

**CCNA Exam**

**640-801**

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### **Planning & Designing (10 Q & A)**

- Design a simple LAN using Cisco Technology
- Design an IP addressing scheme to meet design requirements
- Select an appropriate routing protocol based on user requirements
- Design a simple internetwork using Cisco technology
- Develop an access list to meet user specifications
- Choose WAN services to meet customer requirements

### **Implementation & Operation (10 Q & A)**

- Configure routing protocols given user requirements
- Configure IP addresses, subnet masks, and gateway addresses on routers and hosts
- Configure a router for additional administrative functionality
- Configure a switch with VLANs and inter-switch communication
- Implement a LAN
- Customize a switch configuration to meet specified network requirements
- Manage system image and device configuration files
- Perform an initial configuration on a router
- Perform an initial configuration on a switch
- Implement access lists
- Implement simple WAN protocols

### **Troubleshooting (10 Q & A)**

- Utilize the OSI model as a guide for systematic network troubleshooting
- Perform LAN and VLAN troubleshooting
- Troubleshoot routing protocols
- Troubleshoot IP addressing and host configuration
- Troubleshoot a device as part of a working network
- Troubleshoot an access list
- Perform simple WAN troubleshooting

### **Technology (10 Q & A)**

- Describe network communications using layered models
- Describe the Spanning Tree process
- Compare and contrast key characteristics of LAN environments
- Evaluate the characteristics of routing protocols
- Evaluate TCP/IP communication process and its associated protocols
- Describe the components of network devices
- Evaluate rules for packet control
- Evaluate key characteristics of WANs

## Section 1 Planning & Designing

### Question 1.

How many valid host IP addresses are available on the following network/subnetwork?

131.107.10.16/30

- A. 2
- B. 30
- C. 254
- D. 16,382
- E. 65,534

**Answer: A**

### Explanation:

This is a CIDR problem, also called supernetting. When you see the /xx notation, the xx is the consecutive number of one bits in the subnet mask. In this case, /30 = 30, and is also a subnet mask of 255.255.255.252. This leaves 2 bits (4 hosts) for host addressing, however since we reserve 2 addresses, that leaves a net of 2 Host Addresses, max.

### Question 2.

Given the following IP address from the Class B address range:

131.107.21.12

Your network plan requires no more than 126 hosts on a subnet that includes this address. When you configure the IP address in Cisco IOS software, which value should you use as the subnet mask?

- A. 255.255.0.0
- B. 255.255.128.0
- C. 255.255.255.128
- D. 255.255.255.252

**Answer: C**

### Explanation:

Since we have to reserve the all ones and all zeros broadcast addresses, we take 126, add 2, and round up to the next power of 2. We get  $126+2=128$ , and 128 is a power of 2, and takes 7 bits of the subnet mask to represent the host address.

In the fourth octet of the subnet mask, we have 1 bit for the network, and 7 bits for the host. This high order NETWORK bit is the 128 bit. Based on the definition of the subnet mask, all network bits before this bit MUST BE one, so we get:

255.255.255.128

Option A, B, and D do not provide a maximum of 126 hosts.

### Question 3.

Given an IP address of 131.107.2.160 and a subnet mask of 255.255.255.192, to which subnet does the host belong?

- A. 131.107.2.32
- B. 131.107.2.64
- C. 131.107.2.96

- D. 131.107.2.128
- E. 131.107.2.192

**Answer: D**

**Explanation:**

When we look at the last octet of the subnet mask, we have  $192=128+64$ , which is the two high order mask bits, leaving 6 bits for host addressing. Each subnet strides 64 addresses, including broadcast, leaving the following networks:

131.107.2.0  
131.107.2.64  
131.107.2.128  
131.107.2.192

We now look at the host address, which is 160, and find that it fits between 128 and 192, so the network is  
131.107.2.128.

**Question 4.**

Which statement should you use to deny telnet access only from Network 210.93.105.0 to Network 223.8.151.0?

- A. Access-list one deny 210.93.105.0.0.0.0.0 any eq 23 access-list one permit any.
- B. Access-list 100 deny tcp 210.93.105.0 0.0.0.255 223.8.151.0 0.0.0.255 eq 23
- C. Access-list 100 deny ip 223.8.151.0 0.0.0.255 any eq 23  
Access-list 100 permit ip any any
- D. Access-list 100 deny tcp 210.93.105.0 0.0.0.255 223.8.151.0 0.0.0.255 eq telnet  
Access-list 100 permit ip any any

**Answer: D**

**Explanation:**

Great care must be taken whenever an access list is configured as there is an assumption of deny all when they do not match the access list. The proper command for configuring an extended access to deny telnet traffic is: access-list 100 deny tcp source address destination address eq telnet. When configured this way the access list will deny ftp traffic and permit all other.

In option A, the entire statement has syntax problems. You use a number, not a word (one) for the access list, and the access list for this problem needs to be an extended address list in the range of 100-199.

In option B, access list will deny access, but then any non-match falls through and will be denied.

In option C, access list denies access from 223.8.151.0 to anywhere else – this is not what the problem asked.

223.8.151.0 is supposed to be the destination, not the source.

**Question 5.**

One of the security mechanisms used in securing a router is access-lists. You have decided to use Standard IP access lists in your company which of the following is an example of a Standard IP access lists?

- A. Access-list standard 172.16.4.13
- B. Access-list 2 deny 172.16.4.13 0.0.0.0
- C. Access-list 101 deny 172.16.4.13 0.0.0.0

D. Access-list 199 deny 172.16.4.13 255.255.255.255

**Answer: B**

**Explanation:**

A standard access list is in the range of 1-99 and the proper command syntax is access-list {access-list number} {permit or deny} {test conditions}. In this case the test condition is an ip address.

The access command must contain a number and whether the action is to be permitted or denied.

Option C is an extended access-list number and not a standard number.

199 is also an extended access-list number and not a standard number.

**Question 6.**

Your access list has one statement;

access-list 131 permit ip any 131.107.7.0 0.0.0.255 eq tcp

What does the word "any" mean in the following extended access list statement?

- A. Check any of the bits in the source address.
- B. Permit any wildcard mask for the address.
- C. Accept any source address.
- D. Check any bit in the destination address.
- E. Permit 255.255.255 0.0.0.0.
- F. Accept any destination address.

**Answer: C**

**Explanation:**

The **permit** keyword permits traffic. The **any** keyword implies that any address is allowed. Here any is used as the source and source-wildcard parameter (see note below). Therefore the access-list permits any source address.

Syntax for an extended access list

**access-list** access-list-number {**deny** | **permit**} protocol source source-wildcard destination  
destinationwildcard

[**precedence** precedence] [**tos** tos]

The access-list-number must be in the 100 to 199 or the 2000 to 2699 range.

**Question 7.**

Given the network 192.141.27.0/28, identify the valid host addresses. (Choose three.)

- A. 192.141.27.33
- B. 192.141.27.112
- C. 192.141.27.119
- D. 192.141.27.126
- E. 192.141.27.175
- F. 192.141.27.208

**Answer: A, C & D**

**Explanation:**

When you base your calculations on the network address and the provided subnet mask the valid host addresses are 192.141.27.33, 192.141.27.119, and 192.141.27.126.

Option B, E and F are not valid host addresses.

**Question 8.**

You are concerned about broadcast traffic in your network. You would like to split up your network into two separate broadcast domains. Which one of the following hardware devices can you use?

- A. Hub
- B. Router
- C. Bridge
- D. Repeater

**Answer: B**

**Explanation:**

A router splits the network into subnets. Each subnet is a separate broadcast domain.

Hubs and repeaters work at the physical layer. They are not able to reduce either broadcasts or collisions.

A bridge splits the network into collision domains. However, a bridge would have no effect on the broadcast domains.

**Question 9.**

You have a leased line configured at a small office that connects to the corporate office. You company would also like to have a backup incase the lease line goes down. Which WAN service would you most likely choose to backup the leased line?

- A. Frame relay with SVC
- B. Dedicated serial line
- C. ISDN with DDR
- D. ATM

**Answer: C**

**Explanation:**

ISDN is a low-cost backup solution that only is used when it is needed. DDR (dial-on-demand) dials up the remote site when traffic needs to be transmitted.

Frame Relay is a high-performance solution and would be a costly backup solution.

There is no need to use a dedicated connection. We only need to use the connection if the main line goes down.

ATM is a high-performance solution and would be a costly backup.

**Question 10.**

You have just been hired to setup a new company network. This company will be using an accounting package that requires multiple hosts. These hosts are the accountants and they must be able to support data transfer between each other at a rate of 10 Mbps. The company will also have a file server that is used for the other employees of the company who just use word processing applications that use less than 3 Mbps to transfer files to server. What is your economical recommendation?

- A. That the existing 10BaseT hub be replaced with 100BaseT hub to improve overall performance.
- B. That a router can separate the testing application from the rest of the network thus allowing the testing application more bandwidth.
- C. That the switch be installed so that enterprise server can be provided a 100 Mbps port and each of the testing application hosts can be given dedicated 10 Mbps ports.
- D. That a bridge be placed between the enterprise server and all other users with the exception of the testing application.

**Answer: C**

**Explanation:**

With buffering in the switch, the enterprise server can serve multiple hosts at almost full capacity, since the 100Mbps port will be faster than the rest of the users totaled as a whole.

This would require all NICs to be upgraded, and result in a large collision domain with possible poor performance.

A router would become a bottleneck, and not allow efficient performance.

A bridge would be a bottleneck, and not be able to provide the necessary performance and throughput.

## Section 2 Implementation & Operation

### Question 1.

You need to install RIP on your router. Which command enables directly connected network 131.107.10.0 to be used by RIP?

- A. Router(Config)# rip 131.107.10.0
- B. Router(Config-router)# rip 131.107.10.0
- C. Router(Config-router)# network 131.107.10.0
- D. Router(Config-router)# network 131.107.0.0

**Answer: D**

### Explanation:

The network command allows the routing process to identify the interfaces will participate in the sending and receiving of messages.

131.107.10.0 is the wrong network number. The 131 is a Class C subnet, using a default mask of 255.255.255.0, the network requires 3 octets of individual (1-254) networking addressing. 131.55.0.0 will cause a all zeros subnet broadcast.

Others are not valid commands. In addition, A is in the wrong mode.

### Question 2.

A publishing company has three routers in their network. Marshal, Sherman, and Patton. The Marshal and Sherman routers are fully configured. The Patton router is also fully configured, but need to have a password for the first 5 virtual lines, password for console, and an encrypted password for privileged mode.

Configure the passwords on the Patton router according to the table below.

Type Password

Telnet apple

Console pear

Privileged peach

- The routers are named Marshal, Sherman, and Patton.
- The network is subnetted with a mask 255.255.255.224
- The routing protocol is RIP
- The serial 0 interface is provided with clocking.
- The chart below includes the IP addresses.

### Lab 1

**Name : Marshal**

**E0 : 192.168.12.33**

**S0 : 192.168.12.65**

### Lab 2

**Name : Patton**

**E0 : 192.168.12.97**

**S0 : 192.168.12.129**

**S1 : 192.168.12.68**

### Lab 3

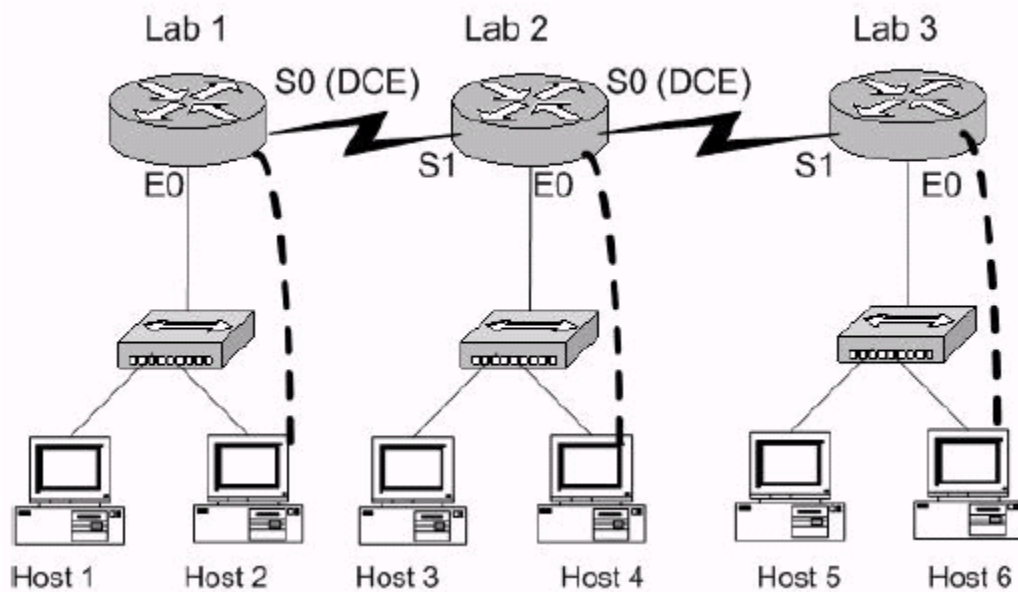
**Name : Sherman**

**E0 : 192.168.12.97**

**S0 : 192.168.12.129**

**S1 : 192.168.12.68**





Start by clicking on host that is connected to the router you want to configure.

#### Answer Lab 2:

<Click Host4, which is connected to Router Lab 2>

```
enable
config terminal
hostname Berley
enable secret peach
line con 0
login
password pear
line vty 0 4
login
password apple
^Z
copy running-config startup-config
```

#### Explanation:

We should configure the passwords, not any IP configuration on the interfaces.

First we click on the Lab2 router.

Router Con0 is now available

Press RETURN to get started. ! We press enter.

Router>enable ! We enter enable mode

Router#config terminal ! We enter terminal configuration mode

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#hostname Patton ! We change the host name. This is however not required.

Patton(config)#enable secret peach ! Set the secret password.

Patton(config)#line con 0 ! Configure the terminal connection

Patton(config-line)#login ! Specify the terminal connection password

Patton(config-line)#password pear

Patton(config-line)#line vty 0 4 ! Configure the telnet connections. Numbered 0, 1, 2, 3, 4.

Patton(config-line)#login ! Specify password

Patton(config-line)#password apple

Patton(config)#^Z ! Exit from configuration mode.

```
%SYS-5-CONFIG_I: Configured from console by console
Patton#copy running-config startup-config ! Save the running config to NVRAM.
Destination filename [startup-config]? ! Confirm default selections
Warning: Attempting to overwrite an NVRAM configuration
previously written by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
Patton#
```

**Question 3.**

You have just created an IP extended access list and now wish to apply this to an interface. Which command will allow you to apply the list to an interface?

- A. Permit access-list 101 out
- B. Ip access-group 101 out
- C. Apply access-list 101 out
- D. Access-class 101 out
- E. Ip access-list e0 out

**Answer: B**

**Explanation:**

In order for an access list to be activated the ip-access group command must be used. This command activates the ip access list on an interface. Before you use the ip-access group command you must take care to ensure that you have configured an access list. If you do not the result will be permit any.

Others are not valid commands.

**Question 4.**

You have been called in to fix a router that is having security issues. The router has an access list configured on it but the list does not seem to be working. What command can you use to see if the access list has been applied to an interface?

- A. Show access-list.
- B. Show ip route.
- C. Show ip interface.
- D. Show interface.
- E. Show interface list.

**Answer: C**

**Explanation:**

The show ip interface command display IP interface information and indicates whether any access list are set for a specific interface and it also indicates if the access list is inbound or outbound.

Option A is not a valid command.

Option B show ip route command displays the contents of the ip routing table.

Option D show interface command displays the serial interface configuration.

Option F is not a valid command.

**Question 5.**

Management has reported that they cannot access the corporate files on the company's ftp server from home. They were able to do this in the past. You feel that somebody has changed an access list that is preventing those managers from accessing the corporate data. The access list number is 131. Which command displays access list 131?

- A. Show access-list 131
- B. Show IP access list 131
- C. Display IP address list 131
- D. Display access-list 131 details

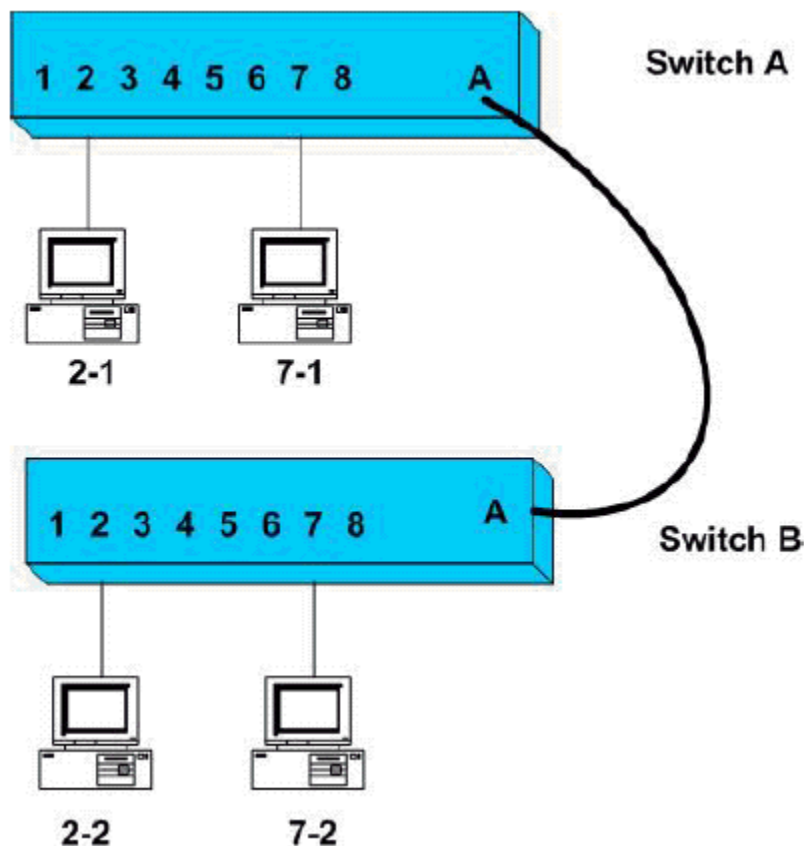
**Answer: A**

**Explanation:**

To display the contents of access list 131 the show access-list 131 command would need to be used.

To show the contents of all ip access lists the show ip access-lists command is required. There is no need to specify the specific access list

With a Cisco device whenever you want to display something a show command will be used.

**Question 6.****Exhibit:**

Looking at the diagram above ports 1 through 4 are assigned to VLAN1 and ports 5 through 8 are assigned to VLAN3 on each switch. The switches are interconnected over an ISL trunk link.

Which of the following actions would test proper VLAN and trunk operation? (Choose three.)

- A. Host 2-1 can ping Host 2-2
- B. Host 2-1 can ping Host 7-2
- C. Host 2-1 can not ping Host 2-2
- D. Host 7-1 can not ping Host 2-2
- E. Host 7-1 can ping Host 7-2

**Answer: A, D & E**

**Explanation:**

Host 2-1 and Host 2-2 are both in VLAN1 and a ping should be successful.

Host 7-1 is in VLAN3 while Host 2-2 is in VLAN1. A ping between those hosts should fail.

Host 7-1 and Host 7-2 are both in VLAN1 and a ping should be successful.

Host 2-1 and Host 7-2 are in different VLANs and a ping should fail.

Host 2-1 and Host 2-2 are both in VLAN1 and a ping should be successful.

**Question 7.**

Your company has decided to use IGRP instead of RIP as the routing protocol. They want to use autonomous system number 130. Which is the correct command for this installation?

- A. Router(config)# igrp 130
- B. Router(config)# network 130
- C. Router(config)# router igrp 130
- D. Router(config)# enable igrp 130

**Answer: C**

**Explanation:**

To enable IGRP as a routing process one uses the router igrp command. This command must include the AS number within it. Thus the command to set IGPR for AS 130 is: router igrp 130

Igrp 100 is not a valid command.

The network command is used to identify what network the AS is directly connected to. In this case (network 100) the command is wrong as it contains the AS number and not the network number.

The enable command is used for entering privilege mode. Further the enable command does not use the AS number.

**Question 8.**

A soft drink company has made the decision to provide 3 branches with network connectivity. There is a LAN in each branch. The Vanilla and Chocolate routers are fully configured. The Plain router is almost fully configured. However, it does not have the routing protocol configured. Configure the routing protocol and publish all networks on the Plain router.

The configurations of the routers are as follows:

- The routers are named Vanilla, Chocolate, and Plain.
- RIP is the routing protocol used.
- The clocking is provided on the serial 0 interface.
- The password on the Plain router is "ITCert"

- The default subnet mask is used on all interfaces
- The IP addresses are listed below.

#### Vanilla

E0 192.168.149.1

S0 192.168.199.1

Chocolate

E0 192.168.55.1

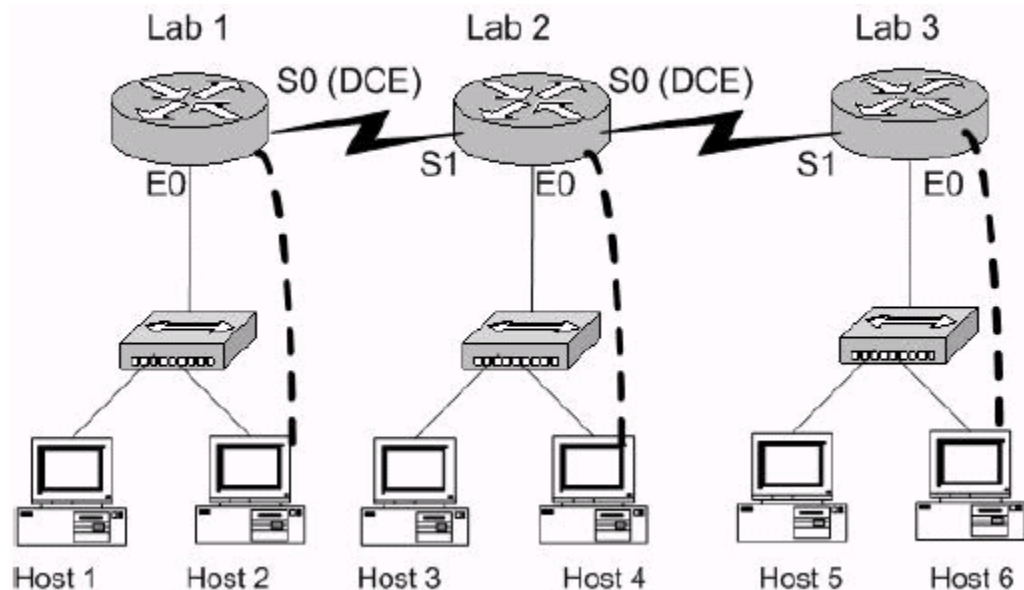
S0 192.168.101.1

S0 192.168.199.1

Plain

E0 192.168.65.1

S0 192.168.101.1



#### Lab 1

Name: Vanilla

E0 192.168.149.1

S0 192.168.199.1

#### Lab 2

Name: Chocolate

E0 192.168.55.1

S0 192.168.101.1

S1 192.168.199.1

#### Lab3

Name: Plain

E0 192.168.65.1

S1 192.168.101.2

Secret Password: ITCert

Start by clicking on host that is connected to the router you want to configure.

#### Answer Lab 3:

enable

config terminal

```

hostname Plain
enable secret ITCert
interface ethernet 0
ip address 192.168.65.1 255.255.255.0
no shutdown
exit
interface serial1
ip address 192.168.101.2 255.255.255.0
no shutdown
exit
router rip
network 192.168.65.0
network 192.168.101.0
network 192.168.55.0
network 192.168.149.0
network 192.168.199.0
^Z
copy running-config startup-config

```

### Explanation:

< Click on Host6, which is connected to the Lab 3 router>  
 Router Con0 is now available  
 Press RETURN to get started. ! Press enter.  
 Router>enable ! Enter enable mode  
 Router#config terminal ! Enter terminal configuration mode.  
 Enter configuration commands, one per line. End with CNTL/Z.  
 Router(config)#hostname Plain ! Change hostname  
 Plain(config)#enable secret ITCert ! Enable secret password  
 Plain(config)#interface ethernet 0 ! Enter interface configuration mode.  
 ! Note the space between Ethernet and 0.  
 Plain(config-if)#ip address 192.168.65.1 255.255.255.0 ! Configure the IP address of the interface.  
 ! Note that we use a class C subnet mask.  
 Plain(config-if)#no shutdown ! Start the interface  
 %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0, changed state to up  
 %LINK-3-UPDOWN: Interface Ethernet0, changed state to up  
 Plain(config-if)#exit ! Exit configuration of Ethernet 0 interface  
 Plain(config)#interface serial1 ! Configure serial1 (no space in serial1)  
 Plain(config-if)#ip address 192.168.101.2 255.255.255.0 ! Configure the IP address of the interface.  
 Plain(config-if)#no shutdown ! Start the interface  
 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed state to up  
 %LINK-3-UPDOWN: Interface Serial1, changed state to up  
 Plain(config-if)#exit ! Exit interface configuration.  
 Plain(config)#router rip ! Enable RIP. Enter router configuration mode.  
 Plain(config-router)#network 192.168.65.0 ! Enable RIP on interface Ethernet 0  
 Plain(config-router)#network 192.168.101.0 ! Enable RIP on interface Serial1  
 ! We have now added the two local networks. That should  
 ! be enough, but we are specifically been required to publish  
 ! all networks. We add the three remote networks as well.  
 Plain(config-router)#network 192.168.55.0 ! The three external networks are added as well.  
 Plain(config-router)#network 192.168.149.0  
 Plain(config-router)#network 192.168.199.0  
 Plain(config-router)#^Z ! Exit configuration mode.  
 %SYS-5-CONFIG\_1: Configured from console by console  
 Plain#copy running-config startup-config ! Save running configuration to NVRAM

Destination filename [startup-config]? ! Accept defaults and save it.  
Warning: Attempting to overwrite an NVRAM configuration  
previously written by a different version of the system image.  
Overwrite the previous NVRAM configuration?[confirm]  
Building configuration...  
[OK]  
Plain#

#### Question 9.

You would like the router to look in NVRAM upon boot up. Which one of the following would be the correct value for the configuration register?

- A. 0x42
- B. 0x2102
- C. 0x001
- D. 0x2101

**Answer: B**

#### Explanation:

The factory-default setting for the configuration register is 0x2102. This indicates that the router should attempt to load an IOS image from Flash memory and load the startup configuration. Flash memory is also known as NVRAM.

#### Question 10.

Access-list 122 permit ip 131.107.30.0 0.0.0.255 any You apply the access-list above. Which is the effect?

- A. Permit all packets matching the first three octets of the source address to all destinations.
- B. Permit all packets matching the last of the destination address and accept all source address.
- C. Permit all packets from the third subnet of the network address to all destinations.
- D. Permit all packets matching the host bits in the source address to all destinations.
- E. Permit all packets to destination matching the first three octets in the destination address.

**Answer: A**

#### Explanation:

This is an extended access list that permits source packets matching the first three octets of the 131.107.30.0 address. Furthermore, the **any** keyword specifies that all destinations will be accepted.

Syntax for an extended access list

**access-list** access-list-number {**deny** | **permit**} protocol source source-wildcard destination  
destinationwildcard  
[**precedence** precedence] [**tos** tos]

The source-wildcard is specified first before the destination wildcard.

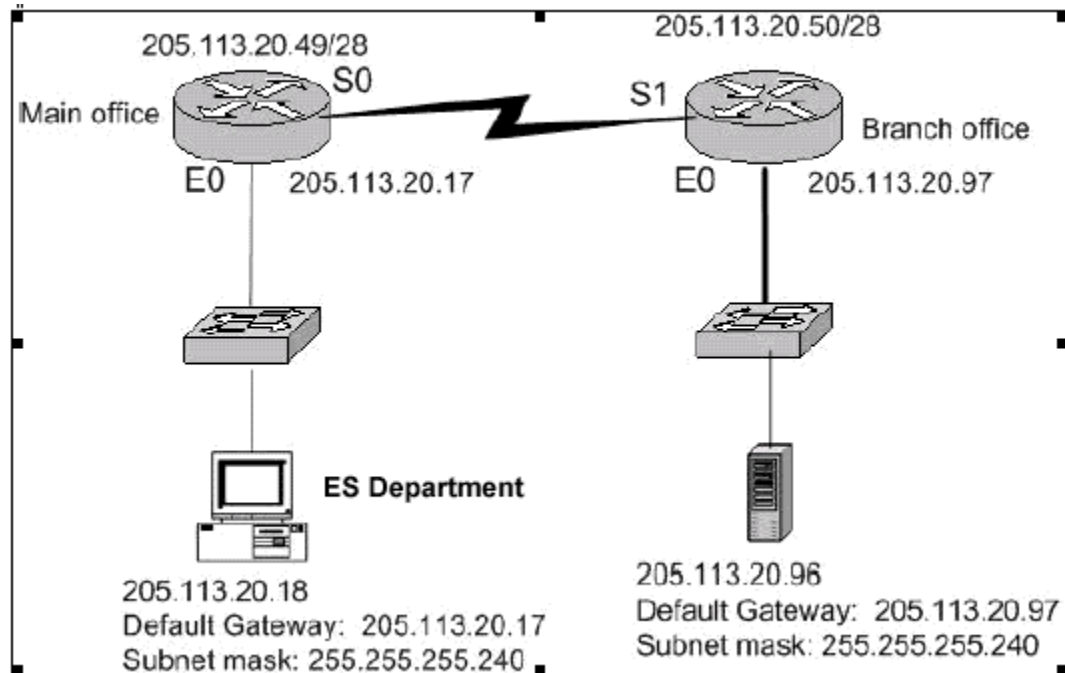
All source addresses matching the first three octets of **131.107.30.0** will be permitted.

The mask used in access-list does not work as a subnet masks. A 0.0.0.255 access-list mask matches the first three octets, not the last "host" octet.

The first three octets in the source, not destination, address must match. All destination addresses are allowed with the **any** keyword.

## Section 3 Troubleshooting

### Question 1.



Clients residing in the Electronic Sales (ES) Department report access problems. They are unable to connect to the new server at the Branch Office. What is a possible cause of this problem?

- A. The default gateway of the workstations in the sales department is incorrect.
- B. The subnet mask of the workstations in the sales department is incorrect.
- C. The default gateway of the server at the Branch Office is incorrect.
- D. The host address of the server at the Branch Office is invalid.
- E. The serial 0 interface on the Main Office router and the serial 1 interface on the Remote Office router are not on the same subnetwork.

**Answer: D**

#### Explanation:

When you convert the IP address (205.113.20.96) of the server and the subnet mask (255.255.255.240) to binary you will get the following results: (IP address first and then the subnet mask.)

11001101 01110001 00010100 01100000

11111111 11111111 11111111 11100000

Thus it is determined that the IP address on the host is in fact the subnet address. This is what would be causing the network problems.

The default gateway in the sales department is correct.

The subnet mask is correct.

The default gateway in the branch office is correct.

In choice E, There is no problem.



**Question 2.**

Router#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, U-per-user static route

Gateway of last resort is not set

R 202.30.8.0/24 [120/1] via 202.30.2.2, 00:00:16, Serial 0

C 202.30.9.0/24 is directly connected, Serial 1

R 202.30.10.0/24 is possibly down, routing via 202.30.9.1, Serial 1

R 202.30.11.0/24 is possibly down, routing via 202.30.9.1, Serial 1

C 202.30.1.0/24 is directly connected, Ethernet 0

C 202.30.2.0/24 is directly connected, Serial 0

R 202.30.3.0/24 [120/1] via 202.30.2.2, 00:00:17, Serial 0

R 202.30.4.0/24 [120/15] via 202.30.2.2, 00:00:17, Serial 0

R 202.30.5.0/24 [120/15] via 202.30.2.2, 00:00:17, Serial 0

R 192.158.6.0/24 [120/15] via 202.30.2.2, 00:00:17, Serial 0

R 202.30.7.0/24 [120/1] via 202.30.2.2, 00:00:17, Serial 0

You are troubleshooting a router with default settings. You are concerned about the 202.30.10.0 and 202.30.11.0 routes. In particular you are interested how long they will be kept in the routing table. What would be the maximum time these routes would be kept in the routing table?

- A. 30 seconds
- B. 60 seconds
- C. 240 seconds
- D. 360 seconds
- E. 630 seconds

**Answer: D**

**Explanation:**

The Rs on the 202.30.10.0 and 202.30.11.0 lines (see below) indicates that the routes were learned from the RIP protocol. With default settings RIP learned routes can be kept for up to 6 minutes before they are removed.

R 202.30.10.0/24 is possibly down, routing via 202.30.9.1, Serial 1

R 202.30.11.0/24 is possibly down, routing via 202.30.9.1, Serial 1

**Question 3.**

You are the network administrator of the ABC Tire Company. You receive a call from a user who is unable to reach a server at a remote server 10.0.5.250/240. Using VNC (Virtual Network Computing)

you connect to the user's computer and discover the following information:

Local PC – 10.0.3.35/24

Default gateway – 10.0.3.1

Remote server – 10.0.5.250/240

You then conduct the following tests from the user's PC:

ping 127.0.0.1 – successful

ping 10.0.3.35 – successful

ping 10.0.3.1 – successful

ping 10.0.5.250 – unsuccessful

Which of the following problems would create the test results listed above?

- A. TCP/IP not correctly installed.

- B. Local physical layer problem.
- C. Local NIC not functioning.
- D. Remote physical layer problem.

**Answer: D**

**Explanation:**

As the ping of the remote server was unsuccessful there is a problem with the remote physical layer problem.

You would not be able to ping anything if TCP/IP was not correctly installed.

You would not be able to ping the local IPs if there was a problem with the local physical layer.

You would not be able to ping anything if the local NIC was not functioning.

**Question 4.**

Users on your network 10.1.0.0/16 are complaining that they cannot access the company's intranet server using the FQDN www.snowball.com. You are able to ping the IP address but you cannot ping www.snowball.com.

What is the likely cause of this problem?

- A. TCP/IP failure.
- B. DNS failure.
- C. FTP failure.
- D. SNMP failure.

**Answer: B**

**Explanation:**

When you combined the fact that user cannot connect to the intranet with its domain but you can ping to it using the IP address, there must be a problem with the DNS. DNS translates names into addresses.

If there was a problem with TCP/IP then you would not have been able to Telnet to web server.

A problem with FTP would not cause this problem.

A SNMP failure would not cause this problem.

**Question 5.**

In troubleshooting an Internetwork which of the following commands are usually used? (Choose two.)

- A. Ping
- B. Trace
- C. Verify
- D. Test IP
- E. Echo IP
- F. Config IP

**Answer: A & B**

**Explanation:**

The ping command will confirm connectivity and trace will determine the routes an outgoing packet will take.

Others are not valid commands.

**Question 6.**

RouterC does not appear to be receiving RIP updates from RouterB, which command can you enter on RouterC to see if it is receiving these RIP updates?

- A. Show ip protocols.
- B. Show ip route rip.
- C. Debug ip rip.
- D. Debug ip updates.
- E. Debug ip transactions.

**Answer: C**

**Explanation:**

The debug **debug ip rip** command displays information on RIP routing transactions. It would enable us to see if the RIP updates are received.

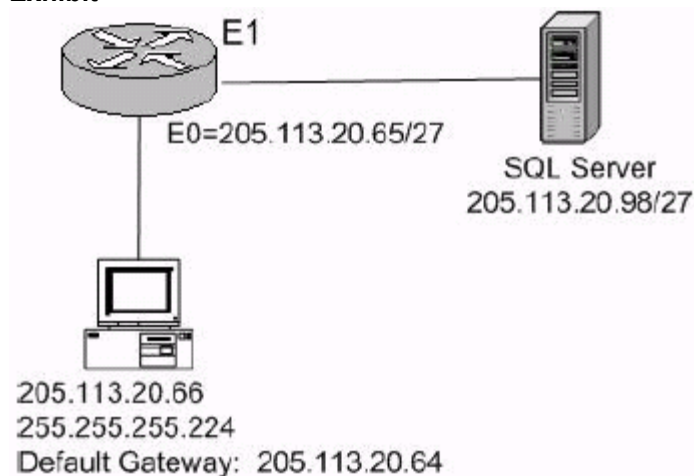
The show ip protocol command is used to see if a router is delivering bad routing information.

Option B is not a valid command. RIP is not a parameter of show ip route command.

Option D and E are not valid debug commands.

**Question 7.**

**Exhibit**



You are the network administrator of the network shown in the exhibit. You have just added a PC to the network. However, the PC is unable to connect to the SQL Server computer. What can be the cause of this problem?

- A. PCs IP address.
- B. PCs subnet mask.
- C. PCs default gateway.
- D. Router interface E0 IP address.

**Answer: C**

**Explanation:**

The default gateway address on the PC, 205.113.20.64, is not part of the local network 205.113.20.65/27. This is a possible cause of the connectivity problem.

The IP address of the PC, 205.113.20.66, is appropriate since it belongs to the local network 205.113.20.65/27.

The PC uses a 27-bit subnet mask, which is the same as the local interface on the router.

224 decimal is 11100000 binary.

The 205.113.20.65 belongs to the 205.113.20.65/27 by definition. It is not a network address or broadcast. It is valid.

#### Question 8.

Using a protocol analyzer you determine your LAN traffic is experiencing congestion. What could be some possible causes for a congested network? (Choose four.)

- A. Too many hosts in a broadcast domain.
- B. Full Duplex operation.
- C. Broadcast storms.
- D. Multicasting.
- E. Segmentation.
- F. Low bandwidth.

**Answer: A, C, D & F**

#### Explanation:

Too many hosts in a broadcast domain would cause many collisions and congestion.

Broadcast storms would have a negative impact on available bandwidth.

Multicasting targets multiple destinations and requires a lot of bandwidth.

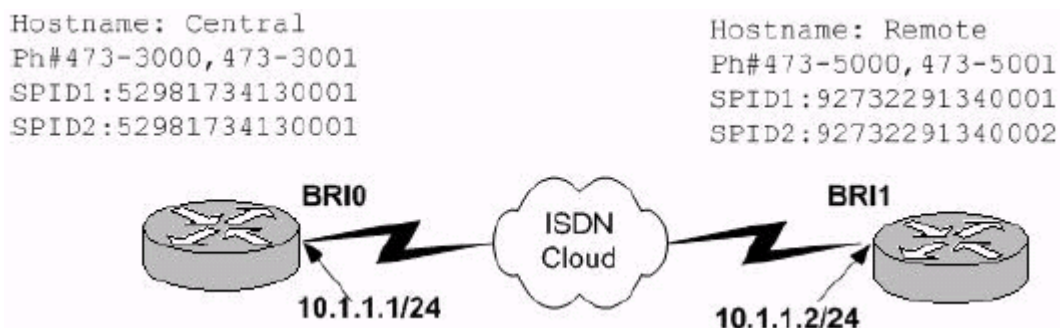
Low available bandwidth would of course result in a congested network faster than a network with higher bandwidth.

Full duplex operation would decrease congestion.

Segmentation decreases the collisions domains, the network traffic, and the congestion.

#### Question 9.

##### Exhibit:



## Central Partial Configuration

```
isdn switch-type basic-ni
username Remote password king
interface bri0
ip address 10.1.1.1 255.255.255.0
encapsulation ppp
ppp authentication chap
isdn spid1 51055512360001
isdn spid1 51055512360002
dialer map ip 10.1.1.2 name Remote
1238001
dialer-list 1 protocol ip permit
```

Your company is using ISDN to connect the Remote office to the Central office. The connection is not working between the two routers. You issue the show running-config command looking at the configuration above. Which additional command must be issued on the Central router before interesting traffic will be sent to the Remote router?

- A. (config-if)# dialer-group 1
- B. (config-if)# dialer-list 1
- C. (config-if)# dialer map 1
- D. (config-if)# dialer-route 1

**Answer: A**

### Explanation:

Once the above commands have been entered to enable DDR, then the last step required is to bind the traffic destination to an interface by linking the interesting traffic definition already created. This is done with the dialer-group command. In this case the proper command would be (config-if)# dialer-group 1.

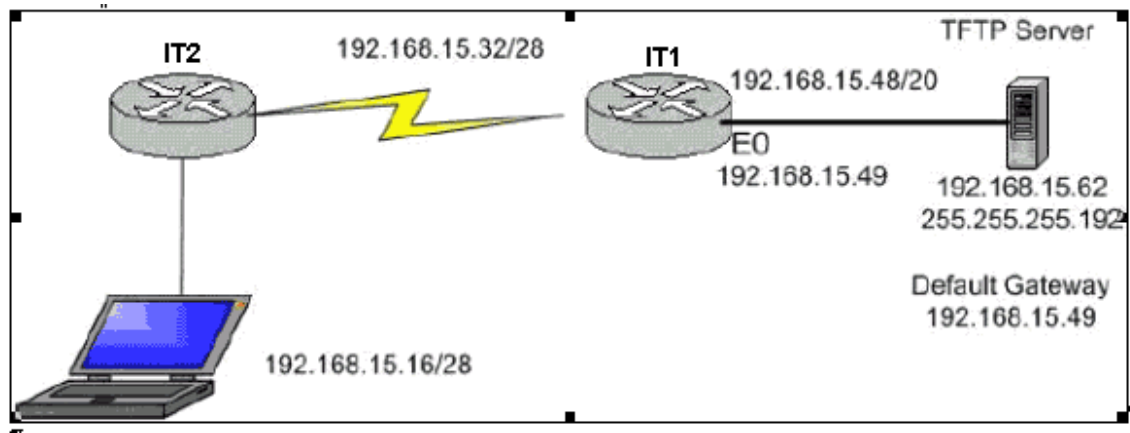
The interesting traffic was already identified the first time the dialer-list 1 command was used.

The dialer map command is used to identify the router to be dialed. In this case this has already been done.

There is no such thing as a dialer route command.

### Question 10.

#### Exhibit



You are network administrator for the network shown in the exhibit above. Adding the new router, called IT2, the network has been augmented. You would like to backup the IOS image of the new router to the TFTP server. However, the backup procedure fails.

What could be the cause of the problem?

- A. Incorrect default gateway of the tftp server.
- B. Incorrect subnet mask of the tftp server.
- C. Incorrect IP address of the tftp server.
- D. Incorrect IP address on E0 of the IT1 server.
- E. Incorrect subnet mask on the IT2 router.

**Answer: B**

**Explanation:**

The subnet mask of the tftp server must match the subnet mask of the local ethernet interface of the IT1 router.

The default gateway of the TFTP server is the local e0 interface of IT1. This is the correct setting.

The IP address of the TFTP server is in the appropriate network range.

The IP address of the E0 interface of IT1 is in the appropriate network range.

The subnet mask of IT2 seems to be correct. It is the same as the subnet mask of the laptop client PC.

## Section 4 Technology

### Question 1.

Identify three valid host addresses in the 192.168.27.0 network with a subnet mask of 255.255.255.240. (Choose three)

- A. 192.168.27.33
- B. 192.168.27.112
- C. 192.168.27.119
- D. 192.168.27.126
- E. 192.168.27.175
- F. 192.168.27.208

**Answer:** A, C & D

### Explanation:

A subnet mask of 255.255.255.240 divides the 4th octet into a subnet parts: the highest four bits, and a host part: the lowest four bits. We simply check the 4th octet to check that all subnet and host parts are ok.

i.e that cannot be: 0000 or 1111

33 decimal is 00100001. Both the subnet and the host part are ok.

119 decimal is 01110111. Both the subnet and the host part are ok.

126 decimal is 1111110. Both the subnet and the host part are ok.

112 decimal is 1110000 binary. This is not a valid host address in this network. It has all host bits 0.

175 decimal is 10101111. All host bits are 1's. This is the local broadcast address and cannot be used as a host address.

208 decimal is 11010000 binary. This is not a valid host address in this network. It has all host bits 0.

### Question 2.

The network 131.107.4.0/24 was advertised by a neighbor router from RIP and IGRP. You also added a static route to 131.107.4.0/24 manually. Which route would be used to forward traffic?

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

**Answer:** B

### Explanation:

If there are several routing sources providing common routing information, an administrative distance value is used to rate the trustworthiness of each routing source. The lower the administrative distance the more trustworthy it is. Static routes have a default distance of 1, IGRP has a default distance of 100, and RIP has a default distance of 120.

IGRP does not have the lowest administrative distance.

RIP does not have the lowest administrative distance in fact it has the highest.

As the administrative distance differs there can be no load balancing.

**Question 3.**

Which WAN technology uses two Bearer (B) channels for data plus one Delta (D) channel for signaling information?

- A. ISDN
- B. Frame Relay
- C. ATM
- D. FDDI

**Answer: A**

**Explanation:**

ISDN BRI use two B channels and one D channel.

Frame Relay and ATM are both WAN encapsulation types.

FDDI is not a WAN technology.

**Question 4.**

Which one of the layers of the seven layer OSI model uses positive acknowledgement and retransmission to ensure reliable delivery?

- A. Application
- B. Presentation
- C. Session
- D. Transport
- E. Data link
- F. Physical

**Answer: D**

**Explanation:**

The transport layer implements connection-oriented communication by using positive acknowledgement and retransmission. This ensures reliable delivery, at the cost of some overhead.

The application layer is how users and applications access protocols and does not deal with the receipting and resending of data.

The presentation layer deal with several things, such as how things are presented and encrypted, but not with the transmission of data.

The session layer ensures that data from different applications are kept separate and with the controlling the communication process.

The data link layer detects errors but not the transmission of data.

The physical layer moves the bits between the devices and is not concerned with the process.

**Question 5.**



There are five different types of IP address classes. What IP address class is used for multicasting?

- A. A
- B. B
- C. C
- D. D
- E. E

**Answer: D**

**Explanation:**

Multicasting is possible due to Class D IP addresses. Class D address range is 224.0.0.0 to 238.255.255.255.

Class A addresses are not used for multicasting.

Class B addresses are not used for multicasting.

Class C addresses are not used for multicasting.

Class E addresses are for research purposes.

**Question 6.**

Which wide area network technology was designed to work with traditional POTS lines and provide SOHO's and users with a higher speed digital dial-up service?

- A. Frame relay
- B. X.25
- C. ATM
- D. ISDN

**Answer: D**

**Explanation:**

Compared to analog modems, ISDN provides a digital service with faster connection times and somewhat higher speeds.

POTS= plain old telephone system. SOHO= small office/home office networks

Incorrect Answers:

- A. Frame relay is used to handle multiple virtual circuits.
- B. X.25 defines how the connections between DTE and DCE are maintained.
- C. ATM was designed to take advantage of the speeds offer by media such as E3 and T3.

**Question 7.**

Encapsulation is the method of passing data down the stack of the OSI model and adding headers and trailers. Which one of the following shows the correct order of Data Encapsulation?

- A. Data, Packet, Segment, Frame.
- B. Segment, Data, Packet, Frame.
- C. Data, Segment, Packet, Frame.
- D. Packet, Data, Segment, frame.

**Answer: C**

**Explanation:**

Data encapsulation is a process in which information is wrapped in the data section of another protocol. In the OSI model each layer encapsulates the layer immediately above as the data flows down the protocol stack. The order of encapsulation is

1. Application/Presentation/Session DATA
2. Transport SEGMENT
3. Network PACKET
4. Data Link FRAMES
5. Physical BITS

With Data, Packet, Segment, Frame; packet and segment are inverted.

With Segment, Data, Packet, Frame; data and segment are inverted.

With Packet, Data, Segment, frame; the only information package in the proper order is frame.

**Question 8.**

Frame relay has a feature that prevents PVCs from shutting down from lack of activity. What is the name of this feature?

- A. DLCI
- B. BECN
- C. FECN
- D. LMI
- E. CIR
- F. De

**Answer: D**

**Explanation:**

The **keepalive** command enables the keepalive sequence, which is part of the Local Management Interface (LMI) protocol. The keepalives will prevent the PVC from shutting down.

The Data Link Connection Identifier (DLCI) is used for identification purposes and not to maintain a connection.

BECN is not a LMI signaling standard. It stands for Backward Explicit Congestion Notification.

FECN is not a LMI signaling standard. It stands for Forward Explicit Congestion Notification.

CIR stands for Committed Information Rate. It does not maintain a connection.

DE will not maintain a connection.

**Question 9.**

If RIP uses hop count to determine the best path what does IGRP use?

- A. The highest metric value.
- B. The lowest composite metric value.
- C. The lowest hop-count and delay.
- D. The highest bandwidth and reliability
- E. The lowest administrative distance.

**Answer: B**

**Explanation:**

IGRP calculates the metric by adding together weighted values of different characteristics of the link to the network in question.

IGRP select the route with the lowest metric value as the best route.

Hop count is not one of the parts of the IGRP composite metric.

IGRP uses the lowest bandwidth value when selecting a path.

Administrative distance is not part of the IGRP composite metric.

**Question 10.**

Your ISP has provided you the following class B network range 131.107.0.0/24. Which of the following statements is true regarding this network? (Choose two.)

- A. There are 254 usable hosts per subnet.
- B. There is one usable network.
- C. There are 255 usable hosts per subnet.
- D. There are 254 usable subnets.
- E. There are 30 usable subnets.
- F. There are 62 usable hosts per subnet.

**Answer: A & D**

**Explanation:**

There are 8 bits for the hosts (32-24). We use the formula  $2^{\text{number\_of\_host\_bits}} - 2$ . So there are 254 hosts ( $2^8 - 2$ ) per subnet.

There are 8 bits for the subnets (8 bits for hosts, 16 bits for the class B subnet: 32-8-16). Cisco want us to use the formula  $2^{\text{number\_of\_subnet\_bits}} - 2$ . This gives 254 ( $2^8 - 2$ ) possible subnets. Cisco routers are able to use 256 subnets. In Microsoft exams the correct answer would be that 256 subnets are available.

According to Cisco there are two unusable networks namely 131.107.0.0/24 and 131.107.255.0/24.

Only 254 hosts are usable on each subnet. The lowest IP address in subnet is the subnet number. The highest address is the broadcast address.

Other choices are incorrect as well.