delete IP routing table entries. This is not a refresh. Static routes will not be recreated.

QUESTION NO: 210

Link state protocols have a hierarchical design. Which advantages does this bring? (Choose two)

- A. It allows link-state protocols to support VLSM.
- B. It allows them to support address summarization.
- C. It reduces the need to flood LSAs to all devices in the internetwork.
- D. Routers are no longer required to keep track of the topology of the entire area.

Answer: B, C

Explanation:

- B:** Most link-state routing protocols require a hierarchical design, especially to support proper address summarization.

C: Hierarchical design can limit the requirement to notify all devices. The use of areas restricts the flooding to the logical boundary of the area rather than to all devices in the OSPF domain.

QUESTION NO: 211

Most distance vector routing protocols use the Bellman-Ford (B-F) algorithm for route calculation. However, the Diffusing Update algorithm (DUAL) is a more advanced algorithm. Which routing protocol use DUAL?

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

Answer: C

Explanation: The Enhanced Interior Gateway Routing Protocol (EIGRP) use DUAL for route calculation.

QUESTION NO: 212

You are deploying a large network. Which two routing protocols should you definitely not use? (Choose two)

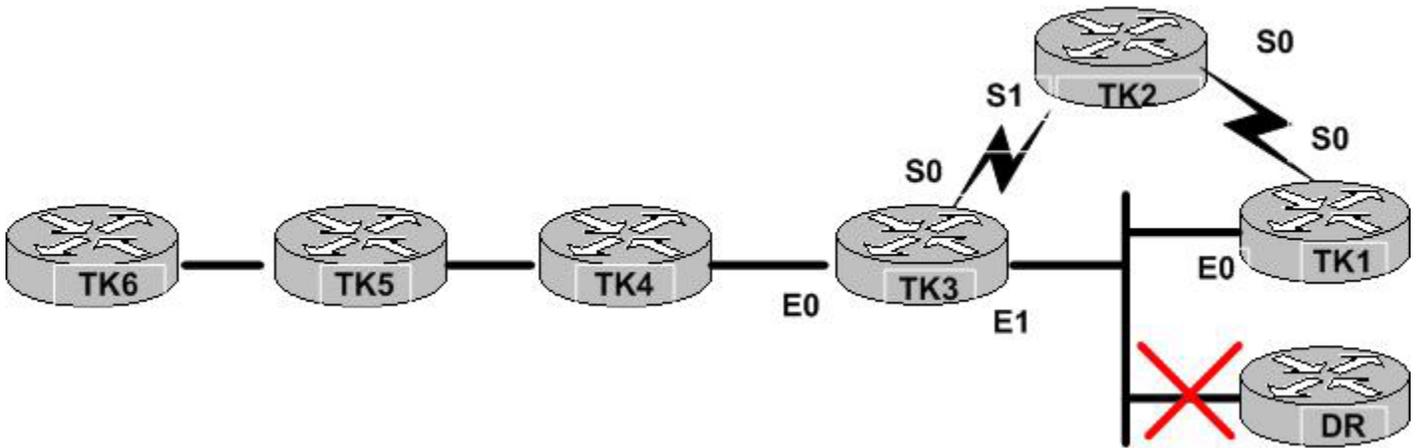
- A. IGRP
- B. OSPF
- C. EIGRP
- D. RIP v.2
- E. RIP v.1

Answer: D, E

Explanation: RIP should only be used in relatively small networks. A large network would be congested by RIP broadcasts. These frequent broadcasts contain the entire routing and table.

QUESTION NO: 213

Diagram:



You are managing a network which uses the OSPF routing protocol. What action will Router TK1 and Router TK3 take if link to the designated router (DR) goes down?

- A. They send a flash update with poison reverse.
- B. They perform the designated router election process.
- C. They re-broadcast their routing tables to all other neighboring routers.
- D. They send a query to neighboring routers for other routers to the failed link.

Answer: B

Explanation: The first step is an election of a new DR.

Note: A Designated Router (DR) router is elected by all other routers on the same LAN to represent all the routers. Each network has one DR.

Incorrect Answers

A: IGRP and EIGRP use poison reverse. Poison reverse is not used by OSPF.

C, D: This is not the first step.

QUESTION NO: 214

You are about to introduce EIGRP in your network. You must consider redistribution between other routing protocols and EIGRP. Which three statements are valid? (Choose three)

- A. IPX RIP redistribution with IPX EIGRP is enabled by default.
- B. AppleTalk EIGRP and RTMP redistribution is enabled by default.
- C. EIGRP automatically redistributes route information with Novell RIP.
- D. Redistribution between EIGRP and IGRP is always enabled by default regardless of the AS number used.

Answer: A, B, C

Explanation:

A: IPX RIP redistribution with Enhanced IGRP is enabled by default.

B: AppleTalk RTMP redistribution is enabled by default.

C: EIGRP automatically redistributes route information with Novell RIP.

Note: Using a routing protocol to advertise routes that are learned by some other means, such as by another routing protocol, static routes, or directly connected routes, is called redistribution.

Incorrect Answers

D: Redistribution between EIGRP and IGRP in the same autonomous system is automatic. Manual configuration is required if different autonomous systems are used.

QUESTION NO: 215

You are managing a huge network:

- **multiple routing protocols are in use**
- **multiple Autonomous Systems (AS) are in use**
- **two-way redistribution is in use**

You need to redistribute between the different routing protocols but you are concerned about routing loops. What step should you take help avoid routing loops?

- A. Manually configuring the default metric.
- B. Manually configuring the default network.
- C. Manually configuring the default gateway.
- D. Manually configuring the gateway of last resort.

Answer: A(?)

Explanation: The metrics of one routing protocol do not necessarily translate into the metrics of another. In such situations, an artificial metric is assigned to the redistributed route. Because of this unavoidable tampering with dynamic information, carelessly exchanging routing information between different routing protocols can create routing loops,

Note: Using a routing protocol to advertise routes that are learned by some other means, such as by another routing protocol, static routes, or directly connected routes, is called redistribution.

QUESTION NO: 216

You are using policy-based routing. How should you prevent packets with no match in the route map from being returned to the normal forwarding process?

- A. Set the next-hop metric to 255 for packets without a match.
- B. Use a `set` statement to route packets to the null0 interface.
- C. Use a `deny all` statement as the last statement in the route map.
- D. Use a logical `OR` in the `match` statement to send packets to the null0 interface.

Answer: B

Explanation: If it is desired not to revert to normal forwarding and to drop a packet that does not match the specified criteria, then a `set` statement to route the packets to interface null 0 should be specified as the last entry in the route-map.

QUESTION NO: 217

You are managing a network.

- it uses the RIP routing protocol
- RIP will be upgrade to OSPF
- the private address 10.0.0.0 is used internally for routing

Your task is to ensure that RIP routes are redistributed into OSPF with a metric of 80.

Select the appropriate commands to achieve this goal.

Place here

RouterTestKing(config)#

Place here

RouterTestKing(config-router)#

Place here

RouterTestKing(config-router)#

Place here

Select from these

router ospf 13

router rip

redistribute ospf 13

redistribute rip

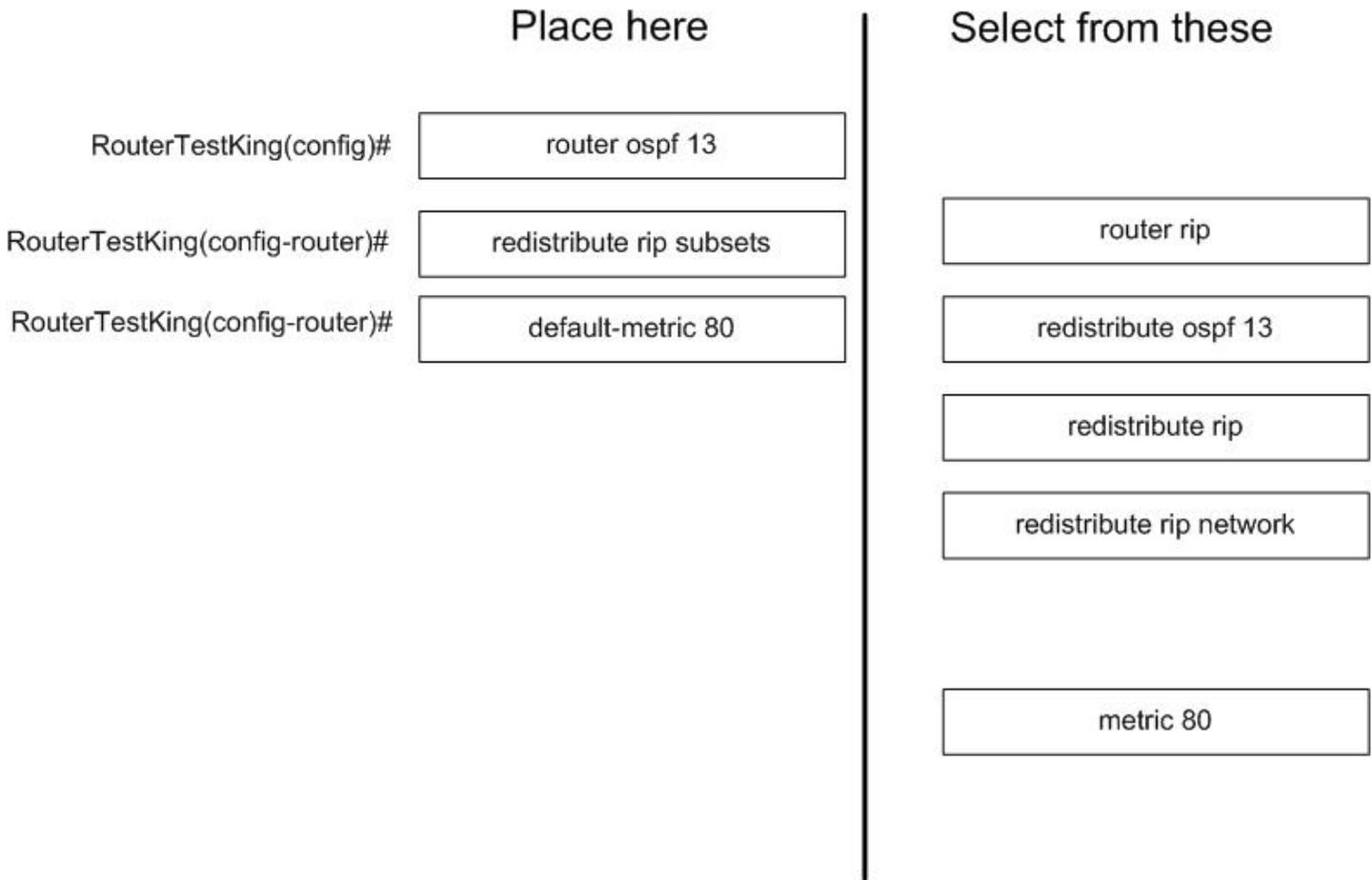
redistribute rip network

redistribute rip subsets

metric 80

default-metric 80

Answer:



Explanation:

Step 1: `router ospf 13`

We are distributing into ospf. 13 denotes the AS (autonomous system) in use (which we only can assume be 13).

Step 2: `redistribute rip subnets`

The RIP routes are redistributed into OSPF. The subnets keyword tells OSPF to redistribute all subnet routes. Without the subnets keyword, only networks that are not subnetted will be redistributed by OSPF.

Step 3: `default-metric 80`

Finally the default metric is set.

Reference: RIP and OSPF Redistribution

<http://www.cisco.com/univercd/cc/td/doc/cisintwk/ics/cs001.htm>

QUESTION NO: 218

A junior technician is configuring EIGRP. He knows that EIGRP supports five generic packet types. However, he is unsure which of these are reliable. What should you tell him? (Choose three)

- A. hello
- B. ACK
- C. reply
- D. query
- E. update

Answer: C, D, E

Explanation:

The ACK is used for acknowledging other types of packets. Those packets are considered reliable. Update, Query, and Reply.

Incorrect Answers

A, B: Hello and Ack are considered unreliable packets since they not require explicit acknowledgement:

QUESTION NO: 219

Your EIGRP network use Variable Length Subnet Masks (VLSM). Where does route summarization take place by default?

- A. At WAN interfaces.
- B. Manually at major network boundaries.
- C. Dynamically at discontinuous interfaces.
- D. Dynamically at major network boundaries.

Answer: D

Explanation: EIGRP supports arbitrary route summarization. Route summarization takes place automatically at major network boundaries (where network are supernetted).

Note: Route summarization is the consolidation of advertised addresses.

Incorrect Answers

A: EIGRP supports arbitrary route summarization.

B: Route summarization is automatic in EIGRP.

C: Route summarization can only be applied at contiguous interfaces.

QUESTION NO: 220

You are configuring a NBMA network that uses EIGRP as routing protocol. You must configure interface bandwidth for a point-to-point interface.

What is the best solution?

- A. The DLCI assigns the bandwidth for the interface.
- B. The sliding window size determines interface bandwidth.
- C. You use the default bandwidth assigned to the interface.
- D. You manually configure bandwidth as the CIR of the PVC.

Answer: D

Explanation: The bandwidth can be configured separately on each subinterface. Since this is NBMA we can assume that Frame Relay is used. For Frame Relay on point-to-point the bandwidth should be set it to the CIR of the PVC.

Note 1: NBMA (Non-broadcast Multi-access) supports many (more than two) routers, but have no broadcast capability. Frame Relay and X.25 are example of NBMA.

Note 2: The CIR (Committed Information Rate) is the committed rate (in bits per second) at which the ingress access interface trunk interfaces, and egress access interface of a Frame Relay network transfer information to the destination Frame Relay end system under normal conditions.

Reference: Configuration Notes for the Enhanced Implementation of EIGRP

<http://www.cisco.com/warp/public/103/12.html>

Incorrect Answers

- A:** Does not apply.
- B:** Sliding windows does not apply.
- C:** The bandwidth can and should be configured separately on each subinterface.

QUESTION NO: 221

A trainee is curious about the EIGRP. In particular he wants to know what could cause SIA (Stuck in Active) route. What should you tell him? (Select two.)

- A. Some query or reply packets are lost between the routers.
- B. The neighboring router stops receiving ACK packets from this router.
- C. The neighboring router starts receiving route updates from this router.
- D. A failure causes traffic on a link between two neighboring routers to flow in only one direction (unidirectional link).

Answer: A, D

Explanation: The acknowledgement does not reach the destination or they are too delayed.

Note: In some circumstances, it takes a very long time for a query to be answered. So long, in fact, that the router that issued the query gives up and clears its connection to the router that isn't answering, effectively restarting the neighbor session. This is known as a stuck in active (SIA) route. The most basic SIA routes occur when it simply takes too long for a query to reach the other end of the network and for a reply to travel back.

Reference: Enhanced Interior Gateway Routing Protocol
<http://www.cisco.com/warp/public/103/eigrp3.html>

Incorrect Answers

B: Ack packets don't reply to Query, only Reply do.

C: Does not apply to SIA.

QUESTION NO: 222

Exhibit:

variance number

You issue the EIGRP command shown in the exhibit. What is the function of *number*?

- A. It acts as a multiplier.
- B. It defines the limit for how far the metrics can be separated.
- C. It indicates how many paths can be used for load balancing.
- D. It indicates how many paths can be used for unequal load balancing.

Answer: A

Explanation: Every routing protocol supports equal cost path load balancing. IGRP and EIGRP also support unequal cost path load balancing, which is known as variance. The **variance number** command instructs the router to include routes with a metric less than or equal to **number** times the minimum metric route for that destination. Thus **number** is used as multiplier, even though it defines a limit for the metrics, This limit is used for unequal load balancing.

Reference: How Does Unequal Cost Path Load Balancing (Variance) Work in IGRP and EIGRP?
<http://www.cisco.com/warp/public/103/19.html>

Incorrect Answers

B: *Number* does not directly define a limit.

C, D: *Number* does directly indicate how many paths that can be used.

QUESTION NO: 223

You are required to implement a large network. Why should use OSPF and not RIP Version 1? (Select two.)

- A. Has faster convergence.
- B. Requires less router memory.
- C. Has fewer internal tables to manage.
- D. Has low bandwidth consumption using incremental updates.

Answer: A, D

Explanation:

A: OSPF has a faster convergence time than RIP.

D: OSPF use incremental updates, while RIP broadcasts the entire routing table.

Incorrect Answers

B: OSPF is more processor intensive. With faster processors this is not a big issue.

C: OSPF use a more complex algorithm. These algorithms require more internal tables.

QUESTION NO: 224

You examine an existing OSPF network segment. You notice that the Designated Router (DR) is overloaded. You would like to use another router as DR. How could you control the DR election process? (Select three.)

- A. Use of the `priority` command.
- B. Use of the `router-id` command.
- C. Assignment of the loopback address.
- D. The IP addresses assigned to internal interfaces.
- E. By adding additional memory to the desired router.

Answer: A, C, D

Explanation:

A: The OSPF router priority is only used on multi-access networks such as LAN's. This establishes whether the router is eligible to become the Designated Router (DR) for the LAN. A priority of 0 means that the router is not eligible to become DR.

C: The loopback address is used in DR election. The highest IP address on the router is the router ID. If a loopback address is configured, then it is the router ID.

D: The lower IP address the more likely a DR candidate.

Incorrect Answers

B: The **set ospf router-id** command, not the non-existent **router-id** command, is used to set a separate OSPF router ID for each interface or subinterface. The router ID is used to break ties during the DR and BDR election processes if the priority values are equal.

E: This would make it a more likely DR candidate.

QUESTION NO: 225

Exhibit:

```
interface serial 0
    ip address 164.67.36.1 255.255.255.224
    encapsulation frame-relay
    ip ospf network non-broadcast
!
router ospf 1
    network 164.67.36.0 31.255.255.255
    neighbor 164.67.36.2
    neighbor 164.67.36.3
```

You have configured a Cisco router as shown in the exhibit. What can be said about the configuration? (Choose two)

- A. There can be no DR or BDR in this configuration.
- B. This is a point-to-point configuration over Frame Relay.
- C. The network mode is nonbroadcast multiaccess (NBMA).
- D. The DR and BDR need a static list of neighbors due to non-broadcast.

Answer: A, C(?)

QUESTION NO: 226

The trainee is curious about EIGRP routing. What could you tell her? (Choose three)

- A. It sends periodic updates every 60 seconds.
- B. EIGRP uses DUAL to achieve rapid convergence.
- C. Adjacencies exist between master routers (MRs) in each domain.

- D. It uses multicast to discover other EIGRP routers on an internetwork.
- E. EIGRP provides support for multiple network layer protocols: IPX, AppleTalk, and IP.

Answer: B, D, E

Explanation:

B: Enhanced IGRP uses the Diffusing Updatebased algorithm (DUAL).

D: EIGRP use hello multicast packets for neighbor discovery/recovery

E: EIGRP supports IPX, Appletalk, IP, etc.

Reference: Introduction to Enhanced IGRP (EIGRP)

<http://www.cisco.com/warp/public/459/7.html>

Incorrect Answers

A: EIGRP use triggered updates, not periodic updates.

C: Each EIGRP router maintains a neighbor table that lists adjacent routers. However, there is no concept of master routers in EIGRP.

QUESTION NO: 227

Variable Length Subnet Masking (VLSM) is a useful feature of some routing protocols. What are true concerning VLSM? (Choose two)

- A. It supports IP version 4 and 6.
- B. It accommodates overlapping address ranges.
- C. It allows for better route summarization within routing tables.
- D. It allows subnetworks to be further divided into smaller subnets.

Answer: C, D

Explanation:

C: VLSM allows multiple levels of subnetted IP addresses within a single network, and thus allow for better route summarization within routing tables.

D: VLSMs provide the ability to include more than one subnet mask within a network, and the ability to subnet an already subnetted network address.

Incorrect Answers

A: VLSM was constructed for IP version 4.

B: Overlapping address ranges should not be used with VLSM.

QUESTION NO: 228

What are synonyms for route summarization? (Choose two)

- A. supernetting
- B. route aggregation
- C. address translation
- D. Classful interdomain routing

Answer: A, B

Explanation: 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.

QUESTION NO: 229

The number of entries in a routing table can be reduced by using route aggregation. Which of the following routing protocols support automatic route summarization? (Choose three)

- A. IS-IS
- B. IGRP
- C. OSPF
- D. EIGRP
- E. RIP v.1

Answer: B, D, E

Explanation: OSPF, IS-IS and EIGRP support manual route summarization.

B: IGRP automatically summarize routes on the class network boundary.

D: EIGRP support both manual and automatic route summarization.

E: RIPv1 automatically summarize routes on the class network boundary.

Incorrect Answers

A: IS-IS only support manual route summarization.

C: OSPF only support manual route summarization.

QUESTION NO: 230

You would like the SNMP broadcasts packets to be going to a specific server. Which command should you use?

- A. ip server udp 161
- B. ip helper-protocol 161
- C. ip forward-protocol 161
- D. ip directed-broadcast 161

Answer: C

Explanation: SNMP requests are typically sent to UDP port 161.

The **ip forward-protocol** command is used to specify which protocols and ports the router forwards when forwarding broadcast packets. If an IP helper address is defined, UDP forwarding is enabled on default ports.

Note, syntax: **ip forward-protocol** {**udp** [*port*] | **nd** | **sdns**}

Incorrect Answers

A: There use of **ip server udp** is not correct.

B: There is not such command.

D: The **ip directed-broadcast** command is used to enable the translation of directed broadcast to physical broadcasts. It does not apply in this scenario. Furthermore, an access-list with number 161 has to be configured.

Syntax: **ip directed-broadcast** [*access-list-number*] | [*extended access-list-number*]

QUESTION NO: 231

You are administering a network that use the Border Gateway Protocol (BGP) for routing. Specific IBGP routers advertise learned to other IBGP neighbors. Which routers advertise these routes?

- A. client
- B. EBGP peer
- C. route reflector
- D. cluster of clients

Answer: C

Explanation: Ordinarily, with no route reflector, a full mesh of IBGP peers is required. Route reflectors modify the BGP split horizon rule by allowing the router configured as the route reflector to propagate routes learned by IBGP to other IBGP peers. Route reflectors reduce the number of BGP neighbor relationships in an AS.

QUESTION NO: 232

You are configuring a Border Gateway Protocol (BGP) prefix list on your Cisco router. Which of the following statements is valid concerning BGP prefix lists?

- A. They start at 10 by default.
- B. They automatically increment by ten by default.
- C. They are displayed using the `show ip prefix-list` command.
- D. They are displayed using the `show bgp prefix-list` command.

Answer: C

Explanation: The `show ip prefix-list` command is used to display information about a prefix list or prefix list entries.

Note: Filtering by prefix list involves matching the prefixes of routes with those listed in the prefix list, similar to using access lists.

Incorrect Answers

- A, B:** By default, the entries of a prefix list will have sequence values of 5, 10, 15 etc. They start at 5 and increment by 5.
- D:** No such command.

QUESTION NO: 233

You have an internal autonomous system that use OSPF an EIGRP. You use BGP between this location and a remote location. You configure redistribution from these IGP protocols (OSPF and EIGRP) into BGP. What happens when dynamically learned routes from the IGP protocols are redistributed into BGP? (Select two.)

- A. Routing loops can occur.
- B. The IGP routing table is reduced.
- C. External IGP learned routes might not necessarily have originated in this AS.
- D. Route processing is done using process switching instead of cache switching.

Answer: A, C

Explanation: Typically, you redistribute IGP routes (such as Enhanced IGRP, IGRP, IS-IS, OSPF, and RIP routes) into BGP.

Some of your IGP routes might have been learned from BGP (C), so you need to use access lists to prevent the redistribution of routes back into BGP, or else routing loops can occur (A).

Reference: Using the Border Gateway Protocol for Interdomain Routing
<http://www.cisco.com/univercd/cc/td/doc/cisintwk/ics/icsbgp4.htm>

QUESTION NO: 234**Exhibit:**

Your network: 164.67.36.0/24
 Your AS number: 300
 AS number of ISP1: 1005
 AS number of ISP2: 1010

You are required to advertise your network to the two ISPs which are connected to your router. Which commands should you use?

- A.

```
router bgp 1005
network 164.67.36.0 mask 255.255.255.0
neighbor 15.1.1.1 remote-as 1005
neighbor 25.1.1.1 remote-as 1010
```
- B.

```
router bgp 300
network 164.67.36.0 mask 255.255.255.0
neighbor 15.1.1.1 remote-as 1005
neighbor 25.1.1.1 remote-as 1010
```
- C.

```
router bgp 300
network 164.67.36.0
neighbor 15.1.1.1 remote-as 1005
neighbor 25.1.1.1 remote-as 1010
```
- D.

```
router bgp 1010
network 164.67.36.0
neighbor 15.1.1.1 remote-as 1005
neighbor 25.1.1.1 remote-as 1010
```

Answer: B**Explanation:**

Step 1: `router bgp 300`

The **router bgp** command is used to activate the BGP protocol and identify the local autonomous system.

Step 2: `network 164.67.36.0 mask 255.255.255.0`

The **network** command controls which networks are originated by this router.

Syntax: `network network-number network-mask`

Step 3:

```
neighbor 15.1.1.1 remote-as 1005
neighbor 25.1.1.1 remote-as 1010
```

The **neighbor remote-as** command to identify a peer router with which the local router will establish a session.

Incorrect Answers

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- A, D:** We must specify the local autonomous system in the **router bgp** command. We must use AS 300, not AS 1005 or AS 1010
- C:** Both the network number and the network mask must be specified with the **network** command.

QUESTION NO: 235

You are required to design and implement a multiple OSPF area network. What must you take in consideration? (Choose two)

- A. Each area must connect to area 0.
- B. Each area must have a unique AS number.
- C. Remote areas must be configured as stub or NSSA areas.
- D. Traffic between two areas must travel across the backbone area.

Answer: A, B

Explanation:

- A:** In OSPF, all areas must be connected to a backbone area, area 0.
- B:** Each area must have a unique AS number

Incorrect Answers

- C:** Remote areas are not required to be either sub or Not so stubby areas.
- D:** Routing information between two areas must travel across the backbone. Ordinary traffic does not have to go through the backbone.

QUESTION NO: 236

OSPF use 5 different Link State Advertisements (LSAs): Type 1, Type 2, Type 3, Type 4, and Type 5. What type of information is found in network summary link LSA of Type 3?

- A. Summary of routes in the AS.
- B. Summary of link states in an OSPF area.
- C. Summary of IP subnets in an OSPF area.
- D. Summary of metric costs from ABR to ASBR.

Answer: A

Explanation: Type-3 LSAs describe routes to networks within the local area and are sent to the backbone area.

QUESTION NO: 237

You are configuring multiple OSPF areas. A junior technician is curious on what benefits you expect to achieve. What should you tell him? (Choose two)

- A. It eliminates the need for a DR or BDR in the OSPF network.
- B. It eliminates security concerns by segregating portions of the network.
- C. Type 1 and 2 LSAs are confined to a single area, reducing routing overhead.
- D. Area members have smaller topological databases than if the network was one large area, requiring less CPU to derive routes.

Answer: C, D

Explanation:

C: Link State update (LSU) traffic is reduced. Rather than send an LSU about each network within an area, you can advertise a single or fewer summarized routes between areas to reduce the overhead associated with linkstate updates when they are crossing areas.

Note: All LSA types, except the AS-external-LSAs (LS type = 5), are flooded throughout a single area only.

D: Topological database size would decrease and fewer CPU cycles would be required to calculate routes.

Incorrect Answers

A: A DR and B+DR for each area would still be required.

B: Security concerns would not be eliminated.

QUESTION NO: 238

You plan to subnet an address with VLSM. What rules apply? (Choose three)

- A. A subnet is made up of all aggregated routes.
- B. A subnet can address hosts, or be further subnetted.
- C. A routing protocol must carry the subnet mask in updates.
- D. Summarized networks must have the same high-order bits.

Answer: B, C, D

Explanation: All these statements are true regarding VLSM subnetting.

B: A subnet can address hosts, or be further subnetted.

C: The subnet mask must be include in route updates.

D: Summarized routes must have the same network number, ie. the same high order bits.

Incorrect Answers

A: Route aggregation is not subnetting, it is supernetting.

QUESTION NO: 239

You need to connect a remote network with your central network. The central network is a OSPF network with multiple areas. You create a new area for the remote network. You are aware of that ordinarily a OSPF area should be connected to the backbone, area 0. However, circumstances require you to connect it to the existing area 2 instead. In order to make this configuration work you must make further configurations.

Which further configurations are required? (Select three.)

- A. There must be a virtual link.
- B. Area 2 must be a stub area.
- C. Area 2 cannot be a stub area.
- D. Area 2 must attach directly to area 0.
- E. Network summary link LSAs must be disabled.

Answer: A, C, D

Explanation:

A: There must be a virtual link from the new area to the backbone, area 0. The virtual link provides the disconnected area a logical path to the backbone.

C: The area through which you configure the virtual link, known as a transit area (here area 2), must have full routing information. It cannot be a stub area.

D: The transit area, area 2, must attach directly to area 0.

Reference: OSPF Virtual Link

<http://www.cisco.com/warp/public/104/ospfdb7.html>

Incorrect Answers

B: The transit area, area 2, cannot be a stub area.

E: This is not a requirement.

QUESTION NO: 240

OSPF use Link State Advertisements (LSAs). You are now interested of the status of the LSAs on your router:

- which LSAs have been sent
- which LSA have been received
- how long was it since the last LSA was received

Which command should you use to obtain the required information?

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- A. show ip ospf database
- B. show ip ospf neighbors
- C. show ip ospf protocols
- D. show ip ospf interfaces

Answer: A

Explanation:

The **show ip ospf database** command is used to display lists of information related to the OSPF topological, the link state, database for a specific router.

Sample output:

```
R_TestKing#show ip ospf database
OSPF Router with ID (192.168.0.12) (Process ID 1)
Router Link States (Area 0)
Link ID      ADV Router  Age   Seq#       Checksum    Link count
192.168.0.10 192.1680.10 817   0x80000003 0xFF56      1
192.168.0.11 192.1680.11 817   0x80000003 0xFD55      1
192.168.0.12 192.168.0.12 816   0x80000003 0xFB54      1
192.168.0.13 192.168.0.13 816   0x80000003 0xF953      1
192.168.0.14 192.168.0.14 817   0x80000003 0xD990      1
Net Link States (Area 0)
Link ID      ADV Router  Age   Seq#       Checksum
192.168.0.14 192.168.0.14 812   0x80000002 0x4AC8
```

Incorrect Answers

B: The **show ip ospf neighbor** is used to display OSPF-neighbor information on a per-interface basis. It does show the required information though.

Sample output:

```
Neighbor ID Pri State Dead Time Address Interface
192.168.0.13 1 2WAY/DROTHER 00:00:31 192.168.0.13 Ethernet0
192.168.0.14 1 FULL/BDR 00:00:38 192.168.0.14 Ethernet0
```

C: There is no such command.

D: The **show ip ospf interface** command is used to display OSPF-related interface information. It displays the circuit name and state, IP address, network mask, broadcast address, redundancy, Internet Control Message Protocol (ICMP) settings, and RIP settings. However, it does not display LSAs.

sample output:

```
RouterTK# show ip interfaces
IP Interface Summary:
Circuit Name:      VLAN2      State:      active
IP Address: 172.16.1.200  Network Mask: 255.255.0.0
Broadcast Address: 172.16.255.255 Redundancy: disabled
```

ICMP Redirect: enabled ICMP Unreachable: enabled
RIP: enabled

QUESTION NO: 241

Exhibit

```
router ospf 200
  network 203.42.67.0 0.0.0.255 area 7
  network 203.42.68.0 0.0.0.255 area 0
  area 7 stub no-summary
  area 7 default-cost 30
```

You configure an Area Border Router according the exhibit. What can be said about the following command? (Select two.)

```
area 7 stub no-summary
```

- A. Area 7 is a totally stubby area.
- B. If the backbone becomes discontinuous, traffic can be routed through area 7.
- C. Redistribution of other routing protocols takes place at the area designated router.
- D. Area 7 non-ABR routers contain only intra-area routing information and a default route.

Answer: A, D

Explanation: An extension to stub areas is what is called "totally stubby areas". Cisco indicates this by adding a "no-summary" keyword to the stub area configuration. A totally stubby area is one that blocks external routes and summary routes (inter-area routes) from going into the area .

Note: The **area stub** command is used to define an area as a stub area.

Syntax: **area** *area-id* **stub** [**no-summary**]

The **no-summary** optional parameter prevents an ABR from sending summary link advertisements into the stub area.

Reference: OSPF Design Guide

<http://www.cisco.com/warp/public/104/3.html>

QUESTION NO: 242

Your internal network is configured to use OSPF: Two gateway routers, TestKing1 and TestKing2 are injecting external routes learned through BGP into OSPF via redistribution. Router TestKing1 is injecting subnets in the range 142.14.64.0 through 142.14.95.0. Router TestKing2 is injecting subnets 142.14.96.0

through 142.14.127.0. Configure router TestKing1 to summarize the subnets into one range before injecting them into OSPF. The router has already been configured as follows:

TestKing1(config)#router ospf 200

TestKing1(config-router)#redistribute bgp 80 metric 1100 subnets

RouterTestKing1(config-router)#

Place here

Place here

Place here

Select from these

auto-summary

summary-address

network

142.14.0.0

255.255.224.0

0.0.31.255

142.14.64.0

Answer:

RouterTestKing1(config-router)#	summary-address	142.14.64.0	255.255.224.0
---------------------------------	-----------------	-------------	---------------

Select from these

auto-summary	network
142.14.0.0	0.0.31.255

Explanation: The **summary-address** router configuration command is used to create aggregate addresses for OSPF.

Simplified syntax: **summary-address** *address mask*

We study the subnets that the TestKing1 router is injecting in binary to decide where to summarize:

Decimal	1 st octet	2 nd octet	3 rd octet	4 th octet
142.14.64.0	10001110	00001110	01000000	00000000
142.14.95.0	10001110	00001110	01011111	00000000

255.255.224.0 11111111 11111111 11100000 00000000

The subnet we can summarize on is marked with red. This is the 142.14.64.0/19 network. It has a 255.255.224.0 subnet mask.

QUESTION NO: 243

Your company, TestKing Inc, has a central office and a remote branch office. Each site has a separate autonomous system (AS). You connect the central office to Internet through the remote AS.

How should we best set up routing into Internet in this scenario?

- A. IGP routing
- B. BGP routing
- C. Configure `ip route prefix mask`
- D. Configure `ip default-gateway ip address`

Answer: B

Explanation: Border Gateway Protocol (BGP) is used to exchange routing information for the Internet and is the protocol used between Internet service providers (ISP).

Reference: Border Gateway Protocol

http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/bgp.htm

Incorrect Answers

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- A:** Customer networks usually employ an Interior Gateway Protocol (IGP) such as RIP or OSPF for the exchange of routing information within their networks.
C, D: Too simplistic for this scenario.

QUESTION NO: 244

Which of the following statements is valid?

- A. Communication between BGP peers runs over RIP.
- B. Communication between BGP peers runs over TCP.
- C. Communication between BGP peers runs over UDP.
- D. Communication between BGP peers runs over ICMP.

Answer: B

Explanation: BGP communicate through a TCP connection.

Reference: Reference: Border Gateway Protocol

http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/bgp.htm

QUESTION NO: 245

Exhibit

```
router bgp 64000
network 17.0.0.0
neighbor 178.5.1.1 remote-as 64000
neighbor 197.4.1.2 remote-as 64100
```

You have configured your router RouterTK as shown in the exhibit. What will be the result? (Select two.)

- A. The router will address 178.5.1.1 runs IBGP with RouterTK.
- B. The router with address 178.5.1.1 runs EBGP with RouterTK.
- C. The router with address 197.4.1.2 runs EBGP with RouterTK.
- D. The router with address 178.5.1.1 runs as a community member with RouterTK.
- E. The router with address 197.4.1.2 runs as a peer group member with RouterTK.

Answer: A, C

Explanation:

The **router bgp** command is used to activate the BGP protocol and identify the local autonomous system.

The **neighbor** command activates a BGP session with another router using either IBGP or EBGP.

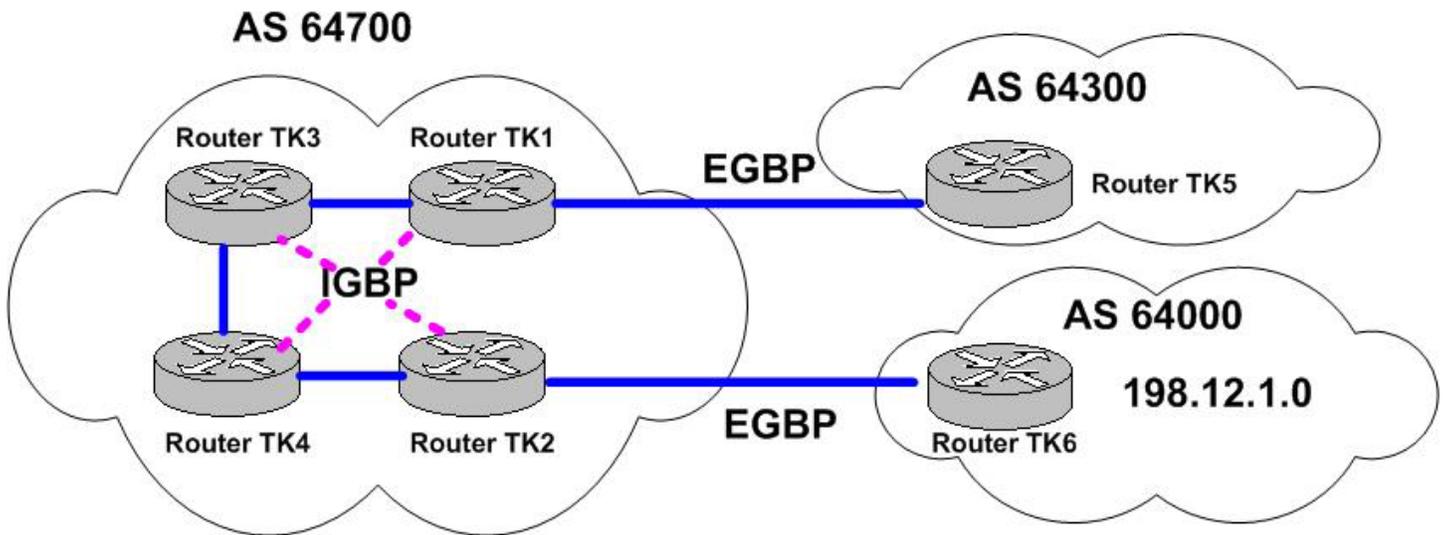
Syntax: `neighbor { ip-address|peer-group-name}remote-as autonomous-system`

The value placed in the autonomous system field of the neighbor command determines whether the communication with the neighbor is an EBGp or an IBGP session.

- A:** If the autonomous system field configured in the `router bgp` command is identical to the field in the `neighbor remote-as` command, then BGP will initiate an internal session (IBGP). Here both the local AS and the neighbor 178.5.1.1 are in the AS 64000.
- C:** If the field values are different, then BGP will initiate an external session (EBGP). The network 197.4.1.2 has a different AS number.

QUESTION NO: 246

Exhibit:



The only routing used on the routers is BGP and all routers use this routing protocol. Furthermore, in the AS 64700 BGP synchronization is off. To which routers will the route to 198.12.1.0 propagate?

- A. Router TK6
- B. Routers TK2 and TK6
- C. Routers TK2, TK4, and TK6
- D. Routers TK2, TK3, TK4, and TK6
- E. Routers TK1, TK2, TK3, TK4, and TK6
- F. Routers TK1, TK2, TK3, TK4, TK5, and TK6

Answer: F

Explanation: Router TK 6 will advertise the 192.12.1.0 route to Router TK2 using EBGp. This route would propagate to Router TK1, TK3, and TK4 through IBGP. And since synchronization is turned off Router TK1 will advertise the internally learned route to Router TK5 using EBGp.

QUESTION NO: 247

There are five paths from router TK to a given destination. The local EIGRP metrics (on router TK) for these paths are as follows:

Local

Path 1: 1500

Path 2: 1500

Path 3: 2000

Path 4: 4000

Path 5: 4000

Which variance 3 configured on Router TK, which paths are included in TK's routing table to get the destination?

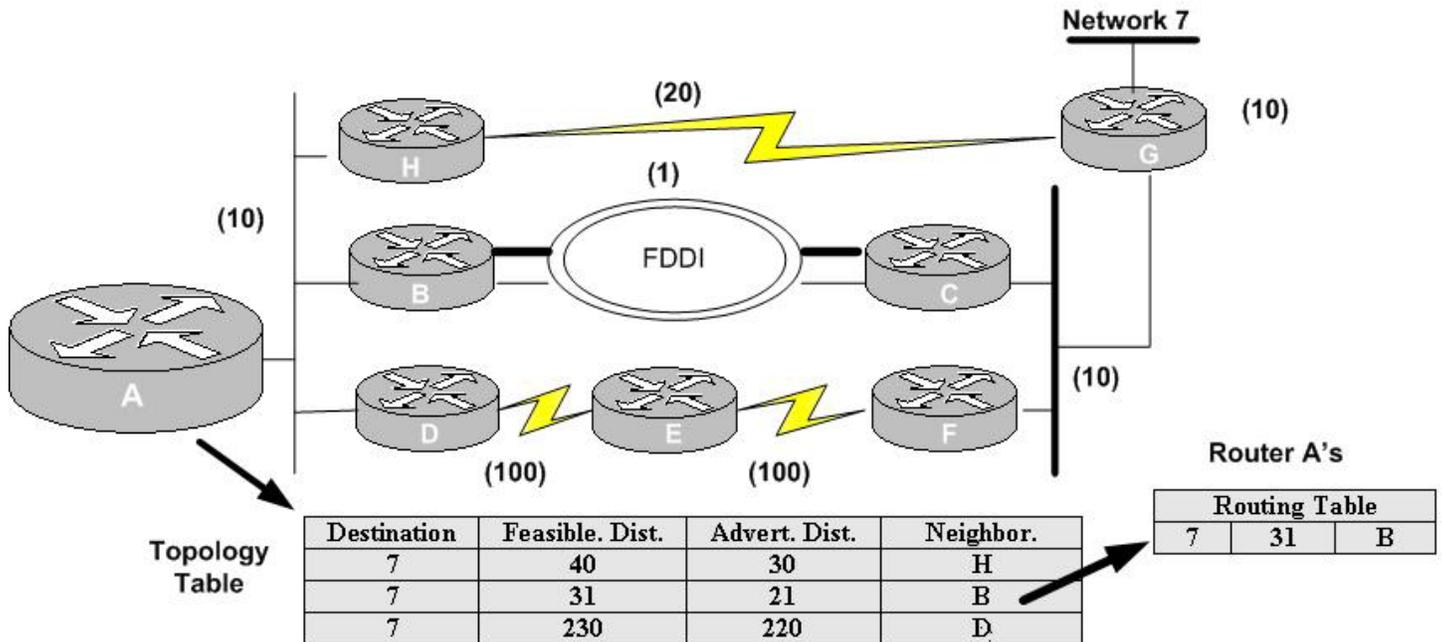
- A. path 1, 2, and 4
- B. path 1, 2, and 3
- C. path 1, 2, and 5
- D. path 1, 2, 4, and 5
- E. path 1, 2, 3, 4, and 5

Answer: E

Explanation: Variance allows the router to include routes with a metric smaller than *variance* times the minimum metric route to that destination. In this scenario variance is equal to 3. All paths with a value less than 4500 (1500×3) would be included in the routing table. All five paths would be included.

QUESTION NO: 248

Exhibit:



You are the administrator of the network shown in the exhibit. You shut down the FDDI interface on router B. Which router will afterwards be the EIGRP feasible successor to network 7 for router A?

- A. B
- B. D
- C. H
- D. There is no feasible successor

Answer: D

Explanation: Router H will be the successor, and that route will be placed in the Routing table.

Router A detects the link failure between Router B and network 7. It checks the topology table for a successor. It finds that H is the successor since the advertised distance for H (30) is less than the feasible distance for B (31).

However, there is no next best route – no feasible successor. The candidate route through D has an advertised distance (220) that is higher than the feasible distance of the successor route (40).

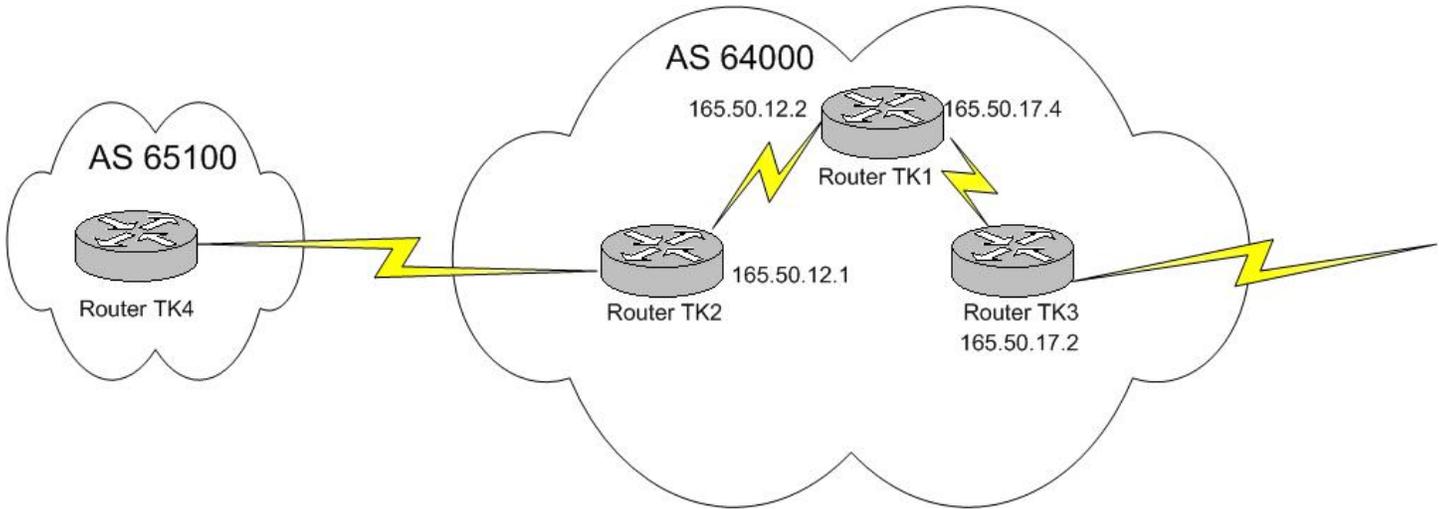
Note: Successor is a route selected as the primary route to use to reach a destination. Successors are the entries kept in the routing table.

A feasible successor is a backup route. These routes are selected at the same time the successors are identified, but they are kept in a topology table,

Incorrect Answers

A: The FDDI interface of B is down.

- B:** The candidate route through D has an advertised distance (220) that is higher than the feasible distance of the successor route (40). It cannot be used as a feasible successor.
- C:** Router H is the successor, not the feasible successor.

QUESTION NO: 249**Exhibit:**

You want to configure Router TK2 as a BGP route reflector and Router TK1 as its client. Router TK3 is not running BGP.

Which two commands are necessary on Router TK2? (Choose two)

- A. `neighbor 165.50.12.1 remote-as 65100`
- B. `neighbor 165.50.12.2 remote-as 64000`
- C. `neighbor 165.50.12.1 route-reflector-client`
- D. `neighbor 165.50.12.2 route-reflector-client`

Answer: B, D

Explanation:

B: RouterTK2(config-router)# **neighbor 165.50.12.2 remote-as 64000**

We configure router TK1 (165.50.12.2) as a neighbor in AS 64000.

D: RouterTK2(config-router)# **neighbor 165.50.12.2 route-reflector-client**

Configures the router TK2 as a BGP route reflector and configures the specified neighbor TK1 (165.50.12.2) as its client.

Incorrect Answers

- A:** We must specify router TK1 as neighbor, not TK2 itself (165.50.12.1). Furthermore, we should use the local AS (64000), not the remote AS 65100.
- C:** We must specify router TK1 as route reflector client, not TK2 itself (165.50.12.1).

QUESTION NO: 250

You want to populate the BGP table on your router with IGP routes. What is the best way to achieve this according to Cisco?

- A. Use the `network` command.
- B. Redistribute EBGP routes into BGP.
- C. Redistribute dynamic routes into BGP.
- D. Redistribute static routes into the IGP.

Answer: A

Explanation: For BGP the **network** command allows BGP to advertise a network that is already in the IP table.

Note: An alternate solution, not listed here, is to redistribute static routes.

Incorrect Answers

- B:** We want to distribute internal routes into BGP, not external routes.
- C:** Redistribution from the IGP is NOT advised because there is a great reliance on the IGP table. It could cause instability.
- D:** We want to populate the BGP table, not the IGP table.

QUESTION NO: 251

You want to deny default route 0.0.0.0 using a BGP prefix list. Which BGP prefix list should you use?

- A. `ip prefix-list abc deny 0.0.0.0/0`
- B. `ip prefix-list abc permit 0.0.0.0/32`
- C. `ip prefix-list abc deny 255.255.255.255/0`
- D. `ip prefix-list abc permit 255.255.255.255/32`

Answer: A

Explanation: To deny the default route 0.0.0.0/0 use the following command:

```
ip prefix-list abc deny 0.0.0.0/0
```

Incorrect Answers

B, D: We are required to deny it, not permit it.

C: We should simply list the route. Not the opposite of the route.

QUESTION NO: 252**Exhibit:**

```
routerTK>show ip bgp
```

```
BGP table version is 1046033, local router ID is 198.32.162.100
```

```
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
```

```
Origin codes: i - IGP, e EGP, ? -incomplete
```

	Network	Next Hop	Metric	LocPrf	Weight	Path
* >	143.16.0.0	128.214.63.2	0	400	0	200 1
*	143.16.0.0	192.208.10.5	0	300	0	300 1
*	143.16.0.0	143.16.63.5	0	100	0	200 1
*	143.16.0.0	203.250.13.41	0	100	0	500 1

What is the preferred path out of the AS that will be taken for the 128.213.0.0 network?

- A. 128.214.63.2
- B. 192.208.10.5
- C. 128.213.63.5
- D. 203.250.13.41

Answer: A

Explanation: Local preference (LocPrf) is a well-known discretionary attribute that provides an indication to routers in the AS about which path is preferred to exit the AS. A path with a higher local preference is more preferred. In this scenario the following entry has the highest local preference value of 400.

	Network	Next Hop	Metric	LocPrf	Weight	Path
* >	128.213.0.0	128.214.63.2	0	400	0	200 1

The preferred exit path of the AS is therefore 128.214.63.2-

QUESTION NO: 253

You configure a full mesh of BGP sessions within an AS (autonomous system). What will occur? (Select two)

- A. Many UDP session will be created.
- B. More memory and CPU are consumed.
- C. The configuration is not permitted by default.
- D. A significant amount of bandwidth for BGP updates and retransmissions can be used.
- E. Permanent Virtual Circuits (PVCs) must be created to link the fully meshed BGP sessions.

Answer: B, D (?)

Explanation:

B: More memory and CPU resources are required on the routers to support the full mesh BGP.

D: There will be many TCP sessions and a significant amount of bandwidth will be required for BGP traffic.

Incorrect Answers

A: Many TCP, not UDP, sessions will be created.

C: It is permitted.

E: PVCs are not required.

QUESTION NO: 254

Partial output of the show ip route command:

```
S    62.99.153.0/24 [1/0] via 209.177.64.130
    172.209.12.0/32 is subnetted, 1 subnets
D EX  172.209.12.1
    [170/2590720] via 209.179.2.114, 06:47:28, Serial0/0/0.1239
    62.113.17.0/24 is variably subnetted, 2 subnets, 2 masks
D    62.113.17.0/29 [90/30208] via 62.113.20.10, 07:35:24, ATMO/1/0.130
S    62.113.17.0/24 [1/0] via 62.113.1.25
D EX 99.3.215.0/24
    [170/27316] via 209.180.96.45, 09:52:10, FastEthernet11/0/0
    [170/27316] via 209.180.96.44, 09:52:10, FastEthernet11/0/0
D    25.248.17.0/24
    [90/1512111] via 209.179.66.25, 10:33:13, Serial0/0/0.1400001
    [90/1512111] via 209.179.66.41, 10:33:13, Serial0/0/0.1402001
    62.113.1.0/24 is variably subnetted, 12 subnets, 2 masks
D    62.113.1.227/32
    [90/24823552] via 209.180.96.45, 07:35:24, FastEthernet1/0/0
    [90/24823552] via 209.180.96.44, 07:35:24, FastEthernet1/0/0
S*  0.0.0.0/0 [1/0] via 209.180.96.14
```

Which network address is a static route entry in the exhibit above.?

- A. 99.3.215.0
- B. 62.99.153.0
- C. 172.209.12.1
- D. 62.113.1.227

Answer: B

Explanation: S denotes a static router (see below).

S 62.99.153.0/24 [1/0] via 209.177.64.130

Incorrect Answers

A, C: D EX denotes a route learned through EIGRP external.

D: D denotes a route learned through EIGRP.

QUESTION NO: 255

Different routing protocols use different metrics. Which routing protocols use the distance metric hop count? (Select two.)

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

Answer: D; E

Explanation: RIP use the hop count to measure the distance to a destination.

Reference:

Incorrect Answers

A, C: IGRP and EIGRP use a composite metric that is calculated by factoring weighted mathematical values for internetwork delay, bandwidth, reliability, and load

B: OSPF supports one or more metrics. It does not use hop counts however.

QUESTION NO: 256

You want to aggregate a route on your Cisco router. The router use EIGRP for routing. Which command should you use to configure a summary route?

- A. `ip auto-summary as-number address mask`
- B. `ip summary-address as-number address mask`
- C. `ip auto-summary eigrp as-number address mask`
- D. `ip summary-route eigrp as-number address mask`
- E. `ip summary-address eigrp as-number address mask`

Answer: E

Explanation: The `ip summary-address eigrp` command is used to configure a summary aggregate address for a specified interface.

Syntax: `ip summary-address eigrp autonomous-system-number address mask`

Incorrect Answers

A, C, D: No such command.

B: We must specify the appropriate protocol with the `eigrp` keyword.

QUESTION NO: 257

You work as a network consultant at TestKing inc. You are required to troubleshoot a network. Initial investigation reveals that OSPF is used. You suspect that there is a convergence problem. Which factors have an effect on the convergence of this network? (Select three.)

- A. Hold-down timers.
- B. The size of the network.
- C. The number of routing areas.
- D. Maximum allowed hop count.
- E. The route calculation algorithm.

Answer: B, C, E

Explanation: OSPF is a link state routing protocol.

B: The size of the network affects the size of the topology table on the routers. The larger topology table the slower convergence.

C: Areas are introduced to put a boundary on the explosion of link-state updates. The number of areas affects the convergence time.

E: The route calculation algorithm used for OSPF affects the convergence time.

Incorrect Answers

A: OSPF does not use hold-down timers. Instead topology changes are flooded immediately. Distance vector routing protocols use hold-down timers.

D: OSPF does not use hop count. Distance vector routing protocols use hop counts.

QUESTION NO: 258

Your trainee has difficulty in grasping the concept of link state protocols. What should you tell her about link state protocols?

- A. Link-state protocols do not support summarization.
- B. Static routes must be used to accommodate link redundancy.
- C. All routers in the area know when another router joins the area.
- D. Link-state protocols utilize spanning tree to propagate routing changes.

Answer: C

Explanation: All routers within an area will have the same view of the area – they will all have the same topology table. All of them will know when another router joins the area.

Incorrect Answers

A: Link State protocols support route summarization.

B: Link redundancy does not require use of static routes.

D: The spanning tree is not to propagate routing changes. Instead it used to find the shortest path to the destinations.

QUESTION NO: 259

What do we call the action which takes place when a topology change forces a synchronizing of the routing tables on the routers?

- A. flooding
- B. broadcasting
- C. convergence
- D. summarization

Answer: C

Explanation: A topology change forces a convergence of the routers to a new routing state. Convergence is the time that it takes for all routers to agree on the network topology after a change.

QUESTION NO: 260

Exhibit

```
show ip ospf interface
```

What parameters does the command shown in the exhibit provide? (Select two.)

- A. router ID
- B. summary link counts
- C. neighbor adjacencies
- D. link-state update interval

Answer: C, D

Explanation:

C: Neighbor adjacencies are included in the output of this command.

D: OSPF use the hello interval as update interval. The hello interval is displayed by this command.

Sample output:

```
RouterTestK#show ip ospf interface e0
Ethernet0 is up, line protocol is up
Internet Address 1.1.1.2 255.255.255.0, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 6.6.6.6, Interface address 1.1.1.1
Backup Designated router (ID) 5.5.5.5, Interface address 1.1.1.2
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 0:00:07
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 6.6.6.6 (Designated Router)
```

Incorrect Answers

A: The router ID will not be shown.

B: Summary link counts are not shown.

QUESTION NO: 261

In an OSPF network what occurs when a router detects a change in the network and tries to maintain route consistency?

- A. It enters the exstart state with its neighbors.
- B. It floods the area with new routing information.
- C. It generates a routing exchange using the hello protocol.
- D. It waits for the holddown timers to expire, then sends the update.

Answer: B

Explanation: Link state routing protocols generate routing updates only when there is a change in the topology. When a link changes state, a link-state advertisement (LSA) concerning that link (route) is created by the device that detected the change and propagated to all neighboring devices using a special multicast address. This process is called flooding.

Incorrect Answers

A: The exstart state is not entered when a change in the topology occurs.

Note: Once the DR and BDR have been elected, the routers are considered to be in the **exstart** state and are ready to discover the link-state information about the internetwork and create their link-state databases.

C: The hello protocol is not used to exchange routing information. The purpose of hellos is for identifying neighbors and verifying periodically that the neighbors exist.

D: OSPF does not use holddown timers like RIP. Topology changes are flooded immediately.

QUESTION NO: 262

You want to deploy BGP policy-based routing. You are concerned what will happen when the next hop router goes down and no alternative path is in place. What is true?

- A. If the next-hop router goes down and no alternative path is in place, policy routing will route to null 0.
- B. If the next-hop router goes down and no alternative path is in place, policy routing will default to another BGP path.
- C. If the next-hop router goes down and no alternative path is in place, policy routing will deny all traffic to that destination.
- D. If the next-hop router goes down and no alternative path is in place, policy routing will default to dynamic routing decisions.

Answer: C

Explanation:

Note: The BGP next-hop attribute is a well-known mandatory attribute that indicates the next hop IP address that is to be used to reach a destination.

QUESTION NO: 263

You are configuring your network routers with IBGP. What it is true?

- A. The IBGP routers must be fully meshed.
- B. The IBGP routers can be in a different AS.
- C. The IBGP routers must be directly connected.
- D. The IBGP routers do not need to be directly connected.

Answer: D

Explanation: The IBGP routers do not have to be directly connected.

Incorrect Answers

A: Using Route Deflectors a full mesh topology is not necessary.

B: The IBGP routers must be placed in separate anonymous area. .

C: The IBGP routers do not have to be directly connected.

QUESTION NO: 264

You are configuring your network routers with IBGP. What are true about BGP peer group in your network? (Select two.)

- A. Peer members inherit all options of the peer group.
- B. Peer groups can be used to simplify BGP configurations.
- C. Peer groups are optional non-transitive attributes for BGP.
- D. A peer group allows options that affect outbound updates to be overridden.
- E. A common name should be used on all routers because this information is passed between neighbors.

Answer: B, C

Explanation: A BGP peer group is a group of BGP neighbors with the same update policies.

B: Peer groups are useful to simplify configurations when many neighbors have the same policy.

C: Peer groups are optional for BGP. One peer group router does not transfer the peer group attribute to other routers, ie. it is non-transitive.

Incorrect Answers

A: Members of the peer group inherit all of the configuration options of the peer group. However, members can also be configured to override these options

D: Does not apply.

E: Not true.

QUESTION NO: 265

You are troubleshooting a router that is currently only using EIGRP for routing. You want to display statistics on the five generic packet types supported by EIGRP (hello, updates, queries, replies, and acknowledgments). Which command should you use?

- A. debug eigrp packets
- B. show ip eigrp traffic
- C. show ip eigrp topology

D. show ip eigrp neighbors

Answer: B

Explanation: The **show ip eigrp traffic** command displays the number of Enhanced IGRP (EIGRP) packets sent and received.

QUESTION NO: 266

You are configuring a BGP prefix list for the 192.0.0.0 network. You want it to permit all prefixes between /8 and /24. Which IOS command should you use?

- A. ip prefix-list 192.0.0.0/8 ge 8 le 24
- B. ip prefix-list 192.0.0.0/8 ge 24 le 8
- C. ip prefix-list 192.0.0.0/24 ge 24 le 8
- D. ip prefix-list 192.0.0.0/24 ge 8 le 24

Answer: A

Explanation: Greater than (ge) 8 and less than (le) 24. Furthermore we must specify an 8 bit network mask, not a 24 bit network mask.

Reference: Cisco, BGP Commands

QUESTION NO: 267

You are configuring a router with the IP Helper feature. Your TestKing trainee is curious about the purpose of this feature. What should you tell him?

- A. IP Helper is used to direct BOOTP clients to a BOOTP server.
- B. IP Helper is used to prevent the router from forwarding IP broadcasts.
- C. IP Helper is used to allow IPX clients to communicate with IP-based servers.
- D. IP Helper is used to accommodate compatibility routers using different IP routing protocols.

Answer: A

Explanation: The **ip helper-address** command is used to have the Cisco IOS software forward User Datagram Protocol (UDP) broadcasts, including BOOTP, received on an interface. DHCP protocol information is carried inside of BOOTP packets. To enable BOOTP broadcast forwarding for a set of clients, configure a helper

address on the router interface closest to the client. The helper address should specify the address of the DHCP server.

Note: A DHCP server can be considered to be a BOOTP server, even though a DHCP server is more advanced.

Incorrect Answers

B: Combined with the **ip forward-protocol** global configuration command, the **ip helper-address** command allows you to control which broadcast packets and which protocols are forwarded. However, the main purpose of the IP helper feature is not to prevent the router from forwarding IP broadcasts.

C: IP helper does not use IPX.

D: This is false.

QUESTION NO: 268

Your trainee is studying the mechanisms of OSPF. He is studying the different types of Link State Advertisements (LSAs). Among the five different LSA types, he is specifically interested in type 2 LSAs. You explain to him that LSA of type 2 are flooded within an OSPF area. Now the trainee wants you to tell him what kind of routers flood these type 2 LSA.

- A. DR
- B. ABR
- C. BDR
- D. ASBR

Answer: A

Explanation: Type 2 LSAs are generated by Designated Routers (DRs) in multiaccess networks. They describe the set of routers attached to a particular network and are flooded within the area that contains the network only.

Note: Instead of each router exchanging link-state information with every other router on the segment, each router sends the link-state information to the DR and Backup Designated Router (BDR). The DR sends each router's link-state information to all other routers in the network. This flooding process significantly reduces the router-related traffic on a segment.

Incorrect Answers

B: Area Border Routers generate Type 3 and Type 4 LSAs.

C: BDRs are just used for backup

D: Autonomous System Boundary Routers (ASBRs) generate Type 5 LSAs.

QUESTION NO: 269

You trainee is curious about multipoint Frame Relay interfaces. In particular, he wants to know how bandwidth per neighbor is determined on Frame Relay interface. What should you tell on how this bandwidth information is determined?

- A. Bandwidth command per neighbor.
- B. The configured CIR per subinterface.
- C. The configured CIR divided by the number of neighbors on that interface.
- D. Bandwidth of the main interface divided by the number of neighbors on that interface.

Answer: C

Explanation: When configuring multipoint interfaces, especially for Frame Relay, remember that all neighbors share the bandwidth equally.

QUESTION NO: 270

A trainee is curious about the EIGRP. In particular she wants to know what could cause SIA (Stuck in Active) route. What should you tell her? (Select two.)

- A. The neighboring router stops receiving ACK packets from this router.
- B. The neighboring router starts receiving route updates from this router.
- C. The neighboring router is too busy to answer the query (generally high CPU utilization).
- D. The neighboring router is having memory problems and cannot allocate the memory to process the query or build the reply packet.

Answer: C, D

Explanation: SIA is due the fact that reply packets are not received. This could be caused by a router which is unable to send reply packets. The router could have reached the limit of its capacity, or it could be malfunctioning.

Notes: If a router does not receive a reply to all outstanding queries within 3 minutes, the route goes to the stuck in active (SIA) state. The router then resets the neighbors that fail to reply by going active on all routes known through that neighbor, and it readvertises all routes to that neighbor.

Reference: Reference: Enhanced Interior Gateway Routing Protocol
<http://www.cisco.com/warp/public/103/eigrp3.html>

Incorrect Answers

- A:** Missing replies, not missing ACKs, cause SIA.
- B:** Routes updates do not cause SIA.

QUESTION NO: 271

You want to contain the EIGRP query traffic. What would be the most effective method?

- A. Route summarization.
- B. Configuring route filters.
- C. Using a hierarchical addressing scheme.
- D. Establishing separate autonomous systems.

Answer: A

Explanation: The best solution to control EIGRP queries is to reduce the range of queries. The most effective method to restrict the range of queries is the establishment of route summarization boundaries.

QUESTION NO: 272

One of your EIGRP routers is malfunctioning. After some initial troubleshooting you discover that it fails to establish adjacency with its neighbor. What could be the cause of this problem? (Select two.)

- A. K-values do not match.
- B. Hold times do not match.
- C. Hello times do not match.
- D. AS numbers do not match.

Answer: A, D

Explanation: Peer relationships, adjacency, between routers will not be formed if the neighbor resides in a different autonomous system or if the metric-calculation mechanism (K values) is mis-aligned for that link.

Incorrect Answers

B, C: It is possible for two routers to become EIGRP neighbors even though the hello and hold timers do not match.

QUESTION NO: 273

You work as a network administrator at TestKing inc. The company is planning to set up small remote offices with WAN connectivity to the central office. For this purpose they have set the network 165.35.76.0/26 aside. Now they want to use Variable Length Subnet Masking (VLSM) to further subnet this network. They want six usable host addresses at each remote location. Which would be the appropriate VLSM to use?

- A. /24
- B. /28
- C. /29
- D. /30
- E. /31

Answer: C

Explanation: To provide for six usable host addresses three host bits must be used. This would give exactly six host address ($2^3-2=6$). This would leave 29 ($32-3$) bits for the network mask.

QUESTION NO: 274

You are setting up a router environment with multiple OSPF areas. What should you do if you want to follow the official Cisco recommendations? (Choose two)

- A. There should not be more than three areas per route.
- B. Area 0 must be larger than any subsequent OSPF area.
- C. A router cannot be a DR or BDR for more than one LAN.
- D. You should not run more than one instance of the OSPF process on an ABR.

Answer: C, D

Explanation:

C: A router cannot be a DR or BDR for more than one LAN.

D: Running multiple OSPF processes on the same router is not recommended because it creates multiple database instances that add extra overhead.

Incorrect Answers

- A:** There is no such limit. The hierarchical structure could be larger.
- B:** There is no requirement that Area 0 must be the largest OSPF area.

QUESTION NO: 275

Your trainee is studying OSPF Link State Advertisements (LSAs). In particular she wants to know which LSA type is flooded by the DR listing all routers on the segment that it has neighbor relationships with. What is the corresponding LSA type?

- A. router link, type 1.

- B. network link, type 2.
- C. external link, type 5.
- D. network summary link, type 3.

Answer: B

Explanation: Network Link, LSA type 2 is generated by DRs in multiaccess networks. They describe the set of routers attached to a particular network. Flooded within the area that contains the network only.

Incorrect Answers

- A:** Router link, LSA type 1 is generated by each router for each area it belongs to. It describes the states of the router's link to the area.
- C:** External link, LSA type 5 is originated by the ASBR. It describes routes to destinations external to the autonomous system. It is flooded throughout an OSPF autonomous system except for stub and totally stubby areas.
- D:** Network summary link entry, LSA type 3 is originated by ABRs. It describes the links between the ABR and the internal routers of a local area. These entries are flooded throughout the backbone area to the other ABRs.

QUESTION NO: 276

Your trainee is studying OSPF Link State Advertisements (LSAs). She knows that there is a LSA type that is generated by Area Border Routers (ABRs) containing summarizations of that area's subnets. Which LSA type is she referring to?

- A. Router link, type 1.
- B. Router summary link, type 8.
- C. Network summary link, type 3.
- D. AS external summary link, type 4.

Answer: C

Explanation: Network summary link entry, LSA type 3 is originated by ABRs. It describes the links between the ABR and the internal routers of a local area. These entries are flooded throughout the backbone area to the other ABRs.

Incorrect Answers

- A:** Router link, LSA type 1 is generated by each router for each area it belongs to. It describes the states of the router's link to the area.
- B, D:** Do not apply here.

QUESTION NO: 277

Your TestKing trainee is studying multi-area OSPF networking. She knows that inter-area summarization occurs and produces type 3 and type 4 Link State Advertisements (LSAs) which are sent through the network. However, she is not sure which routers produce these LSAs. What should you tell her?

Where does inter-area summarization take place, resulting in type 3 and type 4 LSAs being sent in a multi-area OSPF internetwork?

- A. At the ABR.
- B. At the ASBR.
- C. At the backbone DR.
- D. Each internal router calculates and sends network updates.

Answer: A

Explanation: Network summary link entries, LSA type 3 or LSA type 4 are originated by ABRs. They describe the links between the ABR and the internal routers of a local area. These entries are flooded throughout the backbone area to the other ABRs.

Note: Type-3 describes routes to networks within the local area and are sent to the backbone area. Type-4 describes reachability to ASBRs. These link entries are not flooded through totally stubby areas.

Incorrect Answers

A:

B: Autonomous system external link entries, LSA type 5, are originated by ASBRs. They describe routes to destinations external to the autonomous system.

C: Backbone DRs does not generate these LSAs.

D: Internal routers produce router link entries, LSA type 1. They describe the states of the router's link to the area.

QUESTION NO: 278

You are troubleshooting TestKing's multiple-area OSPF network. In particular, one site TestKingNA is unable to connect to resources outside its area.

Now you want to confirm that the TestKingNA router

- has a path to its ABR
- has a path to its ASBR
- and that SPF route calculation is functional.

You connect to the TestKingNA router, log in, and enter privileged mode. What should be your next step?

- A. show ip protocols
- B. show running-config
- C. show ip ospf neighbor
- D. show ip ospf border-routers

Answer: D

Explanation: The **show ip ospf border-routers** command displays the internal OSPF routing table entries to an area border router (ABR) and autonomous system boundary router (ASBR). The SPF No in the output is the internal number of SPF calculation that installs this route.

Sample output:

```
RouterTestKing# show ip ospf border-routers
```

```
OSPF Process 109 internal Routing Table
```

Destination	Next Hop	Cost	Type	Rte Type	Area	SPF No
160.89.97.53	144.144.1.53	10	ABR	INTRA	0.0.0.3	3
160.89.103.51	160.89.96.51	10	ABR	INTRA	0.0.0.3	3
160.89.103.52	160.89.96.51	20	ASBR	INTER	0.0.0.3	3
160.89.103.52	144.144.1.53	22	ASBR	INTER	0.0.0.3	3

Incorrect Answers

- A:** The **show ip protocols** command only displays routing protocol parameters and current timer values.
- B:** The **show running-config** command displays the currently used configuration mode. The required information will not be displayed.
- C:** The **show ip ospf neighbor** command displays OSPF-neighbor information on a per-interface basis. It does not include ABR, ASBR or SPF information.

QUESTION NO: 279

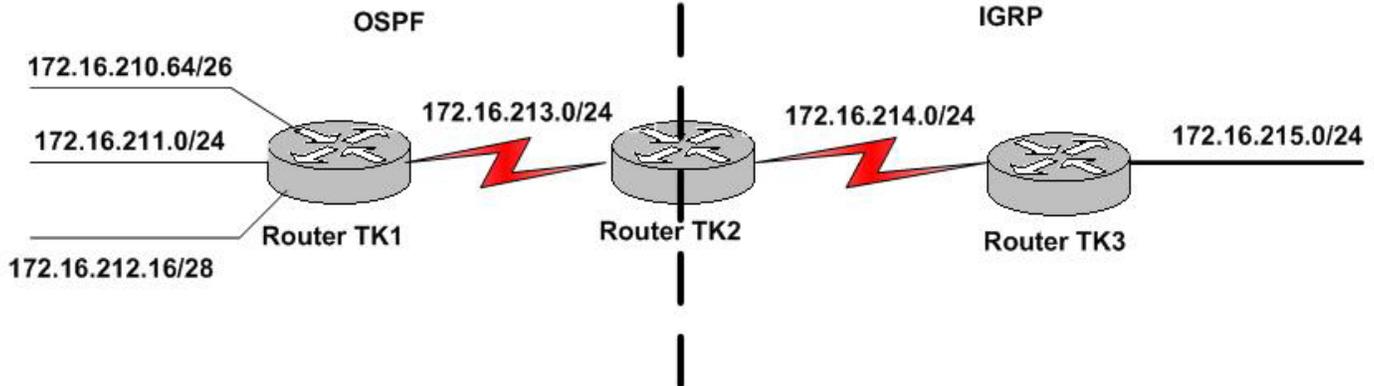
You want to redistribute RIP into your OSPF network. Which router will perform this task?

- A. ABR
- B. ASBR
- C. Internal router
- D. Backbone router

Answer: B

Explanation: External route summarization is specific to external routes that are injected into OSPF via redistribution. Only ASBRs can summarize external routes. These types of routes cannot be summarized by any other router type.

QUESTION NO: 280



You have configured Router TK2 for mutual redistribution. You have also verified that the process is working correctly. Which routes would be present in the routing table of Router TK3? (Choose four)

- A. 172.16.211.0/24
- B. 172.16.213.0/24
- C. 172.16.214.0/24
- D. 172.16.215.0/24
- E. 172.16.210.64/26
- F. 172.16.212.16/28

Answer: A, B, C, D

Explanation:

- A:** This is a classful route.
- B:** This route is redistributed from OSPF into IGRP.
- C:** This route is learned through IGRP.
- D:** This is a directly connected route.

Reference: Redistributing Between Classful and Classless Protocols: EIGRP or OSPF into RIP or IGRP
<http://www.cisco.com/warp/public/105/52.html>

Incorrect Answers

E, F: These are subnetted routes. IGRP is a classful routing protocol. These routes will not be redistributed into IGRP.

Command Line Exhibit

General

```
01 show cdp neighbors
02 show cdp neighbors detail
03 show controllers serial
04 show interface
05 show interface serial
06 show ip interface
07 show ip policy
08 show ip prefix-list
09 show ip prefix-list detail
10 show ip prefix-list summary
11 show ip protocols
12 show ip route
13 show path
14 show policy statistics
15 show prefix-list
16 show prefix-list detail
17 show prefix-list summary
18 show route-map
19 show route-reflector
20 show ip policy
21 show ip ospf
22 show ip ospf area
23 show ip ospf database
24 show ip ospf interface
25 show ip ospf neighbor
26 show ip ospf process-id
27 show ip ospf timers
28 show ospf process-id
29 show eigrp adjacencies
30 show eigrp neighbors
31 show eigrp route
32 show eigrp successors
33 show ip eigrp neighbors1
34 show ip eigrp route
35 show ip route eigrp
36 clear bgp *
37 clear bgp all
38 clear ip bgp *
```

```
39 clear ip bgp * soft
40 clear ip bgp sessions *
41 clear ip bgp sessions all
42 show ip bgp
43 show ip bgp attributes
44 show ip bgp neighbors
45 show ip bgp origin
46 show ip bgp route-reflector
47 show ip bgp summary
```

Configuration

```
60 RouterTK(config-router)# bgp neighbor address weight weight
61 RouterTK(config)# bgp set neighbor address weight weight
62 RouterTK(config)# interface loopback number
63 RouterTK(config-router)# ip maximum-paths 0
64 RouterTK(config)# ip prefix-list list-name
65 RouterTK(config-router)# ip prefix-list list-name
66 RouterTK(config-if)# ip prefix-list list-name
67 RouterTK(config)# neighbor address prefix-list list-name
68 RouterTK(config-router)# neighbor address prefix-list list-
  name
69 RouterTK(config-if)# neighbor address prefix-list list-name
70 RouterTK(config-router)# neighbor address weight weight
71 RouterTK(config-router-map)# neighbor address weight weight
72 RouterTK(config)# ip default route
73 RouterTK(config)# default route
74 RouterTK(config)# no auto-summary
75 RouterTK(config)# no eigrp summary
76 RouterTK(config)# no ip summary
77 RouterTK(config)# ospf interface loopback number
78 RouterTK(config)# ospf loopback number
79 RouterTK(config)# router loopback number
80 RouterTK(config-route-map)# set ip default next-hop
81 RouterTK(config-route-map)# set ip interface
82 RouterTK(config-route-map)# set ip precedence
83 RouterTK(config)# set neighbor address weight weight
84 RouterTK(config-router)# set neighbor address weight weight
85 RouterTK(config-route-map)# set ip next-hop address
86 RouterTK(config)# ip classless
87 RouterTK(config-router)# ip classless
```

Testing

88 debug eigrp adjacencies
89 debug eigrp neighbors
90 debug ip bgp origin
91 debug ip bgp summary
92 debug ip policy
93 ping (extended)
94 ping (record option)
95 ping (standard)
96 test packet
97 traceroute