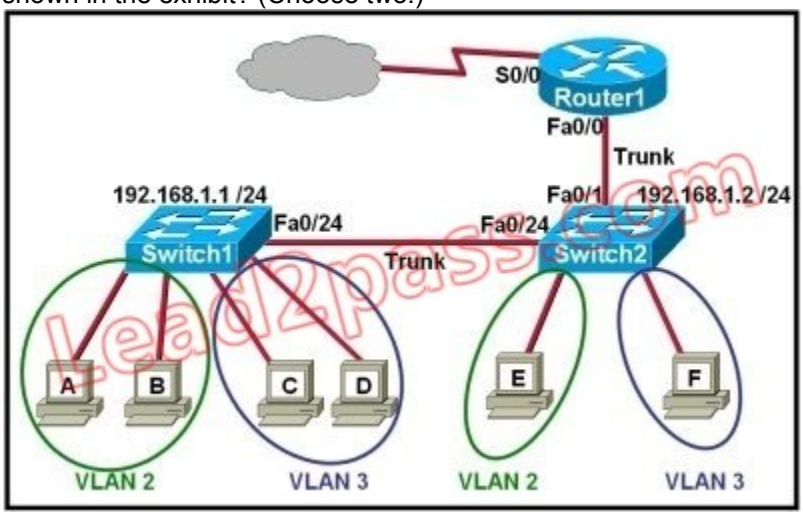
➢ Vendor: Cisco

➢ Exam Code: 200-125

➢ Exam Name: Cisco Certified Network Associate (v3.0)

➢ Question 51 – Question 100

QUESTION 51
Refer to the exhibit. Which two statements are true about interVLAN routing in the topology that is shown in the exhibit? (Choose two.)



A. Host E and host F use the same IP gateway address.
B. Router1 and Switch2 should be connected via a crossover cable.
C. Router1 will not play a role in communications between host A and host D
D. The FastEthernet 0/0 interface on Router1 must be configured with subinterfaces.
E. Router1 needs more LAN interfaces to accommodate the VLANs that are shown in the exhibit.
F. The FastEthernet 0/0 interface on Router1 and the FastEthernet 0/1 interface on Switch2 trunk ports must be configured using the same encapsulation type.

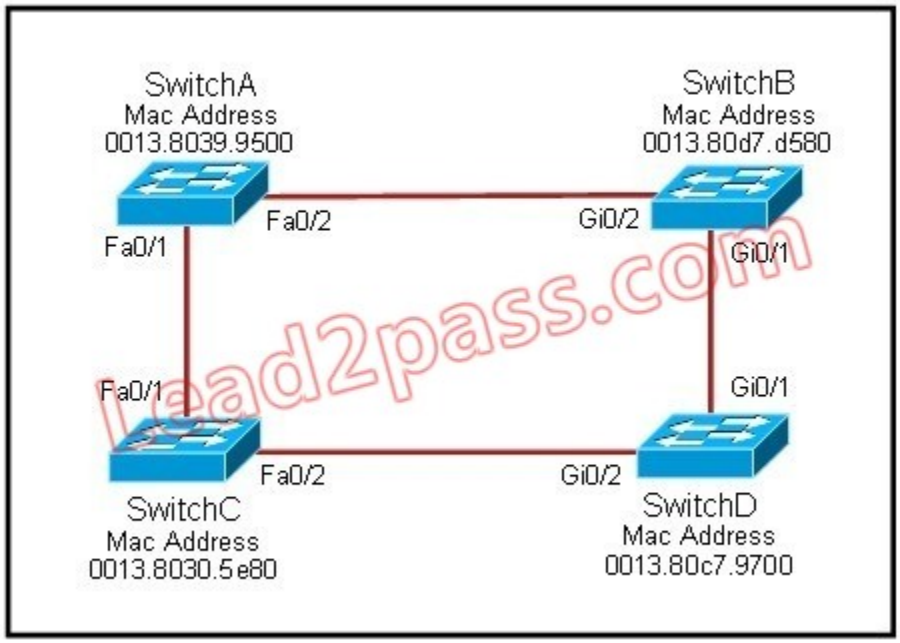
Answer: DF

QUESTION 52
Which two of these are characteristics of the 802.1Q protocol? (Choose two.)

A. It is used exclusively for tagging VLAN frames and does not address network reconvergence following switched network topology changes.
B. It modifies the 802.3 frame header, and thus requires that the FCS be recomputed.
C. It is a Layer 2 messaging protocol which maintains VLAN configurations across networks.
D. It includes an 8-bit field which specifies the priority of a frame.
E. It is a trunking protocol capable of carrying untagged frames.

Answer: BE
Explanation:
802.1Q protocol, or Virtual Bridged Local Area Networks protocol, mainly stipulates the realization of the VLAN. 802.1Q is a standardized relay method that inserts 4 bytes field into the original Ethernet frame and re-calculate the FCS. 802.1Q frame relay supports two types of frame: marked and non-marked. Non-marked frame carries no VLAN identification information.

QUESTION 53
Refer to the exhibit. Each of these four switches has been configured with a hostname, as well as being configured to run RSTP. No other configuration changes have been made. Which three of these show the correct RSTP port roles for the indicated switches and interfaces? (Choose three.)



A. SwitchA, Fa0/2, designated
B. SwitchA, Fa0/1, root
C. SwitchB, Gi0/2, root
D. SwitchB, Gi0/1, designated
E. SwitchC, Fa0/2, root
F. SwitchD, Gi0/2, root

Answer: ABF

Explanation:

The question says "no other configuration changes have been made" so we can understand these switches have the same bridge priority. Switch C has lowest MAC address so it will become root bridge and 2 of its ports (Fa0/1 & Fa0/2) will be designated ports. Because SwitchC is the root bridge so the 2 ports nearest SwitchC on SwitchA (Fa0/1) and SwitchD (Gi0/2) will be root ports..

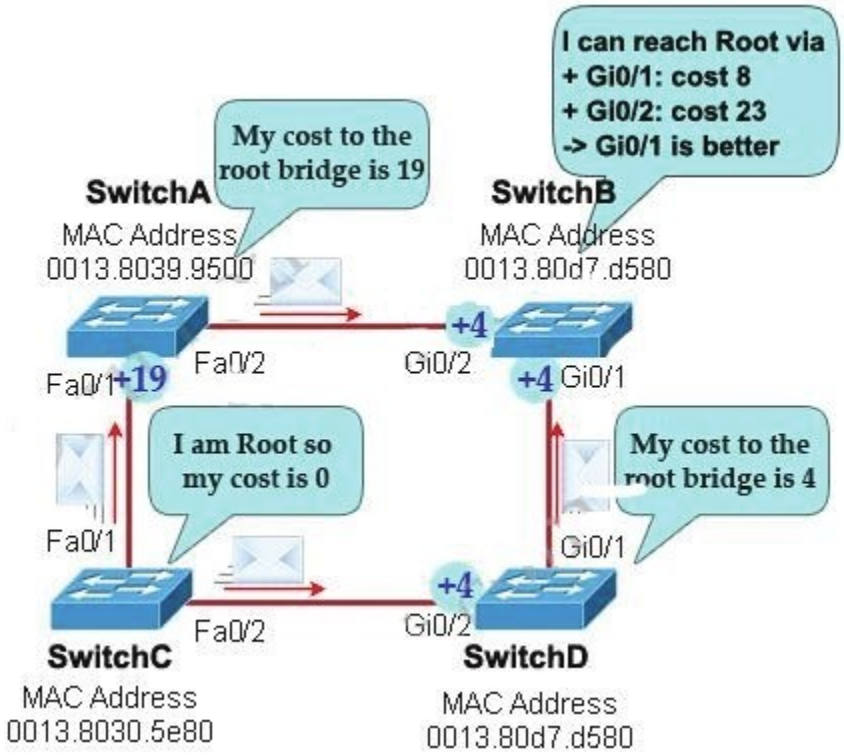
Now we come to the most difficult part of this question: SwitchB must have a root port so which port will it choose? To answer this question we need to know about STP cost and port cost. In general, "cost" is calculated based on bandwidth of the link. The higher the bandwidth on a link, the lower the value of its cost. Below are the cost values you should memorize:

Link speed	Cost
10Mbps	100
100Mbps	19
1 Gbps	4

SwitchB will choose the interface with lower cost to the root bridge as the root port so we must calculate the cost on interface Gi0/1 & Gi0/2 of SwitchB to the root bridge. This can be calculated from the "cost to the root bridge" of each switch because a switch always advertises its cost to the root bridge in its BPDU. The receiving switch will add its local port cost value to the cost in the BPDU.

One more thing to notice is that a root bridge always advertises the cost to the root bridge (itself) with an initial value of 0.

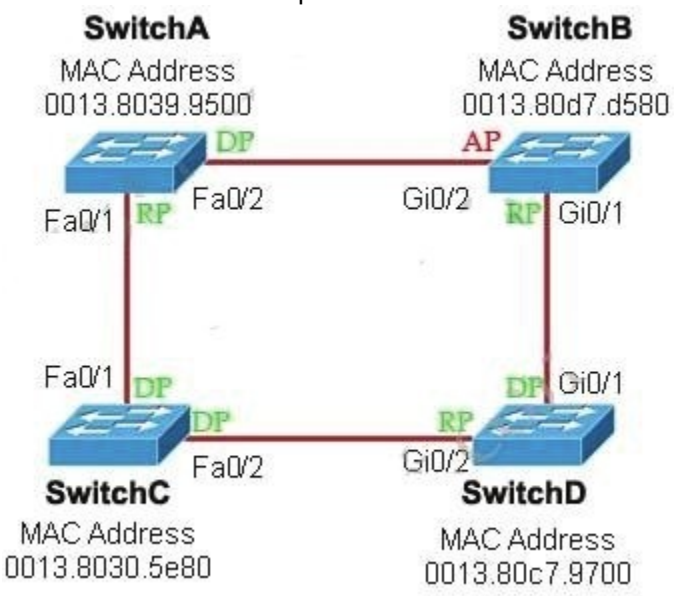
Now let's have a look at the topology again



SwitchC advertises its cost to the root bridge with a value of 0. Switch D adds 4 (the cost value of 1Gbps link) and advertises this value (4) to SwitchB. SwitchB adds another 4 and learns that it can reach SwitchC via Gi0/1 port with a total cost of 8. The same process happens for SwitchA and SwitchB learns that it can reach SwitchC via Gi0/2 with a total cost of 23 -> Switch B chooses Gi0/1 as its root port ->

Now our last task is to identify the port roles of the ports between SwitchA & SwitchB. It is rather

easy as the MAC address of SwitchA is lower than that of SwitchB so Fa0/2 of SwitchA will be designated port while Gi0/2 of SwitchB will be alternative port.
Below summaries all the port roles of these switches:



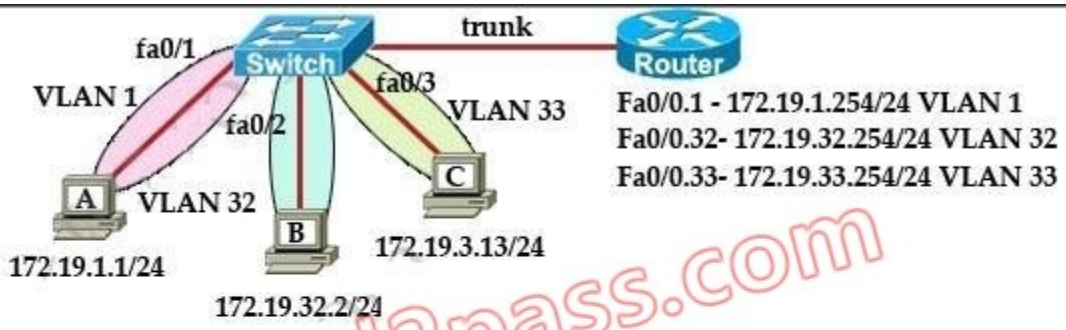
+ DP: Designated Port (forwarding state)
+ RP: Root Port (forwarding state)

QUESTION 54
What is one benefit of PVST+?

A. PVST+ supports Layer 3 load balancing without loops.
B. PVST+ reduces the CPU cycles for all the switches in the network.
C. PVST+ allows the root switch location to be optimized per VLAN.
D. PVST+ automatically selects the root bridge location, to provide optimized bandwidth usage.

Answer: C
Explanation:
The PVST+ provides Layer 2 load-balancing for the VLAN on which it runs. You can create different logical topologies by using the VLANs on your network to ensure that all of your links are used but that no one link is oversubscribed. Each instance of PVST+ on a VLAN has a single root switch. This root switch propagates the spanning-tree information associated with that VLAN to all other switches in the network. Because each switch has the same information about the network, this process ensures that the network topology is maintained and optimized per VLAN.
http://www.cisco.com/en/US/docs/switches/lan/catalyst3750x_3560x/software/release/12.2_55_se/configuration/guide/swstp.html

QUESTION 55
Refer to the exhibit. The network administrator normally establishes a Telnet session with the switch from host A . However, host A is unavailable. The administrator's attempt to telnet to the switch from host B fails, but pings to the other two hosts are successful. What is the issue?



Switch# **show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Vlan 1	172.19.1.250	Yes	manual	up	up
FastEthernet0/1	unassigned	Yes	unset	up	up
FastEthernet0/2	unassigned	Yes	unset	up	up
FastEthernet0/3	unassigned	Yes	unset	up	up

<output omitted>

A. Host B and the switch need to be in the same subnet.
B. The switch interface connected to the router is down.
C. Host B needs to be assigned an IP address in VLAN 1.
D. The switch needs an appropriate default gateway assigned.
E. The switch interfaces need the appropriate IP addresses assigned.

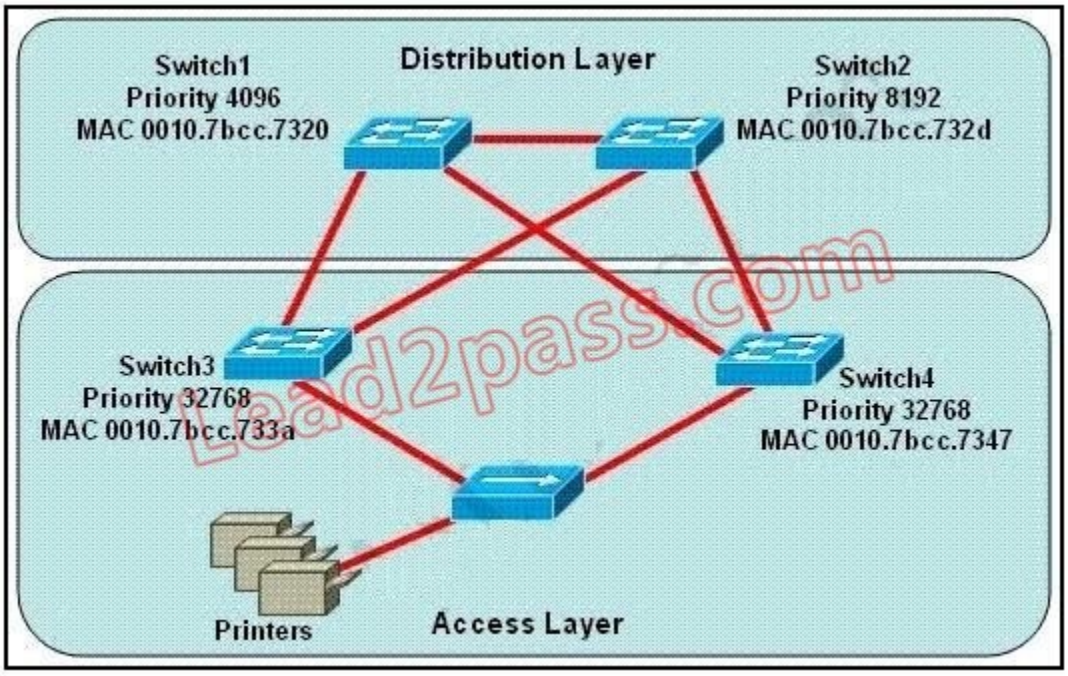
Answer: D
Explanation:
Ping was successful form host B to other hosts because of intervlan routing configured on router. But to manage switch via telnet the VLAN32 on the switch needs to be configured interface vlan32 along with ip address and its appropriate default-gateway address. Since VLAN1 interface is already configure on switch Host A was able to telnet switch.

QUESTION 56
Which are valid modes for a switch port used as a VLAN trunk? (Choose three.)

A. transparent
B. auto
C. on
D. desirable
E. blocking
F. forwarding

Answer: BCD

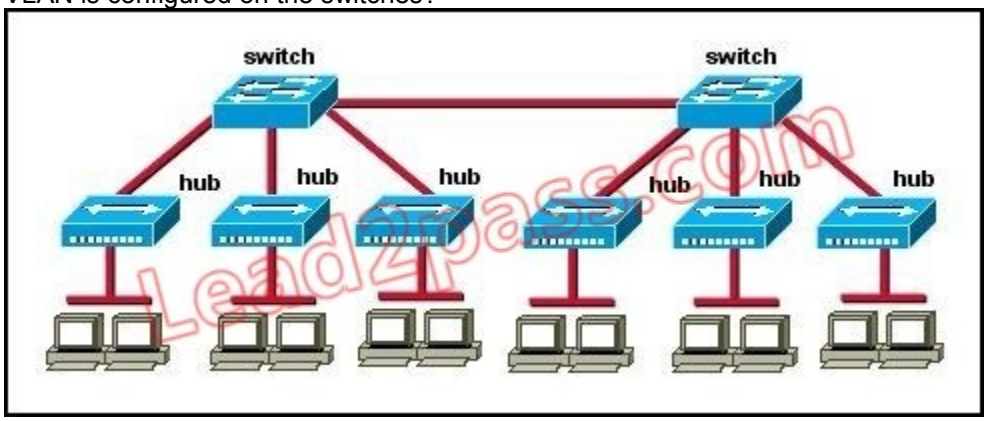
QUESTION 57
Refer to the exhibit. Which switch provides the spanning-tree designated port role for the network segment that services the printers?



A. Switch1
B. Switch2
C. Switch3
D. Switch4

Answer: C
Explanation:
Printers are connected by hubs. Decide the switch that provides the spanning-tree designated port role between Switch3 and Switch4. They have the same priority 32768. Compare their MAC addresses. Switch3 with a smaller MAC address will provide a designated port for printers.

QUESTION 58
Refer to Exhibit. How many broadcast domains are shown in the graphic assuming only the default VLAN is configured on the switches?



A. one
B. two

C. six
D. twelve

Answer: A
Explanation:
Only router can break up broadcast domains but in this exhibit no router is used so there is only 1 broadcast domain.
For your information, there are 7 collision domains in this exhibit (6 collision domains between hubs & switches + 1 collision between the two switches).

QUESTION 59
Which three of these statements regarding 802.1Q trunking are correct? (Choose three.)

A. 802.1Q native VLAN frames are untagged by default.
B. 802.1Q trunking ports can also be secure ports.
C. 802.1Q trunks can use 10 Mb/s Ethernet interfaces.
D. 802.1Q trunks require full-duplex, point-to-point connectivity.
E. 802.1Q trunks should have native VLANs that are the same at both ends.

Answer: ACE
Explanation:
By default, 802.1Q trunk defined Native VLAN in order to forward unmarked frame. Switches can forward Layer 2 frame from Native VLAN on unmarked trunks port. Receiver switches will transmit all unmarked packets to Native VLAN. Native VLAN is the default VLAN configuration of port. Note for the 802.1Q trunk ports between two devices, the same Native VLAN configuration is required on both sides of the link. If the Native VLAN in 802.1Q trunk ports on same trunk link is properly configured, it could lead to layer 2 loops. The 802.1Q trunk link transmits VLAN information through Ethernet.

QUESTION 60
Refer to the exhibit. The output that is shown is generated at a switch. Which three statements are true? (Choose three.)

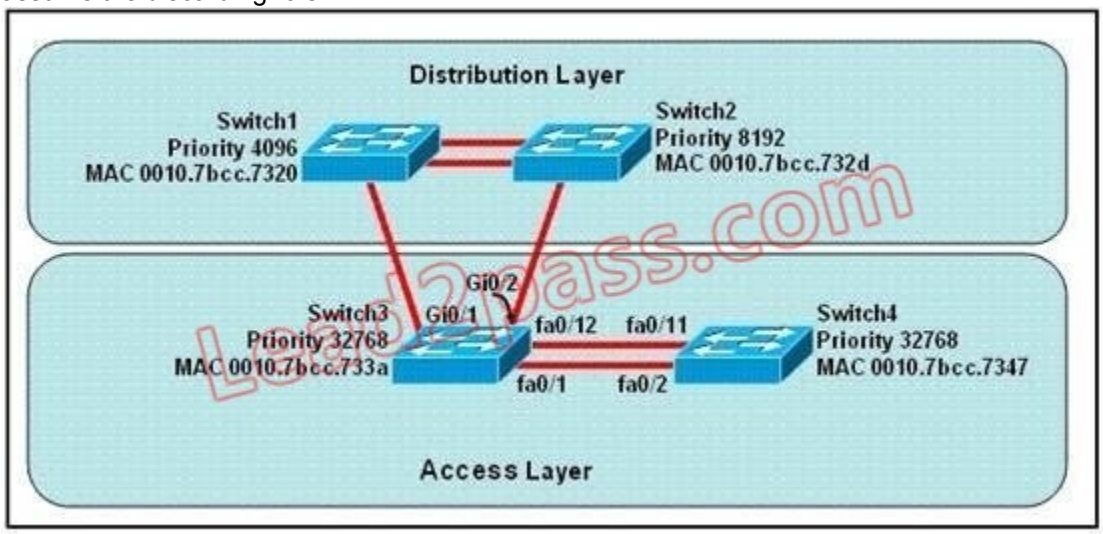
```
Switch# show spanning-tree vlan 30
VLAN0030
Spanning tree enabled protocol rstp
Root ID Priority 24606
Address 00d0.047b.2800
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 24606 (priority 24576 sys-id-ext 30)
Address 00d0.047b.2800
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300
Interface   Role  Sts   Cost  Prio.Nbr    Type
---------   ----  ---   ----  --------    ----------
Fa1/1       Desg FWD    4     128.1       p2p
Fa1/2       Desg FWD    4     128.2       p2p
Fa5/1       Desg FWD    4     128.257     p2p
```


A. All ports will be in a state of discarding, learning, or forwarding.

B. Thirty VLANs have been configured on this switch.
C. The bridge priority is lower than the default value for spanning tree.
D. All interfaces that are shown are on shared media.
E. All designated ports are in a forwarding state.
F. This switch must be the root bridge for all VLANs on this switch.

Answer: ACE
Explanation:
From the output, we see that all ports are in Designated role (forwarding state). The command "show spanning-tree vlan 30 only shows us information about VLAN 30. We don't know how many VLAN exists in this switch ->
The bridge priority of this switch is 24606 which is lower than the default value bridge priority 32768 -> .
All three interfaces on this switch have the connection type "p2p", which means Point-to-point environment ?not a shared media >;
The only thing we can specify is this switch is the root bridge for VLAN 3o but we can not guarantee it is also the root bridge for other VLANs ->

QUESTION 61
Refer to the exhibit. At the end of an RSTP election process, which access layer switch port will assume the discarding role?



A. Switch3, port fa0/1
B. Switch3, port fa0/12
C. Switch4, port fa0/11
D. Switch4, port fa0/2
E. Switch3, port Gi0/1
F. Switch3, port Gi0/2

Answer: C
Explanation:
In this question, we only care about the Access Layer switches (Switch3 & 4). Switch 3 has a lower bridge ID than Switch 4 (because the MAC of Switch3 is smaller than that of Switch4) so both ports of Switch3 will be in forwarding state. The alternative port will surely belong to Switch4. Switch4 will need to block one of its ports to avoid a bridging loop between the two switches. But how does Switch4 select its blocked port? Well, the answer is based on the BPDUs it receives from Switch3.

A BPDU is superior than another if it has:
1. A lower Root Bridge ID
2. A lower path cost to the Root
3. A lower Sending Bridge ID
4. A lower Sending Port ID
These four parameters are examined in order. In this specific case, all the BPDUs sent by Switch3 have the same Root Bridge ID, the same path cost to the Root and the same Sending Bridge ID. The only parameter left to select the best one is the Sending Port ID (Port ID = port priority + port index). In this case the port priorities are equal because they use the default value, so Switch4 will compare port index values, which are unique to each port on the switch, and because Fa0/12 is inferior to Fa0/1, Switch4 will select the port connected with Fa0/1 (of Switch3) as its root port and block the other port -> Port fa0/11 of Switch4 will be blocked (discarding role).

QUESTION 62
Which term describes a spanning-tree network that has all switch ports in either the blocking or fowarding state?

A. converged
B. redundant
C. provisioned
D. spanned

Answer: A
Explanation:
Spanning Tree Protocol convergence (Layer 2 convergence) happens when bridges and switches have transitioned to either the forwarding or blocking state. When layer 2 is converged, root bridge is elected and all port roles (Root, Designated and Non-Designated) in all switches are selected.

QUESTION 63
What are the possible trunking modes for a switch port? (Choose three.)

A. transparent
B. auto
C. on
D. desirable
E. client
F. forwarding

Answer: BCD

QUESTION 64
Which two of these statements regarding RSTP are correct? (Choose two.)

A. RSTP cannot operate with PVST+.
B. RSTP defines new port roles.
C. RSTP defines no new port states.
D. RSTP is a proprietary implementation of IEEE 802.1D STP.
E. RSTP is compatible with the original IEEE 802.1D STP.

Answer: BE
Explanation:
When network topology changes, rapid spanning tree protocol (IEEE802.1W, referred to as RSTP)

will speed up significantly the speed to re-calculate spanning tree. RSTP not only defines the role of other ports: alternative port and backup port, but also defines status of 3 ports: discarding status, learning status, forwarding status.
RSTP is 802.1D standard evolution, not revolution. It retains most of the parameters, and makes no changes.

QUESTION 65
Refer to the exhibit. Which two statements are true of the interfaces on Switch1? (Choose two.)

```
Switch1# show mac-address-table
Dynamic Addresses Count: 19
Secure Addresses (User-defined) Count: 0
Static Addresses (User-defined) Count: 0
System Self Addresses Count: 41
Total MAC addresses: 50
Non-static Address Table:
Destination Address     AddressType    VLAN    Destination Port
-------------------     -----------    ----    --------------------
0010.0de0.e289          Dynamic        1       FastEthernet0/1
0010.7b00.1540          Dynamic        2       FastEthernet0/5
0010.7b00.1545          Dynamic        2       FastEthernet0/5
0060.5cf4.0076          Dynamic        1       FastEthernet0/1
0060.5cf4.0077          Dynamic        3       FastEthernet0/1
0060.5cf4.1315          Dynamic        1       FastEthernet0/1
0060.70cb.f301          Dynamic        2       FastEthernet0/1
0060.70cb.3f01          Dynamic        5       FastEthernet0/2
00e0.1e42.9978          Dynamic        4       FastEthernet0/1
00e0.1e9f.3900          Dynamic        3       FastEthernet0/1
0060.70cb.33f1          Dynamic        6       FastEthernet0/3
0060.70cb.103f          Dynamic        6       FastEthernet0/4

<output omitted>

Switch1# show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID        Local Intrfce     Holdtime    Capability  Platform  Port ID
Switch2          Fas 0/1           157           S         2950-12    Fas 0/1
Switch3          Fas 0/2           143           S         2950-12    Fas 0/5

Switch1#
```


A. Multiple devices are connected directly to FastEthernet0/1.
B. A hub is connected directly to FastEthernet0/5.
C. FastEthernet0/1 is connected to a host with multiple network interface cards.
D. FastEthernet0/5 has statically assigned MAC addresses.
E. FastEthernet0/1 is configured as a trunk link.
F. Interface FastEthernet0/2 has been disabled.

Answer: BE
Explanation:
Carefully observe the information given after command show. Fa0/1 is connected to Switch2, seven MAC addresses correspond to Fa0/1, and these MAC are in different VLAN. From this we know that Fa0/1 is the trunk interface.
From the information given by show cdp neighbors we find that there is no Fa0/5 in CDP neighbor.

However, F0/5 corresponds to two MAC addresses in the same VLAN. Thus we know that Fa0/5 is connected to a Hub.
Based on the output shown, there are multiple MAC addresses from different VLANs attached to the FastEthernet 0/1 interface. Only trunks are able to pass information from devices in multiple VLANs.

QUESTION 66
Three switches are connected to one another via trunk ports. Assuming the default switch configuration, which switch is elected as the root bridge for the spanning-tree instance of VLAN 1?

A. the switch with the highest MAC address
B. the switch with the lowest MAC address
C. the switch with the highest IP address
D. the switch with the lowest IP address

Answer: B
Explanation:
Each switch in your network will have a Bridge ID Priority value, more commonly referred to as a BID. This BID is a combination of a default priority value and the switch's MAC address, with the priority value listed first. The lowest BID will win the election process.
For example, if a Cisco switch has the default priority value of 32,768 and a MAC address of 11-22-33-44-55-66, the BID would be 32768:11-22-33-44-55-66. Therefore, if the switch priority is left at the default, the MAC address is the deciding factor in the root bridge election.

QUESTION 67
What are three advantages of VLANs? (Choose three.)

A. VLANs establish broadcast domains in switched networks.
B. VLANs utilize packet filtering to enhance network security.
C. VLANs provide a method of conserving IP addresses in large networks.
D. VLANs provide a low-latency internetworking alternative to routed networks.
E. VLANs allow access to network services based on department, not physical location.
F. VLANs can greatly simplify adding, moving, or changing hosts on the network.

Answer: AEF
Explanation:
VLAN technology is often used in practice, because it can better control layer2 broadcast to improve network security. This makes network more flexible and scalable. Packet filtering is a function of firewall instead of VLAN.

QUESTION 68
Which two benefits are provided by using a hierarchical addressing network addressing scheme? (Choose two.)

A. reduces routing table entries
B. auto-negotiation of media rates
C. efficient utilization of MAC addresses
D. dedicated communications between devices
E. ease of management and troubleshooting

Answer: AE
Explanation:

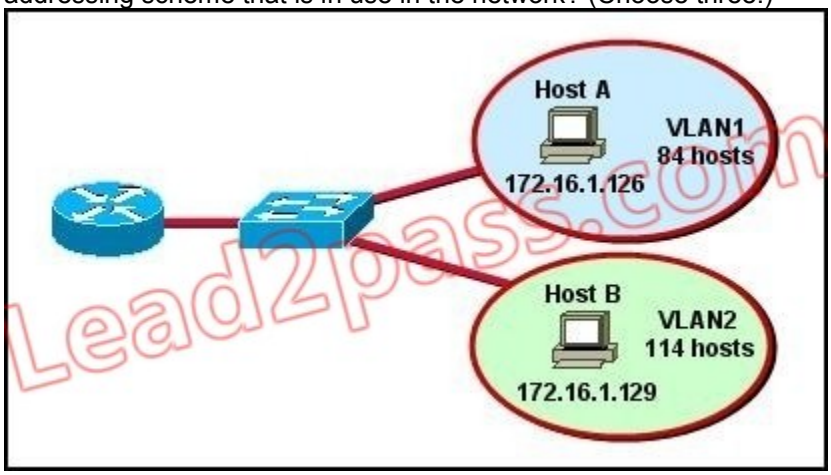
Here are some of the benefits of hierarchical addressing:
Reference: http://www.ciscopress.com/articles/article.asp?p=174107

QUESTION 69
What is the alternative notation for the IPv6 address B514:82C3:0000:0000:0029:EC7A:0000:EC72?

A. B514 : 82C3 : 0029 : EC7A : EC72
B. B514 : 82C3 :: 0029 : EC7A : EC72
C. B514 : 82C3 : 0029 :: EC7A : 0000 : EC72
D. B514 : 82C3 :: 0029 : EC7A : 0 : EC72

Answer: D
Explanation:
There are two ways that an IPv6 address can be additionally compressed: compressing leading zeros and substituting a group of consecutive zeros with a single double colon (::). Both of these can be used in any number of combinations to notate the same address. It is important to note that the double colon (::) can only be used once within a single IPv6 address notation. So, the extra 0's can only be compressed once.

QUESTION 70
Refer to the diagram. All hosts have connectivity with one another. Which statements describe the addressing scheme that is in use in the network? (Choose three.)



A. The subnet mask in use is 255.255.255.192.
B. The subnet mask in use is 255.255.255.128.
C. The IP address 172.16.1.25 can be assigned to hosts in VLAN1
D. The IP address 172.16.1.205 can be assigned to hosts in VLAN1
E. The LAN interface of the router is configured with one IP address.
F. The LAN interface of the router is configured with multiple IP addresses.

Answer: BCF
Explanation:
The subnet mask in use is 255.255.255.128: This is subnet mask will support up to 126 hosts, which is needed.
The IP address 172.16.1.25 can be assigned to hosts in VLAN1: The usable host range in this subnet is 172.16.1.1-172.16.1.126
The LAN interface of the router is configured with multiple IP addresses: The router will need 2

subinterfaces for the single physical interface, one with an IP address that belongs in each VLAN.

QUESTION 71
Which two statements describe characteristics of IPv6 unicast addressing? (Choose two.)

A. Global addresses start with 2000::/3.
B. Link-local addresses start with FE00:/12.
C. Link-local addresses start with FF00::/10.
D. There is only one loopback address and it is ::1.
E. If a global address is assigned to an interface, then that is the only allowable address for the interface.

Answer: AD
Explanation:
Below is the list of common kinds of IPv6 addresses:

Loopback address	::1
Link-local address	FE80::/10
Site-local address	FEC0::/10
Global address	2000::/3
Multicast address	FF00::/8

QUESTION 72
The network administrator has been asked to give reasons for moving from IPv4 to IPv6. What are two valid reasons for adopting IPv6 over IPv4? (Choose two.)

A. no broadcast
B. change of source address in the IPv6 header
C. change of destination address in the IPv6 header
D. Telnet access does not require a password
E. autoconfiguration
F. NAT

Answer: AE
Explanation:
IPv6 does not use broadcasts, and autoconfiguration is a feature of IPV6 that allows for hosts to automatically obtain an IPv6 address.

QUESTION 73
An administrator must assign static IP addresses to the servers in a network. For network 192.168.20.24/29, the router is assigned the first usable host address while the sales server is given the last usable host address. Which of the following should be entered into the IP properties box for the sales server?

A.
```
IP address: 192.168.20.14
Subnet Mask: 255.255.255.248
Default Gateway: 192.168.20.9
```
B.
```
IP address: 192.168.20.254
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.20.1
```
C.
```
IP address: 192.168.20.30
```

```
   Subnet Mask: 255.255.255.248
   Default Gateway: 192.168.20.25
D. IP address: 192.168.20.30
   Subnet Mask: 255.255.255.240
   Default Gateway: 192.168.20.17
E. IP address: 192.168.20.30
   Subnet Mask: 255.255.255.240
   Default Gateway: 192.168.20.25
```

Answer: C
Explanation:
For the 192.168.20.24/29 network, the usable hosts are 192.168.24.25 (router) ?192.168.24.30 (used for the sales server).

QUESTION 74
Which subnet mask would be appropriate for a network address range to be subnetted for up to eight LANs, with each LAN containing 5 to 26 hosts?

A. 0.0.0.240
B. 255.255.255.252
C. 255.255.255.0
D. 255.255.255.224
E. 255.255.255.240

Answer: D
Explanation:
For a class C network, a mask of 255.255.255.224 will allow for up to 8 networks with 32 IP addresses each (30 usable).

QUESTION 75
How many bits are contained in each field of an IPv6 address?

A. 24
B. 4
C. 8
D. 16

Answer: D
Explanation:
An IPv6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits (two octets). The groups are separated by colons (:). An example of an IPv6 address is 2001:0db8:85a3:0000:0000:8a2e:0370:7334.

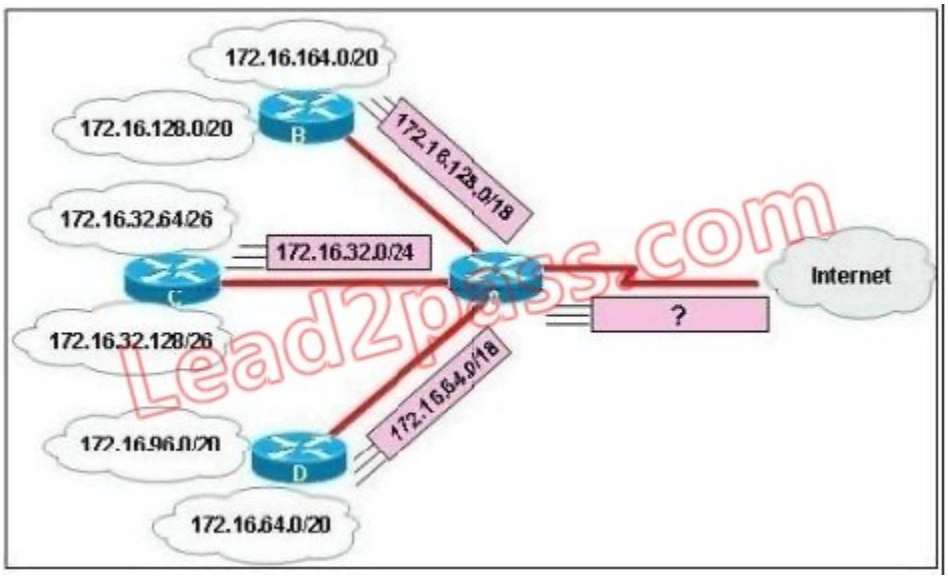
QUESTION 76
What are three approaches that are used when migrating from an IPv4 addressing scheme to an IPv6 scheme. (Choose three.)

A. enable dual-stack routing
B. configure IPv6 directly
C. configure IPv4 tunnels between IPv6 islands
D. use proxying and translation to translate IPv6 packets into IPv4 packets
E. statically map IPv4 addresses to IPv6 addresses

F. use DHCPv6 to map IPv4 addresses to IPv6 addresses

Answer: ACD
Explanation:
Several methods are used terms of migration including tunneling, translators, and dual stack. Tunnels are used to carry one protocol inside another, while translators simply translate IPv6 packets into IPv4 packets. Dual stack uses a combination of both native IPv4 and IPv6. With dual stack, devices are able to run IPv4 and IPv6 together and if IPv6 communication is possible that is the preferred protocol. Hosts can simultaneously reach IPv4 and IPv6 content.

QUESTION 77
Refer to the exhibit. In this VLSM addressing scheme, what summary address would be sent from router A?



A. 172.16.0.0 /16
B. 172.16.0.0 /20
C. 172.16.0.0 /24
D. 172.32.0.0 /16
E. 172.32.0.0 /17
F. 172.64.0.0 /16

Answer: A
Explanation:
Router A receives 3 subnets: 172.16.64.0/18, 172.16.32.0/24 and 172.16.128.0/18. All these 3 subnets have the same form of 172.16.x.x so our summarized subnet must be also in that form -> Only A, B or .
The smallest subnet mask of these 3 subnets is /18 so our summarized subnet must also have its subnet mask equal or smaller than /18.
-> Only answer A has these 2 conditions -> .

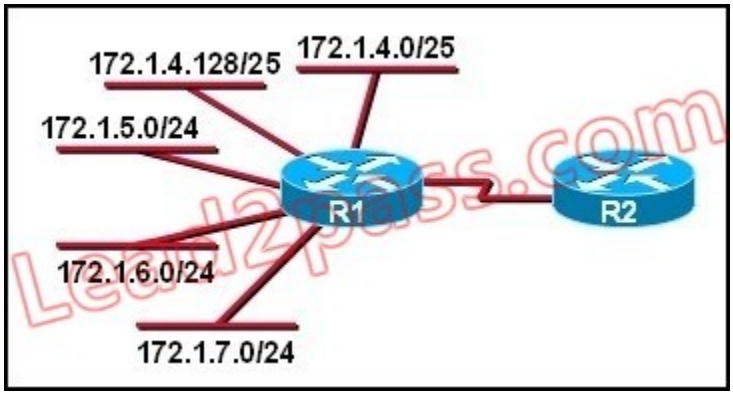
QUESTION 78
How is an EUI-64 format interface ID created from a 48-bit MAC address?

A. by appending 0xFF to the MAC address
B. by prefixing the MAC address with 0xFFEE

C. by prefixing the MAC address with 0xFF and appending 0xFF to it
D. by inserting 0xFFFE between the upper three bytes and the lower three bytes of the MAC address
E. by prefixing the MAC address with 0xF and inserting 0xF after each of its first three bytes

Answer: D
Explanation:
The modified EUI-64 format interface identifier is derived from the 48-bit link-layer (MAC) address by inserting the hexadecimal number FFFE between the upper three bytes (OUI field) and the lower three bytes (serial number) of the link layer address.

QUESTION 79
Refer to the exhibit. What is the most efficient summarization that R1 can use to advertise its networks to R2?



A. 172.1.0.0/22
B. 172.1.0.0/21
C. 172.1.4.0/22
D. 172.1.4.0/24
172.1.5.0/24
172.1.6.0/24
172.1.7.0/24
E. 172.1.4.0/25
172.1.4.128/25
172.1.5.0/24
172.1.6.0/24
172.1.7.0/24

Answer: C
Explanation:
The 172.1.4.0/22 subnet encompasses all routes from the IP range 172.1.4.0 ?172.1.7.255.

QUESTION 80
Which option is a valid IPv6 address?

A. 2001:0000:130F::099a::12a
B. 2002:7654:A1AD:61:81AF:CCC1
C. FEC0:ABCD:WXYZ:0067::2A4
D. 2004:1:25A4:886F::1

Answer: D

Explanation:
An IPv6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits (two octets). The groups are separated by colons (:). An example of an IPv6 address is 2001:0db8:85a3:0000:0000:8a2e:0370:7334. The leading 0's in a group can be collapsed using ::, but this can only be done once in an IP address.

QUESTION 81
Which three are characteristics of an IPv6 anycast address? (Choose three.)

A. one-to-many communication model
B. one-to-nearest communication model
C. any-to-many communication model
D. a unique IPv6 address for each device in the group
E. the same address for multiple devices in the group
F. delivery of packets to the group interface that is closest to the sending device

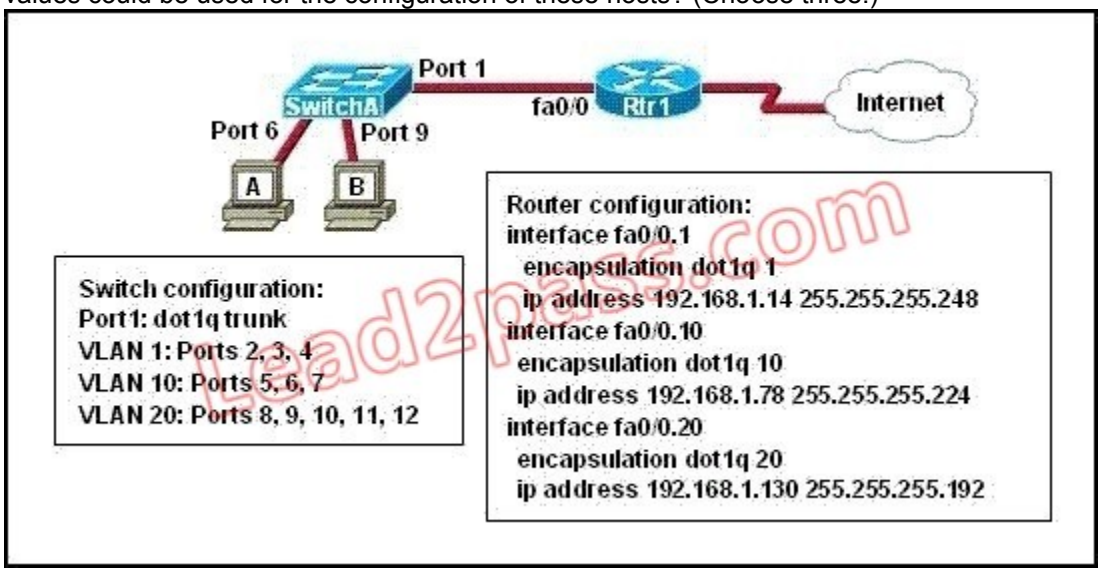
Answer: BEF
Explanation:
A new address type made specifically for IPv6 is called the Anycast Address. These IPv6 addresses are global addresses, these addresses can be assigned to more than one interface unlike an IPv6 unicast address. Anycast is designed to send a packet to the nearest interface that is apart of that anycast group.
The sender creates a packet and forwards the packet to the anycast address as the destination address which goes to the nearest router. The nearest router or interface is found by using the metric of a routing protocol currently running on the network. However in a LAN setting the nearest interface is found depending on the order the neighbors were learned. The anycast packet in a LAN setting forwards the packet to the neighbor it learned about first.

QUESTION 82
A national retail chain needs to design an IP addressing scheme to support a nationwide network. The company needs a minimum of 300 sub-networks and a maximum of 50 host addresses per subnet. Working with only one Class B address, which of the following subnet masks will support an appropriate addressing scheme? (Choose two.)

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

Answer: BE
Explanation:
Subnetting is used to break the network into smaller more efficient subnets to prevent excessive rates of Ethernet packet collision in a large network. Such subnets can be arranged hierarchically, with the organization's network address space (see also Autonomous System) partitioned into a tree-like structure. Routers are used to manage traffic and constitute borders between subnets. A routing prefix is the sequence of leading bits of an IP address that precede the portion of the address used as host identifier. In IPv4 networks, the routing prefix is often expressed as a "subnet mask", which is a bit mask covering the number of bits used in the prefix. An IPv4 subnet mask is frequently expressed in quad-dotted decimal representation, e.g., 255.255.255.0 is the subnet mask for the 192.168.1.0 network with a 24-bit routing prefix (192.168.1.0/24).

QUESTION 83
Refer to the exhibit. A network administrator is adding two new hosts to Switch A . Which three values could be used for the configuration of these hosts? (Choose three.)



A. host A IP address: 192.168.1.79
B. host A IP address: 192.168.1.64
C. host A default gateway: 192.168.1.78
D. host B IP address: 192.168.1.128
E. host B default gateway: 192.168.1.129
F. host B IP address: 192.168.1.190

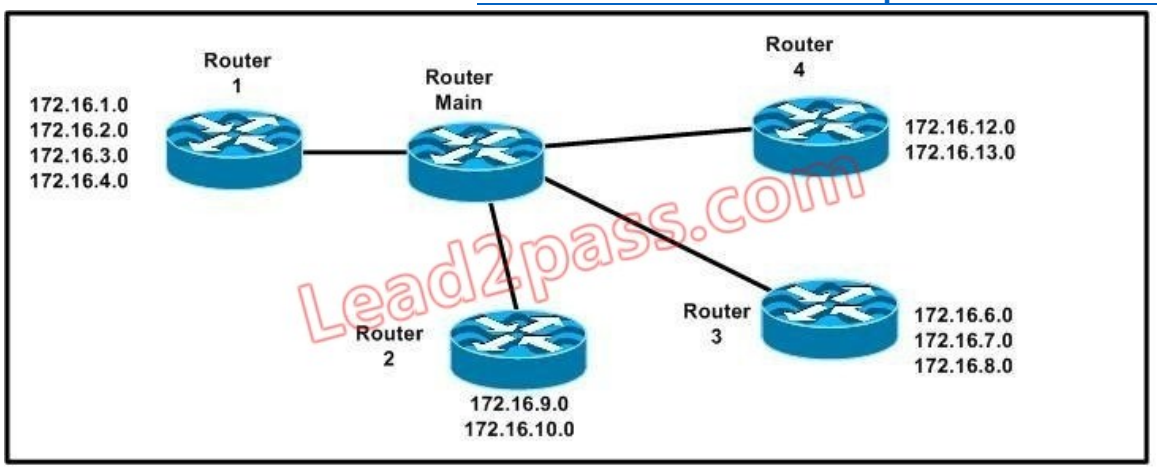
Answer: ACF

QUESTION 84
Which IPv6 address is the all-router multicast group?

A. FF02::1
B. FF02::2
C. FF02::3
D. FF02::4

Answer: B
Explanation:
Well-known IPv6 multicast addresses:
Address
Description
ff02::1
All nodes on the local network segment
ff02::2
All routers on the local network segment

QUESTION 85
Refer to the exhibit. Which address range efficiently summarizes the routing table of the addresses for router Main?



A. 172.16.0.0./21
B. 172.16.0.0./20
C. 172.16.0.0./16
D. 172.16.0.0/18

Answer: B
Explanation:
The 172.16.0.0./20 network is the best option as it includes all networks from 172.16.0.0 - 172.16.16.0 and does it more efficiently than the /16 and /18 subnets. The /21 subnet will not include all the other subnets in this one single summarized address.

QUESTION 86
Which IPv6 address is valid?

A. 2001:0db8:0000:130F:0000:0000:08GC:140B
B. 2001:0db8:0:130H::87C:140B
C. 2031::130F::9C0:876A:130B
D. 2031:0:130F::9C0:876A:130B

Answer: D
Explanation:
An IPv6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits (two octets). The groups are separated by colons (:). An example of an IPv6 address is 2001:0db8:85a3:0000:0000:8a2e:0370:7334. The leading 0's in a group can be collapsed using ::, but this can only be done once in an IP address.

QUESTION 87
Which command can you use to manually assign a static IPv6 address to a router interface?

A. ipv6 autoconfig 2001:db8:2222:7272::72/64
B. ipv6 address 2001:db8:2222:7272::72/64
C. ipv6 address PREFIX_1 ::1/64
D. ipv6 autoconfig

Answer: B
Explanation:
To assign an IPv6 address to an interface, use the "ipv6 address" command and specify the IP

address you wish to use.

QUESTION 88
Which of these represents an IPv6 link-local address?

A. FE80::380e:611a:e14f:3d69
B. FE81::280f:512b:e14f:3d69
C. FEFE:0345:5f1b::e14d:3d69
D. FE08::280e:611:a:f14f:3d69

Answer: A
Explanation:
In the Internet Protocol Version 6 (IPv6), the address block fe80::/10 has been reserved for link-local unicast addressing. The actual link local addresses are assigned with the prefix fe80::/64. They may be assigned by automatic (stateless) or stateful (e.g. manual) mechanisms.

QUESTION 89
The network administrator is asked to configure 113 point-to-point links. Which IP addressing scheme defines the address range and subnet mask that meet the requirement and waste the fewest subnet and host addresses?

A. 10.10.0.0/16 subnetted with mask 255.255.255.252
B. 10.10.0.0/18 subnetted with mask 255.255.255.252
C. 10.10.1.0/24 subnetted with mask 255.255.255.252
D. 10.10.0.0/23 subnetted with mask 255.255.255.252
E. 10.10.1.0/25 subnetted with mask 255.255.255.252

Answer: D
Explanation:
We need 113 point-to-point links which equal to 113 sub-networks < 128 so we need to borrow 7 bits (because 2^7 = 128).
The network used for point-to-point connection should be /30.
So our initial network should be 30 ?7 = 23.
So 10.10.0.0/23 is the correct answer.
You can understand it more clearly when writing it in binary form:
/23 = 1111 1111.1111 1110.0000 0000
/30 = 1111 1111.1111 1111.1111 1100 (borrow 7 bits)

QUESTION 90
A Cisco router is booting and has just completed the POST process. It is now ready to find and load an IOS image. What function does the router perform next?

A. It checks the configuration register.
B. It attempts to boot from a TFTP server.
C. It loads the first image file in flash memory.
D. It inspects the configuration file in NVRAM for boot instructions.

Answer: A
Explanation:
Default (normal) Boot SequencePower on Router - Router does POST - Bootstrap starts IOS load - Check configuration registerto see what mode the router should boot up in (usually 0x2102 to read startup-config in NVRAM / or 0x2142 to start in "setup-mode") - check the startup-config file in NVRAM for boot-system commands - load IOS from Flash.

QUESTION 91
Refer to the exhibit. What is the meaning of the output MTU 1500 bytes?

```
Router# show interfaces ethernet 0
Ethernet0 is up, line protocol is up
Hardware is QUICC Ethernet, address is 00c0.ab73.dead (bia 0010.7bcc.7321)
MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
<output omitted>
```


A. The maximum number of bytes that can traverse this interface per second is 1500.
B. The minimum segment size that can traverse this interface is 1500 bytes.
C. The maximum segment size that can traverse this interface is 1500 bytes.
D. The minimum packet size that can traverse this interface is 1500 bytes.
E. The maximum packet size that can traverse this interface is 1500 bytes.
F. The maximum frame size that can traverse this interface is 1500 bytes.

Answer: E
Explanation:
The Maximum Transmission Unit (MTU) defines the maximum Layer 3 packet (in bytes) that the layer can pass onwards.

QUESTION 92
On a corporate network, hosts on the same VLAN can communicate with each other, but they are unable to communicate with hosts on different VLANs. What is needed to allow communication between the VLANs?

A. a router with subinterfaces configured on the physical interface that is connected to the switch
B. a router with an IP address on the physical interface connected to the switch
C. a switch with an access link that is configured between the switches
D. a switch with a trunk link that is configured between the switches

Answer: A
Explanation:
Different VLANs can't communicate with each other , they can communicate with the help of Layer3 router. Hence , it is needed to connect a router to a switch , then make the sub-interface on the router to connect to the switch, establishing Trunking links to achieve communications of devices which belong to different VLANs.
When using VLANs in networks that have multiple interconnected switches, you need to use VLAN trunking between the switches. With VLAN trunking, the switches tag each frame sent between switches so that the receiving switch knows to what VLAN the frame belongs. End user devices connect to switch ports that provide simple connectivity to a single VLAN each. The attached devices are unaware of any VLAN structure.
By default, only hosts that are members of the same VLAN can communicate. To change this and allow inter-VLAN communication, you need a router or a layer 3 switch.
Here is the example of configuring the router for inter-vlan communication RouterA(config)#int f0/0.1
RouterA(config-subif)#encapsulation ?
dot1Q IEEE 802.1Q Virtual LAN
RouterA(config-subif)#encapsulation dot1Q or isl VLAN ID RouterA(config-subif)# ip address

x.x.x.x y.y.y.y

QUESTION 93
Which command displays CPU utilization?

A. show protocols
B. show process
C. show system
D. show version

Answer: B
Explanation:
The "show process" (in fact, the full command is "show processes") command gives us lots of information about each process but in fact it is not easy to read. Below shows the output of this command (some next pages are omitted)

```
Router#show process
CPU utilization for five seconds: 0%/0%; one minute: 0%; five minutes: 0%
 PID QTy       PC Runtime (ms)     Invoked    uSecs     Stacks TTY Process
   1 Cwe 6048DB4C           0           1        0 5604/6000   0 Chunk Manager
   2 Csp 604BCD68           0          15        0 2632/3000   0 Load Meter
   3 M*         0          28          20   140010724/12000  0 Exec
   5 Mwe 61496B84           0           1        023460/24000  0 EDDRI_MAIN
   6 Lst 6049C5E4          88          10     8800 5632/6000   0 Check heaps
   7 Cwe 604A2754           0           1        0 5592/6000   0 Pool Manager
   8 Mst 603D219C           0           2        0 5580/6000   0 Timers
   9 Mwe 600245DC           0           2        0 5584/6000   0 Serial Backgroun
  10 Mwe 602D6BB4           0           2        0 5680/6000   0 IPC Dynamic Cach
  11 Mwe 602CEF94           0           1        0 5636/6000   0 IPC Zone Manager
  12 Mwe 602CECF4           0          75        0 5708/6000   0 IPC Periodic Tim
  13 Mwe 602CEC3C           4          77       51 5624/6000   0 IPC Deferred Por
  14 Mwe 602CEDA8           4           1     4000 5596/6000   0 IPC Seat Manager
  15 Mwe 603A4900           0           2        0 5576/6000   0 AAA high-capacit
  16 Mwe 60547C2C           0           1        011604/12000  0 OIR Handler
  17 Msi 60572C2C           0           4        0 5600/6000   0 Environmental mo
  19 Mwe 6057B190           4           5      800 5588/6000   0 ARP Input
  20 Mwe 6079D838           0          19        0 5660/6000   0 HC Counter Timer
  21 Mwe 6081D4A0           0           2        0 5576/6000   0 DDR Timers
  22 Lwe 60A9AE28           0           3        0 5532/6000   0 Entity MIB API
  23 Mwe 613B56A0           0           2        0 5584/6000   0 ATM Idle Timer
```

A more friendly way to check the CPU utilization is the command "show processes cpu history", in which the total CPU usage on the router over a period of time: one minute, one hour, and 72 hours are clearly shown:

+ The Y-axis of the graph is the CPU utilization.+ The X-axis of the graph is the increment within the period displayed in the graph
For example, from the last graph (last 72 hours) we learn that the highest CPU utilization within 72 hours is 37% about six hours ago.

QUESTION 94
What two things will a router do when running a distance vector routing protocol? (Choose two.)

A. Send periodic updates regardless of topology changes.
B. Send entire routing table to all routers in the routing domain.
C. Use the shortest-path algorithm to the determine best path.
D. Update the routing table based on updates from their neighbors.
E. Maintain the topology of the entire network in its database.

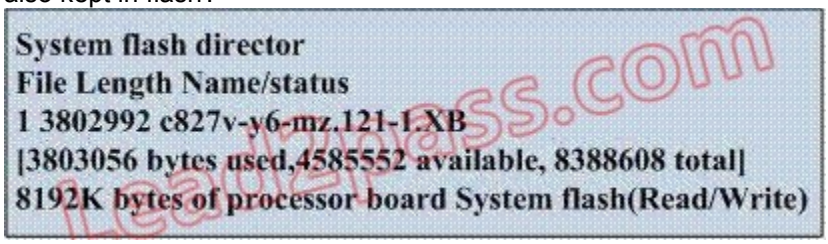
Answer: AD
Explanation:
Distance means how far and Vector means in which direction. Distance Vector routing protocols pass periodic copies of routing table to neighbor routers and accumulate distance vectors. In distance vector routing protocols, routers discover the best path to destination from each neighbor. The routing updates proceed step by step from router to router.

QUESTION 95
Which command is used to display the collection of OSPF link states?

A. show ip ospf link-state
B. show ip ospf lsa database
C. show ip ospf neighbors
D. show ip ospf database

Answer: D
Explanation:
The "show ip ospf database" command displays the link states. Here is an example:
Here is the lsa database on R2.
R2#show ip ospf database
OSPF Router with ID (2.2.2.2) (Process ID 1)
Router Link States (Area 0)
Link ID ADV Router Age Seq# Checksum Link count2.2.2.2 2.2.2.2 793 0x80000003 0x004F85 210.4.4.4 10.4.4.4 776 0x80000004 0x005643 1111.111.111.111 111.111.111.111 755 0x80000005 0x0059CA 2133.133.133.133 133.133.133.133 775 0x80000005 0x00B5B1 2 Net Link States (Area 0)
Link ID ADV Router Age Seq# Checksum10.1.1.1 111.111.111.111 794 0x80000001 0x001E8B10.2.2.3 133.133.133.133 812 0x80000001 0x004BA910.4.4.1 111.111.111.111 755 0x80000001 0x007F1610.4.4.3 133.133.133.133 775 0x80000001 0x00C31F

QUESTION 96
Refer to the exhibit. The technician wants to upload a new IOS in the router while keeping the existing IOS. What is the maximum size of an IOS file that could be loaded if the original IOS is also kept in flash?



A. 3 MB
B. 4 MB
C. 5 MB
D. 7 MB
E. 8 MB

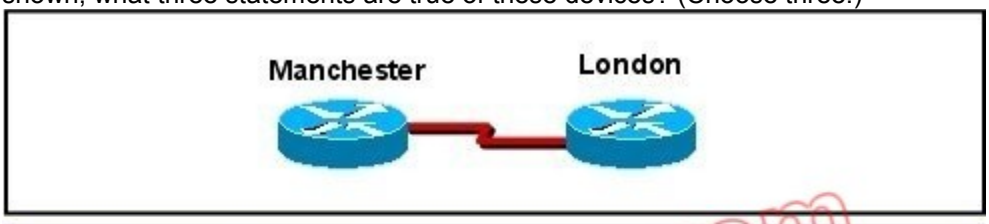
Answer: B
Explanation:
In this example, there are a total of 8 MB, but 3.8 are being used already, so another file as large as 4MB can be loaded in addition to the original file.

QUESTION 97
If IP routing is enabled, which two commands set the gateway of last resort to the default gateway? (Choose two.)

A. ip default-gateway 0.0.0.0
B. ip route 172.16.2.1 0.0.0.0 0.0.0.0
C. ip default-network 0.0.0.0
D. ip default-route 0.0.0.0 0.0.0.0 172.16.2.1
E. ip route 0.0.0.0 0.0.0.0 172.16.2.1

Answer: CE
Explanation:
Both the "ip default-network" and "ip route 0.0.0.0 0.0.0.0 (next hop)" commands can be used to set the default gateway in a Cisco router.

QUESTION 98
Refer to the exhibit. The two exhibited devices are the only Cisco devices on the network. The serial network between the two devices has a mask of 255.255.255.252. Given the output that is shown, what three statements are true of these devices? (Choose three.)




```
Manchester# sh cdp entry *
----------------------
Device ID: London
Entry address (es):
  IP address: 10.1.1.2
Platform: cisco 2610, Capabilities: Router
Interface: Serial0/0, Port ID (outgoing port): Serial0/1
Holdtime : 125 sec

<output omitted>
```


A. The Manchester serial address is 10.1.1.1.
B. The Manchester serial address is 10.1.1.2.
C. The London router is a Cisco 2610.
D. The Manchester router is a Cisco 2610.
E. The CDP information was received on port Serial0/0 of the Manchester router.
F. The CDP information was sent by port Serial0/0 of the London router.

Answer: ACE
Explanation:
From the output, we learn that the IP address of the neighbor router is 10.1.1.2 and the question stated that the subnet mask of the network between two router is 255.255.255.252. Therefore there are only 2 available hosts in this network (22 ?2 = 2). So we can deduce the ip address (of the serial interface) of Manchester router is 10.1.1.1 -> The platform of the neighbor router is cisco 2610, as shown in the output -> Maybe the most difficult choice of this question is the answer E or

F. Please notice that "Interface" refers to the local port on the local router, in this case it is the port of Manchester router, and "Port ID (outgoing port)" refers to the port on the neighbor router.

QUESTION 99
Which parameter would you tune to affect the selection of a static route as a backup, when a dynamic protocol is also being used?

A. hop count
B. administrative distance
C. link bandwidth
D. link delay
E. link cost

Answer: B
Explanation:
By default the administrative distance of a static route is 1, meaning it will be preferred over all dynamic routing protocols. If you want to have the dynamic routing protocol used and have the static route be used only as a backup, you need to increase the AD of the static route so that it is higher than the dynamic routing protocol.

QUESTION 100
Refer to the exhibit. A network associate has configured OSPF with the command:
City(config-router)# network 192.168.12.64 0.0.0.63 area 0
After completing the configuration, the associate discovers that not all the interfaces are participating in OSPF. Which three of the interfaces shown in the exhibit will participate in OSPF according to this configuration statement? (Choose three.)

City#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	192.168.12.48	YES	manual	up	up
FastEthernet0/1	192.168.12.65	YES	manual	up	up
Serial0/0	192.168.12.121	YES	manual	up	up
Serial0/1	unassigned	YES	unset	up	up
Serial0/1.102	192.168.12.125	YES	manual	up	up
Serial0/1.103	192.168.12.129	YES	manual	up	up
Serial0/1.104	192.168.12.133	YES	manual	up	up

City#

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

Answer: BCD
Explanation:
The "network 192.168.12.64 0.0.0.63 equals to network 192.168.12.64/26. This network has:
+ Increment: 64 (/26= 1111 1111.1111 1111.1111 1111.1100 0000) + Network address: 192.168.12.64

+ Broadcast address: 192.168.12.127
Therefore all interface in the range of this network will join OSPF.